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AUGUSTIN BONNETTY
CONSIDERED AS A RECONCILER OF
SCIENCE AND RELIGION
1830-1840

by Edward Alfred Pulker

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CURRICULUM STUDIORUM

Edward Alfred Pulker was born August 21, 1916, in Belleville, Ontario. He received the Bachelor of Arts degree from the University of Toronto in 1940. He graduated in Divinity from Trinity College, Toronto, in 1942, and received the Bachelor of Divinity degree from the General Synod of the Anglican Church of Canada in 1947.

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INTRODUCTION

1. The Importance of this Study.

This particular study is centred around the life and work of Augustin Bonnetty, a man who is little known today. A devoutly religious man, he was wedded to belief in the Mosaic authorship of Genesis and the divine verbal inspiration of the Scriptures, doctrines which are now outmoded among Christians, except those of fundamentalist sects. Yet those same beliefs were commonly held by orthodox Christians during his lifetime.

Although Bonnetty was a man of his times, he was also a man with a mission. That mission was to reconcile science with religion, and to show his fellow Christians in France how much support scientific studies and conclusions gave to the Christian faith. Christians had not kept pace with scientific development. He intended to bring them up to date.

Problems similar to those Bonnetty faced are still with us. In our own day Bishop Robinson claims that there are levels within the thought processes of modern man in which his religious ideas have not kept pace with what he has accepted as scientific reality.¹ This mental dichotomy

¹ John A.T. Robinson, Honest to God, London, Student Christian Movement, 1963, 143 p., p. 13, 17.

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has resulted from failure to reconcile religion and science satisfactorily. This failure is responsible not only for a great loss in adherents to Christianity, but also for a feeling among those who remain faithful to the Church and the Christian faith that their religion is unrelated to life.

In spite of the limitations of his viewpoint, which he shared with the majority of Christians of his time, Bonnetty's work is important, because it represented a positive attempt to reconcile science with religion. Moreover, it represented an attempt to bring his fellow churchmen in France up to date in their ideas about science. They were prepared to embrace the physics of Newton; now they had to face the problems raised by the new science of geology, which was just coming into its own as a recognized and separate discipline. Some geologists had advanced ideas which appeared contrary to the Genesis account of creation. Chronology was one of the most important points of disagreement. Had creation taken place about six thousand years ago, as Christian scholars had concluded from the book of Genesis, or had it taken place in a dim and remote past, as some geologists claimed? Christians had come to accept a universe which extended an unknown, perhaps infinite, distance in space. Would they now accept a world that went back untold ages in time? The very manner of creation was

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also involved. Had God created the world by a series of immediate commands or by a long slow process? Was creation a static or an evolutionary process?

Although the articles in the Annales de philosophie chrétienne² covered a much wider field than that of geology and Genesis, and embraced other sciences as well as religion and philosophy, this study is largely confined to the problems which geology presented to Christian beliefs between 1830 and 1840. The purpose of this study is to see how Bonnetty faced these problems in his attempt to reconcile science with religion. A study of the work of this particular man will also provide some insight into the manner in which other churchmen faced the same issues in the same period.

2. The Relationship of this Study to Previous Work on Bonnetty.

For many years the most complete references to Augustin Bonnetty were to be found in works on French philosophy in the nineteenth century. Writers like Louis Foucher,³

² Hereafter referred to as the Annales.

³ La Philosophie Catholique en France au XIXe Siècle avant la Renaissance Thomiste et dans son rapport avec elle (1800-1880), Paris, J. Vrin, 1955, 280 p.

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George Boas,⁴ M. Ferraz,⁵ and Lucien Levy-Bruhl⁶ saw Bonnetty's significance in his connection with the Traditionalists and in his support of the teaching of men like Bonald, Maistre, and Lamennais. Ferraz has described Bonnetty as the most celebrated of the supporters of Gerbet, Bautain, and Buchez in their opposition to the kind of teaching then given in French seminaries.⁷ Foucher took the position that Bonnetty's purpose in founding the Annales was to defend the theories of knowledge associated with the Traditionalist school.⁸ He barely mentioned Bonnetty's interest in science, saying merely that he expounded the arguments furnished by geology, ethnography, and other disciplines in favour of Genesis, so much attacked in the eighteenth century.⁹

⁴ French Philosophers of the Romantic Period, Baltimore, John Hopkins, 1925, xi-325 p.

⁵ Histoire de la Philosophie en France au XIX Siècle, Traditionalisme et Ultramontanisme, Paris, Didier, 1880, v-513 p.

⁶ History of Modern Philosophy in France, trans. G. Coblenz, Chicago, Open Court Publishing Company, 1924, x-500 p.

⁷ Ferraz, op. cit., p. 345.

⁸ Foucher, op. cit., p. 65.

⁹ Ibid.

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A quite recent work by Jean-René Dérré¹⁰ does more justice to Bonnetty's interest in reconciling science and religion, and includes a section in which the author discusses the role and purpose of the Annales.¹¹ What Dérré has done in a broad and general way, this study will attempt to do in a limited and specific area by going directly to the Annales and examining the articles which bear most directly on science and religion and the attempts to reconcile them. Of special interest will be the field of geology, which provided the new ideas which were in conflict with the Genesis account of creation and of the Flood of Noah. The important question throughout this study is: "In what manner and how effectively did Bonnetty deal with the conflict between Genesis and geology?" It must be assumed that, as chief editor, Bonnetty was responsible for the opinions which were published and that, when they had the support of the Annales, they represented his own views. When he disagreed with views which were given expression in the Annales, he was ready to let the reader know his disagreement by editorial comment or a footnote.

¹⁰ Lamennais, ses amis et le mouvement des idées à l'époque romantique (1824-1834), Paris, C. Klincksieck, 1962, 763 p., p. 492-499.

¹¹ Ibid., p. 499.

CHAPTER I

THE PROBLEM OF SCIENCE AND RELIGION

When we consider what religion is for mankind, and what science is, it is no exaggeration to say that the future course of history depends upon the decision of this generation as to the relations between them.¹

Alfred North Whitehead wrote these words more than forty years ago. The "this generation" of which he spoke has given way to the next, yet mankind is not much closer to the decision as to the relations between science and religion which he considered to be so critical. Philosophers, scientists, and clerics are still trying to reconcile these two great areas of life which are in apparent contradiction to each other. "Of making many books there is no end"² as far as this subject is concerned. The essential elements of the discussion are men's inner need for religious faith on the one hand, and the external facts of the universe as they are revealed by scientific observation on the other. Between these two elements, for much of western society, there is a great gulf fixed. A fundamental divergence exists

¹ Science and the Modern World, Cambridge, University Press, 1925, 265 p., p. 224.

² Ecclesiastes 2:12, Revised Standard Version.

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between those whose viewpoint includes the supernatural and those whose viewpoint is limited to the natural.³

1. The Origin and Nature of the Conflict.

In the thirteenth century European Christianity came under the influence of scholasticism, which for several centuries provided the intellectual framework within which all philosophy, including natural philosophy, as science was then described, had to find its place. The deductive science of Aristotle and Ptolemy became such an integral part of the scholastic scheme of things, that it amounted almost to heresy to question its conclusions.⁴ When the Aristotelian cosmology was confronted by "the most influential new development in the early modern period in Europe",⁵ the rise of modern science, many churchmen defended this cosmology "as if it were a sacred monument, to remove a stone of which would involve the complete downfall

³ Wm. A. Agar, Catholicism and the Progress of Science, New York, Macmillan, 1940, xi-109 p., p. 25.

⁴ Alfred Cobban, In Search of Humanity: The Role of the Enlightenment in Modern History, London, Jonathan Cape, 1960, 254 p., p. 31, 32.

⁵ Ibid., p. 29.

of the whole edifice."⁶ When the new movement gathered force and came into its own in the seventeenth century, men of science like Bacon, Galileo, and Newton no longer accepted certain theories or principles as the starting points for their investigations. They began with observations and drew conclusions from them. They were content to study cause and effect as a relationship which could be studied per se, without being related to final causes.⁷

The first of the sciences to conflict with the old cosmology were astronomy and physics. The conflict led to the condemnation of Galileo and the rejection of the Copernican system by Roman Catholic authorities. Although Pope Benedict XIV in 1757 withdrew the objection to the theory of Copernicus, this theory could not be published with official permission until 1820. Galileo's works remained on the Index until two years later.⁸

These restrictions were therefore in force when Bonnetty received his education. Yet, by the time he

⁶ Cardinal Désiré-Joseph Mercier, et al., A Manual of Modern Scholastic Philosophy, trans. T.L. Parker and S.A. Parker, 2 vols., London, Kegan Paul, 1917, 1919, Vol. 2, p. 429.

⁷ C.A. Coulson, Science and Christian Belief, London, Oxford University Press, 1955, 127 p., p. 40.

⁸ Agar, op. cit., p. 38.

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founded the Annales, he and his associates had warmly embraced the teachings of the great scientists who had contributed to the scientific revolution. What Bonnetty and his friends desired to combat was not the scientific theories which had been widely accepted by their time, but the use which had been made of science in the previous century to undermine the faith. At that time the conflict between science and religion had taken a form peculiar to France, which Basil Willey has brought out by his comparison of the different attitudes toward science and religion to be found in England and France in the eighteenth century.⁹ In this period no conflict between scientific conclusions and religious faith troubled English scientists. The French philosophes, as a result of the different social and religious milieu in which they lived and worked, used science to undermine the position of the Church in the French social structure. To them science revealed a world ruled by natural law. In such a world miracles were either figments of the imagination or deliberate deceit on the part of priests. Whether deist like Voltaire, or atheist like Holbach, they were opposed to organized Christianity, to priesthood, to

⁹ The Eighteenth Century Background; Studies on the Idea of Nature in the Thought of the Period, London, Chatto and Windus, 1950, viii-302 p., p. 155, 156.

ecclesiastical power, to theological quibbling. Reason and science were their weapons of war. In their system Nature replaced God, and natural laws replaced the laws of God. With reason able to discover natural law, there was no place for revelation.¹⁰ Their philosophy eventually reached its ultimate conclusions in the materialism of Holbach whose Systeme de la Nature, published in 1770, held nature to be a realm of complete determinism and the soul to be a function of the body.¹¹

The philosophes were not scientists, and their conclusions were not reached by scientific method. Derwyn Owen has classified them as scientolatrists, and their use of science he has called scientolatry or scientism.¹² His description of how science becomes scientism fits the philosophes perfectly. In their hands the empirical, quantitative, mechanical, and progressive principles by which science works became the dogmas of materialism or naturalism, of determinism, and of utopianism.¹³ The fallacies which resulted from their method of reasoning provided

10 Carl L. Becker, The Heavenly City of the Eighteenth-Century Philosophers, New Haven, Yale University Press, 1932, 168 p., p. 50-53.

11 Willey, op. cit., p. 155.

12 D.R.G. Owen, Scientism, Man, and Religion, Philadelphia, Westminster Press, 1952, 208 p., p. 21.

13 Ibid., see also p. 193, note 3.

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ample scope for the criticism which the next generation would direct at them.

2. The Intellectual Reaction in the Nineteenth Century.

Between the attempts of the philosophes to undermine the Church by means of science and the attempt of Bonnetty to reconcile science with religion, occurred one of those great social upheavals which mark a watershed in the affairs of men. The philosophes contributed much to the forces which ultimately brought about the downfall of the old regime. The very violence of the Revolution led, not only to a social and political reaction, but also to an intellectual reaction which was to influence the course of Bonnetty's thought and career. He passed through childhood into adolescence during the Empire. He completed his education and grew into manhood during the struggle of Frenchmen to establish a more normal and balanced system of government. The first experiment under the Bourbons ended in failure at the very moment the Annales was beginning its career. Yet Bonnetty kept himself somewhat aloof from the social and political changes which took place in France during these years. It was the intellectual movement which caught his interest and imagination. This movement began shortly before he was born, at a time when so many Frenchmen

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were in exile. It produced a new school of thinkers known as Traditionalists, which attempted to provide a sound intellectual base upon which to restore throne and altar to pre-eminence in France.

The two best known names of the Traditionalist school are those of Joseph de Maistre and Louis de Bonald. With logic and confidence, and sometimes with feeling, they exposed the inconsistencies of the philosophes. Against the latter's claim that all truth could be discovered by reason, Maistre and Bonald invoked tradition; against the individualism of the philosophes, they invoked respect for society.¹⁴

Also associated with Traditionalist doctrine was l'abbé Félicité de Lamennais whose house at la Chênie became the centre for a group which set about the rejuvenation of the Church in France. According to Adrien Dansette, the bishops of the Restoration lived lives which were morally irreproachable, but their social activities resulted in neglect of their dioceses.¹⁵ Their ideas were very much those of the past. They still opposed Voltaire

¹⁴ Adrien Dansette, From the Revolution to the Third Republic, Vol. 1 of Religious History of Modern France, 2 vols., trans. John Dingle, New York, Herder and Herder, 1961, p. 176.

¹⁵ Ibid., p. 173.

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and the Jansenists on the one hand, but were unaware of the discoveries of geology on the other.¹⁶ Both bishops and older priests saw faith in Catholicism and faith in the monarchy as interrelated. They both wished to return to the Gallicanism of the old regime.¹⁷

Bonnetty made similar criticisms of the Church as it was in the years following the Restoration.¹⁸ In an article published the year before his death he claimed that the lives of the influential clergy had been purified by exile, but their ideas and methods were still the same. He was critical both of the Gallicanism of the Church and of the teaching of Cartesian philosophy in the seminaries. He also told how l'abbé Gerbet and l'abbé de Salinis went about changing the established method and content of seminary teaching. Following their ordination on June 1, 1822, both these priests taught at the Collège Henri IV. Instead of catechism and addresses they used discussions and conferences. During the same period they introduced the same methods at evening gatherings of scholars, at which

16 Ibid., p. 174.

17 Ibid., p. 174, 5.

18 Augustin Bonnetty, "Le Vrai, Le Beau et Le Bien de M. Cousin mis à l'Index et établissement d'une Eglise Chrétienne sans le Christ", 17e article, in Annales, Vol. 94, March 1878, p. 202.

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questions of religion, philosophy, and politics were discussed. As a result of these soirées, and in order to make their methods more widely known, Gerbet and Salinis, along with l'abbé Guanih, founded the Mémorial Catholique, which first appeared in January 1824, and had the support of men like Bonald, Lacordaire, and Genoude.¹⁹

Such were the men under whose influence Bonnetty came when he arrived in Paris in 1825. He was stirred by the ferment of ideas among these men who sought to remove the weaknesses of the French Church and to bring the Church to face modern conditions positively. He was most influenced by Lamennais, who followed the Traditionalists in his ultramontanism, but who went beyond most of them in his social concern and his desire to reconcile the Church and the working class. Where Lamennais sought to adapt the Church to the political and social conditions of the time, Bonnetty chose the field of reconciling the Church and science. He also gave strong support to those who were trying to improve the education of the clergy. The movement of reform continued and gathered strength in the next decade in spite of the break of Lamennais with the Church.

