

NEWMAN AND SCIENCE

INTRODUCTION

John Henry Newman (1801-1890) was one of the outstanding religious thinkers of the nineteenth century, and he foresaw many of the religious troubles of the present century. He laboured incessantly to prepare the Church to face them, and had a dominating influence on the Second Vatican Council.

He was born in London, and went to Trinity College, Oxford, for his undergraduate studies. After graduation he was elected a Fellow of Oriel College, took Anglican Orders and was appointed Vicar of the University Church of St. Mary the Virgin. Sunday after Sunday he preached to the university, recalling his hearers back to the beliefs of the early Church. He was a leader of the Oxford Movement that tried to establish a *Via Media* between the Church of England and what he then believed to be the decadent Roman Church. Eventually, after intense spiritual struggles, he saw that this was a chimera, that it is the Roman Church that has unbroken continuity with the Church of the Fathers, and that the Church of England is but a man-made national Church. He recognised that he could not remain an Anglican and save his soul, and so was received into what he called the One True Fold in 1845. In so doing, he abandoned the secure and well-endowed life of an Oxford don for the uncertainties and privations of life as a Catholic in Victorian England. In spite of many trials, he never looked back or regretted his conversion, affirming that the Hand of God was most wonderfully over him.

Soon after his reception, he was ordained to the priesthood and established the Oratory of St. Philip Neri in Birmingham. There he continued his preaching and writing, largely in obscurity. This was changed when an Anglican vicar, the Rev. Charles Kingsley, accused him of advocating lying. To clear his name, Newman wrote his *Apologia pro Vita Sua*, giving the full story of his spiritual journey. This re-established him in the eyes of his countrymen, and the seal was set on his life's work by his elevation to the cardinalate in 1879.

Newman is well-known as a theologian and preacher through his many writings and by his extensive correspondence, now published in 31 volumes. He made important contributions to philosophy, notably in his *Essay in Aid of a Grammar of Assent*, a sensitive and subtle account of what it is to believe. He is recognised as a master of English prose, and as the author of *The Dream of Gerontius*. Much less well-known is his keen interest in science and mathematics and this, together with his work on logic, accounts for the clarity and cogency of his writings.

To Newman, material phenomena were remote compared with his vivid apprehension of the abiding presence of Almighty God. His religious experiences at the age of fifteen, confirmed him in his «mistrust of the reality of material phenomena», and made him «rest in the thought of two and only two supreme and luminously self-evident beings, myself and my Creator»¹.

Yet in spite of this there are seminal aspects of his thought and work that are related to science. Mathematics and physics had a large place in his early undergraduate studies, and he had a keen understanding and considerable knowledge of the science of his time. This awareness helped to give his writings the concreteness and force that has enabled them to transcend the accidents of his era and to carry their message to succeeding generations. Indeed, so perceptive was his insight into science that a philosopher of science would find his writings worthy of study, while anyone concerned with the perennial tension between the beliefs of the Christian and the speculations of the agnostic would find that, over a century ago, he cogently outlined the Christian's reply to the many of the problems raised by modern science.

OXFORD

When Newman went up to Oxford, towards the end of the second decade of the nineteenth century, experimental science as we understand it now was virtually unknown. But mathematics flourished, and it was through its study that Newman developed his clear and logical mind, and came to know the power and elegance and generality of those methods of thought that science, as it comes to maturity, increasingly absorbs into its very being.

Newman read for Honours in both Mathematics and Classics and, as a young freshman, he was astonished that his mathematical tutor, Mr Short, began his lectures at the Asses' Bridge, which the young Newman had long left behind at school. It was the tutor's turn to be astonished when, on enquiring of Newman whether he had done any Euclid before, he was told that he had been through five books. So impressed, indeed, was Mr Short by Newman's mathematical ability that he urged him to sit for the newly-opened Trinity Scholarship; Newman did so and was successful.

For his final examination he offered, in addition to Euclid, Bridge's *Algebra* and *Trigonometry*, Newton's *Principia* (how many scientists today have ever opened this classic work?), Robertson's *Conic Sections*, Vince's *Fluxions*, *Hydrostatics* and *Astronomy* and Wood's *Mechanics* and *Optics*.

In the following year, he considerably broadened his interests, attending lectures in Anatomy and Mineralogy. Commenting acutely on Buckland's lectures on Geology, he remarked that «the science is so in its infancy, that no regular system is formed. Hence the lectures are rather an enumeration of facts from which probabilities are deduced, than a consistent and luminous theory of certainties illustrated by occasional examples»².

