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SCIENCE AND CHRISTIAN APOLOGETIC

By

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SYNOPSIS

Science, which is a human activity with a distinctive approach of its own, has a prestige which is both great and well-deserved. Yet its method and results often appear to be in conflict with the approach and content of Christian faith. This conflict, which is real enough to many thinking people, arises not from the inherent nature of science and faith respectively, but rather from the imperfections of our fallen personality, imperfections both of will and of understanding. So long as these remain the conflict will be a source of inner tension. However, these considerations apart, the methodology of science provides very weighty and powerful arguments for the validity of the historic Christian attitude to revelation and to life. While we must recognize that science is a partial activity of man, limited by the *observer*-attitude; while faith is an activity in which man must be a *partaker*, and as a totality (Mark 12: 30), it still remains that there are close parallels between them. In both man must necessarily start with presuppositions, beliefs, taken for granted. In both, knowledge of Reality is founded not on reason, but on perception. The attitude of both the scientist and the conservative Christian to authority is very similar; science is one of man's most authoritarian pursuits. Certainty in each arises from analogous grounds; though in faith it springs from a deeper and more fundamental level. The disparagement that while science gives certain " proof ", faith yields something far less ultimate is a reflection rather on human nature. Finally, both encounter the element of startling paradox. Even within the confines of a single department—physics—Science has had to reconcile, what, for centuries, seemed sheer contradictions. Christian Apologetic should not wonder, therefore, if in its far wider sphere, it meets the same situation.

1.1. Of all the influences that have contributed to fashion the mind of twentieth-century western man that of science is surely one of the most predominant. Its range is all-pervasive; not only do the fruits of scientific research meet us at every turn in our domestic and public lives, their very use requiring of us and confirming in us a scientific twist of mind; but even when the immediate results of scientific inquiry are too intangible or abstruse to make an immediate practical impact on us—as for instance in the case of cosmological theory—they nevertheless excite a fascination and a respect which enhances in its turn the prestige of Science, or more precisely, of the scientific method and approach. Thus from both points of view, oriented towards the twin domains of Applied Science and pure Science, respect for the achievements of the scientific

approach is forced upon us, and few escape being, in certain contexts quite overwhelmed by it.

Now the purpose of this paper is certainly not to belittle science. In all fairness we must admit that the invention of the scientific method has been one of the greatest intellectual achievements of man. To many at the present day this may hardly seem so—after all, isn't science often described as just " organized common sense? " How then can we regard its procedure as anything other than ordinary? The truth, however, is that we have been conditioned so thoroughly by the scientific way of looking at things that many of us can scarcely even imagine another way of doing so. But so far is the scientific method from being obvious, that for many centuries it never occurred to the mind of man. The Chinese and the Indians, broadly speaking, never thought of it; and it was left to arise, almost accidentally, among the numerically weak and insignificant populations of the Greek islands. It is with the scientific method as with our use of Arabic numerals; familiarity has in one sense bred contempt, and we fail to realize what a tremendous intellectual advance was signalled by the invention of each.

The relevance of this to our present subject is obvious. Science not only possesses an immense prestige in the eyes of twentieth-century man; it is a *justified* prestige. Science is a really big thing; it deserves the respect it has. Both facts are of importance to us. The thesis of this paper is that the practice and progress of science form a very helpful and illuminating analogy for Christian apologetic. But were the prestige of science not justified the analogy would be worthless or positively harmful; were it not also widely accepted it would be futile. As it is both, we may reasonably hope that any valid parallels drawn between the life of the scientist on the one hand, and of the Christian believer on the other, will be both arresting and effective.

1.2. To these considerations we may add a further one. Rightly or wrongly, very many people to-day regard science and religion as mutually antagonistic. In a limited and very special sense this is undoubtedly true; but in the sense in which the antagonism is ordinarily understood it is not true—at least that is our present thesis. This misconception however, if such it can be shown to be, challenges us in two ways: firstly it constitutes an additional incentive to clarify the relation between the approaches of science and Christian faith, for the double advantage may be gained of proving science not merely not an adversary, but rather a positive friend; and secondly, it carries with it a warning that in the real interests of our Christian faith we must never, for the sake of apparent immediate advantage fall into the snare of dishonest argument. The author speaks from experience; it is perilously easy to try at all costs, with our tongue in our cheek, to enlist the authority of science on our side by arguments that we know in our hearts would never bear the light

of informed criticism. It may be that if we are honest, we shall have to concede that science appears directly opposed to our faith; but to do so is far more likely in the long run to establish our cause than if we obstinately cling to arguments which do not carry conviction even to ourselves. All life contains the element of paradox, the apparent head-on contradiction. The inner life of science is no exception to this rule, nor is the still wider life which embraces science and other disciplines as part. But the very forceful argument which can be drawn from this fact is entirely lost if we stubbornly refuse to admit paradox. When all is said and done science and Christian faith will still for a long time confront one another with apparently contradictory assertions. Let us accept the probability of this in advance; there we shall be saved from the impossible and damaging position of having to reject on principle, a position for which possibly science can offer very solid evidence.

