AURELII AUGUSTINI DE MUSICA LIBRI VI

A pythagorean interpretation

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Except where noted this thesis is all my own work.
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This thesis attempts to interpret Augustine's of Hippo *De Musica Libri VI* in a fashion consistent with what I assume are typically pythagorean modes of thinking. Its fundamental principle is that the space-time universe and the atemporal universe of being are both constructed and understood on the model of the principles and arrangements of numbers. This position is embedded in a Platonic philosophical tradition communicated via Plotinus and Varro which more specifically provides Augustine with the imagery out of which he constructs his study.

The text is divided into six books which are considered consecutively before finally considering the whole in relation to its most obvious historical counterparts Martianus' *De nuptiis* and Boethius' *De institutione musica*. The opening chapter attempts in very general terms to specify a tradition of 'number imagery' which I notice running through ancient Greek and Roman thought. Some of its more specific locations are described briefly, especially the work of the 'Neo-pythagoreans' and Plotinus' *Ennead VI*. Augustine's relationship to this tradition is briefly sketched.

The second chapter discusses book one in detail. It deals first with the definition of *musica* as *scientia bene modulandi*. It is clear that Augustine thinks of *musica* as first an intellectual discipline directly apprehended by the intellect and founded on a study of number relations. Then the detailed numeric theory is presented as an introduction both to the philosophical imagery of book six and as an introduction to the following books on prosody.
These books two to five contain a unique rhythmic theory which, Augustine argues, issues in a logical way from the theory of number relations and must be clearly distinguished from the grammarian's interest in prosody. The principle of understanding is *ratio* which is used in the treatise to mean both *ratio* and reason. This double meaning is exploited, especially in these books, to make the rational character of his system clear. At the same time he maintains that sense itself is formed after these intellectual qualities and so the perfection of rhythmic movement can be recognized without ever being understood.

Some comparison has been made with Giovanni Masi's recent edition of the

treatise.

Chapter four discusses book six of the treatise in considerable detail. It is a psychological study of sensation and its relation to *ratio*. *Ratio* appears as the centrepiece of a theory of sensation based on kinds of *numeri* which are all immaterial contents of the active soul. Their relation to "natural" and rational judgement is explored. The puzzle of sensible experience is explained in terms of an image, the *carmen universitatis*, which is central to my interpretation of the treatise. The image helps merge several categories of discourse as it locates the rational soul in social, aesthetic and ontological terms.

A short exploration of the influence of the *De Musica* in the middle ages is included in the final chapter. A fairly comprehensive bibliography is attached.

*This, and other, amendments made by Paul Thom, 29th of May 1984.*
My text of the De Musica has been that in the Bibliothèque Augustinienne series Oeuvres de Saint Augustin, 1re série, VII, vi La Musique De Musica Libri Sex (Bruges: Desclée, de Brouwer et Cie, 1947) with introduction, translation and notes by Guy Finaert (books I - V) and F.-J. Thonnard (book VI). This is cited throughout as BA.

Some comparison has been made with Giovanni Marzi's recent edition of the text, Aurelii Augustini De Musica (Florence: Sansoni, 1969) (Collana di Classici della Filosofia Cristiana, 1). This is cited throughout as M.


The De Musica will be cited throughout as DM followed by book number, chapter and section. De Musica lib. VI, ch. 17, sect. 58 would be DMVI17.58. Other works by Augustine are fully named but similarly cited.
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'Tis nature's voice, thro' all the moving wood, Of creatures understood, the universal tongue, To none of all her num'rous race unknown. From her, from her it learn't the mighty art, To court the ear, or strike, or strike the heart. At once the passions to express and move. We hear, and straight we grieve or hate; rejoice or love. In unseen chains, it does the fancy bind, At once it charms the sense, and captivates the mind. Soul of the world, inspir'd by thee, The jarring seeds of matter did agree. Thou did'st the scattered atoms bind, Which by thy laws of true proportion joined, Made up of various parts, one perfect harmony. - Nicholas Brady, 1692
The Pythagorean tradition ...

Explanations of consonance have consistently connected this musical quality with simple numeric ratios. That two voices which are "in tune" or not can be felt, and that this feeling can be explained in terms of simple ratios, led Pythagoras¹, as tradition has it, to argue that all that exists, including sensible qualities, may be explained in terms of numbers and the laws which govern their relations and generation.

Not only has this theory of consonance connected music with mathematics, but it has led to a tradition of philosophical and theological thinking which takes the a priori laws of number as the foundation of all rational thought. This view is as much ontological as it is epistemological; these invariant, immutable laws govern the structure of being itself. As Edward Lippman puts it:

"Music often has resemblances to natural science and philosophic thought, to the first because of its mathematical and structural properties, and to the second because of its concern with the nature of consciousness. The arithmetic, harmonic and geometric proportions of consonant intervals and scales, and the mathematical relationships of scales among themselves and with respect to the whole tonal system, have produced a recurrent tendency to equate music with the natural world. The circle of fifths, the recurrence of the scalar qualities of tonicity at each octave, and in musical rather than tonal terms, the repetition of a melodic phrase literally and especially sequentially, or progressive harmonic modulation through successive fifths, all tend to suggest astronomical and geographical and physical counterparts. The result has been a series of correlations with planetary distances and speeds, with the seasons and months and hours, and with the symmetries of plants and animals and with the body and soul of man (in this context we omit architecture and sculpture and painting), with the structure of crystals and atoms, and with various kinds of


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physical rotation and revolution. These correlations extend from ancient China and Greece to the 20th century. ... In general the resemblance of music to nature has two implications: music may be conceived as nature, which acts through the creative genius of man to produce art, a higher nature; and nature may be conceived as music, a notion that is supported in part by an inter-sensory or even synesthetic factor. The emotional potency of music is also a part of the correlation, ... Fundamentally this is an analogical method of organising the diversity of experience, but the analogies or equivalences can be established only because there is in fact some kind of parallelism or correspondence, whether structural or material, between the phenomena that are to be connected. A striking example of the 'discovery' and development of such a parallelism and concomitant analogy is the history of the quadrivivial sciences in the West, which extends from Greek antiquity to the 17th century. In the beginnings of the quadrivium in Pythagorean thought, arithmetic, geometry, music and astronomy shared common elementary principles and deductive elaboration, their theoretical structure was uniform, and they thus accounted for perceptible phenomena in a uniform way."

The conceptual and the sensible seem inextricably mingled. The feelings which music generates are explained in terms of a fixed theoretical structure. This structure is validated not by some appeal to its consistency, but by an appeal to the senses themselves as they consistently prefer the order expressed in an invariant musical structure to a jumble which displays no structural unity. The relation of sensibility to sense is grounded in this formation of consciousness in rational and numeric terms. The mind is confronted with the multiplicity of sensible experience, it attempts to make sense of this experience by applying the rules it has discovered which seem to explain the continuities and discontinuities of that experience. These rules are themselves invariant patterns which persist not *through* the multiplicity, but *beyond* it as they turn *chaos* into *kosmos*.

More specifically, the imagery with which understanding works is musical. In this context multiplicity itself becomes whole as the various parts of a song 'fit together' (recalling the original meaning of harmony) as musical structure. These parts all have a fixed place in the structure. Yet they all relate to one another as their patterns are perceived in successively more broad categories based first in the binary relation of part to part. These relations may all be described in the language of harmonic and rhythmic theory. In turn, this language is formed of more general laws governing the relations between numbers themselves.