¹⁹ Ibid., p. 203.

From this description of the situation which lay behind Bonnetty's attempt to reconcile religion and science it is obvious that the Church as a whole had a long way to go to catch up with the real political, social, and intellectual problems of the times. Not the least among these problems was the scientific development which was taking place and the challenge that development presented to established religious beliefs. Bonnetty saw in this challenge an opportunity for fruitful service, to which he dedicated himself through the pages of the Annales de philosophie chrétienne.

CHAPTER II

THE CAREER OF AUGUSTIN BONNETTY UNTIL 1830

This chapter presents the early life of Bonnetty, from birth until the founding of the Annales. It shows the factors which influenced his choice of career, how he founded the Annales, his purpose in so doing, and the beliefs which inspired and guided him.

1. His Early Life.

Shortly after the death of Bonnetty on March 26, 1879, the Annales published an account of his life by l'abbé Dedoue, who had known him for more than fifty years. This biography is somewhat eulogistic, but it does provide a fairly full account of Bonnetty's life.¹

Augustin Bonnetty was born on May 9, 1798, the second of three sons and two daughters of Gabriel Bonnetty and Marie Lions, his wife, who lived in the village of Entrevaux in the Basses-Alpes department. The family circumstances were modest, but the parents were devoutly Christian and well thought of in the village. Augustin received his early education at Entrevaux, but, because

¹ "Augustin Bonnetty", in Annales, Vol. 96, May 1879, p. 348-404.

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he showed some leanings toward the sacred ministry, his parents managed to board him with l'abbé Cottier in the nearby village of Puget-Théniers. Two of his fellow students were sons of M. Blanqui, the subprefect. The younger being a poor pupil, was placed under the care of Bonnetty. His name was Auguste, and he grew up to become one of the most revolutionary figures of the nineteenth century.

According to the custom of the period, Bonnetty's education was primarily classical in content. It was the result of a fortunate coincidence that the range of his interest was enlarged to include an introduction to the sciences. An uncle of Dedoue had been taken prisoner-of-war at the battle of Trafalgar and kept in England for some nine years, until the fall of the Empire in 1814. He had spent his time to good advantage by reading and studying, with the help of books lent to him by an émigré priest. After his return to Entrevaux, he offered to pass on to the youthful Augustin some of his learning in mathematics, astronomy, and natural history. Thus, when Bonnetty went to the Great Seminary at Digne in the Fall of 1815, the ground had been prepared for his future life. At seminary he was greatly influenced by Father Jean de Masse, a Jesuit professor of philosophy, and, according to Dedoue, a very good mathematician.²

² *Ibid.*, p. 351.

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The completion of four years training in seminary found Bonnetty too young for ordination. In April 1820 he took a position as a family tutor in Marseilles. During this period he felt moved to make his life's work the defense of religion by learning and science. After discussing his ideas with his parents and his spiritual adviser, he gave up the idea of the priesthood, feeling that he would have more influence in his vocation as a layman. After a short time with another pupil, he decided to relinquish teaching and go to Paris.

Bonnetty arrived in Paris on August 25, 1825, to spend more than a year in studying, attending lectures, and meeting scholars. In January 1827 he went to see l'abbé Gerbet, who gave him much encouragement and took him to meet l'abbé Félicité de Lamennais, who lived in the same house. Together they discussed philosophy and the direction that Christian apologetics ought to take. Bonnetty was greatly impressed by the kindness and simplicity of these two illustrious men. The next month he met M. Flayol, who proposed him for membership in the Société Etudes littéraires, which had been founded by M. Bailly to provide an opportunity for young men to present philosophic and

literary compositions to an audience.³ On February 20 he was unanimously accepted. In this association he met many of his future friends. In the same period he made friends with l'abbé de Salinis and Jacques Jacquenet, who were to play important roles in his later life. He also gained the goodwill of M. Bailly, through whom he joined the Association pour la défense de la religion catholique, of which Lamennais, Gerbet, and Salinis were also prominent members. Not only was Bonnetty given responsibility for the administration of the organization, he was also given a part in the publication of its weekly paper, the Correspondant.

2. The Founding of the Annales.

Augustin Bonnetty was not a man to remain content with doing clerical work for other men, no matter how great their talents. Writing about fifty years later, he admitted that he felt personal frustration caused by difficulties in the relationship. He felt that others derived all the honour and profit, whereas he was left with all the

³ Bonnetty told the story of the founding of this society in the article "Le Vrai, Le Beau et Le Bien de M. Cousin mis à l'Index et établissement d'une Eglise chrétienne sans le Christ", 17e article, in Annales, Vol. 94, March 1878, p. 214-216.

troubles.⁴ He also realized that there was an important area of knowledge, that of science, which all publications were still ignoring. These factors contributed to his decision to found a new publication. Two friends from the Basses-Alpes department, M. l'abbé Savornin and M. le D. Bayle, joined him in making the plans and in putting up five hundred francs apiece. Bayle prepared the Prospectus, of which ten thousand were put in the mail on June 16, 1830. Within fifteen days, ten thousand francs had come in. From that time the Annales went forward "without shareholders, without subsidies, without debts, contrary to every expectation, even our own", wrote Bonnetty forty-eight years later.⁵

Bonnetty seemed to have enjoyed keeping his editorship of the new review secret for a time. When the truth became known to M. Bailly of the Correspondant, Bonnetty, according to his own admission, really began to count for something.⁶ He corrected the proofs of the first edition to the sound of cannon during the July Revolution, and the

⁴ "Le Vrai, Le Beau et Le Bien de M. Cousin mis à l'Index et établissement d'une Eglise sans le Christ", 19e article, in Annales, Vol. 94, May 1878, p. 357.

⁵ Ibid.

⁶ Ibid., p. 358.

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first issue appeared in the early days of August 1830. From then until 1913, issues appeared monthly, the Annales surviving their founder by thirty-four years. The publication was finally placed on the Index as the result of a tendency to support the doctrine of Immanence.⁷

3. The Purpose and Influence of the Annales.

To reconcile science with religion is the purpose which stands out very clearly in the first decade of the publication of the Annales. After 1840 Bonnetty tended to become more involved in defending certain Traditionalist ideas on revelation. Thus it is easy to understand the viewpoint of writers on philosophy like Louis Foucher, who concluded that Bonnetty's primary purpose was to defend the theories of knowledge and certainty put forward by Lamennais in the second volume of his Essai sur l'indifference en matière de religion.⁸ His second purpose, according to Foucher, was to prove the existence of the fundamentals of revealed religion among all people, in keeping with the

⁷ Celestino Testore, "Annales de Philosophie Chrétienne", in the Enciclopedia Cattolica, Vol. 1, ed. G. C. Sansone-Firenze, Vatican City, 1948, p. 1366.

⁸ La Philosophie Catholique en France au XIXe Siècle avant la Renaissance Thomiste et dans son rapport avec elle (1800-1880), Paris, J. Vrin, 1955, 280 p., p. 65.

ideas of the third and fourth volumes of the same work. This second purpose remained dominant and led Bonnetty to concern himself with historical and anthropological research.⁹

This study is concerned with what Bonnetty and his associates claimed to be the purpose of the Annales, both in the Prospectus and in numerous references during the first decade of publication. Here the emphasis was upon science and its relations with religion. The Prospectus expressed concern that so few Christians knew what was going on in the field of science.¹⁰ Science was producing good results; it was making great discoveries. Many people, unaware of the vacuum in their own learning, accused the clergy of ignorance and Christians of being behind the times, of not supporting, of not even liking, the progress being made in the arts and in the sciences. To meet such criticism it was not sufficient for Christians just to be virtuous. They must also show themselves to be leaders of civilization by their knowledge.¹¹ Unfortunately the expense prohibited most readers from procuring the necessary books for keeping

9 Ibid.

10 [Bayle], "Prospectus", in Annales, Vol. 1, June 1830, p. vi.

11 Ibid., p. vii.

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up to date. It was the purpose of the Annales to keep its subscribers informed on the latest works at a price which they could afford.

In case there might be any doubt about the purpose for which the new review was being published, especially after the Revolution of 1830, the editors repeated what they had said in the Prospectus. Their anxiety on this score could be interpreted as a desire to assure the new government that their concern was not with politics. They particularly emphasized that no plans, no articles had been changed. In the following passage they expressed their intention unequivocally:

Défendre la Religion par la science, initier les Chrétiens à ces connaissances dont le siècle se vant tant; nous trouver les premiers sur le champ des découvertes modernes, pour les disputer à l'incrédulité, et en faire hommage à la Religion; scruter dans le passé les monuments, les faits, les actions qui peut tourner à sa gloire; tenir au niveau des connaissances nouvelles les prêtres chargés plus particulièrement d'instruire les peuples: tel est notre but; qui sera nous blâmer ou nous contredire.¹²

Who indeed? But the editors might get in all kinds of trouble if they indulged in expressions of opinion on political matters. The desire not to become involved in such matters was made clear on later occasions. When

¹² The Editors, "A Nos Lecteurs", in Annales, Vol. 1, July 1830, p. 2.

Lamennais was condemned by the papal encyclical Mirari Vos, the Annales not only printed the encyclical in full, but also prefaced it with a statement in which the editors congratulated themselves for not having dealt with political matters.¹³ They affirmed that they would be even more careful in the future. Their purpose was "Recueillir et préparer les matériaux récents qui peuvent servir à la défense de la Religion; arracher à la science du siècle ce qu'elle peut contenir de favorable à notre foi [...]"¹⁴ On another occasion two subscribers sent in a request for political articles.¹⁵ In reply, Bonnetty assured his readers that the refusal to enter into political matters was not the result of weakness, or timidity, or of a lack of concern for France. He believed that he was serving his country better by confining the Annales to works which would lead to spiritual rejuvenation because

13 "Nouvelles et Mélanges", in Annales, Vol. 5, September 1832, p. 229.

14 Ibid.

15 A. Bonnetty, "A Nos Abonnés", in Annales, Vol. 8, June 1834, p. 474.

[...] il est certain qu'aucun des gouvernemens, aucune des formes de société qui suivront, ne pourra devenir stable, ne pourra donner aux hommes, tranquillité, paix, honneur, bonheur, qu'autant que le règne de Dieu pourra s'accorder avec le règne des hommes; qu'autant que la parole de Dieu sera connue et vénéré; qu'autant que le Christ redeviendra roi des intelligences et des coeurs.¹⁶

Bonnetty claimed that the present approach of the Annales would better attain this desired end than would all the ardour of an irritating and passionate polemic.¹⁷ He believed that in working to reconcile science with religion he was working for a great and true regeneration of France.¹⁸

From the above it will be realized that the interest which the Annales would be taking in science would not be concerned with truth for its own sake. Its purpose was really not to reconcile science and religion, which would imply some measure of adjustment on both sides, but to reconcile science with religion. Religion had to be the constant canon of judgment, science the variable factor, in reconciliation. Bonnetty made much of the idea that science was coming back to religion.¹⁹ In considering the success

16 Ibid., p. 475.

17 Ibid.

18 Ibid., p. 476.

19 A. Bonnetty, "A Nos Abonnés", in Annales, Vol. 7, December 1833, p. 467.

of the Annales after five and a half years of existence, Bonnetty attributed it to the belief which inspired the original founding of the review:

[...] c'était que les sciences commençaient à revenir à la religion, et qu'il fallait que les Catholiques se rapprochassent des sciences et les étudiassent avec plus de soin.²⁰

Catholics needed to realize that science was no longer an enemy to be feared.²¹ Instead science provided proofs in support of Scripture and the Christian faith. Unfortunately, most religious people "were not aware of the proofs, so numerous and so sound, that it provided for religion."²²

The Annales intended to make its readers aware of those proofs.

Not only did Bonnetty hope to use the discoveries of science in support of religion and to inform his readers of these discoveries and their meaning, but he also hoped to be the centre of a great movement in which each reader

20 A. Bonnetty, "A Nos Abonnés", in Annales, Vol. 11, December 1835, p. 454.

21 In spite of the different situations in France and England as mentioned on p. 4 above, there was also antipathy on the part of some English churchmen toward science in this period. See Charles Coulston Gillispie, Genesis and Geology, A Study in the Relations of Scientific Thought, Natural Theology, and Social Opinion in Great Britain, 1790-1850, New York, Harper Torchbooks, 1959, xiii-306 p., p. 152.

22 "Prospectus", in Annales, Vol. 1, p. vii.

would be a missionary for the cause of reconciliation between science and religion.²³ If the clergy were to play their part in the modern world, they must be properly trained as well as informed in the sciences as part of their education. He was particularly interested in the work begun by Salinis and Gerbet to improve the education given in the seminaries.²⁴ He was pleased with the number of educators and institutions receiving the Annales. In his report to the subscribers of November 1834, he listed sixty-nine persons associated with seminaries, the majority of them superiors, as receiving the review.²⁵ The Annales also made frequent mention of seminaries where improvements had been made. Seminaries at Montauban and Langres,²⁶ at Fréjus,²⁷ at Forcalquier,²⁸ and in the diocese of Auch²⁹ were among those singled out for commendation for making progress in clerical studies by including scientific courses.

23 A. Bonnetty, "A Nos Abonnés", in Annales, Vol. 7, December 1833, p. 466.

24 See p. § above.

25 A. Bonnetty, "A Nos Abonnés", in Annales, Vol. 9, November 1834, p. 467-471.

26 "Nouvelles et Mélanges", in Annales, Vol. 13, July 1836, p. 454.

27 -----, in Annales, Vol. 14, May 1837, p. 391.

28 -----, in Annales, Vol. 14, April 1837, p. 311.

29 Ibid., p. 312.

Thus the evidence would seem to be overwhelming that the primary purpose of Bonnetty and his associates was to make of the Annales,

[...] une tribune élevée au milieu de notre France pour opérer le rapprochement de la science et de la religion, et faire cesser le divorce affligeant qui les avait séparées.³⁰

There is also evidence that the Annales fulfilled this purpose for contemporary churchmen of the 1830's. In June 1834, there were only 554 subscribers, twenty-seven more than in the previous year.³¹ By December 1842 the number had risen to 842.³² These numbers seem small today, but they were sufficient for survival in those times. Dansette points out that l'Avenir, founded by Lamennais in October 1830, soon had two thousand subscribers, which was, says Dansette, a considerable number for that time.³³ The smaller support of the Annales was to prove more lasting.

³⁰ A. Bonnetty, "A Nos Abonnés", in Annales Vol. 7, December 1833, p. 466.

³¹ -----, "A Nos Abonnés", in Annales, Vol. 8, June 1834, p. 479.

