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\* Feature article \*

THE RELATIONS BETWEEN RELIGION AND SCIENCE

..... (Frederick Temple)

"If indeed it could be said that the progress of Science was really barred by this inability to make the induction complete, and to assert the unbroken uniformity of all nature; if it could be said that any uncertainty was thus cast over scientific conclusions, or any false or misleading lights thus held up to draw inquirers from the true path, it would undoubtedly become a duty to examine, and to examine anxiously, whether indeed it could be true that our faculties were thus hopelessly at variance with each other, the scientific faculty, imposing on us one belief, and the spiritual faculty another, and the two practically irreconcilable."

The Right Reverend Frederick Temple was Lord Bishop of Exeter. This piece is the conclusion from The Relations Between Religion and Science: Eight Lectures Preached Before the University of Oxford in the Year 1884, Published by MacMillan and Co., Ltd., New York.

Curious Creatures

THE RED SWAMP CRAYFISH, WATCHMAN GOBY AND HOUSE-KEEPING

SHRIMP ..... (Mike L Anderson)

Humans, apparently guided by little more than their palate, had little idea what they would unleash by introducing the red swamp or Louisiana crayfish to Africa as a speciality food. The crayfish escaped from the farms and is now a serious threat to local plants, fish and other animals. Dry land is no barrier. It is able to travel long distances between wetlands, particularly when the vegetation is damp (1). Nature is, as Tennyson famously said, "red in tooth and claw." This applies both to humans and the crayfish ... and to plants. The pretty violet flowers of the water hyacinth are a dangerous seduction. It is a menace through pure biological muscle. It can double its mass in less than two weeks. A native of South America, it has now spread to 50 countries and five continents, blocking water-ways and significantly impacting local fauna and flora.

Darwinians have stressed competition as a driving force in evolution, but co-operation is often just as striking. For instance, there are several species of "watchman" goby fishes that have a symbiotic relationship called mutualism (both partners benefit) with "house-keeping" pistol shrimps (2). The goby, with its good eyesight warns its partner of approaching danger by flicking its tail. The shrimp always keeps an antennae in contact with the goby for this purpose. The shrimp, with its many legs, excavates the burrow and always keeps it wide enough for the fish. The goby gets a safe retreat, a place to lay its eggs and food stirred up by the shrimp. There are many species whose continued survival is crucially dependent on mutualism. Indeed, there are many lines of compelling evidence that suggests that that great milestone in evolutionary history, the emergence of the eukaryote cell, came through the endosymbiosis of two prokaryote cells. The mitochondria that we carry in each of our cells are relics of a friendly bacterium.

Nature can be both friendly and aggressive. It seems good strategy to respond accordingly. As the writer of Ecclesiastes said, there is "a time for war and a time for peace" (3). There is a time for competition and there is a time for co-operation. Humans have learnt to co-operate with nature while competing with it. To deal with water hyacinth, for example, humans are co-operating with two beetle species, a moth, a mite and a pathogenic fungus as biological control agents (4). To deal with the red swamp crayfish, humans are introducing fish and

bird predators (5). Of course, proposed biological control agents must be carefully studied lest a biological friend turns out to be even worse than the original enemy (6).

What applies to the natural realm also applies to the spiritual. We need to pick our fights carefully. The apostle John, no doubt fearing the competition, rebuked an outsider for performing a miracle. The reaction of Jesus? "Do not stop him," Jesus said. "No one who does a miracle in my name can in the next moment say anything bad about me, for whoever is not against us is for us" (7). On the other hand, while Jesus called us to love our enemies, this does not mean we cannot compete with them. Jesus and Paul disputed with the enemies of the gospel. Jesus called them a brood of vipers (8) and Paul called them dogs (9). The true Christian spirit does not require us to be invariably polite to the enemies of the cross.

The enemies of the gospel are invasive aliens intent on reproducing themselves spiritually. Jesus said, "Woe to you, teachers of the law and Pharisees, you hypocrites! You travel over land and sea to win a single convert, and when he becomes one, you make him twice as much a son of hell as you are" (10).

Consider, for example, these words of Henry Morris: "It is time, therefore, for "all men everywhere to repent" (Acts 17:30). Repentance means essentially a change of mental attitude, rejecting the man-centred philosophy of struggle and evolution and accepting instead the God-centred truth of creation and redemption" (11). Elsewhere he has said, "One can be a Christian and an evolutionist, just as one can be a Christian thief, or a Christian adulterer, or a Christian liar. It is absolutely impossible for those who profess to believe the Bible and follow Christ to embrace evolutionism (12)." Morris has made a particular stance towards evolution a requirement for salvation. This is anti-gospel. It is playing around with the precious cross.