¹ *Apologia pro Vita Sua* (Oxford: Oxford University Press, 1913), p. 108.

² *Letters & Diaries* (Oxford: Oxford University Press, 1978), vol. I, p. 109.

At the same time he continued his mathematical studies, and wrote an essay on how the mysteries of mathematics prepare the mind to receive the mysteries of religion, thus foreshadowing his later work on the analogy between scientific and religious assent.

In 1822 he conceived the audacious plan of standing for the Oriel Fellowship. Writing to his father he admitted that «few have attained the facility and comprehension which I have arrived at from the regularity and constancy of my reading and the laborious and nerve-bracing and fancy-repressing study of mathematics, which has been my principal subject»³. And later: «I lay great strength on the attention I have given to Mathematics on account of the general strength it imparts to the mind»⁴.

As a Fellow of Oriel, he was increasingly drawn into the theological issues of the day, and his time was absorbed by his duties as tutor and curate. But he still took a lively interest in the affairs of his contemporaries. His constant friend and companion, Froude, wrote of his catholicity of interests: «He was interested in everything that was going on in science, in politics, in literature. Nothing was too large for him, nothing too small, if it threw light on the central question, what man really was, and what was his destiny»⁵.

In 1827 he began course of study in advanced mathematics, wishing to learn «analytics and differentials». In the summer he worked on trigonometry and Hamilton's *Conics*, and the following January he began the *Principia* in earnest. But this noble resolve was soon forgotten as things of even greater moment began increasingly to occupy his mind and soul. In March he began his *Arians of the Fourth Century*, and was soon swept into that tide of prayer and study that was, seventeen years later, to carry him into the Catholic Church.

In the midst of his winter of trials and sufferings he had little thought for science; yet the knowledge he gained at Oxford was never lost, and it was destined to flower again in the coldness of the coming spring.

THE CATHOLIC UNIVERSITY IN IRELAND

On May 9th 1845, a Bill was introduced into Parliament establishing three «Queen's Colleges» in Ireland to provide higher education of a strictly non-sectarian character. The Irish bishops considered them to be unsuitable for Catholic young men and were therefore faced with the task of providing alternative means of higher education for the few students desiring it. The advice of Rome was sought, and the bishops were urged to establish a Catholic university, taking Louvain as their model.

Thus it was that on July 18th, 1851, Dr. Cullen, Archbishop of Armagh and Primate of Ireland, visited Newman in Birmingham and invited him to become Rector of the proposed new Catholic University in Dublin. After seeking the advice

³ *Ibid.*, p. 125.

⁴ *Ibid.*, p. 126.

⁵ James Anthony FROUDE, «The Oxford Counter-Reformation», in *Short Studies on Great Subjects*, 4th Series (New York: Charles Scribner's Sons, 1910).

of his friends, Newman accepted this invitation, and set to work on the immense and complex task of building a university.

In ordinary circumstances, this task would have been hard enough, but several ideological, political and educational factors conspired to make Newman's work of exceptional difficulty.

The middle of the nineteenth century was a period of unprecedented scientific and intellectual advance, and many believed that science would soon be able to solve all human and sociological problems, thus making religion a superfluous relic of a bygone age. Perhaps understandably, Catholics tended on the whole to react against this exaggerated view of science by looking with extreme suspicion on the new advances. Thus Newman had the delicate task of asserting on the one hand the immutable doctrines of the Church and protecting his university against the rising tide of materialism and, on the other, that of preventing his university becoming just a seminary for the laity subject to such strict ecclesiastical control as to prevent all independence and originality of thought.

Politically Ireland was, as ever, in turmoil, with party contending against party and all parties united only by their aversion to the English. Newman, an Englishman himself, had to overcome their suspicion that the proposed university was but another instrument of subjugation, and had to try to win their support for his new venture. This task was made doubly difficult by his lack of knowledge concerning the intricacies of Irish politics, as well as the personalities involved.

Educationally, Ireland was at a low ebb. It was just after the potato famine when large numbers of the population had died of starvation or had emigrated, and most of those who remained were too preoccupied with the task of survival to care much for higher education. Heroic but sporadic efforts to organise primary and secondary education were being made but, on the whole, there was hardly any demand for education at a university level, and experienced observers warned Newman that this lack of interest would be one of his most serious difficulties. They were right.