³² -----, "A Nos Abonnés", in Annales, Vol. 25, December 1842, p. 476.

³³ Dansette, op. cit., p. 220.

In his reports to subscribers Bonnetty did not hesitate to use expressions of commendation which he received. The Archbishop of Aix, the Bishop of Mans, and the Vicar-General of Angers were among those whose words of praise he repeated.³⁴ He claimed subscribers not only among the clergy, but also among the young men at l'Ecole Polytechnique, in schools of law and medicine, and among ships' officers.³⁵ He was particularly pleased with the approval of other publications. In December 1835 he reported an article which appeared in the Gazette de France the previous month. It gave three columns to an account of the first ten volumes of the Annales, and the author praised it as the only journal which proved that the sciences were coming back to religion.³⁶

The Bibliographie Catholique, founded in 1841 to keep Roman Catholics informed on various publications, as its first item reviewed the first ten volumes of the Annales.³⁷ After pointing out that there was great

34 A. Bonnetty, "A Nos Abonnés", in Annales, Vol. 11, December 1835, p. 448, 449.

35 Ibid., p. 450.

36 Ibid., p. 451.

37 "Annales de philosophie chrétienne", in Bibliographie Catholique, Revue Critique des Ouvrages de Religion, de Philosophie, d'Histoire, de Littérature, d'Education, etc., Vol. 1, Paris, 1841, p. 36-38.

variation in the quality of the articles, it especially recommended the Annales for young people who loved and cultivated the sciences, the arts, and literature, and for ecclesiastics and others who wished a sound defence for religion against the attacks of unbelievers.

In discussing the influence of his review Bonnetty observed that other works dedicated to the defense of religion were more or less taking the principles and views of the Annales.³⁸ One scholar who certainly did so was Nicholas Wiseman, who at this time was serving at the English college in Rome, and who later became the first Cardinal-Archbishop of Westminster. In his Twelve Lectures on the Connexion Between Science and Revealed Religion,³⁹ first published in 1836, Wiseman's views reveal a remarkable affinity to those previously expressed in the Annales.⁴⁰

In July 1837, the Annales announced a French edition of Wiseman's Lectures with the following comment:

³⁸ A. Bonnetty, "A Nos Abonnés", in Annales, Vol. 11, December 1835, p. 455.

³⁹ New Edition, London, James Duffy, 1866, ix-468 p.

⁴⁰ The similarity is particularly noticeable in lectures five and six which discuss Genesis and geology. On p. 219 Wiseman acknowledged the Annales as a source, and it is obvious that a large part of p. 218, 219 came from H. de C's article "Tableau des couches minérales du globe et des fossiles qu'elles renferment", in Annales, Vol. 9, August 1834, p. 123-137.

Nous en parlerons même avec d'autant plus de plaisir, qu'il semble n'avoir été fait que pour mettre à exécution et appliquer à la chaire le plan et les recherches que nous publions dans les Annales depuis sept ans.⁴¹

The next month an article on Wiseman's work expressed pleasure over the use Wiseman had made of the Annales:

[...] c'est avec satisfaction que nous avons vu M. Wiseman suivre la même méthode que nous, nous emprunter plusieurs documens, et nous citer avec une estime qui nous encourage et nous charme.⁴²

Imitation is always the highest form of flattery. It would seem that Bonnetty's influence was not confined to France and the small number of subscribers in foreign countries, but through Wiseman also reached English speaking clergy and laity throughout the world.

4. Bonnetty's Beliefs.

The approach of the Annales to reconciling science with religion was ultimately dependent upon what Bonnetty believed the role of each to be in the lives of men. As a Traditionalist he regarded revelation as a prerequisite for human knowledge and progress. The Traditionalists in

⁴¹ July 1837, p. 84.

"Bibliographie", in Annales, Vol. 15,

⁴² A. Bonnetty, "Discours sur les rapports entre la Science et la Religion révélée", in Annales, Vol. 15, August 1837, p.115.

reaction against the rationalism of the eighteenth century philosophes, held that human reason of itself was unable to know with certainty the fundamental truths of the metaphysical, moral, and religious orders.⁴³ According to Bonald and Lamennais human knowledge must be preceded by an act of faith based on the authority of revelation.⁴⁴ History was important to the Traditionalists because it is the record of society, through which revelation is transmitted. For Joseph de Maistre, history was the record of divine activity, to be studied as a kind of divine revelation.⁴⁵ From the very beginning the Annales emphasized the role of history:

L'Histoire nous montrera par quelle suite d'événements tous les peuples sont liés entre eux, et par quelle successions de faits ils remontent tous à une seule famille, qui a Dieu pour créateur, pour protecteur et pour guide; elle nous dira aussi par quelles révélations successives Dieu a manifesté ses volontés aux hommes.⁴⁶

Bonnetty followed up this declaration with a series of articles in the first year of publication, in which he

⁴³ G.M. Sauvage, "Traditionalism", in The Catholic Encyclopedia, Vol. 15, New York, Appleton, 1912, p. 13.

⁴⁴ Ibid.

⁴⁵ Richard Allen Lebrun, Throne and Altar, The Political and Religious Thought of Joseph de Maistre, Ottawa, University of Ottawa Press, x-164 p., p. 78.

⁴⁶ "Prospectus", in Annales, Vol. 1, p. vii, viii.

expressed his views on the importance of revelation. He rejected as pure myth the suggestion that man could have advanced to his present state or have discovered either truth or the laws by which he ought to live by the power of his own reason.⁴⁷ Rather, the God who created him also enlightened him by revealing primitive truths to him and by giving him language by which he could express himself.⁴⁸ The primitive truths revealed to the human race at its origin were part of its heritage and, although they might be altered, their presence was still recognizable even in the traditions of non-Christian peoples.⁴⁹

For Christians one of the chief sources of revelation is the Holy Scriptures. Bonnetty shared with most serious Christians of his day the belief in the divine inspiration of the Bible and in the Mosaic authorship of the Pentateuch. Nicholas Wiseman, who was praised by Andrew Dickson White for his open-minded attitude toward science,⁵⁰

47 A. Bonnetty, "De la croyance en l'état de nature, et ses funestres conséquences", premier article, in Annales, Vol. 1, November 1830, p. 272.

48 Idem, troisième article, Vol. 2, January 1831, p. 7.

49 Ibid., p. 19-22.

50 A History of the Warfare of Science with Theology in Christendom, 2 vols., New York, Dover Publications, 1896, Vol. 1, p. 223-224. White was generally critical of churchmen for their opposition to new scientific ideas.

believed firmly in the Scriptures as divine revelation.⁵¹ The Reverend Dr. Buckland, the leading geologist of Great Britain between 1820 and 1830, did likewise.⁵² Other scientists like Deluc⁵³ and Cuvier,⁵⁴ both favourites of the Annales, produced theories which were reconcilable with the Genesis account of creation. Belief in the divine verbal inspiration of Scripture was part of the Christian climate of opinion until much later in the nineteenth century.

Bonnetty therefore began his task of reconciling science and religion with a strong conviction that Genesis, as far as it went, gave an accurate account of the events of creation. To this conviction he added the belief that true science and true religion could not contradict each other.⁵⁵ They both worked for the glory of God but at different levels:

Ainsi, le but de la Religion est le même, en dernière analyse, que celui de la Science, avec la différence qu'elle s'attache à des choses plus nobles, plus relevées, plus intimement liées à notre bonheur ou à notre malheur.⁵⁶

51 Wiseman, op. cit., p. 195-198, 202, 203, 216, 242.

52 Gillispie, op. cit., p. 103.

53 Ibid., p. 57-66.

54 Ibid., p. 99-102.

55 "De la Religion dans ses rapports avec la Science" in Annales, Vol. 1, July 1830, p. 5.

56 Ibid.

As the Prospectus to the Annales put it, "[...] tout l'univers n'a qu'une voix, et cette voix est un hymne à l'Eternal."⁵⁷ This conviction has its modern counterpart in the conclusion of C.A. Coulson, "There is no other way out of our impasse than to assert that science is an aspect of God's presence, and scientists therefore part of his company of heralds."⁵⁸ The difference between Bonnetty and a modern scholar like Coulson lies in the application of such a belief.

According to Bonnetty the role of science was to elaborate on the description of creation given by Moses and to reveal to men further details on how God had done his marvellous work. The role of science was "rechercher les lois, connaître la composition intérieure de ce monde, voir par quelle action Dieu conserve cet univers: tel est l'objet de la Science."⁵⁹ If science would only confine itself to what another writer for the Annales considered its proper function of confirming the sacred books and making clear obscure passages, there would be no conflict between science

57 Vol. 1, p. vi.

58 Science and Christian Belief, London, Oxford University Press, 1955, 127 p., p. 30.

59 "De la Religion dans ses rapports avec la Science", in Annales, Vol. 1, July 1830, p. 5.

and religion.⁶⁰ It was when scientists postulated improbable theories which were in contradiction to the Scriptures that conflict began.

Bonnetty went further than simply believing that the discoveries of geologists could be reconciled with Genesis; he also believed that they verified and gave positive support to the biblical accounts of the creation and of the Flood of Noah. He believed that science was a strong weapon for the faith against irreligion, rather than a weapon for scepticism and atheism as in the previous century. Science not only supported the revelation of Scripture, it was itself a revelation, to an ever greater extent, of the marvellous details of God's creation. This idea of the wonderful, purposeful design revealed by creation was a recurring theme in the Annales, beginning with this statement in the Prospectus:

La Science des Euler, des Galilée, des Newton, des Copernic et des Leibnitz nous fera admirer les sublimes rapports par lesquels Dieu a lié tous les corps célestes entre eux et comment notre globe est coordonné dans cette merveilleuse harmonie.⁶¹

In the same spirit, the Annales published articles like the ones described below in order to illustrate how God's

⁶⁰ "Rapports entre la Religion et les Sciences", in Annales, Vol. 5, August 1832, p. 94.

⁶¹ Vol. 1, p. viii.

infinite wisdom is shown in creation. The relationship between the breathing of plants and animals by which the oxygen and carbon dioxide in the atmosphere remain in balance, exemplified God's wonderful method of preserving the beings which He created.⁶² The wisdom of God was also shown by the marvellous instincts of insects, by their innate knowledge, by the usefulness even of harmful insects, and by the architecture of bees and wasps.⁶³ The argument from design was quite well-worn by this time, having been popular for over a century.⁶⁴ For many people today, this argument was seriously weakened by Darwin, the theory of evolution having led them to the conclusion that creatures were not given certain features in order to survive, but that certain creatures survived because they had or were able to develop, the features needed for survival.

On the whole it would seem that Bonnetty's creed was the result of an attempt to take a positive attitude

62 B.J., "Harmonies Chimiques", in Annales, Vol. 1, August 1830, p. 119-122.

63 John Rennie, "Merveilleux Instincts des Insectes", in the Library of Entertaining Knowledge, quoted in Annales, Vol. 6, June 1833, p. 452-463.

64 R.R. Palmer, Catholics and Unbelievers in Eighteenth Century France, New York, Cooper Square Publishers, 1961, 236 p., p. 130.

to the problem of science and religion. Although it might look like an attempt to make the best of both worlds, to Bonnetty there was only one world, the world created by God, the world which both science and religion were making known to man. The problem was one of deciding what belonged to the truth about that one world. To Bonnetty everything which Genesis said about creation was true. Having taken this position, he had then the task of deciding which of the current geological theories could also be accepted as true about the same world.

CHAPTER III

GEOLOGY AND THE CREATION STORY OF GENESIS

In this chapter consideration is given to the manner in which Bonnetty attempted to show through the Annales that there was no real conflict between the first creation story of Genesis and the latest geological conclusions. He built his case on certain ideas which turned up frequently in the articles which he published. These ideas were also the main points of accepted geological conclusions in the 1820's. The first was the impossibility of accepting as yet any hypothesis purporting to explain the formation of the earth. The next three were closely connected and will be considered together. They were that the six days of Genesis stood for six epochs, that the order of depth in which fossils were discovered agreed with the order in which creation took place according to the Mosaic account, and that geology proved that a comparatively short time, in keeping with biblical chronology, had elapsed since man was created.

1. The Interpretation of Genesis.

To understand the attempts to reconcile geology with Genesis at the end of the eighteenth century and the first half of the nineteenth it is necessary to realize

that modern biblical criticism had not yet begun. The few students who expressed doubts about a literal interpretation of some parts of the Bible were regarded with disfavour.¹ Christian scholars had no apprehension of the origins of biblical records or of Hebrew cosmology, of which the creation story was an expression.² To modern scholars it is obvious that the first two chapters of Genesis contain two different accounts of creation and that these two accounts are at variance with each other over the order in which the events of creation were supposed to have taken place. Their position today is that the story of Genesis 1:1-2:4a, although based on older material, has come down in its present form from the sixth century before Christ.³ In the Annales all attempts at reconciliation were confined to this first creation story, in which man appeared as the final act of God in creation. Although

1 The story of the Scottish priest, Alexander Geddes who held the Garden of Eden and Flood stories to be myths, and whose bishop therefore refused a requiem mass for his soul is told in Geddes McGregor's The Bible in the Making, Philadelphia, Lippincott, 1959, 447 p., p. 259-262.

2 James Y. Simpson, Landmarks in the Struggle Between Science and Religion, New York, Hodder and Stoughton, 1925, xiii-288 p., p. 37.

3 Theodore H. Robinson, "Genesis", in The Abingdon Bible Commentary, ed. Frederick Carl Eiselen, et al., New York, Abingdon Press, 1929, p. 221a.

the cosmology of this story represented the scientific ideas of both Jews and Babylonians of the sixth century B.C., the points of similarity between this account and modern science provided a basis for apparent reconciliation. Whereas modern Christian scholars would emphasize the religious significance of the story and its lofty presentation of God as the author and origin of all things, until quite recently most Christians regarded the Bible as divinely inspired in both its scientific and historical aspects, as far as these went. In time, biblical scholars were forced to reappraise their understanding and interpretation of the Scriptures in the light of modern science. For Bonnetty every statement of Genesis was a revealed truth. When he saw the revealed truths of Genesis confronted by what seemed to be contradictory truths of geology he took the logical step of trying to reconcile them.

In his attempt to reconcile geology with Genesis Bonnetty published some articles which were original contributions by the editors and others. For the most part, however, he chose articles from outside sources which to his mind, contributed some support for the Genesis narrative. He did not always agree with every statement which he published. Sometimes his own opinion was expressed in an introductory paragraph or a footnote. Within limits,

Bonnetty was willing to keep an open mind. His limits were both specific and narrow:

Quoique nous ayons publié plusieurs manières de concilier les découvertes géologiques avec la Genèse, nous ne faisons aucune difficulté d'insérer dans les Annales d'autres théories sur la même objet. N'importe pour nous quel système on adopte, pourvu, que ce système s'accorde avec le récit de Moïse.⁴

This is the key to understanding the position of the Annales vis-à-vis geology. Any system was all right as long as it agreed with the Mosaic account of creation.

