STRUCTURE AND PHILOSOPHY IN MEDIAEVAL ENCYCLOPAEDIAS

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BY

Faith Wallis

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Abstract

Not content, but structure and philosophy define the mediaeval encyclopaedia. The three structural elements of the encyclopaedias of creation, the artes, and universal history were inherited from the best traditions of classical antiquity and transformed by the Church Fathers, especially Augustine, into the instruments of a Christian encyclopaedic philosophy. The key-notes of this philosophy are comprehensivity and synthesis. Its aim is to express the divinely-ordained, harmonious structure of the created universe, its history, and the products of the human spirit in such a way as to inspire in the reader the desire for an analogous spiritual harmony, completeness, and unity with the Divine. The efforts of mediaeval encyclopaedists to express this philosophy reached their zenith in the twelfth century, while their search for a suitably full and articulated structure culminated in the great encyclopaedias of the thirteenth century, in particular the Speculum maius of Vincent of Beauvais.

Resumé

L'encyclopédie médiévale se définit, non par ce qu'elle contient, mais par sa structure et sa philosophie. Les trois éléments structurels des encyclopédies de la creation, des artes, et de l'histoire universelle ont été héritiés des meilleures traditions de l'antiquité classique. Les Pères de l'Eglise, en particulier Augustin, les ont transformés en instruments d'une philosophie encyclopédique chrétienne. Le trait essentiel de cette philosophie est la volonté de saisir le réel d'un point de vue comprehensif et synthétique. Son but est d'exprimer la structure harmonieuse et divinement ordonnée du cosmos, de l'histoire et des produits de l'esprit humain afin d'inspirer dans l'esprit du lecteur le désir d'une harmonie, d'une totalité, et d'une unité semblables avec le Divin. Les efforts des encyclopédistes médiévaux pour exprimer cette philosophie ont atteint leur apogée au XIIe siècle. La quête d'une structure pleine et articulée s'est accomplié dans les encyclopédies du XIIIe siècle, en particulier le Speculum maius de Vincent de Beauvais.

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STRUCTURE AND PHILOSOPHY OF MEDIAEVAL ENCYCLOPAEDIAS

Introduction: "Arbor Scientiae"

The scope of knowledge deemed available, and the purpose for which men desire to acquire it, give every investigation into the nature of the world a particular character as a manifestation of the general culture of an age or place. Not only is science the dominant element of twentieth century life, but the orientation and basic assumptions of this science tell much about our age. The modern scientist considers that only how things work is truly knowable. What a thing essentially is can be deduced neither from any observed and calculable behaviour, nor from a general principle. For example, everything in the world may indeed be composed of electrical charges, but that which makes a tea-cup different from a daffodil is the combination of these charges. The reason why these various combinations occur may, perhaps, remain forever unknown, while the possibility of establishing some connective pattern between the daffodil and a word, or a human action, seems even more remote. In the same way, the twentieth century investigator sees the question "why" as valid only within the bounds of a tentative arrangement of cause and effect which will serve to illustrate his fundamental preoccupation with how things work. The end envisioned by present-day scientists for their researches appears to be an increase in the health, material well-being, and worldly happiness of their communities. Each scientist, however, has his own definition of what his constituency is.

The basic stumbling-block in the modern historian's path to

a clear understanding of the science of the Middle Ages is the fact that mediaeval people came to radically different conclusions on this question of the scope and end of knowledge. Their outlook on nature was shaped by their heritage of ancient, especially Aristotelian, science, and by their Christian world-view. From antiquity, they received the idea of teleology, the foundation of their science. The conviction that Nature does nothing in vain, and that everything has its purpose within a total scheme, means that all knowledge is potentially available to man, for there is nothing absurd or unexplainable in a natural system conceived as "an ordered whole, bound together by purposes".[1] For them, purpose was a "synthetic principle", yet it was not inferred empirically from data.[2] To understand the moving purpose of the world would enable man to know it in its entirety even without the examination of each individual phaenomenon. Like Plato's discussion of the goodness of the Creator as the purpose and informing principle of the creation,[3] this key to nature was something known a priori and imposed, as it were, from the outside. The uncovering of purpose was, for the ancients, the work of reason.

For Christians, the question of purpose was far more complex. The world was created from nothing by the One God, whose dealings towards men had, from the beginning, been centred on educating them in His ways and eliciting their free consent to His will. Yet, as He is One, so are all His purposes one: creation and redemption sprang from the same Love, and were even effected by the same Person of the Holy Trinity, the Son. Thus, for Christians, there is one purpose in the world, but many levels on which the purpose operates. From the simple lesson of God's providential

care for His creatures, to the most complex statements of holy doctrine, all could be found in His handiwork, in the geometry of the heavens, the bodies and manners of birds and beasts, the unfolding pattern of time, or the mind and soul of man. This concept of purpose transcends Aristotle's natural teleology to embrace humanity's moral and spiritual life. In this way, Christians repaired what is, perhaps, Aristotle's greatest flaw, his failure to integrate his science of nature with his science of man.[4] The aim of Christian scientific thought was therefore quite plain. It sought to teach men of their salvation through the "book" of the world, in which, as in the book of the Scriptures, images gave a body, an Incarnation, to the Spirit of Truth.

The doctrine of the Incarnation revolutionized the ancients' views of the world as much as it changed their ideas of God and man. As Charles Williams said, it "set free the images" to become icons of the Divine, not simply in the passive sense in which Plato's world was a reflection of the realm of Ideas, but in a dynamic sense as well. They were a message as well as a mirror.

> At its best such an outlook enabled a coherent and Christian philosophy whereby the universe is regarded as the scene and in some sense the means of divine self-revelation which had its full representative for man in the person of Jesus. The special incarnation in Him was regarded as typical of a similar though obviously incomplete manifestation in the whole creation.[5]

If it was heresy to regard Christ's manhood as illusory, it was similarly unthinkable to deny, or ignore, the world's reality. If "otherworldliness" is an adjective which can be applied to the Middle Ages, it consists only in insisting that this world derives from and depends upon another; that it is the symbol and instrument of that other; and that it is to be studied and interpreted,

if at all, not for its own sake but to disclose its spiritual meaning.[6]

If the task of science is conceived of in this manner, it follows that the revelation of scripture and of nature ought to be used in conjunction with each other. The former provides that key of divine purpose which explains the happenings of this world, especially those which would appear, from simple observation, to have no direct relationship with man and his salvation, while natural science is useful in the elucidation of the Scriptures, where knowledge is often transmitted in summary, or even occult form.[7]

The doctrine of the Incarnation affected the methodology of the Christian intellectual as well. The belief in the perfect concord of seeming opposites, without detriment to the individuality of either, is at the very heart of Christianity, whose Lord is perfect God and perfect man, joined without contradiction in one nature. Christ as the Divine Wisdom, as Truth itself, was seen by the Middle Ages as the model for all the lesser truths of this world. Not only did this signify the union of spiritual message with created form, but it also meant that in Him, all seeming conflicts are no true conflict at all.[8] For writers of the Middle Ages, a symbolic world-view was the means whereby all truths could be made to flow into Christ, and so be revealed as one truth.[9] Christians are thus free to claim all learning, all science and philosophy, as their own, provided they are willing to undertake the high task of uncovering its true concord with the Divine Revelation. When related to the great Truth, all knowledge possesses, in the literal sense of the word, significance. It recovers its pristine character as an image of Him who made both the world, and the human intellect to understand

it. This understanding, in order to fulfill its divinely given nature, must comprehend the truth of all things in their totality, both in their natural forms and their supernatural ends. Hence, our own age's efforts to isolate these two elements would have struck mediaeval man as the very suicide of humanity's capacity to think.

An exegete, commenting on the first chapters of the Bible, would naturally be led to consider the world of nature as an explicit statement of divine purpose. This idea is not entirely new with Christianity. It had been formulated in Aristotelian teleology, and dramatized in the creation myth of Timaeus. The Demiurge has no reality for Plato, but simply embodies the philosopher's belief in the rational design of the cosmos, and its status as a mirror of the unchanging Ideas.[10] However, this mirror is inherently of limited usefulness as a vehicle for knowledge of the higher order, for the Artificer has had to use as a medium something which was not created by him, and is not naturally amenable to his ends. Hence Plato believed that knowledge by intuition was alone worthy of the name, and was by nature superior to the mere "opinion" obtainable by sensory and temporal means, whether words or things.[11] The Christian had a two-fold theory of knowledge. He accepted the Platonic supremacy of the eternal world, but he could successfully combine this with the Bible's statements that God could be known through His creation, and the Aristotelian idea that sensory data can lead to the knowledge of prior and non-sensible realities. The result was the Christian belief in the mediation of cognition through signs.[12]

Christianity solved the problem of combining Aristotelian and

Platonic thought on this question, as it solved many of the metaphysical problems of anitquity, by positing an omnipotent, personal God, who created the world ex nihilo. The fabric of nature, like the person of Christ, is the "express image of the Father", for through the creation of matter, He made His medium fulfill His purpose unhesitatingly. Thus, the world is a true image, and it is possible to "read" it from the top down, and from the bottom up. If, however, we cannot read this message, if the image is obscure, it is due to our fall from grace. Hence the repair of our spiritual wound will coincide with the restoration of our intellectual powers. On another level, the completed redemption of man, culminating in the restoration of his divine likeness, will result in the restored imagehood of the world, whose epitome he is. It is noteworthy that that period of the Middle Ages when these doctrines were most fully perceived and articulated, the twelfth and thirteenth centuries, also witnessed a renewed interest in the idea of man as microcosm.

For Plato, creation was a dramatic and convenient framework for the exposition of the rational order of the universe. He could just as easily, if not as effectively, have employed an analytical approach.[13] Christian thinkers not only believed in the reality of the Creator, as Plato did not, but saw the process of creation as far more radically linked with the structure, and hence the comprehensibility of the world. It was its status as a creature that made it, as it were, a point of intersection between an earthly order and its heavenly source. But as Plato sees time as the moving image of eternity, so Christians see the events of time as loci where divine purpose is fused with the things of this world. A symbolic history has even more obvious roots in the person of Jesus

Christ than does a symbolic science, for He is depicted in the very words of the Bible as the fulfillment of a temporal process of prophesy and foreshadowing. He is Alpha and Omega, the first and the last;[14] He is with the Father in the beginning,[15] and the Lamb of the Revelation of the Last Days. The transformation of history into a dynamic process whose very chain of events spells out a spiritual message is essentially a Christian achievement, and represents a radical change from the ancient view of time as an eternal cycle, void of meaning.

Nature and history were both pageants, created to reach the whole man through his understanding. Though the Middle Ages was by no means immune to the beauties of nature in a physical or emotional sense, its purpose was seen in terms of a sacred paedagogy. Thus, the question of educating man to understand the world and time, and their key in the Scriptures, was as basic to Christian intellectuals as that of the preparation for philosophy or rhetoric was to Plato or Isocrates. Augustine saw this problem in terms of the correct harnessing of the educational achievement of antiquity to a comprehensive <u>doctrina christiana</u>, but it is significant that the Middle Ages was not entirely satisfied with this solution. Its defensive, cautious and limited character was eventually abandoned as the strictly pagan use of these materials and methods faded into the past. More important, the fuller implications of Augustine's own philosophy were eventually integrated into his programme of Christian education. The restoration of the broken image of the divine involved the renewal not only of the will of man, or of his body at the general resurrection, but of his mind as well. In the <u>Confessions</u>, Augustine describes his own fall in terms of the

perversion of his intellectual gifts.[16] As a pagan teacher of rhetoric, he abused those human words which are images of the Word Himself, while the "redeemed rhetoric" of St. Ambrose, and the written message of the Epistle to the Romans,[17] were responsible for his conversion. This integration of the life of the mind into the total Christian experience led his spiritual son, Hugh of St. Victor, to redefine philosophy as a total education, a love of wisdom in all its modes.[18] Mediated through the Divine Wisdom, it takes its place as part of the process of salvation and the renewal of man's true status as an image of God.[19] Through education, man was himself to become, like nature and history, the locus where Creator and created intersect.

The belief in the potential comprehensiveness and synthesis of human and divine knowledge constitutes the encyclopaedic philosophy of the Middle Ages, while natural science, history, and education are the characteristic structures through which it is expressed. From Ambrose and Augustine to the Speculum majus, this philosophy and these structures formed the basis of a continuous literary tradition. These encyclopaedias share many characteristics with works of all ages and lands which have borne this name. They are compilations, written in a general and non-technical vein, which claim to present a body of knowledge both complete and compendious, though as Vincent of Beauvais says,[20] it is often hard to combine these goals, for striving after completeness often produces unwieldy bulk.

What makes an encyclopaedia mediaeval is not its nature as a compilation, or even the information it purports to convey. As I hope to show, much of the latter was a heritage from antiquity,

and much survived beyond the Middle Ages. What was not inherited and did not survive was the structure and the philosophy of the mediaeval encyclopaedia, that is, that which oriented the encyclopaedic work towards a comprehensive and synthetic understanding of the world of nature, the events of the past, the processes of learning, or any combination of these three, in terms of a conviction that the totality of these subjects can be understood in terms of the intersection of the divine nature and purpose with the world and its inhabitants at all levels. The aim of this thesis is to trace this philosophy and these structures from their roots in antiquity through their transformation into Christian forms by the Church Fathers. From there, it will follow the often tentative efforts to embody this philosophy and these structures by writers of the early Middle Ages, and the emergence of the great encyclopaedias of the twelfth and thirteenth centuries. Here the fullest implications of the Christian world-view were worked out, and the three structures were fused in the Speculum majus. Finally, it will consider the demise of this form in the fourteenth and fifteenth centuries.

Before commencing, however, it might be useful to elaborate somewhat further on the characteristics of the mediaeval encyclopaedia. Many twentieth century preconceptions about the proper structure, use, and source materials for an encyclopaedia will have to be dispelled. The first, and perhaps most distinctly mediaeval difference is the order in which the encyclopaedic materials were presented. For the writer of the Middle Ages, order was a major preoccupation.

> At his most characteristic, mediaeval man was not a dreamer or a wanderer. He was an organizer, a codifier, a builder of systems. He wanted 'a place for everything and everything in its place'. Distinction, definition, and tabulation were his delight...There was nothing mediaeval people liked better, or did better, than sorting out and tidying up. Of all our modern inventions, I suspect they would most have admired the card index. 21

The Discarded Image suffers somewhat from a tendency to generalize for the entire Middle Ages what was actually the achievement of the twelfth and thirteenth centuries. I nevertheless agree with Prof. Lewis' assessment of the mediaeval love of order and system, especially if this love is seen in terms of progress towards an ideal -- a progress which reached its zenith in the High Middle Ages. I hope to show in subsequent chapters how the systems employed by the encyclopaedists became increasingly complex, articulated, and expressive of their comprehensive and synthetic philosophy.

There is, however, one aspect of the card index which mediaeval encyclopaedists would not have admired: its alphabetical order. Modern encyclopaedias are rarely arranged according to a system. If they are, the choice of a plan is based on practical and paedagogical, not philosophical grounds. Such systems are admittedly arbitrary, like the alphabetical order. We see these schemes as violations of the mutable, evolutionary nature of the world, and we arrange facts largely for convenience. Our systems are relative and tentative, for we have little faith, or at least little interest, in any inherent order to the universe. But the mediaeval encyclopaedists felt that there was an ineluctable order to things. Their keenness to understand the Creator's purpose spurred them to uncover this natural system, while the divine command to tell all mankind of God's ways and ends inspired them to reproduce that system in their encyclopaedias. 22

> Le fait que Vincent ait préféré pour son encyclopédie l'ordre méthodique à l'ordre alphabétique nous semble significatif d'un temps pour lequel il existait une hiérarchie naturelle et surnaturelle, chaque chose occupant nécéssairement son rang particulier, en relation définie avec les espèces du même genre. Etablir un miroir de la nature et de la science consistait simplement à mettre en relief les grandes lignes d'un ordre déjà donné. L'ordre alphabétique au contraire s'impose en des temps où l'on admettra que la realité se compose d'objets indépendents, pour ainsi dire en désordre, et par là rebelles à toute veritable connaissance. 23

Therefore, the encyclopaedist's belief in an objective order is intimately linked with his faith in a comprehensive and synthetic understanding of the world. He sought to embody this in the fabric of his work, not only by including every creature and every event, but by reproducing their divinely created order.[24] The encyclopaedia was to be a speculum, or imago of the world as seen by mediaeval man. It is this aim and the philosophy that inspired it that assert the claim of the encyclopaedia to be representative of mediaeval thought as a whole. It at least deserves greater prominence in the intellectual histories of the age than it has hitherto received.

The above analysis of objective order in the mediaeval encyclopaedia should put us on our guard against imposing upon it the modern encyclopaedia's character as a reference book. What we would call an encyclopaedia, the mediaevals called a vocabularium. This type of work was a sort of dictionnaire encyclopédique, containing a modest amount of information above and beyond a definition.[25] It is generally arranged alphabetically by subject. On the other hand, the encyclopaedia has a rational order, never a mechanical one. Its purpose is to provide a complete education and orientation in the ordered, complex reality of the whole creation, not to afford easy access to isolated facts. That even mediaevals found their encyclopaedias hard to use as reference books is attested by

the fact that indexes and alphabetical tables of contents were later added to the great Specula and Imagines, as they were to the florilegia,[26] to facilitate reference. However, neither the encyclopaedia nor the florilegium was originally intended to be so used.

The mediaeval encyclopaedist's effort to unfold to his readers the divine plan meant that he deliberately fused Christian edification with scientific instruction. Hence the ubiquity of moralizations, or symbolic interpretations, in his writing. Such a symbolic outlook presents many pitfalls to the modern reader, who is apt to interpret the fusion of scientific and religious truth as the confusion of the two. However, an example from the Bestiary will clearly illustrate the position of moralization and symbolism in mediaeval man's scientific outlook.

The whale, says the Bestiary, likes to lie submerged in some quiet part of the sea, where, after a period of time, grass and bushes cover his back. Sailors land there, thinking it is an island. They light a fire, but the whale, feeling the heat of the flame, suddenly dives into the deep, dragging to their destruction the seamen and their anchored vessel. "Now this is just the way in which unbelievers get paid out, I mean the people who are ignorant of the wiles of the Devil and place their hopes in him and in his works. They anchor themselves to him, and down they go into the fires of Hell."[27]

This illustration supports Colish's conclusion that mediaeval symbolism never posits equivalency between the symbol and the symbolized.[28] The whale is not the Devil, but a message about the Devil. In view of God's aims regarding man's education, the whale's role as a warning about Satan is not "merely symbolic". In mediaeval

eyes, it is probably the most important thing we can know about the whale. Such interpretations were not simply added "extras"; they were the whole point of studying nature at all. The fulfillment of science is the comprehension of Nature in its most profound and complete sense. The Middle Ages would doubtless look upon our brand of science as insipid and wrong-headed. It would not seem to them to be science at all, for we are only concerned with half the story, and with the less interesting and important half at that.

With this alternate perspective in mind, it is rather amusing to hear modern scientists criticize mediaeval man's ignorance of the richness of nature. But it is saddening also that many historians persist in judging mediaeval works of science and natural history in terms of their failure to conform to modern standards. They conclude that that which makes these works mediaeval makes them unscientific. It is little wonder that the encyclopaedic genre has been so neglected. Students of mediaeval art, literature, and science have used them, inappropriately, as reference books, rummaging through their contents for examples and allusions, but as a realm of their own, they have been largely ignored--one is tempted to say, despised.

I have discovered only three monographs dealing with the encyclopaedic tradition as a whole. Of these, the article by Sanford is a short notice,[29] while that by de Gandillac, though fuller, is not generally concerned with establishing a definition or classification of these works.[30] This leaves M. de Boüard's "Encyclopédies médievales",[31] a pioneering work which is unfortunately marred by that modern error of perspective regarding symbolism and moralization

referred to above. De Boüard's classification is open to a great deal of criticism, especially since it is impossible to find a mediaeval encyclopaedia which fits with any ease into either of his two categories. One kind of encyclopaedia, he says, sets out to examine the world objectively, and its purpose is simply to instruct. De Boüard sees this as the only true type of encyclopaedia.[32] The second type aims at edification. It studies the world strictly as a mass of symbols whose contemplation leads the soul to God.[33] The trade mark of the latter, he contends, is the presence of moralizations; yet Vincent of Beauvais states that his encyclopaedia is for an edifying end, though he does not include moralizations, or else does so very briefly.

Generally, de Boüard fails to understand why the Middle Ages refused to separate instruction from edification. Waxing angry at moralizers, he complains that in their view "l'explication des choses ne peut être fournie par son aspect."[34] Sensitive reading of the great encyclopaedias will show, I believe, that the Middle Ages was less concerned with having things explained than with having things explain. There is a close analogy here between the study of Scripture and the study of nature. Both were "books" whose "aspect" was writ large with spiritual meaning. The aim of the student is in both cases to penetrate from the surface inwards to uncover that kernel of allegorical and mystical truth. As Hugh of St. Victor said, the basis and "control" as it were, of all tropological interpretation is the literal, historical meaning of the Bible.[35] The analogy for this in mediaeval science is the "aspect" of things.

But de Boüard sees truth only in terms of scientific data, to

which the encyclopaedists have added an artificial and arbitrary encrustation of allegory. Indulgence in symbolism marred the factual purity of the encyclopaedia.[36] He cites the example of Alexander Neckam, to whose scientific discussion of the marks on the moon is appended a paragraph on God's purpose in creating these marks. If we suppress the moralization, says de Boüard, all will be quite reasonable,[37] and he holds up his own favourite encyclopaedia, the Compendium philosophiae, as the epitome of the genre in its true, unmoralized form. But if we suppress the moralization, we have destroyed the whole economy of the mediaeval encyclopaedia. Even in works where actual moralizations are at a minimum, this Christian fusion of instruction and edification is upheld. De Boüard is forced to admit that the Compendium, besides being late and uninfluential, is not typical of the encyclopaedic tradition.

> On chercherait en vain une encyclopédie latine où la célèbre théorie de Saint Paul et de Saint Augustin (that by the study of His creatures, we may learn about God) ne soit pas citée en bonne place, non pas en titre documentaire, mais comme idée directrice du travail.[38]

In conclusion, de Boüard's definition of the mediaeval encyclopaedia would destroy its characteristics (in our eyes) of being mediaeval and (in mediaeval eyes) of being an encyclopaedia.

This by no means attempts to deny any value whatsoever to de Boüard's work. Above and beyond his services in producing an edition of an extremely interesting encyclopaedia,[39] he makes two very important points concerning the genre in general. The first is that the "raw" information presented in the encyclopaedias is often quite respectable. If it is not what we consider scientific fact, it is usually the best its age could offer. Neckam's fascination with Arabic science, and Vincent of Beauvais' extensive use of Aristotle,

are good barometers of the intellectual preoccupations and fashions of their times. However, de Boüard's insistence on the incompatibility of science and moralization would tear these nuggets of truth out of the context which made them valid for mediaeval people. This is what the Renaissance did, and what modern historians of science still do. It is scarcely a promising basis for de Boüard's proposed "ouvrage d'ensemble"[40] and, as such, serves to illustrate a basic theme of this thesis--that it is the structure and philosophy, not the content, of mediaeval encyclopaedias which is at issue, and which must provide us with materials for definition and classification.

De Boüard's second point is a corollary of his first, and is one with which I unreservedly agree. He asserts the importance of the study of the encyclopaedia within the whole context of mediaeval learning.

> Ainsi se confirme sur ce point précis, ce que j'ai dit des encyclopédies latines, savoir, qu'elles ne sont pas, comme on l'a trop souvent cru, en marge de l'activité intellectuelle, mais au contraire, qu'elles y participent: elles bénéficient sans retard des trouvailles des savants. [41]

Another difficulty which modern students might encounter when reading the mediaeval encyclopaedias concerns the amount of not only outmoded, but downright fanciful information found therein. The acceptance of this information without empirical or experimental proof is generally cited as a prime example of the crude naïveté of our mediaeval ancestors. This is a rather slick judgment which ignores the different cultural basis of the Middle Ages, the foundation upon which the edifice of the great encyclopaedias was erected. It is necessary not to label the Middle Ages' many seemingly infantile beliefs about the world as "primitive". Their character is quite different from that of the beliefs of savages, for they were per-

ceived by literate men through reading the most authoritative books available. These in turn stem from a different, more highly developed culture. As C.S. Lewis has pointed out, literacy and contact with other cultures usually dispel savage beliefs. Yet it is these very things which created mediaeval man's belief in what we would consider fables and fancies.[42] A brief consideration of the taste for mirabilia in antiquity will show that the mediaevals by no means exaggerated what they read.

The culture of the Middle Ages was basically bookish. After all, was not the Book of Books the source of every truth, and did not the symbolism of books and reading pervade their whole epistemology? Furthermore, even if the literacy rate was considerably lower then, reading "was, in one way, a more important ingredient of the total culture".[43] The mediaeval intellectual found it hard to doubt anything he read in a book, the way we find it hard to disbelieve scientific observation, the cornerstone of our culture. But the mediaeval library was rather heterogenous, and its users were committed, since the time of St. Augustine, to accepting, though with certain reservations, the cultural legacy of Antiquity. There were, therefore, bound to be clashes. As they could not betray the bookish nature of their civilization, "a Model must be found which will get everything in without a clash, and it can only do this by becoming intricate, by mediating its unity through a great and finely ordered multiplicity."[44] This last phrase is practically a definition of the encyclopaedic philosophy, and provides a second imperative to the encyclopaedia's conscious search for systematic structure.

Another misconception which must be dispelled holds that the

mediaeval symbolic and unified world-view, and the encyclopaedias which epitomize it, are the products of the peculiar conformation and limitations of scientific information available to the age. Thus, they say, the Ptolemaic cosmos, centripetal and symmetrical, produced the world-view and philosophic approach of the Middle Ages. The major flaw in this argument is that, of course, Ptolemy himself believed in this world view, and he was certainly not mediaeval. But more important, this is putting the cart before the horse. The Ptolemaic cosmology was accepted from the Arabs because it satisfied an already developed mediaeval taste for synthetic order. To the twelfth century intellectual, Ptolemy's system represented a distinct improvement over the Heraclidean scheme propounded by Martianus Capella (later taken up and developed by Copernicus) where the revolutions of Venus and Mercury around the Sun not only did not satisfactorily account for the appearances, but seemed to be inconsistent with the regularity believed characteristic of the heavens. Regularity and uniformity were the marks of the rational and deliberate Creator. This is but one example, but it clearly shows that the world-view selected and adapted the information, not vice versa.

Thus it would not be correct to say that the abandoning of the geocentric cosmology engendered the collapse of the mediaeval ideology. After all, attacks against the comprehensive and synthetic world-view, and its assumption of a close relationship between earth and heaven were under way in the schools of the 14th century, before the voyages of discovery of the new astronomy were dreamt of. The philosophical work of Siger of Brabant, Scotus and Occam is of greater significance in this respect than the discoveries of Columbus or Copernicus. When the intellectual accepts, or even seriously

entertains the idea of the "two truths", the mediaeval framework has been discarded. The system was eroded from within before it was ever threatened from without.

Therefore, in general, the mediaeval viewpoint is independent of the specific content of the data available. Indeed, most of the scientific knowledge possessed by the Middle Ages came from the ancients, who certainly did not share the mediaeval outlook. Moreover, in a somewhat eccentric way, the mediaeval attitude toward the Creator and His handiwork survived far into the age of science. Prof. Tillyard has emphasized the importance to the Elizabethans of the idea of interlocking and parallel hierarchies.[45] The works of the Caroline poets and divines, especially Thomas Traherne, are filled with that mystic fusion of earthly object and sacred meaning. Even in the bosom of the Enlightenment, philosophes who scorned "Gothick" superstition and barbarism would extol Nature and Nature's God for providently making breadfruit exactly the right shape to be cut by man's knife. Doubtless they little realized how eagerly the benighted mediaeval scholar would have agreed with them!

The ability to look upon Nature as the pageant of Christian truth is not necessarily bound to any particular cosmology. As we no longer accept the Ptolemaic system, we do not see in the heavens the circular perfection of Dante's souls in bliss, revolving like lights on the rim of a wheel whose centre is "the love that moves the sun and the other stars." But as Dorothy Sayers points out, a twentieth century man could look at the elliptical path of a planet and still see an image of the soul moving around the Divine,[46] this time in the form of two poles, Christ's manhood and Godhood. Historians of science rather flatter their subject when they claim

that the discovery of new data shattered the mediaeval world-view. A world-view is not a body of knowledge, but a mode of perception. The demise of encyclopaedic philosophy had much more far-ranging causes, of which new information concerning the physical world is a minor one.[47]

Still other students might object that the mediaeval view is at least dependent on a limited universe. Surely our boundless cosmos, and the staggering amount of knowledge concerning it, make the comprehensive and synthetic philosophy practically, if not theoretically, impossible. Should not the death of this outlook be attributed, if not to the content, at least to the bulk of the new knowledge? As Chapter 6 will show, this is true in a limited and rather technical sense of the encyclopaedia as a literary form capable of achieving its express goals. However, it is an error in perspective to apply this to the goals themselves. Grimal, for example, sees a limited physical world as the sine qua non of the encyclopaedia, for only under these conditions is a universal knowledge attainable.[48] This rests on a misconception of the word "universal" in this context. The idea of universal knowledge is the creation of Pythagorean and Ionian thinkers who, as Sambursky indicates, set Greek science on its historic path of searching for a cosmic law.[49] Whether the foundation of the world was deemed to be number, Empedoclean Love and Strife, or one of the four elements, there follows the possibility of universal knowledge. This possibility, however, is not quantitative, but qualitative. It is not a mathematically total knowledge, but the grasp of a universally applicable principle. If one believes, as did the Pythagoreans, in a universal structure according to number, then it is scarcely significant that there exists an infinity of numbers. They are all made up of the same ten units and are thus

fully comprehensible once this "key" is understood. For the Middle Ages, the informing principle of the world was the Divine Will, and hence they preferred to base themselves on revelation rather than reason. But revelation was still regarded as a "key". It is significant that the title of one of Honorius of Regensburg's encyclopaedias (a reworking of Erigena's De divisione naturae) is Clavis Physicae, the "Key to Natural History".

Grimal's notion of universal knowledge is rather anachronistically based on modern inductive methods of science. The ancients and the mediaevals, as has often been said, preferred to consider why rather than how something was the way it was. We accumulate "hows" to discover a tentative "why"; they applied an absolute "why" to interpret a "how". Application, not accumulation, is the clue to their idea of universal knowledge. Indeed, mere accumulation was disdained as the amusement of the unprincipled and unscientific curiosus. It is noteworthy that the Natural History of Pliny the Elder, a curiosus who boasts of his herculean achievements in the accumulation of sheer fact, was never imitated as the framework for a mediaeval encyclopaedia, though its information was eagerly abstracted and relocated into new structures.

In conclusion, we should see the mediaeval encyclopaedia, in its structure and philosophy, as a devotion, despite the grave effect of the Fall on man's intellectual powers, to a rather ambitious global view of life, and the belief in a comprehensive synthesis.[50] Man was designed for this kind of universal knowledge, and the desire and potential for it are yet alive in him. The pursuit of it is, in Hugh of St. Victor's view, the pursuit of the restoration of God's image in man.[51]

The Middle Ages loved the image of the arbor scientiae, the tree of knowledge, with its clearly defined limbs and interlacing branches. This is perhaps an appropriate image for my own work on the mediaeval encyclopaedia, but applied in a developmental sense. First there is the seed; the science and education of antiquity,[52] plus the hints of the encyclopaedic philosophy perceptible in ancient thought. Then, the tender shoot; the Christians fertilize the ancient plant with their own world-view and interests. They prune from it much that is useless, and graft onto it the third great structural concept, universal history. Next, the struggling sapling; the early Middle Ages attempts, sometimes clumsily, often suggestively, to formulate the philosophy and embody it in the structure. Fourth, the young tree; in the twelfth century, a new vigour and confidence welds old and new materials, especially Arabic science, into a comprehensive and synthetic philosophy. Finally the spreading oak; the thirteenth century witnesses the full union of all the structures with the encyclopaedic philosophy, but soon the leaves will fade and fall, and we must try to understand not only how, but why the great tree of the encyclopaedia eventually perished.

FOOTNOTES

1. S.C. Easton, Roger Bacon and his Search for a Universal Science (New York: Russell and Russell, 1952) p. 170

2. ibid.

3. cf. Plato, Timaeus 29e-30c. Translated by Benjamin Jowett. (London: Sphere Books, 1970), pp. 234-235.

4. Easton, op. cit., p. 178

5. Charles E. Raven, English Naturalists from Neckam to Ray (Cambridge: Cambridge University Press, 1947) p. 2

6. ibid., p. 2

7. Easton, op. cit., p. 172

8. For example, in Dante's Heaven of the Sun, Thomas of Aquinas praises his old enemy, Siger of Brabant, who shares his glory (Paradisio X, 136), and tells the story of the foundation of the Franciscans, rival order of the Dominicans (ibid., 43-115). Thus, in the sight of God, all partial truths are seen to be one Truth.

9. "Even so, the Divine Page, in its literal sense, contains many things which seem both to be opposed to each other and, sometimes, to impart something which smacks of the absurd or the impossible. But the spiritual meaning admits no opposition; in it, many things can be different from one another, but none can be opposed." Hugh of St. Victor, Didascalion. Translated with introduction by Jerome Taylor. (New York: Columbia University Press, 1961) p. 140 cf. Aquinas' "Non sunt adversi sed diversi".

10. Francis MacDonald Cornford, Plato's Cosmology (London: Routledge and Kegan Paul, 1939) p. 28

11. Marcia L. Colish, The Mirror of Language. (New Haven and London: Yale University Press, 1968), pp. 10-11

12. ibid., p. ix

13. Cornford, op. cit., p. 28

14. Revelation 22:13

15. John 1:2

16. Colish, op. cit., pp. 22-25

17. ibid., p. 44

18. Didascalion, op. cit., p. 51

19. ibid., p. 19

20. Vincent of Beauvais, Speculum majus. (Graz: Akademisches Druck Verlag, 1964) vols, Reprint of Douai, 1624 ed. Praefatio, ch. 4

21. C.S. Lewis, The Discarded Image. (Cambridge: Cambridge University Press, 1964) p. 10. cf. Aquinas' "Sapientia est ordinare".

22. Michael Lemoine, "L'oeuvre encyclopédique de Vincent de Beauvais." Cahiers d'histoire mondiale, vol. 9 (1965-66) p. 574

23. ibid., p. 573

24. "Cum proprietatibus rerum sequantur substantias, secundum distinctionem et ordinem substantiarum: erit ordo et distinctio proprietatum de quibus adiutorio divino est praesens opusculum compilatum." Bartholemew the Englishman (Anglicus), De rerum proprietatibus (Frankfurt: Minerva, 1963) Reprint of Frankfurt, 1601 edition. Praefatio, p. 1

25. Paul Abelson, The Seven Liberal Arts. (New York: Teacher's College, Columbia University, 1906) p. 47. The prototype of the vocabularium is probably Sextus Pompeius Festus' De verborum significatione.

26. M. de Boüard, "Encyclopédies médiévales". Revue des questions historiques, vol. 16, Third Series, (1930) p. 269-70

27. T.H. White, translator, The Bestiary. (New York: Putnam, 1960) p. 198

28. Colish, op. cit. p. 4

29. Eva Mathews Sanford, "Famous Latin Encyclopaedias" Classical Journal, vol. 44 (1949) pp. 462-467

30. Maurice de Gandillac, "Encyclopédies pré-médiévales et médiévales' Cahiers d'histoire mondiale, vol. 9 (1965-66) p. 482-518

31. op. cit.

32. ibid., p. 265

33. ibid., p. 264

34. ibid., p. 274

35. Didascalion, op. cit., p. 138

36. de Boüard, "Encyclopédies médiévales", op. cit., p. 272

37. ibid., p. 273

38. ibid., p. 285

39. M. de Boüard, Une nouvelle encyclopédie médiévale: la Compendium Philosophiae. (Paris: de Boccard, 1936)

40. de Boüard, "Encyclopédies médiévales", op. cit., p. 258

41. de Bouard, Compendium, op. cit., p. 100

42. Lewis, op. cit., p. 3

43. ibid., p. 5

44. ibid., p. 11

45. E.M.W. Tillyard, The Elizabethan World Picture. (New York: Random House, n.d.)

46. Dorothy L. Sayers, Introductory Papers on Dante. (London: Methuen, 1954) p. 183

47. An interesting instance of the transferral of the mediaeval mode of thought to a modern scientific setting is C.S. Lewis' use of the heliocentric solar system as the setting for a Christian myth. Like the mediaevals, he interprets the structure of the system as a sacred message. In Lewis' science fiction trilogy (Out of the Silent Planet, Perelandra, That Hideous Strength) the Creator has populated the planets of the "Field of Arbol in the order of their distance from the Sun. Jupiter's life is already extinct, Mars' is drawing to a close, Earth's is in its middle age, but Venus was created only yesterday. Coming into being and passing away are part of His plan. Only the "bent ones" of Earth refuse to recognize this, hating their own lives for being mortal, yet rejecting the life of Eternity.

48. Pierre Grimal, "Encyclopédies antiques". Cahiers d'histoire mondiale, vol. 9 (1965-66) p. 482

49. S. Sambursky, The Physical World of the Greeks. Trans. by Merton Dagut. (London: Routledge and Kegan Paul, 1956.) pp. 11, 26.

50. de Gandillac, op. cit. p. 488-9

51. Didascalion, op. cit. p. 4

52. The educational programme of the ancient world, the enkuklios paideia, in reality gave its name to the encyclopaedia. The latter work was not actually coined until the Renaissance, however, and does not enter the English language until 1531, probably through Elyot's The Governour.

CHAPTER ONE

ROOTS OF ENCYCLOPAEDISM IN ANTIQUITY

The late William Harris Stahl's work on Roman science in general,[1] and Martianus Capella in particular,[2] tends to the conclusion that the mediaeval encyclopaedia is the direct offspring of ancient science in its decadence and senility. Since the major transmitters of the legacy of the ancient world were the literary and scientific handbooks of Chalcidius, Martianus Capella, and Macrobius, he reasons that the traditions of the ancient handbooks and their faults of pedantry, superficiality, and garbled second-hand knowledge is all that the middle ages inherited. Because the early middle ages did not read Plato, Varro, Aristotle, and the Pythagoreans, he concludes that they were totally uninfluenced by these forces. This is, I believe, an error in perspective resulting from Stahl's almost exclusive preoccupation with the content of the works under consideration. He has neglected to see behind the data presented by the handbooks that structure of ideas, preoccupations, unwritten assumptions and theories that is as much a part of ancient science as its actual statements regarding physics, astronomy or biology. Moreover he has forgotten that ever since the Milesian philosophers first set up their *logos* against *mythos*,[3] ancient science was indissolubly linked with ancient philosophy. It is well known how much Christianity absorbed from the philosophy of the Greeks, especially Stoicism and that brave effort to unite the best of the Academy and the Lyceum, Neo-Platonism. Is it not logical that Christians would have seen a significance in, for example, the idea of the music of the spheres, whether expressed by Macrobius or by Pythagoras himself?