One of Newman's first acts was to seek to arouse interest in and support for the proposed university by a series of discourses on the nature and scope of university education, afterwards published as *The Idea of a University*. In these discourses he emphasised the unity of knowledge and laid down that a university «teaches all knowledge by teaching all branches of knowledge»⁶. Hence, contrary to the demands of the materialists, theology must be included in the curriculum. Science also, in all its complexity, must be included. He went on to discuss the relation between this scientific knowledge and the Catholic Faith that pervades and inspires the whole university.

It was proposed that the university should be divided into four Faculties: Arts, Medicine, Law and Theology. The Arts Faculty was founded at once, with Medicine soon after. Law and Theology were to follow when practicable. The Faculty of Arts was subdivided into Letters and Science. Letters comprised Latin, Greek, Semitic and Modern Languages, History (ancient and modern), Archaeology, English Literature and Criticism. Science comprised Logic, Metaphysics, Ethics (including Economy and Politics), Philosophy of Religion, Mathematics, Natural Philosophy,

⁶ F. MCGRATH, *Newman's University: Ideal and Reality* (London: Longmans Green, 1971), p. 135.

Chemistry, Natural History, Mineralogy, Geology and so on. As a subsidiary to the Faculty of Arts there was to be a School of Engineering. It is clear from this list that the word «science» is used in a rather broader sense than is usual today.

The course of studies lasted five years; for the first two of these all the students followed the same lectures on liberal and cultural subjects, and in the final three they devoted themselves to more specialised professional studies. They were thus «educated» according to Newman's ideal, and also trained for the professions that they aspired to enter.

Newman built a university Church to be the centre of the life of the university and he expressed the hope that it would «maintain and symbolise that great principle in which we glory as our characteristic, the union of Science with Religion»⁷. It was not until May 18th 1854 that a Synodal Meeting of the Irish Episcopate formally announced their decision to erect a university, and laid down the essentials of its Constitution. On June 5th 1854, Newman was installed as Rector, Cardinal Cullen publicly charging him to «Teach the young committed to your care to cultivate every branch of learning, to scan the depths of every science, and explore the mysteries of every art»⁸.

Undeterred by the inadequacy of his resources, Newman announced that «It is proposed to open the classical and mathematical schools of the university on the Feast of St. Malachi next Friday November 3rd. The schools of Medicine, of civil engineering, and of other material and physical sciences will be opened at the same time, or as soon after as possible»⁹. It will be noticed how large a part of Newman's infant university was devoted to the sciences.

Among the names that he submitted provisionally to the Archbishops on October 3rd 1854 were those of Edward Butler as Professor of Mathematics and Terence Flanagan as Professor of Civil Engineering. Later, in 1856, William K. Sullivan, Professor of Theoretical and Practical Chemistry in the School of Science of the Museum of Irish Industry in Dublin was appointed Professor of Chemistry. He was later to become Professor of Theoretical Chemistry in the Royal College of Science, Dublin, and President of Queen's College, Cork. The following year the mathematical physicist Henry Hennessy, F.R.S., was appointed to the Chair of Natural Philosophy. He later became the Professor of Applied Mathematics at the Royal College of Science.

Newman was fortunate in obtaining fully-equipped premises for his Medical School. This school was opened in October 1855 and flourished right up to its incorporation into the National University of Ireland in 1908. «Did our efforts towards the foundation of a Catholic University», he wrote, «issue in nothing beyond the establishment of a first-rate Catholic School of Medicine in the Metropolis, as it has already done, they would have met with sufficient reward»¹⁰.

In his Report to the Bishops on October 31st 1857, Newman records that the Medical School had 43 students and a chemical laboratory «in a state of completeness

⁷ *Ibid.*, p. 277.

⁸ *Ibid.*, p. 314.

⁹ *Ibid.*, p. 316.

¹⁰ *Ibid.*, p. 369.

that may safely challenge comparison with anything of a similar kind in these islands»¹¹. It was modelled on German lines, and provided facilities for the medical students and also for pure research and the needs of those studying the application of chemistry to industrial processes.

Newman was particularly anxious to establish the Faculty of Science. «The establishment of a good School of Science», he wrote, «was one of the foremost objects which I kept in view»¹². Again, writing to J. M. Capes on 1st February 1857 he discussed possible ways in which English gentlemen might help the university and suggests: «Or let them do a thing which *must* be good, whatever comes of the university, e.g. set up a School of Physical Science, or make us a present of instruments and apparatus»¹³.