2. The Impossibility of Accepting any Geological Hypothesis.

Before the advent of geology all the sciences had been concerned with the order of nature, i.e., with the cause of present happenings. Geology was concerned with what had happened in the past, i.e., with the history of nature.⁵ This difference had two consequences. First it involved geologists in dispute over the chronology of Genesis. The second consequence was that its conclusions

⁴ P***, "Sur la Création", in Annales, Vol. 4, May 1832, p. 346, note by the editor.

⁵ Charles Coulston Gillispie, Genesis and Geology, A Study in the Relations of Scientific Thought, Natural Theology, and Social Opinion in Great Britain, 1790-1850, New York, Harper Torchbooks, 1959, xiii-306 p., p. 39.

were suspect because they seemed to be based on the interpretation of evidence rather than on demonstrable proofs.⁶ As a result there was wide scope for argument, not only between geologists and defenders of Genesis, but also among geologists themselves. The early years of geology as a serious study had been a period of sharp and bitter debate between two schools of thought, the Neptunist and the Vulcanist. Ostensibly, the issue which divided them was whether water or heat was the primary agency in the formation of the earth's crust.⁷ The Vulcanists took their stand on the aspect of James Hutton's theory which said that subterranean heat was the major factor in the formation of rocks. The Neptunists explained all rock formation and stratification as the result of precipitation from an aqueous solution. In actual fact the issue went deeper and involved the antiquity of the earth.⁸ Hutton's theory called for vast ages of time,⁹ whereas Neptunists like the English geologist, Richard Kirwan, thought their theory was reconcilable with a literal interpretation of Genesis.¹⁰

6 Ibid., p. 40.

7 Ibid., p. 43.

8 Ibid.

9 Ibid., p. 48.

10 Ibid., p. 56.

By 1820 the quarrel of the Vulcanists and the Neptunists had died away. According to Charles Lyell, both names had become terms of reproach, inasmuch as the adherents of both schools had replaced concern for truth with the desire to find arguments that supported their particular cause.¹¹ In reaction there was for some years a tendency to avoid theories, which led to controversy, in favour of the observation of facts.¹²

Thus, in its aversion to geological hypotheses, the Annales shared in the general opinion of the time. Nicholas Wiseman expressed a similar opinion:

So long, indeed, as phenomena are simply recorded, and only the natural and obvious consequences drawn from them, there can be no fear that the results of the study may prove hostile to religion.¹³

The aversion to theories, however, was a relative matter. The Annales was far more opposed to theories which appeared to contradict Genesis than to theories which seemed to support it. In its eyes those hypotheses and systems which

¹¹ Principles of Geology, or the Modern Changes of the Earth and Its Inhabitants, 3 vols., 10th edition, London, Murray, 1867, Vol. 1, p. 85.

¹² Ibid.

¹³ Twelve Lectures on the Connexion Between Science and Revealed Religion, new edition, London, James Duffy, 1866, ix-468 p., p. 195.

were contrary to Moses were the ones which refuted each other. They were the ones condemned as hypothetical and lacking foundation. On the other hand, all particular facts discovered in recent years testified to the Genesis account of creation. These claims were made in the first year of publication, in an article which brought to readers of the Annales the best known geological systems formulated up to that time.¹⁴ Its material was derived from the Précis de la géographie universelle of Conrad Malte-Brun, the eminent French geographer, who died in 1826. After studying the various systems Malte-Brun reached the conclusion that there were some questions about the earth which were insoluble, and "Tout ce qu'on apprend, en les étudiant, c'est d'en douter."¹⁵

Bonnetty's own position was explicitly defined the following month in a personal footnote in which he drew attention to the great number of geological systems which had been advanced. He then continued:

14 "Analyse des différens systèmes géologiques", in Annales, Vol. 2, March 1831, p. 195-214.

15 Ibid., p. 211.

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Comme la nature de ce recueil ne permet point d'entrer dans ces détails, purement scientifiques, nous déclarons que nous n'adoptons précisément aucun de ces systèmes. Nous les exposons dans le seul but de montrer qu'ils confirment le récit de Moïse, mais ne nous chargeons pas de les concilier entr'eux, ni de les discuter. Nous en donnerons même qui se contredisent entièrement. Mais ils ont cela de commun, qu'ils s'accordent également avec l'écrivain sacré des premiers tems du monde. C'est tout ce qui nous importe.¹⁶

In a situation where the number of systems and theories were endlessly multiplied, and where the same systems contradicted and opposed each other, the position of the Annales was that it could not support any hypothesis on the formation of the world. Throughout the period covered by this study it was to maintain:

Nous avons dit plusieurs fois dans ce journal, et nous le répéterons de nouveau: nous n'adoptons positivement aucun système de géologie; cette science n'est pas faite encore; elle se compose d'une masse de faits bien constaté sans doute, mais qu'il est impossible jusqu'aujourd'hui d'expliquer et de coordonner de manière à élever un édifice scientifique complet. C'est ce qui rend compte de la multitude et de la divergence des théories de la terre publiées jusqu'ici.¹⁷

Even after ten years of publication the Annales still expressed unwillingness to support any system. It now felt

¹⁶ H. de C., "Travaux de Deluc; preuves géologiques de la mission divine de Moïse", premier article, in Annales, Vol. 3, September 1831, p. 195, note.

¹⁷ A.L., "Accord de la Géologie et de la Genèse, relativement à la création", in Annales, Vol. 3, October 1831, p. 233.

that because geology was making so much progress no particular system was yet established.¹⁸

Despite these protestations of unwillingness to support any system, the Annales had such leanings toward the theories of Deluc and Cuvier as to amount to support of what was known as catastrophism as opposed to what was known as uniformitarianism. Catastrophism held that the earth, in the earlier stages of its development, had been subject to a series of violent revolutions and inundations, which accounted for the present condition of the earth.¹⁹ Uniformitarianism, in contrast, held that the present condition of the earth was caused by natural forces which are still operating and which had been operating over an immense period of time.²⁰ Bonnetty supported catastrophism because it appeared more readily reconciled with Genesis. It allowed more scope for supernatural action. It certainly provided an explanation for a universal flood. It was supposedly based on facts, but in reality was an erroneous interpretation of observations. The irony is that James

¹⁸ H. de C., "Théorie de la terre d'après M. Ampère, ses rapports avec la Genèse", in Annales, Vol. 21, November 1840, p. 369.

¹⁹ Gillispie, op. cit., p. 98-100.

²⁰ Ibid., p. 47, 48.

Hutton, the originator of uniformitarian doctrine, did confine himself to the discussion of facts, to causes which men could observe in actual operation, in order to account for phenomena.²¹ Men like Cuvier, whom the Annales supported, were the ones who speculated and invented catastrophes. Although the uniformitarian side of the question was to a great extent ignored in the Annales, these two opposing explanations formed the background to the discussion of Genesis and geology in its pages. Wiseman at least discussed the theories of Hutton, Playfair, and Lyell, even though he disagreed with them.²²

3. Geology and Biblical Chronology.

In its attempt to reconcile geology with the creation story of Genesis 1:1-2:4a, the Annales leaned heavily on Jean André Deluc and Georges Cuvier. Deluc was a Genevan Calvinist born February 8, 1727. He spent the last half of his long life in England, where he died November 7, 1817. Deeply concerned with the loss of faith in the eighteenth century, Deluc set about demonstrating that geology confirmed the Genesis account of creation.²³ In

21 Ibid.

22 Wiseman, op. cit., p. 230, 231.

23 Gillispie, op. cit., p. 63.

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this task he found himself on the opposite side of the fence to James Hutton, whose Theory of the Earth, published in 1795, put forward the uniformitarian view.²⁴ The ideas which Deluc advanced on behalf of reconciliation were that the six days of Genesis really stood for six epochs,²⁵ that the earth during these epochs underwent several violent inundations, the last being the Flood of Noah,²⁶ and that a comparatively short time had elapsed since this last disaster and the formation of the present continents.²⁷

To provide a source for the vast amount of water required for his inundations, Deluc postulated great cavities beneath the earth's surface.²⁸ Malte-Brun, in the article which analyzed the various geological systems set forth up to his time, generally supported Deluc's views, but expressed some doubt over the cavities from which the waters came and to which they receded, and suggested that they were introduced by a desire to explain the Flood.²⁹

24 Theory of the Earth, with Proofs and Illustrations, 2 vols., Weinheim, Engleman, 1959, a reprint of the Edinburgh edition of 1795.

25 Gillispie, op. cit., p. 57, 58.

26 Ibid., p. 60.

27 Ibid., p. 59.

28 Ibid., p. 58.

29 "Analyse des différens systèmes géologiques", in Annales, Vol. 2, p. 209.

He also desired his readers to realize how much the system of Hutton and Playfair was contrary to the facts.³⁰ He did think that the formation of mineral layers under the sea by subterranean heat, as postulated by Hutton, was worthy of further attention.³¹ This aspect of Hutton's theory was not supported by later geologists and George White wrote in his "Introduction" to Playfair's Illustrations "that Huttonian views on the consolidation by heat are the most unhappy ones of the whole system."³²

The Annales did not spend much time condemning systems with which its editors did not agree. References to the ideas of Hutton and Playfair are rare. It is difficult to find the name of Charles Lyell who carried on uniformitarian theories as a contemporary of Bonnetty.³³ Bonnetty gave a great deal of space to views which he favoured and tended to ignore those which he disfavoured.

In its second year the Annales ran a series of two articles on Deluc, which Bonnetty described as an analysis

30 Ibid., p. 212.

31 Ibid.

32 John Playfair, Illustrations of the Huttonian Theory of the Earth, New York, Dover Publications, 1956, xix-528 p., p. ix. This edition is a reprint of the 1802 edition. This work supported and helped in the understanding of Hutton's ideas.

33 In Vol. 23, p. 180, Lyell is referred to as an authority opposed to the doctrine of the transmutation of species. Under the influence of Darwin, Lyell later changed his views in this matter.

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of his Lettres physiques et morales sur l'histoire de la terre et de l'homme, adressées à la reine de la Grande Bretagne, and of his Lettres géologiques à Blumenach.³⁴

In these two works Deluc attempted to show the agreement of the Mosaic creation story with the natural history of the earth. His theory was that the sea changed its bed by a sudden revolution, covering the former continents, while the beds formerly occupied became the present continents.³⁵

This revolution, according to Deluc, corresponded to the Flood of Noah, and no great number of centuries had elapsed since it occurred. H. de C. claimed the support of several reputable scientists for Deluc's theory that the present state of the globe could not go back further than the times which Moses assigned to creation and the Flood.³⁶ One reason given by H. de C. for favouring Deluc's system was that it was the result of actual observation, and not of peaceful meditation.³⁷ As far as those naturalists who attributed the present condition of the earth to the work of rivers were concerned, Deluc had demonstrated that the

34 H. de C., "Travaux de Deluc", Annales, Vol. 3, p. 195, note.

35 Ibid., p. 197.

36 Ibid., note 3. H. de C. claimed the support of Saussure, Dolomieu, and Cuvier.

37 Ibid.

action of running water could not produce any of the effects attributed to it.³⁸

In the second article H. de C. gave Deluc's definition of geology as "la connaissance des causes qui ont agi et qui continuent encore d'agir sur la terre."³⁹ These causes could be learned through their effects. This position appears similar to that of Hutton. The difference was that Hutton's causes of today were the same causes which had been operative since the beginning, whereas for Deluc present causes went back only to the last catastrophe.⁴⁰ He did agree that long periods of time were required to account for geological phenomena. Therefore "pour expliquer la formation de tous les corps qui sont sur la terre, suppose que les six jours de la création sont des époques dont la durée nous est inconnue."⁴¹ H. de C. added further reasons to justify this interpretation of the sacred text and continued with Deluc's description of what happened in the six epochs. The reason that the remains

38 Ibid., p. 199.

39 "Travaux de Deluc; Explication géologique de l'oeuvre des six jours, et réponses à quelque objections contre la Genèse", deuxième article, in Annales, Vol. 3, October 1831, p. 255.

40 Gillispie, op. cit., p. 58.

41 H. de C., "Travaux de Deluc", Annales, Vol. 3, p. 257.

of men were not being discovered along with the relics of marine and terrestrial animals was that man was created last and had not spread out over the earth before the last deluge. The bones of people who perished in this catastrophe would, of course, be under the sea, "car il paraît très certain que les anciens continents n'existent plus, et que ceux où nous vivons ont été opérés, comme nous l'avons vu précédemment."⁴² H. de C. not only agreed with Deluc's proofs for the recent origin of the continents; he thought they were invincible.⁴³ For measuring the age of present land masses Deluc used certain chronometers such as the rate at which sediment carried by rivers built up at the deltas and the rate of accumulation of ice on mountain peaks. From them he concluded that the age of the present continents could not be more than four or five thousand years.⁴⁴

The second scientist on whom the Annales leaned was primarily a palaeontologist who has been justly recognized for his work with fossils. Georges Cuvier, 1769-1832, became interested in fossils while a young teacher. The

42 Ibid., p. 265.

43 Ibid., p. 268.

44 Ibid., p. 269.

discovery of the remains of creatures no longer in existence led him into the field of geology, and he postulated a series of creations and catastrophes to explain the extinction of these creatures.⁴⁵ According to his theory, God created the world about eighty thousand years ago. His first creation consisted of fish, other sea creatures, and some amphibians. Reptiles belonged to the second creation and mammals, to the third. Like Deluc, he identified the last catastrophe with the Flood of Noah, which he believed occurred quite recently in keeping with the biblical chronology.⁴⁶

The Annales continuously praised the work of Cuvier. Its only regret was that he was a Protestant.⁴⁷ Bonnetty described his work in geology and biblical chronology as, without contradiction, the most important of which he had spoken.⁴⁸ He believed that Cuvier's

⁴⁵ Richard Carrington, The Story of Our Earth, New York, Harper, 1956, xvi-260 p., p. 58.

⁴⁶ Cuvier, "De Déluge Universel", in La Raison du Christianisme ou preuves de la vérité de la Religion tirées des écrits des plus grands hommes de la France, de l'Angleterre, et de l'Allemagne, Vol. 3, M. de Genoude, ed., (no place, no date), p. 438. This work of Genoude was reviewed favourably in the Annales, Vol. 8, May 1834, p. 403-404.

⁴⁷ A., "Chronologie de la Bible justifiée", in Annales, Vol. 1, December 1831, p. 391.