Surely the idea of the seven liberal arts is older than Martianus Capella and reached the Christian West through a variety of paths simply because it was such an important concept for antiquity as a whole. In other words, we must search a bit further beyond the handbooks of late antiquity if we wish to understand how the structure and philosophy of mediaeval encyclopaedias were influenced consciously or unconsciously by the Greco-Roman centuries.

A viewpoint and attitude quite different from Stahl's is represented by Sambursky. A reading of his Physical World of the Greeks would lead one to the conclusion that many of the basic ideas which formed the staple of mediaeval encyclopaedic science, though obtained at third and fourth-hand, were derived from some of the most honourable achievements of ancient scientific thought. Sambursky is mercifully immune to that temptation to patronise, refute, or wax indignant about the primitiveness or whatever of the ancient scientific viewpoint, a failing to which Stahl is often susceptible. Instead, Sambursky looks at the broad spectrum of Greco-Roman science in an effort to understand what basic direction of thought a particular theory, however strange and unpalatable to modern minds, may represent. For example, he regards it as a basic axiom of science that a maximum number of phenomena should be explained by a minimum number of hypotheses. The long-lived theory of the four elements propounded by the Milesian philosophers receives his praise for representing, in its simplification and unification, a definite advance in scientific thinking. That such a theory should have survived so long is to be attributed not to ignorance, or even to traditionalism and authority, but to the fact that it is good science. Aristotle, one of the greatest and most original of ancient scientific

minds, not only accepted the four-elements theory, but increased its scientific potential by adding to it the four qualities. As time passed, the signs of the zodiac, the four seasons, the humours of the human body, and the ages of human life were all integrated into this simple and all encompassing theory. In their encyclopaedias, ornamented with diagrams showing the intertwining of all things into this four-fold pattern, mediaeval thinkers showed their inheritance of this oldest of Greek scientific ideas. It appealed to the encyclopaedists for the same reasons that it appealed to the Greeks; it explained the maximum number of phenomena with the minimum number of hypotheses, or, in other words, it was comprehensive and synthetic.

Pierre Grimal sees antiquity as the source for these two basic encyclopaedic ideas. The effort towards synthesis goes all the way back to the pre-Socratics, whose cosmologies, based on a "key" to all natural processes, sought an understanding of the universe through the identification of that single principle upon which all existence rested. Comprehensiveness has an equally long pedigree growing out of the unbounded curiosity of the Ionian philosophers and the desire of Socrates himself to embrace all knowledge.[4] Much of the abiding value of Greek scientific achievement consists of the changes rung on these two complementary notions. Observation and experiment, the accepted basis of modern science, were not central to the ancient scientific experience, though they were certainly practiced to some extent during these centuries. The legacy of Greek science to the middle ages was its concern with the order of the cosmos[5] as a whole, and its unifying principles. To these the Christian age simply added new meanings and sophistications. The ancient and mediaeval scienti-

fic viewpoints are in many ways so closely akin that although the middle ages came long after the end of what is generally deemed the creative period of ancient science, its basic outlook can be most easily compared to one of the earliest known scientific traditions, Pythagoreanism, in that God, the unifying and informing principle of mediaeval natural philosophy is less like the physical component of atom or element than like Pythagorean number, for it is the basis for both the physical and spiritual worlds.

Through this general pattern of synthesis and comprehensiveness, it is possible, before entering into the specific contribution of various schools and individuals, to discern the parallels between the Greek and mediaeval scientific outlooks. To begin with, Greek science gave to its mediaeval heir its basically deductive and apriorist cast. The early natural philosophers

> did not work by summarizing a series of separate results and systematizing them into an abstract conclusion, but went much further, and interpreted each isolated fact from a general conception which gave it position and meaning as part of a whole. 6

Like the mediaeval encyclopaedist, the Greek believed in a science of application, not accumulation. For him, one aimed above all to study things in their totality, in their environment, and with all interconnections with other things fully elucidated. Their prime mode of scientific vision was cosmic, and this cosmos was envisioned as animate, "a living organism, a body that can be understood and comprehended in its entirety." 7 The mediaeval encyclopaedists, though they were somewhat more reticent about characterizing the universe as a living creature, not only retained but insisted upon and expanded the idea of its organic wholeness, and of the interdependence and co-inherence of all its parts through their common

status as the creation of a single intelligent Craftsman.

It is well known that ancient science had very close connections with ancient philosophy, particularly on the theoretical side. Each sect had not only a moral teaching and metaphysical framework, but a cosmology as well -- the Aristotelian division of philosophy into rationalis, moralis and physica. However, from the point of view of the mediaeval encyclopaedia, it might be interesting to investigate the relationship between ancient science and religion. The polytheistic cults seem to have taken little from, and given little to science; it was the doctrinal religions, as it were, that experienced the greatest interaction with natural philosophy. Empedocles, for example, expressed his cosmological doctrines through the Orphic religiosity of love and strife. To embrace Pythagoras' philosophy was to undergo a genuine religious initiation; in demanding not only intellectual but spiritual assent to the mathematical foundations of the universe, and the independent existence of the human soul.[8] Sambursky sees Epicurean atheism as directly responsible for that philosophy's scientific sterility. Stoicism, on the other hand, by identifying the cosmic processes with Providence, clarified the problem of cause and effect by distinguishing between preliminary (external) and determining (internal) causes.[9] For Neo-Platonists, the everlasting descent from, and return to the One was at once a philosophical proposition, a theory of physics, and a religious dogma. Christianity was by no means unique in fusing religious teaching with a doctrine concerning the nature of the world. The major difference is that the above examples from pagan antiquity illustrate the fusion of theology and science in various philosophies. Christianity is first of all religion; hence it does not treat even its own science on equal terms, nor can its decisions about science be reached

outside the religious framework.

A basic characteristic of ancient science which was inherited and fully endorsed by the middle ages was its conscious, often jealously-guarded divorce from technology. The ancient distinctions of theory and practice, the science of music versus the art of playing an instrument, arithmetic versus computation, geometry versus architecture or surveying, remained valid in later centuries. For example, the science of music was a sophisticated discipline, the subject of much mathematical investigation and subtle theorizing, while in schools, playing the lyre was taught strictly by imitation and memory. To the Greeks, a science was the object of intellectual activity, and was lauded by philosophers as a preparation for the reception of divine wisdom. The art or craft was taught empirically, and as mechanica (a category to which even medicine was relegated), of use simply in relieving the weaknesses of mortal life. This tendency was particularly marked in the works of the later Stoics, such as Seneca, in whose moral ambiance Latin Christianity grew up. This attitude was to a certain extent a defiance of their own roots, for Zeno in his De natura deorum describes the creator of the world, in Platonic fashion as an artificer of nature. However, as a rule, tekhne and episteme scarcely missed each other's company, and if it is true that they failed to fertilize each other, it is also true that science enjoyed that fruitful interchange of ideas and discoveries with philosophy and theology that is now the product of the union of science and technology. This accounts to a large extent for the theoretical, bookish, authoritative, and, as it were, contemplative character of both ancient and mediaeval science, a character which the encyclopaedias clearly reflect, and which in no way implies their degradation of ancient ideals. As Charles Singer said,

"Science was a way of looking at the world rather than a way of dealing with the world."[10]

Simply to explain this away as mere aristocratic prejudice is to ignore the rich philosophical implications of this division. We, who live in an age of machines, regard the regularity of the celestial phenomena as proof of the soullessness of the heavens. The machine produces the mathematically perfect, the precisely identical. The mark of intelligence is, on the other hand, the original, the inimitable, the eccentric. We recognize, and often prize a hand-made article because of its flaws or irregularities. For men of antiquity and the Christian centuries, who lived in an age of handcraft, to produce something perfectly regular, or indistinguishably like another thing, was the mark of an almost preternaturally skilled craftsman, while the inimitable and eccentric could be bought on any street corner from a man who, even if highly trained, simply produced them according to fancy, fashion, and rule of thumb. So when they looked at the heavens, thinking people would regard their unvaryingly regular movements as a certain indicator of the supreme intelligence, either of the designer, or of the inhabitants thereof.[11] From this point of view, tekhne would doubtless feel that there was little of practical use in episteme, while episteme would feel that imparting its knowledge to tekhne was not only a waste of time, but more than faintly sacrilegious, rather like trying to teach someone to walk on water.

There is one final characteristic of ancient science as a whole which influenced the mediaeval encyclopaedia, and this was the principle of "saving the appearances". This means accounting for the visible phenomena in the most simple and complete manner. To this definition may also be added "that is in accord with, or at least not invalidating, the axioms of one's philosophy", though as far as

antiquity is concerned, this is not absolutely necessary. That it "saved the appearances" was the hallmark of a good scientific theory, not that it possessed some kind of absolute truth, and it is perhaps the dogmatism of the Stoic and Epicurean cosmologies that make them of such little import to the history of science. Plato said that this kind of absolute knowledge was impossible anyway, since the experience of the senses constituted "opinion", of which one interpretation was as good as the next, provided it could stand the test of reason. This gave rise to the scientific scepticism of the Old Academy.

"Saving the appearances" applies, above all to cosmography and astronomy. In antiquity, theoretical astronomy was largely concerned with constructing a model along mathematical lines, while practical astronomy was preoccupied with the accurate prediction of the future position of the heavens.[12] For either purpose, doctrinaire statements about celestial organization were by no means necessary. The highest aim of ancient astronomy was Ptolemy's aim, that is, to give a geometrical account, not of what the heavens are actually like, but of what they look like.[13] If the finite, geocentric universe finally carried the day, it was largely through respect for the authority of Aristotle.

Revelation meant that Christians had to account for the words of the Bible as well as the appearances of the skies. Nonetheless, they accepted this ancient principle[14] for if God had intended that man should "read" the celestial phenomena, what they looked like to man was obviously of first importance. In the thirteenth century, "saving the appearances" was to become an important encyclopaedic idea. In the mean time, it would affect encyclopaedias largely by encouraging a large variety of cosmologies, which their eclecticism would reflect.

Of all the schools of ancient thought which influenced the outlook of the mediaeval encyclopaedist, the Pythagoreans are first both in time and in importance. Their doctrine that everything found its being in number had a truly incalculable influence on the mind of the Christian West. Their arithmology provided not only a parallel in nature to the number symbolism of the Scriptures, but a principle of encyclopaedic knowledge actually endorsed by the Bible. Moreover, their teaching fostered two ideas, whose potential for effecting a comprehensive synthesis of many kinds of knowledge won them a place on the pages of virtually every mediaeval encyclopaedia: the notion of the music of the spheres and the idea of the microcosm. The scope of Pythagorean researches also defined the mathematical sciences of antiquity; arithmetic, geometry, music, and astronomy. These later became the quadrivium of ancient and mediaeval schoolrooms, and a principle of encyclopaedic classification.

The clue to Pythagorean number doctrine is that it is envisioned in geometrical terms. What was significant about numbers was the way in which their modifications produced visible patterns.[15] The number one represented the indivisible point; two, the line. Three embodied the first plane figure, the triangle, which Plato held to be the basic unit of all surfaces. Four represented the solid tetrahedron. Thus all physical objects were numbers, while the sum of these four basic numbers was the sacred decad, symbol of the universe.

This unity between nature and number was one of the richest and most suggestive ideas in the history of western thought. It

captivated antiquity and the middle ages alike. Combined with the Psalmist's declaration that God laid out the world according to number, measure and weight, it found a sure place in Christian thought on the Creation. In many mediaeval manuscripts, the Creator is depicted as hovering over the still formless world, a pair of geometer's compasses in hand. The image itself is from the Timaeus; the idea it represents is both far older and a far more common feature of ancient thought.

> The arithmologists believed that God himself thought of his creation, indeed thought it up, arithmetically, and they were more theologically motivated to share the thought of God, than to make philosophical sense out of everyday experience.[16]

Indeed the Pythagoreans and their followers felt that their speculations on number would redound to the good of their souls, in much the same way as Hugh of St. Victor saw the study of the artes as a road to salvation, or Vincent of Beauvais believed that the contemplation of the totality of nature might prove the initiation into a mystical vision of God.[17]

For the Pythagoreans, number existed, not only in isolation, but in relation to other numbers, producing proportion on a visual level, and harmony on an aural level. Sambursky sees the idea of harmony as encyclopaedic, in the mediaeval sense, for it effects a synthesis on a universal scale of substance and form.[18] The immateriality of harmony and number meant that these concepts quickly took on religious and philosophical connotations. It is for this reason that the fate of the quadrivium in antiquity is of vital importance to our topic; it is almost the history of the encyclopaedic idea itself.

By combining the idea of the mathematical basis of the universe with the notion of the musical value of number, the Pythagoreans concluded that the whole organic unity of the cosmos was in itself a kind of harmony, what Boethius termed musica mundana. In particular, they felt that the spatial intervals between the spheres of the seven planets and that of the fixed stars must correspond to the harmonic ratios of the octave. This idea of the music of the spheres, with all its overtones of concord, beauty and worship, was transmitted to the middle ages by the neo-Platonist Macrobius,[19] and its subsequent influence upon the religious, scientific and literary mind of the west can scarcely be measured. Plato's Timaeus, perhaps the middle ages' most treasured legacy from antiquity, stands in the true Pythagorean tradition. It is concerned with number in a geometrical and musical context; that is, in finding some rational proportion which would hold the world together in harmony and prevent its dissolution through discord.[20] This identification of proportion with physical cohesion is a major factor in the mediaeval appreciation of a symmetrical cosmos. Its aesthetic beauty was aural as well as visual, and called up images of supernal choirs whose praise of the Creator was echoed by the Church on earth. It is for this reason that mediaeval composers paid such close attention to Pythagorean-Platonic arithmology. Their concern was shared by the architects of the Gothic cathedral,[21] who aimed at building a diagram of the cosmos, to be filled with that cosmic music spoken of by the ancients.

Apart from its own merits, this idea of celestial harmony meant that the Pythagoreans were the first thinkers to construct

a theoretical model for the cosmos,[22] probably as a paedagogical device to explain the music of the spheres. This was a radical departure from the Babylonian practice of simple observation, tabulation, and prediction. This effort to produce a model, through which both the physical structure of the skies, and the spiritual value of that structure, could be expressed, was a major preoccupation of the ancient and mediaeval worlds, and did much to counterbalance the danger of relativism implied in "saving the appearances". The mediaeval encyclopaedias, with their characteristic titles of Imago and Speculum, were cast in this role of a model whose very structure would reflect both physical and spiritual truth concerning the universe. Lest this lesson be lost on their readers, the encyclopaedists filled the pages of their works with symbolic diagrams and symbolic pictures illustrating the proportion and symmetry of the world.

Because all things were made according to number, "everything becomes a microcosmos insofar as the same numerical principle underlies the particular and its relations on one hand and the 'universe' or the heavens on the other."[23] Though everything stood in the relationship of microcosm to the macrocosm, it was through the analogy of human and divine music that this came to be applied specifically to the relationship between man and the cosmos.[24] As Plato phrased it, there was a basic identity between the World-Soul, created according to number and the human soul, "the harmony of the body".[25]

The notion of man as microcosm, as hinge or mid-point of a chain of interlocking correspondences throughout the universe is

truly, as Allers said, a "symptom" of a certain type of historical mentality.[26] It is a mentality whose central preoccupation is structure and order, defining the levels through which meaning operates. Things (and later, for Christians, events) have a transcending significance which can be understood through their position in the order of being (or time).[27] Without order, the world is silent; with a false order, it will only speak in nonsense, or worse still, perversions. Ulysses' "degree" speech in Shakespeare's Troilus and Cressida is more than a justification of hierarchical society. It is a warning to the age of Bruno, Tycho Brahe and Galileo that if they "untune that string", upsetting the order of nature, neither it nor its corresponding orders will "speak" to men, and the musica mundana will be replaced by senseless discord. Shakespeare speaks for the ancient and mediaeval world, for whom that Pythagorean mixture of hierarchy and harmony was a universal index, synthetic, comprehensive, and hence encyclopaedic.

Reserving our discussion of Platonic science, in order to deal with it in the context of that Hellenistic handbook science which so radically shaped the mediaeval concept of the Timaeus, we must now attempt the ambitious task of analyzing the effect of Aristotle upon the structure and philosophy of the mediaeval encyclopaedia. It is tempting to omit the Stagirite altogether, for his scientific works were unknown in the West before the twelfth century, by which time the basic forms and thought patterns of the encyclopaedia had long been established. Thereafter, if one excepts the Compendium philosophiae, his influence

was largely felt on their content. He nevertheless occupies an important place in the history of the encyclopaedia's origins through his effect on ancient civilization as a whole.

The evocative and fruitful idea which Aristotle bequeathed, through the works of others, to the mediaeval encyclopaedists was that of teleology. If the harmony of Plato's universe reflected the nature of its creator, that of Aristotle illustrated the creator's purpose, which was perfection.[28] In the long run, this is also the message of the Timaeus; indeed, Sambursky sees little ground for conflict, properly speaking, between Plato and Aristotle on the subject of natural science.[29] Neither did the mediaeval encyclopaedist. For example, a mediaeval scholar like Hermann of Carinthia felt no embarrassment in combining a fervent adherence to Platonism with the keenest interest in the Aristotelian science filtering in through Spain. Haskins calls Hermann's De essentiis "a curious mixture of the Platonism of Chartres, the Aristotelian physics, and the neo-Platonism of Hermes Trismegistus".[30] Aristotle felt he could trace the creator's purpose through an inductive study of the world as a whole, just as the function of a building is discernible through the details of its various parts.[31] This was the philosophical mainspring of Aristotle's great scientific achievement of observation, classification and causal connection of all things, and was passed on to Christianity through the eclecticism and neo-Platonism of late antiquity. Within the doctrine of Creation, it was possible to join the deductive structure of Plato's world, centred as it was on the source of all things, with the inductive world of Aristotle, oriented towards their ends.[32]

Aristotle's passion for system[33] also left a profound, though, ironically, somewhat unfortunate legacy to the encyclopaedists. Though Aristotle was scientifically unmediaeval in that he offered no "key" to the physical world, he did set the pace for mediaeval science by his propensity for fitting all his findings into fixed patterns from which he constructed an absolute general theory.[34] Aristotle's dogmatism and instinct for classification at all costs, filtering through that awed respect with which his scientific views were treated in late antiquity, led to a certain loss of flexibility in ancient science, from which there was no corrective in experimentation.

Eudoxus' spherical model of the heavens was taken over by Aristotle, who transformed this ad hoc aid for explaining the celestial phenomena into a model of the cosmos far more literal and concrete than ever the Pythagoreans dared claim. This gave to this particular model, as it were, a life of its own, which to a perceptible extent prevented the abandonment of old and the creating of new models as new knowledge appeared. In the early middle ages, this was partially mitigated by the eclecticism of the heritage of late antiquity, but after the re-discovery of Aristotelian science in the eleventh through thirteenth centuries, one senses a certain tension between the desire to save the appearances and the desire to save the model.[35]

For the most part, however, the middle ages would naturally incline to accepting Aristotle's judgements. Pre-Aristotelian thinkers had widely differed concerning the finiteness of the cosmos, but Christians definitely preferred the Aristotelian

solution, implying as it did a contrast between a contingent universe and its infinite Creator. Furthermore, according to Aristotelian physics, the circularity of the heavens (to which the Timaeus, as we shall see, attached such philosophical importance) leads logically to the finiteness of the cosmos, since to admit otherwise would imply the existence of Aristotle's major taboo, an infinite velocity. In order to be complete, the celestial circle would have to be traversed; in other words, an infinite distance would have to be covered in a finite time.

Aristotle's human sciences never found their way into the encyclopaedias, either by direct citation or osmosis through other ancient writers, until rather late, probably because he never integrated them into those natural or rational sciences upon which his fame was so largely based. The exception to this is his doctrine of the microcosm, but in a way, it is the exception that proves the rule, for despite its wide influence, it was not particularly important to Aristotle. Certainly in his hands the theory is treated at once in a more abstract and a less sustained way than in Plato's.[36] The Aristotelian idea of the vegetative, animal and rational souls, and their union in man, was a fundamental commonplace of microcosmic theories in the middle ages. Though this idea had little philosophical significance for the Stagirite, being for him less a statement about man himself than about his position in the order of being,[37] it assumed greater importance for a later age which saw the order of being as a statement about being itself. It was the Aristotelian theory of the microcosm which, through the authority of Gregory the

Great, became one of the most frequently repeated microcosmic formulae of the middle ages.

> Omnis enim creaturae aliquid habet homo. Homini namque commune esse cum lapidibus, vivere cum arboribus, sentire cum animalibus, intelligere cum angelis.[38]

The career of Aristotle marks the end of the Hellenic age of science. As we pass the frontier into the Hellenistic age, we are moving into a world which, scientifically speaking, is beginning to show the definite outlines of the middle ages. In the wake of Alexander's conquests, Greek culture was spread over a vast area whose habits of thought were not Greek. In an effort to define the dividing line between the Hellenes and the <u>barbaroi</u>, the Greeks consciously looked back, for the first time, on their own cultural achievements. Encouraged by the patronage of Alexander's successors, the Hellenistic age invented the scholar, glossator, commentator, and codifier, the library, the graduate student, and of course, the popularization. This was particularly noticeable in the realm of science, where an ever-widening rift began to appear between original, creative research (for which this age was unexcelled by any other period in antiquity) and the popular level of handbooks and commentaries.[39] The burgeoning "knowledge explosion" tended to leave the handbooks behind. Combined with the fact that the handbooks were frequently a commentary on scientific allusions in the old poets, this meant that the popularizations preferred to recount the broadly accepted cosmology and scientific viewpoint, rather than the more original and up-to-date ideas of, say, Aristarchos of Samos.

Gandillac sees the avoidance of scientific sources and the use of compendia by early mediaeval encyclopaedias as a Christian attempt to disinfect classical learning of its fatal charm and dangerous doctrines.[40] I would tend to agree with Stahl that this simply shows how deeply Christianity, particularly in these early centuries, was embedded in the intellectual habits of late antiquity, and especially in its educational system, which will shortly be discussed at greater length. These intellectual habits were forged by the Hellenistic curiosi, scientific popularizers and literary savants who churned out instant erudition. It was reinforced by the ambivalent attitude of the Romans, who though contemptuous of theory, were eager to appropriate the learning of Greece in a simple and, above all, practical form. It was rendered permanent by the triumph of rhetoric, and the reduction of all other branches of learning to the minimum necessary for an orator. When St. Augustine renounced rhetoric in favour of philosophy and, later, doctrina christiana, he tried to fill in those gaps in his scientific education left by his schooling. However, its influence was so deep that he was ever dependent on compendia.[41] Thus, both the pagan and the Christian of late antiquity supported the supreme position of the handbook in the world of secular learning.

By far the most important and influential of ancient handbooks were the commentaries on the Timaeus of Plato, the most popular of his dialogues in antiquity. The effect of these handbooks was profound. For example, in Hellenistic and Roman times, the average educated man's knowledge of arithmetic came

from Theon of Smyrna's Mathematical Knowledge Useful to the Understanding of Plato. Indeed, it is Stahl's opinion that since so much of the astronomical material in late Latin encyclopaedic works is attributed to Posidonius, it must come from a lost Timaeus commentary by him.[42]

> Because the correspondances in handbooks are most abundant in fields covered by Timaeus commentators, it has generally been acknowledged that the dominant tradition in ancient popular science is represented by a nine-hundred year line of Timaeus commentaries, beginning shortly after Plato's death.[43]

The inherent qualities of the Timaeus, as well as the number and influence of its commentaries, make an understanding of it vital to the study of the encyclopaedia. It is easy to justify its popularity in the middle ages. An exposition of the natural world presented as an account of its creation was bound to find favour with those who believed that the cosmos' primal mode of existence was as a creature. Christian enthusiasm was often so great that they claimed, quite mistakenly, that the Demiurge was identical with the Creator. This identification was encouraged by Plato's declaration that it was the spontaneous outpouring of the Demiurge's goodness which prompted him to fashion the world as an image.

As Olerud has pointed out, much of what Plato says about the universe is not original, but rather "la transposition platonicienne des cosmogonies antiques".[44] It was through the Timaeus (or rather its first fifty-three chapters, all the middle ages possessed) that many of those vital concepts of Greek science discussed above were transmitted to the mediaeval encyclopaedists, arranged in a context which mediaeval writers

would appreciate. It is no accident that the twelfth century nurtured at once a revival in interest in science, a revival of Platonism, and the production of the first great encyclopaedias of the high middle ages. The Timaeus influenced encyclopaedic structure and philosophy through imitation of its own framework, as well as through the ideas it conveyed. In consciously selecting and arranging his data in strict subordination to his exposition of the world's status as icon of the goodness and power of its Artificer, Plato virtually created a paradigm of the mediaeval Christian encyclopaedia.

Alerting the reader to the provisional nature of "saving the appearances",[45] Plato begins to outline how the Craftsman's goodness freely proceeding from him brought order out of chaos, and how his model was the blessed realm of the Ideas.[46] Of necessity, the world would be constructed of the four elements,[47] and in a spherical shape, for this comprehends all other shapes.[48] Then the Demiurge made the World-Soul out of Being, Sameness and Difference, and disposed its dimensions according to number and proportion.[49] From this World-Soul material, he fashioned the heavenly spheres according to a fixed ratio,[50] and by setting the planets in them, created time, "the moving image of eternity", just as number is the image of the unity of the realm of Ideas.[51] To inhabit the element of fire, he made the race of celestial gods, to whom the Demiurge assigned the task of fashioning animals appropriate to the other three elements, reserving for himself the creation of man. Human nature is made from the same stuff as the World-Soul, only diluted, and contains the same

"circles" of the Same and the Different.[52] In its descent to earth, the soul's powers of proportion and reason are disordered, though not destroyed, by sensation. However, education can correct this[53] and man carries an everlasting reminder of his celestial origin and destiny in the spherical form of his head.[54] Close to the end of the mediaeval Timaeus, Plato states the lesson for which his creation story, and its parallel in Genesis, was such an apt illustration: "the lover of intellect and knowledge ought to explore the causes of intelligent nature first of all, and secondly, of those things which, being moved by others, are compelled to move others."[55]

Plato's warning about saving the appearances is closely linked to his doctrine of creation. As the physical world is contingent, what we think of it constitutes, not knowledge (episteme), but opinion (doxe). Though no theory concerning it will be absolutely correct, any theory is plausible, provided that it does not violate the one necessary belief: "that the visible world exhibited the working of a divine intelligence aiming at what is good." Furthermore, "he held it to be of utmost importance for the conduct of human life that this should be believed".[56] In placing the imagehood of the world as the unmoving centre of that bewildering variety of cosmological ideas put forward by the ancients, Plato sanctioned their free use within the framework of this kind of creation. He guaranteed the innocence of that pluralism of scientific notions displayed by the mediaeval encyclopaedias, particularly before the thirteenth century. After that, Aristotle's authority dominated,

but as C.S. Lewis suggests, perhaps Galileo's sin was not an offence so much against Aristotle as against Plato. Galileo differed from all his predecessors, even Copernicus, by claiming that his doxe was actually episteme. "The real revolution consisted not in a new theory of the heavens, but in 'a new theory of the nature of theory'".[57]

The Timaeus also set the tone for the mediaeval encyclopaedia in being, above all else, an exposition in philosophical and theological terms of the origin and ultimate meaning of the world.

> It should not be forgotten that the Timaeus is a myth, not a treatise on astronomy. The surprising thing is that Plato should have found room for so many details in his broad picture of rational design in the cosmos, not that he should have simplified by omitting the subtleties which would have contributed nothing to his main purpose, and might be superseded at any time, as indeed they were very soon afterwards.[58]

In short, Plato subordinated content to structure and philosophy, a modus agendi followed by Christians, perhaps with an even greater imperative, in their version of the Timaeus commentary, the Hexaemeron. The encyclopaedia, with its commitment to comprehensiveness, was more dedicated to detail than the Platonic dialogue. Nevertheless, we must not be disappointed if the account of things is often sketchy. Not only is it difficult for a non-specialist, possibly a busy bishop or monk, to understand or paraphrase in the greatest detail much difficult scientific matter. More important, this was not his aim. Vincent of Beauvais apologises for digressing on so many flora and fauna not found in Holy Writ,[59] and describes his futile efforts to keep his volumes to a manageable size.[60] Finally, he says, he divided the work into three parts in order that the

structure and aim of the work might still be clear despite its magnitude. In this overriding concern with argument and framework, Vincent and the other encyclopaedists were following the early Hexaemeron commentators, who in turn had their eye on the Timaeus. Furthermore, the mediaeval encyclopaedia, like the Timaeus was conceived as a preface.[61] In Plato's case, cosmology was a prologue to his discussion of the ideal society; for mediaeval thinkers, it prepared one for the study of theology, or for contemplation.

The chain of created being described in the Timaeus is based on a series of interlocking resemblances to the cosmic whole.[62] This in turn is an icon of the Ideas. The concept of "nesting" correspondences, the repetition of a single principle on a variety of levels, was to become a basic doctrine of the encyclopaedists and a cultural commonplace for the middle ages as a whole. For Plato, it was the circularity of the cosmos that held these correspondences together. This figure "containing all others" mediated their multiplicity into a synthetic and comprehensive unity. Plato emphasizes this by ordering the biological life of the cosmos according to its four elements. This transformation of circularity into an encyclopaedic principle, together with its endorsement by Aristotelian astrophysics, helped give the spherical universe its tremendous prestige in the middle ages.[63]

The most important correspondence is, of course, that of man and the cosmos. From the cosmocentric angle, the processes of exchange and distribution in the universe are connected with the processes of digestion and respiration in man.[64] From an

anthropocentric perspective, man's head reproduces the all-inclusive sphericity of the cosmos, hinting at humanity's inherent, one might almost say biological, capacity for universal understanding. Plato's picture of the minor mundus was to prove one of the most influential aspects of his philosophy. "Microcosmism appears, in fact, historically considered, mostly as a part of a more or less Platonic or, especially, neo-Platonic philosophy."[65] The contribution of neo-Platonism was a confirmation and elaboration of the alliance between the ideas of microcosm and hierarchy through its doctrine of emanation.[66] It is no accident that the fifth, twelfth, and fifteenth centuries were great eras of both neo-Platonism and microcosmic speculation.

But the aspect of Plato's microcosmism which most forcefully suggests later Christian developments is his injection of the idea of salvation. For Plato, the aim of the soul's life on earth is, through education, to restore its true correspondence to the World-Soul, to go back to its pristine state. In preparation for its return to the celestial world after death, man's intelligence should contemplate the regularity of the world. It should seek a vision of the unblurred distinction between Sameness and Difference, and imitate it.[67] The quality of Plato's philosophy which emerges most strongly in the Timaeus is that which "projects human qualities into the cosmos only to have the cosmic forces guide things human."[68] Within himself, man could find the secrets of the cosmos, and in the cosmos, the meaning of his own soul. Man's status as microcosm is the

justification of the Timaeus' very existence, the true reason for studying the world of nature. Contemplation, conversion and salvation were also the raisons d'être of the mediaeval encyclopaedias.

The influence of the Timaeus on the middle ages is due to its synthetic combination of a number of different strains of ancient thought. By the mediaeval definition, it is encyclopaedic in spirit, and, to a large extent, in form, fusing religious, scientific and psychological notions. The fascination that this held for the ancients themselves indicates that even in the Hellenistic age, a cradle was being prepared for the mind of the Christian West.

Characteristically, the Timaeus found its way into the middle ages in the form of a handbook; Chalcidius' incomplete translation and commentary. Chalcidius offered elucidations of obscure passages and supplementary data. He also honoured Plato's principle of "saving the appearances" by providing several explanations of epicycles, but choosing none. They were all equally valid to him, in that they accounted for the phenomena without threatening the philosophical framework of the Timaeus.[69]

It is ironic, but possibly true, that it was less what Chalcidius did than what he did not do that made the Timaeus such a success in the middle ages. The point where his translation and commentary break off is precisely the point where the dialogue begins to show serious resistance to a possible Christian interpretation. Shortly before Chapter 53, Plato declares his intention to retell the whole creation story, this

time not from the point of view of the Demiurge's success, but from the perspective of his failure to completely coerce Necessity to his will, to make a perfect image out of this intractable medium. It could well be that Chalcidius died or gave up the project at this point. But if he were a Jew or a Christian, who believed in creation ex nihilo, and that failure and evil are part of the world not because of the Creator's impotence but because of man's disobedience, he might have deliberately stopped there.

It was Greek science in its Hellenistic form that entered the Latin-speaking West, but it did not come alone. Its inseparable companion was the Greek philosophy of education. To understand that world of Roman culture from which the Latin encyclopaedists emerged, it is necessary to retrace our steps, and recount the ancient history of that second encyclopaedic form, the enkuklios paideia.

Much has been written, and with great justice, of the uniqueness of the Greek ideal of education. It was directed towards a humanistic ideal whose very essence was synthesis. Education was for the whole man, body and spirit, the artist, warrior and sage, "for man included all this and any kind of choosing meant self-mutilation".[70] It meant the process of educating man "into his true form, the real and genuine human nature".[71] It is not often realized how much the middle ages inherited of this ideal. In the Didascalion, Hugh of St. Victor's picture of the "real and genuine human nature" is, of course, vastly different from the Greek notion. Hugh's ideal of

education, though synthetic, is not complete unto itself. It will be transcended in time and completed, as it were, from outside. The important thing, however, is that Hugh considered education a necessity in man's progress towards becoming fully man. He ascribed to it a transforming power that is thoroughly Greek.

The early Greek educational ideal was an aristocratic one, a training in wisdom. This wisdom is very close to the wisdom of the sapiential books of the Bible, consisting of a basic world-view, a moral code, and an ideal of savoir-faire.[72] The basic intellectual framework was the study of Homer, more as a sourcebook for an ethical ideal than as a work of aesthetic value.[73] Its final product was the nobly-born hero.

With the rise of the polis as an ideal in the fifth century B.C., a new educational goal emerged, particularly in Athens.[74] Instead of producing a gentleman, whose life revolved around sports and polite society, the sophists were concerned with developing a citizen whose education would fit him for politics. In place of the time-honoured balance between physical and mental training, the sophist education was based entirely on the intellect.[75] It was from this basis that the sophists were the first to recognize the educational value of the quadrivium,[76] "the first recognition of the value of a purely theoretical discipline in the cultivation of the intellect."[77] Science formed the substantive element, literature and eristic the formal element of the sophist programme of education. This was the scheme of the liberal arts[78] whose canon, with its divisions

into form and substance, was a precious heritage to the middle ages. It was by reinterpreting and filling out the categories of the sophists' skeletal framework that mediaeval thinkers transformed it into an encyclopaedia.

However, the sophist programme was not encyclopaedia. They called the liberal arts enkuklios paideia. When dealing with antiquity, it is better to translate this as "general education" rather than "universal education".[79] It was the culture that every citizen should possess. It made him fully human, and thus served as a propaedeutic to any career he should care to undertake, orator or philosopher, lawyer or physician.

This constitutes, as it were, the explicit contribution of the sophists to the mediaeval encyclopaedia. Yet so profound was their influence on ancient thought that this is scarcely a sufficient description of their legacy. To begin with, by integrating mathematical sciences into the "general education", the sophists created a split between science-as-science and science-as-paedagogy.[80] The latter tended to become more contracted and elementary, thus laying the basis and creating the demand for the handbook science of the Hellenistic age. The sophist outlook emphasized that one should study not to become expert but to become educated, thus setting up "a fundamental antinomy between scientific research and education".[81] By hedging the study of the quadrivium about with qualifications, the sophists shifted the emphasis of the programme towards its formal side. This caution in the face of content became normative for the rest of antiquity, whose education remained

basically literary. This attitude of suspicion was plain in St. Augustine, and though the suspicion tended to fade as the middle ages progressed, its influence can be felt in the oft-noted disproportion between the trivium and quadrivium sections of mediaeval liberal arts encyclopaedias.[82]

In their day, the sophists effected a lasting revolution on the way literature was handled as the basic material of education. This is a vast, complex topic, but if we limit ourselves to tracing those influences directly affecting the encyclopaedia, one clear thread definitely emerges. The sophists were at one with Greek tradition as a whole in believing that the poets could instruct as well as delight, but their concept of instruction was intellectual rather than moral. Where the old aristocratic culture saw Homer as a code book of ethics and etiquette, the sophists saw him as a mine of practical, even scientific information.[83] This fusion of science and literature is a result of the incapability of the enkuklios paideia to come to grips with the quadrivium, and the reduction of the scientific part of the programme to what one picked up from, it is sometimes tempting to say, forced out of the poets. This was to have far-reaching results. It raised the poet to the status of a universal genius, endowed by the muses with visionary powers which disclosed the secrets of the universe. An index of the extent of this belief is the fact that as a scientist, Eratosthenes was more famous in his own time for his application of mathematical geography to the interpretation of Homer and Plato than for his original work.[84] Who can say how much the Christian technique

of exegesis is indebted to the ancient scholia on the poets, which painstakingly rooted out of every metaphor some scientific or philosophical truth? There is a very close parallel between the handbooks that grew up around this kind of literary study and the Christian encyclopaedia envisioned by St. Augustine in De doctrina christiana in which every river, animal, flower and stone found in the Bible would be defined and explained, so that the full riches of Scripture might be unfolded.

The sophist ideal was a relativistic humanism, and their educated man, like Cicero's orator, was supposed to be able to argue on either side of any question. This claim to a universal competence carried in its wake polymathesis, the acquisition of vast quantities of facts through a curiosity unchecked by a philosophical framework.[85] This curiositas, serving oratory and limited to the competence afforded by a sketchy and non-scientific education, resulted in a deplorable taste for mirabilia. Research into mediaeval literature for over a century has demonstrated how much of the data of mediaeval "fables" are the legacy of antiquity. "The fantasticalness of mediaeval science is due to the 'clear light of Hellas' as well as to the gloom of the 'dark ages'".[86]

The literary education of antiquity managed to edge the quadrivium out of the programme in practice, if not in theory. Handbook science reflects this, for it is directed at the average product of the Hellenistic schools. Theon of Smyrna's extremely popular manual indicates that theoretical mathematics of even the most elementary sort was not part of most people's education,[87]

while Arator's Phaenomena was a widely-used school text on astronomy because of its literary value.[88] It was certainly not written by a trained astronomer and was consulted largely for its mythological information.[89] Nevertheless, we must not judge Arator too harshly, for it was thanks to his literary virtues that astronomy had any place in the curriculum at all. Science embedded in literature was becoming the norm. Its fragmentary and elementary quality, and its subordination to literary values were to shape both the content and position of the quadrivium within the mediaeval liberal arts encyclopaedia.