In spite of his efforts, the faculty of science was never fully established in his time. His Report in 1858 urged the immediate establishment of Chairs of Botany and Zoology, and of Geology and Mineralogy, and the expenditure of £20,000 on scientific laboratories. He referred also to the urgent recommendations which he had received from «persons of the highest consideration in Rome»¹⁴ to further the study of physical science in the university.

He also wanted the university to include a school of useful arts, comprising professorships of engineering, mining and agriculture in order to develop and to apply the natural resources of Ireland. A century ago this was a bold and far-sighted innovation.

The School of Engineering was opened in 1855, and provided a five-year course. In 1858 a new periodical, *The Atlantis*, was started. It had a markedly scientific character in order to justify the faculty of science to the public. Newman also tried to set up astronomical and meteorological observatories, but he was unable to do so for lack of funds.

To Newman, a university was primarily a teaching institution, and research took second place. He considered that teaching and research abilities were not usually found combined in the same person, and that the university teacher had neither the time nor the solitude necessary for research. Nevertheless, he desired his professors to undertake some research, in order that they become better teachers through being in contact with the latest advances. Newman also envisaged a series of Research Institutes for the single-minded pursuit of original investigations. It is interesting that this idea is now being increasingly followed in the national research centres for pure science and in many industrial laboratories.

Newman remained Rector of the university for seven years. Throughout this time he was also the Superior of the Oratory in Birmingham, and the strain of the double responsibility bore heavily on his health. He had ever considered that his task in Ireland was simply to establish the university, and that it would be the work of others to develop and to extend it. These and other considerations led to his resignation on November 12, 1858.

¹¹ *Ibid.*, p. 420.

¹² *Ibid.*, p. 330.

¹³ *Ibid.*, p. 435.

¹⁴ *Ibid.*, p. 372.

THEOLOGICAL AND SCIENTIFIC KNOWLEDGE

In the course of his lectures on the Scope and Nature of University Education, later published in book form under the title *The Idea of a University*, and in addresses on other occasions, Newman developed in some detail his view of the relation between theological and scientific knowledge. This is worth recalling not only because of the intrinsic interest attaching to his masterly handling of so difficult a theme, but also because mistaken views of the relation are still prevalent today.

In his discourses, Newman had to steer a delicate course between two erroneous views. On the one hand, the rising tide of materialistic humanism proclaimed that scientific knowledge alone was worth having, and that consequently theology could be disregarded as either false and superseded or as the private affair of the individual. On the other hand, he had to avoid making science so subservient to theology that its natural growth and development would be made impossible.

He began his lectures by showing that theology constitutes genuine knowledge, and thus cannot be excluded from the curriculum of a university. Likewise, because of the unity of knowledge, theology and science cannot be kept in watertight compartments; that is, a relation exists between these two types of knowledge. Furthermore, the scientist must be a man of faith and the theologian aware of contemporary science.

From the unity of knowledge it follows that there is no intrinsic antagonism between religion and science, since truth cannot contradict truth. There is thus a relation between theological and scientific knowledge: they cannot be divorced from each other. This relation, however, is rather a subtle one, and Newman's view may conveniently be approached by first considering an erroneous conception of it. According to this view, science and theology must ever advance hand in hand, each advance of one being reflected by an advance of the other. No scientific discovery must be made that does not immediately appear to confirm and illustrate theology not only as it is contained in the defined doctrines of the Church, but also in the popular imagination of the time. Likewise nothing must be found likely to dissipate even the most naive pious fancies of the faithful. The scientist must ever be anxiously looking over his shoulder, so to speak, to see the effect of his work on the beliefs of the multitude. Even his research programme must be planned in advance in order to provide results to confirm *this* doctrine, or refute *that* argument that is currently being urged against the Church.

It is clear that, according to this view, science becomes a mere slave to theology, simply existing to provide useful illustrations of revealed truth, but with no life or freedom of its own. That view is decisively rejected by Newman: The scientist, he writes, «is not bound, in conducting his researches to be at every moment adjusting his course by the maxims of the schools or by popular traditions [...] or to be determined to be edifying or to be ever answering heretics and unbelievers»¹⁵. «Unless he is at liberty to investigate on the basis, and according to the peculiarities, of his science, he cannot investigate at all»¹⁶. «Great minds need elbow room, not indeed in the domain of Faith, but of thought»¹⁷. «If you insist that in their speculations,

¹⁵ *The Idea of a University* (London: Longmans Green, 1947), pp. 348-349.