⁴⁸ A. Bonnetty, "Aux anciens et aux nouveaux abonnés des Annales de philosophie chrétienne", in Annales, Vol. 7, July 1833, p. 8.

conclusions should be the starting point for all religious apologists and for all professors of theology and philosophy. The person who denied Cuvier's conclusions did so at the certain risk of exposing himself to the derision of the most well-informed men of the times.⁴⁹ There was a tendency in the Annales to impugn the intelligence or the motives of those whose opinions on Genesis and geology were not in harmony with its own.

From Cuvier, then, the Annales obtained support for one of its most cherished doctrines, that there was a universal flood in the time of Noah.⁵⁰ Cuvier also gave strong support to the chronology of Moses.⁵¹ Churchmen seemed quite willing to extend time prior to the creation of man as long as the Genesis account was accepted as an accurate record of what took place since that event. This distinction was made clear in an early article, which is of special significance because it reported on a church conference called by Mgr. Frayssinous, titular Bishop of Hermopolis, to discuss the relations of science and

49 Ibid., p. 9.

50 The Flood is the subject of the next chapter.

51 Bonnetty, "Aux anciens et aux nouveaux abonnés", in Annales, Vol. 7, p. 9.

religion.⁵² It revealed a wider effort than that of the Annales, on the part of churchmen to come to terms with scientific ideas. The article in the Annales to a great extent consisted of material from another article entitled "Examen analytique de la conférence de Mgr. l'évêque d'Hermopolis" from the scholarly pages of the Bulletin Universel des sciences et de l'industrie, edited by Baron Férussac. An introductory paragraph by the writer for the Annales expressed approval of the original article as evidence of the return of science to religion, and gave high praise to M. Champollion-Figeac, its author.⁵³

To Champollion-Figeac the evidence for a much longer period of time since the formation of the earth than was generally supposed, was beyond question. This evidence included remains from the sea, gathered on the highest mountains, the excavation of the remains of enormous animals, and the geneologies of eastern peoples dating back hundreds of centuries. Such discoveries were contrary to the suppositions of Genesis, "telles du moins qu'on les entend généralement."⁵⁴ Later in the article he took the position that the

52 "Accord des Sciences avec la Genèse, relativement à l'histoire des tems primitifs", in Annales, Vol. 1, December 1830, p. 370-376.

53 Ibid., p. 370.

54 Ibid., p. 371.

part of the evidence dealing with the geneologies of eastern peoples was untrustworthy, thus protecting the Mosaic chronology of six thousand years for the existence of man.⁵⁵ This conclusion did not affect the evidence for the great geological age of the earth.

Bishop Frayssinous, who called the conference, would not disagree with the proposed extension of time from six days to six periods of indefinite length. In his statement to the geologists present he said:

Fouillez tant que vous voudrez les entrailles de la terre. Si vos observations ne demandent pas que les jours de la création soient plus longs que nos jours ordinaire, nous continuerons de suivre les sentiments commun sur la durée de ces jours. Si, au contraire, vous découvrez d'une manière évidente que le globe terrestre, avec ses plantes et ses animaux, doit être beaucoup plus ancien que le genre humain, la Genèse n'aura rien de contraire à cette découverte; car il vous est permis de voir dans chacun des six jours, autant de périodes de tems indéterminées, et alors vos découvertes seraient le commentaire explicatif d'un passage dont les sens n'est pas entièrement fixé.⁵⁶

This statement was taken as authoritative by later writers in the Annales, and frequently quoted. Like Nicholas Wiseman,⁵⁷ Bishop Frayssinous was keeping an open mind. He was by no means certain that the last word had yet been spoken.

⁵⁵ Ibid., p. 373.

⁵⁶ Ibid., p. 372.

⁵⁷ Wiseman, op. cit., p. 217.

One person who quoted the Bishop's statement was Baron Férussac, who also attended the conference and who, according to Champollion-Figeac, pushed the discussion of the principal facts of the Mosaic account of creation much further than the Bishop thought should be done.⁵⁸

Férussac also wrote an article for his Bulletin Universel, which was subsequently published in the Annales.⁵⁹ His position was that the proofs were unimpeachable for long periods of time between the consolidation of the first layers of the earth and the appearance of life, between the creation of the different kinds of plants and the different kinds of animals, and between the creation of animals and the creation of man. Men, he said, cannot even begin to estimate the duration of these epochs.⁶⁰

Bonnetty did not share the hesitation of the Bishop of Hermopolis over interpreting the six days of Genesis as six epochs, but gave this interpretation his full support. A later article, which also quoted

⁵⁸ "Accord des sciences avec la Genèse", in Annales, Vol. 1, p. 374.

⁵⁹ "Examen de l'oeuvre des six jours", in Annales, Vol. 2, April 1831, p. 275-285.

⁶⁰ Ibid., p. 279.

Frayssinous,⁶¹ referred to the extension of time required by geology as an apparent victory for the opponents of Genesis. The new science did appear to have rejected the common and literal explanation of the six days. However, instead of convicting Genesis of falsehood, scientists substituted six long periods in which God worked slowly to prepare the world for men.⁶² Other articles on the subject supported this view. Sometimes Augustine and other church Fathers were cited in its support,⁶³ and sometimes reasons were given why the word "day" could not be taken in its literal sense.⁶⁴ Bonnetty even used Scripture itself to support the view that the word "day" really meant a period of time. Saint Peter the Apostle referred to the days of Noah, whereas he actually meant the times of Noah.⁶⁵ And

61 "Rapports entre la Religion et les Sciences", in Annales, Vol. 5, August 1832, p. 92.

62 Ibid.

63 A. Bonnetty, "De l'Interpretation donnée par les pères et les docteurs aux différens mots qu'emploie Moïse pour raconter la création du monde", in Annales, Vol. 13, July 1836, p. 31-38. The same point was made by L.H. (de J.), "Quelques Réflexions sur le plan total de la création et sur la palingénésie humaine de M. Nodier", in Annales, Vol. 7, July 1833, p. 53.

64 H. de C., "Essai sur l'état du globe terrestre, pendant les époques qui précéderent la création de l'homme", in Annales, Vol. 13, July 1836, p. 39.

65 A. Bonnetty, "De l'Interpretation", in Annales, Vol. 13, p. 36. Passage referred to is 1 Peter 3:20.

did not the psalmist tell us that a thousand years were but a day in God's sight, and that a single day equalled a thousand years to Him.⁶⁶ This same article concluded with the oft-quoted passage of Bishop Frayssinous, in which he accepted the six days as six epochs, a passage which seems to have been regarded as the last word on the subject.⁶⁷

Later in the decade there was desire by some to return to the literal interpretation of the six days. In reviewing a work by a friend who held this opinion,⁶⁸ Bonnetty referred to this tendency on the part of Buckland, Gosselin, Bonnaire-Mansuy, and Desdouts. They held that the six days of Genesis were true days, but that the creation which took place during them was a creation from the remains of an older world which had been created previously.⁶⁹ Bonnetty expressed his support for the system of Dolomieu and Cuvier, as appearing more probable.⁷⁰ When

⁶⁶ Ibid., p. 37. Passage refers to 2 Peter 3:8 and Psalm 90:4.

⁶⁷ Ibid., p. 38.

⁶⁸ A. Bonnetty, "Philosophie Catholique de l'histoire ou l'histoire expliquée; introduction renfermant l'histoire de la création universelle, par M. le baron Alexandre Guirard de l'academie française", in Annales, Vol. 19, April 1839, p. 135-160.

⁶⁹ Ibid., p. 137.

⁷⁰ Ibid.

William Buckland, whose influence in England was greatest between 1820 and 1830,⁷¹ finally made the pages of the Annales in 1840,⁷² Bonnetty added a footnote to the article, in which he indicated his preference for the six epochs:

Les Annales ont donné de nombreux documens qui tous prouvent la probabilité de cette hypothèse (Voir la table générale mise à la fin du 12^e vol. aux mots géologie et Genèse). Rien jusqu'ici ne nous a semblé détruire cette probabilité.⁷³

In spite of his disagreement on this one point, Bonnetty thought Buckland's opinions deserved the particular attention of the readers of the Annales.

However much churchmen of the period were ready to extend time before the creation of man or, as in the case of Buckland, before the six days of Genesis, they were agreed that the Mosaic chronology allowed only five or six thousand years since the creation of man. Even geologists who accepted uniformitarian doctrine saw no conflict with their beliefs and the late arrival of man upon the earth. John Playfair answered the objection that the vast ages required by Hutton's system were inconsistent with the scriptural chronology by writing:

71 Gillispie, op. cit., p. 98.

72 L'abbé H. de V. [Val-Roger], "La Géologie et la Minérogologie dans leurs rapports avec la Théologie naturelle, par le Révérend Dr. William Buckland", in Annales, Vol. 21, September 1840, p. 165-192.

73 Ibid., p. 172, note.

This objection would no doubt be of weight, if the high antiquity in question were not restricted merely to the globe of the earth, but were also extended to the human race. That the origin of mankind does not go back beyond five or seven thousand years, is a position so involved in the narrative of the Mosaic books, that anything inconsistent with it, would no doubt stand in opposition to the testimony of those ancient records.⁷⁴

On this basis Playfair went on to plead for the autonomy of geology:

It is but reasonable therefore that we should extend to the geologist the same liberty of speculation which the astronomer and mathematician are in possession of; and this may be done, by supposing that the chronology of Moses related only to the human race.⁷⁵

Writing in Bonnetty's time, the English geologist, G.A. Mantell, seemed to desire a complete separation of geology and the sacred text, for he wrote, "Nothing is more unwarrantable than attempts to identify theories in science with particular interpretations of the sacred text."⁷⁶ It was not the task of geology "to explain the inexplicable and to reconcile the irreconcilable."⁷⁷ Yet, in almost the same

74 Playfair, op. cit., p. 125.

75 Ibid., p. 126, 127.

76 Gideon Algernon Mantell, The Wonders of Geology, or a Familiar Exposition of Geological Phenomena, 2 vols., London, Relfe and Fletcher, 1839, Vol. 1, p. 6.

77 Ibid., p. 5.

breath he stated that geology did bear out the scriptural revelation that man had existed on the earth for only a few thousand years.⁷⁸ Three years later G.F. Richardson, who had accepted the ideas of Hutton and Lyell and saw no conflict between them and revelation, affirmed that the creation of man was comparatively recent. It was "a fact revealed by scripture and confirmed by science."⁷⁹ He felt obliged "to acknowledge the chronology of Holy Writ; to recognize the complete and satisfactory accordance of science with revelation."⁸⁰

In its stand for the recent origin of man, the Annales therefore was in complete harmony with geologists of different schools. It was the same position which was defined by Bishop Frayssinous at his conference:

La chronologie de Moïse date moins de l'instant de la création de la matière, que de l'instant de la création de l'homme, laquelle n'eut lieu que le sixième jour. L'écrivain sacré suppose le nombre d'années du premier homme et de ses descendens, et c'est de la supputation des années des patriarches successifs, que se forme la chronologie des livres saintes, en sorte qu'elle remonte moins à l'origine même de globe qu'à l'origine de l'espèce humaine.⁸¹

78 Ibid., p. 7.

79 G.F. Richardson, Geology for Beginners, London Hippolyte Ballière, 1842, xx-530 p., p. 58.

80 Ibid., p. 60.

81 "Accord des Sciences avec la Genèse", in Annales, Vol. 1, p. 372.

The theories of Cuvier and Deluc referred to above,⁸² were used to confirm this belief. There was to be no change in the position of the Annales during Bonnetty's lifetime, and he opposed Darwinism when that theory provided the next great crisis between science and religion.⁸³ It should be noted that the conclusion that man was a late creation, while based on the knowledge that geologists had at that time, depended on negative evidence. Traces of his earlier existence had not yet been found and interpreted. When such evidence was forthcoming, it was to antedate his presence on earth by many thousands of years.⁸⁴

Once the word "day" was taken to mean an indefinite period of time, and this extension of time was confined to the period before the creation of man, the chief obstacle to reconciling scientific fact with the creation story was removed. Some minor difficulties remained, but they were not deemed worthy of very much attention. There was the problem of explaining how light was created before the

82 See p. 43-50.

83 L'abbé Gagnet, "Unité de l'espèce humaine; réfutation de système de Darwin", in Annales, Vol. 79, December 1869, p. 448-467. For a similar attitude see also the article by N...de Cauvigny, "Réfutation du système d'une succession indéfinie des êtres", in Annales, Vol. 23, September 1841, p. 165-181.

84 Kenneth K. Landes and Russell C. Hussey, Geology and Man, New York, Prentice-Hall, 1948, ix-518 p., p. 443-447.

sun.⁸⁵ One explanation held that light was created independently of the sun, in the sense that that which was to become light was created first.⁸⁶ More acceptable was the theory that the Scriptures simply meant that the sun, moon, and stars had been created earlier, but appeared on the fourth day through the thick clouds which had surrounded the earth until that time.⁸⁷ This view also had the support of Wiseman.⁸⁸

Far more important to the Annales was the apparent agreement between science and Genesis on the order of creation. Here Bonnetty thought that he had the strongest evidence for the truth of revelation. That Moses could write so accurately of events which he had not witnessed was proof that he was divinely inspired when he compiled his account of creation.⁸⁹ To Bishop Frayssinous the order of creation was the most important part of the Mosaic account, and Cuvier was the authority who verified the

85 Compare Genesis 1:3 with Genesis 1:14-16.

86 "Accord des Sciences avec la Genèse", Annales, Vol. 1, p. 374.

87 Ibid., p. 375.

88 Wiseman, op. cit., p. 204.

89 "Rapports entre la Religion et les Sciences", Annales, Vol. 5, p. 93, 94.

truth of Genesis in this matter.⁹⁰ Genesis put vegetation first in the order in which living things were created. Sea creatures came next, then birds, then mammals, and finally, men. Geology discovered evidence of pre-historic plant life in the lower rock layers. Above them came primitive forms of shell-fish, then fish, reptiles, birds, and mammals, in that order.⁹¹ H. de C., who wrote a number of articles on geology for the Annales, contributed one article on this particular subject with the intention of bringing together the various ideas put forward in a number of previous articles.⁹² It was intended to help readers who would not be familiar with recent geological development and how it agreed with the Mosaic account of creation. He used a table drawn up by M. Al. de Humboldt, which showed the various layers of the earth's crust from granite, the oldest rock, up to flood deposits, with the fossilized remnants found in each layer, and the corresponding scriptural verse from the first chapter of Genesis.⁹³

90 "Accord des Sciences avec la Genèse", Annales, Vol. 1, p. 373.

91 "Rapports entre la Religion et les Sciences", Annales, Vol. 5, p. 93.

92 "Tableau des couches minérales du globe et des fossiles qu'elles referment", in Annales, Vol. 5, August 1834, p. 132-137.