The direction that ancient education was taking is symbolized by the opposition of Isocrates the rhetorician and Plato the philosopher. The positions taken up by these two men and their historical results illustrate how the enkuklios paideia was to change from an educational to a philosophical ideal. For Plato, the aim of all instruction is the apprehension of truth. Hence he felt that the rigour and precision of the mathematical sciences gave them a paedagogical superiority over the poets. Isocrates' supreme value was the word, foundation of the polis and its culture. He subordinated the quadrivium and philosophy to the needs of the primary human art of communication.[90] From then on, orator and philosopher became two opposing vocations, almost two separate views of man, in the eyes of the ancient world. Their division was also the division of the liberal arts.

Historically speaking, Isocrates won, and ancient education remained to the end fundamentally rhetorical. Yet it is important to take Plato's educational theories into account. Through

them, we can understand how the Platonism of Cicero and Apuleius inspired them to combine the roles of orator and philosopher, and how the neo-Platonic ambiance surrounding early Christianity championed the whole programme of the artes and encouraged its closer integration with philosophy itself.

Plato saw the quadrivium as an advanced study whose purpose was the development of abstract thought and a priori reasoning. At first sight, this would seem to be a formal and utilitarian ethos worthy of the orators. What about the apprehending of real knowledge (episteme)? The answer lies in Plato's idealism, and in his firm comprehension of the principles of Greek science. These lead him to define episteme, not as the acquisition of fact, but as the development of the scientific mind. Application, not accumulation, was his rule. What the orator wanted out of the quadrivium was fact; what the philosopher desired was a faculty, "by developing a wider viewpoint, by coordinating and combining... to detect the unity from behind their mutual relationships, the nature of the fundamental reality from which they all derived."[91]

In short, both rhetoric and philosophy saw the enkuklios paedeia as a propaedeutic, but where the rhetoricians saw the artes as useful, the philosophers held them to be necessary. Oratory saw the artes as an external preparation, providing technical access to a wisdom derived from other sources. Philosophy considered the artes "as preparatory in the sense of contributing substantially to the content of that wisdom while depending on it for the determination of their end or principle of unity".[92] This difference of opinion would survive

both ancient rhetoric and ancient philosophy; indeed, it would last as long as the artes themselves. Nonetheless, it was the philosophers' outlook which was the most encyclopaedic. Hence it was philosophy that came to defend the unity and value of the liberal arts. The domination of philosophy by ethics did not change this, for philosophers recalled that Plato claimed that the mathematical sciences produced a harmonious soul which delighted in justice.[93]

When Rome conquered the Greek world politically, and was conquered by it culturally, the many rifts in the scientific and educational ideals of Hellenism had produced a crisis which would eventually prove fatal. Paradoxically, the more Greek civilization expanded and progressed, the less it became possible to achieve the educational aims so closely tied to the values and products of that culture. The two most characteristic elements of Greek schooling, music and gymnastics, were gradually being eliminated from the programme, due to the increasing complexity and virtuosity of Hellenistic music, and the growing dominance of professional athletes. In striving for excellence, these arts reduced the educated amateur to a mere spectator. Ominously, this was also happening to rhetoric, the centre of Hellenistic education. Encumbered with theory and rules, it was fast becoming a post-graduate study for specially gifted professionals.

> Hellenistic man was already beginning to be torn between that aspiration towards totality which we with our bad Greek call the encyclopaedic tendency, and the need, no less essential to humanism, to preserve culture as something human, within the limits of some sort of personalism.[94]

It is within the context of this crisis that the work of Cicero is important for this study, for he sought to repair the division of humanism and encyclopaedism, and unite the claims of orator and philosopher, Greek and Roman. In De oratore, he outlines the culture of the ideal orator, a programme almost encyclopaedic in the mediaeval sense.[95] It is comprehensive and, thanks to Cicero's Platonism and the fact that this ideal is mediated through one man and one art, synthetic as well. Cicero's orator is no shallow dilettante. Rhetoric is "the trained skill of a highly educated man",[96] and the rhetor should be able to handle any subject "with both distinction and knowledge".[97] The dangers of superficiality or aimless curiositas are countered by repeated references to the brotherhood of poets and orators as encyclopaedic men[98] whose potential range of knowledge was unlimited.[99] Considering the ancient apotheosis of the poet into a visionary whose muse gave him universal understanding, Cicero's orator is indeed in exalted company.

In essence, Cicero's orator was to represent both philosophy and rhetoric. Philosophy needed rhetoric in order to reach and benefit mankind[100], while the excellence of oratory was dependent upon the knowledge of the true and the beautiful.[101] If anything, philosophy was the stronger partner, as the opening words of De inventione suggest: "Eloquentia sine sapientia nunquam profuit, saepe nocuit." It is noteworthy that Augustine was converted to philosophy through reading Cicero.

If this rhetoric was comprehensive, claiming the arts and sciences as "attendants and handmaids",[102] the philosophy to which it is joined is similarly encyclopaedic, striving "to know the significance, nature, and causes of everything divine or human, and to master and follow out as a whole the theory of right living."[103] The formula of the De oratore, as modified by Augustine, would enjoy a long history, for it fused eloquentia and sapientia into a single encyclopaedic ideal. For Cicero, the artes liberales were completely integrated into this ideal. This was

> the truth enunciated by Plato...that the whole content of the liberal and humane sciences is comprised within a single bond of union; since, when we grasp the meaning of the theory that explains the causes and issues of things, we discover that a marvellous agreement and harmony underlies all branches of knowledge.[104]

For Cicero, the power of eloquentia was not merely aesthetic, or even moral. It was an instrument by which the ideals of Greek education could be forged anew. Philosophy which discovered truth, and oratory which expressed it, constituted humanitas, the supreme value of ancient paedagogy.[105] Through his own works, and the influence he had, particularly upon the Church Fathers, he becomes a patron of the mediaeval encyclopaedia, for he saw the divine power and eternal virtue of a synthetic and comprehensive knowledge.

Had Cicero known what the future held, he would doubtless have opposed Caesar on cultural as well as political grounds. The founding of the empire crippled the social and political potential of eloquentia so important to Cicero. Rhetoric turned in upon itself, becoming at once more complex and more myopically

bogged down in the niceties of technique, style and phrase.[106] It was the ultimate aridity of ancient education that it did not know what to do with its own admirable products.[107]

Quintilian's educational programme, though based on a return to Cicero,[108] is fundamentally out of tune with Cicero's thought. Quintilian was a far more typical ancient orator than Cicero, for he rejected philosophy as irrelevant to the practical life which rhetoric served,[109] and he had no integrated programme of the artes.[110]

In Book I, Chapter 10 of the Institutio oratoriae, Quintilian discusses the place of the enkuklios paideia in his programme. For the orator qua orator, it is not necessary, though it can be helpful. It is a necessity for the perfect orator, not because he is an orator but because he is perfect, that is, not deficient in any area of knowledge.[111] Quintilian even apologizes at length for the teaching of music. That such a justification is deemed necessary is disquieting, and so are the bluntly utilitarian reasons given in its defence, such as voice training. Not a word on the philosophy of harmony, number theory etc.; though he does say that a smattering of musical theory is helpful in reading the Timaeus.[112] Considering Quintilian's general attitude to philosophy, it is likely that if the Timaeus was studied at all, it was as a source of images and topoi, or because it would not do to neglect such a widely-read book. Geometry, reduced to a virtually literal level, is granted admission into the programme because court cases frequently concern the division of land.[113] Arithmetic and astronomy are

omitted entirely. Quintilian is certainly aware of what the higher study of scientific theory has to offer, but he vulgarizes it to the mere accumulation of *loci communes* and *exempla* with which the good orator adorns his speeches.

> And what of the fact that this same science of geometry rises even to the explanation of the laws which control the universe? And as it teaches us by numerical calculation that the courses of the stars are fixed and established, we learn in the course of this study that nothing is haphazard and mere matter of chance: a lesson which may sometimes be of importance to the orator.[114]

Yet surely it is unnecessary to undergo a long study of advanced science simply to pick up a few platitudes. This is but half-hearted lip-service to Cicero's ideal. Quintilian's real opinion, the common one of his age, was that for the orator, and hence for the average educated man, study was a *divertissement*. It was not until he renounced rhetoric that Augustine set out to acquire the liberal arts.

This was the atmosphere which the encyclopaedias of the Imperial period breathed, and its limitations were reinforced by certain traits of the Roman national character. The work of Varro, Pliny, Seneca, the commentators, and even Galen, would tend as a whole to confirm Singer's judgement that Roman science was strongest when concerned with the general study of nature, and weakest in pure mathematics.[115] As a rule, the Romans had little sympathy for *theoria*. This emphasis on general systems, and neglect of the more complex and specialized products of the ancient scientific mind, were the inheritance of the encyclopaedias of the Christian West.

A preoccupation with practicality is the hallmark of the Roman encyclopaedic tradition.[116] The classic example is Celsus' Artes, a guidebook for citizen and paterfamilias of essential knowledge in the fields of husbandry, warfare, rhetoric, philosophy (i.e. ethics) medicine and law. Well over half of the Historia naturalis deals with medicine and farming, and Varro includes architecture and medicine in his Disciplinarum libri as a concession to the utilitarian tastes of his audience. Though not a central feature of the mediaeval encyclopaedia, this practicality influenced the way it dealt with materials from the bestiaries, lapidaries and herbals: alongside symbolic interpretations, they did not fail to include magical and curative powers which Pliny would, no doubt, have vouched for.

The first great Roman encyclopaedia is Varro's Disciplinarum libri IX, where knowledge is arranged according to the enkuklios paideia. Yet it would be too much to claim that Varro created a liberal arts encyclopaedia in the mediaeval sense. Though endowed by others with philosophical, even religious significance, this structure was not intended by Varro as anything other than practical and conventional. Nor did he see his disciplinae as a gateway to divine wisdom. Though close to Cicero in his ideal of a doctus et perfectus orator, whose eloquence had a solid cultural base,[117] he does not seem to have embraced Cicero's loftier ideals. His intention was to analyze and catalogue facts, not to reason about natures and essences.[118] Possibly this was why his encyclopaedia, like Pliny's was fragmented and rearranged by later writers in more philosophically suggestive contexts.

Since most of the Disciplinarum libri is lost, it is hazardous to gauge the precise extent of Varro's influence. Some general trends can, however, be discerned. He appears to have been the father of Roman curiositas, with all its possibilities for good and ill. His scientific curiositas is best dealt with in terms of his major pillager, Pliny. His literary curiositas has more directly visible progeny. Varro popularized the ancient tradition that words contain a precise insight into the nature of reality, "verbum a veritate dictum", and devoted much of his book on grammar to "philology".[119] This belief that words particularly in their uncorrupted, "original" form, were an index of reality, was a powerful impetus to the grammatical curiositas of the Noctes Atticae and Macrobius' Saturnalia. The grammar of Dionysius Thrax, concentrating on form rather than syntax, was a perfect field for pedantic and minute classification,[120] and these litterateurs were emboldened to claim that all knowledge could be absorbed within a grammatical erudition.

Though most of the products of this movement are fascinating, but futile exercises in the art of hotch-potch, grammatical curiositas is not, historically speaking, entirely sterile. Its claims to universal applicability, mirror-like accuracy (through which Christ the Word could be called "the express image of the Father"), and an all-powerful tool in etymology, would be taken up to better purpose by Isidore of Seville. He saw himself an heir to these ancient grammarians,[121] and grammar itself as the highest intellectual activity.[122]

Like Varro, Pliny the Elder explicitly denies any philosophical basis to his work. He feels that concern with what

lies beyond the physical world is futile. His belief in the eternity of the cosmos eliminates, for him, any problem of creation or purpose. To Pliny, it justifies itself and is utterly satisfying in itself, without considering its origin or end.

> What is without the compasse hereof, neither is it fit for men to search, nor within man's wit to reach or conceive. Sacred it is, everlasting, infinite, all in all, or rather itself all and absolute: finite and limited, yet seeming infinite: in all motions orderly and certaine: howbeit in shew and judgement of men, uncertaine: comprehending and containing all whatsoever, both without and within: Nature's worke, and yet very Nature itselfe, producing all things.[123]

This philosophical agnosticism and materialism is coupled with religious skepticism. He professes to know nothing of God, and of the gods, only that men worship them for selfish ends. He scoffs at myths, especially those imputing immortality to the gods, nor does he believe that they have any consciousness of, or care for, human beings.[124]

This attitude leaves indelible marks on the structure and philosophy of the Historia naturalis. In a one-dimensional world, where high does not commune with low, nor temporal answer eternal, facts have no significance beyond man's desire to know them, either for their own sake, or for the material advantage they offer. Pliny's account of the lion is filled with all those odd and marvellous "properties" which delighted mediaeval writers[125] yet unredeemed by any significatio that might rescue it from being sheer trivia. Pliny is oblivious to this, for his outlook and methods are those of a curiosus. His view of the world is fragmented. His modus agendi is to select not according

to philosophical principle, or the economy of scientific writing which seeks the most complete and illustrative example, but strictly with a view to the random and individual interest such material arouses.

> The world of nature was to Pliny, like the world of books, hundreds of thousands of discrete phenomena, of which only thousands are interesting enough to be culled and catalogued in his note-books.[126]

It is not surprising that Pliny's lost treatise on the education of the orator, Studiosi, seems to have been close in spirit to the Institutio oratoriae.[127] This is to be expected from one so indifferent to philosophy and whose interest in the physical world amounts to collecting useful and startling facts. Pliny's introduction indicates no purpose to his work beyond Titus' entertainment. He considered it a reference book, and devoted the whole first book to a table of contents.

The Historia naturalis' want of a positive structure and a positive philosophy was not imitated in the middle ages. Its significant contribution, beyond its wealth of information, whose influence is almost impossible to assess, lies in Pliny's method of compilation.[128] He tells in his dedicatory epistle of the accumulation of hundreds of facts from his vast reading. Pliny the Younger relates how his uncle read, or was read to, even while travelling, and kept an army of secretaries around his bath ready to take down notes and extracts and file them away under various headings. Pliny was proud of this system, and lists under each chapter not only a somewhat "padded" bibliography, but the actual number of facts noted and observations made! This method was eclectic and livresque, and the

middle ages loved it. In Vincent of Beauvais' workroom we find the same abstracts, the same subject file, and even the army of secretaries.

The encyclopaedia of Julius Solinus Polyhistor is basically an abridgement of Pliny, cast in the framework of the periplus geography of books 3-6 of the Historia naturalis. He eliminates all of Pliny's practical chapters on medicine and agriculture, and redistributes the animals, herbs, and stones etc. through the countries in which they are found. Solinus' criteria for selecting facts from Pliny are virtually the same as Pliny's for choosing data from his books. The difference with Solinus is that utility plays a vastly inferior role to curiosity, and curiosity is, to an even greater extent than with Pliny, attached to the frankly miraculous, magical, and out of the ordinary. For example, Pliny's book on animals contains not only the monsters and wild animals of Africa and India, but also the domestic creatures of farm and town. Solinus is only interested in the former, and expands Pliny's two chapters on monstrous species of men[129] into a major theme of his work. The two encyclopaedias are so different in character that Thomas of Cantimpré used both for his De natura rerum. He failed to see that one was a reworking of the other (as he does, for instance, with St. Ambrose's and St. Basil's Hexamera) yet aptly singles out Solinus as an author "de mirabilibus mundi".[130] Solinus differs from Pliny as well in his taste for certain more philosophical ideas, such as that of the microcosm.[131] However, these are treated in much the same way as the factual materials, and supply no

structural or philosophical principle to the whole. Yet when we read Solinus' marvellous accounts of magical stones, healing plants, cockatrices and Cynocephali, we sense that we are already halfway into the world of bestiaries, lapidaries, and the Travels of Sir John Mandeville.

As Pliny and Solinus were compiling their encyclopaedias, other thinkers were re-evaluating the relationships between science, philosophy, and the enkuklios paideia. In this time of increasing decadence, rigidity, and stagnation, when the ancient world was almost imperceptibly losing confidence in its values, many older ideas were being revived and strengthened, and a half-articulated desire for some kind of synthesis possessed many thoughtful persons.

Two Roman scientific writers, both highly influential in the middle ages, reveal a preoccupation with the implication of the study of nature which had long seemed dormant, yet were to prove of vital importance to the Christian centuries. Galen felt that an animal's anatomy revealed the mind of a wise creator, and that contemplation of it would be instructive for religion and morals;[132] while Seneca reflected a trend in Stoic science, since the time of Sextius Niger's Peri hyles, to neglect abstract theory,[133] and to expect from studying the world, not speculative, but practical lessons concerning personal conduct.[134] Both the revival of teleology and the philosophical preoccupation with ethics seem to be preparing for the mediaeval world-view.

The experiments in late antiquity with a broadening of the framework of the enkuklios paideia, were of even greater importance for the encyclopaedia. The artes had lost their old

identity as a programme of school instruction, and were being transformed into an encyclopaedic classification of all human knowledge. An index of this is the fact that the word ars was becoming more and more comprehensive, covering all human activity.[135] Marius Victorinus, for example, devised a two-fold scheme of artes animi et corporis and artes animi tantum, which Augustine renamed vestimenta and instituta. The instituta was the old enkuklios paideia; the former were the mechanica, not real crafts, but mixed arts like medicine and architecture. Through this development, antiquity made it possible for encyclopaedias like Isidore of Seville's, Hugh of St. Victor's, and the Speculum doctrinale to be far more comprehensive than the old framework of the artes would have originally allowed.

In the mean time, the mechanica themselves were laying claim to what they saw as the encyclopaedic character of philosophy. Galen the physician and Vitruvius the architect defended their professions as all-embracing disciplines, worthy to be ranked with divine philosophy in scope and import. Like Cicero, though without his precision and consistency, they sought to unite a basically practical calling with speculative science. They even claimed that the enkuklios paideia was essential to their craft.[136] This was necessary if they were to demand the encyclopaedic prerogative of philosophy. This desire to escape from Hellenistic specialization into some new, all-embracing unity affected the sciences as well. Strabo, for instance, believed that geography was a true polymathesis, encompassing the study of all things.[137]

The vital union between enkuklios paideia and philosophy, despite the objections of the Epicureans and Cynics, was becoming stronger. Those who studied the artes without proceeding to philosophy were compared to Penelope's suitors, who seduced her handmaids, yet never enjoyed their mistress.[138] Conversely, Cicero described philosophy as the mother of the arts.[139] A good indicator of the forthcoming mediaeval fusion of philosophy with its integral propaedeutic, the arts, is that in late antiquity, philosophy is almost always placed at the end, and sometimes even in the midst of, lists of the artes.[140] For example, St. Augustine's unfinished encyclopaedia of the arts was to have ended with a book on philosophy.

Finally, the neo-Platonist movement represented not only a revival of Plato's thought, but a restatement of the old Greek view of the physical world.[141] The cosmos was an animate being, with natural sympathies connecting and integrating all its parts. This renewed consciousness of the links between celestial and earthly, material and spiritual, prompted Plotinus to declare, and Christians to echo, that "all things are full of signs".[142] Moreover, neo-Platonic science entailed a full application of the enkuklios paideia. Their disciple Apuleius boasts that he has gone beyond what satisfies most men in the way of education, that is, the trivium, and has studied the quadrivium as a prelude to "universal philosophy".[143] Mathematics, along with a revived Aristotelian dialectic, flourished in the neo-Platonist schools of Alexandria and Athens from the third to sixth centuries.[144]

Apuleius himself is one of the most fascinating literary figures of antiquity, and his ideas, his career, and the popularity his works enjoyed in the middle ages, seem to suggest ways in which the mentality of the curiosus might serve as a bridge to the mediaeval encyclopaedic mind.[145] At first glance, Apuleius seems to typify curiositas, dabbling in everything, a man who "cherished all the nine Muses".[146] He was known to his own age primarily as a Platonist and a man of scientific learning, two highly compatible callings, whose dignity he was believed to have compromised by indulging in that frivolity of romance-writing for which he is most famous today.[147] Yet, going beyond our initial impression, we find that Apuleius is far from sharing Pliny's blunt faith in curiositas. Beneath his energetic polymathy lies an earnest desire for some kind of synthesis, some unity through which the multiplicity of the world would reveal its message. As a first step, he tried to reconcile in his own person the traditionally opposed vocations of philosopher and orator,[148] a task which reflects the tendency of that age towards a cross-fertilization, albeit unconscious, between these two ideals.[149] Moreover, he appears to have had a keen sense of the dangers of curiositas. This greed for odd and striking trivia seems to carry a judgement against the banality of everyday life. This easily leads to a fascination with magic, which Apuleius condemns as not only a desire for possession and domination, but also as a temptation to sacrilege.[150] In his famous myth of Amor and Psyche, Psyche's illicit disclosing of her husband is the pernicious result of hubristic

curiosity, an artificially provoked epiphany.[151] Even without meddling in magic, mere curiosity for mirabilia constitutes a sin of omission. In the preface of De Mundo, Apuleius castigates those who eagerly devour minutiae concerning towns, mountains, etc., while neglecting the true purpose of such studies, that is, an appreciation of the wholeness of the universe.

> Pour moi, j'ai pitié de ces hommes qui se prennent d'une telle admiration pour des choses d'une si médiocre importance....S'ils avaient pû contempler tout le globe de la terre et l'ensemble du monde, ils en loueraît moins quelques parcelles, ayant l'intelligence du tout.[152]

In this way, Apuleius signifies the encyclopaedic philosophy to come, even though he often fails to practice what he preaches. However, I would not, like Lancel, dismiss Apuleius' condemnation of curiositas as pure rhetoric.[153] Other pagan texts, like the Hermetic Kore Kosmou exhibit much the same ambiguity on this question. Perhaps their paganism prevented them from finding an overwhelming imperative; the first clear and consistent condemnation of curiositas comes from Tertullian. Or it could be that, ironically, it was Apuleius' effort to be both philosopher and orator that undid him. Curiositas is philosophically repellent, but an occupational hazard to a lecture-tour rhetorician.

Apulieus also points to the coming age of encyclopaedias in his blending of theology and natural science in his work. His most popular works in the middle ages were De Deo Socratis and De Mundo; and amongst his lost works are several large volumes of questiones naturales and even an epitome of history.[154] He also wrote a commentary on the Timaeus in the first section of De Platone et eius dogmate. Of course, his history probably

bore no resemblance to the Christian universal history, and this catalogue of writings would not appear to express a vision, or at least a clearly formulated one, of a comprehensive knowledge. Yet Apuleius occupies an important place in the history of the ancient roots of mediaeval encyclopaedism because he transmitted many important aspects of ancient culture, Platonism, and even curiositas in forms easily appreciable by the encyclopaedists.

Looking back on this vast panorama of encyclopaedic ideas flowing from ancient science and the enkuklios paideia, it is with a sense almost of anti-climax that we come to deal with those two works which, for most of the middle ages, seemed to typify their inheritance from antiquity. They seem so brief, derivative and second-rate, yet we must avoid Stahl's error of assuming that what the middle ages did to them was likewise unoriginal. It was through the good offices of Macrobius and Martianus Capella that many of the most significant encyclopaedic ideas of the ancient world found their way through the upheavals of the barbarian centuries onto the pages of Isidore and Bede. These works survived precisely because, as handbooks, they were so typical and popular in late antiquity. It was the fault of the ancients themselves that the middle ages inherited so few of their truly monumental achievements.

The importance of Macrobius' Commentary on Cicero's Dream of Scipio lies not only in the amount of astronomical and geometrical material with which it supplied mediaeval encyclopaedists, but also in its succinct and lucid expression of Platonism in general, and of Platonic cosmology in particular.[155] Though it

is a literary commentary, whose science never gets beyond the layman's comprehension, it is nonetheless "encyclopaedic in scope".[156] It is also encyclopaedic in purpose, for Macrobius, in his dedication to his son, claims that all this natural science is intended to educate him in the highest philosophical and ethical truths. Macrobius is no curiosus.[157] Indeed, he embraced Seneca's notion that only speculative science raises a man above his own nature and thereby makes him truly human.[158]

Macrobius follows the method of the best literary and scientific commentators of the neo-Platonic school, like Iambilicus, Chalcidius, and Proclus,[159] by expounding on selected passages from the work. Macrobius chose his excerpts to illustrate the close parallel between Cicero's and Plato's thought. Hence much of the material in the Commentary stems from the Timaeus and its glossators, such as Macrobius' identification of Scipio's odd-times-even life-span with the Same and the Different in the World-Soul.[160] The Commentary also contains a full exposition of elements and qualities,[161] and Pythagorean number symbolism. The discussion of cosmology presents important chapters on celestial music and its human parallel,[162] the Great Year,[163] and the microcosm.[164]

Macrobius' major virtue is his clarity and lucid organization in exposing the most important points of Platonic cosmology, points which Plato himself often expresses in a compressed and poetic manner. Ironically, Macrobius' influence is so great that it is virtually impossible to trace, so quickly did his material become a commonplace of encyclopaedic literature. As

an independent writer, he was rediscovered, as it were, by the Platonizing twelfth century,[165] and he is cited by such important encyclopaedic figures as the Victorines, Adelard of Bath, Bernardus Silvestris, William of Conches, Alain of Lille, John of Salisbury, Bartholemew the Englishman, and Vincent of Beauvais. At the end of the middle ages, Macrobius still provided the basic framework and data for encyclopaedias like Gautier of Metz' Ymage du Monde. It inspired Chaucer, a great reader of encyclopaedias, as the "olde bok totorn" of the Parliament of Fowles. Perhaps no book so clearly demonstrates the continuity of the encyclopaedia, or the debt it owes to Platonism, as the Commentary.

As we have seen, the artes liberales were, especially in late antiquity, "a philosopher's curriculum",[166] and had left the arena of education for the realm of the ideal. In short, they had been transmuted from a curriculum into a classification. Trivium and quadrivium, word and number, Mercury and Philologia, sermo and ratio: the enkuklios paideia was becoming the encyclopaedia, enfolding and unifying all knowledge. This final assessment of the artes by antiquity was relayed to the middle ages by a North African lawyer, who between 410 and 439 wrote a strange, virtually unreadable, yet highly influential Menippean satire. This was Martianus Capella, whose De nuptiis mercurii et philologiae can safely be called the first liberal arts encyclopaedia. Its neo-Platonism, its wealth of material (particularly in astronomy), and most of all, its allegorical framework, prompted an almost unbroken chain of commentaries and imitations right to the end of the middle ages. It still

inspired Alphonso de la Torres, whose Vision Delectabile de la Philosophia y Artes Liberales, Metaphysica y Philosophia Moral was published in 1435.

Martianus' chief virtue is that, alongside a very ambitious and exalted idea of the scope and import of the artes, he still manages to present much of their basic content within a manageable size. It is therefore quite understandable, though somewhat ironic, considering the basic trend of thinking on the artes which De nuptiis represents, that Martianus was widely used as a textbook during those centuries of upheaval and gradual retraction of Latin culture in North Africa, Italy, Gaul, and Spain.[167] Here, the structure of ancient education was slowly being ousted by Christian monastic and cethedral establishments. Christians, far from having a lifetime to devote to the artes, appreciated a compendium which was modest in size, yet still suggested a relationship between secular studies and a heavenly vision. A compact, vivid work like Martianus' was ideal for elementary teaching, and its eclecticism must have influenced the mediaeval tendency to take what was deemed good from the ancients, regardless of philosophical school.

However, it was more than mere convenience that made Martianus popular with encyclopaedic writers. In the early middle ages, the first two books, which set forth the allegorical framework of De nuptiis, were neglected in favour of the "content" sections. Later ages, especially the Carolingian Renaissance and the twelfth century, were to find this framework fascinating, and speculated freely on its possibilities as an encyclopaedic

classification, along with the usual didactic and paedagogical commentaries.[168] Martianus was thus the main transmitter of the artes both as philosophy and as a real educational programme. Moreover, this wedding on Olympus signified a divine sanction of the arts, whose study earned one the company of the gods. Such a vindication of the artes would inspire Christian writers as well, such as Hugh of St. Victor.

In conclusion, the contribution of antiquity to the mediaeval encyclopaedia came through two channels, scientific and educational. These provided not only many encyclopaedic concepts and forms, but through their changes and vicissitudes, shaped the very means by which these ideas would be handed on to the middle ages. However, both handbook science and the ambitious new schemes of the liberal arts would have to undergo a transformation at the hands of the Church Fathers before the outlines of the mediaeval encyclopaedic philosophy would clearly emerge.

FOOTNOTES

1. William Harris Stahl, Roman Science. (Madison: University of Wisconsin Press, 1962).

2. William Harris Stahl, Richard Johnson and E.L. Burge, Martianus Capella and the Seven Liberal Arts. Volume I: The Quadrivium of Martianus Capella. (New York and London: Columbia University Press, 1971).

3. Sambursky, op.cit., p. 224.

4. Grimal, op. cit., p. 460.

5. Sambursky, op. cit., p. 11.

6. Werner Jaeger, Paideia. Translated by Gilbert Highet. (Oxford: Oxford University Press, 1945) Vol. I., p. xxii.

7. Sambursky, op. cit., p. 241.

8. Jaeger, op. cit., Vol. I, p. 169.

9. Sambursky, op. cit., p. 241.

10. Charles Singer, A Short History of Scientific Ideas to 1900. (Oxford: Clarendon Press, 1959) p. 132.

11. Sambursky, op. cit., p. 54.

12. Stahl, Roman Science, op. cit., p. 31.

13. ibid., p. 125.

14. cf. St. Thomas Aquinas, Summa Theologica. Ia, XXXII, art. 1, ad secundum.

15. Christopher Butler, Number Symbolism. (London: Routledge and Kegan Paul, 1970) p. 3.

16. ibid., p. 16.

17. Speculum Maius, op. cit., Prologus, c. VI.

18. Sambursky, op. cit., p. 39.

19. Macrobius, Commentary on the Dream of Scipio. Translated with introduction by William Harris Stahl. (New York: Columbia University Press, 1952) Book 2, ch. 1.

20. Butler, op. cit., p. 14.

21. cf. Otto von Simpson, The Gothic Cathedral. Rev. ed. (New York: Harper and Row, 1962) ch. 2.

22. Butler, op. cit., p. 14.

23. Rudolf Allers, "Microcosmos from Anaximander to Paracelsus". Traditio, vol. 2 (1944) p. 342.

24. Leo Spitzer, "Classical and Christian Ideas of World Harmony", Part I. Traditio, vol. 2 (1944) p. 414.

25. Allers, op. cit., p. 342.

26. ibid., p. 319.

27. ibid., p. 327.

28. Sambursky, op. cit., p. 83.

29. ibid., p. 80.

30. Charles Homer Haskins, Studies in the History of Mediaeval Science. (New York: Ungar, 1960) Reprint of 1924 edition.

31. Sambursky, op. cit., p. 83.

32. David Knowles, The Evolution of Mediaeval Thought. (New York: Vintage, 1962) pp. 6-9.

33. Stahl, Roman Science, op. cit., p. 27.

34. Sambursky, op. cit., p. 81.

35. ibid., p. 100.

36. C.P. Conger, Theories of Macrocosms and Microcosms in the History of Philosophy. (New York: Russell and Russell, 1967) Reprint of 1922 edition, p. 9.

37. Allers, op. cit., pp. 347-9.

38. St. Gregory the Great, Homelia in Evangelium XXIX. Migne, Patrologia Latina, vol. 76, col. 1214.

39. Stahl, Roman Science, op. cit., p. 7.

40. Gandillac, op. cit., p. 496.

41. H.-I. Marrou, "Saint Augustin et l'encyclopédisme philosophique". Revue des études latines, vol. 12 (1934) p. 283.

42. William Harris Stahl, "Dominant Traditions in Early Mediaeval Science". Isis, vol. 50 (1959) p. 124.

43. Stahl, Roman Science, op. cit., p. 56.

44. Anders Olerud, L'idée de macrocosmos et microcosmos dans le Timée de Platon. (Uppsala: Almquist and Wiksell, 1951) p. 5.

45. Timaeus, op. cit., 29:c-d.

46. ibid., 30:a-31:a.

47. ibid., 32:a-b.

48. ibid., 33:d.

49. ibid., 35:a-36:b.

50. ibid., 36:b-d.

51. ibid., 37:d-38:a.

52. ibid., 41:d.

53. ibid., 43:d-e

54. ibid., 44:d.

55. ibid., 46:d-e.

56. Cornford, op. cit., p. 27.

57. Lewis, op. cit., p. 16.

58. Cornford, op. cit., pp. 92-3.

59. Speculum Maius, op. cit., Prologus, c. XVII.

60. ibid., c. XVI.

61. Cornford, op. cit., p. 20.

62. Olerud, op. cit., p. 15.

63. I believe that the only mediaeval encyclopaedist to posit a non-spherical universe was Hildegard of Bingen, and even she revised her views later in life.

64. Olerud, op. cit., pp. 20-3.

65. Allers, op. cit., p. 331.

66. ibid., p. 357.

67. Olerud, op. cit., pp. 33-7.

68. Spitzer, op. cit., p. 420.

69. Stahl, "Dominant Traditions", op.cit., p. 123.

70. H.-I. Marrou, A History of Education in Antiquity. Translated by George Lamb. (New York: New American Library, 1964) p. 300.

71. Jaeger, op. cit., Vol. I, p. xiii.

72. Marrou, History, op. cit., p. 26.

73. ibid., p. 30.

74. Jaeger, op. cit., Vol. I, pp. 286-8.

75. ibid., Vol. I, p. 289.

76. Marrou, History, op. cit., p. 88.

77. Jaeger, op. cit., Vol. I, p. 318.

78. There were many schemes of artes liberales in antiquity, not always comprising the classical seven. The quadrivium, Pythagorean in origin, was fixed from very early on. A science of dialectic was included in the trivium after Aristotle's time, and grammar was not even invented until the first century B.C., by Dionysius Thrax. The mediaeval canon of artes was inherited from Martianus Capella, who modified Varro's disciplinae.

79. Marrou, History, op. cit., p. 244.

80. ibid., pp. 88-9.

81. ibid., p. 90.

82. In Lindsay's Oxford edition of Isidore, for instance, the trivium occupies two books, the entire quadrivium only one rather short one.

83. Jaeger, op. cit., Vol. I, p. 296.

84. Stahl, Roman Science, op. cit., p. 8.

85. Marrou, History, op. cit., p. 87.

86. Lynn Thorndike, A History of Magic and Experimental Science. 2nd edition. (New York: Macmillan, 1929) Vol. I, p. 21.

87. Marrou, History, op. cit., p. 252. It should be noted that curiositas is not in itself a dishonourable term. Lewis and Short give as its first meaning "eagerness for knowledge", and the first definition of curiosus as "painstaking, devoted, attentive". For our purposes, however, it denotes the second, debased meaning of "inquisitive, prying".

88. ibid., p. 254

89. ibid., p. 397.

90. ibid., p. 122.

91. ibid., p. 115.

92. Robert Darwin Crouse, "Honorius Augustodunensis: the Arts as Via ad Patriam". Arts libéraux et philosophie au moyen age. Actes du IVe congrès international de philosophie médiévale: Montréal, 1967. (Montréal: Centre d'études médiévales, Paris: Vrin, 1969) p. 536.

93. Spitzer, op. cit., p. 417.

94. Marrou, History, op. cit., p. 300.

95. Grimal, op. cit., p. 468.

96. Cicero, De Oratore. Translated with introduction by E.W. Rackham. (Cambridge, Mass.: Harvard University Press, London: Heinemann, 1942) I:5.

97. ibid., I:21.

98. ibid., I:9-10.

99. ibid., I:70.

100. ibid., I:61.

101. ibid., I:48.

102. ibid., I:75.

103. ibid., I:212.

104. ibid., III:21.

105. Marrou, History, op. cit., p. 270.

106. William M. Smail, translator and editor, Quintilian on Education. (Oxford: Clarendon Press, 1938) Introduction, p. xxiii.

107. Marrou, History, op. cit., p. 307.

108. Quintilian, op. cit., Introduction, p. xxviii.

109. ibid., Introduction, p. xxix.

110. In this, I would disagree with H.-I. Marrou, "Les arts libéraux dans l'antiquité classique". Arts libéraux et philosophie, op. cit., p. 23.

111. Quintilian, op. cit., I:10:8.

112. ibid., I:10:36.

113. ibid., I:10:13.

114. ibid., I:10:46.

115. Singer, op. cit., p. 104.

116. Marrou, History, op. cit., p. 323.

117. Marrou, "Les arts liberaux", op. cit., p. 19.

118. Grimal, op. cit., p. 472.

119. ibid., p. 471.

120. Jacques Fontaine, Isidore de Seville et la culture classique dans l'Espagne visigothique. (Paris: Etudes augustiniennes, 1959) Vol. I, p. 30.

121. ibid., Vol. I , p. 27.

122. ibid., Vol. I, p. 29.

123. Pliny the Elder, Historie of the World. Translated by Philemon Holland. London: Adam Islip, 1634) II:1.

124. ibid., II:7.

125. ibid., II:16.

126. Stahl, Roman Science, op. cit., p. 106.

127. Grimal, op. cit., p. 478.

128. de Boüard, Compendium, op. cit., p. 95.

129. Pliny, op. cit., Book VII, ch. 1-2.

130. Thomas of Camtimpré, De natura rerum. Bodleian ms. Rawlinson D358, f.384r.

131. Caius Julius Solinus, An Excellent and Pleasant Worke of Julius Solinus Polyhistor. Translated by Arthur Golding. Gainsville, Fla: Scholar's Reprints, 1955) Reprint of London, 1587 edition. Ch. 4.

132. Thorndike, History, op. cit., Vol. I, p. 149.

133. ibid., Vol. I, p. 101.

134. Grimal, op. cit., pp. 474-5.

135. Marrou, "Les arts liberaux", op. cit., pp. 8-9.

136. ibid., p. 23.

137. Stahl, Roman Science, op. cit., p. 60.

138. Marrou, "Les arts liberaux", op. cit., p. 13.

139. ibid., p. 24.

140. ibid.

141. ibid.

142. Thorndike, History, op. cit., Vol. I, p. 305.

143. Elizabeth Hazelton Haight, Apuleius. (New York: Longman's, 1927) p. 28.

144. Marrou, "Les arts liberaux", op. cit., p. 25.

145. Haight, op. cit., pp. 93-107.

146. ibid., p. 72.

147. Stahl, Martianus Capella, op. cit., p. 27.

148. Haight, op. cit., pp. 72-3.

149. Marrou, History, op. cit., p. 290.

150. Serge Lancel, "Curiositas et preoccupations spirituelles chez Apulée". Revue de l'histoire des religions, Vol. 160 (1961) p. 29.