2.1. *The Characteristics of Science*

We must begin our considerations by endeavouring to get an adequate idea of what we mean by science. To begin with, the term is apt to mislead. In the minds of many " Science " is almost a personal being, like the Greek goddess Athene, presiding over a realm of human endeavour. This sort of idea arises very naturally from our way of speaking— " Science fights superstition ", " Science conquers disease ", " Science has immensely enriched life ". These are common expressions, and unconsciously they condition our minds to thinking of science as a sort of Entity existing in its own right, and very often semi-personified. A man serves the cause of " Science ". Of course, a moment's reflection shows that this personification of science ought to be regarded as a mere figure; but so fundamentally is the idea of God implanted in man's nature that except where God is consciously present to his thoughts ideas like Science, or Evolution, or the State or Reason tend to find themselves—permit the expression—gravitating into that category, and becoming almost deified.

We must therefore free ourselves from this verbal tangle at the outset When science is set in opposition to Christian faith what is meant is one of two things: either, that the *results* of scientific inquiry, its established facts, are at variance with the assertions of Christian faith (for instance, that drought is due to physical causes, not to Divine displeasure); or that the *method* of scientific inquiry is capable of leading man into all truth; all the truth, that is, essential to his fulfilment stated like this, Science does not appear as an Entity; and the subject of our discussion takes the form of a comparison between the scientific method, and in a subsidiary sense its results, and the practice of the Christian in the realm of the spiritual life. Whenever the word " science " is used, therefore, it must be understood in this sense; man is the entity, science is a method and result of his activity.

What are the characteristics of the scientific method? In the very broadest sense it is conditioned and in part defined by a particular human attitude, the observer-attitude. The characteristic of this is that, as far as possible, the man remains outside the situation he is studying. He is an observer only, and in moments of reflection is at once conscious of his " outsideness ", as a position deliberately taken up. In this sense we can speak truly of the scientific study of history, or art, or religion, no less than of nature. This " outsideness " constitutes both the strength and the weakness of science; its strength, for it means that science connotes impartiality and universality, its results being without personal bias and therefore acceptable equally to all; and its weakness, for it excludes science for ever from the battleground where the real conflicts of human life are fought out.

But the observer-attitude is only a definition in part; it covers only the collection of material. The scientific method implies also a rational element, for the collection of facts is followed by their logical arrangement into an ordered body of knowledge; and here again the approach of science can be directed towards any department of human life. If science has limitations (and it clearly has), they belong to its method, not to its subject matter.

Different sciences, of course, are distinguished in both the above respects. They employ different methods for gathering their facts, different modes of observation; and they differ in the way in which they attempt to relate these facts together. At this point however we shall narrow our conception of science rather drastically, both for reasons of space and also for reasons of clarity. We shall confine the rest of this discussion to the natural sciences, such as physics, chemistry and biology; but in doing so we shall gain far more than we shall lose. On the one hand it is probably true to say that, to the average man the prestige of science belongs mostly to the natural sciences; on the other hand there is about them something tangible and immediate which does not at once make its appeal with the others (such as history or psychology). But the analogy will hold with these also, if suitable changes are made in terminology and emphasis; the narrowing down is therefore more apparent than real.

2.2. *Nature of Scientific Activity*

From now on therefore, " scientific " refers to the natural sciences. The method of fact-gathering here is by means of observation with the physical senses, pre-eminently vision. Following this descriptive stage comes the explanatory one, the attempt to relate facts together in terms of physical cause and effect. This involves the invention of hypotheses and theories, and this again is followed by a final appeal to observation —again sense-observation is meant—to see if consequences logically derived from the hypotheses correspond to facts.

There are several highly suggestive elements in this pattern of scientific procedure, but before we enlarge on them it will be useful to consider an analogy, in simple terms, of the nature of scientific activity. It is due, I believe, to the Cambridge physicist, the late Sir Arthur Eddington. According to him the scientist is like a child sitting before a box containing the pieces of a jig-saw puzzle. He removes the curiously shaped pieces one-by-one, and looks at them carefully. They correspond to the facts of observation of the scientist. Sometimes they appear to stand quite in isolation; at others the child sees sooner or later that the piece he has just picked up can be fitted into what is evidently its proper place on the edge of a section of the picture already built up. On the scientific side of the analogy we say that the new observation had been " explained " in terms of older and more familiar ones, facts which have already been brought together into an ordered group by means of an hypothesis. Such an hypothesis in the case of the puzzle, might take the form of a suggestion that particular dark lines on certain pieces really represent parts of a cart-wheel, and the child hopes to build up the complete picture with the help of such suggestions. Thus to the scientist hopes to arrive at a unified picture of physical nature with the help of hypothesis such as relativity or the leafy nature of floral organs, suggestions which individually help him to unify particular and restricted groups of observations.

2.3. *Relevance to the Activity of Faith*

Now what is the relevance of this picture of scientific activity to the life of faith? How can we argue from the validity of the scientific approach to that of the Christian believer? The points of resemblance are in fact numerous and weighty. Let us take them in order.

One of the criticisms levelled against Christian faith is that it requires a position of fundamental importance to be taken for granted. Something of supreme moment must be " believed ". No proof is offered, nor, it is beginning to appear, can one be offered. This, it is argued, is a state of affairs inacceptable to intellect and reason, and certainly it is a sore point with many young objectors trained to think scientifically. The objection is often quite sincerely held; " Science teaches us to take nothing for granted but to test every hypothesis; and here at the very outset of the Christian life we are required to take on trust a position so fundamental that should it prove untenable, the entire fabric erected on it would come down in ruins." This seems to many to be an unreasonable requirement for a rational being; and even before the advent of modern science the objection was evidently felt to be so weighty that immense efforts were made by Christians—like Ambrose and Thomas Aquinas—to erect irrefutable arguments in support of this basic article; I refer, of course, to that which asserts the existence of God. All such arguments have failed to carry conviction, and we are back where we were before.