93 Ibid., between pages 132 and 133.

The article later included a quotation from the French geologist, Boubée, in which he expressed wonder that Moses was able to write of facts which were not known until the eighteenth and nineteenth centuries, from which he concluded that the Bible did indeed contain something which was superior to man.⁹⁴ Wiseman took part of his fifth lecture directly from this article.⁹⁵ There was a pathetic eagerness on the part of religious reconcilers to press to the limit what they thought was their advantage in this matter of the order of creation. Unfortunately, the foundation on which they chose to build was not a strong and lasting one, and in the long run could only harm their cause.

Later in the decade there were indications in the Annales that science should have a more independent role than merely providing support for the truth of the Scriptures. In an article in which he considered a new work by Marcel de Serres, professor of minerology and geology at Montpellier, l'abbé Flottes asserted the autonomy of science to a far greater extent than had been done previously in the Annales:

94 "Tableau des couches", Annales, Vol. 5, p. 136.

95 Wiseman, op. cit., p. 218, 219.

L'objet des sciences naturelles et celui de la religion sont donc tout à fait différents; aux unes appartient le monde physique, à l'autre le monde moral; elles sont indépendantes dans leurs sphères respectives.⁹⁶

God had left the task of unravelling the mysteries of the physical world to the intellects of men:

Ce sont énigmes abandonnées à l'activité de nos recherches; c'est un domaine livré à l'esprit humain il a le droit de s'en emparer; il peut librement y créer [...].⁹⁷

However, this autonomy for science was not absolute.

Flottes came back to the restriction that Moses, even though he did not say much that had to do with science, was correct in what he did say. He considered it absurd that the account of the sacred writer should be treated as infallible, with its purpose and language being so different from the purpose and language of the nineteenth century science.⁹⁸ Here Flottes was chiefly concerned with answering critics of Genesis who thought that Moses should have given more details about creation and should have used more precise scientific terminology. When Scripture did speak of natural phenomena, its purpose was "pour établir

⁹⁶ "De la Cosmogonie de Moïse, comparée aux faits géologiques", in Annales, Vol. 17, August 1838, p. 153.

⁹⁷ Ibid.

⁹⁸ Ibid., p. 154.

un dogme ou pour imposer un devoir."⁹⁹ Moses wished to arm the Hebrews against idolatry and polytheism, and therefore he thought it sufficient to teach them that all power belonged to God, and that everything that existed, from a blade of grass to the sun itself, was the work of His hands.¹⁰⁰ Then, after going so far in distinguishing the roles of science and religion, Flottes challenged geologists to demonstrate any disagreement between geological facts and the Mosaic account of creation:

Moïse ne conteste nulle part l'existence des faits géologiques. On défie les géologues d'établir le contraire, et la science, loin de combattre, confirme l'ordre de la formation des êtres constaté dans le récit de la Genèse.¹⁰¹

The rest of the article consisted of a consideration of the place that could be assigned to geological facts within the Mosaic account in the light of differing interpretations of the six days. Science might be autonomous, but it was so only within the original limits set by the Annales.

The article on William Buckland expressed ideas very similar to those of l'abbé Flottes.¹⁰² Again the claim was made that Genesis was not a scientific treatise.

99 Ibid.

100 Ibid., p. 155.

101 Ibid.,

102 H. de V., "La Géologie et la Minéralogie", Annales, Vol. 21, p. 165-192.

The unique end of Scripture was to fix religious convictions and to give rules of conduct.¹⁰³ Its purpose was moral enlightenment, not scientific information. Therefore it should not be criticized for not giving geological details. Bonnetty showed his personal agreement by a footnote in which he repeated the thought of Flottes that Moses

[...] voulait seulement prémunir son peuple contre le polythéisme naissant, et lui rappeler que toutes les parties de la nature déifiées par les païens étaient l'oeuvre de Dieu et avaient été mises par lui au service de l'homme créé à son image.¹⁰⁴

At the same time the Scriptures were right as far as they went, and the purpose of this article, like that of the previous one, was to show the agreement between geology and the first chapter of Genesis.

Although Flottes and Buckland did indeed represent a great advance in understanding the purpose of the Scriptures, they could not quite free themselves from the idea that there could be no fundamental difference between the science of the nineteenth century and that of three thousand years earlier. The same problem hindered Bonnetty in

103 Ibid., p. 170.

104 Ibid., p. 171.

his understanding of the Flood of Noah and how it should be reconciled with geological findings. It was to take almost another century for Christians to understand this difference and its implications for understanding the meaning and purpose of the Bible.

CHAPTER IV

GEOLOGY AND THE FLOOD

This chapter is a consideration of the other great issue faced by Bonnetty and others who sought to reconcile geology and Genesis. That issue was the Flood of Noah. The support which the Annales gave to Noah's Flood as a world-wide event is studied against the background of what are accepted today as the true geological, archaeological, and biblical facts of the Flood described in Genesis.

One of the strongest reasons Bonnetty had for accepting the catastrophic theories of Deluc and Cuvier was that their theories accounted for the Flood of Noah as a universal deluge. Hutton and Playfair, on the other hand, claimed that the geology of the time had absolutely nothing to say in the matter of the Flood as it was described in the Bible:

In Dr. Hutton's theory, nothing whatever is ascribed to such accidental and unknown causes; and though their existence is not absolutely denied, their effects, whatever they may have been, are alleged to be entirely obliterated, so they can be referred to no other class but that of mere possibilities.¹

¹ John Playfair, Illustrations of the Huttonian Theory of the Earth, New York, Dover Publications, 1956, xix-528 p., p. 400, a reprint of the 1802 edition.

In spite of the opinion of the uniformitarians, much geological evidence was pressed into service to prove that the great universal Flood described in Genesis 6:5 to 9:19 had really taken place. The discussion involved many factors in a confused mixture. Some of them, like the effects of the last "Ice Age", were not recognized for their true nature until the work of the Swiss geologist, Louis Agassiz, in 1840.² Thus the meaning of fossils, the effects of glaciers, the records of ancient peoples, biblical and geological chronology, and universal catastrophes all played their irrelevant roles in a play which turned out to have no point or purpose.

1. The Origin of the Flood Story.

Since the end of the nineteenth century biblical scholars have distinguished in the Genesis story of the Flood, two separate accounts from two sources which they have called P and J.³ P was also the source for the first creation story and J for the second. In the Flood story J

2 George Gamow, Biography of the Earth, Its Past, Present, and Future, New York, Viking Press, 1948, xii-242 p., p. 166.

3 Cuthbert A. Simpson, "Exegesis, The Book of Genesis", in The Interpreter's Bible, ed. George Arthur Buttrick, et al., Vol. 1, New York, Abingdon Press, 1952, p. 537.

spoke of seven pairs of clean animals being taken into the ark and of forty days rain, whereas P said Noah took two of each kind of animal into the ark, and that the water for the deluge came from beneath the earth as well as from the opening of the windows of heaven. P also made the Flood last one hundred and fifty days.⁴

The primary source for the Genesis story was the Babylonian myth known as the Gilgamesh Epic.⁵ The Genesis and Babylonian stories are only two of the legends of a universal flood, which have been found to exist in the traditions of many peoples. The prevalence of this legend was one of the chief arguments in the Annales that the Flood actually occurred.⁶ Floods are a too frequent disaster in any age, and it is probable that the Babylonian-Hebrew legend was based on a particularly devastating flood in the Euphrates valley. That such a catastrophe did take place was born out by the archaeological evidence discovered by C. Leonard Woolley and described in his Ur of the Chaldees, A Record of Seven Years of Excavation.⁷

4 Ibid., p. 538.

5 Ibid., p. 539.

6 A.L., "Synchronisme des annales indiennes et chinoise avec la Genèse relativement à l'existence et à l'époque de déluge universel", in Annales, Vol. 2, March 1831, p. 215-218.

7 (no place), Ernest Benn, 1929, 210 p., p. 21-32.

Woolley concluded that a flood "of a magnitude unparalleled in local history" and large enough to deposit eight feet of clay, occurred about 3200 B.C.⁸ It was confined to the lower valley of the Tigris and Euphrates Rivers, an area about four hundred miles long and one hundred miles wide, a region far from universal; but in the words of Woolley, "for the occupants of the valley that was the whole world."⁹

The truth about the Flood of Noah would seem to be that there was an actual flood, devastating but local in character, which passed into Babylonian tradition and literature. From there it entered Hebrew folk-lore in two versions which were later lended into a single story by a skilful editor to form the Genesis story.

2. Fossils and the Flood.

One hundred years before Woolley, Bonnetty and others who sought to reconcile science with Genesis were not satisfied with a limited and local flood. After all, the sacred historian claimed that the Flood covered all the earth, even the highest mountains.¹⁰ Further, certain

8 Ibid., p. 29.

9 Ibid., p. 31.

10 Genesis, 7:19,20.

geological evidence, as it was interpreted by the catastrophists like Deluc, Cuvier, and Buckland, seemed to provide factual support for more than one deluge upon the earth. Their theories were largely founded on the evidence provided by fossils and by large rocks found far from their place of origin.

Fossils of marine creatures were found not only well inland but even on mountain peaks. How did they get there unless the mountains were once covered by the sea? That marine fossils must have been deposited by the sea is a fact which has provided modern geologists with definite proof as to what parts of our continents have been submerged at various periods in the past.¹¹ On the whole they follow the uniformitarian explanation that past changes were caused over long periods by the operation of the same natural forces which are at work in the present. According to Landes and Hussey, the continents and oceans still occupy much the same locations as they have throughout traceable geological history.¹² However, there have been changes in their relative boundaries. According to Carrington, these changes have been extensive, especially

¹¹ Kenneth K. Landes and Russell C. Hussey, Geology and Man, New York, Prentice-Hall, 1948, ix-518 p., p. 372.

¹² Ibid., p. 183.

for Europe and Asia, large parts of which have been covered with water.¹³ Sea level fell and rose with the formation and melting of the great glaciers of the "Ice Ages".¹⁴ The weight of ice some eight thousand feet thick had a depressing effect on the land beneath it.¹⁵ Probably the greatest factor of all has been the vertical movements of parts of the continents and their tilting so that one part rose out of the sea while another sank below the surface.¹⁶ The fact that marine fossils have been found high in mountains is the result of the comparatively late formation of the mountains now in existence.

In the seventeenth century the discovery of marine fossils inland was taken as evidence of the Flood of Noah.¹⁷ Most scholars attributed all such phenomena, including all the different types of fossils and the different strata of rock in which they were found "to one cause and one brief period, not to a variety of causes acting throughout a long

¹³ Richard Carrington, The Story of Our Earth, New York, Harper, 1956, xvi-240 p., p. 76, 77.

¹⁴ Landes and Hussey, op. cit., p. 198.

¹⁵ Carrington, op. cit., p. 176, 177.

¹⁶ Landes and Hussey, op. cit., p. 199.

¹⁷ Charles Lyell, A Manual of Elementary Geology; or the Ancient Changes of the Earth and Its Inhabitants as Illustrated by Geological Monuments, New York, Appleton, 1856, xvi-647 p., p. 4.

succession of epochs."¹⁸ That marine fossils were deposited on land by the Flood of Noah became almost an article of faith.¹⁹ The catastrophists, realizing that one flood was not sufficient to account for the several layers of rocks and fossils, therefore postulated a series of violent deluges separated by long periods of time. The last of the catastrophes was the Flood of Noah. According to Deluc it resulted in the destruction of the former continents and their inhabitants.²⁰ Deluc also claimed that Noah's Ark came to rest on one of the islands which was to become one of the mountains of the new continents.²¹ The rapidity with which such changes were supposed to have taken place reveals the contrast between the ideas of the catastrophists and those of the uniformitarians.

Although Bonnetty embraced the catastrophic theory that several inundations were required to account for the different layers of fossils, he had a brief spell of

¹⁸ Charles Lyell, Principles of Geology; or the Modern Changes of the Earth and Its Inhabitants, 3 vols., 10th ed., London, Murray, 1867, Vol. 1, p. 38.

¹⁹ Ibid.

²⁰ "Analyse des différens systèmes géologiques", in Annales, Vol. 2, March 1831, p. 208, 209.

²¹ H. de C., "Travaux de Deluc, preuves géologiques de la mission divine de Moïse", deuxième article; in Annales, Vol. 3, October 1831, p. 271.

enthusiasm for an explanation which accounted for phenomena by one flood. It came from the pen of one Felix Passot, who, at the request of Bonnetty, expressed his views in a letter for the Annales.²² His opinions were prefaced by an editorial statement, which declared that this explanation was even more in conformity with the spirit and letter of the sacred historian than the theories of Deluc, Cuvier, Bonnaire-Mansuy, and others whose views had been favoured by the Annales. Although Passot's explanation sounds very fanciful today, he does give some insight into the issue which troubled would-be reconcilers of that time. Passot saw the religious issue as nothing less than knowing if there had ever been intelligent intercourse between God and man.²³ To him the universal Flood, sent as a judgment on the wickedness of men, was the principal fact which could be invoked as evidence that such direct communication had indeed taken place. Passot pointed out that it had been believed for some time that fossils proved that the Flood had taken place.²⁴ When it was realized that such a

22 "Lettre sur le Déluge dans laquelle on examine la possibilité d'accorder le récit de Moïse avec les faits constatés par l'observation et les principes de la physique", in Annales, Vol. 6, April 1833, p. 243-262.

23 Ibid., p. 244.

24 Ibid., p. 245.

short-lived inundation could not be responsible for such an accumulation of fossils, a series of inundations were postulated, each thought to have lasted several centuries. There were even geologists who thought that these great upheavals which had left their marks on the earth had all taken place before the earth was inhabited.

In order to get back to one flood of short duration, Passot produced his personal and original theory.²⁵ He held that marine creatures, as they died, sank to different levels in the sea depending on their weight. They remained there in suspension until brought over the land by the Flood. As the waters withdrew the fossils were deposited in their layers on the land. He thought the whole process could have been accomplished by a single inundation which lasted only a few months.²⁶

In spite of Bonnetty's original enthusiasm for Passot's theory, nothing more was said about it in the Annales, which continued to rely on the theories of Deluc and Cuvier. Bonnetty could not give up his conviction that fossils and the Flood were somehow connected. When geologists turned more to other evidence as proof of the Flood, Bonnetty went so far as to agree that the formation of

25 Ibid., p. 246-248.

26 Ibid., p. 249.

shell-fish fossils took place before the deluge; but he still held that their upheaval on the land, at least in some cases, was the result of the Flood.²⁷

3. Rocks and the Flood.

In admitting that fossils could no longer be accepted as evidence of the Flood of Genesis, the reconcilers found a substitute in the geological phenomena of stones and rocks, including huge blocks of granite, which were to be found at great distances from their place of origin. One of the earlier articles, that on André de Gy, claimed that only a great cataclysm could account for their transportation.²⁸ The same explanation was given in *Les Soirées de Montlhéry*, which was reviewed by the Annales several years later.²⁹ Nicholas Wiseman likewise accounted for the movement of stones and rocks from their places of origin by "the short duration of the deluge, and the convulsive

27 H. de C., "Essai sur l'état du globe terrestre, pendant les époques qui précédèrent la création de l'homme", in Annales, Vol. 13, July 1836, p. 45 note.