151. ibid., p. 41.

152. ibid., p. 29.

153. ibid.

154. Haight, op. cit., p. 83.

155. Macrobius, op. cit., p. 10.

156. ibid., p. 55.

157. ibid., p. 56.

158. T. Whittaker, Macrobius, or, Philosophy, Science and Letters in the year 400. (Cambridge University Press, 1923), p. 68.

159. Stahl, "Dominant Traditions", op. cit., p. 112.

160. Macrobius, op. cit., I:VI:3..

161. ibid., I:VI:36-40.

162. ibid., II:I-IV.

163. ibid., II:XI.

164. ibid., II:XII.

165. ibid., p. 44.

166. Stahl, Martianus Capella, op. cit., p. 91.

167. ibid., p. 56.

168. William Harris Stahl, "Towards a Better Understanding of Martianus Capella". Speculum, Vol. 40 (1965) p. 113.

CHAPTER TWO

THE CHRISTIAN TRANSFORMATION OF ANCIENT ENCYCLOPAEDISM

As Christopher Dawson has pointed out, historians of science appear to be the last bastions of the outmoded idea that mediaeval Christianity was an obscurantist force which retarded the development of scientific thought.[1] To the worst platitudes about mysticism and "otherworldliness" are added stronger accusations of suspicious hatred of science and thick-witted repression of original thinking. It is not my intention to offer here an apology; this thesis rests on the assumption that it has already been made. It can only be hoped that the reader will recall that the ancient world itself bequeathed its scientific achievements to the middle ages in a rather dilapidated state; that the only science which St. Augustine did not earnestly recommend that the Christian intellectual study was astrology; that when Justinian closed the schools of Athens, they were thoroughly riddled with occultism; and that Hypatia's murder had no more to do with her scientific views than Einstein's exile from Germany had to do with relativity.

The strongest argument against such historians is the fact that many converts of a philosophical temperament felt Christianity to be, not a threat or a superstitious philistinism, but the answer to their most pressing problems. The Greeks of the Hellenistic and Roman age, to whom a philosopher was primarily a man interested in God, and Plato basically a theologian[2], dubbed the Jews "the philosophical race" because they believed in the oneness of the Divine Principle.[3] The first chapter of

Etienne Gilson's Spirit of Mediaeval Philosophy clearly shows how the omnipotence and personality of the Christian God provided an answer to the unresolvable problems of late antique philosophy. Indeed, the apostle Paul proclaimed on the Areopagus that Christianity was the paideia of Christ, a higher stage to which the possessor of Greek paideia would logically wish to proceed.[4] According to Clement of Alexandria, the Greek paideia, as well as the Jewish law, had been fulfilled by the coming of Christ.[5] Justin Martyr tells how Christianity satisfied his philosophical hunger where no pagan school could. Tertullian might proclaim the unbreachable rift between Athens and Jerusalem, yet his own erudition and fine command of argument and expression belie his words. Even St. Jerome modified his harsh attitude towards pagan learning in later life, for he realized that such a view had no future, and was probably unnecessary.[6] That Christianity should not only absorb, but transform classical culture was, to men such as these, neither degradation not betrayal, but a promise of new life to a dying world. Christianity replaced the failing pagan spirit with its own, and enlisted its achievements in the service of a new ideal. What the Renaissance deplored about the "Gothic centuries" was precisely this powerful redirection of ancient civilization, for it meant that "il n'y a pas continuité, de l'antiquité au moyen age, que par un certain nombre d'éléments de la culture, non par la culture elle-même en tant d'organique."[7]

That Christianity in confronting classical culture was not so much weeding through an overgrown garden as irrigating a

desert is nowhere more aptly illustrated than in the history of the encyclopaedia. Christianity provided an imperative which summoned the various encyclopaedic ideas and structures of the ancient world to form a vigorous, organic whole. The nexus of this transformation was the Bible. The Bible "stands in the middle ages as a kind of transcendent magnet which arranges the innumerable filings of cultural enterprise into patterns relating to itself".[8] From the time of Ambrose and Augustine, it provided a structure and aim for the mediaeval encyclopaedia, for it was itself "literally encyclopaedic, both in its own content and in the range of learning that could be brought to bear on it."[9] For Augustine it was the encyclopaedia par excellence, not only in containing everything which pagan encyclopaedic literature contained, but also because it was the basis of that faith which scientia illumined, and which illumined scientia.[10] Furthermore, it provided a means for judging what was good in classical culture, and of sanctifying it for a higher use.[11]

The encyclopaedic possibilities of the Bible were increased by the four-fold way of scriptural exegesis. The ancient philosophers had developed one method of interpretation, the moral, and had used it to "purify" the myths of the sacrilege of ascribing wanton or cruel behaviour to the gods. For Christians, however, the Bible had many layers of meaning, arranged according to a hierarchy of values. Allegory, because it led to the exposition of doctrine, was more important than tropology (leading to moral philosophy) or analogy (leading to eschatology). All were deemed of higher worth than the historical sense. "What

is consistent is the complementary literal and spiritual levels and the unity and interdependence of the spiritual levels."[12] These exegetical categories, and their mutual relationships, constitute a sort of cultural paradigm for the middle ages as a whole.[13] Not only did they spill over into secular literature,[14] but they were a prototypical encyclopaedic structure. If God's word could be envisioned as operating on many levels, both literal and spiritual, could not his other works, the physical world for example, be interpreted in a similar fashion? Like the levels of Scripture, were not the artes "separate dimensions of the same enterprise"?[15] This attitude was reinforced and complemented by the sacraments of the Gospel and Christian worship. When a priest declares that earthly bread is, through the power of the Almighty, at once true bread and true body of our Lord, he also proclaims the Christian encyclopaedic principle.

The channel through which ancient science entered the mediaeval encyclopaedia is the very first words of the Bible. The account of the creation of the world in Genesis was, until the very end of the mediaeval encyclopaedic tradition, a source of both its structure and philosophy. Even if viewed strictly as mythos, Genesis is, at bottom, scientifically sound according to Greek standards, for it emphasises the emergence of order out of chaos, the differentiation of unformed matter, and the separation of opposite qualities.[16] The Christian encyclopaedists saw their efforts to reproduce the inherent order of the cosmos along these scientific lines, for they depended upon an imitation of these very characteristics of the Creator's work. The result was an

explicit emphasis on finely articulated order, minute classification, and detailed, rigorous distinction -- the differentiae of Isidore of Seville.

Christians were not without a precedent in imagining that Greek science could be integrated with the Bible, or in employing the symbolic method to do so. A forerunner of the Christian Hexaemeron was Philo Judaeus' De opificio mundi, whose philosophical system combines the Scriptures with Greek thought through a medium of allegorical interpretation.[17] Like his Christian counterparts, Philo was inspired by the Timaeus and encouraged by the many parallels to Genesis which it presented. He particularly emphasised the goodness of the Creator as the reason for creation, and the symbolic powers of numbers as instruments of divine authority.[18] Both of these ideas were reiterated and expanded by later Hexaemeron writers. Unlike them, however, Philo does not seem to have had the courage to either reject or reinterpret Plato on the vital questions of creation ex nihilo and the origin of evil.[19]

The major Latin Hexaemeron of the patristic period was that of St. Ambrose of Milan, whose model, according to St. Jerome, was a now-lost treatise on Genesis by Origen. If this is so, Origen's influence must have been mediated through Ambrose's most obvious source, St. Basil of Caesarea. The latter's Hexaemeron was translated into Latin quite early, and obtained for him an honourable place among western encyclopaedists. Basil takes his information about, but not his opinions on the nature of the physical world from the Greek scientific

writings, especially Plato's Timaeus,[20] and he is careful to underscore the difference by presenting a full elucidation of creation ex nihilo. He consistently emphasizes how the Biblical narrative, in the very order in which the facts of creation are set forth, shows the utter dependence of the world upon God's transcendent power. For example, He made light, and even plants, before creating the sun, lest man should mistake the strength of the creature for that of the Creator. "His purpose", says Ambrose, "was to reveal the knowledge of His will by the effects of His works."[21] But perhaps the most positive effect of Basil's Hexaemeron is his uninhibited delight in the variety and detail of the created world. For him, it was evidence of a divine craftsmanship at once breathtakingly prodigal with form, colour, and beauty, and economical in instilling each thing with a spiritual significance from which man could learn.[22] This attitude is very encyclopaedic, sanctioning the comprehensive study of the world through the synthesis of divine plan and purpose.

Ambrose's Christianized Timaeus is based quite closely on Basil's and, like the original Timaeus, sets out to demonstrate the nature of the Creator from that of the creation. "This world is an example of the workings of God, because, while we observe His work, the Worker is brought before us."[23] Ambrose is proud to point out the superiority, in this respect, of Genesis to Timaeus. According to the former, "the substances and causes of all things visible and invisible were contained in the divine mind"[24] not externally, either in the realm of Ideas or in

Necessity. Hence, the faith of the Christian encyclopaedist in the full explicability of the world was far greater than that of a Platonist. Like Basil, Ambrose is also careful to point out that the existence of evil is due, not to the impotence of the Creator, but to the sin of man.[25]

Unlike Augustine, or even the Timaeus, Ambrose prefers the moral interpretation of the discrete and concrete fact to the doctrinal or mystical allegory of a broad cosmology. "Better than knowledge about the extent of the earth, is knowledge about concrete things in it".[26] His favourite field for this type of interpretation is zoology, and his accounts of the behaviour of birds and beasts are designed to show God's care for our moral lives in providing us with good examples. Indeed, as far as encouragement towards righteous behaviour is concerned, "far more conviction is gained from the observation of irrational creatures than from the arguments of rational beings".[27] This judgement was eagerly embraced by the mediaeval encyclopaedias, especially those directed at preachers. As Gregory the Great demonstrated, one vivid and appropriate exemplum was worth hours of exhortation.[28]

Many of Ambrose's stories about animals, and the moralizations attached thereto, are associated with the mysterious Physiologus, the great bestiary of the middle ages. In fact, many mediaeval authors actually attributed the work to Ambrose. Problems regarding the actual source of the Physiologus, and whether it was originally moralized or not, are beyond the scope of this thesis[29] and are, perhaps not particularly important.

As Thorndike points out, during the middle ages the title Physiologus "came to apply less to any particular book, author, or authority than to almost any treatment of animals in a certain style".[30] This style was one of Christian allegory and moralization found in the Hexaemera and the encyclopaedias.

Together with Basil and Ambrose, St. Augustine completed that great triumvirate of hexaemeral writers cited as authoritative by Cassiodorus[31] and Bede.[32] This is due not only to his great prestige, but also to the fact that his De Genesi ad litteram provides an effective counterpoise to the two Hexaemera. Though he shares with them a foundation in Plato and the neo-Platonists[33] (in fact, the Timaeus is the only Platonic dialogue he actually cites), Augustine places far less emphasis on detail and anecdote than on the broad questions of cosmology. Where Ambrose leans towards moral allegory Augustine prefers doctrinal symbolism.[34] For example, he sees the six days, not as actual days, but as a sort of literary and educational device.[35] If Ambrose influenced the comprehensive optimism of the Christian encyclopaedia, Augustine reinforced its philosophical synthesis, for "he produced an interpretation unique in its self-consistency, depending upon the fundamental principles of a transcendent God, an eternal ideal world, and a systematic allegorical explanation of the six days as something other than natural days".[36] In this way, Augustine rounded out the possibilities of the Christian encyclopaedia.

> Augustine the encyclopaedist, who in all branches of knowledge worked towards unity, is one Christian possibility; the width and fulness of Ambrose, another. Two ways open to Christianity: the one, inherited from Plato, turning its back on the saeculum, aspiring towards monotheistic monody; the other, transforming pantheistic fulness into Catholic polyphony.[37]

His work on Genesis is, however, but a minor aspect of Augustine's total contribution to the encyclopaedia. Indeed, he is the single most influential figure in its history, for he suggested a structure which would incorporate science, the liberal arts, and an encyclopaedic history, and a symbolic philosophy which would inform and unify it. Because his was such a forceful personality, and one whose works had such a tremendous influence, it is important, in order to understand his views on Christian culture, to have some knowledge of what his own general culture consisted of. It can be summed up as both typical of his age and education, and a reaction against these factors. The science of Augustine's time was simply that which the general schooling placed at the disposal of the orator[38], and in many ways Augustine never transcended it. Most of what he knows about physica is superficial, bookish, and oriented towards mirabilia.[39] On the other hand, thanks to his interest in Genesis, he displays an unusual interest in the sciences of the questiones naturales -- cosmology, physics, astronomy etc.[40] As far as the enkuklios paideia was concerned, Augustine was a contemporary of Martianus Capella, and the movement of ancient thought on the artes had gone far towards redefining them from being a curriculum to being "simplement un cadre que l'érudition de chacun s'éfforce de remplir ... un but en soi, celui qui l'éfforce d'atteindre l'érudit qui aspire au titre de vir doctissimus."[41] For the middle ages, it was Augustine who made the enkuklios paideia into the encyclopaedia, for he steered a middle course between the artes as the encyclopaedic structure of knowledge and the

artes as propaedeutic to a higher study. He restated the old philosophical ideal of the internal propaedeutic, a universal knowledge that is both part of and subordinate to a higher end.[42]

Autustine's whole attitude towards culture was profoundly marked by his conversion from rhetoric to philosophy through reading Cicero's Hortensius. The aim of this treatise was less to communicate a specific philosophy than "to commend the exercise of philosophizing as an adjunct to the good life".[43] This was to become Augustine's definition of philosophy as well. An activity rather than a dogma, it was well suited to the appropriation of the artes as an internal propaedeutic. Philosophy's end became, in a sense, encyclopaedic: "to enable the learner, who through the study of the liberal arts has learned to think in universals rather than particulars, to fuse together all that he has previously learned in a concentrated exploration of ultimate reality."[44]

It is through his educational treatises, in particular the De doctrina christiana, that Augustine presents his ideal for Christian culture, and his plan for its great eneyclopaedia. His educational thought falls along two lines. First, he felt that in order to propagate the Faith amongst the pagans, especially the educated pagans, the Christian should have a thorough grounding in classical culture. The exegete and teacher of De doctrina christiana should be able to explain the Bible with the skill and thoroughness of a student of ancient literature, and argue on Christian dogma with the force and subtlety of a philosopher. Secondly, Augustine advocates that pagan learning "be integrated

with religious studies in a curriculum recognisably Christian in its direction".[45] In this, Augustine differed markedly from previous thinkers, and even from "liberals" like Basil, who could not envision a Christian education, but simply a Christian use of the traditional education. Though they rejected from the start the spirit which pagan education served, Christians felt that to send their children to a grammaticus was a necessary evil.[46] Its bad effects would be offset by instruction in the Faith at home, and young Christians would simply be encouraged to sort out what they had learned, interpreting it if possible, in the light of the Gospel.[47] Though there was no attempt to expurgate, there was also little attempt to integrate. Christians taught in the schools, and composed the fashionable poetry or prose without mentioning Christ, for their humanistic education had few common frontiers with their religion. In attempting to synthesize, Augustine, for all his caution, was making classical learning, not less dangerous, but more productive for the Faith. He was formulating as well a Christian encyclopaedic policy.

St. Augustine's encyclopaedia was an instrument of education, whose aim was a life happy through the knowledge of God. The educational process consisted not simply of learning anything and everything, but of acquiring wisdom "which leads to an understanding of principles of ever-widening generality".[48] This put Augustine in opposition to the curiosus,[49] and encourages the encyclopaedia's quest for an orderly structure and a synthetic and comprehensive philosophy. Wisdom itself was the unifying and explanatory principle. Scientia was a propaedeutic in that

the rational understanding of temporal things could only raise questions, not answer them. But *scientia* is also the subject of *sapientia*, whose power makes the knowledge of *scientia* possible. There are many sciences, but only one wisdom; many things to see, but only one light by which they are all seen.[50] Augustine includes philosophy within the canon of the *artes*, because *sapientia* is both that which culminates and that which permeates all true education.[51]

In *De doctrina christiana*, Augustine classifies all human *doctrina* into two great categories, that which is founded on the conventions of human society, and that which is based on observation. The first category is in turn subdivided into superstitious knowledge, which the Christian should of course eschew, and that which is not superstitious. This might be superfluous (like the fine arts) or useful (such as speech, writing and other techniques). The latter alone interests Christians, largely as an aid to the understanding of the second great category of sciences, those based on observation. This category is the basis of the true and universal knowledge of the encyclopaedia, and is divided into the empirical sciences (human and natural history) and rational sciences (the "sciences de l'esprit" or seven liberal arts).[52] Thus, *De doctrina christiana* outlines a threefold programme of encyclopaedic literature. Firstly, the exegete and teacher must know the matter of the *enkuklios paideia*, both the trivium, to solve textual questions, reason with pagans or heretics, and preach to the faithful, and the quadrivium, which leads to an understanding of universal number, "the divinely

ordained principle by which the universe is controlled".[53] Augustine's De musica, for example, rises from a rational discussion of rhythmics, to a definition of music as a force not simply yoking together what is otherwise inimicable, but revealing the unity behind all apparent diversity.[54] This is a practical illustration of how the subject matter of the artes can be used to develop the student's understanding of first principles.[55] Moreover, the arts will truly "liberate", i.e. give insight into the mind of God, if they are taught in the correct, significant order.[56] Secondly, the Christian intellectual must have a thorough grounding in, and a correct perspective on, the totality of human history, both of God's people and of the Gentiles. Thirdly, he must have a complete knowledge of natural history and cosmology, in order to fully understand Scriptural allusions to the habits of beasts or the movements of the heavens.[57] The liberal arts, natural history, human history: St. Augustine has sketched out the three major types of encyclopaedic literature. The history of the genre as a whole is that of an effort to achieve the unity of these three elements. Its zenith is the three-fold plan of Vincent of Beauvais' Speculum maius, truly the encyclopaedia of encyclopaedias.

Many historians have noticed that St. Augustine's De doctrina christiana seems to be somewhat half-hearted, even suspicious of the study of the arts and soiences. He wants it to be "modesta, sana atque succincta"[58], and to stay within the bounds imposed by the need to understand the Scriptures.

Augustine is here rejecting, not secular learning in general, but simply the dangers of curiositas to which young men brought up in the ancient rhetorical tradition would be prone. From a negative point of view, he is reflecting the somewhat harsh attitude towards learning with which philosophical minds of the Imperial period sought to combat curiositas. Marcus Aurelius thanks the gods that he is insensitive to literature and not in the least interested in science. Seneca tartly reminds young students that the artes are not to be studied, but to have been studied.[59] But if we look at this positively, we can see that Augustine desires, not to minimize the influence of science, but to maximize its potential, by freeing it from the sterility of curiositas. His own dissatisfaction at his superficial training in the artes indicates that he did not intend his exegete's knowledge to be deliberately flimsy. Even the knowledge of mirabilia could be put to Christian use if only to prove by the number of marvellous and inexplicable things in this world how miracles are not really "unnatural".[60]

Howie feels that Augustine's warnings about penetrating more than is necessary into any study are less an expression of suspicion than an exercise in economy. Indeed, Augustine declares that all knowledge is useful, and no effort of learning is wasted, provided that a hierarchy of intellectual values is maintained.[61] Above all, the student must keep in mind that the core of concentration is religious studies. All other studies flow into this one, and all are illumined and put into their proper perspective by this one. This view is supported by Augustine's

other works on education, notably the De catechizandis rudibus. The vastness of the topic and the limited amount of time at our disposal, he says, are no excuse for not being comprehensive. Even if some parts of a subject are treated sketchily and others given heavy emphasis, the teacher should order his material "so that the whole forms a unity in which the leading principles are never lost to view".[62] In structure lay the secret of comprehensiveness and synthesis, the key to the encyclopaedia.

De doctrina christiana is a source, not only of the three-fold structure of the encyclopaedia, but also of its symbolic philosophy. It is typical of Augustine, and of the Christian culture he proposes, that his symbolism has both pagan and Christian roots. From the neo-Platonists, he took the idea that "an inherent and essential symbolism pervading the whole order of things offered a key to the whole universe".[63] Symbols were not mere conventional signs designed to provide variety and some mental exercise to the human mind, but "a representation of the idea as it dwells in the intelligible world".[64] It is a means of perceiving a reality which, due to our moral limitations, we cannot otherwise see. The links between this theory and the doctrines of Incarnation and sacrament are obvious, and laid Christianity open to the reception of ancient symbolic thought. Throughout the middle ages, this neo-Platonic mystical symbolism co-existed with the more didactic, intellectual Aristotelian approach, which saw the symbol as a means to "kindle love by vision."[65] Through the symbols of Scripture, or nature, or history, God descended to man and man aspired to God. The

Christian source of Augustine's symbolic philosophy is St. Paul. Indeed, the Apostle of the Gentiles deepened and broadened the pagan symbolism by emphasizing that it was not enough simply to assent to the contingency of the created world or acknowledge that the order of the universe reveals a creative intelligence. We are also obliged to directly read the "book of reality", and to translate each of its signs into the reality they indicate.[66] In this way, symbolism was transformed from a philosophical proposition into a principle of encyclopaedic knowledge.

> Every object, animate and inanimate, has its symbolical meaning in the cipher-book of the universe, and the real function of Christian education is to provide training in the appreciation of this universal riddle.[67]

For Augustine, things have a double existence; in themselves, and as signs of other things.[68] When it comes to the Scriptures, any passage which does not bear directly on faith and morals is taken to act in a figurative sense,[69] and the exegete must be prepared to call upon Christian erudition to interpret it. This erudition is encyclopaedic, for it covers the spiritual meanings of everything; words, numbers, plants, animals, events, etc., for nothing can be a sign which is not also a thing. Often Scripture will supply the meaning. For example, due to its associations with the tribes of Israel and the Apostles, the number twelve has a whole series of significances. On the other hand, the secular sciences also flow into the Scriptures. A knowledge that the Pythagoreans attributed perfection to the number seven can deepen one's appreciation of the seven days of creation, or of the seven last words from the Cross. This type of sign is not a conventional one, whose comprehension is

dependent on the consent of a society,[70] but rather, it is built into the order of creation by God.[71]

"The letter killeth but the spirit quickeneth", and it is not only possible for, but incumbent upon a Christian to see everything symbolically. In this way, man's natural urge to understand all things is liberated and sanctified.

> He is a slave to a sign who uses or worships a significant thing without knowing what it signifies. But he who uses or venerates a useful sign divinely instituted whose signifying force he understands does not venerate what he sees and what passes away but rather that to which all such things are referred.[72]

Scripture is the most important body of signs, for the elucidation of Scripture both employs and illumines signs from other divine "books", such as nature and history. Thus, Augustine's plea for a Christian encyclopaedia in De doctrina christiana is centred on the exegesis of the Bible.

> Just as certain scholars have interpreted separately all the Hebrew, Syrian, Egyptian and other foreign names that appear in Holy Scripture without interpretation, and just as Eusebius has written a history because of questions in the divine books which demand its use, so that it is not necessary for Christians to engage in much labour for a few things, in the same way I think it might be possible, if any capable person could be persuaded to undertake the task for the sake of his brethren, to collect in order and write down singly explanations of whatever unfamiliar geographical locations, animals, herbs and trees, stones and metals are mentioned in Scripture. The same thing could be done with numbers, so that the rationale only of those numbers mentioned in Scripture is explained. I have discovered that some of this material, or indeed, almost all of it, contrary to my expectation, has already been explained and written down by good and learned Christians, but either because of common negligence or envious disregard it remains hidden.[73]

The encyclopaedic compilation desired by Augustine was what the middle ages attempted to provide. Although the mediaeval encyclopaedists often went beyond the strictly Biblical parameters

suggested by De doctrina christiana, they almost always claim that their works are intended to assist the Scriptural exegete and teacher of the Faith. Allegiance to Augustine's symbolic mentality was so profound as to be almost instinctive. Simply because things act as symbols does not negate their individual reality. The world is no illusion for Christians, because their symbolism operates according to analogy, not participation. This would transform, for instance, the ancient idea of the microcosm. Man was not a minor mundus through being a reproduction of the cosmos, but because both man and cosmos were created according to an analogous divine principle.[74] This affected their use of the idea of world harmony as well, making it a more flexible encyclopaedic instrument. "The Christian idea of world harmony makes possible the shift from one picture to another since they all converge in the transcendental."[75]

Being an orator brought up in a literary culture which had a profound belief in the connexion between things and the words which signify them, Augustine's symbolism is expressed primarily in verbal terms. God's creation "speaks", its individual creatures spell out "messages". Between heaven and earth, Christ is the link because He is the Word.[76] When Augustine became a Christian, he did not so much renounce rhetoric as convert it. Human speech took on for him the character of a Pauline mirror, through which the imperceptible is seen "in aenigmate". Moreover, verbal knowledge translates partial knowledge by faith into knowledge by direct vision.[77] Perception and expression are the two tasks of the Christian intellectual of De doctrina christiana,

who is both exegete and preacher. "The work treats verbal signs as a means of discovery of the Word in the interpretation of the Bible, and as a means of expressing the Word from the pulpit."[78] Perception and expression also reflect the basic Christian paradox that though words cannot hope to approximate the divine, Christ the Logos bade his followers preach the Gospel to all nations. The encyclopaedia embraced the needs of both exegete and preacher.

Moreover, according to Augustine, conventional signs bear a close and easily perceived resemblance to the thing signified,[79] but essential signs are not as easily relatable to their _significata_, expecially where spiritual things are concerned. Often these will be expressed by grotesque or outlandish signs, or even by enigmas. Such signs are, however, not primarily intended to mystify.

> An aenigma, like any other form of speech, and like speech itself, is designed to communicate information. Its built-in difficulties thus enhance, rather than reduce, its expressive powers. In attempting to convey the infinite incomprehensibility of God, the aenigma is the most useful _vox significans rem_.[80]

The encyclopaedists were to find this idea exhilarating, for it redeemed their taste for wonders and _mirabilia_ inherited from the ancients. The stranger the creature, the more improbable the combination of "properties", the greater hope the encyclopaedist had of eliciting some truly profound meaning. Perhaps the disparaging judgement of the older school of historians that the encyclopaedists only liked the _Physiologus_ for its odd and fantastic beasts carries a deeper truth than they anticipated.

It will have been noticed that Augustine's framework contains a third category not found in the ancient encyclopaedias. This was universal history, and though it owes its encyclopaedic status to Augustine, its roots extend far beyond him. There are hints of it in pagan antiquity. It is Jaeger's theory that the polis was the original model for the idea of the ordered universe. He deduces this from Anaximander's statement that things must compensate, in the legal sense, for their aggrandizement against each other by returning to their original state.[81] This sort of cosmic justice is closely related to Solon's political poetry, where time judges and rights all wrongs. Jaeger's theory is very controversial, and it is hard to say what degree of reality Anaximander would have felt lay behind his analogy. Yet it is quite possible that ancient thinkers, in an embryonic way at least, made the typically mediaeval connexion between society and cosmos, human and natural history. Plato does this, and even subordinates it to a philosophical and theological end in the Critylus. This unfinished companionpiece to the Timaeus was intended to supply from history the same lessons concerning the human condition that Timaeus drew out of cosmology. Together, they would provide a prologue to the Republic. That Plato should have suggested that the unrolling events of time "say" much the same thing as the physical fabric of the universe is a startling anticipation of the mediaeval viewpoint. The great and essential difference is that for Plato both the Demiurge and Atlantis are mythos, mere parables designed to illustrate a philosophical truth. For Christians, of course, the activity of God both as

Creator and as Lord of Time was very real. It is also noteworthy that long before the Christian era, historical writing had been following much the same pattern as scientific writing; that is, it was consistently being reduced to epitomes and compilations.[82] As early as Hadrian's time, summaries of and exerpts from Livy had all but replaced the original work. Like natural history, human history had become the hunting ground of the curiosus searching for topics and exempla for the rhetorical schools.[83]

From the very start, the uniquely Christian idea of the physical world and the uniquely Christian idea of history were profoundly linked. For Origen, the concept of cosmology as creation "necessitated a philosophy of the mind and of human culture that looked for a plan in the world of history comparable to divine planning in the physical world".[84] Because Christianity as a whole is based on the historicity of one man and one life, whose past and future form a web of prophecy, one would expect the writing of history to become an immediate arena of conflict between Christianity and classical culture. As it happened, the concerns of Christian and pagan historiography were so diverse that there was not even enough common ground for a confrontation.[85] It is quite startling to note than Ammianus Marcellinus and Orosius completed their works within eight years of each other.

While the traditional writing of history remained in pagan hands, Christians were intent on fitting the Biblical account into the known patterns of secular history, after the fashion of the account of Christ's birth in the Gospel of Luke. The resulting work of chroniclers and devisers of concordances

> made it possible to trace the contours of the Biblical landscape on a historical map familiar to educated Romans. They thus introduced the pagan convert to Christianity to a redemptive history for which the history he learned at school had no place; and at the same time they provided their Christian readers with a framework derived from the redemptive history on which their faith was founded, into which they could fit other historical information as it became familiar to them. For both the pagan convert to Christianity and the uninstructed, such works helped to map out the course of human history with the aid of the fixed points in the story of redemption. They compelled the pagan convert to "enlarge his historical horizon". They introduced him, as well as the Christian convert, to the idea of universal history, and at the same time, furnished the clues with the aid of which it could be read as bound up with man's destiny.[86]

Thus, even before Augustine, Christian history was on its way to becoming synthetic, comprehensive, and endowed with a "key". Augustine clarified and lent his authority to an already extant interpretation of the historical process.

Three aspects of Augustine's thought impelled him to develop a Christian philosophy of history. The first was the idea of memory, defining the connexion between past acts and the present activity of remembering.[87] The second was the idea of the rationes seminales, designed to account for the emergence of new species in time by positing that God implanted in His creation the "seeds" of those things which would not emerge into the fulness of being until later.[88] This gave creation a temporal aspect, and made the important point that though God only acts once, this action can unfold as a process. Finally the problem of free will and God's foreknowledge brought Augustine to the conclusion that the difference between eternity and time was a qualitative, not a quantitative one.[89] This made time as much a part of creation as the physical world, and hence, also a vehicle for a divine message.

The idea of God speaking through events raises the question of what distinguishes events which speak from those which do not. If all speak equally, what makes one series of events, the "privileged strand of history" embodied in the narratives of the Old and New Testaments, particularly significant? In other words, can Christian history be really encyclopaedic? Augustine's affirmative answer is based on the divine inspiration of the Bible, and on a parallel drawn from prophecy. To prophesy is to have insight into the significance of images.[90] Though Pharaoh actually has the dream of the fat and lean cattle, it is Joseph who prophesies the famine, because he can interpret the images. In essence, every Biblical author is a prophet, for divine inspiration discloses to him the significance of what he recounts. It is this insight, and not any dichotomy between man and God, that differentiates sacred from secular history. Since history is a record of events, not the events themselves, the sacredness lies not in the particular facts recorded, but in the quality of the narrative "presenting, under this inspiration, its historical material within a perspective which transcends that of the secular historian, for it is throughout conceived as part of the pattern of God's redemptive work".[91] It is precisely this orientation towards a unifying meaning which divides pagan and Christian encyclopaedias of natural science, and which makes the latter truly encyclopaedic. That Augustine meant history to be conceived in like terms is supported by his application of the metaphor of cosmic music to the vast fabric of human history,[92] and by his division of universal history

into six ages, reflecting the six days of creation.[93] For Augustine, the history set forth in the Bible "représente un principe qui permet de penser la totalité de l'histoire, de la comprendre, de lui donner un sens".[94]

In many ways, the idea of universal history, like the other encyclopaedic forms, would take centuries to ripen and mature. The first attempts to produce such a history were not too successful. Augustine commissioned Paulus Orosius to write a true universal history, of all times and places, from the point of view of God's providence and purpose.[95] In a way, Contra Paganos is universal in that it is based, although vaguely and unevenly, on the notion of four great world empires: Babylon, Macedon, Carthage and Rome. But Orosius basically failed to comprehend the potential of universal history. He interpreted Augustine's instructions to demonstrate that the sorrows of the world began long before Christianity as a mandate for a catalogue of historical horrors, while the unfolding of God's plan is cheapened to a rather tedious punishment of tyrants and wicked cities. Though Orosius' threadbare scholarship scarcely adds any value to the work, it had a long life, largely through the authority of its patron, Augustine, and of his original, encyclopaedic philosophy of history.

To conclude, Augustine developed the three-fold structure and the symbolic philosophy of the mediaeval encyclopaedia. In the total scheme of salvation, his encyclopaedia was an avenue, not only opening up the secrets of Scripture, but transforming the individual. "La Bible, l'histoire, la 'prose

du monde' n'ont d'autre fonction que d'ouvrir un espace de reminiscence du divin."[96] But the most important part of the programme in this respect was the liberal arts, "a kind of intellectual ascesis" for apprehending eternal truth.[97] The artes occupy a key position in the encyclopaedic programme, being as it were channels through which whatever lay behind the "languages" of words or things might emerge in a humanly comprehensible form.[98]

It is curious, but true that Christians felt little need to establish their own schools, even after the Church's triumph under Constantine made it possible, and the work of Augustine made it desirable. In the face of the barbarians, both pagan and Christian Romans clung to the educational system as if it embodied the superiority of their life and culture.[99] Nevertheless, the system did not cease to decline, and lose touch with the world. The death of city life meant that educated people, after their schooldays were over, frequently lost contact with the intellectual life of the times. The need of the barbarian kings for educated administrators absorbed the best minds of the age, such as Boethius and Cassiodorus.

Nevertheless, the advent of the barbarians gave an impetus to the formation of Christian schools in that it gave the Church a new sense of missionary urgency. In their zeal to reach pagans and heretics in a language they could understand, Christians came to actively oppose the old literary culture, whose aim was the production of a florid, consciously archaic and affected Latinity. In the light of his well-known evangelistic fervour, it is understandable that Gregory the Great felt that the study

and imitation of the classics was incompatible with the status of a clerk.[100] To this was added the growth of the monasteries, which emphasized not only an ascetic attitude towards culture in general, but a positive interest in theology. The Christian schools of cathedral and cloister, fired with a sense of a different mission and different methods, grew up alongside the existing classical schools, which they did not always displace, especially in Mediterranean lands. Following the De doctrina christiana, they were primarily designed to produce clerical exegetes and preachers. This was the basis of Isidore of Seville's organization of Spanish episcopal schools at the Council of Toledo in 633.[101] The Christian school was no pale imitation of its classical forerunner. Nor did it succeed only because it was the sole educational institution left after the barbarian invasions. It did not replace the ancient school, it ousted it. It was a new idea of education, "a seed, not a mere residue".[102]

The encyclopaedic work of Cassiodorus emerged from this educational situation, and under the influence of Augustine. The Institutiones is a compensation, for the failure of his and Pope Agapetus' scheme to set up a Christian school in Rome along the lines proposed by De doctrina christiana. Yet even his substitute, the monastery of Vivarium, is in line with the practice of the great Bishop of Hippo, who even before his ordination, taught the Faith and trained exegetes in a monastic atmosphere.[103] Cassiodorus' aim was to transform the monastery, hitherto regarded in strictly spiritual terms, into a centre for

the preservation and transmission of both sacred and secular culture,[104] and also to mobilize the seclusion and leisure of the convent to tend the flames of learning in a harsh and war-like world. In this he was a fundamentally innovative spirit, as Cassian had denied the value of the liberal arts in the study of Scripture, and most monastic rules enjoined reading and copying only for young and physically weak brethren.[105]

Furthermore, Cassiodorus' outlook on the relationship of sacred to secular studies is quite Augustinian. Since the Scriptures contain the substance of all the sciences and arts, it is not only useful, but a duty to know something of the latter. Because the arts have their origin in the divine mind, applying them to the study of the Bible means restoring them to their proper place and usage.[106] Like Augustine, he sees the quadrivium as an abstract, theoretical study which prepares for the contemplation of the incorporeal. Cassiodorus defines history in terms of an Augustinian effort to see the totality of the past as an expression of the Creator's will. In comparison with the encyclopaedic universal history which this philosophy demands, chronicles are "the mere shadows of history".[107] Also, he shares Augustine's delight in the symbolism of number.

Augustine initiated a long-lived mediaeval practice of arranging works according to a numerical symbolism, as if to emphasize their status as mirrors of a higher reality. The City of God is divided according to the twenty-two letters of the Hebrew alphabet, symbolic of perfection. Two groups of five books are devoted to refuting pagan accusations: this number was chosen

to suggest the negative principles of the Jewish Law. The more positive doctrines are arranged in three sections of four books each, to correspond with the twelve disciples and four Gospels.[108] Cassiodorus' Institutiones show how the structure of the encyclopaedia is being invaded by this number symbolism, seeking to give the work itself a divine significance similar to that of the mathematically ordered body of the world. The first book, dealing with Christian literature, is appropriately arranged according to a Christian symbolism, its thirty-three chapters corresponding to the thirty-three years of our Lord's life. The second book, on secular literature, is divided according to the seven liberal arts, the framework of the inherited wisdom of the ancient world. The number seven, symbolizing the days of the week in which God perfected his creation, is deemed by Cassiodorus to be continuous and perpetual,[109] like the circle that gave its name to the enkuklios paideia.

Of the two sections, the second "on human readings" was the more widely disseminated. It was heavily used by Isidore, Alcuin, and Rabanus Maurus for both definitions and framework, and factual matter.[110] As happened to Martianus Capella's work the Institutiones, though based on the non-encyclopaedic enkuklios paideia, became more and more encyclopaedic in the eyes of its readers. Vivarium's curriculum and bibliographical guide became a basic text-book of the early middle ages.[111] As the more technical and specialized works had come to be neglected long before, this book seemed to contain not only a plan and key to all knowledge, but its substance.

Comparatively speaking, it is easy to discern the influence of the content of Cassiodorus' encyclopaedia. For structure and philosophy, the case is more difficult. Despite the Augustinian background, Book II is not particularly thorough or explicit on how secular studies are to be integrated into the programme of study. The original division of the two parts of the Institutiones, and their separate fates, seem to suggest that as a comprehensive synthesis, Cassiodorus' work was not particularly successful.

To sum up, the Church Fathers transformed ancient science into the Hexaemeron, the only scientific classification of phenomena in the early middle ages. They also redirected the artes, and formulated the concept of universal history. St. Augustine mapped out the relationship of these three elements, and proposed a scheme for their encyclopaedic unification. However, the history of the encyclopaedia over the next seven hundred years is less an effort to achieve than to comprehend this ideal.

FOOTNOTES

1. Christopher Dawson, "The Scientific Development of Western Culture". Mediaeval Essays (London and New York: Sheed and Ward, 1953) p. 136.