When we turn to science, however, we find a strikingly similar state of affairs. The scientist picks out, one after another, the fragments of the puzzle. He may spend his entire life looking for the connections of a single obstreperous piece, only to fail. But unless he is a quite unusual sort of scientist he never pauses to ask, " Am I sure that all the pieces belong to *one* puzzle? " In spite of his domestic experience—if he is a father—he maintains an unshakeable conviction that the puzzle is all of one piece, and that every genuine observation has its place in a single unified pattern. He does more; for he not only entertains this conviction, he is also persuaded that the single pattern is of such a sort as to be intelligible, capable of being " spotted " by himself; that is, with his human faculties.

Now these two presuppositions, of the Unity and Intelligibility of physical nature, are closely similar to the presuppositions of the Christian life so clearly expressed in Heb. 11: 6. In proportion as they are strongly held, scientific inquiry is vigorously pursued; where they are seriously questioned, to that extent the intellectual impulse of science dies; where they are genuinely disbelieved, no real science is possible at all. They are entirely fundamental to the life of science. Yet neither is susceptible of proof *a priori*. They can only be demonstrated as increasingly probable *a posteriori*. Nor is either self-evident. Where polytheism or animism reigns men would hardly expect unity in natural phenomena; and where the gods are capricious they would hardly expect intelligibility. If it is not true that polytheism is self-evidently false, neither can it be true that the presuppositions of science are self-evidently true. For the scientist no less than for the Christian, the foundations of his life must be taken for granted; he that comes into the laboratory must believe that there is a single pattern in nature, and that it will be rewarding to seek it. For to live without presuppositions is the prerogative of Absolute Being, not of the Creature. Christian faith therefore, rightly involves the element of presupposition.

2.4. *The Knowledge of Reality*

There are two categories, the occupants of which cannot be defined; will o' the wisps, and concrete realities. The former cannot be defined, enclosed in words, because of their indefiniteness; they *evade* definition. The latter cannot be defined just because of their concreteness; they *transcend* definition. Thus the abstract idea " table " can be defined; the concrete reality, " *this* table ", cannot. It is important to recognize that Faith cannot really be defined not because it is indefinite, but because it is concrete. This is shown by the fact that many very definite things can nevertheless be said about it; its concreteness means that there is no end to them.

We have just seen that one thing that can be said about Faith is that it involves presupposition; we now come to another of its aspects.

Unlike many branches of mathematics, science is concerned with reality, with the real world. The scientist is not interested in geometries as such as the mathematician is; he wants to know which geometry fits the facts of nature. This concern with reality is a very obvious characteristic of science; but at the moment we merely want to ask—In his approach to the knowledge of the real world, what constitutes the first and basic step? There was a time when men believed that in this quest reason by itself was adequate. The early philosophers were rationalists in this sense. They believed that from their arm-chairs—or their early equivalent—logical inquiry would enable them to establish the nature of reality. The rise of science put an end to this attitude. Nature's laws were not necessary laws, deducible by reason; they were contingent, they might have been otherwise, and their form could only be discovered by observation. Thus it came about that in the search for real knowledge, the recognition dawned that perception must take the first place, reason the second. Only when perception has acquainted her with the facts can reason proceed to weave them into her description of the real world. The doctrine of the self-sufficiency of reason can now be of interest to those alone who are concerned with fantasies.

It is at this point that the procedure of science is again of interest to the Christian. Faith is often considered to be in antithesis to reason: As Watts says:

> " Where reason fails with all its powers
> There faith prevails and love adores."

It is hardly a fair criticism of Watts, but it can be pointed out that in Scripture faith is set in antithesis, or is compared, not to reason, but to sense:

" We walk by faith, not by sight."[1]

" Moses endured, as seeing Him who is invisible."[2]

" God who commanded light to shine out of darkness, hath shined in our hearts. . . ."[3]

" Except a man be born again, he cannot see the Kingdom of God."[4]

" The hearing of faith."[5]

In all these passages there is a clear reference to faith under the metaphor of one or other of the physical senses. Faith in other words possesses the aspect of perception; it is " new eyes "; once we were blind, now we see. " He that followeth me shall not walk in darkness "[6] expresses the same truth; so does " The dead shall hear the voice of the Son of God."[7] It would hardly be too much to say that the contact, by faith, of the believer with Christ is spoken of metaphorically in Scripture under the image of every one of the five senses.[8]

Now that is the significance of this to our inquiry? Briefly it is this. It means that when Scripture asserts that the " righteousness of God is

[1] II Cor. 5: 7. [2] Heb. 11: 27. [3] II Cor. 4: 6. [4] John 3: 3. [5] Gal. 3: 2.
[6] John 8: 12. [7] John 5: 25. [8] See e.g. I John 1: 1. Ps. 45: 8. Cant. 2: 3.

revealed from faith to faith "[1] rather than that it is discoverable by reason, it is only saying the same sort of thing as that which science has already concluded holds in the physical realm; perception must precede reason if we would gain contact with reality, and not merely entertain fantasies of our own devising. But perception is merely one pole; in a sense it means nothing more than the being open to receive impressions. The other pole, without which perception is unfulfilled, is revelation. Unless the table makes an approach to me, reveals itself, through the medium of light my eye does not see it, and can, in fact, do precisely nothing about it; and unless God reveals Himself to my faith through the medium of Spirit, I must for ever remain ignorant of Him. I can never by searching find Him out. Where then does reason enter? It comes in of course afterwards, just as in science. When faith has apprehended spiritual truth reason has still to work out its implications, or reconcile truth with truth; and the Bible places no premium on mental laziness. But again it belongs to our very status as creatures that spiritual perception, with its complement of revelation, should have the primacy over reason; and any attempt to formulate rationally a " religion without revelation " not only runs counter to the intuitions of the great majority of men but finds no support from the experience of science.