Musical imagery emphasises a series of perspectives. In a song, individual parts relate one to another sequentially. They form patterns which fluctuate as the song is sung. Integrated patterns are altered, transformed, and finally disintegrate into new patterns. So the process of understanding itself fluctuates: first integrating its experience into patterns and then transforming them as it explores their possibilities, and adds new experiences. Such imagery organises sensation into spatial and temporal experience. Each integrated pattern forms a point of view, a way of understanding the related parts. These integrations themselves may change both as they are explored and as the mind encounters new experiences which it attempts to fit into the integrated sequence. As the future moves into the past what is understood changes in the sense that points of view alter. These alterations may become themselves more general positions out of which a more comprehensive perspective can be achieved. This is the journey beyond.

Why should understanding choose this image? As it moves beyond its immediate, momentary experience it appears to discover within itself the laws which make such introspection possible. These laws transcend even its own attempts at synthesis as they form such synthesis. By analogy, they provide the means for reflecting on the whole and not simply settling on its parts. Understanding, a product of reflective thought, is formed of these laws which are also the principles of number. As we understand, so we perceive the cosmos. It, too, is like a song, its parts relate to one another as they integrate into patterns which fluctuate over time. The quadrival sciences of music and astronomy attempt an explanation of movement and relations in terms founded in the theoretical disciplines of arithmetic and geometry. All four sciences are founded on number, which is both an explanatory device and an ontological principle.

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Ernest G. McClain has argued that detailed musical analogies, based on a cryptic use of the number ratios which explain tuning theory, pervade many ancient texts and are especially to be found in some of Plato's later dialogues.3 This imagery is specifically musical and requires a detailed knowledge of tuning theory. It is also very rich in explanatory power. In one image it is possible to capture a multitude of perspectives and allusions which form a kind of explanatory map. For example, Plato's detailed exposition of the structure of the World Soul in his Timaeus is given in terms of a tuning theory based on powers of two and three. The detail is too complicated to reproduce here but it shews that Plato was very familiar with that detail.4 His final image is highly complex and the idea of "self moving number" is at its centre.

Plato was not simply a Pythagorean. But the doctrine of being which bears his name and forms, for instance, that metaphysical picture in the Timaeus, was strongly influenced by contemporary pythagorean thinking, in turn, it revolutionized that thinking.5 Plato frequently uses the language of number theory as imagery to illustrate or argue for some particular philosophical position, either about the sensible universe or the relations between ideas themselves.6 The consistency of the mathematical sciences is taken as an ideal for the consistency of both the cosmos and the world of being. This is a central pythagorean doctrine. Its consistent feature is the acceptance of number as that which determines what may be understood.

3. Ernest G. McClain’s The Myth of Invariance (New York: N. Hays, 1976) interprets the Rg Veda, the Book of Revelation, some Babylonic and Sumerian myths, and some Platonic texts (from Republic and Critias) in this manner. His The Pythagorean Plato (New York: N. Hays, 1977) analyses fully passages from Republic, Timaeus, Critias and the Laws, demonstrating how the musical analogies are fully worked out in terms of pre-Euclidian number theory.

4. See McClain, Plato, op. cit., ch. 5.

5. The early pythagoreans were materialists (cf. Walter Burket Lore and Science in Ancient Pythagoreanism (tr Edwin L. Minor, Jr)(Cambridge, Mass.: Harvard University Press, 1972) p 31), those after Plato, and perhaps those in the Academy itself, held a doctrine of being similar to Plato's and derived from it. (e.g. Nicomachus, Introducitio Arithmetica I 1-3)

6. eg. Republic 545E-547C, the ‘Muses Jest’.
The patterns of number relations form a series of perspectives which determine the variety of experience by providing for its consistency. This tradition extends into the recondite areas of numerology and number mysticism as well as remaining within the more sober quadrivial sciences. Perhaps its most famous theory, and one which often signals a pythagorean influence, is that of the harmony of the spheres. This theory may be looked at in many ways. At one level (thought of as 'unscientific', notably by Aristotle) it asserts that as the planets move they produce a heavenly harmony of sounds which form the most perfect consonance. But, more seriously, the theory captures in one image both the musical and numeric themes of the pythagorean tradition. The endlessly repeated, consistently varied musical quality of harmony, as each planet moves in relation to the others, is linked to a rigorous mathematical detail which explains the movement as the discipline of astronomy.

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Augustine's writings are firmly grounded in the Platonic tradition, including its reverence for number. His thought, especially in his early works, is formed from many sources which include Cicero, Varro, Marius Victorinus as well as Latin translations of Plotinus, Porphyry and, perhaps, Nicomachus. His attitude to number as the key to eternity is attested in many places. What may be understood (as opposed to what may be felt) of the world is founded on the predisposition of the soul to think in certain ways. The ideas and immutable laws of number are held in the soul and form its thought. In his De Musica this attitude reaches an intensity


8. At least for his philosophical background see, for instance, Pierre Courcelle Late Latin Writers and their Greek Sources (tr. Harry E. Wedeck) (Cambridge, Mass.: Harvard University Press, 1969) Ch. 4.


to be felt nowhere else. Perhaps because his subject was *musica*, the treatise exhibits a peculiarly pythagorean disposition. His dialogue about music and hearing generates a psychological theory where numbers appear as musical structure and provide the apparatus through which the soul apprehends that structure. 11

The discourse of the *De Musica* centres on number and its all-pervasive explanatory power. First Augustine locates *musica* as *scientia*, a body of knowledge apprehended directly by the intellect and forming the basis of musical practice. Music is entirely numeric in content, it is founded in the theory of number relations. Rhythm, the study of which is the central focus of the treatise, is discussed as deriving *a priori* from these number relations. The discussion is reminiscent of more traditional harmonic treatises. Finally, Augustine’s psychology of feeling and thinking is given in terms of the *numeri* which constitute the patterns of verse and the objects of *scientia* itself. The ideas of order and pattern, *aequalitas*, proportion and above all, *ratio*, pervade this discussion and give it its peculiarly pythagorean tone.

I do not mean to suggest that Augustine was a Pythagorean or that he accepted all the beliefs that his contemporary neo-Pythagoreans espoused. I would venture to suggest that he did accept the view that God preserves both the form and nature of all existence, especially material existence, and orders it on a numerical basis. 12 Augustine’s imagery in the *De Musica* is, however, not just numeric; it is specifically musical. The ideas of ratio and proportion, and the concentration on song and its measures, all suggest pythagorean themes. But his imagery lacks the mathematical detail which is to be found in specifically pythagorean sources. Augustine appears to have acquired a smattering of mathematics without its detail. So the imagery remains allusive and general in its application. Perhaps this generality reflects something of Plotinus’ own number imagery, especially that in the Enneads “On time and eternity” and “On number”.

11. *cf.* P. Víctor Tuesta’s “Eficacia del número, según San Agustín” _Estudio Augustantino_ 3(1968) pp 82-107, esp. sect. III, which discuss the journey to truth *via* numbers.

discussed below. But, at least in the *De Musica*, the numeric theme is far stronger. Plotinus' influence on Augustine's philosophical thinking is undoubted, but, in the sixth book where that influence is to be felt so strongly, he adds to it the apparatus of *numeri* which provides for a fundamental unity between various activities of the soul. This unity is captured in a musical vision, the *carmen universitatis*, which is an important key to interpreting the individual, social and cosmic visions in his closing chapters.

**Unit and Number: counting and collecting**

The early Pythagoreans countered Eleatic objections to multiplicity by invoking the mathematical notions of *calculation* and *counting*. In order to understand how number becomes so ontologically and epistemologically significant, it is important to distinguish the ancient meaning of *arithmos* from modern, post-Fregian, conceptions.