The true gospel declares that salvation is absolutely a free gift and not based on any human achievement- moral (13) or intellectual (14). Membership in the body of Christ does not depend on taking any particular intellectual stance. Anti-evolutionists of the Henry Morris type are not merely pseudo-scientists. If they were that we could leave them to academics. They are anti-cross anti-evolutionists. For the sake of the gospel it is necessary to call it as it is.

1. <http://www.ens-newswire.com/ens/feb2003/2003-02-05-07.asp>
2. [http://en.wikipedia.org/wiki/Black-ray\\_goby](http://en.wikipedia.org/wiki/Black-ray_goby)
3. Ecclesiastes 3:9
4. <http://news.bbc.co.uk/2/hi/science/nature/2730693.stm>
5. <http://www.ext.vt.edu/pubs/fisheries/420-253/420-253.html>
6. A classic example is the cane toad introduced half a century ago to Australia to control beet. It has become a serious pest.
7. Mark 9:39
8. Matthew 23:33
9. Phillipians 3:2
10. Matthew 23:15
11. Morris, H.M. 1972. The Remarkable Birth of Planet Earth, Dimension Books, Minneapolis, p. v.
12. Quoted in Berry, R.J. (1988) God and Evolution. Hodder and Stoughton, London, p. 13.
13. Ephesians 2:8-9
14. 1 Corinthians 1:18-25

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NEWS BRIEFS ..... (From the Internet)

\* The power of games in problem solving  
Humans spend enormous amounts of time playing online games. Computer scientists are dreaming up ways to use this time to solve problems while humans have fun.

Take the ESP game. Logged on users are randomly paired. The same image is presented to the users independently. Each player provides terms to describe the image. If the terms match the pair earns point. Google is using the game to improve captions for images located by its search engine. A kind of symbiosis seems to be occurring between man and machine. The machine does the boring part, humans have the fun and together they problem solve!  
<http://www.sciencenews.org/articles/20070317/bob9.asp>

\* Trains in sperm marathons

The sperm of the common wood mouse have a remarkable adaptation for fertilizing the egg. In this race to the finish line, the sperm have learnt to swim in trains. For this purpose their heads have hooks. Since only one sperm can fertilize the egg, why do they co-operate? It turns out that in the species with the most promiscuous females, the sperm hooks are larger and more curved. This is an instance of the well-documented phenomenon of sperm competition. By co-operating, the sperm are more likely to defeat the opposing team (the sperm of another male).  
<http://scienceweek.com/2007/sw070209.htm>

\* Wandering genes and microbial teamwork

Genes wander between micro-organisms - from bacterium to bacterium and from virus to bacterium. The phenomenon is called horizontal gene transfer (HGT). Recently, it has been realised how important this is in revolutionising our concept of evolution. Microbes are deeply co-operative with viruses acting as gene repositories that bacteria draw upon in reconstructing their genomes to environmental stresses. The conventional concepts of individuals in isolation and species break down in this scenario. Of all organisms, it is the microbe that could say, "we are in flux!"  
<http://scienceweek.com/2007/sw070202.htm>

\* The pace of polar melting

Last years researchers confirmed using satellite, laser, radar and other technologies that the Antarctic and Greenland ice sheets are melting into the oceans. The Greenland sheet is disappearing at the rate of 100 billion tons per year. Even more worrying is the finding that the melting is accelerating. Scientists have been surprised by the rapidity of melting in light of the relatively slow warming of the earth's air and oceans.  
<http://scienceweek.com/2007/sw070105.htm>

\* Fastest spinning black hole record broken

Astronomers have found a black hole in our galaxy called GRS 1915+105 that has the fastest known spin. It is 36 000 light years and spinning at 98% of the theoretical maximum. Its RPM? A cool 36000! However, referees may disqualify this contender. The spin cannot be directly measured and the indirect methods used are forced to make assumptions. Another study suggests that the spin could be lower.  
<http://space.newscientist.com/article/dn10611-spinning-black-hole-is-fastest-on-record.html>

\* Howzit cousin crab

With their spectacular success both in number of species and individuals, it is a good approximation to say that earthlings are insects. Despite this the origin of insects is very largely a mystery. Comparative morphology has suggested that hexapods (six-legged arthropods) are most closely related to centipedes and millipedes. New evidence from comparative neurology and genetic sequencing is suggesting that insects evolved from branchiopod crustaceans (the familiar sea-monkeys are from this group) and that it happened about 400 million years in freshwater rather than the previously favoured 500 million years ago in the sea.  
<http://scienceweek.com/2006/sw061229.htm>

\* Using mathematics to identify cheats

Digital photography and the power of the computer software is making it easy to create fake photographs. No wonder then that fake photographs are appearing in

newspapers and on the web. (It is a piece of cake to make a photograph showing you shaking hands with the queen). Computer scientist Hany Farid is using mathematics to expose digital tampering. His mathematical tools work so well that Associated Press asks him to examine suspect photographs. Farid says the tools cannot guarantee exposure, but are making it extremely difficult for cheats to go undetected.