28 -----, "Travaux géologiques de M. André de Gy (Le Père Chrysologue)", in Annales, Vol. 3, December 1831, p. 372.

29 Alexis C., "Les Soirées de Montlhéry, entretiens sur les origines bibliques, recueillis et publiés par M. Desdouts", in Annales, Vol. 14, January 1837, p. 18.

nature of its destructive action."³⁰ In so doing he rejected the slower processes of Hutton, Playfair, and Lyell.³¹

A Dr. Pouchet, who taught zoology at Rouen, believed that the movement of stones and rocks was evidence for a universal deluge, but he also believed that such a deluge was not to be identified with the Flood of Noah and was prior to the biblical Flood.³² To him, fragments from the Alps found in the plain of Crau in Provence, could be explained only by a great flood of water, which had dragged them down as it found its way to the Mediterranean. Some years previously, Hutton had tried to deal with this phenomenon of Alpine stones and rocks from the description of them given by the Swiss physicist and Alpine traveller, Horace Benedict de Saussure.³³ The latter had concluded that only a great deluge could account for the passing of stones and boulders through openings in the mountains.³⁴ Hutton, of course, rejected such an unnatural explanation.

³⁰ Twelve Lectures on the Connexion Between Science and Revealed Religion, new edition, London, James Duffy, 1866, ix-468 p., p. 223.

³¹ Ibid., p. 230, 231.

³² H. de C., "Essai sur l'état", Annales, Vol. 13, p. 45.

³³ James Hutton, Theory of the Earth, with Proofs and Illustrations, 2 vols., Weinheim, Engleman, 1959, reprint of Edinburgh edition of 1795, Vol. 2, p. 172.

³⁴ Ibid.

"There is no occasion to have recourse to any extraordinary cause for this explanation", he claimed.³⁵ He was sure that the process was part of the natural operations which had hollowed out the valleys and was wearing away the mountains:

In that case, it will be allowed that there are natural means for the transportation of those granite masses from the top of the Alps, by means of water and ice adhering to those masses of stone.³⁶

Hutton allowed that the "method of transportation is not to be immediately perceived",³⁷ but he was convinced that a natural explanation would be forthcoming.

In this view he was supported by Playfair, who did indeed come closer to the true natural explanation. Playfair argued that such transportation was not impossible "by such powers as nature employs at present."³⁸ One of the arguments used by Playfair against a deluge was similar to that used by catastrophists against uniformitarianism. The catastrophists said that water acting over long periods of time could not account for phenomena like valleys.

35 Ibid., p. 173.

36 Ibid., p. 173, 174.

37 Ibid., p. 180.

38 Playfair, op. cit., p. 407.

Playfair claimed that "a debacle is insufficient for the transportation of stones".³⁹ Nor could the valleys have been produced by a single great torrent. "No force of water suddenly applied could loosen and remove the great mass of stone which has actually disappeared."⁴⁰ The following conclusion from the works of Gy is typical of the contrary opinion of the catastrophists: "Les volcans, les tremblemens de terre, les fleuves et les courans de la mer n'ont pas pu arranger la surface de la terre comme elle à présent."⁴¹ In their view only the deluge could explain what had happened on the earth: "Notre globe a été recouvert d'eaux jusqu'au dessus des montagnes les plus élevées. Ce sont ces eaux qui ont changé la surface."⁴²

Playfair attributed the removal of stones and rocks to glacial action, and in so doing came close to the truth:

The most powerful engines without doubt which nature employs are the glaciers, those lakes or rivers of ice which are found in the highest valleys of the Alps. These great masses are in perpetual motion undermined by the influx of heat from the earth.⁴³

39 Ibid., p. 408.

40 Ibid., p. 401.

41 H. de C., "Travaux géologiques de M. André de Gy", Annales, Vol. 3, p. 372.

42 Ibid.

43 Playfair, op. cit., p. 388, 389.

Besides being mistaken as to the reason for glacial movement, Playfair was thinking in terms of small glaciers similar to those still in existence. It was not until the work of Louis Agassiz in 1840, work which the Annales seems to have ignored, that geologists began to understand that the force which had moved huge boulders and rocks of granite, as well as masses of smaller material came from continent-covering glaciers, which had built up in the latest "Ice Age".⁴⁴ With the effects of those glaciers being observed over such large areas as all northern Europe and northern North America, it is hardly any wonder that those who attributed the same effects to a deluge thought that it was universal.

4. The Flood, Universal or Local?

Although Bonnetty held to the end that the Flood of Noah was universal, as implied by Genesis, the suggestion that Moses really meant a local flood found its way into the Annales. This theory was espoused by writers whose ideas were otherwise acceptable to Bonnetty. One of the earliest to suggest it was Baron Férussac, who took part in the conference sponsored by Bishop Frayssinous.⁴⁵

⁴⁴ Gamow, op. cit., p. 166.

⁴⁵ See p. 51 above.

Férussac there put forward the view of the Flood "qu'il fut en effet universel selon la connaissance que Moïse avait de la terre habitée."⁴⁶ In his own article, which appeared later in the Annales, he made the definite claim: "La seule chose importante à établir, c'est que la déluge n'a point été universel."⁴⁷ He asked why a universal flood would be necessary to destroy the human race, when parts of the globe were not yet inhabited. Moses did not even know of Australia and America. Surely he meant the world as it was then known. According to Férussac:

Cette façon de voir plus conforme à la raison et aux observations géologiques, qui repoussent formellement les cataclysmes et les perturbations de tous les genres, ne saurait contrarier l'esprit du texte sacré.⁴⁸

The editorial comment which preceded Férussac's views expressed reservations about some of his opinions:

[...] nous ne prétendons pas cependant approuver toutes les assertions qui y sont contenues; il en est même plusieurs sur la physique et la religion, qui ne nous pas recevables.⁴⁹

⁴⁶ "Accord des Sciences avec la Genèse, relativement à l'histoire des tems primitifs", in Annales, Vol. 1, December 1830, p. 376.

⁴⁷ "Examen de l'oeuvre de six jours par le baron de Férussac", in Annales, Vol. 2, April 1831, p. 285.

⁴⁸ Ibid.

⁴⁹ Ibid., p. 275.

When Férussac made the bald statement that the Flood was not universal, the editor added a footnote advising the readers: "Lisez l'Avertissement de l'éditeur des Lettres sur l'Histoire phys. de la terre, par J.-A. Deluc."⁵⁰

Férussac apparently leaned toward uniformitarian theories and, like Playfair, saw no conflict between such views and the sacred Scriptures. But there were also catastrophists whose opinions were published in the Annales and who also believed that Noah's Flood was confined to one locality. Dr. Pouchet, the zoologist of Rouen, concluded that the great deluge could not have been the Mosaic Flood, because the remains of men had not been found in pre-diluvial material. Therefore "le déluge Moïsen a eu lieu à une époque postérieure à l'inondation générale, et probablement n'a été que partiel."⁵¹ At least Pouchet was on the right track in distinguishing the periods when fossils became part of the continents, from the later and local Flood of Genesis.

Another geologist who was favoured by the Annales although he was sceptical about a universal flood, was Bonnaire-Mansuy, whose ideas were the subject of an article

⁵⁰ Ibid., p. 285, note.

⁵¹ H. de C., "Essai sur l'état", Annales, Vol. 13, p. 46.

in the second year of the Annales.⁵² Mansuy did not believe that water could produce the changes that were evident on the earth.⁵³ He accounted for fossils by successive deposits of the sea which had taken place during a first creation.⁵⁴ A second creation produced this present world, which is a special world for men.⁵⁵ The Flood of Noah came later and did not cover the whole earth. If it had done so, the dove could not have brought back the olive branch,⁵⁶ for all plant life would have been destroyed and the soil rendered sterile.⁵⁷

Against these opinions of scientists, writers for the Annales like A.L. and H. de C. argued the case for the last catastrophe being the Flood of Genesis. A.L. brought out Cuvier to contradict Mansuy's assertion that the earth showed no traces of the Flood of Noah.⁵⁸ He also referred to information published in the Annales on some pre-

52 A.L., "Accord de la géologie et de la Genèse relativement à la création", in Annales, Vol. 3, October 1831, p. 233-252.

53 Ibid., p. 239.

54 Ibid., p. 237.

55 Ibid., p. 238.

56 Genesis 8:11.

57 A.L., "Accord de la géologie", Annales, Vol. 3, p. 239, 240.

58 Ibid., p. 252.

diluvial remains which appeared to be human.⁵⁹ H. de C. likewise used Cuvier to refute Pouchet's claim that the failure to find evidence of human existence before the Flood proved that the Flood of Noah came later and was local. Cuvier's answer to the problem was:

Je pense, dit-il, que s'il y a quelque chose de constaté en géologie, c'est que la surface de notre globe a été victime d'une grande et subite révolution, dont la date ne peut remonter beaucoup au delà de 5 à 6,000 ans; que cette révolution a enfoncé et fait disparaître les pays qu'habitaient auparavant les hommes et les espèces des animaux aujourd'hui les plus connus; qu'elle au contraire, mis à sec le fond de la dernière mer, et en forme les pays aujourd'hui habités.⁶⁰

In spite of his enthusiasm for Cuvier, Bonnetty did not think his opinions on the disappearance of the remains of men were the last word on the subject. Opponents of Genesis were using the failure to find pre-diluvial human remains as proof that men did not yet exist when the waters covered the earth. Reconcilers who had used the same failure to find early human remains in order to prove man's recent arrival, were in the position of trying to prove that man had come early but not too early. Thus the article on Pouchet concluded with the wise observation that, if the remains of men had not been found in flood formations,

⁵⁹ See p. 85, below.

⁶⁰ H. de C., "Essai sur l'état", Annales, Vol. 13, p. 47.

the fact was negative because so little geological exploration had yet been done.⁶¹ However, the similar negative fact had been taken as positive proof that man's arrival on the earth occurred only five or six thousand years ago.

About six years before the article on Pouchet, the Annales publicized what was purported to be the discovery of the petrified feet and heart of a two year old pre-flood child, which were found at St. Arnould.⁶² As the feet and heart were found in ancient beds of earth with shell-fish and the fossilized remains of various animals, they were considered to be evidently ante-diluvian.⁶³ To this article Bonnetty added a note claiming the discovery as the answer to those who said the deluge took place more than thirty thousand years ago or who denied it completely. He gave notice that he intended to show that the most exact geological research perfectly confirmed the Mosaic revelation, not only as to the age of the world, but also as to the circumstances of the great disaster.⁶⁴ Important as the discovery at St. Arnould appeared to Bonnetty at the

61 Ibid., p. 49.

62 A.L., "Fossiles humains anté diluviens", in Annales, Vol. 1, September 1830, p. 135-140.

63 Ibid., p. 139.

64 Ibid., p. 140.

time, it seems to have been forgotten by the time that the article on Pouchet was published.

Bonnetty's intention never changed. To him the circumstances of the great disaster were those he concluded from a literal interpretation of Genesis as historical fact. It would seem that to the end of his life he believed that the Flood of Noah covered the whole earth. As late as 1869 the Annales still defended the universal flood against the arguments of a distinguished priest of Paris, l'abbé Lambert, who denied it.⁶⁵ The previous year an article whose title began with the question, "Tous les hommes descendent-ils de Noé?", answered its own question with a definite "yes", and went on to list a great many peoples and tribes in Asia, Africa, North and South America whose traditions included a story of a great flood.⁶⁶ There is nothing in the Annales between this article and his death that would indicate that Bonnetty ever modified his belief in the universal flood.

⁶⁵ F. Moigno, "Examen critique du livre: Le Déluge Mosaique, l'histoire et la géologie, par l'abbé Ed. Lambert" in Annales, first article, Vol. 78, April 1869, p. 306-315, second article, Vol. 79, July 1869, p. 7-28.

⁶⁶ L'abbé de Barral, "Tous les hommes descendent-ils de Noé? Examen d'une assertion de M. d'Homalius d'Hally", in Annales, Vol. 77, September 1868, p. 201, 216.

SUMMARY AND CONCLUSIONS

The purpose of this study has been to examine the manner in which Augustin Bonnetty, in the pages of his Annales de philosophie chrétienne, tried to reconcile science and religion for his fellow Roman Catholics in France in the 1830's. He faced a situation in which many churchmen were antipathetic to science because they associated it with the anti-religious bias of the philosophes. Bonnetty sought to overcome their antipathy by showing them that science was not only coming back to religion, but giving it active support as well, by its latest discoveries and conclusions. He desired especially to bring the clergy up to date in their attitude to science. To this end he praised seminaries which introduced their students to scientific ideas. On the whole, his approach to the problem of science and religion was a positive one and probably aided reconciliation at that particular time.

That a review like the Annales had a vital role to play in this period is evident by the support which it received. Although its six to eight hundred subscribers seem a small number today, they indicated a strong and faithful body of support for that time and were sufficient for the Annales to survive long after the death of its founder. The support of the heads of seminaries, as well as of professors,

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both of whom Bonnetty was proud to number among his subscribers, meant that the Annales went to places where its influence would be most effective and where it would probably be read by more than its own subscribers. That seminaries began to place more emphasis on sciences is not enough to prove a cause and effect relationship. It may simply have been a parallel development. At the same time, the Annales would naturally encourage and strengthen the tendency to recognize science as worthy of the attention of theological students.

That Bonnetty's purpose was a lofty one is beyond contradiction. His praise of science and his positive acceptance of its discoveries as revelations of the wonders of God's creative activity could do nothing but good. Bonnetty's belief in the Mosaic authorship of Genesis and the divine verbal inspiration of the Scriptures was mistaken, but ought to be accepted as normal for a Christian of that time. Indeed if Bonnetty had taken any other position on the Bible, his review probably would not have had any subscribers among church members. He might be criticized for lacking originality and for simply passing on the opinions of others; but the world needs mediators as well as originators, and Bonnetty did not claim to be other than a mediator. Having said these things it has also to be admitted that his effectiveness was decidedly limited both

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by the original terms of reference which he set for the Annales, and by his subsequent failure to give adequate consideration to new ideas as they were put forward by contemporary scientists.

In trying to reconcile Genesis and geology Bonnetty confined the Annales to publicizing geological systems which in his view gave support to the Genesis account of creation and the Flood. He thought he found this support in the theories of the catastrophist school. His own interest in science developed at a time when catastrophist theories of geology were popular. In spite of his claim to support no particular system, he did embrace the general approach of this school, and he continued to support it long after most geologists had forsaken it. His pre-judgment in favour of catastrophism prevented him from giving due consideration to new theories and discoveries as they were put forward. How beneficial it would have been to the readers of the Annales to have been given clear expositions of the work of men like Lyell and Agassiz, even if the Annales had also given its reasons for not accepting their ideas. Its failure to do so was unfortunate, to say the least.