The experience of concord precedes the discovery of the ratios which measure it. Attempts to solve ontological problems associated with this process of discovery form a large part of the inspiration of ancient metaphysics. Modern science, on the other hand, does not seem to intend that any particular concept be based in an immediate experience.\(^{13}\) All that is expected is that the concept function harmoniously within an edifice of interrelated concepts.

In ancient mathematics the objects of the inquiry (numbers, ratios, geometric figures and so on) are the objects about which speculation takes place; they thus direct its method. The ways in which these objects are interrelated derive significance from these objects' ontological status.\(^{14}\) Modern mathematics, on the other hand, is more preoccupied with the interrelations themselves as they form a cohesive, abstract structure.


14. *eg.* Aristotle's explanation that the 'being' of the objects of mathematics is the task of philosophy and to be found in their separation by reflective thought. (*Metaphysics* K4. 1061b25-27; *De Anima* III17, 431b15f, note Klein, *op.cit.*, p 122f.)
Number arises out of the experience of things. This is the "immediate experience" from which the idea of natural numbers arises. Things of the same kind are grouped together and numbered off. Each number is "a definite number of definite things." Pure numbers, then, which are not associated with any particular collection (like a mob of sheep or a group of triangles) must still be a definite number of "pure" units. In this sense number is always determinate.

It follows that unity is not a number itself but the source of number. The smallest number is two, i.e. "two units." In this case the unit (one) is a substratum for numbers, its multiplicity making counting possible. There is an ontological problem, however, as to how this multitude of units can be comprehended by one number. This is the classic problem of how one and many are to be related. It is tied always to its foundation in the theory of number.

Pure numbers are those used in general calculation. They need to be understood independently of things as counted. To ensure the generality of what is known the understanding needs objects which are not dependent on the mutable groups of counted kinds. The theory turns on the ontology of number. Plato says the soul turns to objects devoid of material substance. The understanding needs an object of knowledge which is countable. The singular object is the nonsensual unit, or monad. Pure numbers are a finite multitude of nonsensual units. These units form a series which is studied as arithmetic.

Arithmetic, however, does not arise "out of" the fields of pure units. Rather it is the study of how this apparently unlimited field of units is arranged so that its multiplicity may be understood as bounded and not 15. Theaetetus 198c.

16. Klein, op. cit., p 46. Note also Aristotle Physics A14, 224a2ff; Metaphysics 11, 1052b22: number is "recognized as quantity through the one."


18. Cf. Republic VII 518D.

19. Klein's list (op. cit., p 51f) of ancient definitions is instructive on this point.
uncomfortably (and incomprehensively) limitless.\textsuperscript{20} This is one reason for the detailed descriptions of arrangements of numbers as collections of points (monads). These arrangements possess unambiguous characteristics which may be reduced to particular elements. Number is intelligible because the multitude of its units is determinate. Numbers may then be understood in terms of other formal characteristics such as whether they are equal or unequal, greater or less than each other, and so on.\textsuperscript{21}

Numbers are \textit{first} apprehended when numbers of objects are apprehended. There is no clear distinction between a number and a numbered group.\textsuperscript{22} Plato suggests that numbers themselves are the objects of knowledge, appearing along with the ideas in the intellect.\textsuperscript{23} It is this suggestion that numbers are the objects of knowledge in themselves which gives rise to the notion of numbers as "pure" units. These are inaccessible to the senses and are thus, for Plato, superior as ideas because they are not subject to change. As ideas they are subject to the same principles which determine the structure of Being.\textsuperscript{24}

Aristotle rejects this idealistic theory in favour of a position where the being of abstract things like numbers and qualities depends on the being of the substances in which they inhere.\textsuperscript{25} In that, the whole ontological edifice of number collapses into the view that numbers are a determined multitude of collections of things. The mathematician studies mathematical objects as they are "lifted off" or "taken away from" the substances that generate them.\textsuperscript{26} Their definition does not depend on the attributes of their underlying substances, but on some theoretical account

\textsuperscript{20} e.g. Nicomachus \textit{Introduction} 12.5: "... a science dealing either with magnitude, per se, or with multitude, per se, could never be formulated ... A science, however, would arise to deal with something separated from each of them, ... with quantity, ... and size, ...". Note also at I7.1: "Number is limited magnitude..." (tr. D'Ooge).

\textsuperscript{21} cf. \textit{Philebus} 25A7-B1 and \textit{Theaetetus} 147E4-148B4.


\textsuperscript{23} \textit{Theaetetus} 198Af.

\textsuperscript{24} below pp 12-17

\textsuperscript{25} \textit{Metaphysics} M2, 1077blff.

\textsuperscript{26} \textit{Metaphysics} K3, 1061a28-32.
which excludes the contingencies of sense by eliminating them "in thought".

Numbers (and other mathematical objects) are discussed as if they were detached from the objects of sense. They become the objects of a study which itself must accept the being of its objects without an accompanying ontology. It is commonly held that this theory is one of abstraction. This should be taken in a qualified sense. The process of "lifting off in thought" is not just a psychological explanation of a cognitive process but an attempt to present a kind of anti-ontological description of objects "lifted off". I do not think Aristotle intends this process to be abstraction where the object becomes an abstracted object. Most commentators, especially Annas and Klein, do take it this way and so generate many of the problems they find with his theory. But its origin, at least, is an attempt to explain the nature of mathematics in terms of its method and, in order to avoid any commitment to the being of numbers apart from their being in substances, they are simply "collections of things".

This theory explains, in psychological terms, number as consisting in "indifferent" material which is ignored in the process of mathematical reasoning. "As if" denotes an act of inattention to the ontological question. The mathematician is happy to leave it aside and examine numbers and their interrelations "in thought". Even if this is not construed as a fully developed theory of abstraction it does seem to detach mathematical (scientific) thinking from the foundations of "immediate experience" and so detach the question of coherence (internal truth) from that of how it might explain the world of sensible objects, and thus come to be "true".

On the other hand, to explain how numbers are determinate Plato invokes the idea of structure: that two is one thing - a pair. Aristotle rejects this because it separates numbers from things and because it makes

27. This is the substance of Metaphysics M3, cf. Klein, op. cit., pp 101-104; Annas, op. cit., pp 29-34.

28. The term here is again aphairesis (to take away).

29. cf. De Anima III7, 431b15f and De Memoria 449b30ff. Klein proposes (op. cit., p 105) that this is the ontology of numbers - that their mode of being is their "subsequent 'indifference'" to substances.

30. see below pp 15,16
something "not one" into "one". He proposes that instead of thinking of a number as a separate, single quantity (thus generating it as an object 'in itself'): number should be understood as a heap of things. Again he proposes the more primitive view that number is the count of some collection.

Klein notes that one advantage of this view is that it does away with the need to explain unit as ontologically indivisible, independent of number itself. 'Indivisibility' is simply the very measuring character of the unit in terms of the collection it defines. In this way Aristotle introduces a theoretical concept of knowledge which makes it possible to discuss numbers without reference to any ontological framework, or to any particular collection of objects. His description of 'unit' may be altered at will. Yet the very openness of this means that there seems to be no apparent way of comparing the units themselves. In order to collect things as a certain number, 'thing' needs a definition. But to be able to define 'thing', it must be possible to individuate it and in that case there is already a definition of 'thing' in terms of how many there are.