<http://www.sciencenews.org/articles/20070317/mathtrek.asp>

\* Plankton feeling the effects of global warming

Satellite colour imaging of the oceans is now making it possible to monitor long term, global plankton biomass production. A pattern is emerging. From 1999 there has been a decline in plankton production. Colder water is richer in nutrients than warm water. Nutrient availability and hence plankton distribution is influenced by ocean currents and upwelling which in turn is influenced by global warming.

<http://scienceweek.com/2006/sw061215.htm>

\* The physiological response of animals to climate change

Change in the distribution of many organisms has been linked to global warming. There is a firm negative correlation between summer temperatures and population size. Now researchers are finding out why. There is a threshold temperature beyond which the capacity of animals to increase aerobic respiration is reduced. The problem is exacerbated in aquatic animals because the concentration of dissolved oxygen declines with increased water temperature.

<http://scienceweek.com/2007/sw070112.htm>

\* The travels of modern humans

Truly modern humans emerged in sub-Saharan Africa around 200 000 years ago. 160 000 years later they appear all over the earth, from Eurasia to Oceania. How did this happen. Anthropologists are piecing together the global jaunt. The so-called Hofmeyer skull from South Africa has been dated at 36 000 years ago and is very similar to modern humans from Europe. Modern humans probably arrived in southeast Asia by 50 000 years ago. A mere 5000 years later they were in northern Eurasia and Australia.

<http://scienceweek.com/2007/sw070119.htm>

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Humour from the Web

LIGHT BULB JOKES

Q: How many Psychiatrists does it take to change a light bulb?

A: Only one, but the bulb has got to really WANT to change.

Q: How many nuclear engineers does it take to change a light bulb?

A: Seven. One to install the new bulb and six to figure out what to do with the old one for the next 10,000 years.

Q: How many mathematicians does it take to change a light bulb?

Approximately 1.0000000000000000000000.

Q: How many software engineers does it take to change a light bulb?

None. It's a hardware problem.

Q: How many professors does it take to change a light bulb?

A: Only one, but they get papers out of it.

Q: How many missionaries does it take to change a light bulb?

A: 101. One to change it and 100 to convince everyone else to change light bulbs too.

Q: How many evolutionists does it take to change a light bulb?

A: Only one, but it takes eight million years.

Q: How many biologists does it take to change a light bulb?

A: Four. One to change it and three to write the environmental-impact statement.

Q:How many statisticians does it take to change a lightbulb?

A: 1-3, alpha = .05

Q: How many chemists does it take to change a light bulb?

A: Just one, but as it is an equilibrium system they will only do it under pressure

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Spot the Fallacy

THE GENETIC FALLACY OR PLACING SPERM ON A PEDESTAL

..... (Mike L Anderson)

The genetic fallacy or [putting sperm in its place - this does not work - putting sperm on a pedestal?]

"Humans are but a stage in the life-cycle of a sperm." This little joke is no doubt intended to put humans in their place, but it is a dubious antidote to pride. The trouble is that it commits the so-called genetic fallacy. "It occurs when one attempts to reduce the significance of an idea, person, practice, or institution merely to an account of its origin (genesis) or earlier form." (1) If humans are a stage, it is a stage of a very different sort to that of the sperm. Premeditated destruction of sperm will not lead to a charge of first-degree murder! Sperm does not love, hate, play or steal. The joke collapses the distinctiveness of the "stages." It puts sperm on a pedestal. "A man's origins, no matter how unspectacular, prove nothing about his present state. Something that can grow, change, and improve is obviously going to outrun its origins; any observation made of it must correspond to its present status, not its beginnings" (2).

The fallacy is easy to see here, but can be hidden behind the dazzling success of scientific discovery. Take the tremendous achievement of the human genome project - the revealing of our entire genetic code. Here is how evolutionary biologist Jon Seger describes it, "Looking at the genome, and taking it as a kind of image of who we are, places us squarely with the rest of nature. You can see the same genes in flies, worms, monkeys, mice and people. It's evolution laid out for all to see. There's nothing peculiar or distinctive about us" (3). He must have momentarily forgotten Handel's Messiah or da Vinci's The Last Supper or that it was the unique capabilities of humans that made the human genome project even possible!\_Of course, the cross teaches that all humans are significant irrespective of our abilities or performance.

The essential argument is that since we have a common genetic heritage with other organisms on the planet, we are not really different from them. Hold on a minute. One can fully accept the findings of the human genome project and its evolutionary implications. But Seger has taken a logical leap in concluding that there is nothing distinctive about us. In placing our genetic history on a pedestal, he has committed the genetic fallacy.

In fact, the findings of the human genome project argue against genetic determinism. At 30000 genes, humans do not have significantly more genes than the simple weed Arabidopsis at 26000 (4,5). Something besides genes must be going on to make us different to a weed! And something besides genes must be going on whenever we pray, curse, laugh or take a photograph.