2. Werner Jaeger, Early Christianity and Greek Paideia. (Cambridge, Mass.: Harvard University Press, 1961) p. 45.

3. ibid., p. 29.

4. ibid., p. 12.

5. ibid., p. 66.

6. ibid., pp. 28-9.

7. H.-I. Marrou, Saint Augustin et la fin de la culture antique. (Paris: de Boccard, 1938) p. 544.

8. Maxwell Sidney Luria, "Some literary implications of Hugh of St. Victor's Didascalion". Arts libéraux et philosophie, op. cit., p. 544.

9. Butler, op. cit., p. 25.

10. Marrou, Saint Augustin, op. cit., p. 376.

11. ibid., p. 381.

12. Luria, op. cit., p. 543.

13. ibid., p. 545.

14. For example, Dante, in his epistle to his patron, Can Grande de la Scala, outlines a fourfold interpretation of the Divina Commedia based on the categories of Scriptural exegesis.

15. Luria, op. cit., p. 547.

16. Sambursky, op. cit., p. 545.

17. Frank Egleston Robbins, The Hexaemeral Literature. (University of Chicago Ph.D. dissertation, 1912) p. 28.

18. Butler, op. cit., p. 22; Edmund Reiss, "Number Symbolism and Mediaeval Literature". Mediaevalia et Humanistica, New Series, Vol. I (1970) p. 161.

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20. Lynn Thorndike, "Early Christianity and Natural Science". Biblical Review, vol. 7 (1922) p. 37; Robbins, op. cit., p. 42.

21. St. Ambrose, Hexaemeron. Translated by John J. Savage. Fathers of the Church, vol. 42. (New York: Fathers of the Church, 1961) II:9.

22. Thorndike, "Early Christianity", op. cit., pp. 341-3; Robbins, op. cit., p. 51.

23. St. Ambrose, op. cit., I:5.

24. ibid., I:2.

25. ibid., II:8.

26. ibid., IX:3.

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28. J.-Th. Welter, L'Exemplum dans la littérature didactique du moyen âge. (Paris et Toulouse: Occitania, 1927), pp. 15-6.

29. for more information see F. Lauchert, Geschichte der Physiologus. (Strassburg: 1889); Max Wellman, "Der Physiologus. Eine religions-geschichtlich-naturwissenschaftliche Untersuchung". Philologus, Supplementband XXI (1930) pp. 1-116; Thorndike, History, op. cit., Vol. 1, p. 503.

30. Thorndike, "Early Christianity", op. cit., p. 336.

31. Cassiodorus, Introduction to Divine and Human Readings. Translated by Leslie Webber Jones. (New York: Columbia University Press, 1946): I:1:1-4.

32. Thorndike, "Early Christianity", op. cit., p. 353.

33. Robbins, op. cit., p. 65.

34. Marrou, Saint Augustin, op. cit., p. 448.

35. Robbins, op. cit., pt. I, p. 437.

36. ibid., p. 64.

37. Spitzer, op. cit., pt. I, p. 437.

38. Marrou, Saint Augustin, op. cit., p. 107.

39. ibid., pp. 137-43.

40. ibid., p. 145.

41. ibid., p. 266.

42. ibid., p. 287.

43. George Howie, Educational Theory and Practice in St. Augustine. (London: Routledge and Kegan Paul, 1969) p. 6.

44. ibid., p. 249.

45. ibid., pp. 222-3.

46. Marrou, History, op. cit., p. 428.

47. ibid., p. 429.

48. Howie, op. cit., p. 42.

49. Marrou, "Saint Augustin et l'encyclopédisme latin", op. cit., p. 282.

50. Howie, op. cit., pp. 107-8.

51. ibid., pp. 250-1.

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54. Spitzer, op. cit., pt. I, p. 443.

55. Howie, op. cit., p. 274.

56. ibid., p. 245.

57. Marrou, Saint Augustin, op. cit., pp. 403-6.

58. ibid., p. 278.

59. ibid., p. 281.

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73. ibid., 2:LIX.

74. Allers, op. cit., pp. 370-1.

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86. ibid., pp. 4-5.

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88. Knowles, op. cit., p. 48.

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90. Markus, op. cit., p. 15.

91. ibid., p. 16.

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CHAPTER THREE

THE EARLY MIDDLE AGES: FROM ISIDORE TO THE CAROLINGIANS

The figure of Isidore, Bishop of Seville, casts a long shadow not only across the intellectual life of the early middle ages, but also over the entire encyclopaedic tradition. Up to the time of Vincent of Beauvais, and even beyond, his Etymologiae Libri XX was a basic source-book for all areas of encyclopaedic knowledge. His De natura rerum, as this chapter hopes to show, had an even more profound influence on the structure and philosophy of this genre, while his Institutionum Disciplinae was the source of the rather interesting tradition of combining, or accompanying, an encyclopaedic work with a treatise on the education of princes. Isidore's programme is based on the liberal arts, and is designed to produce a sort of Platonic philosopher-king;[1] this is, as it were, a counter-weight to De doctrina christiana, whose aim is to build up the culture of the exegete and preacher, also from the foundation of the artes liberales. Clear evidence of the continuity of Isidorean influence is Vincent of Beauvais' De eruditione filiorum nobilium, whose aims and methods correspond closely to those of the Institutionum Disciplinae.

In most general accounts of the history of the encyclopaedia,[2] Isidore is remembered solely in terms of his Etymologies, a vast and incomplete compilation whose viewpoint is admittedly secular. The first four books deal with the liberal arts. Save for parts of the section on rhetoric, they might have been written by a fourth-century pagan. The books on God, the Church, and heresies[3]

have the air of being mechanically attached to the rest of the encyclopaedia, where references to the Christian faith are frequently omitted, even when the material is taken from the Church Fathers. For example, Isidore took his information on the atom from a sermon by St. Augustine wherein this data is used to help prove the possibility of resurrection from the dead. Isidore took the facts, but left the significatio behind. Does this imply, as Burnelle suggests, that he saw secular learning as existing for its own sake?[4] Where does this place the Etymologies within the context of our definition of the mediaeval encyclopaedia? Perhaps the best place to begin answering these questions is in the title of Isidore's encyclopaedia itself, for it signifies what he considered its most important aspect: its method of organizing knowledge and understanding the world.

Isidore's belief in the universal power of etymology grows out of late Stoicism, and the grammatical totalitarianism of works such as the Noctes Atticae and of the doxographic tradition. He tends in practice to interpret the activities of etymology broadly. Under its aegis are marshalled all the forces of grammatical analysis[5], differentia, analogy, synonym, and gloss. His philosophy of etymology is based on a twofold tradition: Hellenistic literary criticism, and Biblical textual and exegetical studies. Isidore's originality lies in his blend of the two.[6] For him, the act of knowing consists of a fusion of etymological analysis with a sort of analogical synthesis.[7] Although Isidore's method is based on the knowledge of words, it is "moins soucieuse d'éclairer, sur le plan de la grammaire, le processus linguistique de la

formation des mots à partir de leur etymologie, que preoccupée de découvrir la raison dernière de leur être. Bref, l'esprit de la recherche étymologique d'Isidore est de l'ordre de pourquoi plutôt que de l'ordre de comment."[8] In short, his method is of quite unprecedented encyclopaedic promise: etymology would do justice to the comprehensiveness of the work, and analogy would effect a synthesis. Isidore's encyclopaedism was fundamentally grammatical. His world was a giant pyramid of distinctions, capped by the great distinction that exists between the three Persons of the Trinity.[9]

In practice, however, the Etymologies of Isidore of Seville presents a somewhat ambiguous encyclopaedic picture. This ambiguity has a double source: Isidore's attitude towards the relationship between classical learning and Christian culture, and the built-in weaknesses of the etymological method. Though Isidore read De doctrina christiana and quotes frequently from it,[10] the extent to which he understood and sought to embody its ideal of a Christian encyclopaedia seems to vary from book to book of the Etymologies. Within his intellectual temperament, the schoolmaster, the curiosus with an "ambition universaliste" for learning, and the Christian churchman seem, from time to time, to gain dominion over one another, but seldom achieve a synthesis. In the first book, on grammar, Isidore appears to experience difficulties in adapting his matter to the needs of the theologian.[11] On the other hand, his book on rhetoric is a masterful adaptation of both the ars rhetorica and the ancient theory of tropes and figures for Christian preachers and exegetes. The classical style of

Cicero is praised, not only on aesthetic grounds, but also because its clarity and dignity are best suited to the simplicity and sobriety of the Gospel message.[12] Nor does his respect for Cicero and Quintilian hinder him from disapproving of their use of archaism.[13] However, even this section on rhetoric is not particularly thorough in applying the programme of De doctrina christiana. In essence, Isidore is too much a man of the ancient world, raised in a time and place where the ancient school and its methods and texts prevented him from understanding why Christianization of culture should be necessary, or how it could be accomplished. Hence the Christian allegory of the star-names in the Book of Job which we find in De natura rerum, could exist side by side with Etymologies III:71, where the star-names are rather blandly de-mythologized and "moralized", according to the Stoic-inspired conventions of the ancient scholia on the poets.

The old scholarly argument whether Isidore is the last of the ancient or the first of the mediaeval encyclopaedists might be clarified to some small extent if the question were considered under the separate headings of structure and philosophy. As far as structure is concerned, the table of contents of the Etymologies suggests a rather careless mixture of Varro and Pliny. The books on the liberal arts are followed by sections on medicine, architecture, God and the angels, time, plants, animals, the world, astronomy, and mechanica. Although "the clarity of his disposition of his subject matter under appropriate headings appealed to the mediaeval mind as a convenient assistance in its search for knowledge",[14] it is also true that philosophically Isidore's

structure suggested very little. Like Varro's and Pliny's encyclopaedias, the Etymologies was pillaged by later encyclopaedists, from Bede and Rabanus Maurus onwards, who incorporated its materials into what they felt were more encyclopaedic schemes. When approached from the point of view of encyclopaedic philosophy, the question of Isidore's position between the ancient and mediaeval worlds is a far more delicate one. He tends to mistake for Christian knowledge what is simply the knowledge of antiquity as expressed by the Christian Fathers. He will take morsels of science from Augustine and Jerome, yet omit the spiritual context in which this knowledge was placed. These he arranges beside extracts culled from pagan authors, with no particular indication of a system of values. A structure which would suggest subordination to, and integration within a Christian universe is quite lacking. In short, "il n'utilise d'ordinaire le De doctrina christiana de saint Augustin qu'avec myopie et paresse d'esprit."[15] The result is not synthesis, but peaceful coexistence.[16]

This attitude can in part be explained by Isidore's geographical and historical setting. Coming from the highly Romanized province of Betica, a fellow countryman of Martial and Seneca, Isidore lived at a time when paganism of an educated and literary sort was dead. Hence he saw its dangers, not in doctrinal, but in moral terms: philosophical pride, rhetorical vanity, etc.[17] Such paganism as he personally came into contact with was popular, and its mischievous results were ignorance and superstition, not philosophy and poetry. For Isidore, ignorance and superstition,

offered greater threats. However, Isidore's environment does not explain everything. In his personal mental habits, as displayed in the Etymologies at least, he shows little interest in an Augustinian synthesis, and interprets the humanism and breadth of culture of the Church Fathers as sanctioning the autonomous study of secular sciences.[18] "One thing is clear -- the starting point is never theology. Isidore always considered the liberal arts and secular learning as the true basis of a Christian education."[19] This is particularly evident in his treatment of philosophy, which he champions as an independent discipline, even though most of his materials come from those very Fathers who laboured hardest to convert philosophy into an instrument of Christian truth.[20] In citing a number of opinions without choosing any, Isidore is not so much offering various possibilities for Christian interpretation as following the old Hellenistic doxographical tradition of philosophical eclecticism.[21]

It is indicative of the Etymologies' cultural ambiguity that Sanford sees its major contribution as providing an adjunct, not to scriptural exegesis, but to the reading of the classics.[22] It is also significant that Isidore's pupil and editor, Braulion of Saragossa, saw Isidore as a reviver of ancient intellectual values.[23] This very notion of resurrecting something dead will be met again in the Great Renaissance. It is symptomatic, I believe, of a point of view which sees little fruitful contact between classical learning and Christian culture. The closest Isidore came to a synthesis of the two, outside the book on rhetoric and, to some extent, that on music, was a mechanical mixture of sources.

The second root of ambiguity is the etymological method itself. Since this tends to "treat each subject by defining the terms belonging to it"[24] it often results in a picture of the world at once fragmented and static. It is fragmented because etymology concentrates inordinately on the uniqueness and independent reality of a thing,[25] and static because it loses in its passion for watertight grammatical categories, not only the idea of movement and change, but also the sense of continuity and connexion which is essential to all true science, and to the mediaeval encyclopaedia. "Hora enim finis est temporum, sicut et ora sunt finis maris, fluviorum, vestimentorum",[26] as if hours and sea-shores existed as disconnected, impassive realities in themselves. The etymologist believes that the origin of the word will explain the nature of the thing it designates. The nature of a thing is composed of attributes, among them motion, change and behaviour. All these spring from the unalterable, inviolate centre of the creature's being.[27] The extent to which this etymological view of reality influences encyclopaedic practice can be gauged by the prevalence of such titles as De natura rerum, or Bartholemew the Englishman's De proprietatibis rerum. It is part of the centripetal effect of this method that things should be believed to contain their own explanations in toto.[28] Moreover, it flung wide the doors of the mediaeval encyclopaedia to receive the jumbled and inconsistent mass of ancient mirabilia,[29] for any "property", however far-fetched and unconnected, could be explained with reference to the "nature" of the creature. Clearly, the effects of this etymological method are visible on the

pages of every mediaeval encyclopaedia. Nevertheless, it is basically anti-encyclopaedic, or at least potentially so, unless the information is set forth in a comprehensive and synthetic structure, and infused with a philosophy founded on the creative power of God. As we have seen, Isidore's structure has neither of these two qualities, and the Etymologies seems to deliberately omit references to a Christian philosophy.

What insures some encyclopaedic value to the Etymologies is, ironically, the fact that Isidore was genuinely enamoured of the literature and life of pagan antiquity. What particularly captivated him were the notions of the microcosm and of harmonia mundi.[30] The microcosmic world-view is essentially one which emphasises sameness in diversity and diversity in sameness.[31] Isidore's etymological outlook corresponds to this same world-view, for in applying a universally applicable "key", he exaggerates the uniqueness of the individual creature. It is thus fitting that the idea of the microcosm should occupy such a prominent place in Isidore's works. Hence, if the etymological method itself was not entirely successful, and had no future as an encyclopaedic form, it was nonetheless, to some extent, in accord with the mediaeval encyclopaedic philosophy. Nor was it completely remote from the ideals of harmony and totality so characteristic of that philosophy. Though resulting in practice in a somewhat fragmented picture of the world, it held out the promise of a synthetic explanation of that world as a piece of divine "music", articulate and harmonious. What might appear to modern readers as a collection of punning para-etymologies was

within the context of ancient and mediaeval linguistics, an expression of belief that the cohesion of sounds revealed the cohesion of reality. "The phonetic assonance was a revelation of truth."[32]

Furthermore, the Etymologies does suggest, in spite of its haphazard structure, the possibilities of unity between the three encyclopaedic structures inherited from classical antiquity and the Church Fathers. In a discussion of the Augustinian idea of the liberal arts as a propaedeutic to abstract thinking, Isidore makes the interesting statement that the artes were devised by philosophers to culminate in the study of the stars and in the contemplation of the heavens.[33] This seems to suggest that Isidore saw a bridge between the two encyclopaedic structures of cosmology and the liberal arts. Like Martianus Capella and Cassiodorus, he interprets geometry in its etymological sense, allowing his discussion of the art to fade into an account of the countries of the world.[34] Though this has an adverse effect on the clarity of his own encyclopaedic organization, it reveals Isidore's awareness of connections between encyclopaedic forms.

Finally, the etymological method must be given credit for representing a scientific advance in the writing of encyclopaedias. Thorndike considers Isidore to be less superstitious than Pliny, and contrasts the Bishop of Seville's belief that the methodical study of word-origins contained a key to the reality that these words expressed with Pliny's faith in charms and incantations. The one was, all things considered, scientific in spirit; the other was arbitrary and magical.[35]

In conclusion, it was Isidore's personal method, the etymology, which was both the strength and the fatal weakness of his encyclopaedia. He regarded this work as the culmination of his career,[36] one for which he had been preparing and perfecting the tools in such early works as the Synonyms and the Differences.

> Les deux oeuvres marquent ainsi des étapes de la pensée isidorienne vers une synthèse entre les méthodes de l'enseignement élémentaire heritées du grammaticus antique et la matière de l'encyclopédisme antique, envisagée au double niveau de savoir inclus dans ce mot: les sept arts de la Sagesse et de Martianus Capella et Cassiodore, mais aussi le connaissance scientifique universelle à laquelle avaient visée tour à tour de manière distincte Varron, Pline ou Apulée. La grandeur et la servitude de l'oeuvre isidorienne est d'avoir tenté la réduction de ces deux idées à la plus modeste d'entre elles, en faisant des methodes d'analyse grammaire antique les catégories fondementales d'une penseé encyclopédique encore fidèle à ses ambitions universelles.[37]

It is both a tribute to the success of the Etymologies, and an indication of its failures from the mediaeval standpoint, that the second great encyclopaedist of the early middle ages should have been at once so dependent on, and so independent of the works of Isidore. Rabanus Maurus, pupil of Alcuin, abbot of Fulda and bishop of Mainz, was steeped in Isidorean learning, yet his De clericorum institutione and De universo display a fundamentally different spirit. At first, it seems we have taken a step backwards in the mediaeval encyclopaedia's progress toward a full synthesis, for Rabanus separated the educational encyclopaedia and the encyclopaedia of the created world which Isidore united. However, when these works are examined more closely, it will be seen that from the mediaeval viewpoint, a gain in terms of encyclopaedic clarity and unity has been made. First, the De

clericorum institutione takes the material on the artes contained in the Etymologies and relates it in a thorough manner to an Augustinian programme for the training of exegetes and preachers. Second, the De universo adds allegorical meanings and a Christian structure to the picture of the physical world painted by Isidore.

Rabanus' subtitle to De universo emphasizes the changes he has made in the spirit of the Etymologies and, one is tempted to say, offers a mild rebuke to Isidore's encyclopaedic failures: "de rerum naturis, et verborum proprietatibus, nec non etiam de mystica rerum significatione."[38] Rabanus also completely rearranged Isidore's order of topics so that they would more pointedly suggest the subordination of the secular to the sacred element. This is basically the Hexaemeral scheme, beginning with God and ending with man. Moreover, he divided De universo into twenty-two books, a number symbolic of divine knowledge, since there are twenty-two books in the Vulgate New Testament, and an equal number of letters in the Hebrew alphabet. Rabanus left out very little of Isidore's material, and the Christianization he added insured its popularity with his contemporaries and posterity.[39] It was, in fact, the first encyclopaedia to be printed: this shows the value his allegories and rearrangement had for the middle ages. He certainly approached the task of elucidating the mystical meaning of everything with a heroic sense of thoroughness. Even the medical information, normally quite straightforward in mediaeval encyclopaedias, was given a significatio, and related to Biblical miracles.

Perhaps Isidore of Seville shows more clearly the inspiration of De doctrina christiana than I have given him credit for, because he does believe in the positive usefulness of pagan learning to Christians.[40] The problem with the Etymologies is that he brings vast quantities of knowledge into the purview of the Christian intellectual without properly synthesizing it or defining that system of values which Augustine considered essential to the right use of such learning. In this respect, Isidore's De natura rerum, though not as vast as the Etymologies, is at once more Augustinian and more mediaeval.[41] It is also more encyclopaedic, both in structure and in philosophy, and had a much greater influence on these aspects of the tradition. Fontaine sees De natura rerum and its companion piece, the Liber numerorum as "les syntheses partielles de la science et de la foi, comme les fragments d'un Speculum Mundi qu'Isidore ne s'est senti ni la force ni sans doute la vocation de réaliser".[42]

The Liber numerorum is the direct fulfillment of the hope expressed by Augustine in De doctrina christiana that some generous Christian scholar would compile a handbook of number used in the Bible, together with their mystical significances. Indeed, Isidore took most of his allegorical meanings for numbers directly from Augustine's own sermons and exegetical works. He also included many numbers not found in Scripture, but which he felt expressed the numerical foundations of Creation.[43] Though in this he transgressed the letter of De doctrina christiana, it was out of obedience to that Augustinian spirit which sees number as the essence of nature that he did so.[44] The fascination of the Liber

numerorum for students of the encyclopaedic tradition lies in Isidore's use of number as a connecting link and a common element between the three encyclopaedic structures. Of course, number was a key to the physical world and to the macro-microcosmic relationship,[45] yet for Isidore, it is time which most explicitly "revèle l'empire des nombres sur tous les êtres".[46] Number symbolism extends as well to the sphere of human knowledge and philosophy.[47] Though Isidore puts pagan and Christian symbolism on parallel planes, where each can offer explanations of the other,[48] the exegetical and Augustinian framework of the Liber numerorum make it a far clearer expression of the Christian encyclopaedic philosophy than the Etymologies.

De natura rerum is an even closer approximation to the Augustinian idea of a Christianized science. It was written at the request of King Sisebut in order to dispel, through rational explanations, the superstitions of the ignorant regarding celestial and meteorological phenomena, and as such, it retains a faint odour of Ionian science, also intent on replacing mythos with logos.[49] Indeed, Fontaine feels that the title of the treatise was taken from Lucretius, with whom Isidore shared a rationalizing aim, if not his atheist and materialist philosophy.[50] Amongst Christian scientific writers, Isidore was a bit of a pioneer, for Ambrose and Augustine, due to the mischieveous popularity of astrology in their time, had been rather suspicious of the study of the sky.[51] Nonetheless, De natura rerum is a deeply Christian work, whose inquiry into the nature of the cosmos was designed to prepare the Christian soul for the knowledge of God.[52] Isidore

openly declares that he is offering an aid to the exegete,[53] and gives explicit allegorical meanings to the phenomena he investigates. Here he stands in the tradition of Augustinian mystical astronomy, which considered the heavens as a symbol of particular value, requiring its own spiritual interpretation.[54] For Isidore, the rhythm of night and day symbolizes the economy of salvation. The times and seasons are images of various aspects of mortal life. The nature of the sun is a natural Christology; that of the moon, the stars and the rainbow is a theology of the Church. Nowhere is the contrast between the Etymologies and De natura rerum more revealing than in the comparison of their respective chapters on the sun. The account in Etymologies III:49-52 is in the dry straightforward style of the Hellenistic doxographers. In De natura rerum[55] there is an elaborate comparison of Christ to the sun, a metaphor which spills over the borders of the section devoted specifically to this "planet" into the descriptions of the moon, the other stars, and rainbows. The whole pattern of heavenly movements becomes a vast, closely-knit simile of the relationship between Christ and His Church. Whereas in the Etymologies, Isidore seems intent on banishing the mystical significances of things and asserting the independent value of secular knowledge, he behaves in De natura rerum as if the factual information of the scientist and the allegorical insight of the exegete were inseparable.[56] Moreover, in discussing the pagan names for the stars cited in the Book of Job, Isidore tells how secular science served sacred studies in terms which clearly echo De doctrina christiana.

> Quo vero eisdem nominibus sacra utitur scriptura, non eorum idcirco vanas adprobat fabulas, sed faciens ex rebus visibilis invisibilium rerum figuras ea nomina pro cognitione hominum ponit, quae late sunt cognita, ut quidquid incognitum significat, facilius per id quod est cognitum humanis sensibus innotescat.[57]

A good indication of the high symbolic value placed on cosmology and astronomy is that it was was by far the most highly developed part of the quadrivium in the early middle ages.[58] It was probably the only mathematical science which was taught to any extent in monastic schools. Bede's textbooks, Gregory of Tours De cursu stellarum, and Alcuin's De astronomia are witnesses to the kind of instruction which grew out of the practical need to tell time and calculate dates. Isidore's major innovation was to turn this cosmological treatise into an encyclopaedic form. His own De natura rerum is simply the seed of this transformation, but all the important elements are present, waiting to be developed by Bede and others whose works were namesakes of Isidore's. To begin with, Isidore's cosmology is heavily dependent on the Timaeus, as it appeared in the commentary and translation of Chalcidius.[59] It is possible that Chalcidius dedicated his work to a Bishop of Cordova; this would go far to explain Isidore's precise knowledge of it.[60] Isidore uses the arguments of the Timaeus in two ways. First he takes as his basic philosophic stand Plato's belief that the perfection of the cosmos indicates the presence of a wise Creator.[61] However, Isidore interprets this wisdom in an explicitly Christian way. Secondly, he lays greater emphasis on hierarchies and correspondences in the De

natura rerum than in the Etymologies. Here, he closely follows the Timaeus, but with extensive Christianizations.[62] There are two by-products of this affection for symmetry. The first is, so to speak, the great temptation of the mediaeval encyclopaedist, one to which Isidore's grammatical habits made him particularly susceptible. He tended to choose the materials available to him with an eye to this desire for system and balance,[63] and even to invent categories where one hierarchy did not correspond precisely to another. Secondly, the De natura rerum sets forth a very full and explicit statement of microcosmic theory. The universe signifies man "secundum mysticum sensum" in its elemental constitution.[64] This is but one type of microcosmism; Isidore elucidates others elsewhere. However, this elemental microcosmism is of particular importance because Isidore makes it an encyclopaedic vehicle through the illustrations which accompany De natura rerum. The treatise and the drawings were associated from very early on. They were probably devised by Isidore himself, or at least by his scriptorium, and their generally circular form gave the work its alternate title of Liber rotarum. The calendar figure,[65] the diagram of the circles of the world,[66] and the plan of the universe[67] all have a human head in the centre. The culmination of this is the famous Mundus-Annus-Homo diagram, in which matter, time and man are connected through the shared qualities of the four elements. As Southern pointed out, this formula, even when the possibilities of understanding and exploring it were few, remained a sort of slogan for the mediaeval humanist and intellectual, the emblem of their craving for a synthetic and universal knowledge.[68]

The historical importance of this three-fold correspondence in De natura rerum lies primarily in the connexion between the world and time. Isidore felt that the first thing to be created was the day.[69] His treatise thus begins with the divisions of time. Taking his cue from Genesis 1:14 and the Timaeus, he associates the motion of the heavens with the regular progress of time.[70] Finally, Isidore achieved Augustine's proposed encyclopaedic innovation by concluding De natura rerum with a short chronicle of the six ages, a sort of outline universal history. This was the first attempt to fuse the encyclopaedia of creation with that of universal history, for though it does not follow the traditional Hexaemeral form, De natura rerum is an encyclopaedia of creation, for the order of the four elements which Isidore follows is exactly the order of their appearance in Genesis.[71] Creation is made "the touchstone by the aid of which was interpreted not only the material world, but also the course of history."[72] Though Isidore's resources were inadequate to fill the ambitious scope of De natura rerum, the treatise had an incalculable effect on the encyclopaedic tradition. The fusion of nature and history into a form which satisfied both Genesis and the elemental theory of classical antiquity was far more comprehensive and synthetic than the Etymologies.[73]

The work of the Venerable Bede as an encyclopaedist can best be understood within the context of Isidore's De natura rerum, for the major intellectual preoccupations of the monk of Jarrow were allegorical exegesis, cosmology, time and history. In his works, the body of science inherited from antiquity takes on a

new unity and purpose. He saw number, the foundation of the quadrivium, as at once the basis of the physical world, the measure of time, and a primary Biblical symbol. For example, in his commentary on the Apocalypse, the number seven is a Biblically sanctioned emblem of both the world and time: "Solet enim universitas septentrio numero designari, quod septem diebus cunctum hoc seculi tempus evolvatur."[74] His two text-books of computus, De temporibus liber and De temporum ratione, proceed from instructions on the calculation of Easter to chronicles of universal history. This reflects both the Augustinian philosophy of history, and the monastic practice of transforming the blank left-hand side of Paschal tables and calendars into an annalist's and hagiographer's notebook.[75] This union of historical and astronomical time, of chronicle and chronology "inevitably developed from the Christian calendars under the stimulation of the Catholic doctrine that the physical, moral, and spiritual worlds were one and inseparable."[76] Chronology represents, therefore, an encyclopaedic tendency, one which Bede was anxious to give a full Christian value to by adopting the B.C.-A.D. division of Dionysius Exiguus.

Though C.W. Jones would put Bede's De natura rerum with his works on Genesis, Bede himself associated this work with his computus texts.[77] Like Isidore, he sees cosmology as both an introduction to time, and as an ancilla to Biblical exegesis. Bede patterned this treatise on Isidore's, but transferred the chapters on time to the companion-piece, De temporibus. In place of this section on time, he substitutes a brief account of the six days of creation, as if to preserve and emphasize the

Hexaemaeral setting of his archetype.[78] Thereafter, he proceeds according to the scheme of the four elements. But Bede is not an uncritical imitator of Isidore. His is a finer scientific mind: his thought is less vague and more consistent,[79] and his knowledge of both chronology and history is more ample.

To Bede, the scientific study of time and the understanding of history were inseparable. Both were grounded in the creation, both focused on the return of Christ at the end of time.[80] Bede had a keen sense of the solidity of time, of its mystical progression from and towards eternity, and of its status as an image.[81] Hence his works proceed from the smallest unit of time to the largest both on paedagogical and on philosophical grounds. "Bede saw everywhere the whole reflected in the part, and to him the hour, the day, the week and the month were but microcosms interpreting the greater unity" of eternity.[82] Bede rounds out his treatises on time with an outline of universal history which far surpasses that of Isidore of Seville. It is "a chronicle of the world more chronologically consolidated and better fitted with historical facts."[83] In its Augustinian spirit and its concern for detail, it heralds the encyclopaedic histories of Peter Comestor and Otto of Freising.[84]

It is not surprising that Bede was cautious and mistrustful when using Isidore's works. Unlike Isidore, Bede was basically an exegete and student of the scriptures, and naturally preferred a more Augustinian encyclopaedia,[85] stemming from and flowing back into the words of the Bible, to the overtly secular Etymologies.[86] Bede was also one of the major exponents of the allegorical

method of interpretation,[87] and popularized its use in the early middle ages.[88] From this point of view, the Etymologies offered only unredeemed fact, while Bede's own scientific knowledge surpassed anything Isidore set down in De natura rerum. Moreover, Bede had little sympathy with Isidore's marked openness to classical culture,[89] and was keenly aware of the ambiguity of the Etymologies.[90] Where Isidore illustrates his grammar from the ancient poets, Bede prefers (with the exception of Vergil) their Christian counterparts. Yet in terms of producing an encyclopaedic philosophy within the Augustinian mold, Bede was possibly the more successful of the two. Perhaps it is true that the area covered by the old Empire was too deeply implanted in the ancient ways to boldly devise new forms and make innovative judgements on the values of various areas of knowledge. The Irish and the Anglo-Saxons were, in this respect, a little freer. From this point of view, there is a certain symbolic justice in the background of the two men whom Charlemagne invited to his court to lead his cultural and educational programmes: Paul the Deacon, from the ancient heart of Mediterranean culture, and Alcuin, from a remote and slightly detached outpost.

In the capitulary of 789, and at the Council of Chalons in 813, Charlemagne formally commanded dioceses and monasteries to take on teaching activities. The programme of education he had in mind was in many ways encyclopaedic. In the 790's, he wrote to Baugulf, Abbot of Fulda, the Epistola de litteris colendis, emphasizing that the aim of his policy was to produce skilled exegetes, and in particular, scholars who were apt at ascertaining

the spiritual meaning of the Bible's "figures and tropes and other forms of speech".[91] It is, in short, an Augustinian programme.[92] Its foundation was to be the seven liberal arts,[93] and much of the cultural achievement of the Carolingian ages consists of a rediscovery, reinterpretation, and revitalization of the encyclopaedia of the liberal arts. The schoolmasters of the time used Martianus Capella, Cassiodorus, and Isidore as basic classroom texts, but in commenting on them to their pupils, they discovered that the structure as well as the substance of the old enkuklios paideia offered a new synthetic vision of human knowledge. Alcuin sensed that the understanding of the liberal arts was intimately connected with that of the world of nature, for he saw the artes as part of God's creation. His idea of their status as creatures was far more literal than that of Augustine or Cassiodorus; for him, they were "a part of nature, for man to find and develop."[94] Unlike Isidore, Alcuin sought not only a revival of classical learning, but its transcendence by a new Christian culture. The new Athens in the kingdom of the Franks was greater than the old, for it not only had the seven liberal arts, but also possessed the seven gifts of the Spirit.[95] The age of Alcuin believed in Augustine's promise that the liberal arts would lead to a perception of heavenly truth, and in the monastery of St. Gall, a painter from Reichenau depicted the figure of Divine Wisdom as a mother seated amongst her daughters, the arts.[96]

The brilliant and enigmatic John Scotus Erigena, though deemed by many historians of philosophy to have been quite uninfluential in the development of mediaeval thought, nevertheless

made a rather profound impact on the encyclopaedic tradition. First, he stands at the apex of Carolingian speculation on the nature of the liberal arts, and their relationship to philosophy and the growth of the Christian intellectual. Second, his De divisione naturae deserves our attention, for it expresses an encyclopaedic outlook which is fascinating in itself, and which deeply influenced later writers such as Honorius Augustodunensis.

To his contemporaries, Erigena was known, not primarily as a philosopher, but as the master of the palace school of Louis the Pious. Like most schoolmasters of any standing at that time, he wrote (or else his students compiled from notes) a commentary on his basic text, the De nuptiis of Martianus Capella. However, he was the first commentator to consider in depth the mythological setting of the divine wedding.[97] Erigena interpreted this as the fulfilment of Cicero's dream of a synthesis between eloquentia and sapientia, a synthesis which lifted the artes from the status of a mere propaedeutic to that of an integral part of divine wisdom.[98] This is, however, a Christian wisdom, whose power extends far beyond the exercise of rational thought. A crucial passage in the commentary discusses Urania's gift of a mirror to Psyche:

> In qua virtute dico veluti in quodam speculo clarissimo lumine renidenti dignitatem naturae suae et primordialem fontem humana anima, quamvis adhuc merito originalis peccati ignorantiae nebulis circumfusa, perspicit et quonian ex sapientiae studiis et donis Virtus recognitione originis suae et libertatis notitia humanae distributor naturae, pulchre Sophia aditis Animae speculum spiritualis notitiae et donasse et finxisse discribitur.[99]

This passage, taken in conjunction with the description of the ascent of Philology as a return to the source of being through

the study of the arts, represents a new stage in the Christianization of knowledge. Like Hugh of St. Victor, Erigena saw the intellectual life of the Christian not simply as an assistance to, but as an integral part of the economy of salvation. A perception of truth, like an act of charity, was of value in restoring the obscured image of God in man. The seven liberal arts were the divinely-chosen instrument of this restoration, for "omnes artis quibus rationalis anima utitur naturaliter omnibus hominibus inesse".[100] It is important for the history of the encyclopaedic tradition that Erigena added the study of nature to that of the arts: together, they would lead the soul back to God.[101] To the usual formulations of microcosmic theory, Erigena added a new epistemological aspect by drawing a detailed comparison between the order of the heavenly bodies and the modes of knowledge possible in the human mind.[102] Isidore and Bede had used microcosmism to bind together the encyclopaedic form of creation and universal history; Erigena suggests that it might also provide a synthesis between the encyclopaedia of nature and that of the artes.

Though De divisione naturae is "a vast analysis of reality, making no attempt to catalogue facts",[103] it is exceedingly important as a revival of the Hexaemeron, in a new, more metaphysically suggestive setting.[104] Just as the liberal arts have their foundation, not in convention, but in the human soul, so also dialectic resides in the very nature of things.[105] This is a dialectic of theophany, of the various and innumerable appearances of the Creator in His Creation. "Alles was ist, ist Gottes Theophanie. Jedes Einzelne ist ein Modus des Ursprungs, der sich

in ständigen Metamorphosen befindet."[106] Erigena goes so far as to say that before His Creation, God does not realize a full consciousness of Himself, and that the ultimate act of creation was the Incarnation.[107] Through the Incarnation, the true nature of the created world is revealed. It is the express image of the Father, inasmuch as everything which is, is God -- "Esse omnium est superesse divinitatis."[108] The world of nature is God. It can be nothing else, for He created it from nothing, that is, from Himself.

Here lies, of course, that famous charge of pantheism that has often been brought against De divisione naturae. It is my personal belief that within the context of Dionysian negative theology, or the neo-Platonism of Chalcidius and Macrobius from which Erigena worked, the charge of materialism or pantheism can only be brought against him if his difficulties in devising a proper metaphysical vocabulary are utterly ignored. In fact, he consistently emphasizes the difference between that which is uncreated and that which is created. In his eyes, it proves the omnipotence of God, not that there is no difference, but that there is no contradiction between Creator and creature.[109] It is a delicate question, one that requires a more finely-honed language and a better-articulated logical structure than Erigena possessed. It should be remembered that his work was only condemned at the beginning of the thirteenth century, when it was taken up, and possibly misrepresented, by Amaury of Bène and his followers.

De divisione naturae found a small reading public, mostly in the British Isles and in the Schottenkloster of the Rhine and

Moselle valleys. It was from the monastery of St. Jacobus in Regensburg that it would re-emerge, in the twelfth century, through the encyclopaedic work of Honorius Augustodunensis. By that time, and in those hands, the pantheistic overtones were, generally speaking, lost. What remained to influence the subsequent encyclopaedic tradition was Erigena's theory of the connexion between divine and human knowledge. Since we are mortal and created beings, whom the tragedy of the Fall has intellectually and spiritually blinded, "ipse Deus in seipso ultra creaturam omnem nullo intellectu comprehenditur".[110] Yet this is a cause for hope, not despair, for all things are theophanies and images of God. To ascertain something's true being or *esse* is to see God, who is the *esse* of all, yet who is in His own *esse* incomprehensible. This is, in short, a triumph of encyclopaedic optimism, yet it contains the proviso that He remain utterly unknowable, to be truly seen only in mystical union. The study of nature and of the arts becomes, therefore, a propaedeutic to this ineffable vision: it is thus that Hugh of St. Victor and Vincent of Beauvais saw it.

The schoolmaster Remigius of Auxerre, like Erigena, saw the *De nuptiis philologiae et mercurii* in a fresh light, and sought through his commentaries on this work to elucidate what he felt was its powerful message regarding the nature of learning. Like Erigena as well, he saw the *artes* as "not a creation of the intellect, but part of the very structure of reality",[111] and the mystic marriage as the union of *ratio* and *sermo*, the trivium and the quadrivium. The techniques of thought and its communication, in combination with theoretical knowledge based on number,

the principle both of mind and of the physical world,[112] were an internal propaedeutic to divine wisdom. Remigius shares with Erigena the belief that such knowledge opens the way to a true perception of God. The arts

> are important in themselves for they are eternal; they are intimately united with the soul. Far from being elementary skills that can be learned from a text-book, the arts are the very symbols of metaphysical contemplation by which God and His creation are most surely known.[113]

In short, the arts, like creation or the events of history, had a sensus mysticus. They also were mirrors, through which the soul could restore its own status as an image of the Godhead. His etymology of ars from arete shows his belief in the spiritual power of such studies.