2.5. *Certainty in Science and Religion*

Of course, it is not intended to imply that the parallel between faith as a mode of perception and the physical senses is a perfect one. It is sometimes said that no analogy is perfect, but that is merely a tautology; were it perfect it would no longer be an analogy, but an identity. Faith has profound differences from sight; but so has sight from hearing. One difference is that faith, in the Biblical sense, is very much less a universal characteristic of men than is sight; and it is to this fact that we must attribute a situation often emphasized to the disparagement of Christian belief. Science, it is maintained, yields assured results, perfect certainty. Everyone knows that sugar dissolves in tea; if he doesn't, he can easily ascertain it for himself and all controversy will end. But in matters of religion, where faith is involved, it is far different. Except for obvious aberrations, there is only one science the world over; but there are numerous great religions. Even where differences of opinion do exist among scientists they are essentially temporary, for the procedure of science contains within itself the element of self-correction. In its final appeal to observation it possesses a technique which, applied consistently and with ability, is ultimately infallible. Only if " science " repudiates the scientific method can it land in permanent error. Can anything comparable be said for religion?

There are several things to be said in answer to this criticism. In the first place the certainty of science is hardly so cast-iron as it appears. It

[1] Rom. 1: 17.

is based, of course, on the reliability of our sense-observations. But what we see, for instance, may be mirage, illusion or hallucination. Even if it be argued that hallucinations are rare among scientists actually engaged in their work it is still true that the other two categories, or something like them, are exceedingly common. Every time we see a simple reflection we have to recognize that we are confronted with an observation we cannot accept at its face value; there isn't a chair the other side of the mirror. It may be impatiently objected to this that of course any reasonable person knows how to interpret such a situation; but the fact is that reason has little to do with it. A Cambridge professor of logic who had never seen a shiny surface in his life would undoubtedly be fooled; and even a dog will in turn learn that there is not another dog behind the glass. Once we are outside the realm of the familiar the difficulty of interpreting sense impressions becomes at once obvious, as every high-power microscopist knows. The fact is that we have formulated a working series of rules-of-thumb, by the use of which we more-or-less unthinkingly decide whether we can accept our observations at their face value. But they remain rules-of-thumb, formulated—unconsciously as a rule—as a result of experience and not of logic, and liable on occasion (witness the controversy about flying saucers) to prove inadequate. Into these rules enter such diverse elements as the " majority opinion " of our senses and of occasions, our distance from our object, the weighted opinion of others, subjective calculations of probability, and a whole complex of considerations elaborated by reason. Experimentally of course, it is found that by-and-large our arbitrary rules of decision do lead to general agreement, and that is their justification. But it can hardly be maintained that the " facts " of science are of cast-iron certainty. Mass hypnotism does occasionally occur.

In the second place it can be pointed out that Christian certainty does follow, to quite a large degree, the analogy of science. According to Scripture we are members one of another; we are never intended to function in isolation. The Christian's certainty does, therefore, to some extent (just as the scientist's) depend on the fact that others believe as he does. Did no one else but he in all history believe in Christ as Divine there would be a grave doubt whether this belief of his was not indicative of obstinacy rather than of insight, for the Divinely-established solidarity of the human race must mean that all truth, whether scientific or religious, must be to some extent public property, in actuality no less than in potentiality. Thus the element of the agreement of opinion, in distinguishing fantasy from fact, has a place here also. Admittedly it should not be over-emphasized; but then neither should it be in science. The element of individual training is important in both spheres; the trained microscopist can see a reality which very many inexperienced observers fail to see, and the man who, like Abraham has walked all his life with God has an insight into Divine realities which the casual majority may repudiate.

What is important for our purposes is that the basis of certainty in both cases includes the element, not of logical inescapability, but of agreement of opinion.