Even our origin from simple chemicals does not detract in the slightest from our current status as sons and daughters of God. As philosopher Morris Engel writes, "it would be fallacious to argue that, since chemical elements are involved in all life processes, life is therefore nothing more than a chemical process" (6).

I suspect that there are agendas around funding behind making too much of

chemicals and genes. We can let them have the money without buying into the conclusions over who we are. The very act of giving puts us above genes and chemicals!

Notes

1. [http://en.wikipedia.org/wiki/Genetic\\_fallacy](http://en.wikipedia.org/wiki/Genetic_fallacy)
2. Hoover, A.J. (1982) Don't You Believe It. Moody Press, Chicago, p.29.
3. <http://query.nytimes.com/gst/fullpage.html?sec=health&res=9901E4DA1330F934A15755C0A9669C8B63>
4. Pennisi, E. (2001) The Human Genome. Science 291:1177-1180.
5. [www.genetics.com.au/pdf/factSheets/FS22.pdf](http://www.genetics.com.au/pdf/factSheets/FS22.pdf)
6. Engel S.M., 1990, "With Good Reason: An Introduction to Informal Fallacies," St. Martin's Press, New York, p.188.

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\* Feature article \*

THE CONCLUSION OF THE ARGUMENT

..... (Frederick Temple)

'No man can say that Jesus is the Lord, but by the Holy Ghost.'  
1 Corinthians 12:3

It is now the proper time to review the argument of these Lectures, and to endeavour to trace, if possible, the source of the estrangement which just at present separates Religion and Science.

The postulate of Science is admitted on all hands to be the uniformity of nature, and the proof of this postulate has been found to consist in an induction from the facts which nature presents and our senses observe. Uniformity is quickly noticed, and after it has been noticed for some time it is instinctively used as a working hypothesis. So used it accumulates perpetually increasing evidence of its truth, and if we except two great classes of facts, we never find any instance of its failure. The two classes of facts which are thus excepted are the acts of the human will and the miraculous element in Revelation, both of them instances of one thing, namely, the interference of the moral with the physical. To complete the induction and to deprive the denial of universal uniformity of all evidence to rest on, all that is necessary is to get rid of these two exceptions. If Science could get rid of these exceptions, though it could not be said that the fundamental postulate was demonstrated, it could be said that all the evidence was in its favour and absolutely no evidence against it. And although scientific belief would then still rank below mathematical belief, it would nevertheless have a cogency quite irresistible. Science would not thereby gain in power of progress, in practical acceptance, or in utility to man. But men are so constituted that completeness gives a special kind of satisfaction not to be got in any other way. If Science could but be complete it would seem to gain in dignity, if it gained in nothing else. And it is easy to foster a kind of passion for this completeness until every attempt to question it is resented. I have seen a boy first learning mechanics show a dislike to consider the effect of friction as marring the symmetry and beauty of mechanical problems; too vague, too uncertain, too irregular to be allowed any entrance into a system which is so rounded and so precise without it. And something of the same temper can sometimes be seen in students of Science at the very thought of there being anything in the world not under the dominion of the great scientific postulate. The world which thus contains something which Science cannot deal with is pronounced forthwith to be not the world that we know, not the world with which we

are concerned; a conceivable world if we choose to indulge our imagination in such dreams, but not a real world either now or at any time before or after. And yet the freedom of the human will and the sense which cannot be eradicated of the responsibility attaching to all human conduct, perpetually retorts that this world in which we live contains an element which cannot be subdued to obedience to the scientific law, but will have a course of its own. The sense of responsibility is a rock which no demand for completeness in Science can crush. All attempts at reconciling the mechanical firmness of an unbroken law of uniformity with the voice within that cannot be silenced telling us that we must answer for our action, have failed, and we know that they will for ever fail.

If indeed it could be said that the progress of Science was really barred by this inability to make the induction complete, and to assert the unbroken uniformity of all nature; if it could be said that any uncertainty was thus cast over scientific conclusions, or any false or misleading lights thus held up to draw inquirers from the true path, it would undoubtedly become a duty to examine, and to examine anxiously, whether indeed it could be true that our faculties were thus hopelessly at variance with each other, the scientific faculty, imposing on us one belief, and the spiritual faculty another, and the two practically irreconcilable. But there is no reason whatever for thinking this. Newton's investigations were unquestionably pursued, as all true scientific investigations must ever be pursued, in reliance on the truth of the uniformity of nature, and yet he never felt it the slightest hindrance to his progress that he always tacitly and often expressly acknowledged that God had reserved to Himself the power of setting this uniformity aside, and indeed believed that He had used this power. The believer who asserts the universality of a law except when God works a miracle to set it aside is certainly at no real disadvantage in comparison with an unbeliever who makes the same assertion with no qualification at all. It is granted on all hands that miracles are, and ever have been, exceedingly rare, and for that reason need not be taken into account in the investigation of nature. It is granted that the freedom of the human will works within narrow limits, and very slowly and slightly affects the great mass of human conduct and what depends on human conduct. And Science has often to deal with approximations when nothing but approximations can be obtained. We perpetually meet in nature with quantities and relations that cannot be accurately expressed nor accurately ascertained, and we have to be content with approximations, and we know how to use them in Science. Many chemical properties can only be so expressed; many primary facts, such as the distances, the volumes, the weights of heavenly bodies; and yet the approximations serve our purpose. And so too, if there be a reserve still uncovered by the scientific postulate, that will not in any degree affect our investigation of what is so covered.