In choosing certain scientific conclusions over others in support of his religious position, Bonnetty made his position dependent on the truth of the conclusions which he chose. A religion which is wedded to a scientific

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system, be that system Aristotelian, Copernican, or catastrophic, stands or falls with that system. Such identification has done great harm to Christianity in the past, but the Church has always managed to free itself in time from theories which have outlived their usefulness.

On the surface there seems little reason why the interpretation of Genesis could not have been adapted to the uniformitarian theory. It would have meant understanding the six epochs in terms of millions instead of thousands of years. It would also have meant accepting Noah's Flood as a local event, as Baron Férussac and others urged, instead of insisting that it was a universal deluge. Such an adaptation of ideas might have been possible for Bonnetty, but the issue cut more deeply and involved far more than the interpretation of Genesis.

The issue involved the very nature of God and of His relationship with His universe. In a manner of speaking it is whether God is Himself a catastrophist or a uniformitarian, whether His government depends upon continual interference with His creation or whether His purposes are being fulfilled according to those principles of His nature known to science as natural laws. Bonnetty and many Christians have seen the choice to be between a potentate who keeps His eye on everything and an absentee ruler who, after setting His universe in order, left it to run of its own

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accord, and they have preferred the first of these alternatives. They tried to keep God as the controlling agent as long as possible, by using Him as the explanation for what had not yet been explained by science, with the result that the more phenomena explained by natural means, the less scope was left for God. Hence the opposition which naturalistic explanations like uniformitarianism and later, evolutionism, aroused on the part of men who, like Bonnetty, thought they were defending the faith from destruction.

That these defenders of religion were fighting a losing battle is evident now. They lost because they took their position on a particular interpretation of religion and of the Scriptures, and held that interpretation to be infallible. That truth is one and that religion cannot be hurt by truth, as Bonnetty believed, has yet to be disproved; but what Bonnetty did not realize was that religion itself has to progress and develop. There has been evidence in recent years of such development, in that those who believe in God are coming to a different but deeper understanding of His nature, by which men will no longer see Him as One who interferes with and directs affairs from above, but as One who is working out His ultimate purposes from below in the whole creative process, the conditions of which flow from His very nature.

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Contemporary with the period of this study, this work gives the position of one geologist on uniformitarianism and catastrophism and shows him supporting the former.

Playfair, John, Illustrations of the Huttonian Theory of the Earth, New York, Dover Publications, 1956, xix-528 p., reprint of Edinburgh edition of 1802.

In carrying on uniformitarian beliefs, this work of Playfair made Hutton's ideas better known and more easily understood.

Richardson, G.F., Geology for Beginners, London, Hippolyte Ballière, 1842, xx-530 p.

This work of the early 1840's shows that uniformitarian views were becoming widely accepted by that time.

Wiseman, Nicholas Cardinal, Twelve Lectures on the Connexion Between Science and Revealed Religion, new edition, London, James Duffy, 1866, ix-468 p.

These lectures were given in Rome and England in the 1830's and are of interest because they deal with the same questions as did Bonnetty in the same period. This study made use of the fifth and sixth lectures which discuss science and religion and which show the influence of the Annales upon the thinking of Wiseman.

"Annales de philosophie chrétienne", in the Bibliographie Catholique, Revue critique des ouvrages de Religion, de Philosophie, d'Histoire, de Littérature, d'Éducation, etc., Vol. 1, p. 36-38.

This review of the first ten volumes of the Annales useful for giving a contemporary opinion of its value.

Secondary Sources

Agar, Wm. A., Catholicism and the Progress of Science, New York, Macmillan, 1940, xi-109 p.

Wm. Agar is described as a Fellow of the Geological Society of America. This short work is sympathetic to the Church and presents clearly the main issues on which the Church and science had disagreement in the past.

Becker, Carl L., The Heavenly City of the Eighteenth Century Philosophers, New Haven, Yale University Press, 1932, 168 p.

Becker's primary purpose was to give a historical explanation of the main ideas of eighteenth century thought in France, by relating the ideas of the philosophes both to the system of thought of the Middle Ages and to the ideas which came after the philosophes. He helps to make clear how the lines were drawn between Christianity and the secular philosophy based on science.

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Boas, George, French Philosophers of the Romantic Period, Baltimore, Hopkins, 1925, xi-325 p.

This book is an attempt to correlate beliefs and the political and cultural changes taking place in this period. It is more interested in the rise and decline of beliefs than in their truth. It was of value for this study because Boas described the effect of the ideas of Traditionalists on the Catholic faith in France prior to the start of the Annales.

Butterfield, Herbert, The Origins of Modern Science, 1300-1800, London, G. Bell and Sons, 1957, 242 p.

An excellent explanation of the changes in men's thinking which made possible the scientific revolution of the seventeenth century. It describes the effects of this revolution and how the philosophes gave the movement an anti-religious bias which was not found in the scientists themselves.

Carrington, Richard, The Story of Our Earth, New York, Harper, 1956, xvi-240 p.

A simple straightforward account of where geology stands today. Useful for this study to compare present thinking in geology with that of the 1830's.

Charlton, D.G., Secular Religions in France, 1815-1870, London, Oxford University Press, 1963, 250 p.

A study of certain French thinkers who tried to replace Christianity with a religion for the modern age of science. This book helps to make clear the type of opinions Bonnetty was combatting on behalf of the Christian faith.

Cobban, Alfred, In Search of Humanity: The Role of the Enlightenment in Modern History, London, Jonathan Cape, 1960, 254 p.

This work traces the intellectual development of modern Europe from the rise of modern science through the Enlightenment and its consequences. Of value to this study in that it made clear the influence of science on the thinking of the nineteenth century.

Coulson, C.A., Science and Christian Belief, London, Oxford University Press, 1955, 127 p.

These John Calvin McNair Lectures are a clear, reasonable attempt to reconcile religion and science. The author sees science as a religious activity. This work is useful for comparing Bonnetty's attempt at reconciliation with a modern attempt.

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Gives a panoramic view of the development of science and of the interactions of that development with philosophical and religious thought. Useful for background of period of this study.

Dansette, Adrien, From the Revolution to the Third Republic, Vol. 1 of Religious History of Modern France, 2 vols., trans. John Dingle, New York, Herder and Herder, 1961.

This work deals with the origins of the conflict between the Church and modern society from the political and social aspects. It was of some help for historical background to the period but it ignores the conflict between science and religion.

Derré, Jean-René, Lamennais, ses amis et le mouvement des idées à l'époque romantique (1824-1834), Paris, C. Klincksieck, 1962, 763 p.

This recent work gives an excellent account of the role and purpose of the Annales and discusses its importance.

Dublanchy, E., "Bonnetty", in Dictionnaire de Théologie Catholique, Tome 2, ed. A. Vacant, et al., Paris, Letouzey et Ané, 1905, p. 1020-1025.

Gives a short synopsis of Bonnetty's life and goes into Traditionalist controversy in some detail.

Dubray, C.A., "Bonnetty", in The Catholic Encyclopedia, Vol. 2, ed. Charles G. Herbermann, et al., New York, Appleton, 1907, p. 677.

Another short account of the life and thought of Bonnetty.

Ferraz, M., Histoire de la Philosophie en France, au XIXe siècle, Traditionalisme et Ultramontanisme, Librairie academique, Paris, Didier, 1880, v-513 p.

Gives a full account of the teachings of the Traditionalists. There is a short account of Bonnetty as the most celebrated of the supporters of Gerbet, Bautain, and Buchez in their opposition to the teaching of philosophy then given in French seminaries.

Foucher, Louis, La Philosophie Catholique en France au XIXe Siècle avant la Renaissance Thomiste et dans son rapport avec elle (1800-1880), Paris, J. Vrin, 1955, 280 p.

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This work contains a few paragraphs on Bonnetty but only deals with him as a Traditionalist.

Gamow, George, Biography of the Earth, Its Past, Present and Future, New York, Viking Press, 1948, xii-242 p.

This work was found useful for its description of continental glaciers and their effects.

Gillispie, Charles Coulston, Genesis and Geology, A Study in the Relations of Scientific Thought, Natural Theology, and Social Opinion in Great Britain, 1790-1850, New York, Harper Torchbooks, 1959, xiii-306 p.

This work was very important to this study because it examines the parallel conflict in Great Britain. Many of the ideas, theories, and geologists dealt with in this work are also discussed in the Annales.

Jordan, W.G., "The Old Testament and Science", in The Abingdon Bible Commentary, ed. Frederick Carl Eiselen, et al., New York, Abingdon Press, 1929, p. 122-128.

A useful account of how to interpret Genesis in the light of modern science.

Landes, Kenneth K., and Russell C. Hussey, Geology and Man, New York, Prentice-Hall, 1948, ix-518 p.

A very useful work in explaining modern geological ideas to the layman. The first chapter, which gives a brief historical resumé of the development of geology, and Part IV on "Earth History" were particularly relevant to this study.

Latreille, A., La Période contemporaine, Vol. 3 of Histoire du Catholicisme en France, 3 vols., ed. A. Latreille, et al., Paris, Spes, 1962.

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Launay, Louis de, L'Eglise et la Science, Paris, Bernard Grosset, 1936, 233 p.

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Lévy-Bruhl, Lucien, History of Modern Philosophy in France, trans. G. Coblenze, Chicago, Open Court Publishing Co., 1924, x-500 p.

A clear account of the ideas of French philosophers from Descartes through the nineteenth century. Of particular help to this study were the chapters on Voltaire, the Encyclopaedists, the Ideologists and the Traditionalists.

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Owen, D.R.G., Scientism, Man, and Religion, Philadelphia, Westminster Press, 1952, 208 p.

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Palmer, R.R., Catholics and Unbelievers in Eighteenth Century France, New York, Cooper Square Publishers, 1961, 236 p.

Palmer's purpose was to examine the ideas of opponents to the philosophes from 1740 to the Revolution. Important to this study as Bonnetty in the same tradition as many of the apologists described by Palmer.

Pollard, William G., Physicist and Christian, A Dialogue between the Communities, London, Society for the Promotion of Christian Knowledge, 1962, 178 p.

An example of a contemporary attempt to reconcile science and religion by a prominent American scientist who is also an Anglican priest. He sees great similarity between science and Christianity as communities.

Robinson, John A.T., Honest to God, London, Student Christian Movement, 1963, 143 p.

This recent "popular" religious work by an English bishop points out how we have still failed to come to terms with the universe revealed by science as far as our religious outlook is concerned.

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Sauvage, George M., "Traditionalism", in The Catholic Encyclopedia, Vol. 15, ed. Charles G. Herbermann, et al., New York, Appleton, 1907, p. 13.

An excellent short account defining this philosophy and describing the views of its chief exponents.

Simpson, Cuthbert A., "Exegesis, the Book of Genesis", in The Interpreter's Bible, Vol. 1, ed. George Arthur Buttrick, et al., New York, Abingdon Press, 1952, p. 458-829.

Very useful for the modern interpretation of the creation and Flood stories.

Simpson, James Y., Landmarks in the Struggle between Science and Religion, London, Hodder and Stoughton, 1925, xiii-288 p.

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Singer, Charles, A Short History of Scientific Ideas to 1900, London, Oxford University Press, 1959, xvii-525 p.

A synopsis of the development of science from ancient Mesopotamia, Egypt, and Greece to the end of the nineteenth century. Helpful in that it gives the main ideas of geology relevant to this study.

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A brief history of the Annales and its editors which explains its demise in 1913.

Walsh, James Joseph, The Popes and Science: the history of the papal relations to science during the Middle Ages and down to our own time, Knights of Columbus edition, New York, Fordham University Press, 1911, xii-431 p.

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A thorough history of the conflict between science and religion, this work is also a polemic against churchmen who opposed new scientific ideas.

Whitehead, Alfred North, Science and the Modern World, Cambridge, Cambridge University Press, 1932, 265 p.

After tracing the origins of modern science Whitehead goes on to describe the effects which science had on the thought of different periods. Of particular interest to this study were his ideas of the effect of science on religion and conclusion that religion should change and develop as science does.

Wiley, Basil, The Eighteenth Century Background, Studies in the Idea of Nature in the Thought of the Period, London, Chatto and Windus, 1950, viii-302 p.

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Of value for the story of Woolley's own excavations that verified a great flood about 3200 B.C.

APPENDIX 1

ABSTRACT OF

Augustin Bonnetty Considered as a Reconciler of
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Augustin Bonnetty felt that his mission in life was to inform French Roman Catholics of the developments in modern knowledge, especially in the sciences, and how those developments gave support to the truths of religion. To this end he founded in 1830 a monthly review called the Annales de philosophie chrétienne. His primary object during the first ten years of publication was to reconcile science with religion. This study is an examination of relevant articles in the Annales to see how Bonnetty went about his task of reconciliation. It is important because the conflict between science and religion is still with us today. It began with the rise of modern science and under the influence of the philosophes took a very acrimonious form in France. Philosophe ideas contributed to the French Revolution, which in turn caused an intellectual reaction, of which the Traditionalists were the leading exponents. Bonnetty belonged to this school which emphasized tradition

¹ Edward Alfred Pulker, Master's thesis presented to the Faculty of Arts, Graduate Division, of the University of Ottawa, Ontario, 1966, ix-102 p.

and divine revelation. To him Holy Writ was one of the ways in which God revealed truth to men. His attempt to reconcile science and religion was largely a matter of using scientific theories which could be adapted to the interpretation given to the Scriptures by Christians of the time.

Geology provided the main issue for the conflict at this time. Reconcilers tried to harmonize its findings with the creation and Flood stories of Genesis. Bonnetty's position was that geology was too young a science to have any particular theory accepted. He was ready to keep an open mind toward all systems as long as they agreed with the account of Moses. However, he definitely favoured the catastrophist theories of Deluc and Cuvier, as against the uniformitarian explanation of Hutton, Playfair, and Lyell. He readily accepted the interpretation that the six days of Genesis represented six epochs, but he would admit an extension of time only prior to the creation of man. He claimed that geology supported the Mosaic chronology as well as the order of creation given in Genesis.

Bonnetty also supported catastrophist theories because they explained a universal flood. The finding of marine fossils on land had long been taken as evidence for the Flood of Noah, but geologists now saw the chief

evidence in the movement of rocks from their place of origin. In 1840 Agassiz explained this phenomenon by continental glaciers. Bonnetty, however, held to the idea of a universal flood all his life.

Although Bonnetty filled a need and probably had some influence in the period under study, his narrow interpretation of the Scriptures and his failure to realize that religion itself has to progress, meant that his approach to the problem of reconciling science and religion soon proved inadequate and contributed little of lasting value to the problem of reconciliation.