¹⁶ *Ibid.*, p. 349.

¹⁷ *Ibid.*, p. 350.

researches, or conclusions in their particular science, it is not enough that they should submit to the Church generally, and acknowledge its dogmas, but that they must get up all that divines have said or the multitude believed upon religious matters, you simply crush and stamp out the flame within them, and they can do nothing at all»¹⁸

«I say, then, that it is a matter of primary importance in the cultivation of those sciences, in which truth is discoverable by the human intellect, that the investigator should be free, independent, unshackled in his movements; that he should be allowed and enabled, without impediment, to fix his mind intently, nay, exclusively, on his special object, without the risk of being distracted every other minute in the process and progress of his enquiry, by charges of temerariousness, or by warnings against extravagance or scandal»¹⁹.

The essential harmony between religion and science thus means that each can be followed using the appropriate methods, without constantly worrying about their exact concordance at every stage. In the end, when our knowledge is complete, they will appear in perfect agreement, but this is not necessarily the case for all our partial and provisional views evolved in the course of discovery. While it is true that truth cannot contradict truth, it is frequently the case that one truth seems contrary to another, and thus «we must be patient with such appearances, and not be hasty to pronounce them to be really of a more formidable character»²⁰. Newman pointed out that there are many inexplicable truths and contradictions in other departments of knowledge, so we should not be surprised to find some apparent antagonisms between religious beliefs on the one hand and contemporary scientific speculations on the other. We confidently expect that in the former case these difficulties will be dissipated by the advance of knowledge, so it is reasonable to expect the same in the latter.

The freedom of the scientist naturally demands responsible exercise. Apparent disagreements should not be published in a sensational manner that could scandalise those unacquainted with the difficulty of attaining truth. Newman would be horrified by the mass media of today, ever ready to exploit the wildest scientific speculations to the detriment of religion.

Newman was being rather optimistic when he asked «religious writers, jurists, economists, physiologists, chemists, geologists and historians to go on quietly, and in a neighbourly way, in their respective lines of speculation, research and experiment, with full faith in the consistency of that multiform truth»²¹. He believed that the Catholic is not a «nervous creature who startles at every sudden sound, and is fluttered by every strange or novel appearance that meets his eyes. He has no sort of apprehension, he laughs at the idea that anything can be discovered by any other scientific method which can contradict any of the dogmas of religion»²².

A deeper insight into the relation between science and theology may be obtained by comparing their respective subject matters and methods of enquiry. This Newman does in his essay on «Christianity and Physical Science», and he is here more concern-

¹⁸ *Ibid.*, p. 351.

¹⁹ *Ibid.*, p. 346.

²⁰ *Ibid.*, p. 338.

²¹ *Ibid.*, p. 341.

²² *Ibid.*, p. 342.

ed to point out the differences than to emphasise the similarities. He begins by observing that, broadly speaking, we may divide knowledge into the natural and the supernatural, science being concerned with the former and theology with the latter. The most detailed knowledge of either of these worlds does not by itself give us any knowledge of the other. He allows that the two worlds do sometimes intersect, «as far as supernatural knowledge includes truths and facts of the natural world, and as far as truths and facts of the natural world are on the other hand data for inference about the supernatural. But on the whole, Theology and Science, whether in their respective ideas, or again in their own actual fields, on the whole, are incommunicable, incapable of collision, and needing at most to be connected, never to be reconciled»²³.

This separation is even more marked when we compare theology with physics. The physicist is concerned to understand the measurable aspects of phenomena in terms of laws and first principles. Physics begins with matter and ends with matter. It is of no concern to the physicist, as such, to ask how the universe is sustained, how it came to be, or whether it can cease to be. He cannot say whether the laws of nature are immutable or can be suspended, or what is the nature of time or causality. Theology, on the other hand, does not deal with matter at all. It is concerned with just those questions that are beyond the sphere of the physicist. «Theology contemplates the world, not of matter, but of mind; the Supreme Intelligence; souls and their destiny; conscience and duty; the past, present and future dealings of the Creator with the creature»²⁴.

As a result, the physicist and the theologian regard phenomena from different points of view. The physicist is concerned with the behaviour of matter, not with its origin and purpose. This is a methodological limitation, a definition of the subject matter. In this sense it is atheistic, and this is why the exclusive pursuit of science can tend to indifferentism or scepticism concerning theological questions.