On the other hand, number understood in terms of its formal characteristics (its principles) explains determination. Very general classes of determinate being explain the arrangement of the numbers in their particular order. In this (Platonic) sense, the structure of Being generates number as it informs that which is precisely the limit of a multiplicity of units. The first division, it is often noted, is that between the even and the odd. Here at the beginning of the generation of numbers the original multitude is gathered into two groups, each with unambiguous characteristics. While each group is still, apparently,

32. *Physics* A14, 223a24f; *Metaphysics* M8, 1084b21f. cf. Klein, op. cit., p 107. The problem of abstraction arises when 'pure' numbers are said to be heaps of monads separate but not detached from the experience of counting things.
33. op. cit., p 112.
34. Annas, op. cit., p 41.
35. cf. *Philebus* 25A7-B1, *Theaetetus* 147E4-148B4 and Nicomachus *Introduction* 17.1 "... the first division of number is even and odd."
unlimited each is also comprehensively one thing.

The idea of 'determinate' at this point is being used as a principle of understanding. The details of the generation of number from "the even and the odd" need not be of concern here. But it is notable that the determination of numerical quantity is again independent of whatever is the 'immediate experience', the case of counting. The limit of number is to be found in its formal articulation. It would not even be necessary to presuppose a substratum of 'pure' units. Yet the original conception of number arose from just such considerations. Arithmetic was supposed to have provided some account of how the field of units, that limitless multiplicity, was determined. It does that in general ontological terms as number is generated from the principles of number. This is significantly different from Aristotle's 'anti-ontological' account.

The principle of Number: The One and the Dyad

The early Pythagoreans did not think of numbers as separate from things. They had not generated the concept of 'pure' number. Rather, they spoke of things as "consisting" of numbers or "being" numbers. Musical concord, then, was understood to be simple ratios of numbers. These do not make concord; they are just that which the concord is. This way of talking presents a view of the world where things fit together (harmonize) in a richness of "mutual allusiveness and interconnection".

The principle of Number, accordingly, is the primary pair, the Odd and the Even, or the Limited and the Unlimited. The Pythagoreans regarded this pair, as a primeval opposition which lies behind Number and thus the cosmos. They argued that these two principles moving in the One caused it to breathe, producing a flow of more complex structures, the series of

37. There are many critical explanations of Plato's theory of generation to which I allude here. I note Annas' critical description of Plato's theory and some of its secondary literature (op. cit., pp 8f, 51-55) and also Anders Wedberg Plato's Philosophy of mathematics (Stockholm: Almqvist & Wiksell, 1955) esp. p 23f. A more sympathetic and ingenious method based on superparticular ratios and doubling is given by McClain (Myth, op. cit., p 24) which seems to avoid many problems.

38. This is Aristotle's version; after Burkert, op. cit., p 31.

natural numbers which were identified with the material world. Number, then, signifies the power of order in the universe. "Things are numbers" is an insight into how the material world is to be understood.

The plurality of things, and their constant flux, made it appear that nothing was certain. Plurality represented a change - a becoming that never resulted in being. The Pythagoreans asserted, however, that plurality could be understood in terms of being, in terms of an ontology of number where even abstract qualities correspond to numerical quantity. Plurality need not stand in opposition to being and unity. But it raises problems for the understanding of that unity. It becomes necessary to invoke the aid of calculation and counting in order to explain multiplicity and alteration. In many places Aristotle's examples of pythagorean thinking evidence a correspondence between the plurality of things and the system of numbers, importantly, alterations of things correspond to alterations in the number-matrix. These alterations, the movement of numbers both as they proceed from their principles, and as they need to be understood in terms of ratios and proportions, form the basis of a 'dynamic' perspective which permeates ancient thought.

This perspective is essentially a musical one, just as its beginnings are usually explained in terms of Pythagoras' 'discoveries' about musical concords. Plato's dialogues, for instance, abound in mathematical allegories which are constituted as models for the understanding of the soul, the material universe or social relations. These allegories employ

40. Burkert, op. cit., p 34f.

41. Aristotle's terminology is often inadequate to the task of expressing pythagorean doctrine because he imports into his account concepts inappropriate to the presocratic understanding that number and cosmos correspond to one another. (Burkert, op. cit., pp 44-47). For instance, the numbers which make up the tetractys are significant because they explain how the fundamental intervals are concords. But it may equally be said that these concords were known to be concords before their numerical ratios were discovered. The cosmos infuses certain concords with significance just as the superparticular proportions indicate the simplicity of their nature. At this level, as nothing may be known without number, number cannot be known without things.

42. Burkert, op. cit., p 466ff.


44. McClain, Myth, op. cit., esp. pp 196ff, but passim.

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an archaic, pre-Euclidian mathematics and involve largely musical images explained in terms of tuning theory - the way the notes of the octave fit together.

Tuning theory, in Pythagorean terms, uses the octave consonance as a reference point. The recurrence of the octave invokes a cyclic metaphor into which other ratios may be fitted. These simple proportions form a kind of algebra for number in general. As Professor McClain remarks:

"...‘God’ is the immovable ‘1’, the reference point; ‘2’ is ‘mother’ or ‘Receptacle’, symbolized by the undivided circle; and her first ‘child’ is the arithmetic mean between them, the prime number 3 in the octave which has been doubled to avoid fractions so that it reads 2:3:4. But this child always has a ‘twin’ brother derived from the reciprocal meanings of 3 - functioning as harmonic mean - so that we actually meet our first Platonic children in the musical proportion 6:8:9:12."

What do these principles have to do with ideas? As they generate, and thus determine, the number series, so they also determine the structure of ideas because they are ‘pure’ objects of thought. In the world of ideas two questions may be asked: what is this idea, and how does it relate to other ideas? As the ideas collect into related groups, Plato, in the *Sophist*, introduces a term to describe them as classes - *genres*.49

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45. In order to avoid fractions the Pythagoreans chose ratios with a final number allowing a particular set of fractions to be cleared within the octave relation 2:1 (i.e. 12 divides the octave into 6:8:9:12; cf. Republic 545A-D and McClain, Plato, op. cit. p 17)


47. cf. Sophist 238A-239B.

48. Consider the ideas Motion and Rest. Each is entirely opposite to the other and they are thus logically related as opposites. As ideas they each have Being, but that is not to be identified with either of them but is a separate idea as each participates in it, but do not participate in each other. (Sophist 252D) Motion is not Rest and vice versa, so each also participates in non-Being which later becomes identified with Difference. (Sophist 254D).

49. Sophist 253B.
This term may be useful in explaining the structure of number. Numbers which are "pure" heaps of units are related to each other arithmetically. But it is not clear how numbers are to be uniquely determined. Aristotle argues that Plato needed to distinguish number-ideas from these objects of arithmetic. These would be all distinct from one another and generated according to the structure of the ideas themselves. They distinguish each number from each other number and are constituted of units which combine to form each number-idea uniquely. There is no idea of 'Number' itself - each number-idea is distinct. However they form a genus which is the assemblage of all number-ideas under that description.

The ideas themselves are interrelated as they assemble into gene. Klein identifies such assemblages of ideas as they very collections which constitute number-ideas. Number, then, is still understood in terms of collected group. "Animal" may be understood as a finite collection of ideas (human, cat, ...) bound together under the description, the genus, 'animal'. Neither the individual members nor the genus itself lose their determinate quality in such an arrangement. The unity of a genus is whatever is held in common between the ideas that constitute it. As units combine to form finite groups, so the ideas combine to form unique genus.