In short, the unity of all things which Science is for ever seeking will be found not in the physical world alone, but in the physical and spiritual united. That unity embraces both. And the uniformity which is the expression of that unity is not a uniformity complete in nature, taken by itself, but complete when the two worlds are taken together. And this Science ought to recognise.

Let us turn from the physical to the spiritual.

The voice within us which demands our acceptance of religion makes no direct appeal to the evidence supplied by the senses. We are called on to believe in a supreme law of duty on pain of being lowered before our own consciences. And this law of duty goes on to assert its own supremacy over all things that exist, and that not as an accidental fact, but as inherent in its essence. And this supremacy cannot be other than an accidental fact unless it be not only actual but intended. And



intention implies personality; and the law thus shows itself to be a Supreme Being, claiming our reverence, and asserting Himself to be the Creator, the Ruler, and the Judge of all things that are. And this same voice within us asserts that we are responsible to Him for all our conduct, and are capable of that responsibility because free to choose what that conduct shall be. We are to believe not because the truth of this voice is proved independently of itself, but simply because we are commanded. Corroborative evidence may be looked for elsewhere, but the main, the primary evidence is within the soul.

Hence the strength of this belief depends on ourselves and on our own character. To every man the voice speaks. But its authority is felt in proportion to the spirituality of each who hears. Its acceptance is bound up in some way with our own wills. How far it is a matter of choice to believe or to disbelieve it is not possible to define. The will lies hidden as it were behind the emotions, the affections, the nobler impulses. The conscience shades off into the other faculties, and we cannot always isolate it from the rest. But though it be impossible to say precisely how the will is concerned in the spiritual belief, there can be no doubt that it always takes its part in such belief. It is the keen conscience, it is the will that can be moved to its depths by the conscience, that grasp most strongly the certainty of the law of duty. It is the man with the strongest and noblest aspirations, the man who sees the beauty of humility, the man who feels most strongly the deep peace of self-sacrifice, that is the man who finds the voice within most irresistible. It is not by any means always the man who lives the most correct life; correctness of life may be due to natural and not to spiritual causes. And the man whom we should find faultless in point of morals may yet be wanting in spiritual depth, and not have as yet, and perhaps may not have to the last, the spiritual faculty strong within him. But the man, even if he have many and grievous faults, who nevertheless is keenly susceptible of higher things, is the one to whom the voice within speaks with authority not to be gainsaid, and to him that voice is final.

It is this fact that the perception of things spiritual varies from man to man, and depends on character, and involves action of the will, that makes it always possible to represent our knowledge of the law of duty as in itself standing on a less sure foundation than our knowledge of scientific truth. Whether a man has or has not the necessary power of mind to comprehend scientific reasoning is tested with comparative ease. And if he have that power, the reasoning is certain in course of time to be understood, and when it is understood it compels assent so long as it keeps within its own proper domain. But the perception of spiritual truth depends on a faculty whose power or weakness it is far more difficult to test; and it involves the will which may be exerted on either side. And for this reason men sometimes dismiss this truth as being no more than an imagination, needed by some men to satisfy an emotional nature, but having no substance that can be brought to an external test. The believer in God knows that the truth which he holds is as certain as the axioms of mathematics; but he cannot make others know this whose spiritual faculty is not awake; and he is liable to be asked for proof not of the spiritual but of the physical kind.

Now this much must be acknowledged, that we cannot but expect the claim to supremacy over all things to show itself in some way in the creation which has come from Him who makes that claim. It would, no doubt, be a serious difficulty if things physical and things spiritual were cut off from one another by an absolute gulf; if we were required to believe that God had created and now ruled everything, and yet we could trace not the slightest evidence of His hand either in the creation or in the history of the world.