Having thus described the respective spheres of theology and science, and shown that they but rarely impinge on each other from the very nature of their subject matter, Newman goes on to contrast their respective methods. Theology, he points out, is deductive, whereas physics is inductive. Theology is based on the truths of Revelation, and nothing further can be added. Physics lacks such known principles and has to find them through a detailed analysis of diverse phenomena. Thus theology relies on tradition, physics on experiment; theology looks to the past, physics to the future.

These distinctions between theology and physics need to be qualified by in several respects, and Newman did so in his other writings. In his day, theology was unduly systematised, and uneasily fitted into a strict deductive mould, while science as we know it now, with the vast interlocking structure of theoretical physics, was barely glimpsed. It is indeed possible to draw several instructive parallels between the methods of theology and science, thus modifying the sharp antithesis painted by Newman. In a certain sense theology also is progressive and inductive, as Newman himself showed in his *Essay on the Development of Christian Doctrine*. Deduction, on the other hand, plays a central part in modern science in drawing out the numerous consequences of its general principles

²³ *Ibid.*, p. 310.

²⁴ *Ibid.*, p. 313.

The inadequacy of the simple antithesis between induction and deduction to characterise the respective methods of Science and Theology was shown by Newman in his later work on a *Grammar of Assent*, where he shows the similarity between assent in religion and in science. Newman was concerned to justify the certainty with which Catholics hold the Faith, even though they may be unable to provide a rational justification.

He began by distinguishing between notional and real assent. If we are shown a geometrical proof, for example, and are unable to see any flaw, we accept it notionally. It does not engage us deeply, we would not die for it, as we know very well that there may be a hidden flaw. If, however, we are provided with the demonstration of a result that is embedded in a web of arguments, all pointing to the same conclusion, our assent is much stronger and can be called real. An example is provided by the many arguments, from a wide variety of premises, that support the Lorentz transformation in special relativity.

It is a common experience in scientific research that assent to the reality of a certain phenomenon grows gradually as many separate indications coalesce and fall into place. It is rather like forming a friendship. At first one is unsure, but gradually the various impressions join together to reveal a real person. Once the real assent is attained, it is possible to predict the likely behaviour of the phenomenon, or of the friend, in circumstances not yet experienced. In such cases, «the warrant for our certitude about them is not mere common sense, but the true healthy action of our ratiocinative powers, an action more subtle and more comprehensive than the mere appreciation of a syllogistic argument»²⁵.

Many other examples can be adduced from experimental science, and from our everyday experiences. We believe that the planets rotate around the sun, that the stars are very far away and that the earth rotates on its axis, each on the basis of a large number of probable arguments. Newman gives many examples of such assents, such as the belief that Britain is an island, and that we will all eventually die, all showing how it is possible for many individual arguments, each probable, to fuse together to give certainty. Newman called this the illative sense. This way to belief is found in everyday affairs, in science and also in religion. It is indeed fitting that our religious beliefs should engage the whole person and not just our minds for «man is *not* a reasoning animal; he is a seeing, feeling, contemplating, active animal».

It might well be objected that sometimes we are quite certain about some belief, and afterwards find that we are mistaken. In such cases, however, it is possible to find an underlying continuity between the new belief and the old, so that the one can be seen as a natural development of the other. In physics this is found, for example, in the transition from Newtonian to Einsteinian dynamics, where the latter is a development of the former. Similarly, in theology we find an organic growth through the years, as described by Newman in his *Essay on the Development of Christian Doctrine*.

Newman emphasises both the apparently paradoxical aspects of the relation between theology and science. On the one hand, since all knowledge is ultimately one, they are intimately linked together, yet, on the other, this link is such as to permit each to develop in full freedom in accord with its own inner life.

²⁵ *An Essay in Aid of a Grammar of Assent* (London: Longmans Green, 1947), p. 241.

Such a relationship has many parallels, both in the material world and in human affairs. The nucleus in the atom, the atom in the molecule, the molecule in the cell, the cell in the body, the individual in the family and the family in society each has a distinct life of its own and yet is bound to the higher organism of which it is a part.