The use of number in this account is not mathematical. The interrelations of ideas, that structure which permits thought to make distinctions and to discern likenesses, provide for the possibility of counting because each is a unit, and may be collected together as a definite number of units. It is in this way, then, that numbers might be said to form the structure of ideas, a relation particularly intimate, but not mathematical. It is notable that the phenomenon of counting, and the

52. op. cit., p 91.
53. see above.
54. Plato continues the pythagorean tradition. As the soul contemplates the interrelation of ideas, it finds the principle of number at the heart of that contemplation. For the Pythagoreans number constituted the material world. (Metaphysics A8, 990a3-10). For Plato the perfect world of Being is so constituted. Aristotle credits Plato with limiting the number-ideas to ten, again continuing a pythagorean tradition. (Metaphysics Σ8, 1073a20; M8, 1084a12ff, Physics Τ6,
finitude of particular number, lie at the heart of this relation between one and many.\textsuperscript{55}

The number-ideas are ideas of quantity in the sense that they enumerate the structure of ideas; they are not themselves quantitative. They may be differentiated according to the principle of the Dyad as it differentiates One itself. The Dyad is the indefinite relation between being and non-being, between what a thing (an idea) \textit{is} and what it is not. In combination with the One, the principle of Unity, it produces all things.\textsuperscript{56}

These principles, it is argued, generate numbers. Aristotle says so at \textit{Metaphysics} A6\textsuperscript{57} and presupposes such argument in books M and N where he is critical of what he supposes are Plato's theories. These arguments have been defended by Annas\textsuperscript{58} who alludes to Plato's heavy dependence on pythagorean thought. Burkert, too, notes this.\textsuperscript{59} It may be that, given the careful mathematics of the \textit{Timaeus} for instance, more care needs to be taken in understanding how number proceeds from the One and the Dyad. There, Different and Same are a metaphor for the phenomenon of octave.

\textsuperscript{206b32f}).

\textsuperscript{55} Being as a \textit{genos} comprehends both \textit{Motion} and Rest. One idea comprehends two others.

\textsuperscript{56} The Dyad is often characterized as "the great and small". There is an argument which explains the 'irrational' surd, $\sqrt{2}$ by a converging series \textit{from either side}. Originally from A.E. Taylor, it is presented in Edward A. Maziarz and Thomas Greenwood \textit{Greek Mathematical Philosophy} (New York: Frederick Ungar Pub. Co., 1968) pp 120-124. It attempts to shew that Plato explains the surd by "great and small" approximations to its value. Taylor concludes that the dyad is significantly not a \textit{single} indefinite because it provides for the possibility of "dialectic" even between numbers themselves. Annas (\textit{op. cit.}, pp 8-11) notes that to claim, from this, that Plato's conception of number was 'geometrical' and could accommodate all real numbers is to overstate the case. Plato's conception of number is typically the Greek one of counting. But that need not limit him to only simplistic arithmetic arguments. It is possible to accommodate, within pythagorean calculation, quite intricate arrangements of fractions which, while they can be \textit{diagrammatically} represented, are not essentially geometric. (\textit{cf.} McClain, \textit{Myth}, \textit{op. cit.}, p 11).

\textsuperscript{57} 987b21-22, 29-35.

\textsuperscript{58} \textit{op. cit.}, pp 42-55.

\textsuperscript{59} Burkert, \textit{op. cit.}, pp 22, 26.
displacement and tonal invariance: a cyclic pattern which form the whole structure of the Soul.\textsuperscript{60}

It is certainly true that superparticular ratios and their arithmetic means can generate a series of odd numbers as successive divisions of the octave, while doubling clears fractions and constantly widens the field:

\begin{tabular}{cccccccc}
1 & 2 & \textbf{3} & 4 & 5 & 6 & 7 & 8 \\
4 & & & & 9 & 10 & 11 & 12 \\
8 & 16 & 17 & 18 & 19 & 20 & 21 & 22 & 23 & 24 & ... \\
\end{tabular}

Notably, at any point of division in such a sequence, whole is comprehended by a particular level of explicit description. As principles of number, then, the One and the Dyad generate a determinate series of number-ideas which exhibits various levels of generality and explicitness. In this they also determine the structure of ideas, providing both for their unity and diversity, and the possibility of rational explanation.

I suspect that Plato would want to carefully distinguish between numbers and these principles of enumeration which distinguish ideas. Numbers are generated simply by counting and Plato's \textit{arithmoi} are no different from any ordinary definition of that term. Number-ideas, which guarantee the unity of \textit{genē}, are generated according to the principles of the One and the Dyad. These determine the field of natural numbers first by dividing them into odd and even. The formal structure which they exhibit seems very removed from the counting process which is said to characterise \textit{genē} (a definite number of definite things). In exhibiting a theoretical ontological structure they explain unity in terms of the One as indivisible and whole, not simply as finite.

\textbf{The Neo-Pythagoreans and Number}

It is not possible to account fully for the history of pythagorean attitudes after Plato and Aristotle. John Dillon has observed traces of the influence of Pythagoras, or of what was conceived to be his teaching, on the development of Platonism.

\textit{De Musica}

\textsuperscript{60} cf. McClain, \textit{Myth}, op. cit., p 19
Already in the Old Academy, with Speusippus and Xenocrates, there existed a lively interest in Pythagoreanism. Both Antiochus and Posidonius paid respect to Pythagoras, though neither could be said, on the evidence to "Pythagorize". It is only with Eudorus that Pythagoreanism as a living force finds its way again into Platonism, ... [this is] at work also ... in Philo. ... there are also on the fringes of Platonism, in the first and second centuries A.D., men who profess themselves to be Pythagoreans ...".

This tradition of later Greek pythagoreanism preserves an ontology based on the principles of the One and Dyad, while displaying a considerable eclecticism in its detail. Three groups of texts may be distinguished of which the third is most significant: pseudepigrapha ascribed to Pythagoras himself and other early Pythagoreans; anonymous writings presented by Photius, Alexander Polyhistor and Sextus Empiricus; and the works of Moderatus of Gades, Nicomachus of Gerasa and Numenius of Apamea. Their eclecticism is represented by Platonic, Peripatetic and Stoic material, but always with the intention of preserving the fundamental pythagorean position that all things are derived from the One and the Dyad, and that they may be understood in those terms. It is notable that both Varro and Nigidius Figulus, Roman scholars par excellence, claimed to be Pythagoreans.

Moderatus argues for a One which is "above being and any entity ... which contains within [itself] all ratios of beings, ... paradigms of the matter of bodies, ... called quantity ... in the sense of privation,

paralysis, dispersion, and severance ... Matter is caught by it and is not permitted to overstep its boundaries, as dispersion receives the ratio of ideal magnitude and is bounded by it, and as severance is by numerical distinction rendered eidetic". The allusions are clearly to the numerical structure of all there is in terms of ratio. The One disperses according to ratio, and beings are also identified as ratios. Iamblichus notes that Moderatus identified the soul with the octave proportions, both the original One-Dyad (2:1) and the next expansion of the series (4:3 and 3:2).

The concept of number as a collection, and its ideal structure from the principles of One and Dyad, persist especially in Nicomachus' works, which exemplify the neo-Pythagorean tradition and its eclecticism. His number philosophy is firmly grounded in the Platonic dual of an immutable and a dependently mutable world. In its articulation the principles of One and Dyad are invoked as those which produce all things.

Nicomachus distinguishes clearly between number-ideas and the objects of arithmetic. The number-ideas are divine and have specific properties and qualities reflected in the objects they generate. This is classic pythagorean doctrine. In the wake of Plato he associates the unit with One (a principle of Sameness) and identifies two with the Dyad (an archetype of Difference). These two are the "elements of the universe". Briefly, the world is first formed as a plan in the mind of god. This plan is an ideal pattern governed by the principle of number. Further, as they are formed,

64. quoted in Merlan, op. cit., pp 91-92. The text is from Simplicius In Physicam Auscultationem p 230.34-231.27. (Diels). The italics are my own.