The effect of Remigius' philosophy of education, and its practical paedagogical result, was to free the artes from being simply a homogeneous group of secular studies whose only justification was their usefulness in exegesis. To him, they served a related, but far more comprehensive end: philosophy, whose crown is wisdom.[114] Remigius' work contributed substantially to the progress of the artes as encyclopaedic structure and philosophy, steadily extending the frontiers of the old classical and patristic framework by adding to, and in many cases revising the material of De nuptiis. He also included some typically encyclopaedic discussions on the World-Soul and the Ideas, and a specifically Christian content of theology and ethics. It was thus that the Carolingian commentaries transformed the old encyclopaedic texts into ongoing encyclopaedias,[115] in much the same way as early commentaries on Genesis formed the foundation of the encyclopaedia

of the created world. It is indicative of the tendencies of the ninth century in this direction that Remigius also wrote a Hexaemeron, though probably not the one attributed to him by Migne,[116] just as Erigena matched his commentary on Martianus with De divisione naturae.

Historically, the Carolingian renaissance seems to have failed to fulfill the promises it made. It was a renaissance of imitation, and it was basically concerned with trying to cope with its inheritance from the past, and with building up centres of intellectual activity from the most meagre of foundations. With the exception of De divisione naturae, its expressions of the encyclopaedic idea, though sometimes original and suggestive, lie buried in commentaries on, and reworkings of materials from the past. By the time Carolingian scholars seemed ready to undertake the dimly-perceived task of Isidore and Bede in forging a vital unity between the various encyclopaedic structures, the onslaughts of the Magyars and the Northmen, and the consequent disruption of the Empire, made further intellectual progress difficult.

Yet the encyclopaedic ideal was far from forgotten. In the year 1000, when the fortunes of Europe seemed at their lowest, the occupant of the see of St. Peter was Gerbert of Aurillac, a man of universal, and sometimes suspect, curiosity, and wide learning in Arabic science. For him, philosophy was "divinarum et humanarum rerum comprehensio veritatis".[117] A philosopher was therefore one who pursued a full and synthetic encyclopaedic knowledge, for "comprehensio" denotes not only "perception",

but also "combining". For Gerbert and his followers, the task of the encyclopaedist is "combining the truth of things divine and human."

FOOTNOTES

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30. ibid., p. 824.

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32. Spitzer, op. cit., pt. II, p. 322.

33. Etymologiarum, op. cit., III:71.

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CHAPTER FOUR

THE TWELFTH CENTURY: TRIUMPH OF THE ENCYCLOPAEDIC PHILOSOPHY

A time of intellectual expansion, discovery, and rediscovery, the twelfth century is difficult to characterize concisely. Without doing too great an injustice to this complex age, it is nonetheless possible to extract two aspects of the twelfth-century renaissance which greatly influenced the encyclopaedic genre: the new ideas about nature, and the deepening Christian symbolism.

The twelfth century experienced a genuine scientific rebirth in terms of the search for comprehensive, general and coherent systems. Out of the early mediaeval concept of nature as an organized collection of discrete symbols emerged a new consciousness of the organic integrity of the cosmos.[1] This synthetic totality revealed the unity and power of the divine mind. Though the twelfth century was by no means a secular age, it might well be called a scientific one. In fact, the emergence of more precise and sophisticated thinking on scientific questions is inseparable from the general spiritual and intellectual renaissance of the twelfth century -- a renaissance whose framework was Christianity.

This new consciousness of the cosmos as a totality is symbolized by the use of the word universitas, which at this time replaced the older universitas rerum. This implied a greater emphasis on the "encyclopaedic" qualities of harmony, order, beauty, and unity in diversity. "Est mundus ordinata collectio creaturarum":[2] Guillaume of Conches' definition of nature epitomizes the new awareness of a comprehensive and synthetic approach to the study of nature.

The introduction of Arabic science and the burgeoning interest in dialectic puts the accent definitely on the ordinata. Without becoming secularized or rationalized, Christian ideas about the natural world were turning towards more far-ranging, logical, and comprehensible explanations of phenomena. Gradually, the eccentrically miraculous was yielding place to the "surnaturel de la grace."[3] Twelfth century man was moved to awe, admiration and worship by the contemplation of the complex, interconnected laws of a regular cosmos -- a sentiment not incompatible with, yet quite distinct from, the belief in marvels.

> O Dei proles genetrixque rerum
> Vinculum mundi, stabilisque nexus,
> Gemma terrenis, speculum caducis,
> Lucifer orbis.
>
> Pax, amor, virtus, regimen, potestas,
> Ordo, lex, finis, via, dux, origo,
> Vita, lux, splendor, species, figura,
> Regula mundi.[4]

Alongside this new appreciation of the regularity of the universe grew up a revived interest in the process of creation, and in God as Architect of this work of surpassing beauty and flawless functioning. Little wonder that the twelfth century rediscovered the Timaeus, was captivated by it, and sought to use it to clarify the Biblical account of the origin of the world. In dealing with the Timaeus, twelfth-century intellectuals were greatly influenced by the symbolic and hierarchical world-view of its major Christian interpreter, Erigena. Far from being arbitrary or meaningless, the order of creation was not only logical, but the very essence of Divine activity and a major revelation of truth concerning God. "Le clef de l'intelligence

de l'univers est la liaison ordonnée, dynamique, progressive de tous les êtres, considerés comme une "théophanie" où la causalité et la signification coincide."[5]

The Christian humanism of the twelfth century drew much strength from this new view of nature. If, as the philosophers say, man is made in the image of the cosmos, and, as the theologians say, in the image of God, then surely the qualities of reason, clarity and order are as primary within him as they are within the universe, and his own labour assumes new dignity as the imitatio of the great creative act itself. The zenith of this trend is the Didascalion of Hugh of St. Victor, which raised the philosophy of the Augustinian educational encyclopaedia to new heights and, at the same time, broke the time-honoured mold of the seven liberal arts to admit a broader range of human activity, including the mechanical arts. The new Nature produced its new naturalism, a naturalism which heightened rather than diminished the sacramental meaning attached to the universe, yet which understood and appreciated in an entirely new way the direct reality and tangible coherence of human life and its cosmic setting.

> De même que l'Eté n'est point une gracieuse déesse, mais un rude moissoneur qui peine à la tache, de même la construction du monde n'est plus contemplée ni realisée comme une série de mirabilia, mais comme une cooperation active et valable a l'oeuvre créatrice.[6]

The twelfth century also witnessed a resurgence of original Christian thought on the ideas of symbol and image. Like the renewed interest in the creation, this trend was considerably influenced by the Timaeus, and in particular, by its theory of vision. Plato attributed sight to the union of the rays of light emitted by the object of sight and those emitted by the eyes

themselves. Christians and Neo-Platonists, commenting on this passage, declared that it was the response of like to like which effects vision and its attendant acts of recognition and comprehension. As a corollary, if the soul would see God, it must become an image of God -- a mirror, just as nature is a mirror. Then God will be known in the mirror of the soul in the same way as He is known in the mirror of nature: imperfectly, but in a way adapted to human modes of perception. Through St. Augustine, this doctrine deeply influenced the middle ages.[7] A current of thought stemming from Greek theology added to this the idea of deification -- that man, because he is in the image of God, can become by grace what He is by His nature.[8] We have noted that this concept of image and restoration has appeared in several early mediaeval encyclopaedias in connection with the Christian philosophy of learning. Its full integration into the encyclopaedic philosophy was, however, the work of the twelfth century and in particular of the school of St. Victor.

Richard of St. Victor categorized the powers of man along a three-fold pattern. Man possesses three goods: first, his image-hood or intellecta; second, resemblance to the divine; and third, the immortality of the body. Against these are ranged three great ills; ignorance, vice, and infirmity, for which there are three remedies, wisdom, virtue and necessity.[9] Hugh of St. Victor transformed this scheme into an encyclopaedic structure, but as far as encyclopaedic philosophy is concerned, it was the aspect of image of intellecta which the Victorines most fully developed. For them, intellecta was not ratiocinatio but an

interior vision which "lit à l'intérieur des créatures le Créateur".[10] This image or intellecta was an encyclopaedic quality.

> Il y a une "anagoge" des Ecritures; il en est une aussi pour le grand livre du monde; le mieux est encore de lire Dieu dans le monde raconté aux livres de la Bible, particulièrement la Genèse. Le méthode est identique pour atteindre à la verité qui est Sagesse. La nature a sa lettre et son histoire; elle est allégorique et tropologique. Si la physique ne doit pas être une voie d'ignorance, elle doit être une voie de symboles, de significations qui mènent à l'intellection de Dieu. C'est donc une science orientée; elle n'est science que finalisée. Miroir que n'est pas sans obscurité ni énigmes, elle reflète l'invisible dont elle permet "à l'oeil du coeur et de l'esprit" la connaissance profonde. L'oeil charnel voit les choses comme extérieures; celui qui contemple, voit au contraire un monde qui est sensé, harmonisé, relié, en correspondence du sensible au divin.[11]

God's creation is most aptly studied in its microcosm, man. Standing at the cross-roads of creation, "il est un noeud de relations et d'images".[12] It was through this interlocking revolution in the ideas of nature and of man that the twelfth century effected a revolution in the encyclopaedia, transmuting its traditional forms in a new spirit of Christian optimism and daring.

As we have observed, the development of encyclopaedias and that of biblical exegesis have been closely allied since the Patristic age. In the twelfth century, the new naturalism in encyclopaedias was paralleled by a renewed interest on the part of scriptural commentators in the historiale, with a corresponding tendency to give this world a little more weight in the symbolic balance. This trend is exemplified by the two final books of Hugh of St. Victor's Didascalion. A direct result of the Victorine's emphasis on the literal meaning of the Scriptures was a revival of universal history,[13] whose purpose was to set forth

the events of the past as they related to the sacred plan of salvation. The most successful of these was the Historia Scholastica of Peter Comestor. This work was designed as a guide to the totality of the Bible in its broad structure, not simply as an explanation of discrete fragments.[14] His affiliation with the evangelical and preaching movements led Comestor to stick closely to the literal meaning, while commentaries such as Langton's supplied the allegoria.

However, in encyclopaedic scope and spirit, the Historia Scholastica pales beside Otto of Freising's Chronicle of the Two Cities. In this work, the depth of the Augustinian concept of universal history is captured by a literary talent of the first order, for Otto was "the first to record the leading events of world history in a smooth and flowing style and at the same time to attempt to fit them into the eternal scheme."[15] His philosophical background was well attuned to his encyclopaedic task, for he was possibly a pupil of Thierry of Chartres and most certainly studied under Gilbert de la Porrée and Hugh of St. Victor.[16] His position of mediating realism -- that universals have reality, but only as manifest in individuals -- is also well suited to a balanced view of the symbolic cosmos. Yet Otto's main source of inspiration was not the dialectical controversies of his own day, but the Augustinian tradition. From this he derived a double focus, centred simultaneously on the world to come, where endless felicity would be secured or missed, and on the means of that felicity, Christ's sacrifice.[17] Between these two poles was slung the broad fabric of history, a complex

tapestry composed of two interlacing motifs, the rivalry of the two cities (which Otto defined as the Church and the secular power) and the theme of Empire. The latter was important not only in the light of Augustine's idea of history as a succession of world-empires, but also because Otto was himself closely related to the Hohenstaufen. This gives his account of contemporary history a particularly personal and detailed quality. Nonetheless, his reader never forgets that this is a symbolic and sacramental history. The Chronicle of the Two Cities is the fulfillment of Augustine's dream, a fully encyclopaedic history such as Orosius could not produce. "Comme mise en oeuvre de la conception augustinienne, le Chronicon d'Othon de Freising est l'oeuvre le plus originale du XIIe siècle."[18]

The twelfth century revival of the science of Biblical exegesis produced a new sensitivity and sophistication in handling the ideas of symbol and image. It is thus not surprising that the production of encyclopaedias, whose philosophical basis depended on symbolism, should have experienced a rebirth at this time. The resurrection of the encyclopaedic genre, stagnant since the time of the Carolingians,[19] is largely the achievement of Honorius Augustodunensis. So modest and secretive was he that for many years the translation of his surname was the occasion for considerable rivalry, as France, England, and Germany claimed the famous writer for their own. Autun, Canterbury and Regensberg all qualify on linguistic grounds, but the internal evidence of Honorius' works points to Regensberg as his home. He appears to have been a monk in one of that city's many houses of Irish

foundation, where learning and artistic activity dwelt harmoniously beside solitary asceticism, an atmosphere which Sanford finds congenial to the encyclopaedic outlook.[20] Another aspect of life in the Schottenkloster which encouraged Honorius towards the writing of encyclopaedias was a tradition launched by the monasteries' founder, Marianus Scotus, of writing books for the use of poorer clergy and pious laymen.[21] These books dispensed education and edification within a concise, interesting, and non-technical format.[22] It was within this traditional framework that Honorius conceived his Imago Mundi, "seine berühmteste und geschätzteste Werk."[23] As a prolific Biblical commentator, Honorius' encyclopaedic works demonstrate a keen understanding of symbolic thought. It is this appreciation of encyclopaedic philosophy that wins him a prominent place among mediaeval encyclopaedists, for as far as content is concerned, he is at best "un vulgarisateur intelligent".[24]

The idea of image is enshrined not only in the title, but also in the very fabric of the Imago Mundi. Honorius consistently emphasizes an objective pattern of interlocking symbols which he has sought to capture in his treatise. Just as the world is an image of eternal reality, so his work is an image of the world.[25] For him, imago is virtually synonymous with the Augustinian speculum.[26] It is easy to see why these words were favoured titles for encyclopaedias, for their Augustinian connotation was one of comprehensiveness and synthesis: "omnia talia de canonicis libris colligam, atque ut facile inspici non possint, in unum tanquam speculum congeram."[27] The Imago Mundi is, as it

were, the encyclopaedic philosophy in action. Its organization reflects the ancient connection between cosmology and history which sprang from the Timaeus and flowed through Isidore and Bede. According to Plato, time was the movement of the heavens. Hence Honorius' first section is concerned with that which produces time, the cosmos or globus totius mundi. The second discusses time itself: "tempus, in quo volvitur". The third is devoted to the product of time, the history of the world in six ages, from Adam to Barbarossa.[28] The Imago Mundi not only achieved a more satisfying coordination of cosmology and chronology than ever before, but also, as was typical of the twelfth century, sought to locate this synthesis within a wider perspective of philosophy and theology. "Geschichte und Natur finden ihren Vergleichspunkt im Ratschluss der Gottheit, den Honorius 'archetypus' nannte."[29] In the Clavis physicae, Honorius presents a guide to the archetypus mundus and the means by which it is reflected in this world. It is virtually a treatise on the mediaeval encyclopaedic philosophy.

> La Clavis est, en effet, une explication de cette monde mysterieux et changeant des apparences sensibles à la lumière de la contemplation des plus haut vérités qui revèlent l'ordre divin du cosmos. La nature dont il est question ici comprend, harmonieusement liées, les choses qui sont et les choses qui ne sont pas, c'est à dire l'univers visible et l'univers archetype.[30]

This archetypus mundus is a fusion of the two great ideas of Honorius' acknowledged master, Scotus Erigena. The notion of the archetypes or primordial causes of all things was, though not original with Erigena, very closely linked with his idea of Theophany.[31] This Honorian synthesis is typical of both the new

scientific spirit and the new encyclopaedism of the twelfth century, seeking "the causes of things in their effects and the effects in their causes".[32] Honorius' work was affected in two ways. First, he diagrammed a more precise hierarchy of beings in the cosmos, beginning with inanimate rocks and earth, which possess being alone, and working up through plants, which have being and movement, animals, which have movement and sense, and man, who has reason in addition to all these other things, culminating in the angels, who possess intelligence of the divine. What is important about this hierarchy is that, seen in Erigena's terms, it is simply the schematization of a dynamic process. Being, Movement, Sense, Reason and Intellect are not frozen categories, but the eternal descent of, and return to the divine Alpha and Omega.[33] This seven-fold process, from God through the first causes and the five divisions of nature, closes in the perfect octave of God as the end of all things. This idea of cosmic musical harmony, so encyclopaedic in its implications, pervades Honorius' work. It binds together a rich and complex structure of parallels and correspondences between the world, man, and the Scriptures.[34]

> Summus namque opifex universitatem quasi citharem magnam condidit, in qua veluti chordas ad multiplices sonos reddendos posuit...Reciprocum sonum reddunt spiritus et corpus, angelus et diabolus, coelum et infernus, ignis et aqua, aer et terra, dulce et amarum, molle et durum, et sic caetera in hunc mundum.[35]

Joined to this cosmic harmony is a revitalized and optimistic microcosmic theory. Honorius' idea of the microcosm operates on many levels. Man can be seen as an epitome of the five levels of created being, for he contains all those stages of the hierarchy

that are below him and through salvation can also attain the intellectus of the angels. He is also a sort of pictorial representation of the universe, his head symbolizing the heavens, his eyes the sun and moon, etc.[36] Honorius' microcosmism displays a new zeal for humanity's natural qualities that is characteristic of the optimism of the twelfth century. Expanding the doctrines of Scotus Erigena and the Greek Fathers, he declares that man can not only attain the status of the angels, but that he is, indeed, superior to them, for he possesses a body.[37] The idea that the body, its senses and temporal existence, was God's chosen instrument for the glorification of man flung open the confines of the encyclopaedia, long limited to the seven arts, or the content of the scriptures, to a truly comprehensive view of human life. For Honorius, the capacity to grasp this total knowledge was at once the duty and delight of mankind: "Miserum enim videtur res propter nos factas quotidie spectare, et cum jumentis insipientibus quid sint, penitus ignorare."[38]

Honorius' encyclopaedic works display a concern with education that is both a personal quality and a characteristic of his age. His preoccupation with the Christian training of the laity affected the structure of his encyclopaedias in a number of ways. It tended to exaggerate the didactic tone and explicit emphasis on form and order which typifies the genre as a whole. This repeated insistence on clarity of division and organization has been associated with oral instruction,[39] such as a clerical lecturer or preacher would impart to an uneducated, yet spiritually eager and knowledgeable congregation. The needs of the

pulpit affected not only the content of the encyclopaedias, but also their form. Furthermore, there is a preponderance of pictorial imagery, which was Honorius' trademark, in both the Imago mundi and the Clavis physicae, and which was to be the major medium through which his influential teachings spread. This ranges from the portal of his own monastic church of St. Jacobus in Regensberg, to the famous Hortus deliciarum, a portfolio of symbolic drawings illustrating Honorius' cosmology and theology. This was compiled by the Abbess Herrad of Landsberg, and heavily influenced the iconography of Strasbourg cathedral.[40] In the Imago mundi, Honorius tells us that his purpose is "expositionem orbis quasi in tabella",[41] and his discussion of cosmology is strewn with imaginative visual analogies, such as the famous comparison of the universe to an egg.[42] The Clavis physicae shows even more clearly the connection between didactic purpose and pictorialism, for it is filled with diagrams "qui paraissent conformes au génie pédagogique de l'auteur."[43] The general disposition and particular details of these diagrams are often surprisingly apt and concise summaries of very sophisticated cosmological doctrines.

It is specially important for the history of the encyclopaedia that Honorius' concern with the link between education and the spiritual life should have led him to reassess the relationship of the arts to philosophy in the light of the deeper needs of the Christian life. His De animae exilio et patria forms an important link in the chain of Christian thought on this subject which stretches from St. Augustine, through the

Carolingian schoolmasters, to Hugh of St. Victor. He reemphasized the belief of his precursors that the highest philosophy was contained in the artes, which in turn were stations on the road "from the Babylonian exile of spiritual ignorance to the knowledge of Sacred Scripture, their true patria, where multiplex sapientia reigns."[44] This scientia is not the science of Toledo or Alexandria: "es ist vielmehr das alte, bescheiderne, oft auch kümmerliche System der Enzykopädisten, mit dem Rüstzeug der Artes liberales, die immerhin für das Mittelalter -- wie Ernst Robert Curtius sagte -- 'die Fundementalordnung des Geistes' darstellen könnten."[45] Neither Honorius' subordination of the artes to exegesis nor his idea of their status as internal propaedeutic to philosophy is particularly original. Where Honorius breaks away from tradition -- and in a fashion characteristic of the twelfth century -- is in expanding the scheme of the seven arts to include medicine, mechanica and oeconomica. It is typical of such an optimistic writer, and of an age so eager to include every human activity in the grand synthesis of Christian life, that medicine should encourage the pilgrim of De animae exilio to the healing of his soul as well as of his body. How interesting to read, in a period when advances in science and philosophy coincided with the growth of national kingdoms and the revival of cities and commerce, how oeconomica discloses parallels between human society and the order of nature.[46] Bold in his reclassification of the arts, yet respectful of the traditional doctrine of the relationship of secular knowledge to Christianity, Honorius is a prophet of the great achievement of Hugh of St. Victor.

I have chosen to discuss the work of Honorius first not only because he is chronologically the earliest of the twelfth-century encyclopaedists, but also because he distills in a clear, concise, and somewhat unsophisticated manner the two major preoccupations of his age, education and symbolic cosmogony. He thus serves as a useful introduction to the two great encyclopaedic forces of the time, the educational thought of the Victorines, and the Platonic-Christian world-view of the school of Chartres.

One important link between Honorius Augustodunensis and the Victorines is a shared reverence for, and use of, the work of Scotus Erigena. It could be said that Dionysius the Areopagite, as translated and interpreted by Erigena, was to the school of St. Victor what Plato was to Chartres. Yet, in twelfth-century fashion, both Honorius and the Victorines modified this heritage by correcting Erigena's dualistic leanings, especially on the subject of the body.[47]

The whole development of encyclopaedic philosophy in the twelfth century can be seen as the fruitful interaction of the Dionysian symbolism of the school of St. Victor and the Platonism of Chartres. Though springing from much the same roots, neither could have singly produced the revolution in encyclopaedic thinking that the two of them, reaching a zenith of power and influence at much the same time, effected.

> La hierarchia suppose évidemment la thèse platonicienne classique des deux mondes, intelligible et sensible, mais elle la transpose profondément en considerant l'univers sensible comme un champ de symboles. C'etait là certes une ressource originelle du platonisme, mais son amplification modifie l'atmosphère du système, et lui procure, dans son interference avec le symbolisme sacremental chrétien, une densité religieuse à la fois féconde et ambigue.[48]

It is typical of both the similarities and the differences of the schools of St. Victor and Chartres that they both produced works entitled Microcosmus, yet growing out of their quite individual view-points. Bernardus Silvestris begins with cosmology to arrive at anthropology, while Godefroy of St. Victor starts from psychology to arrive at theology. Chartres' interests were scientific and humanistic, St. Victor's spiritual and theological, yet both believed in what was the essence of the mediaeval encyclopaedic world-view, a hierarchical universe of mutually explanatory levels.

Many historians of the twelfth century have noted that the humanism of that age produced a new confidence and pride in humanity, comparable to the exaltation of man in the Great Renaissance. In many ways this judgement is just. The pagan vision of man in the classics, combined with a scientific consciousness of his physical and psychological wholeness, did radically alter the old ideas of man's ineptitude, weakness and passivity before the universe and its Creator. Nonetheless, this new confidence, unlike its fifteenth-century counterpart, was always subordinate to the Christian scheme of values. "Gislebertus hoc facit" is, after all, inscribed beneath the feet of the triumphant Christ. Such an ambiguous attitude towards humanity lies at the heart of orthodox Christianity.

From this perspective, it is rather interesting that it was the monastic and somewhat traditionalist atmosphere of St. Victor that produced some of the most radical statements regarding man's dignity and powers, and in particular, the nature of his capacity

to know. In part, this was due to St. Victor's own peculiar history. It grew out of both the university and the evangelical movements and stood, as it were, halfway between the Benedictine-type orders and the friars in its structure and spirit. When William of Champeaux left his position at the University of Paris to found St. Victor, many churchmen complained about his continued teaching activity, and declared it incompatible with the religious life. Others like Hildebert of Le Mans countered that, on the contrary, teaching was part of William's evangelical duty.[49] From the beginning, St. Victor made the more adventurous spirit of the twelfth century its own.

Godefroy of St. Victor reflected both the learned and evangelical aspects of his convent's life. A student of Adam of the Petit-Pont before embracing the religious life, he occupied his later years with theological study, the writing of sermons, and composing a popular, versified summary of the Didascalion. In all of these he displayed a keen concern with vindicating the worth of man, yet the final work of his life, the Microcosmus, surpasses all else in its radically humanistic outlook. Its editor has called it an encyclopaedia of anthropology, psychology and morals,[50] and its purpose is to edify the faithful by protesting against the prevalent pessimistic view of man. This view ranged from Augustinian insistence on the powerlessness of nature before grace, to neo-Platonic and gnostic-inspired hatred of the body. It even found a foothold in the encyclopaedic literature of the age. Alexander Neckam, so curious, kind-hearted, anxious to uplift and edify, consumed eight pages of De rerum naturis in a diatribe

on the worthlessness of human life and accomplishment.[51] Drawing on the doctrine of the resurrection of the body and the philosophical idea of the microcosm, Godefroy objected that only in his earthly span is man a vain and fleeting thing, and that every aspect, even the humblest, of his existence can be the occasion of spiritual elevation.[52] In his view, one of the first fruits of charity is love towards one's own body, followed by divine love of the soul for its own sake.[53] In short, Godefroy sees that body and soul, though separate and of unequal value, are equally indispensable to the totality of personhood. Man's nature is a coordinated whole, as synthetic, comprehensible, and true to its own inner laws as the cosmos of which it is the image.

Godefroy sets forth his arguments by amplifying the encyclopaedic structure of the Hexaemeron into an exposition of the encyclopaedic idea of the microcosm.[54] His approach is along the characteristically Victorine lines of allegorical and tropological interpretation of the Old Testament -- a "sacramental" way of viewing Scripture typified by Hugh of St. Victor's De arca Noe mystice. For example, the light of the first day represents, on a physical level, man's most vital sense, sight, and on a deeper level, his primary spiritual capacity for knowledge. It had already been noted by early commentators that the first three days of the Genesis account of creation depicted the fabrication of the world, while the last three dealt with its ornamentation. Godefroy saw this as a symbolic statement of one of his most precious theories, the mutual dependence of nature and grace.

Since the time of Augustine, "nature" had meant what was congenital to man, what was left to Adam after the fall and transmitted to his descendants. It was, therefore, associated with man's sin. However, the twelfth century revived the Boethian idea of nature as the consitution of man, independent of sin, and representing a type of being. Godefroy followed in the steps of Hugh of St. Victor in affirming this: nature is not the opposite of grace, but a stage towards it.[55] In fact, according to Hugh's teachings on the opus conditionis and the opus restaurationis, grace would have perfected man even had he not fallen, although in a different way. Godefroy's conclusion is that man's sin in refusing grace is that he desires to be less than himself.[56]

The importance of Godefroy's Microcosmus for the history of encyclopaedias lies, in the first place, in his highly imaginative use of the long-dormant Hexaemeral form to Christianize the encyclopaedic idea of the microcosm. This in turn gave microcosmism a significantly greater value, for it established the importance of the natural world within the total divine plan as well as applying to man and his activities the optimistic and comprehensive spirit with which the twelfth century explored the cosmos. The new man whose portrait Godefroy sketched is truly a magnificent creature: a Christian whose consciousness of grace opened his physical and intellectual powers to a fuller and more spiritual use. It was Godefroy's more famous brother in religion, Hugh of St. Victor, who set forth a plan for the education of this new man.

As Godefroy of St. Victor transformed the Hexaemeral encyclopaedia in the light of the twelfth century's new concerns and

interests, so his greater contemporary, Hugh, effected radical changes in the old encyclopaedia of the liberal arts. The theme of the integration and unity of the opus conditionis and the opus restorationis which ran through the Microcosmus was the ruling paedagogical principle of the Didascalion. The purpose of this work is to build up in the individual lector the image of Divine Wisdom, the second Person of the Trinity "through whom, as through the primordial pattern of all things, the Father has established the universe and through whose mysteries, from the Fall to the end of time, he accomplishes the work of restoration".[57] This concept of the two-fold manifestation of Divine Wisdom is the source of a broad and optimistic philosophy,[58] for Hugh interprets creation and restoration as types of the two kinds of human knowledge, science and wisdom. Just as Godefroy emphasizes the necessary coinherence of nature and grace functioning according to separately valid, yet mutually dependent criteria, so Hugh envisions earthly "science" and heavenly "wisdom".

> Ainsi nous avons déjà le sentiment qu'il n'y a chez Hugues aucune conversion de la science à la sagesse, ou encore moins de la sagesse à la science, mais une approfondissement pour la coéxistance ordonnée, et un effort tendant à la harmonie de la science et de la sagesse.[59]

In his work of organizing and evaluating secular science within the total context of the Christian life, Hugh's Didascalion is worthy to stand next to De doctrina christiana in influence and scope. Yet although he is often called "the second Augustine", Hugh belongs to an age whose hopes and expectations are higher, and whose attitude toward the legacy of antiquity is more remote, and consequently, less nervous. In essence Augustine, and the

early mediaeval period which he dominated so completely, lived with two doctrinae, the wisdom of the ancient world, which Augustine in his early years as a Christian sought to bring into a somewhat facile accord with revealed truth, and doctrina christiana, a dimly-realized vision of a synthesis, which Augustine tended in later life to set in ever more uncompromising terms against the ancient learning. Hugh's situation was quite different. For him, there was only one doctrina, and that was doctrina christiana. There was only one philosophy, and that was Christian philosophy, incomparably superior to pagan learning in that it was more comprehensive.[60] Doctrina christiana was so great as to be all-sufficient. Such doctrina was so lofty that nothing should be neglected which might assist one in understanding it better.[61] Where Augustine warned the Christian student against penetrating any subject beyond a barely necessary level, Hugh counselled, "Omnis disce, videbis postea nihil esse superfluum".

Most historians of the intellectual life of the twelfth century have perceived, in a vague sort of way, that the Didascalion deserves to be classed with the encyclopaedias of that age. Jean Chatillon, in an essay in a special volume of Cahiers d'histoire mondiale devoted to encyclopaedias, justifies Hugh's inclusion on the ground that he deals with human knowledge in all its aspects.[62] Other similarly vague references have been made to Hugh's passionate defence of the unity of knowledge, or his creation of a comprehensive scheme of science, as qualifying the Didascalion for encyclopaedic status. In my view, the

Didascalion is less an encyclopaedia than a treatise on encyclopaedias. Its two pivotal themes are the structure of universal learning and the spirit which gives life to this structure.

For Hugh, all knowledge consisted of making divisions (descending from the universal to the particular) and definitions (ascending from the particular to the universal).[63] The old scheme of the liberal arts, the old Cassiodorian dichotomies, were obviously unsatisfying for such a large-scale project. It is typical of the twelfth century that it was unafraid to rethink the problem from the beginning. The De divisione philosophiae of Dominicus Gundisallinus, for example, reclassified the sciences according to al-Farabi's interpretation of Aristotle's three degrees of abstraction. This was "à la fois un bouleversement du programme d'enseignement et l'inauguration d'une ordre scientifique du savoir."[64] In accordance with the Victorine spirit of Christian mystical humanism, Hugh chose to begin -- and end -- his division of knowledge with man himself. In Augustinian and early mediaeval eyes, philosophy was the encyclopaedia of the arts and sciences. Hugh built on this foundation, but saw philosophy less as the content of the encyclopaedia than as its function of explaining and organizing all knowledge.[65] "Philosophy is the discipline which investigates comprehensively the ideas of all things, human and divine."[66] For Hugh, philosophy was the unique prerogative of human nature, and must therefore contain as many parts as there are types of human action. "Hugues est en quête de cette sagesse connaturelle à l'esprit de l'homme, par quoi se définit son humanité qui est présent à tous les actes vraiement humaines."[67]

Of the types of human activity, two are restorative, seeking to heal the effects of the fall through knowledge and virtue, while the third is concerned with relieving the weaknesses of bodily life.[68] Philosophy therefore has three parts. The theoretical branch seeks truth, and is divided into mathematics (the quadrivium), physica (natural history), and natural theology. The practical branch pursues virtue through the three spheres of moral activity: ethica (private morality), oeconomica (moral relationships between individuals), and politica (public morals). To alleviate the weaknesses of the flesh is the concern of the mechanical branch. Hugh's seven mechanical arts are fashioned after Martianus Capella's seven liberal ones. Like their prototype, three serve the exterior man (weaving, armory and navigation) and four the interior (agriculture, hunting, medicine, and theatrica).[69] The comprehensive spirit of the twelfth century expanded the meaning of specific words to their broadest extent. For Hugh, "armory" means the construction of any tool or instrument, and "navigation" encompasses all the skills of commerce. To these three branches are added the logical arts. Though living in a time of increased interest and confidence in the powers of dialectic, Hugh conceived of a logic "non du raisonnement qui prouve, mais du raisonnement qui trouve."[70] It was basically an instrument, making the study of all the others possible.

It is thus the human soul, its needs and capacities, which define the structure of the encyclopaedia. The four branches of knowledge are related by Hugh, in a complex feat of numerology,

to the four-fold powers of the soul and body.[71] But the spirit of the encyclopaedia is also measured according to the human soul.

> Whether it goes out to sensible things through its senses or ascends to invisible things through its understanding, it circles about, drawing to itself the likeness of things; and thus it is that one and the same mind, having the capacity for all things, is fitted together out of every substance and nature by the fact that it represents within itself their imaged likeness.[72]

The soul as microcosm

> consists of all natures 'not as being physically composed of them, but as having an analogous type of composition', (Chalcidius) For it is not to be thought that this similitude to all things comes into the soul from elsewhere, or from without; on the contrary, the soul grasps the similitude in and of itself, out of a certain native power and proper capacity of its own.[73]

The important words are, of course, "image" and "likeness", key phrases of the encyclopaedic philosophy. The ultimate phase of Hugh's educational programme is the monastic lectio divina, the reading of Holy Scripture. It is in the third book of the Didascalion, devoted to this subject, that Hugh's exquisite equilibrium between science and wisdom is most clearly expressed. Here, the historialis is accorded praise and careful study not at the expense of, but for the sake of the allegoria.[74] Knowledge of the one grows with the other, for the things described in scripture have even greater power than the words which describe them to reveal to us the spiritual reality of the universe: "the insubstantial word is the sign of man's perceptions; the thing is the resemblance of the divine Idea".[75] All things are charged with a holy significance "comme un livre écrit par le droit de Dieu, orné de figures, qui sont les créatures".[76] The symbols

of nature indicate the existence of God, while those of grace, so masterfully described in Hugh's De sacramentis, demonstrate His presence. Thus nothing in the universe is barren.[77] "Sensibilia symbola materialia sunt signa, sive in creaturis, sive in scripturis, sive in sacramentis divinis, ad demonstrationem invisibilium proposita".[78] The ultimate result of the contemplation of these symbols, and hence the end-product of the encyclopaedia, is the recognition by man of his status as the image of God and the restoration of his likeness to his Creator. Thus does science lead to wisdom, and image to idea.

> This then is what the arts are concerned with, this is what they intend, namely, to restore within us the divine likeness, a likeness which to us is a form, but to God is His nature. The more we are conformed to the divine nature, the more do we possess Wisdom, for then there begins to shine forth within us again what has forever existed in the divine Idea or Pattern, coming and going in us but standing changeless in God.[79]

This idea of the divine pattern, and its relationship with, and revelation through the solid realities of this world, received very different, yet equally encyclopaedic treatment at the hands of that group of scholars associated by historians with the cathedral school of Chartres. These differences can be clearly seen through the opposing interpretations of the meaning of Creation propounded by Hugh of St. Victor and the Chartrian master, Guillaume of Conches. Guillaume's theology, influenced by the Christian naturalism of which we have spoken, and by the scientific interests of Chartres, was "congue non plus comme une pure reflexion spirituelle mais comme une science technique de la parole de Dieu et de son économie terrestre".[80] It would be a mistake, however, to view this difference of approach in too

simplistic terms. It was Hugh who rejected the "mystical" interpretation of the six days in favour of the literal historicity of the steps of creation.[81] What is significant is that his reason for doing so was spiritual: God desired, through this drama, to educate men and angels.[82] Guillaume, on the other hand, felt that the story of creation was a metaphor for the actual structure of the world. The laws of nature contain the internal constitutive order of things. The elements are created according to their own constitutions, which automatically co-ordinates them. The commands of God have as their object precisely this order of natures. Thus there was no need for a primitive chaos. To Hugh's educative argument, Guillaume replied that the angels did not require such enlightenment and men were not there to witness it. Hugh's response that God was lord of history as well as of nature reveals the heart of the controversy. Chartrians saw God's creative acts in terms of the internal "programming" which men call the laws of nature. Victorines saw nature as handled from without, part of the larger "programme" of history.

In many ways, the speculations of the masters of Chartres are highly relevant to the history of encyclopaedic structures and philosophy. Their concept of nature offered the possibility of integrating observable facts and events into a synthesis both philosophically and theologically satisfying. This was explored by such encyclopaedias as Guillaume of Conches' De philosophia mundi and by commentaries on both the Platonic and Christian accounts of creation by Guillaume, Thierry of Chartres, Clarembald

of Arras, and others. In addition, the Chartrian view of education and the relationship between trivium and quadrivium, word and reality, is vital to our understanding not only of the encyclopaedia of the liberal arts, but of the whole encyclopaedic mentality.

As a philosophical "school", Chartres deserves to be handled very cautiously. R.W. Southern and others have seriously questioned the actual physical presence of any centre of advanced studies at Chartres, while others have busied themselves, quite justifiably, with pointing out the considerable differences which lie between many writers normally designated as Chartrians. Plainly, we are discovering that the phenomenon of Chartres is more complex than it seemed in the days of Clerval's great work. Nonetheless, it is possible to trace a certain unity of interest and assumption, if not of conclusion, in the subjects of the nature of Creation, the relationship between the science of pagan antiquity and the Biblical revelation, and the connection between the physical world and the divine Trinity. It is this, I believe, which defines the school of Chartres, and its contribution to the encyclopaedic philosophy.