This relationship Newman expresses in the terminology of scholastic philosophy by calling Theology the external form of the sciences. In saying this he maintains that Christianity, «where it has been laid as the first stone» (of education) «and acknowledged as the governing spirit, it will take up into itself, assimilate, and give a character to literature and science»²⁶. But this is not done by dictating any of the specific methods or results of science, as it would be if theology were the *internal* form of science. In making this distinction Newman rejects the notion «that Theology stands to other knowledge as the soul to the body; or that the sciences are but its instruments or appendages. Theology is the highest, and the widest, but it does not interfere with the real freedom of any secular science in its own secular department»²⁷.

EVOLUTION

In an entry in his *Philosophical Notebook*, dated 9 December 1863, Newman reflects: «There is as much want of simplicity in the idea of the creation of distinct species as in that of the creation of trees in full growth, whose seed is in themselves, or of rocks with fossils in them. I mean that it is as strange that monkeys should be so like men with no *historical* connection between them, as the notion that there should be no course of history by which fossil bones got into rocks»²⁸.

In this passage, Newman is not concerned to consider the detailed scientific arguments for and against the theory of evolution. He does not see it as his duty to argue for or against the theory. Instead, he simply remarks that in its overall sweep it is far more plausible than the belief in special creation a few thousand years ago, a view that is still vigorously propagated. Such creationists, having rejected the authority of the Church as the Divine interpreter of Scripture, are trapped by the superficial meaning of the words, which inevitably leads them to a position that is antithetical both to theology and to science.

Newman believed that the Creator lets His work develop through secondary causes, which have imparted «certain laws to matter millions of ages ago, which have surely and precisely worked out, in the course of these long ages, those effects which He from the first proposed»²⁹. In a letter to Pusey, he addresses the same question: «If second causes are conceivable at all, an Almighty Agent being supposed, I don't see why the series should not last for millions of years as for thousands»³⁰. Thus, «Mr Darwin's theory *need* not be atheistical, be it true or not; it may simply be suggesting a larger idea of Divine Prescience and Skill»³¹.

²⁶ *The Idea of a University*, pp. 319-320.

²⁷ *Ibid.*

²⁸ Cf. *The Philosophical Notebook of John Henry Newman*, ed. by E. Sillem (Louvain: Nauwelaerts Publishing House, 1969), vol. II, p. 158.

²⁹ «Letter to Canon J. Walkers», in *Letters & Diaries* (Oxford: Oxford University Press, 1973), 24.77.

³⁰ «Letter to Pusey», in *Letters & Diaries* (Oxford: Oxford University Press, 1973), 25.137.

³¹ *Ibid.*

This is not of course to say that Newman concurred with all Darwin's views. By 1871 Darwin had been a rank materialist for over thirty years, although he concealed it to avoid controversy. In particular, Newman was clear about what should he behind talk about chance as the causative agent in evolution. In a letter to Mivart he emphasised that *chance is not a cause*, because «what seems chance must be the result of existing laws as yet undiscovered»³². In another letter he expressed his view that «a theist did not necessarily have to hold that “the *accidental* evolution of living beings is inconsistent with divine design”», adding that «it is accidental to us, not to God».

Newman was not much interested in meetings of the British Association for the Advancement of Science, and kept well clear of them. He deplored the habit of scientists, on the occasion of these meetings, to air their views on theological matters. In a letter written in 1874 to the Rev. David Brown, a Free Kirk minister, he remarked: «Doubtless theologians have meddled with science, and now scientific men are paying them off by meddling with theology. With you, I see nothing in the theory of evolution inconsistent with an Almighty Creator and Protector: but these men assume, assume with an abundant scorn of us and superciliousness, that religion and science are on this point contradictory, and on this audacious assumption they proceed dogmatically to conclude that there is no truth in religion. It is dreadful to think of the number of souls that will suffer while the epidemic lasts; but the truth is too powerful not in the end to get the upper hand»³³. One can only remark that the epidemic has lasted a rather long time.

SCIENCE AND MAN

When Newman was in his prime, the high tide of scientific humanism was in full flood. Enthusiastic and loquacious orators vied with one another to introduce the masses to the marvels of the new worlds opened up by science. Museums were founded, Libraries and Reading Rooms established, and evening classes started for the instruction of all.

On the occasion of the opening of the Library and Reading Room at Tamworth, no less a person than Sir Robert Peel excelled himself in enthusiastically praising the benefits of the new learning: «Let me earnestly entreat you not to neglect the opportunity which we are now willing to afford you! It will not be our fault if the ample page of knowledge, rich with the spoils of time, is not unrolled to you [...] Not only will this spread new knowledge, but man in becoming wiser will become better. He will rise *at once* in the scale of intellectual and moral existence, and by being accustomed to such contemplations, he will feel the *moral dignity of his nature exalted*. Not only is physical knowledge the means of useful knowledge and rational recreation, but its pleasures supersede the indulgence of sensual appetites. Thus it will contribute to the intellectual and *moral improvement* of the community»³⁴.