There are then two ways in which we are able to recognise Him even in

this world of phenomena. For in the first place, the creation in its order and its beauty and its marvellous adaptation of means to ends, confirms the assertion of the spiritual faculty that it owes its origin to an intelligent and benevolent purpose, exhibited in the form in which purpose is always exhibited. It works towards ends which we should expect a holy and benevolent Creator to have in view, and it accomplishes those ends in so large a proportion that, making allowance for the limited range of our knowledge, the general aim of the whole is seen with sufficient clearness. The argument is not strong enough to compel assent from those who have no ears for the inward spiritual voice, but it is abundantly sufficient to answer those who argue that there cannot be a Creator because they cannot trace His action. And the scientific doctrine of Evolution, which at first seemed to take away the force of this argument, is found on examination to confirm it and expand it. The doctrine of Evolution shows that with whatever design the world was formed, that design was entertained at the very beginning and impressed on every particle of created matter, and that the appearances of failure are not only to be accounted for by the limitation of our knowledge, but also by the fact that we are contemplating the work before it has been completed.

And in the second place, while the creation, the more closely it is examined the more distinctly shows the marks of the wisdom and goodness of the Creator, so the history of the world exhibits in the Revelation made to man clear proofs of that heavenly love which corresponds to the character of Him who has put love at the head of all the requirements of His law. The Revelation given to us has undeniably made a real mark on the world. It has upheld millions of men in a holiness of life corresponding in a very real degree to the holiness required by the law of duty. It has perpetually more and more cleared up the true teaching of that law. It is still continuing the same process, and generation after generation is better able to understand that teaching. Its fruits have been a harvest of saints and martyrs, some known and revered, some quite unnoticed. It has leavened all literature and all legislation. It has changed the customs of mankind and is still changing them. And if it be replied that all this is nothing but one form of the development of humanity and shows no proof of a Divine Ruler, we have a right to ask what then could be the source of such a development, and how is it that so great a power should always have worked in the name of God and should have always referred everything to His command? That fanaticism should plead God's authority without any right to do so is intelligible. But is it intelligible that all this truth and justice and purity and self-sacrificing love, all this obedience to the Supreme Law, should be the fruit of believing a lie? If there be a God, it is to be expected that He would communicate with His creatures if those creatures were capable of receiving the communication; and if He did communicate with His creatures it is to be expected that His communication would be such as we find in the Bible. The purpose of the Bible, the form of it, the gradual formation of it, the steadily-growing Revelation contained in it, these harmonise with the moral law revealed originally in the conscience. And the effect which the Revelation has produced on human history is real and great. The power which God's Revelation has exerted on the world is an undeniable fact among phenomena. It is not a demonstration of His existence; but it is a full answer to those who say, 'If God made and rules the world why do we find no signs of His hand in its course?'

And thirdly, this Revelation has not merely taken the form of a message or a series of messages, but has culminated in the appearance of a person who has always satisfied and still satisfies the conception formed by our spiritual faculty of a human representation of the divine law. Our Lord's life is that law translated into human action, and all the more because human faculties had not first framed the conception which He then came to fulfil, but He exhibited the ideal, and our

conception rose as it were to correspond to it. And, as He includes in Himself all the teaching, so does He give from Himself all the power of the Revelation which He came to crown. And every true disciple of Christ can bear witness to the reality of that power in sustaining the soul.

Thus has the God, whom our spiritual faculty commands us to worship and to reverence, shown Himself in the world of phenomena. And He has given proofs of His existence and His character precisely corresponding to the conception which He has enabled, and indeed commanded, us to form of Him. And it is because the proofs that He has given are of this nature that we are tempted to ask for more proofs of a different kind.

For it is undeniable that believers and unbelievers alike are perpetually asking for proofs that shall have more of the scientific and less of the religious character, proofs that shall more distinctly appeal to the senses. Believers in all ages have longed for external support to their faith; unbelievers have refused to believe unless supplied with more physical evidence. Believers shrink from being thrown inwards on themselves; they fear the wavering of their own faith; they are alarmed at the prospect of the buttresses of their belief being taken from them. They find it easier to believe the spiritual evidence, if they can first find much physical evidence. They wish (to use the Apostle's words) to walk by sight and not by faith. And unbelievers want a tangible proof that shall compel their understanding before it awakes their conscience. They demand a Revelation, not only confirmed by miracles at the time, but confirmed again and again by repeated miracles to every succeeding generation. They want miracles in every age adapted to the science of the age, miracles which no hardness of heart would be able to deny, which would convince the scientific man through his Science independently of his having any will to make holiness his aim when he had been convinced. This kind of evidence it has not pleased God to give. It is not the scientific man that God seeks as such, any more than it is the ignorant man that He seeks as such. And the proofs that He gives are plainly in all cases conditioned by the rule that the spiritually minded shall most easily and most keenly perceive their force.

And, as far as unbelievers are concerned, I do not see that more need be said except to tell them that this rule is inflexible, and that it is by another way that they must look to find God, and not by the way that they insist on choosing. But believers who are in the same case need to be warned of some very real dangers that always attend a faith which makes too much of things not spiritual.