In dealing with Chartrian cosmology, I have chosen to restrict myself to Guillaume of Conches and Thierry of Chartres, because their works are most clearly related to the kind of encyclopaedia of creation which we have been discussing. Besides Guillaume's famous commentary on the Timaeus, and Thierry's on Genesis, Guillaume's encyclopaedic De philosophia mundi also reveals basic Chartrian concerns. Like most of his contemporaries, Guillaume

saw philosophy as the sum of all knowledge,[83] and defined the scope of a philosophia mundi as follows: "incipientes a prima causa rerum Deo usque ad hominem continuabimus tractatus".[84] The first book deals with the creation of the world according to Genesis' historical scheme while the second is concerned with the rational order of the elements, thus illustrating Guillaume's belief that history is an image or metaphor of nature. This final book is a tour through the created world and its ornatus, designed to provide factual illustration of the two theoretical books. It would be wrong, however, to see Guillaume as rationalizing or secularizing Scripture. He did not believe that reason could possibly oppose or supplant faith. Yet reason could provide logical explanations which would strengthen and assist our understanding of divinely revealed truth. Moreover, the existence of revealed truth does not dispense man from using his God-given intelligence in interpreting and expanding on Biblical information.[85]

The same bold attitude is to be found in the De operis sex dierum and other commentaries on Genesis by Thierry of Chartres. Thierry proposes to discuss Genesis secundum naturam, that is, literally and scientifically, in complete confidence that this interpretation will be in full harmony with the mystical and allegorical expositions of others. Thierry's method consists of setting forth a thoroughly rational cosmology, constructed according to the best scientific and logical principles, and after convincing the reader of its truth, citing the text of the Bible to show that this conforms exactly with the teachings of

revelation. Thierry keeps his promise of harmony with the mystical approach to exegesis, for his aim is not to confine mystery to the limits of reason, but to use reason to reveal the depths of mystery.

> Although the results of Thierry's new approach do not differ greatly from what we can find in the commentaries of Ambrose, Augustine, or Bede, Thierry's attitude may fitly be called rationalism as far as he uses reason to prepare the way for a deeper understanding of the Biblical account.[86]

It was with the same eager confidence in the harmony of reason and revelation that both Thierry and Guillaume approached the Timaeus. This work held a particular fascination for the school of Chartres, enamoured as it was of the mathematical sciences, cosmology, and the classical tradition. Their treatment of the Timaeus is symbolic of their whole philosophy that reason, while an adequate instrument for many tasks in itself, is used at its finest and fullest when it acts as the handmaid of theological wisdom. Because their Platonism was the Platonism of Chalcidius and the Church Fathers,[87] they felt little embarrassment in interpreting Timaeus in the creationist sense, giving Plato a Christian benefit of the doubt on any obscure or poetic passage. To see them as "reconciling" reason and revelation would be a serious distortion. Their Christian synthesis was "moins souci apologetique que conviction de la convergence des deux doctrines".[88] Chartres' general feelings, regardless of differences over details of interpretation are summed up by its most eloquent spokesman, John of Salisbury:

> Opinio tamen illa convaluit quia in libris Platonis inveniuntur multa dictis consona prophetarum. Nam in Thimeo, dum causas mundi subtilius investigat, manifeste videtur exprimere Trinitatem quae Deus est, efficientem causam constituens in potentia Dei, in sapientia formalem, finalem in bonitate quae sola faceret, prout natura cuiusque capax beatitudinis esse potest. Unus tamen in his visus est intellexisse et docuisse substantiam, dum opificem universitatis et formatorem Deum unum esse asseruit, quem ob insigne bonitatis et dulcis effectus dixit omnium genitorem, quem propter infinitatem maiestatis, potentiae, sapientiae, et bonitatis suae tam est invenire difficile quam inventum digne profari impossibile.[89]

Just as the most important contribution of the Timaeus to the mediaeval encyclopaedia was the idea of the image relationship between the eternal and temporal worlds, so the contemplation of the Timaeus by the scholars of Chartres produced new, more Christian and more encyclopaedic variations on the theme of the exemplar. By identifying the Ideas of Plato with the Mind of God (i.e. the Word, or second Person of the Trinity), they recast the whole problem into the more Christian terms of the image-relationship between the Creator and His creation. Trinitarian theology enabled the Chartrians to transcend the vexing difficulties of the limited Demiurge and opened the way for an immediate and intimate relationship between God and the world. Indeed, the Platonizing Christianity of Chartres had a passionate awareness of the "in-Goddedness" of the world which they expressed with the controversial formula, "Deus forma essendi".

> Il s'agit bien, dans les developpements annexes, de l'essence divine considérée comme exemplaire universel et d'un rapport d'exemplairisme entre la forme divine et les autres formes; d'où l'insistence à marquer leur réunion dans l'intelligence divine, leur unité, voir même leur identité avec la forme divine, parce qu'en Dieu il ne peut y avoir que Dieu. Dieu est donc "forma essendi" de toute chose parce que toutes les essences sont modelées sur la sienne, et de toute éternité les formes des choses sont en Dieu, puisque c'est la sagesse eternelle qui les determine.[90]

The obvious danger of this sort of doctrine is pantheism, or, in encyclopaedic terms, the swallowing up of comprehensivity by synthesis. We have seen the same tendencies in Erigena, one of the major sources of Chartrian thought. Many who claimed affinity with the school of Chartres, such as Amaury of Bene, failed to resist this attraction. The major figures of the school of Chartres itself, however, managed to avoid pantheism. They were saved by two factors: the Christian idea of the image, and their own fascination with natural science. No better illustration can be found of that fruitful interplay of sacred and secular knowledge which produced the encyclopaedic philosophy. Bernard of Chartres qualified the idea of "Deus forma essendi" by saying that the particular form of any individual thing is a copy of the divine Idea, not a union with that Idea.[91] Inspired by the Boethian notion that the composite nature of creature is, by definition, an image of pure being, Thierry of Chartres declares that forms in matter can only be images of the true forms in God.[92] Like light which illumines all, God's power creates and sustains without destroying the reality of the creature.[93] It was this idea of the autonomy of the creature within its imagehood which captured the scientific imagination of Guillaume of Conches. The aim of his De philosophia mundi was to expose the essential harmony of purpose and function between the creative activity of God, and the activity which science sees as proper to nature.[94] This faith in the unity, but not identity, of Creator and creation enabled Thierry of Chartres

in De operis sex dierum to study nature without direct reference to God, and to seek natural explanations before ascribing phenomena to God's direct activity. On such faith and such reason, the mediaeval encyclopaedia would thrive. "C'est poser en principe la legitimité et l'autonomie des sciences naturelles. Une telle attitude exercera dans la suite une heureuse influence sur l'organisation du savoir humain."[95]

Though I have been emphasizing the innovative elements in the school of Chartres' influence on the encyclopaedia, their treatment of the more traditional encyclopaedic concepts should not be forgotten. As Brandt has pointed out, though Guillaume of Conches' cosmology was superior to Isidore's in clarity of arrangement, and though he shifted the emphasis from the elements themselves to the qualities that formed them, he maintained nonetheless a fundamentally Isidorean view of a universe wherein activity and attribute were part of the nature of a thing.[96] Certainly, Chartres' sophisticated use of Platorism only further endeared to them the encyclopaedic belief in the mystical value of numbers, which they employed to prove the theology of the Trinity.[97] They retained, furthermore, an Isidorean faith in the divine origin and almost magical symbolism of words. From their point of view, it is highly significant that the only activity we see Adam performing in Paradise is the naming of the animals.[98] To bestow a name upon something was the essence of knowledge, greatest of the divinely-given powers of man. It was also the crux of Chartrian humanism, for despite Guillaume's affection for the quadrivium, he was known in his own day

primarily as a grammarian. This belief in the unity of verba and res resulted in an allegiance to the old scheme of the seven arts, which existed happily beside their innovations in the encyclopaedia of nature. Thierry's giant compilation of readings on the seven arts, the Heptateuchon, "une luxueuse encyclopédie du savoir humain,"[99] bears witness to this. So does the Metalogicon of John of Salisbury, a defence of the trivium based on the Ciceronian view that "the concerns of wisdom (the search for the hidden truth of things) and those of eloquence (the efficacious use of language) are mutual."[100]

It is scarcely surprising that the most characteristic products of Chartrian thought are two works wherein science and philosophy vie with poetic virtuosity for our interest. The De mundi universitate of Bernardus Silvestris of Tours has much in common with the Anticlaudianus of Alain of Lille and its companion-piece, the De planctu naturae. Both are complex allegories in the best mediaeval tradition, depicting elaborate abstractions in vivid, dramatic form. The central figure of both is Natura, embodiment of the self-consistent functioning of the created world. For example, in the Anticlaudianus, Natura receives the charge from God to insure that like always proceeds from like.[101] Yet Natura also has a moral role: Alain calls her God's vicar, and the source of all virtues,[102] while Bernardus' Natura stipulates that her proposed new order for the world also be a moral improvement over the old.[103] In both poems, Natura is actively engaged in assisting God to repair the faults of humanity by fashioning a new, perfect man.

In the course of the fashioning and adorning of this new creature, both Alain and Bernardus spread before their readers an integrated and encyclopaedic vision of the cosmos. The Anticlaudianus has been called "une docte encyclopédie de omni re scibili".[104] Its author earned the sobriquet "doctor universalis" for his extensive range of studies: "qui duo, qui septem, qui totum scibile scivit".[105] It is indicative of the encyclopaedic mentality of Alain that he defined philosophia naturalis as comprising both the liberal arts and the natural sciences.[106] Moreover, he was conscious of the natural world as a book-like image of the spiritual realm.

> Omnis mundi creatura
> Quasi liber et pictura
> Nobis est et speculum.[107]

Thus Alain integrates a vast amount of cosmological doctrine into a framework which is at once a poetic embodiment of the great themes of twelfth-century Platonism, and fully Christian.[108] His idea of nature is closely related to Hugh of St. Victor's scheme of opus conditionis and opus restorationis.[109] Nature works with the sacramental order of a hierarchical world; though highly powerful, it is utterly subordinate to the Creator.[110] In De planctu naturae, she can only lament, not remedy man's defection from her rule.[111] Yet it is through Natura that the forms of the divine realm become the sensible reality of this world,[112] so that human intellect and will can perceive through her activities the eternal truths.[113] Alain's Natura is the encyclopaedic principle of the whole cosmos, descending from heaven to earth and ascending from earth to heaven, a providential figure whose activities are inseparable from God's plan for man's salvation.

Bernardus' De universitate mundi, also entitled Megacosmus et microcosmus, has been called "an encyclopaedic myth" in the tradition of the Timaeus, building a cosmic order, and then analysing the resulting order and the relationship of its parts.[114] The first part of the work describes the formation, contents and functioning of the cosmos, while the second deals with the creation of man. The poem is a symbolic cosmogony, emphasizing the idea of Natura as the principle of order and comprehensivity in the cosmos,[115] and an allegory whose concealed meanings are scientific. Bernardus' encyclopaedic description, more comprehensive than any other produced in the twelfth century,[116] is supported by his idea of universitas, the "structural-encyclopaedic relationship" between the cosmos as a whole and its individual parts.[117] Indeed, Bernardus' greatest strength as an encyclopaedist lies in his flair for striking a balance between the claims of comprehensivity and synthesis, hierarchy and unfolding, through the use of allegory.[118] Platonic philosophy was his instrument of synthesis, Arabic science of comprehensivity, and in the true spirit of Chartres, his work omits all mention of God, only to prove more fully than before the truth of the Biblical doctrines of creation.[119]

Although the problem of the creation of the world and of man was treated, as Guillaume of Conches said, by "fere omnes modernos",[120] the first large-scale work which we would recognize as an encyclopaedia was written only very shortly before the end of the twelfth century. This was the De naturis rerum of Alexander Neckam of St. Alban's.

Alexander Neckam's intellectual accomplishments were considerable, for he could read Greek, and possibly Arabic as well.

He was thus open to the scientific influence of Byzantium and of the Arab world. He was the first person in the West to know both the Greco-Latin and Arabo-Latin versions of Aristotle. Besides his studies in Paris and teaching activities in England, he was also thoroughly acquainted with the work of the Salernitan doctors: whole chapters of De naturis rerum are lifted from the Aphorismi of Viso of Calabria. Alexander was also the first western theologian to introduce into his work an Avicennan concept, concerning the powers of the soul. Yet despite these far-reaching intellectual contacts, his encyclopaedia is arranged on the hexameral model, contains much famous bestiary material, and is moralized from end to end for the edification of the reader. Why did not contacts with other cultures of advanced scientific activity more radically alter the shape of the encyclopaedia?

It is certainly true that in the twelfth century western thinkers absorbed Greek and Arabic science as clusters of isolated facts rather than as a total system. This was the case with the school of Chartres, whose data came from Islam, but whose framework and values of thought were those of the Platonic and Augustinian encyclopaedia. Even such a keen innovator as Daniel of Morley, who in the preface of his Liber de naturis inferiorum et superiorum attacks the backwardness and credulity of the West and vows to follow only the method of the Arabs,[121] proceeds in the body of that work strictly according to the pattern of the six days, with the accompanying encyclopaedic ideas of image and edification.[122] The fact is that neither the Byzantine nor the

Arab world had much of an encyclopaedic tradition such as we have seen emerging in the West. Byzantine works such as the Excerpta which have been loosely described as encyclopaedias are in reality little but choice potpourris, culled for the political and moral usefulness they might have for their princely readers. There were many technical encyclopaedias, like the Geoponics, and a large number of dictionary encyclopaedias arranged in alphabetical order, but in general, Byzantium lacked that encyclopaedic spirit we have been engaged in defining and tracing. Their encyclopaedias, though numerous, are backward-looking, intent on preserving the classical heritage, and show little interest in a dynamic integration with Christianity.[123]

In Byzantium, the necessary components of an encyclopaedic world-view simply never materialized; in Islam, they were actively condemned. Scriptural interpretation in the Muslim world had had an almost diametrically opposite effect to that which it had in the Christian world, for symbols in shari'ah-minded literature, rather than being mystically or comprehensively enhanced in meaning, were simply reduced to common sense or metaphor. Moreover, so jealous was Islam of the idea of the one all-powerful God that it could not conceive of His creative and sustaining powers in terms of a logical system or natural progression. Hence their view of history in particular was very atomized, and quite antipathetic to encyclopaedism. Such a view differs markedly from the "dramatic" Christian philosophy of history.

> Every event happens in direct response to God's will -- no dramatic development is allowed to it, no inherent cyclicism or culmination, no exemplification of hierophanies, only separate factual events.[124]

Thus Alexander's encyclopaedic approach can only be thoroughly traditional. De naturis rerum is constructed on the Hexaemeron/four elements pattern, and his purpose in writing is the edification of his readers through interpreting the symbolism of nature: "Sed sciendum est, in signum et in instructionem nostri hoc factum esse."[125] His description of every property of bird or beast, precious stone, or even human capacity such as vision, is followed by a moralis adaptatio. This should not, however, suggest that the work is unoriginal, conventional and dull. In fact, De naturis rerum is living proof of both the continued vitality of the traditional encyclopaedia, and its new sophistication at the hands of the learned and curious men of the twelfth century. Alexander's morales adaptationes, far from being arbitrary or far-fetched allegories, grow naturally out of the text, show imagination, and are seldom conventional. In part, this has its source in his wide literary experience and classical learning,[126] and in part in the general twelfth-century spirit of rational integration. This spirit is certainly evident in the structure and philosophy of the work as a whole. It is difficult indeed to give within the bounds of this chapter an adequate impression of the many connecting themes which run through De naturis rerum. Alexander's elucidation of the created world is structured not simply according to the Hexaemeron, but also according to the pattern of the three attributes of the Divinity: power, goodness, and love.[127] The opening chapter establishes the parallelism of opus conditionis and opus restorationis through an elaborate comparison of the first words

of the Gospel of John and of Genesis. This simile of the plans of creation and salvation is maintained throughout the encyclopaedia by the juxtaposition of "qualities" and morales adaptationes. The seven planets are likened to the seven gifts of the Spirit[128] and to the seven arts.[129] The nightingale represents the contemplative life,[130] while the ancient story of Juno and Argus is moralized to reveal the Christian significance of the peacock.[131] Alexander is committed on an even deeper level to the encyclopaedic spirit, for if the central message of De naturis rerum could be distilled into one word, that would be "concord". The celestial harmony of the stars answers the eternal praises of the saints,[132] the "certain discordant concord" of the four elements, and the dynamic tension of microcosm and macrocosm.

> Oritur igitur ex discordia rerum quaedam confoederatio. Mundus enim ipse, megacosmus scilicet, ex elementis constat in quibus concors discordia reperitur. Microcosmus etiam, hominem loquor, constat ex iis in quibus est discordia sed concors.[133]

Beginning with the concord of the Old and New Testaments, and ending with the concord of various classes within the kingdom, De naturis rerum is bound together by the harmony of individual realities.

If few historians have been able to understand how Alexander Neckam could couple an Aristotelian discourse on fire with a completely unscientific moralis adaptatio,[134] even fewer have been able to rationalize why such an obviously intelligent and learned man should have employed so much of what is loosely termed "bestiary material" in his work.[135] It is hard to say what is actually meant by "bestiary material", but a rough definition

might be constructed as follows: a bestiary describes animals (often imaginary) according to their properties (often magical), and frequently follows this with a moral or mystical interpretation (often far-fetched). Reflecting that the high middle ages also possessed Aristotle's Historia Animalium as a zoological text-book, historians have branded the use of bestiary materials as unscientific, and have generally been at a loss to understand its significance within such works as encyclopaedias.

Delving deeper into bestiary literature, however, we find that it is of far greater variety and subtlety than our careless definition could convey. First, description by "properties" or "virtues" is, as we have seen, a basic mediaeval approach to the natural world, embraced even by the scientific minds of Chartres and the thirteenth-century scholastics. Second, not all the animals or the stories connected with them were fantastic by any means. Even those whose descriptions make them seem so often have some basis in fact. As T.H. White has pointed out, the camelopard, shaped like a camel and spotted like a leopard, is a fairly decent description of a giraffe.[136] The account of the hedgehog rolling over onto fruit, long thought to be typical of the "old wives' tales" found in bestiaries, has recently been vindicated as truth.[137] Moreover, the experience of such a scientist as Albertus Magnus shows that belief in occult virtues is not necessarily incompatible with intelligent observation or reading of the ancients. The nature of their intellectual priorities inclined mediaeval men to accept as possible much that we have been conditioned to doubt. Not only their trust in books,

especially those by ancient authors, but also their conviction of the variety, wonder and spirituality of the creation lead them to consider as truth much that they had not seen, or could not mathematically verify.[138]

The bestiary did not necessarily exist for the sake of its mystical and moral symbolism, though some, such as the De bestiis et aliis rebus of pseudo-Hugh of St. Victor, manifestly did: "Non tantum volui columbam formando pingere, sed etiam dictando describere, et per scripturam demonstrare picturam, ut cui non placuit simplicitas picturae, placeat saltem moralitas scripturae".[139] Bestiaries certainly had a secular appeal of their own, as is shown by the number of vernacular and unmoralized bestiaries, as well as by the adaptation of the form to such worldly ends as Richard Furnivall's Bestiare d'Amour. Moreover, the presence of morales adaptationes does not automatically preclude the presence of a scientific, or at least scholarly spirit. The audience of St. Basil's Hexaemeron was eager for both instruction and edification, and Basil tried to gratify them in both respects.[140] The encyclopaedic approach to knowledge, per visibilia ad invisibilia, had a large role to play in this.

> Isidore, Rabanus, Bede and their fellow encyclopaedists had a homilectic purpose, but at the same time their sense of scholarship was not despicable from a purely secular point of view. They were not intent on losing sight of this world in order to acquire an understanding of the next; rather it was their problem to acquire an understanding of the next world through the proper understanding of the present visible world.[141]

As we proceed with our study of the mediaeval encyclopaedia, we would do well to bear Alexander Neckam in mind. Despite

expanded intellectual horizons, the great encyclopaedists of the thirteenth century display much the same mixture of tradition and modernity as is found in De naturis rerum. Chronologically and spiritually, it is an encyclopaedia of transition.[142]

FOOTNOTES

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CHAPTER FIVE

THE THIRTEENTH CENTURY: TRIUMPH OF THE ENCYCLOPAEDIC FORM

If we can call the twelfth century "the triumph of the encyclopaedic philosophy" because of its Christian naturalism and renewed interest in symbolism, it is possible to see the thirteenth century as "the triumph of the encyclopaedic structure". This is the age of the great compendia of universal knowledge -- the De rerum proprietatibus of Bartholemew the Englishman, the De naturis rerum of Thomas of Cantimpré, and towering over all, the Speculum maius of Vincent of Beauvais. Where twelfth century encyclopaedias excel in presenting a sophisticated and articulate Christian philosophy of nature and knowledge, those of the thirteenth century are remarkable for their ambitious scope, admirable erudition, and development of a complex, yet majestic structure finely tuned to the demands of the philosophy. When Vincent of Beauvais succeeds in forging the three structural components of the encyclopaedia of nature, the encyclopaedia of the liberal arts, and the encyclopaedia of universal history into a unity, the Christian encyclopaedia of the middle ages reaches its zenith of development. The triumph of the form was, however, short-lived, and at the end of this chapter we shall discuss Roger Bacon as a frustrated encyclopaedist, no longer able to find expression for his traditional encyclopaedic philosophy in any well-defined structure.

In order to fully comprehend the nature of the thirteenth-century achievement, two factors should be kept in mind. These are the mendicant orders and the universities. The peculiar needs of the Franciscans and Dominicans clamoured for encyclopaedic

works. Their major concern was with preaching, and their oratory, characterized by originality, breadth and picturesqueness,[1] relied for much of its thrust on the skillful use of exempla and anecdotes drawn from the natural world or the events of history. Handbooks of exempla multiplied in the wake of these preachers, whose audiences ranged from book-learned university communities to semi-literate burghers and country gentry. Since many entered the Grey or Black Friars with little education, studia were instituted to outfit the novice, in as brief a space of time as possible, to take on his duties as a preacher. In such an atmosphere, a compendious encyclopaedia, geared to explaining the correspondences between heavenly things and earthly, would obviously be a welcome teaching aid. Furthermore, the mendicant movement grew up within the evangelical revival of the late twelfth century, a movement which, as we have seen in the case of Peter Comestor, emphasized the substance of the Bible and the renewal of scriptural studies. St. Bonaventure declared that a friar must first be pure in life, and then learned in the scriptures. Thus Bible studies took their place beside oratorical training in the programme of the studia. Yet the friars concurred with the general mediaeval opinion that knowledge of the Bible required a background of secular learning, a line of reasoning which had long been used to justify the existence of the encyclopaedia. Again, a tidy and complete compendium based on such a philosophy would be of great use to young friars of little learning. It is therefore no accident that all the encyclopaedists we will be treating in this chapter were members of the mendicant orders.

Training in encyclopaedic lore would also fit the friar for admission to the theology course at the university, which he was privileged to enter without the prerequisite arts training. Indeed, many ordinary arts students of the time, anxious to proceed to the more exhil ar ating and prestigious delights of dialectic and theology, used encyclopaedias to "cram" for the obligatory examinations in the studia artium and studia naturalium.[2] Vincent of Beauvais' Speculum doctrinale has been described as a "cours classique",[3] while Bartholemew the Englishman's work was so popular for this purpose that its price was fixed by the authorities of the University of Paris. In the short run, the encyclopaedia throve in the university atmosphere, but in the broad perspective, university and encyclopaedic learning were not always compatible. To begin with, the reduction of the artes to a somewhat hasty propaedeutic indicates that the old identification of encyclopaedic learning with philosophy was dissolving.[4] Moreover, the mathematical sciences of the quadrivium were by 1255 almost completely eclipsed by the Aristotelian concept of natural philosophy.[5] The trivium also suffered, for under Aristotelian influence, grammar and dialectic were gradually becoming more speculative and detached from the old balanced scheme of knowledge, yet, at the same time, were being reduced to propaedeutics.[6] Nonetheless, the danger which Aristotelian learning posed was far from obvious to either the thirteenth-century encyclopaedists or their university audiences. Following Neckam's example, the encyclopaedists chose to ignore the implications of the Aristotelian system, while making full and frequently intelligent use of the concepts and data it afforded.

In many cases, they were seconded by the learned readers, for it is a vulgar error to assume that Aristotle's conquest of the Latin world was either swift or complete.

One clue to the lack of embarrassment exhibited by the thirteenth-century encyclopaedists in dealing with Aristotle is that the Aristotelian view of nature is not particularly remote from the early mediaeval concepts which we discussed in relation to Isidore of Seville. Both the Peripatetic and early mediaeval viewpoints saw the individual creature in terms of a subject-predicate, substance-attribute relationship, nor did the Aristotelians offer any radical solution to the problem of change.[7] Except for such concepts as the eternity of the world, Aristotle's cosmology presented little that was startling to the mediaeval mind, for it was based on two principles with which the middle ages were quite familiar; that the behaviour of things was due to qualitatively determined forms or "natures", and that these "natures" were arranged in the universe in a hierarchical fashion.[8] From this point of view, it is easy to see how the thirteenth-century encyclopaedists could ignore the Aristotelian system as a self-contained synthesis, and simply treat Aristotle as the greatest among many authorities. This also goes far towards explaining why the advent of Aristotelian science did not in itself drive other, older types of science from the scene. For example, Albertus Magnus combined the most authoritative mineralogical science of his day, derived from Aristotle and the Arabs, with an attitude towards the powers and properties of precious stones stemming directly from the lapidary of Marbode.[9]

The doubt and hesitation which the thirteenth-century thinkers did experience in confronting the science of Aristotle was inspired, in most cases, not so much by what Aristotle said as by the way in which he said it. It was the Stagirite's own dogmatism and conviction of the necessary truth of his account of things, reinforced by the idolatry of the Arab commentators, especially Averroes, which was to cause countless problems,[10] This idolatry is precisely the Averroistic element in the so-called Latin Averroism of Siger of Brabant and his followers. They refused to compromise the integrity of the Aristotelian philosophical system in the name of the Augustinian principle of the necessary concord of philosophical and theological expressions of truth.[11] Siger's Aristotelianism was heterodox because it was rationalistic, defying any union with theology in the pursuit of divine truth.[12] While van Steenberghen is correct in pointing out that Siger did not precisely hold the "double-truth" doctrine, in that he deferred to theology when conflicts occurred,[13] this very act of deferral indicates his belief in the independent validity of philosophy and theology. Clearly, the fate of the encyclopaedic principles of synthesis and comprehensiveness were closely bound up, in the thirteenth century, with the fate of Aristotle. Thus Aquinas might be termed an encyclopaedic thinker, for he not only defended concordism, but steadfastly refused to idolize Aristotle. To Aquinas, Aristotle was a great, perhaps the greatest, guide to human reasoning, yet his opinions still had to be tested and qualified in the light of both revealed truth and of rational experience and

observation. The great thirteenth-century encyclopaedists were concordists almost by virtue of their calling, and they used Aristotle in much the same fashion.

Of the three great encyclopaedic authors of the thirteenth century, the earliest, Bartholemew the Englishman, most clearly illustrates the importance of the encyclopaedia within the context of university and mendicant life. Though little concerning Bartholemew's career is clearly known, it is thought that he planned his De rerum proprietatibus while yet a student at Oxford and Paris.[14] When the Order of Friars Minor appointed him lector of their studium in Magdeburg, his encyclopaedia began to take on its final form in response to Bartholemew's teaching and preaching needs. As an Englishman, a Franciscan, and an Oxford alumnus, he was greatly influenced by Robert Grosseteste, whose insistence on the importance of philosophy (i.e. the entire range of the sciences) to theology (i.e. the study of scripture) was shared by the order as a whole. Not only the necessity of the Order to educate its members, but also the traditional Scriptural approach of this training, made De rerum proprietatibus what it was: a compendium of some of the most modern learning poured into what was, philosophically and structurally speaking, the most traditional of mediaeval moulds. It would be a grave error to attribute this traditionalism strictly to the atmosphere of the studia. Bartholemew's encyclopaedia, "quorum lectio simplicioribus fratribus necessaria indicatur",[15] was "required reading" at the University of Paris. Its price was fixed, and a copy was chained to the desk of the

Sorbonne chapel, where its author had once given lectures on the whole Bible.[16] The odd mixture of old form and new matter belonged not only to the evangelical movement, but to the thirteenth century as a whole.

Bartholemew's encyclopaedic approach was acceptable to many outside the learned worlds of studium and university. In fact, translations of De rerum proprietatibus are among the earliest prose works in the vernacular. Besides Trevisa's famous English rendition, there is Jean Corbechon's French version (commissioned by Charles V), as well as Italian, Spanish, and Provencal translations. The advent of printing only served to increase its popularity, eloquent proof of the vigour of a thousand-year-old tradition.

The preface of De rerum proprietatibus is an exposition of the aims and philosophy of the Christian encyclopaedia of superb clarity and conciseness. In his very first sentence, Bartholemew establishes his principle of organization, which will in turn reflect an order inherent in nature.

> Cum proprietates rerum sequantur substantias, secundum distinctionem et ordinem substantiarum: erit ordo et distinctio proprietatum de quibus adiutorio divino est presens opusculum compilatum.[17]

The "ordo et distinctio rerum" Bartholemew adopts is a Platonic hierarchy of being, descending from God, through man, to the other living and inanimate beings, and terminating with mere "accidents" such as smell, colour, savour, and touch. Broadly speaking, the encyclopaedia is divided into corporeal and incorporeal substances, the latter comprising God Himself, the soul, and the angels. The whole gives the impression of an inverted

Hexaemeron, a logical rather than historical order of the cosmos. De rerum proprietatibus proposes to trace this order not only in correct sequence, but also through a numerical parallelism. We have noticed such parallelisms frequently before, but Bartholemew's is particularly interesting in that it may shed some light on why many encyclopaedias, such as De rerum proprietatibus and Thomas of Cantimpré's De natura rerum, are divided into nineteen or twenty books. In his preface, Bartholemew ends his discussion of the three-times-three order of the angels with the following statement:

> Unde a beato Dionysio distinguuntur tres hierarchiae coelestes, quarum quaelibet trium ordinum continet dispositiones. Novemdecim itaque sunt de quibus in hoc opusculo...[18]

"Consequently there are nineteen orders in this book..." Why should nine orders of angels logically lead to nineteen orders in the cosmos? The answer to this puzzle lies, I believe, less in some obscure twist of mediaeval number symbolism than in the heart of the encyclopaedic philosophy itself. Bartholemew intends his work to be used "ad intelligenda aenigmata scripturarum, quae sub symbolis et figuris proprietatum rerum naturalium et artificialium a Spiritu Sancto traditae et velatae",[19] and cites Dionysius the Areopagite to the effect that our souls know the Divine Ray "varietate sacrorum velaminum anagogice circum velatu,".[20] Through the visibilia we understand the invisibilia and vice versa: "sic carnalibus et visibilibus spiritualia et invisibilia coaptentur".[21] Of course, such statements are the commonplaces of the mediaeval encyclopaedic genre. What sets Bartholemew apart is his marked insistence that the natural world is not only

useful to our understanding of the supernatural, but positively indispensible. It is simply impossible to rise to the contemplation of things invisible without consideration of things visible. Historians such as Se Boyar have noted this as Bartholemew's intellectual trade-mark;[22] moreover, the greater the scientific matter, the more pronounced the emphasis on its relationship to the scriptural and spiritual.

In the light of this belief in an existential mirror-relationship between the two realms of creation, it would be logical to assume that the nine-fold angelic order corresponds to a nine-fold earthly order of, say, metals, gems, herbs, trees, reptiles, fishes, birds, animals, and man. Hints of such a parallel had appeared in earlier encyclopaedic literature. If we add to these eighteen categories God Himself, who reigns over both realms, the result is nineteen. In the case of Thomas of Cantimpré, it is the human soul, the microcosmic link, which makes up the nineteenth element. In some manuscripts, a book on God is added to produce twenty. In both cases, the distinctive philosophy of the Christian encyclopaedia has had a determining effect on the structure.

Once the structural and philosophical boundaries of his work are established, Bartholemew launches his readers onto the vast ocean of his erudition. As a piece of literature, De rerum proprietatibus is considerably more coherent than Vincent of Beauvais' Speculum maius. By staying within a modest and manageable format, Bartholemew avoided the patchy results of a scissors-and-paste method.[23] The sources of the encyclopaedia

reflect Bartholemew's philosophically ambiguous position of using a Platonic framework for Aristotelian knowledge. On the one hand, he is heavily indebted to Albertus Magnus and Michael Scot's translation of Aristotle, while on the other, he shows the strong influence of Isidore, Pliny, Basil, Ambrose, and the Augustinian-Platonic tradition.[24] This should alert us against rashly characterizing the encyclopaedias of the twelfth century as Platonic and those of the thirteenth as Aristotelian. The middle ages as a whole, and its encyclopaedic compilations in particular, are too eclectic, both in their heritage and in their outlook, to be forced into such rigid categories. It is true that Plato emphasizes the symbolic value of the physical world, and Aristotle its solidity, internal cohesiveness and completeness,[25] but it would be a mistake to see these tendencies as mutually exclusive. The Christian encyclopaedias of the high middle ages knew how to exploit the possibilities of both. Such works reflect curiosity, fascination with detail, and often surprising accuracy concerning the world around them, yet seldom fail to relate these facts or observations to their symbolic view of the cosmos and its heavenly archetype. To say that the encyclopaedia is both Aristotelian and Platonic is simply another way of saying that it is both comprehensive and synthetic.

There are, however, disquieting signs of disintegration even in Bartholemew's encyclopaedia. It is difficult to determine the cause of this, whether it be the influence of Arabo-Aristotelian rationalism, or simply the difficulties of handling a "knowledge explosion", but <u>De rerum proprietatibus</u> shows a

marked increase in the use of alphabetical order over twelfth-century encyclopaedias. While the theological sections (Books I-III) and the medical sections (Books V-VII) follow the traditional logical order, all the books dealing with what we now regard as science -- geography, botany, zoology etc. -- are in alphabetical order. In our introduction, it was pointed out that alphabetical order is an indicator of a fragmented and unencyclopaedic mentality. Though it would be rash to question Bartholemew's encyclopaedism, it is interesting to notice that the mediaeval encyclopaedia was beginning to show some difficulties in handling its content. Though it is only the structure of De rerum proprietatibus which seems to have been affected, the close historical connection between structure and philosophy should alert us to coming problems for the genre as a whole.

But Bartholemew himself has utter confidence in the encyclopaedic approach. He believes in the relationship of macrocosm to microcosm: the human head "habens septem foramina, quae sunt sensuum instrumenta, et hoc secundum aliquos, septem planetarum orbibus correspondent".[26] His boldness and skill in handling a wide spectrum of materials are particularly noticeable in the areas of geography[27] and medicine[28], far surpassing the usual treatment in compendia. Throughout his encyclopaedia, Bartholemew is inspired by the traditional spirit of this genre, a spirit of wonder and trust in the comprehensibility of a divinely ordained cosmos.

> In his ergo et in aliis operationibus naturae conditionibus admiranda est divina sapientia, quae per ista et talia similia dat nobis quodam modo intelligere, qualiter per ista sensata materialia ad intellectum eorum, quae sunt supra sensum, sint paulatim cordis interiora ad intelligentiam spiritualia promovenda, et propter hoc ista simpliciter est in hoc opusculo mea intentio et finis meus.[29]

Though a printed edition of the De naturis rerum of Thomas of Cantimpré, a Flemish Dominican writing in the fourth decade of the thirteenth century, has yet to appear[30], it is possible by means of a cursory overview of the prologue of this work, and the general disposition of its chapters, aided by the few extant secondary sources, to form some general impression of this encyclopaedist, and to tentatively situate his work within the encyclopaedic tradition as a whole. In general, it seems to conform to the pattern of thirteenth-century encyclopaedias. Like De rerum proprietatibus, it is an inverted hexaemeron, though it lacks a specific section devoted to God and the angels. Its author, like Bartholemew, was deeply imbued with the ideals of his order, and spent a large part of his later life trekking through German-speaking lands, under conditions of truly apostolic poverty and hardship,[31] preaching to the people. De rerum proprietatibus retains much of the flavour of this humble sermonizing, as was, indeed, its aim.

> His ergo scriptis si quis studium adhibuerit ad argumenta fidei et correctiones morum integumentis mediis sufficientam reperiet, ut interdum predicatore quasi e vestigio scriptorum aperte digresse cessantibus eloquiis prophetarum ad evigilationem brutarum mentium occulta fide creaturarum testes aducat ut si que sepius audita de scripturis et inculcata non movent, saltem nova more suo pigritantium aures demulceant.[32]

Such was Thomas' zeal for bringing the Christian message to the masses via instruction in natural science that he expanded various sections of De natura rerum into full-length treatises, wherein science and morality were fused. The most famous of these was the Bonum universale de apibus, an application of the study of bee society to the problems of sacred and secular community. This popular approach assured Thomas' welcome amongst ordinary folk, and De naturis rerum had many vernacular translations, notably Konrad of Megenburg's Buch der Natur. However, this popular tone, combined with Thomas' faults of scrappy organization and absence of relevant commentary,[33] did not endear the work to the learned society of its day, and it never found its way into print, unlike most mediaeval encyclopaedias.

There are indications, however, that Thomas and his encyclopaedia have been rather unjustly neglected. Not only did Vincent of Beauvais use De naturis rerum,[34] but even greater scientific minds show dependence on this modest encyclopaedia. For example, Pauline Aiken has proven fairly conclusively that Albertus Magnus' De animalibus is based almost entirely on Thomas' original errors and misreadings of Pliny. This is particularly evident in the section on fish and monstra marina, where, for instance, Thomas turns one of Pliny's sources, Trebius Niger, into a fish.[35] Albertus copies this mistake, as well as a similar one regarding Statius Sebosus,[36] and many others. The section on animals suffered less, probably because Thomas was here in a better position to use his own observation and experience as a corrective for a faulty or poorly punctuated

text.[37] As De naturis rerum was composed over a period of fifteen years, and Thomas, like Vincent, was in the habit of accumulating excerpts on separate sheets of paper, on whose headings he would have to rely when assembling his material, some mistakes and exotic fusings were bound to occur. Thomas is the source for 400 of Albertus' 475 animals, and for 374 of them, Albertus does not even add supplementary material. Clearly, the thirteenth-century encyclopaedia was far from being on the borderlands of the scientific and intellectual activities of the age.

In this age of great encyclopaedias and encyclopaedists, the Speculum maius of Vincent of Beauvais towers above all others. Its huge size, ambitious scope and thorough grasp of source materials, all united within the traditional Augustinian-Platonic framework, mark this work as the highest development of the mediaeval encyclopaedia. In its three-fold structure -- Speculum naturale, Speculum historiale and Speculum Doctrinale -- it unites for the first time the three threads of encyclopaedic literature whose developments and interactions we have been following. Remarkable both for its knowledge of Aristotle and its thorough command of the traditional encyclopaedic lore, the Speculum maius weds vast erudition to a completely controlled and minutely articulated structure. In its own way, it deserves to stand beside the Divine Comedy or Rheims Cathedral. All are grand, complete, delicately-balanced structures. All are masterpieces of arts which are distinctly mediaeval.