³² «Letter to Mivart», in *Letters & Diaries* (Oxford: Oxford University Press, 1974), 26.384.

³³ «Letter to Rev. David Brown», in *Letters & Diaries* (Oxford: Oxford University Press, 1975), 27.43.

³⁴ Sir Robert PEEL, *Lecture on the Occasion of the Opening of the Tamworth Reading Room*. 19 January 1841, published in *The Times* (London) and subsequently as a pamphlet.

Newman enquires «*how* these wonderful moral effects are to be wrought under the instrumentality of the physical sciences [...] Does Sir Robert Peel mean to say that [...] you have but to drench the popular mind with physics, and moral and religious advancement follows?». He points out that «to know is one thing, to do is another; the two things are altogether distinct». Newman immediately puts his finger on the error lying behind this —the view «that true excellence comes not from within, but from without; not wrought out through personal struggles and sufferings, but following upon a passive exposure to influences over which we have no control»³⁵.

After some further exposures of the total inadequacy of the new method of elevating people's morals by diffusing scientific knowledge, he releases upon it the full force of his withering scorn:

«It does not require many words, then, to determine that, taking nature as it is actually found, and assuming that there is an Art of life, to say that it consists, or in any essential manner is placed, in the cultivation of Knowledge, that the mind is changed by a discovery, or saved by a diversion, and can thus be amused into immortality, —that grief, anger, cowardice, self-conceit, pride or passion, can be subdued by an examination of shells and grasses, or inhaling of gases, or chipping of rocks, or calculating the longitude, is the veriest of pretences which sophist or mountebank ever professed to a gaping auditory. If virtue be a mastery over the mind, if its end be action, if its perfection be inward order, harmony and peace, we must seek it in graver and holier places than in Libraries and Reading rooms»³⁶.

This insistence on interior formation rather than on exterior organisation as the means of improvement, Newman applied also to human society as a whole. He was not impressed by the optimism of those who sought to ensure the happiness of mankind by the devising of a perfect political system. «Men see that those parts of the national system», he observed, «which really depend on personal and private virtue, do not work well —and, not seeing where the deficiency lies, viz., in want of personal virtue, they imagine that they can put things right by applying their scientific knowledge to the improvement of the existing system [...] I will state a principle», he continues, «which seems to me most important and most neglected —that the difference between this or that system is *as nothing* compared with the effects of human will upon them, that till the will be changed from evil to good, the difference of the results between the two systems will be imperceptible».

CONCLUSION

Newman was notable for his holiness, long-suffering, sensitivity and courage. He was ever-conscious of the presence of God, and devoted his life to His service. During the first half of his life he served God in the Church of England, and conscientiously carried out his duties to his students and parishioners. Then, as he reflected on contemporary events, he gradually came to the agonising realisation that the Church of England, which he had loved so ardently and served so faithfully, is a

³⁵ *Discussions and Arguments on Various Subjects* (London: Longmans Green, 1947), p. 261.

³⁶ *Ibid.*, p. 294.

house divided against itself, a man-made sham. As he studied ever more deeply the early history of the Church and the writings of the Fathers he saw that it is the Church of Rome that has maintained the true faith throughout the ages. Once convinced, he did not hesitate to abandon the security of a well-endowed Oxford don to join the despised remnant of the Catholic Church in England, where he was treated with suspicion and incomprehension. He was always absolutely obedient to his superiors, although bitter experience taught him that he could never trust them. He was always unconditionally loyal to the Papacy.

In his writings he showed a keen insight into the psychology of belief, and illustrated his discourses on its nature by examples from the whole realm of human experience from mathematics and physical science to history and theology. His early studies of mathematics and physics, and his later work on logic, gave his writings a clarity and cogency that place them far above those of his contemporaries.

His courage was not only spiritual and intellectual. When the cholera was raging he was asked to send two priests to take the places of those who had died, Newman went himself, accompanied by the ever-faithful Ambrose St John.

Although he always put truth above friendship, he nevertheless retained the affection of his Anglican friends and won for himself a unique place in the esteem of Englishmen, and indeed of people everywhere, from his own times until the present day.

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