2.6. *The Moral Question.*

Here however we run up against a distinction. It applies in two ways. Faith operates in the moral sphere; the physical senses do not. A bad man can read a thermometer, and his badness has no direct relevance to the observation he makes. We should be surprised if he observed anything differently from a good man, always supposing he is a capable scientist. But the same is not true in the spiritual sphere. The Scriptures make plain that a mean man sees God, if he sees Him at all, as mean; the merciful man as merciful, and so on. " Thou thoughtest that I was altogether such an one as thyself." Certainly this state of affairs has its analogy in the realm of science, for the imperfect eye sees things as deformed, or only in monochrome; whereas the perfect eye sees them complete. But the moral sphere of faith has a very important difference from the physical sphere of sense. Men have a vested interest in seeing things correctly, and in hearing them distinctly, and this gives them a decided inclination to do so by all means in their power. That is why they wear spectacles and use deaf aids. But, as Scripture declares and as experience only too often corroborates, these same men rarely feel the inclination at all costs to attain moral uprightness. Where they appear to do so, all that is frequently indicated is a perverse desire to attain one virtue at the expense of another—the pursuit, shall we say, of honesty (for respectability's sake) at the cost of disinterestedness. " Light is come into the world, and men loved darkness rather than light."[1] The result of this is that clear-sighted faith is much less universal among men than clear-sighted vision, and the majority rules which the scientist applies, albeit unconsciously, to determine the status of his observations cannot be employed to anything like the same extent. It is this more than anything else that means the exchange of the universally accepted and agreed conclusions of primary scientific data—the existence of which is one of the chief glories of science—for the hazy notions and conflicting opinions that so dominate the world of religion. Yet the Biblical emphasis is certainly reflected by Bunyan; the man who will faithfully follow " yonder shining light " will inevitably come to the wicket gate; and if only sufficient men would do this, Christian conviction believes that the whole question of certainty would begin to appear in religion very much as it does in science. In so far as men are disposed to cast reflections on the life of faith as affording shallower degrees of certainty than the life of science they are really casting reflections on human kind. Scientific truth if open to the curious; Christian truth only to the obedient.

[1] John 3: 19.

2.7. *The Voice of Conscience*

There is a further thing however which must be said while we are discussing this question of the relation between the moral and the physical spheres. From what might be called the external, public point of view faith offers, for the reasons just given, less certainty than sight. This gives the advantage to science. But from the inward, personal point of view the tables are turned completely. The advantage lies decisively with faith. The reason for this resides in the unique nature of moral experience. In the realm of science, a conclusion may be established with the utmost rigour of logic, but that does not mean to say that I shall experience it as a compelling force in my life. I can turn away from it with considerable facility and decide that it has interested me enough. In doing so I do not open any cracks in the structure of my personality; I do not start a process of inner disintegration. But in the realm of faith the matter is far different. Conscience steps in to enforce the conclusion and demand a decision. It has a finality, an intolerance about it that I cannot escape, and if I refuse and turn away a disintegrating influence at once sets to work. " I ought " arises as a new conception, unknown in science. Science is abstract; it touches part only of that totality which is a man, and among the elements in his nature which are left untouched are conscience and the will to obey. This follows at once from the fact that science is defined by the observer attitude, for obedience clearly means more than seeing or hearing. " I go sir; but he went not." But faith is concrete; it touches the total life, and the truths which faith knows cannot be known by any sort of observation alone, but only when the will to obey is present. " If any man willeth to do God's will he shall know."[1] And this fact means that to the obedient man faith's certainty, when it comes, rises from a far deeper level than that of science. Not only his physical senses, but the voice of conscience and of every other element in his nature adds its Amen to it; and he becomes profoundly conscious of a unifying and integrating influence in his total personality. It is a " making whole ". This may make his certainty appear like irrational pig-headedness to an outsider; but in measure it is surely a universal experience of men of faith in all times and places.

3.1. *Science and Authority*

We must now turn to another topic altogether, that of the place of authority in science and faith. This may be particularly relevant to those of us who hold the historic Christian view of Scripture; but to every type of outlook the problem of the seat of authority is a pressing one. Man is a creature, he is not self-existent. He did not choose when or whether he should come into existence, and the essential nature of his earthly environment is altogether beyond his control. Yet he has

[1] John 7: 17 R.V.

freedom, an endowment which the profoundest thinkers, such as Dostoievsky and Schweitzer, have recognized as his greatest burden. Why? Because even here where genuine freedom exists it encounters the fact of obligation; even when man *can* do what he likes he has to consider whether he *may*.

Thus in the physical sphere man confronts "givenness"; his life is given him, and he finds he has to live it in an environment the form and pattern of whose behaviour is given. His science may discover its laws and teach him to use them; but he can do nothing to change them. He has to accept that his gastric juices will attack the last meal he had; he is immediately conscious that the chemical behaviour within him follows a pattern independent of his will. In the spiritual realm he is, it is true, conscious of freedom, and only sophistry would lead him to deny it; but even in the presence of freedom he is compelled to recognize a givenness, a law he cannot alter. Conscience confronts him; only now he has the power to disobey.

In the realms of both science and faith therefore man has to recognize givenness; in other words he has to acknowledge authority. It is because this springs from his very nature as a creature that lawlessness is so entirely disruptive of his personality—it digs it up by the roots. And this in itself confirms the Christian in his conviction that, in every department of his life, submission to rightful authority is a prerequisite of personal fulfilment.

The question however which remains to be answered is, what is rightful authority? And it is here that the analogy of science is of help to the Christian.

Science arose among the Greeks of the little islands of the eastern Mediterranean. Its progress was sometimes fitful, sometimes steady. Eventually it threw up a man of consummate genius, Aristotle, and then for various reasons it began to decline. So great became the prestige of Aristotle that, fostered no doubt by the authoritarian attitude of rulers of church and state the practice became widespread of settling points of dispute in science by appealing to his authority. Other great leaders of science, such as Galen, were revered similarly, and the result was the stagnation of science. For centuries very little advance was made, and it was only when men once again became bold enough to question the rightness of what Aristotle and Galen had said that progress again began. So obvious was the new tempo of advance that the new outlook which arose became firmly established, and to-day the scientist enjoys a cherished tradition of freedom from the shackles of authority from which it would be difficult to separate him. Even when, as has recently happened, political authority asserts itself scientists everywhere instinctively recognize it as an unseemly state of affairs, bound in the long run to strangle science and discredit politics.