65. Merlan, op. cit., p 94. He notes (n. 5) that as the soul "contains" these ratios it may be affected by musical harmony.


70. ibid. II17.2.

71. ibid. I6.1.
numbers articulate the natural world.

The objects of arithmetic are also generated according to these two principles. Number is defined as a determined multitude of units.72 The importance of both the One and the Dyad is indicated by Nicomachus’ reluctance actually to call the Dyad a number. Numbers begin properly with three.73 The Dyad represents the principle of division which is “unbounded” and it “disperses” into the multitude of ideas and the plurality of the natural world. In his *Theologumena Arithmeticae*, Nicomachus explicitly notes that things are “one” as they reflect the One from which they have been generated, and divisible as they reflect the Dyad. The Dyad itself, however is one because it, too, is a whole and a beginning.74 Even and Odd, as the fundamental characterisation of number, represent the distinction between the being of number and its definition. The primacy of the unit is preserved in this distinction.75

As Nicomachus associates the One and the Dyad with Sameness and Difference76 and Odd and Even, he clearly founds his ontology on the principle of ratio and thus on harmonious structure. All harmonies are constructed out of opposites.77 The first division of number is the first evidence for this, and further regularities to be observed in the interrelations of numbers are evidence for the harmonious structure of the number series. Nicomachus notes78 that the harmonious structure of

72. *ibid.* 17.1.


74. Robbins and Karpinski, *op. cit.*, p 117 n. 115. Nicomachus uses some Aristotelian terminology in calling both the One and the Dyad the form of number.

75. Numbers are found in collections which Nicomachus (*Introductio* 12.4) calls “heaps” of things, recalling Aristotle. But he does not pursue Aristotel’s ontological move of defining heap in terms of its separate units. In the text, however, numbers are often “heaped up” to generate other numbers (e.g. the “perfect” numbers at 116.4).

76. Nicomachus, *Introductio* III8.1. He clearly regards this as a received doctrine.


78. *Introductio* I6.3, recalling Aristotle’s view that units must be of some
opposites, wherever it is found, is an image of the fundamental unity of all things which bear relations to one another.

Augustine's description of number recalls much of Nicomachus. The determined multitude for which Augustine argues as his definition of number, and the discovery of the first whole number at three, indicate that Augustine was working, perhaps, from some translation of the Introduitio or a compilation from it; although this cannot be certain. It is certain, however, that the tradition within which such passages from the De Musica fall are pythagorean, and they indicate a significant ontological perspective from which to interpret the De Musica. 79

Plotinus on Number and time

It is not possible to give an adequate description of Plotinus' psychological opinions here. I will note certain correspondences between his and Augustine's psychology below. Plotinus' own theories are to be found scattered throughout the Enneads but concentrated in Enneads III and IV. They combine an idealistic metaphysic derived from Plato, based on the division between a material, sensible world and an intelligible, non-material world, with many of the detailed features of Aristotle's carefully worked psychology. This synthesis of views has been discussed at length by H.J. Blumenthal. 80

This section will present some of Plotinus' views on number and the related metaphysical problem of "one and many". Plotinus' explanation of the problem of plurality in both the intelligible and the material world is again part of that pythagorean/Platonic tradition which so influenced the general principles of his philosophy. 81

kind.

79. see pp 73ff.

The treatise on number continues the tradition of number ontology already outlined. In it there is an interplay between the idea of number as a collection of things and Number as a formative principle of all noetic reality. As the One extends itself into Noûs, where its characteristics are first manifest as Being and then individual, multiple ideas, the problem of many things forming a coherent whole is encountered. The treatise on number attempts to deal with the problem in ontological terms which depend on Number as a principle within Being and so which informs the structure and order of the ideas.

The subject of the treatise is located entirely within the context of Noûs. It opens with a statement of the problem of multiplicity:

"It is suggested that multiplicity is a falling away from The Unity, infinity [limitlessness] being the complete departure ... A thing, in fact, becomes manifold when, unable to remain self-centred, it flows outward and by that dissipation takes extension: utterly losing unity ... there is nothing to bind part to part: ..."82

He then offers a classic statement of its solution:

"... a thing most exists not when it takes multiplicity or extension but when it holds its own being, that is when its movement is inward. ... if that original [thing] is to persist, the members must stand collected to their total; in other words, a thing is itself not by being extended but by remaining, in its degree, a unity: through expansion and in the measure of the expansion it is less than itself; retaining unity, it retains essential being."83

The rest of the treatise expands this solution.

Two interrelated themes introduce the discussion. First is that of flowing outward from the One, of "dissipation". In order to be itself, a thing must "hold its own being" and move inward. This is the idea of a return inward from plurality to unity, ultimately associated with the One

81. e.g. R.T. Wallis Neoplatonism (New York: Scribner’s, 1972) pp 32-36.
82. Ennead VI6.1 (Mackenna’s translation is used throughout).
83. ibid.
itself. Second, a thing with parts must "stand collected" as their total is their "unity". Unity contains multiplicity as Being contains the procession of ideas undifferentiated. This second theme is the view that Number is an ontological principle by which all things may be related.

Plotinus turns briefly to sensibles. No sensible is unlimited because each may be distinguished from the others — it is thus determined numerically. Such numerical determination is essential to existence, which is always finite. Similarly the ideas are determined. If the unlimited were an idea then it, too, would need to be determined. But the unlimited is precisely that which cannot be determined — it is neither in motion nor at rest. It is always other than any definition which might be offered for it.

Having disposed of the unlimited Plotinus then turns to the status of numbers in Nous. They are either ideas or the "necessary concomitants of ideas". He invokes Plato and says that things numerable precede and by difference produce Number which is itself a product of the mind "reawakened by changes in things of sense". Two things do not present themselves as "two" — the mind unifies them and says "two". Numbers accompany things as they enumerate them. Each number is a unity as it can be understood as whole; it is multiple as it is understood as separate. Numbers are attributes of things just as other qualities are attributes. The problem is that they are also attributes of the ideas themselves, as are other general qualities like Being and, significantly, Unity, which must be predicable of all ideas.

The ideas themselves are the objects of knowledge. The ontological question collapses into an epistemological one because by their very nature the ideas pass from Nous to the noetic subject:

"... the thing itself, as belonging to the Intellectual, can be nothing else than intellect or knowledge. ... the thing in the

84. Ennead VI6.2.
85. Ennead VI6.3.
87. Ennead VI6.4-5.
Intellectual transmutes the knowledge ..."\textsuperscript{88}

Further, ideas are states or activities of the Intellectual Principle in Noûs:

"Justice is ... a state or activity of the Intellectual Principle, or rather an activity of it."\textsuperscript{89}

All things, then, form a "collective Life, made up of all living things, ... forming a unity co-existensive with all, ..."\textsuperscript{90} And Noûs is a "power without magnitude" which issues from the One, and it is known by an interior, intellectual, reflection ("by Intellectual-Principle we know Intellectual-Principle").\textsuperscript{91}

Number precedes the ideas as it enumerates them. It is potential in Being, and even the One, as it is "unparted". It is the principle of division in Being, the "substance or activity" of being:

"Clearly Being is to be thought of as Number Collective, while the Beings are Number unfolded: the Intellectual Principle is Number moving within itself, while the Living-form is Number as container of the universe. Even Being is the outcome of the Unity and since the prior is Unity the secondary must be Number."\textsuperscript{92}

This passage is the ontological mirror of the way numbers proceed from their principles: Unity and the principle of division - the dyad. It recalls, on one interpretation, the generation of numbers by division illustrated above \textsuperscript{93} and depends on those prior principles of Unity and division which are essentially epistemological - that is, they are principles of understanding. Plotinus notes this:

"It must be affirmed ... [that] the subject cannot be conceived without the attribute - man, for example without unity - the attribute is either not later but concomitant or, being essential to the existence, is precedent. In our view, Unity and Number are precedent."\textsuperscript{94}

\textsuperscript{88} Ennead VI6.6.
\textsuperscript{89} ibid.
\textsuperscript{90} Ennead VI6.7.
\textsuperscript{91} Ennead VI6.8.
\textsuperscript{92} Ennead VI6.9.
\textsuperscript{93} above p 17.
The principle of unity applies to all numbers, indeed Unity is common to all things:

"Each particular, considered in itself, would be a manifold of monads totalling to a collective unity."^95

Unity is the precondition for affirming and naming. It is not a construct, but is coextensive with ideas as they stir the noetic subject to active thought:

"Unless the mind has first rested upon Unity it cannot affirm Otherness or Difference. ... A thing must be either one thing or more than one, manifold; and if ... [the latter] there must be a precedent Unity. ... the mind makes the truth clear; it draws a separate many into one, either supplying a unity not present or keen to perceive the unity brought about by the ordering of parts; ..."^96

And unity is not lost in division because numbers are only predictable of groups of things. So a relation may be a unity, where the terms of the relation are the parts as they stand collected.^97 In this sense Number is not present as an idea in Noûs, but as

"... a reckoning of the Acts of Intellectual Principle; it tallies with the Justice in the Intellectual-Principle, its moral wisdom, its virtues, its knowledge, all whose possession makes that principle what it is."^98

Number then is a state or activity of Being which "unifies" the different ideas - also activities of Being. Number does not constitute those ideas and in this sense Plotinus is no pythagorean. But it does order them and provides, from its own principles, those principles which structure thought itself. The two related ideas of number (collection and principle) are both required for Plotinus' explanation of Being as the unity of ideas. In this sense there is a considerable pythagorean influence in the treatise. Numbers have explaining power as they exhibit

^94. Ennead VI6.10.
^95. Ennead VI6.11.
^98. Ennead VI6.15. (italics mine).
structure: to say that Virtue is a Tetrad is to argue that it is essentially constituted of three parts.\textsuperscript{99}

As the unlimited and Number are contradictory, infinite number is not unlimited. For example, the absolute Line is infinite because it does not involve the concept of finitude: it lacks quantity. But it is not unlimited:

"... For these primals are not shapes in something; self-belonging, they are perfect without extension; ..."\textsuperscript{100}

The ideas, distinguished in Living Form, have no magnitude, they are just broken apart. Each of them is always a unity.

Number itself is definite in Noûs. Plotinus' concluding passage recalls Aristotle on the potential and actual infinite:

"It is we that can conceive more than is present; the infinity lies in our counting: in the Real is no conceiving more that has been conceived, all stands entire. ... It might be described as infinity in the sense that it has not been measured - ... but it is solely its own, a concentrated unit, entire, not ringed round by any boundary. ... There every being is Measure; and therefore it is all that is beautiful."\textsuperscript{101}

Plotinus is careful not be confuse the distinction between Number and Unity. Numbers form out of units as they measure things.\textsuperscript{102} Number-ideas (the Dyad, the Tetrad, ...) exist in Being as undifferentiated and proceed with the ideas as their enumeration. It is notable that he never speaks of numbers existing in Being, only of Number, which can be thought of as a potential or principle in Being which will determine how many and in what order the ideas are to be differentiated. In a similar way Unity is a principle of Being which holds it together as it reflects the ultimate Unity of the One (although it is not possible to say that of the One with any sense).

\textsuperscript{99}. Ennead VI6.16.

\textsuperscript{100}. Ennead VI6.17.

\textsuperscript{101}. Ennead VI6.18; cf. Aristotle \textit{Physics} \textit{\nu}6-\textit{v}.

\textsuperscript{102}. Ennead VI6.16.
Plotinus does not discuss, in this Ennead, multiplicity in the material world. There, number is an attribute, an idea which arises in the mind as it recognises and chooses likenesses. In Nous the numbers appear as the ideas appear. He speaks of the first ten forms as “Decad-Absolute”. They form a unity in Being as they are collected. Their relations are to be understood as structured in the same way that the first numbers are structured.

**Ennead I, ‘On eternity and time’**

Robert O’Connell has noted that “the atmosphere, central intuition, and method” of book six, if not the whole of the *De Musica*, are drawn from this treatise. He also comments that Augustine, at this stage in his career, begins his discussions of time with an example of a line of poetry and then moves to more general speculations on time in relation to God’s eternity. “The conclusion is always the same: the experience of time indicates that the soul is ‘distended’, fallen from the *otium*, the restful contemplation of eternal truth, into the busy *negotium*, of temporal activity.”

Plotinus’ treatise does indeed explain time in terms similar to these. It also includes an analysis of time and eternity which involves the ideas of unity and diversity which themselves depend on movement and measure, ideas related to number.

Plotinus begins by discussing eternity. It “must at once be something in the nature of unity and yet a notion compact of diversity, ... that waits upon the Existent of that Other World, ...” Its relation to them

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104. Robert J. O’Connell, *Art and the Christian Intelligence in St. Augustine* (Oxford: Blackwell, 1978), p 72. In this paragraph he also comments that “The ponderous numerical accent, the septenary scheme are both Augustine’s own; they represent, again, a somewhat intrusive insertion of Neo-Pythagorean elements into a basically Plotinian matrix”. I hope that both the discussion of Ennead VI6 and what follows will dispel this opinion that the pythagorean “numerical accent” is intrusive to the Plotinian system. On the contrary, it forms a basic part of that system.

105. *ibid.*

106. Ennead III7.3.
is problematic, but like Number, it is something which informs their nature, "either associated with them or known in and upon them ..."\textsuperscript{107} As the ideas are "unity with variety", they may be collected together into one:

"we sum all into a collected unity once more ...; we concentrate Diversity and all the endless production of Act: Thus we know Identity, a concept or, rather, a Life never varying, not becoming ..., the thing immutably itself, broken by no interval; and knowing this we know Eternity."\textsuperscript{108}

As with Number, the question of what eternity is becomes a question of how it may be known. Like Number, it is part of the way ideas are said to exist. It is a principle of Being itself, not in the sense of \textit{perpetual} existence, but as a "substratum" of Being’s changeless structure.\textsuperscript{109} It is "a life limitless in being all the life there is ...".

Indeed, it is so much a principle that it is centred on the One itself - "at rest within the One".\textsuperscript{110} In Being it is still (like Number) indistinguishable, and this is its character. It is static and without any \textit{sequence}, which is an attribute of time.\textsuperscript{111} As time is associated with movement and change so it is contrasted with Eternity as an extension of it.\textsuperscript{112}

Movement, which exists in the eternal world, produces succession - the procession of ideas. So it is intimately related to Number which is the quantitative principle of movement. At this level no change is to be associated with movement. So time is not Movement, but depends on it.\textsuperscript{113} Similarly time is not \textit{measure}, although it has magnitude.\textsuperscript{114}

\begin{footnotesize}
\begin{enumerate}
\item[107.] \textit{ibid.}
\item[108.] \textit{ibid.}
\item[109.] Ennead III7.4-5.
\item[110.] Ennead III7.6.
\item[111.] \textit{ibid.}
\item[112.] Ennead III7.7.
\item[113.] Ennead, III7.7.
\item[114.] Ennead III7.9-10.
\end{enumerate}
\end{footnotesize}
Rather, time is an active principle which humans, "stirring to a ceaseless succession, to a next, to the discrimination of identity and establishment of ever new difference, traversed a portion of the outgoing path and produced an image of Eternity, produced Time".\(^{115}\) In contrast to the "sum collected", Soul "fritters unity away, it advances into weaker greatness ... To bring this Kosmos into being, the Soul first laid aside its eternity and clothed itself with Time".\(^{116}\) Time is contained by the act of Soul, copying the One, and producing succession, "putting forth its energy in act after act ...".