For, first, there is a real and great danger that the spiritual may be altogether obscured by the literal and the physical. We look back with astonishment on the Rabbinical interpretations of the Old Testament, and all the more because of the really great and true thoughts that are sometimes to be found in the midst of their fanciful conceits. We can trace the mischief they did to true Religion by the perverted reverence with which they regarded the words and even the letters, and the very shapes of the letters, in which their sacred books were written. Their perversions of the law of God, their subtle refinements of interpretation, their trivial conceits, their false and misleading comments and inferences, all certainly tended to encourage the hypocrisy which our Lord rebuked, and against which St. Paul contended. But we still see something of the same spirit in the attempt to maintain a verbal and even literal inspiration of the whole Bible, filling it not with the breath of a Divine Spirit, but with minute details of doctrine and precept often questionable, and, whenever separated from the principles of the eternal law, valueless or even mischievous. God's Word, instead of leading us to Him, is made to stand between and hide His face.

But, secondly, there is a serious risk that if the mind be fastened on things external in some way connected with, but yet distinct from the substance of Revelation, it may turn out that these external things cannot hold the ground on which they have been placed. They have to be given up by force at last, when they ought to have been given up long before. And when given up they too often tear away with them part of the strength of that faith of which they had previously been not only the buttress outside but a part of the living framework. It is distinctly the fault of religious, not of scientific men, that there was once a great contest between the Bible and Astronomy, that there has since been a great contest between the Bible and Geology, that there is still a great contest between the Bible and Evolution. In no one of these cases was the Revelation contained in the Bible in danger, but only the interpretation commonly put on the Bible. It is easy long afterwards to condemn the opponents of Galileo and speak of their treatment of him and his teaching as fanaticism and bigotry; and such condemnation has not unfrequently been heard from the very lips that nevertheless denounced the teaching of the geologists. But in all these cases the principle has been the same, and believers have insisted that the Bible itself was gone unless their interpretation of it was upheld. And the mischief is double. For many believers, and more especially unlearned believers, instead of gently helping one another to form the necessary modification of their view of the Bible teaching, instead of endeavouring to find the way out of the perplexity and to disentangle the true spiritual lesson from the accessories which are no part of itself, insisted that it must be all or nothing, and prepared for themselves a very severe trial. There was no doctrine involved whatever; there was nothing at stake on which the spiritual life depended. The duty to be patient, to enquire carefully, to study the other side, to wait for light, was as plain as any duty could be. But all this was forgotten in a somewhat unreasoning impulse to resist an assault on the faith. And there cannot be a doubt that on all these occasions many believers have been seriously shaken by slowly finding out that the position they have taken is untenable. When men have to give up in such circumstances they generally give up far more than they need, and in some cases an unreasonable resistance has been followed by an equally unreasonable surrender. And while believers have thus prepared a stumblingblock for themselves they have put quite as great a stumblingblock before others. For students of Science, informed by instant voices all around that they must choose between their Science and the Bible, knowing as they did that their Science was true, and supposing that the lovers and defenders of the Bible best knew what its teaching was, had no choice as honest men but to hold the truth as far as they possessed it and to give up the Bible in order to maintain their Science. It was a grievous injury inflicted on them; and though some among them might deserve no sympathy, there were some whom it was a great loss to lose.

But in the third place, the result of this clinging to externals is to shut out Science and all its correlative branches of knowledge from their proper office of making perpetually clearer the true and full meaning of the Revelation itself. It is intended that Religion should use the aid of Science in clearing her own conceptions. It is intended that as men advance in knowledge of God's works and in power of handling that knowledge, they should find themselves better able to interpret the message which they have received from their Father in Heaven. Our knowledge of the true meaning of the Bible has gained, and it was intended that it should gain, by the increase of other knowledge. Science makes clearer than anything else could have made it the higher level on which the Bible puts what is spiritual over what is material. I do not hesitate to ascribe to Science a clearer knowledge of the true interpretation of the first chapter of Genesis, and to scientific history a truer knowledge of the great historical prophets. The advance of secular studies, as they are called, clears up much in the Psalms,

and much in the other poetical Books of Scripture. I cannot doubt that this was intended from the beginning, and that as Science has already done genuine service to Religion in this way, so will it do still better service with process of time.

On this side also, as on the scientific side, the teaching of the spiritual faculty and the teaching of Revelation indicate that the physical and the spiritual worlds are one whole, and that neither is complete without the other. Science enters into Religion, and is its counterpart, and has its share to take in the conduct of life and in the formation of opinion. And the believer is bound to recognise its value and make use of its services.

In conclusion, it is plain that the antagonism between Science and Religion arises much more from a difference of spirit and temper in the students of each than from any inherent opposition between the two. The man of Science is inclined to shut out from consideration a whole body of evidence, the moral and spiritual; the believer is inclined to shut out the physical. And each, from long looking at that evidence alone which properly belongs to his own subject, is inclined to hold the other cheap, and to charge on those who adduce it either blindness of understanding or wilful refusal to accept the truth. And when such a conflict arises it is the higher and not the lower, it is Faith and not Science that is likely to suffer. For the physical evidence is tangible, and the perception of it not much affected by the character of the man who studies it; the spiritual evidence stands unshaken in itself, but it is hid from eyes that have no spiritual perception, and that perception necessarily varies with the man.