Now from this attitude of science to authority—an attitude to which

manifestly science owes its success—it has been argued, for instance by Prof. Huxley, that religion ought to repudiate revelation; only then will it find universal acceptance. Revelation, as something " given ", obviously means authority; hence it must, on the analogy of science, be eschewed. But this surely, is a very shallow view. It has already been argued that science operates in the realm of the givenness of physical nature; revelation, to sense though not to faith, operates in the scientific sphere also. What the experience of science teaches is surely this: not that authority should be repudiated, but rather that the *right* authority should be found and acknowledged. In no sense can the works of Aristotle be said to be fundamentally " given "; it is the pattern of nature which is ultimately given to human experience. Nature therefore is the authority to which science must bow; appeal must be made to observation and experiment to settle points in dispute. In turning from Aristotle and Galen science did not become lawless; it merely submitted to what has proved to be the right authority. That this is a correct interpretation of the situation is clear; for when scientists differ the question as to how the rights and wrongs of the case shall be decided is never for a moment in dispute. Nature shall be interrogated by experiment; all that remains to be decided between them is, How? And if her answer is decisive against one of the disputants he never complains that in the experiment Nature made a slip, or misbehaved, or that some extra-natural agency had inserted a gloss. In so far as he is a true scientist the answer of nature, of experiment, is final; her authority is absolute. Thus it comes about that science, as opposed to art or philosophy, can point to a vast body of universally agreed data. In a dispute as to whether Picasso or Michaelangelo is the greater artist, no final answer can be given; no agreed authority exists to give it. The same is true in philosophy. But in science the case is far different. Of all human disciplines science is the most authoritarian.

3.2. *Authority in Religion*

To the conservative Christian this is an encouraging state of affairs. He recalls that in Psalm 19, and in Romans 1 the Bible supports the idea that physical nature and Scripture are two modes of revelation of the Creator. They are apprehended in different ways. The study of one—in the role of observer—constitutes science. Obedience to the other—in the totality of one's being—constitutes faith. And just as nature, as apprehended by sense, is the authority for science; so scripture, as apprehended by faith, is the authority for religion. Looked at thus, he is not ashamed of the charge of authoritarianism. All he is concerned to ask is, Have I the right authority? How he decides this question is beyond the scope of this paper, but doubtless the attitude of Jesus Christ looms very large in his mind. To him the analogue of the scientific renaissance is not the

modern movement for " religion without revelation "; it is the Protestant Reformation with which, in fact it had historical ties.

Nor is he concerned with the charge that such a view of Scripture means that religion is not a living growing thing, but tied to a " faith once for all delivered to the Saints ". He can point out that there is something in nature which every scientist believes is " once for all ": the fixed pattern of laws to elucidate which he devotes his life. The givenness of Scripture no more means a static theology than the givenness of nature means a static science. Whatever objection can be raised against one can be raised against the other.

3.3. *The " Reformulation " of Christian Doctrine*

Far more than this can, in fact, be derived from our analogy. Scripture does not present us with formulated doctrines, like a theological text; its language is concrete, not abstract. Nor do we find scientific laws written across nature; her language again is concrete. Scientific laws are never once-for-all statements. They are continually subject to revision, though precisely in so far as they are true and accurate for one age they are true for another also. The same is doubtless the case with theological statements. To the conservative Christian the urge to jettison the great creeds is thus to be resisted. In so far as they accurately interpreted experience in the light of Scripture they are just as valid to-day as they were then. Only in those respects in which our experience goes beyond that of the Saints of the past—as the study of high energy particles goes beyond the experience of Newton—only in so far as this is the case should we call for their reformulation. The mere change of intellectual climate and thought forms does not make the inverse square law of gravitation out of date; it is the recognition of a new type of experience, inaccessible to Newton, which does this. The great creeds may indeed require rewording, since words change their meaning; but on the analogy of science those who press for a radical reformulation of Christian belief, in which, shall we say, the ideas of expiatory atonement and justification by faith are no longer represented—those who advocate such a restatement have to show that we now have accessible to us a type of spiritual experience which in the nature of the case St. Paul and St. John could never have known. It is no more adequate here to say that thought-forms have changed than it would be to attribute the rise of Quantum Theory to the same cause. The Analogy of Science and Religion indeed, points rather in the reverse direction. No one can deny that the range of scientific experience open to man since New Testament times is now vastly extended; very few would affirm anything of the sort for spiritual experience. It is to be expected therefore that other things being equal theological statements would have a far more timeless relevance than scientific ones. But other things are not equal; and their inequality, stemming as it does from the distinction between time and eternity,

reinforces the contention. Those who would radically reformulate Christian doctrine find little encouragement therefore from the analogy of science.