Though the Speculum maius is unique, in that no mediaeval encyclopaedist before or after Vincent achieved the unity of the

three encyclopaedic branches with anything like his thoroughness and mastery, it is by no means unexpected or eccentric. We have noticed several attempts to create a total encyclopaedia since the time of Augustine himself. Honorius' Imago mundi, in so many ways the source and inspiration of the encyclopaedia of the high middle ages, was also one of the earliest efforts to synthesize nature and history. Richard of St. Victor's combination of didascalion, hexaemeron and universal history in the Liber excerptionum, described by de Gandillac as "maladroit mais suggestive",[38] is to my knowledge, the first attempt on a practical level to combine the three strands of Augustinian encyclopaedism, and points directly to Vincent's fuller and more assured treatment. Alexander Neckam also tentatively reaches toward a unification by expanding his section on man to include a modest encyclopaedia of education. Inspired by Hugh of St. Victor, he dealt not only with intellectual disciplines, but also with crafts and techniques.[39] I thus feel that there is little need to seriously entertain de Gandillac's theory that the three-fold scheme of the Speculum maius came from the Arabs. He offers no proof for this hypothesis, while the pages of De doctrina christiana and the history of the encyclopaedia of the Latin middle ages argue eloquently for a western, Augustinian origin.

Unlike those of earlier encyclopaedists, Vincent's monumental labours were not the solitary efforts of a single writer. The legend of St. Louis' patronage has long been exploded, but truth is probably even more impressive. Vincent seems to have

had the active support of the Dominican order, who gave him funds, leisure and secretaries sufficient to compile his thousands of excerpts from classical, patristic and modern authors.[40] The work is definitely a product of the life and needs of the order, both in the pulpit and in the university. His encyclopaedia will be of great use, he declares, in promoting the knowledge of, and hence delight in God Himself, and in His creatures visible and invisible. This will not only excite the heart of the reader to devout charity through the inspired words and deeds of famous men, but will be of great utility in all aspects of preaching, disputation, and proof.[41] In serving the Dominican preacher and student, Vincent feels obliged to strike a balance between sacred and secular and to establish some hierarchy of authorities which will include all the writers available to him. His basic method consists of linking a quotation from a secular author with a corresponding excerpt from a sacred writer,[42] thus asserting the concord of the two branches and their usefulness one to the other. Nonetheless, he warns the reader that controversies are bound to occur; however, he is but a compiler, and has laboured not so much to reduce the sayings of the philosophers to a concord as to relate as briefly as possible what they have said on a given topic.[43] Vincent leaves it up to the reader to effect his own synthesis, an approach which reflects the interests of the dialectic-conscious universities of the age. Despite Vincent's concordist stance, I believe that Boutaric is mistaken when he claims that "tout auteur païen ou chrétien, pourvu qu'il n'eût pas été censuré par l'église était cité avec une autorité

égale".[44] On the contrary, chapters XI-XIV of the Prologus generalis are devoted to determining the correct weight allotted to each type of authority. Holy Scripture was first, by virtue both of its antiquity and its divine inspiration. Apocryphal and patristic writers follow, arranged according to the judgement of the universal Church concerning their authenticity and orthodoxy. Modern and pagan writers bring up the rear, the first because they lack the dignity of age, the second because they tell only a partial truth.

For the benefit of the university audience, Vincent includes a special section in his prologue on his method of excerpting from Aristotle.[45] Typically, he has ignored the order of Aristotle's work and recast the Stagirite's thought in what he feels is a more useful sequence. He often paraphrases, and waxes indignant at pedants who insist on Aristotle's precise words. Vincent declares that he prefers the substance of Aristotle, and cites various examples connected with translations of the scriptures in support of his method. Though he is vague concerning the identity of his opponents, Vincent is obviously in agreement with those who wish to treat Aristotle as an authority, of great use when properly adapted to a Christian world-view, rather than as the authority, whose system has to be appropriated as an inflexible whole.

Vincent is certainly proud of his majestic three-fold structure, and repeatedly emphasizes the coherence and correspondence of the encyclopaedias of nature, knowledge and history.[46] In particular, he vindicates the moral value of the study of history,[47] and compares the beauty of the unfolding ages with that of the structure of the physical world.[48] Necessary to

both of these is "universal science", the encyclopaedia of knowledge as set forth by Isidore of Seville, and Hugh and Richard of St. Victor.[49] The Speculum maius is not merely mechanical composition. The author insists on the essential unity of its three parts, and their natural yoking together, by employing parallel six-fold divisions within each "mirror". The six days of creation echo the six ages of the world and reflect the six divisions of doctrina: literature, ethics, mathematics, physics, mechanica, and theology,[50] Moreover, each "mirror" contains thirty-three books, symbolic of Christ's earthly life, wherein the world of spirit and nature were completely united, the prototype and fulfillment of the encyclopaedic aim. Never is structure more clearly proclaimed as the index of encyclopaedic belief in unity and comprehensivity as here. Furthermore, each "mirror" contains the other two "mirrors" in miniature. Book XXII of the Speculum naturale sets forth a brief universal history, while the entire first book of the Speculum historiale, designed to provide a framework for the events to be described, is a condensation of Vincent's great hexameron. The Speculum historiale also contains a literary history which appears, in more expanded form, in the Speculum doctrinale. The ultimate product of the mutual cooperation of these three strands is not simply skill in preaching or dialectic but a mystical intuition of the wholeness of the universe, and the ecstatic dependence of all creatures, all ages, all thought, upon the Almighty. Such had been the philosophy of the Christian encyclopaedia since the time of Augustine, and to this philosophy Vincent assented.

> Ipsa namque mens, plerumque paulum a praefatis cogitationum et affectionum faecibus se erigens, et in speculationis lucem (ut potest) assurgens, quasi de quodam eminenti loco totius mundi magnitudinem uno ictu considerat, infinita loca diversis creaturae generibus repleta intra se continentem. Aevum quoque totius mundi, videlicet a principio, usque nunc, quodam aspectu nihilominus conspicit: ibique tempora omnia per diversas generationum successiones rerum mutationes continentia, quasi sub quadam linea comprehendit. Et inde, saltem intuitu fidei, ad cogitandum utcunque Creatoris ipsius magnitudinem, pulchritudinem, atque perpetuitatem ascendit. Ipse namque mundus spaciositate locorum imitatur pro modulo suo Creatoris immensitatem. Varietate specierum ipsius pulchritudinem, prolixitate temporum eius aeternitatem.[51]

The Speculum naturale is a marvellously detailed panorama of the created world, from God and His angels, down to atoms. Though organized on the traditional hexaemeral pattern, it betrays a considerable knowledge of the latest scientific developments. For example, Vincent was one of the first Latin writers to explain clearly and systematically the use of Arabic numerals.[52] He was also well-versed in Aristotle, especially on the subjects of anthropology, cosmology, and natural history.[53] Significantly, Vincent did not incorporate Aristotle's classification scheme; in the section on animals, he fell back on the unsatisfying alphabetical order rather than do so.[54] Whether cautious, conservative, or simply unimpressed, Vincent was not about to embrace Aristotle's hierarchy with as much zeal as he welcomed his data.

In terms of our study of encyclopaedic structure and philosophy, the most interesting part of the Speculum naturale is Book XXIX, on the meaning of creation. The whole book is a remarkable paean of praise, a rather unexpectedly lyrical and intoxicated hymn to the beauty of the cosmos, grounded on the

Creator's goodness,[55] disposed in a pleasing hierarchy,[56] solid and fitting in its constitution ("apta et firma compositione").[57] From the synthetic vision "de mira omnium rerum dispositione",[58] we descend to the comprehensive "varia et mirabili rerum qualitate".[59] The sagacity of beasts, the splendour of colours, and the goodness of the universe are consolations to the human soul which even the deformity of evil cannot diminish.[60] All creatures are joined in the bond of harmony and beauty,[61] and divine peace fills the whole cosmos.[62] The beauty of the universe is the beauty of Him who made it and who is revealed through it, inspiring the praise of all His creatures.[63]

> Denique mundus iste sensibilis est, quasi liber quidam digito Dei scriptus, hoc est divina virtute creatus, et singulae creaturae sunt quasi figurae, et ut alias dictum est, potentiam Dei manifestat creaturarum immensitas, sapientiam decor, benignitatem utilitas.[64]

The created world as "book" carries much the same message as its analogue, the Bible. Modelling himself on Hugh of St. Victor's De arca Noe mystice, Vincent defines this as, first, conviction of the vanity of all things, second, revelation of the nature of the Creator, third, instruction in the correction of morals, and fourth, incitement to the building up of Christian character.[65] This is accomplished not simply by moralizing the activities of living creatures,[66] but also through consideration of the structure, order, measure, and mode of the cosmos as a whole and of its individual parts.[67] Vincent conceives of the encyclopaedic approach in broad terms and means it to be applied with radical thoroughness, warning the reader "de inani studio circum operum Dei et non opificis cognitionem".[68]

Vincent's work represents the full, confident and vigorous flowering of both encyclopaedic structure and encyclopaedic philosophy. Since the time of Augustine, the Christian encyclopaedia had been groping for that unity of its three component strands which Vincent accomplished. At the same time, the Speculum maius

> nous rappelle...l'importance pour le moyen age d'un principe d'unification appliqué à l'ensemble du savoir. Aux yeux de Vincent, toute l'activité de l'homme se situe dans le cadre grandiose d'une création ordonnée; mais ce cadre n'est pas purement statique: grace au Miroir historique, l'histoire d'une évolution complète la description d'une état et lui donne tout son sens.[69]

It is perhaps the finest compliment to Vincent of Beauvais that, though his name and his encyclopaedia are unknown outside a small circle of scholars, yet his spirit is, in a way, every bit as alive today as it was in the thirteenth century. H.G. Wells, in a series of speeches and essays written in 1936 and 1937, outlined a new kind of encyclopaedia which he felt was not only useful, but necessary to cope with the intellectual and practical needs of the twentieth century. He rejected the post-eighteenth-century format of special articles in favour of a structure of "selections, extracts, quotations, very carefully assembled with the approval of outstanding authorities in the subject, carefully collated and edited and presented. It would not be a miscellany, but a concentration, a clarification, and a synthesis."[70] Was this not Vincent of Beauvais' aim, his method, and, to a large extent, his achievement?

Only recently has it become possibly to assess fairly and completely the character and achievements of Roger Bacon. For

many years, he was treated as a controversial football, kicked back and forth by the opposing forces of science and religion. The former hailed him as the morning star of the scientific revolution, the first to admit the piercing light of reason and experiment into the gloomy halls of mediaeval learning. The latter denounced him as a Donatist and Joachite, as well as an incorrigible offender against the discipline of his order. As the flames of this mighty debate began to die down, Roger himself, always eager to talk about himself, his interests, personality, and emotions, began to emerge as a far more mediaeval figure than was previously imagined. Beneath his prophetic fervour, his hopeless disorganization, and his bitter illus ions of persecution, one can clearly perceive the outline of that most traditional of mediaeval thinkers, the encyclopaedist.

Fundamentally out of tune with the speculative theology of the thirteenth century, and preferring the positive theology and scriptural exegesis of an earlier age, Bacon refused to follow the accepted pattern by proceeding from the arts course to the theology schools. Like Vincent, he had little patience with the sententarii who strained, and even revised Biblical texts to suit their gloss. Moreover, it was in his character to harbour resentment against those who succeeded in fields in which he was professedly not interested in succeeding: Roger felt himself to be a theologian manqué.[71] He found relief for his wounded feelings, and a practical alternative to the learned world of his time, in the pseudo-Aristotelian Secreta secretorum, a much-copied and much-translated treatise, largely concerned with

astrology, medicine and physiognomy, allegedly written by Aristotle for the benefit of Alexander the Great. This book had an incalculable effect on Bacon. It convinced him that science, not philosophy, would be his back door into theology, and planted in him the obsessive idea that true knowledge had two characteristics: totality and usefulness.

This desire for, and belief in, the absolute necessity of total knowledge is "Bacon's personal credo, and the key to his whole work".[72] To him, knowledge was worthless unless it was complete, a rather extreme opinion, even in that age of encyclopaedias, though it might represent a warning to the age of summae not to rest on its oars. The parameters of this total knowledge are those suggested by the Secreta secretorum, and reflect its odd mixture of occult and natural sciences, laced with metaphysics and ethics.

> The distinguishing mark of scientia experimentalis seems to be that it is based on singular experiences, and these include the whole range of possible experiences from observations by means of the senses to mystical experiences and the experience of reading particular statements in a book certified by its author's experiences, or by divine revelation.[73]

Thus it is not surprising that Bacon's great, and unrealized, project was to write an encyclopaedia for the Pope, the Alexander to whom he would be an Aristotle. Because his personal talents refused to keep step with his prophetic vision, he abandoned this in order to write his three persuasiones, the Opus maius, Opus minus, and Opus tertius. However, the outline for his proposed compendium is preserved in his Communia naturalium.[74] Within the four-fold scheme of grammar and logic, mathematics, natural

science, and metaphysics, Bacon hoped to encompass every subject, integrate and interconnect it with all other disciplines, and declare it utilissima for theology. Utilissima is one of Bacon's favourite words. Basically, it is the traditional encyclopaedic ideal of a vast collection of learning of all types forged into a synthesis through its application to the study of revelation. Such a synthesis would reflect the unified nature of knowledge in its Creator. As the opening chapters of the Opus tertium explain, the wisdom first given by God to man was unbroken and "encyclopaedic" in the mediaeval sense, and became fragmented in the process of transmission from generation to generation. Thus Bacon, like the Victorines, envisioned the writing of encyclopaedias as part of the great restoration, a healing of the shattered body of knowledge and its return to divine completeness and simplicity. Bacon, far from rejecting this time-honoured Augustinian philosophy, objected that most encyclopaedias were not encyclopaedic enough. In particular, they neglected to apply the "secrets", or occult sciences to theology, and Bacon extols "the value of extracting allegorical meanings from astronomy and astrology for the deeper understanding of the scriptures, of the value of speculative alchemy for understanding such mysteries as the composition of the bodies of Adam and Eve after the Fall".[75] Utilitas, for Bacon, was the highest end of knowledge, and as a Franciscan of the thirteenth century, he saw utilitas in terms of the moral regeneration of Christendom, the conversion of pagan and heretic, and most important, victory against the approaching Antichrist.[76] "The whole structure of

universal science, beautiful as it is, might not be worth struggling for if it were not to be used."[77] Bacon, like all mediaeval encyclopaedists, saw the search for this beautiful synthesis not simply as a natural, but also as an ethical impulse, both in terms of the individual soul and of the Church as a whole.

Bacon's vocabulary abounds in the words "beauty", describing the wholeness and coherence of knowledge, and "usefulness", concerning its application to man's final end.[78] This reflects his proposed encyclopaedic procedure: verification of facts, synthesis of these into a coherent whole, and application of these to Christian purposes.[79] Philosophically, Bacon was an encyclopaedist, yet he floundered about in his sprawling, half-baked erudition without ever finding a structure that could discipline and shape his encyclopaedic spirit. In part, this is Bacon's personal failing, yet it is also in part a sign of disintegration within the encyclopaedia itself.

FOOTNOTES

1. T. Plassman, "Bartholemaeus Anglicus", Archivum Franciscanum Historicum, vol. 12 (1919) p. 104.

2. Pearl Kibre, "The Quadrivium in the thirteenth-century Universities". Arts libéraux et philosophie, op. cit., p. 176.

3. Philippe Delhaye, "La place des arts libéraux dans les programmes scholaires du XIIIe siècle", ibid., p. 169.

4. H. Roos, "Le trivium a l'université au XIIIe siècle", ibid., p. 193.

5. Delhaye,"La place des arts libéraux", op. cit., p. 169.

6. Roos, op. cit., p. 193.

7. Crombie, op. cit., pp. 82-83.

8. ibid., p. 89.

9. ibid., pp. 135-136.

10. ibid., pp. 72-73.

11. ibid., p. 74.

12. Fernand van Steenberghen, The Philosophical Movement of the Thirteenth Century. (London: Nelson, 1955) p. 79.

13. ibid., p. 89.

14. Plassman, op. cit., p. 72.

15. ibid., p. 73.

16. G.E. Se Boyar, "Bartholemaeus Anglicus and his encyclopaedia", Journal of English and Germanic Philology, vol. 19 (1920) p. 175.

17. Bartholemew the Englishman, De rerum proprietatibus, op. cit., p. 1.

18. ibid., p. 2.

19. ibid., p. 1.

20. ibid.

21. ibid., p. 2.

22. Se Boyar, op. cit., p. 179.

23. De Gandillac, op. cit., p. 516.

24. Raven, op. cit., pp. 14-15.

25. Alexandre Koyré, "Platonisme et aristotelisme dans la philosophie du moyen age," Gants du ciel, vol. 4 (1944) p. 95.

26. De rerum proprietatibus, op. cit., Book 5, ch. 2.

27. De Gandillac, op. cit., p. 487.

28. Plassman, op. cit., p. 78.

29. De rerum proprietatibus, op. cit., Book 3, ch. 19.

30. G.J.J. Walstra, "Thomas de Cantimpré, De naturis rerum: état de la question", Vivarium, vol. 5 (1967) pp. 146-171.

31. A. Kaufmann, Thomas von Cantimpré. (Köln: 1899) p. 14.

32. Thomas of Cantimpré, De naturis rerum, op. cit., f 359v.

33. Michaud-Quentin, op. cit., pp. 590-591.

34. Christian Hünemörder, "Die Bedeutung und Arbeitsweise des Thomas von Cantimpré und sein Beitrag zur Naturkunde des Mittelalters", Medizinhistorisches Journal, vol. 3 (1968) p. 350.

35. Pauline Aiken, "The Animal History of Albertus Magnus and Thomas of Cantimpré", Speculum, vol. 22 (1947) pp. 207-208.

36. ibid., p. 209.

37. ibid., p. 216.

38. De Gandillac, op. cit., p. 506.

39. Michaud-Quentin, op. cit., p. 583.

40. E. Boutaric, "Vincent de Beauvais et la connaissance de l'antiquité classique au XIIIe siècle", Revue des questions historiques, vol. 17 (1895) pp. 21.

41. Vincent of Beauvais, op. cit., Prologus, ch. 4.

42. ibid., Prologus, ch. 7.

43. ibid., Prologus, ch. 8.

44. Boutaric, op. cit., p. 14.

45. Vincent of Beauvais, op. cit., Prologus, ch. 10.

46. ibid., Prologus, ch. 6-7, 15-16.

47. ibid., Prologus, ch. 5.

48. ibid., Prologus, ch. 6.

49. ibid., Prologus, ch. 7.

50. Michel Lemoine, "L'oeuvre encyclopédique de Vincent de Beauvais", Cahiers d'histoire mondiale, vol. 9 (1965-1966) pp. 572-573.

51. Vincent of Beauvais, op. cit., Prologus, ch. 6.

52. Lemoine, op. cit., p. 577.

53. ibid., p. 578.

54. de Gandillac, op. cit., p. 514.

55. Vincent of Beauvais, op. cit., Speculum naturale, Book 29, ch. 1-3.

56. ibid., Spec. Nat. Book 29, ch. 4-5.

57. ibid., Spec. Nat. Book 29, ch. 8.

58. ibid., Spec. Nat. Book 29, ch. 13.

59. ibid., Spec. Nat. Book 29, ch. 11.

60. ibid., Spec. Nat. Book 29, ch. 13.

61. ibid., Spec. Nat. Book 29, ch. 12.

62. ibid., Spec. Nat. Book 29, ch. 16-17.

63. ibid., Spec. Nat. Book 29, ch. 17-22.

64. ibid., Spec. Nat. Book 29, ch. 23.

65. ibid., Spec. Nat. Book 29, ch. 26-30.

66. ibid., Spec. Nat. Book 29, ch. 24.

67. ibid., Spec. Nat. Book 29, ch. 25-26.

68. ibid., Spec. Nat. Book 29, ch. 33.

69. Lemoine, op. cit., p. 579.

70. Collison, op. cit., p. 17.

71. S.C. Easton, Roger Bacon and his Search for a Universal Science. (New York: Russell and Russell, 1952) pp. 28-31.

72. ibid., p. 72.

73. ibid., p. 158.

74. R. Steele, "Roger Bacon and the State of Science in the thirteenth century", in Chas. Singer, Studies in the History and Method of Science. (Oxford: Oxford University Press, 1917-21) p. 137.

75. Easton, op. cit., p. 85.

76. ibid., pp. 134-137.

77. ibid., p. 179.

78. ibid.

79. "In sensu literali jacet tota philosophiae potestas, in naturis et proprietatibus rerum, naturalium, artificialium, et moralium, ut per convenientes adaptationes et similitudines eliciantes sensus spirituales. Ut sic simul sciatur philosophia cum theologia". Roger Bacon, Opus tertium (ed. Brewer) ch. 24.

CHAPTER SIX

THE LATER MEDIAEVAL ENCYCLOPAEDIA: PROLIFERATION AND DECLINE

The paradox of the history of the later mediaeval encyclopaedia is that the genre experienced a remarkable proliferation, particularly in its vernacular forms, and yet simultaneously exhibited the unmistakable signs of decline and failure of inspiration. Not only did size diminish, but there was a disturbing tendency toward the disintegration of that taut organization and disciplined Christian philosophy which was the hall-mark of the encyclopaedic tradition. On a social level as well, encyclopaedias began to lose their universal appeal. The Compendium Philosophiae, for example, is no mirror of the world, but simply a vade-mecum for students of Aristotelian philosophy. Li Livres du Tresor is rather obviously "pitched", in terms of its content and outlook, at the Florentine middle-classes;[1] the Konungs Skuggsja is similarly designed for the ruling orders of Scandinavia, nobles and Hansa merchants. Even the traditional readers of encyclopaedias, preachers and exegetes, were beginning to prefer handy reference books to the great specula, whose huge size and complexity limited their practical use. Because material on science and natural history was not usually available in the collections of exempla, handbooks like the Lumen Animae and the Proprietates rerum naturalium adaptate sermonibus per totius anni circulum were devised in the early fourteenth century.[2] Like encyclopaedias, these were compendia of moralized natural history taken from a great number of works representing the whole spectrum of scientific literature: Avicenna, Fontinus, Galen, Macrobius, Seneca, the Lapidary ("Evax in libro de sigillis"),

Averroës, etc. Yet such works are not encyclopaedias. They are the transformation of the encyclopaedia into a reference book; the information is not arranged according to any scientific, philosophical, or religious theory, but is listed under the sermon it is intended to illustrate. These in turn are arranged chronologically according to the liturgical year. The organization of these works is obviously intended, not to reflect the objective pattern of creation, history, or the human mind, but to permit easy consultation.

There were many encyclopaedias which did not follow the trend towards reference works, but the impression of continuity and development from the thirteenth century is largely illusory. Encyclopaedias such as the Hortus sanitatus were merely reworkings of Bartholemew the Englishman's De rerum proprietatibus into a medical handbook. The Image du monde of Gautier of Metz and its numberless translations is little more than a pastiche of Honorius, Neckam, and other encyclopaedists of the twelfth and thirteenth centuries. To Chaucer's mind no modern had even challenged Vincent of Beauvais as an encyclopaedist,[3] while literary clerics like Pierre Bercheure and the anonymous Bolognese who composed the Multiflorum in 1326 contented themselves with shuffling the information found in the Speculum maius and the De rerum proprietatibus. One senses that there has been a failure of inspiration. Writers of the later mediaeval period seem to have seen only two options before them: either a slavish copying of the old tradition, or its complete abandonment in favour of newer, less encyclopaedic forms.

We have seen how the encyclopaedia has been a barometer of mediaeval civilization, reflecting the nature of its classical inheritance and the Christian universalism of its golden age. Hence it is essential to situate the decline of the mediaeval encyclopaedia within the context of the great spiritual and intellectual changes of the fourteenth and fifteenth centuries. Huizinga's thesis that this period represents less a time of renaissance and renewal than of decay and sclerosis in mediaeval culture could find no apter illustration than that of the mediaeval encyclopaedia. The old forms were either disintegrating or being imitated slavishly and unintelligently, and the well-springs of the encyclopaedic philosophy had dried up.

One can see this happening in the university atmosphere which both fostered and lived off the great thirteenth-century encyclopaedias. The curriculum of the liberal arts ceased to be an integrated propaedeutic to the study of theology and dissolved into a collection of autonomous studies.[4] New notions of the status of Nature, as expressed, for example, by Jean of Meung, and a spirit of extremism, sometimes bordering on hysteria, induced by the wars, plagues, famines, and apocalyptic fears of the time were shattering the solid and satisfying vision of a balanced and harmonious cosmos. The mediaeval conviction of the cohesion of matter and spirit, reason and revelation, was being openly challenged in the halls of Oxford and Paris. Duns Scotus insisted on the separation of the intuitive function, which apprehends primary reality, from the ability to reason, operating on a secondary, disconnected level. Such a gap between the

phenomenal and spiritual world proscribed that ancient lingua franca between the two realms, the image, the mirror, and the allegory. Science and "wisdom" became two parallel paths which would never necessarily intersect in any creature of the natural world, any event in time, or any activity of the human spirit. While it might be true that the isolation of earth from heaven was a great impetus to modern science, it certainly took the heart out of mediaeval science by destroying its encyclopaedism. The death of the symbolic world-view was also the death of the universal-historical outlook,[5] for if there was no code to be deciphered, there was no need for a key. Apart from each other, a universal code or language and the idea of a spiritually cohesive cosmos make little sense. As Koyré points out, the primary characteristic of modern science is the destruction of cosmos and "the disappearance from science of all considerations based on that notion".[6] Hierarchy, value, perfection, meaning, and purpose were slowly becoming obsolete concepts.

The new vernacular encyclopaedias clearly reflect the demise of the old encyclopaedic tradition. Adaptations of the great thirteenth-century works tended to emphasize some practical aspect, such as medicine. This upset the balanced unity of the work, and pushed the Christian philosophy into the background. Original works like Latini's Livres du Tresor, though structured roughly on the three-fold pattern, substituted ethics for the artes liberales and politics for universal history in order to please its Florentine middle-class audience.[7] Moreover, Latini does not seem to take altogether seriously the necessity for a

well-defined structure. Beginning with a division of knowledge, he digresses for a moment on the process of creation before launching into the divisions of world history. From there he jumps back to cosmography and zoology, punctuated with advice on agriculture and directions for building cisterns. This want of clear progression from subject to subject, as well as the absence of an informing philosophy, gives the Livres du Tresor an air of being a refugee from the later Roman Empire.

To a lesser extent, the same faults mar the Image du Monde of Gautier of Metz.[8] This work is far more conscious of the Christian encyclopaedic philosophy than Latini's, possibly because it is the earliest of these latter-day encyclopaedias, and hence closer to the spirit of the thirteenth century. Opening with a discussion of the Creator and his power, it continually emphasizes the basic encyclopaedic theme of knowing God through contemplation of His works. Knowledge of nature does not exist for its own sake. In the words of Caxton's translation,

> ffor men shal never wel knowe the maistre, but yf byfore men shal knowe parfightly his estate and what his werkes been; ffor by the werkys is the werkeman knowen, and how he may be such one.[9]

Throughout this encyclopaedia of cosmology and the arts, the traditional emphasis of mediaeval encyclopaedism is maintained. The parallels between the artes liberales and natural science are explicitly set forth ("God made the world by worde, and the worde is to the world sentence."[10]) and in particular, the appreciation of the marvellous, inherited from ancient writers like Pliny and given Christian application over the centuries, is clearly evident.[11] Yet these classic examples of the mediaeval

encyclopaedic philosophy are set forth in a confused, formless, and episodic structure which expresses little of the spirit of cosmic order. Brave beginnings in the theology of creation bog down in the seven arts, digress into the cosmology of the four elements and from thence to a world geography, return to the four elements, meteorology, and astronomy, indulge in an excursus on the preservation of the arts during the Flood, definitions of philosophy, the invention of money, and the miracles of Vergil, and end with yet another section on astronomy. Such a weak structure reflects the lack of discipline, imagination and deep understanding of the demands of Christian encyclopaedism by men of this period. The Image du Monde allowed structure to disintegrate while keeping philosophy intact. Other works like Pierre d'Ailly's Ymago mundi, emptied the structural shell of its philosophic content.

The Ymago mundi of Cardinal Pierre d'Ailly (1350-1420) is generally only remembered in connection with its most famous reader, Christopher Columbus, whose marginal notes are reproduced in the modern printed edition.[12] That Columbus was definitely inspired by d'Ailly's discussion of the sphericity of the world and the possibility of sailing west to the Orient has led d'Ailly's editors to extol him as a prophet of modern science. They indicate with pride, but not much proof, the Cardinal's adherence to the idea of the "double truth", "qu'il poursuivra à sa limite extrême",[13] and mistakenly classify the Ymago mundi with mediaeval works of practical and descriptive geography designed for the use of travellers.[14] In reality, d'Ailly's treatise is an essay in theoretical cosmology in the tradition

of Isidore's and Bede's De natura rerum. It is a compilation, in the style to which we have grown familiar, of old Latin and Arabic sources, seasoned generously with some contemporary teachings, notably those of Nicholas d'Oresme, d'Ailly's predecessor at the College de Navarre. The format of the Ymago mundi is quite traditional: a discussion of the composition of the world according to the four elements and its disposition according to five zones leads into a general exposition of astronomy and cosmology, concentrating on the explanation of visible phenomena. Thereafter follows a mappemonde of Classical and Biblical lands, much as Pliny or Honorius would have described them. In short, the Ymago mundi is a rather commonplace mediaeval encyclopaedia, save for the interesting suggestions on the rotation of the earth around the sun absorbed from Oresme. Far from being a champion of the "double truth", d'Ailly's other works show him to have been a faithful, if not particularly inspired or energetic exponent of the older, concordist view. From his pen came Twenty speeches or propositions on the agreement of astronomical with theological truth, a Treatise on the agreement of astronomical truth with history, and an Elucidation of the agreement of astronomy with theology and history.

Two factors set d'Ailly's encyclopaedia apart and mark it as a late product. The first is the dissolution of the unity of structure and philosophy. The Ymago mundi is in form a mediaeval encyclopaedia, but there is no mention therein of the philosophy which he clearly expressed in his short treatises, nor does it suggest those complexities of converging and interconnecting

patterns that characterized the encyclopaedia even in its crudest forms. Bede's or Isidore's structure may have been unsophisticated and their philosophy only partly articulate, but at least structure and philosophy were united. The second factor is the use to which the Ymago mundi was put. Because it failed to situate the structure of the cosmos within the context of creation, it did not openly invite the exegete or preacher to seek an understanding of God's word in its pages, or the contemplative Christian to find a vision of a vast and complex universe held together by a Divine Intelligence and a Divine Love. Rather, it served as an introduction to the geographical opinions of the ancients and a manual of elementary astronomy to a self-educated Genoese bourgeois.[15] Like the Livres du Tresor, the Ymago mundi reflects a secularized world-view and the tastes of a new reading public. Stripped of its distinctive philosophy and aim, the encyclopaedia ceased to be, in the mediaeval sense, encyclopaedic.

The Compendium philosophiae, an anonymous early fourteenth-century compilation from Aristotelian sources is perhaps the hardest of these later mediaeval encyclopaedias to assess. Though its modern editor, de Boüard, praises its organization as a stunning piece of originality and "le plus parfait, peut-être, qui ait été imaginé par un encyclopédiste du moyen age",[16] it strikes me as being precisely that hexaemeral pattern which de Boüard condemns other encyclopaedias for blindly and unintelligently following.[17] The compilator begins, like Bartholemew or Vincent, with the elements of theology, primarily according to Aristotle, but with reference to the Timaeus as well. The subsequent section on angels includes a general discussion of the superlunary

world, mostly from Aristotle's De coelo and the Metereology, but considerably supplemented by more descriptive sources.[18] A discussion of living things follows, classified according to Aristotle and Genesis into vegetative, animal and rational. Thus far, the Compendium philosophiae has followed the well-worn path of encyclopaedic structure. Now however it departs from the norm in a rather revolutionary way. The cosmology and natural history, which emphasized description rather than theory, are followed by an outline of the general theories of Aristotelian science. The ideas of the Physics, Metaphysics, De generatione et corruptione, etc., are examined and applied to those things previously discussed individually. This is a betrayal of the encyclopaedia at once more subtle and more radical than that of Latini, d'Ailly, or Gautier of Metz. Instead of being the product of a total world-view whose philosophy organically shapes and is expressed through its form, it has become the vehicle of a particular philosophy imposed from without.

> Les oeuvres précédents utilisaient dans les mésures diverses les éléments du savoir apportés par le corpus aristotelien; avec le Compendium la situation s'inverse, c'est le cadre de l'encyclopédie qui est utilisé pour exposer ce savoir d'une manière plus accesible à une publique peu habituée aux méthodes du Stagirite et de ceux qui s'explique en latin depuis bientôt un siècle.[19]

Though the Compendium seems to have satisfied neither the partisans of thorough-going Aristotelianism nor those of the traditional encyclopaedia,[20] it is a witness to the disintegration and deflection of the encyclopaedic ideal. There are countless such encyclopaedias from the fourteenth and fifteenth centuries, yet to discuss each of them is unnecessary. They all display,

though in varying degrees and with different emphases, the characteristics of the Compendium philosophiae, Ymago mundi, Image du Monde, and Li Livres du Tresor. The encyclopaedic structure and the encyclopaedic philosophy survive, but there is little imaginative development. Moreover, that sense of their vital unity which had always inspired the growth and maturing of encyclopaedism had clearly ceased to be meaningful. The result is structure without spirit, as in the Compendium, or the Ymago mundi, or philosophy without structure, as in the case of the Image du Monde. The spirit of the later middle ages, compounded of an uninspired elaboration of old form and a taste for bold and unprecedented novelty offered little that was congenial to the delicate, yet intellectually rigorous world-view of Christian universalism.

Because it structures all that is deemed knowable by any culture, an encyclopaedia is an excellent barometer of the values of that culture. How broad are its intellectual horizons? What order, or want of order, does it acknowledge in the cosmos? What does it consider worth knowing and how does it feel it can best be imparted? Examining encyclopaedias, both for what they contain and how it is expressed, can lead to deeper insights into the heart of a civilization. Even titles can be revealing. Speculum, for instance, accords with the claim of mediaeval encyclopaedias to reveal faithfully the organic wholeness of the physical and spiritual universe, both as regards contents and form. The Renaissance preferred the title Anatomy, which suggests that the cosmos itself has a passive role and the encyclopaedia

an active one of exploration and dissection, quite the opposite of the mediaeval view-point. Yet first impressions can be deceptive. Ironically, the title Speculum, suggesting a vast mirror reflecting the random and mutable world, designated a highly formal and structured encyclopaedic work, whose orientation was towards the eternal and unchanging plan of God. Anatomy, on the other hand, has connotations of minute division and classification of something permanent, even dead; yet Robert Burton chose this as the title of a work of structural and philosophical ambivalence.

The ordinary twentieth-century encyclopaedia reflects our own cultural position. Discrete fragments of knowledge, held together by no principle stronger than alphabetical order, are lumped into twenty volumes for easy reference. Our encyclopaedias offer what our culture offers; vast amounts of information, distrust of universal order, skepticism concerning intangibles, and a mechanical, utilitarian approach. Yet old concepts, even those as culturally specialized as mediaeval encyclopaedism, seldom perish utterly. They are simply shelved away, and perhaps in our own day we shall witness a renewal of the old encyclopaedic spirit. In early 1974, the publishers of the Encyclopaedia Britannica announced plans for a new edition.[21] It would not simply correct and update data contained in the old edition, but provide a wholly new structure. The new encyclopaedia will be composed of three sections. The Propaedeia will provide a total framework for knowledge. The Micropaedeia, a dictionnaire encyclopédique, will contain short articles on subjects of narrow

range, while the Macropaedeia will synthesize these into broader topics and emphasize comprehensive patterns and interconnections, according to the Propaedeia outline. If a major encyclopaedia like the Britannica adopts the principles of comprehensivity and synthesis, then the spirit of the Speculum maius lives still. May it grow stronger, and help heal the wounds of our age. If we would learn to think in terms of world peace, a global environment, and the family of man, then the shade of Vincent of Beauvais might prove an unexpected, yet valuable guide.

FOOTNOTES

1. Collison, op. cit., p. 65.

2. Lynn Thorndike, "The properties of things of nature adapted to sermons." Mediaevalia et Humanistica, vol. 12 (1958) pp. 78-79.

3. For discussions of Chaucer's use of Vincent of Beauvais, see the following:
   Pauline Aiken, "Chaucer's Cleopatra and the Speculum historiale." Speculum, vol. 13 (1938) pp. 232ff.
   ---------, "Vincent of Beauvais and Dame Pertelote's medicine." Speculum, vol. 10 (1935) pp. 281ff.
   ----------, "Vincent of Beauvais and Chaucer's Monk's Tale". Speculum, vol. 17 (1942) pp. 56ff.
   Walter Clyde Curry, Chaucer and the Mediaeval Sciences (New York: Barnes and Noble, 1960)
   John M. Steadman, "Chaunticleer and mediaeval natural history" Isis, vol. 50 (1959) pp. 236-244.
   W.K. Wimsatt, Jr., "Vincent of Beauvais and Chaucer's Cleopatra and Croesus". Speculum, vol. 12 (1937) pp. 375-381.

4. Georges A. Barrois, "La fin des synthèse médiévales", Arts libéraux et philosophie, op. cit., pp. 741-2.

5. ibid., pp. 742-743.

6. Alexander Koyré, "Galileo and Plato", Journal of the History of Ideas, vol. 4 (1943) p. 404.

7. Ch. Langlois, La connaissance de la nature et du monde au moyen âge (Paris: Hachette, 1911) p. 334.

8. ibid., p. 70.

9. Oliver H. Prior, ed., Caxton's Mirrour of the World. Early English Text Society, E.S. vol. 110, pp. 21-22.

10. ibid., p. 34. 1912

11. see in particular ibid., pp. 96-97.

12. Pierre d'Ailly, Ymago mundi. Ed. and Trans. by Edmond Buron. (Paris: Maisonneuve Frères, 1930).

13. ibid., p. 96.

14. ibid., p. 34.

15. ibid., p. 38.

16. de Boüard, "Une nouvelle encyclopédie", op. cit., p. 37.

17. ibid., p. 39.

18. Michaud-Quentin, op. cit., p. 592.

19. ibid., p. 594.

20. ibid.

21. The New York Times, January 11, 1974, p. 39.

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