By what means then can a man keep his spiritual perception in full activity? And is there any test by which a man may know whether his spiritual faculty is in contact with the source of all spiritual life and is deriving from that source the full flow of spiritual power? Revelation, if it tells us anything, ought to tell us this. And the answer which Revelation makes is expressed in the words of St. Paul, 'No man can say that Jesus is the Lord, but by the Holy Ghost.' This doctrine runs through the New Testament, and it implies that one main purpose of our Lord's appearance among men was to give them in His life, His character, His example, His teaching, at once a touchstone by which they could always try their own spirits, and judge of the real condition of their own spiritual faculty, and also a vivid presentation of the supreme spiritual law by which they could for ever more and more elevate and purify and strengthen their own spiritual power and knowledge.

Let a man study the Jesus of the Gospels. Let him put before his conscience the teaching that Jesus gives; the picture drawn of our Father in Heaven whose holiness cannot allow a stain upon a single soul, and whose tenderness cannot endure that a single soul should perish; Who ruleth all the universe, and yet without whom not a sparrow falleth to the ground; the picture drawn of the ideal human life, the humility, the hunger and thirst after righteousness, the utter self-sacrifice, the purity; the picture drawn of human need, the helplessness, the hopelessness of man without God. Let him ponder on all this and on the many touching expressions, the truth, the depth, the force, the superhuman sweetness and gentleness with which all is presented. And if his conscience bows before it, and can say without reserve and in unalloyed sincerity, 'This is my Lord; He shall be my teacher; here I recognise the fulness of the eternal law; at His feet will I henceforth sit and learn; through Him will I drink of the well-springs of eternal truth; His voice will I trust to the very utmost;' then may that man be sure that his conscience is in contact with the Father of spirits, and that his study will guide him into fuller and clearer knowledge, and more certain conviction that he is grasping the truth of God.

Let a man put before his heart our Lord's own character. Let him think of the life of privation without complaint, of service to His kind without a thought of self; of His unfailing sympathy with the unhappy, of His tenderness to the penitent; of His royal simplicity and humility; of His unwearied perseverance in the face of angry opposition; of His deep affection for the friends of His choice even when they deserted Him in His hour of darkness; of His death on the Cross and the unearthly love that breathed in every word He uttered and everything He did. Let him read all this many times; and if his heart goes out to the Man whom he is thus beholding, if he can say with all his soul, This is my Lord; here is the supreme object of my affection; Him will I love with all my strength; from Him I will never, if I can help it, let my heart swerve; no other do I know more worthy to be loved; no other will I keep more steadily before my eyes; no other will I more earnestly desire to imitate; no other shall be my example, my trust, my strength, my Saviour; if a man can say this, it is certain that his heart is touched by God, and the heavenly fire is kindled in his soul.

Let a man put before his will the Lord's commands; the aims, the self-restraints, the aspirations that the Lord required in His disciples. Let him ponder on the call to heavenly courage in spite of all that earth can inflict or can take away; the call to take up the Cross and follow Him that was crucified; the warnings and the promises, the precepts and the prohibitions; let him think of the Leader who never flinched, of the Lawgiver who outdid His own law; let him think on the nobleness of the aims to which He pointed; of the promise of inward peace made to those who sacrificed themselves, made by our Lord and re-echoed from the very depths of our spiritual being; let him think of the sure help promised in return for absolute trust, tried by millions of saints and never yet known to fail. Let a man put this before his will, and if he can say with all his soul, This is my Lord; here I recognise Him who has a right to my absolute obedience; here is the Master that I mean to serve and follow; and in spite of my own weakness and blindness, in spite of my sins, in spite of stumbling and weariness of resolution, in spite of temptations and in spite of falls, I will not let my eyes swerve, nor my purpose quit my will; through death itself I will obey my Lord and trust to Him to carry me through whatever comes; that man most certainly is moving in the strength of God, and the power of the Eternal Spirit lives within him.

Our Lord is the crown, nay, the very substance of all Revelation. If He cannot convince the soul, no other can. The believer stakes all faith on His truth; all hope on His power. If the man of Science would learn what it is that makes believers so sure of what they hold, he must study with an open heart the Jesus of the Gospels; if the believer seeks to keep his faith steady in the presence of so many and sometimes so violent storms of disputation, he will read of, ponder on, pray to, the Lord Jesus Christ.

The Right Reverend Frederick Temple was Lord Bishop of Exeter. This piece is the conclusion from The Relations Between Religion and Science: Eight Lectures Preached Before the University of Oxford in the Year 1884, Published by MacMillan and Co., Ltd., New York.

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