4.1. *Plural Explanations*

It would take far more than the compass of the present short paper to deal adequately with the subject of what is meant by the term " explanation ". That this term is understood will therefore have to be taken largely for granted—rather an unsatisfactory state of affairs. In a very obvious way however this question of explanation is of immediate interest in apologetics. As small boys—or girls—we learned that one satisfactory explanation alone was needed to fix the blame and secure punishment for breaking a window pane or doing something else equally reprehensible. If the evidence showed conclusively that *A* did it, no other explanation was admissible. This attitude, obviously justified in such a case, is often carried over within a much wider context. Man has always been more or less puzzled by his experiences, and has accordingly sought for explanations of them. In his earlier history these explanations took the form of myth; later came the scientific treatment in terms of physical cause and effect. It is too obvious to need statement that the scientific programme of explanation has been extraordinarily successful. It has carried all before it in a long range of successful predictions, culminating in the astonishing success of atomic explosions. Science has, moreover, in its advance, often encountered situations and offered explanations for them where other disciples, earlier in the field, had done similarly. It is then an obvious question, which explanation is right? The scientific explanation, as has been discussed earlier, can in principle be very simply put to the test. Further, if established, it confers an immediate power over the material side of experience which has time and time again been put to very great use. Is it any wonder then that many people have jumped to the conclusion that a scientific explanation, once established, renders any other sort of explanation not merely unnecessary, but invalid? If disease is due to germs, why then entertain the idea that it may be due to Satan, or to Divine displeasure? If Newton's Laws of Motion present an adequate explanation of planetary motions, why then bring in God? This at least seems to have been the reaction of Laplace who in reply to Napoleon's query about the place of God in his system replied, " Sir, I have no need of that hypothesis ". And while perhaps not directly formulated in the mind, the idea that only one explanation can be valid does seem to influence many. And the climate of the times ensures that it is the scientific explanation which usually holds the field.

The idea that one explanation only can be valid does not of course stand up to any real scrutiny. We are constantly advancing plural explanations; my arm moves because of muscular contraction; but it also moves because I have decided to relieve an irritation. What is

interesting at the moment, however, is the fact that in science itself plural explanations form a very real and important contribution to advance. What is the explanation of the appearance of starch in an illuminated green leaf, and of the concomitant disappearance of carbon dioxide from its vicinity? The biochemist now has a fairly complete explanation worked out with great skill and labour, and its elaboration has been a remarkable triumph. But the scientific fraternity does not thereupon fold its hands on the completion of a task. A complementary explanation has to be worked out in terms of energy quanta, electron levels, entropy and many other conceptions. These two explanations, the chemical and the thermodynamic, move in worlds of quite different ideas. Their language and methods are entirely distinct, even if, deceptively, they appear sometimes to employ the same words. They diverge entirely; only in the concrete reality itself do they meet. Their relation to one another is of course, that of complementarity, a notion which has become, within the last few decades, of great importance in science. And this, it is at once obvious, is of interest to the Christian. No longer need he regard the success of scientific explanations as endangering the validity of Biblical ones. Rather should the experience of science lead him to expect that from points of view not based on the observer-attitude, that is not within the framework of science, there should be valid explanations of experience given in terms of altogether different worlds of ideas. Happenings may follow a pattern satisfactorily predicted by scientific laws; but the thoughtful Christian can still give thanks to God for an answer to prayer. Of course complementary explanations, like the chemical and thermodynamic ones previously quoted, have still to be patiently fitted together into a unified whole. Their " points of contact " have to be established, and this may be a matter of supreme difficulty. But at least science suggests that the mere existence of diverse accounts, within different frameworks of ideas, is no real difficulty; rather is it to be expected.

4.2. *Science and Paradox*

The foregoing considerations lead on rather naturally to the question of paradox. A statement is paradoxical for our present purposes, when, though true to experience, it has logically the form of a contradiction. Many great thinkers, such as Kierkegaard, have stressed the paradoxical element in human life; and the simple Christian who knows the Scriptures is well aware that it is a very present element there.[1] " He that findeth his life shall lose it," in the very finding, is something we all know to be true, despite its logical absurdity; and the historic controversies over predestination and free will, grace and faith, God's goodness and His severity, springing as they have done from deeply-felt convictions present us with the same problem.

[1] See e.g. Phil. 2: 12, 13; Acts 2: 23; John 6: 37, 44.

But this element of contradiction is very important in science too. It has also more than once been the pointer to a striking advance. When the Second Law of Thermodynamics, which distinguishes a forward and a back direction for time, was formulated the molecular theory of matter and Newton's laws of motion were already well established. Matter was believed to be composed of molecules which individually obeyed Newton's laws; and Newton's laws were reversible with respect to time; backwards and forwards were both the same to them. The problem then arose, How could matter in bulk behave irreversibly, as Thermodynamics described, when it was made up of elements which knew only reversible behaviour? This was a paradox indeed, and its history is illuminating. Only when a totally new idea was introduced, that of probability, could the paradox be resolved. Thinkers had to go right outside the world of concepts then comprising the discipline of Mechanics to find the answer; but when it had been found a fundamentally new insight had been gained. A new view-point had been won. Is it too much to suggest that in the wider sphere of personal and social life many of the tragic contradictions now facing us will only be resolved when a totally new element is brought in? And is the Christian altogether unreasonable in asserting that this new element lies in the direction of faith in God? Surely science at least would not suggest it.

A still more striking example of scientific paradox arose from the discovery of the dual wave-particle nature of light and matter. A particle, by definition, can only be described as occupying a point; a wave must be described as occupying an extended region. How then can an electron, say, be both? One has only to remember that the opinion that the two views were mutually contradictory was not, in the case of light, merely the conclusion of third rate minds but rather the conviction for over two centuries of the foremost men of science, to see how startling the paradox raised by the Quantum Theory really was. For Newton himself regarded the two points of view as irreconcilable. Yet faced with overwhelming evidence Science has been forced to embrace both. For a long time it was an uneasy marriage; only slowly have the two views been reconciled, and again only by the incorporation of radically new ideas.

The lessons to be learned from the history of paradox within science itself ought to be written in letters of gold for all to see. Every Christian ought to think deeply over them, and they ought to mould and condition his apologetic. They will warn him from the pursuit of immediate but cheap advantage, and they will put into his hands a weapon very difficult to blunt. They will encourage him to take a more generous and sympathetic view of the difficulties of others, and of the ability and honesty of his opponents. And they will preserve him from the all-too-frequent attitude of claiming for the faith he holds what the Bible itself never claims for it; that it here and now resolves all difficulties

and settles all problems. He will be the more willing to recognize that, even on the plane of intellect, we must be content, even with New Testament light, to " know in part ", believing that we shall " know hereafter ".

To see the force of these lessons we must transfer them from the realm of science to the wider sphere of real life where faith and science meet. What then do we find? Firstly, that we must expect, almost inevitably. to encounter paradox. It must not surprise us in the least if even *well-founded* scientific theory appears to meet Christian doctrine in head-on collision. We must not throw up our hands in despair if science's revelation of the law-abidingness of Nature seems to rule out the possibility of miracle; or if its discovery of man's physical insignificance seems to dethrone him from the lordship of creation; or if its tentative account of origins threatens to obliterate respect for what he believes is Divine revelation. Many genuinely great minds may consider the entire world-view of science to be irreconcilable with that of the Bible; but he must remember that the Quantum Theory met and overturned even more widely-held and impregnably-entrenched convictions.

In the second place, we are led to expect that the solution of such life-paradoxes will not be easy. Both sides of the paradox must be fully accepted; neither may be whittled down. It has not been easy in the narrow field of Physics alone to do this; how can we expect it to be when the scene is immeasurably enlarged to embrace the whole range of human life and endeavour; the fields of art, of morals, of politics as well as the mysterious unfathomed depths of moral experience and of suffering? Only a fool would imagine that the answer was within his easy grasp. Yet that is the line that apologetic has often unthinkingly taken, and which the Christian apologist now has to live down.

And finally, the experience of science leads us to anticipate that paradoxes indicate the presence of an unsuspected element. A consideration of great importance has been overlooked; it must be re-established in its rightful place and the paradox will sooner or later, as the mind accustoms itself to thinking in the new way, dissolve into a new and enriched view of things. With Thermodynamics the new consideration was that of probability; with Quantum Theory it was the essential place of the observer in the scientific scheme of things. Only the transformation we must expect in the wider scene is vastly more complex. Thought is only part of life; the transforming of life therefore will transcend the transforming of thought. By such a line of approach we are brought nearer to the New Testament conception of conversion; the " change of mind " (repentance) consequent on the recollection of a forgotten factor, our relationship to God, issuing with increasing clarity in the dissolution of our tormenting paradoxes; the inner contradictions which all of us, in our moments of insight, recognize as belonging to our fallen nature.

5.1. *The Conflict of Science and Religion*

This paper began with a recognition that in the minds of many science and religion were not friends, but enemies. It has attempted to show, by the method of analogy, that there was really no essential conflict at all; in fact, that science can be a powerful ally. We have to recall again that science and religion are not self-existent entities, having a being apart from the minds of men, and engaging in friendly or unfriendly encounter which we can sit by and watch, like a football match. They are human concerns; and the real problem is whether this or that particular man, in his inner life and thought, finds that the committal of himself to both approaches produces within himself a stress or tension. In this sense it is difficult to avoid the conclusion that religion and science are, in fact, in conflict. And this may happen in two ways. Western man is often said to have concentrated his attention on vision to the detriment of hearing. That there is a danger of doing this can be appreciated at once; one has only to deliberately close one's eyes on a summer day in the forest to become conscious of a whole world of sounds of which one was formerly almost unaware. The complementary approach of vision, being the more spectacular and arresting, diverts the attention from the universe of sound to such an extent that it may require a real effort of will to bring the mind into intimate contact with it. Something of this sort is true of science. Its world has an immediate impact and " glamour " which the unseen world of faith has not; and it needs a strong act of will, an established self-discipline, to determine to " hear " as well as to " see ". The cares of this world, and the deceitfulness of riches, and the lusts of other things entering in, monopolize the attention.

Further than this, there is the element of paradox which we have discussed. No doubt all men of faith have problems; but he who is also scientifically aware has to face this particular one, that his faith and his science confront one another paradoxically. There is no need to enlarge on this; but it obviously introduces the experience of conflict.

But these two relationships of conflict can hardly be said to be inherent in the nature of science and religion themselves. The scientific approach may distract our energies too totally from the approach of faith; and it may appear to lead to results which meet those of faith in head-on collision. But the element of conflict really arises from within the nature of man. In the one case it is due to the imperfection of his will and affections; in the other, to the imperfection of his understanding. And that being so, we must expect that, so long as human nature is not fully regenerate, Science and Religion will appear, somewhere, to be in conflict. Complete reconciliation belongs to a state which, while we remain in the flesh, we can never know. The most we can hope for is the gradual enlistment of the one in the service of the other, of science in the service of Faith. In this enlistment reconciliation will become more and more apparent; and the notion of conflict, already on the run, less and less obtrusive.

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