Time, too, is a principle, but a principle of the "expanse of the Life of Soul" which is always sequential.\(^{117}\) In that it depends on Number as quantity and measure in order that its "uniform changes following silently upon each other" will have any meaning at all.\(^{118}\) In this manner Professor O'Connell's point is made: that as the soul is distracted by the changes in sensible things, it forgets its proper objects of attention - the 'restful' eternals.\(^{119}\) It may turn back to them and return to rest in Eternity. In this case time would disappear and with it the spatio-temporal world.

It should be noted, however, that Number and Movement are principles, also, of time; they measure it and provide part of the epistemological apparatus by which it is understood as succession ("a constant progress of novelty"). Movement in Soul itself has no extension and indeed is the source of time.\(^{120}\) This contrast between a static Eternity and a dynamic time is, in part, an epistemological device to differentiate levels of understanding (and existence). In one, important, sense it is not that human artistic activity, indeed all symbolic activity, is lost in the return from time to Eternity; that activity is also returned to its

\(^{115}\) Ennead III7.11.

\(^{116}\) ibid.

\(^{117}\) Ennead III7.12.

\(^{118}\) cf. Timaeus 34E-36D (on the construction of Soul) and 41D-44B (individual souls).


\(^{120}\) Ennead III7.13.

Augustine
principles outside time and may be contemplated as complete and finally "immutably itself ... holding the Universal content (time, space and phenomena) in actual presence; ..." which Plotinus himself notes.\textsuperscript{121}

\textit{The De Musica, its context, composition, and the problem of 'emendatio'.}

Augustine's careful distinction between music and grammar\textsuperscript{122} locates the former within this speculative numerical tradition providing it with considerable ontological and epistemological power. The relations between syllables in poetry are determined by their measure. It is in this sense that Augustine's \textit{numeri}, which appear on measuring, are to be understood as the principles of rhythm. The relations between \textit{numeri} are the rational principles which define verse. In book six of the \textit{De Musica}, \textit{numeri} become (quite naturally it seems) elements in the structure of sensation, perception and judgement. Their interrelations in this context, I shall argue, can be explained as correspondences between patterns.

On the face of it it is puzzling that Augustine should want to speak of numbers at all in this context. But as principles of unity and diversity they provide him with a foundation for rational thought as they do Plotinus, the neo-Platonists, Pythagoreans of all kinds, and Plato himself. When Plotinus turns to sensibles and the individual soul, it is not Number that is a principle, but quantitative measure which must occupy thought.\textsuperscript{123} This is one of the problems with temporal extension. These measures are no less principles of human understanding. I shall argue that this tradition is behind Augustine's use of \textit{numeri} as a psychological principle.

In his \textit{Retractationes} Augustine comments twice on the \textit{De Musica}. He notes that at the time of his baptism (387 AD) he had planned to write books on all the liberal arts. The only two to appear were a book on grammar and the \textit{De Musica}, the latter begun at Milan but finished on his

\textsuperscript{121} Ennead III.7.13; cf. O'Connell, \textit{op. cit.}, pp 71-73, 148-150.

\textsuperscript{122} at DM III.1, II.1; discussed below pp 38,39,78,79.

\textsuperscript{123} e.g. pp 28,29 above.
return to Africa.\textsuperscript{124} Later he remarks that the \textit{De Musica} was written after his \textit{De Genesi adversus Manicheos}\textsuperscript{125} at the same time as his \textit{De Magistro} and \textit{De Vera Religione}.\textsuperscript{126} He considers only the sixth book to be of value and says that it is about:

"how from corporeal and spiritual but changeable numbers, one comes to the knowledge of unchangeable numbers which are already in unchangeable truth itself, and how, in this way, "the invisible attributes" of God, "being understood through things that are made, are clearly seen".\textsuperscript{127}

Whatever the interpretation that might be placed on the \textit{De Musica}, Augustine's own assessment of book six emphasises the centrality of number to his vision of the divine contained there.

A letter to Bishop Memorius, written in 408 or 409, comments that the sixth book is of greater interest than the first five which are more difficult to understand.\textsuperscript{128} He also says that he had intended a further six books on melody. These were never written, but the extant six are complete in themselves, and the sixth book contains the "essence" of all the others.\textsuperscript{129} From these comments it is difficult to justify the oft repeated claim that the \textit{De Musica} was left incomplete. Augustine summarises its contents thus:

"... the pervasive influence of rhythm is more easily studied in speech, and an analysis of it leads by gradually mounting steps to the highest secrets of truth ..."\textsuperscript{130}

By implication, again, number is central to his discourse.

Augustine also notes that he is sending a copy of the sixth book \textit{emended}. Heinz Edelstein, and, following him, Karel Svoboda, have argued that book six was written at a later date than the first five books and is

\textsuperscript{124} \textit{Retractiones} I5.3 (FC60, pp 21-22).

\textsuperscript{125} \textit{ibid.} II0.1 (FC60, p 45)

\textsuperscript{126} \textit{ibid.} II1, 12.

\textsuperscript{127} \textit{ibid.} II.10.1 (tr. Mary Bogan, FC60, pp 45-46).

\textsuperscript{128} \textit{Epistula} 101 (FC18, Vol, II).

\textsuperscript{129} \textit{ibid.} pp 146-147.

\textsuperscript{130} \textit{ibid.} p 146 (tr. Wilfrid Parsons).
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a specifically Christian discourse on music.¹³¹ Their interpretation depends on the change of tone at De Musica VII.1 and 17.59. However, both H.-I. Marrou and Professor O’Connell note that it is only in these sections that the tone does change.¹³²

The evidence of the Retractiones and the letter to Memorius indicate that the De Musica was written all at once between 387 and 390/1. Professor O’Connell’s lengthy discussion of this point and that in Marrou seem to me conclusive proof that only the two sections mentioned above are of a later composition. There is no need to rehearse their arguments but some further evidence of my own may be of interest.

The terminology which I take to be central to a pythagorean reading of the De Musica is employed freely throughout the text, except in the emendatio sections. Instead the "vestigiiis numerorum ad moras temporum" condemn ratio as "trivial ...". The faithful do need such props and "fly" over them.¹³³ Further, the final section returns to this imagery adding to it a notion of purification involving both the authority of Scripture and the "burning fire of love".¹³⁴ The tone of both sections suggests a vision quite different (although not opposed) to that expressed in the final chapters of book six.¹³⁵ What is missing from the account are the numeri which are so central to the rest of the discussion. These emendatio sections will play no part in my interpretation.

Both Svoboda and Marrou have noted that Augustine’s numeric discourse, and certainly his definition of music, are derived from the supposed contents of Varro’s Disciplinarum Libri IX.¹³⁶ Svoboda also compares the

¹³¹ Heinz Edelstein Die Musikanschauung Augustins nach seiner Schrift "De Musica" (Ohlau: Dr. H. Eschenhagen, 1929); Karel Svoboda L’Esthétique de S. Augustin et ses sources (Paris & Brno: Komisi Knihkupectvl A. Pisa, 1933).


¹³³ DMVII.1.

¹³⁴ DMVII.17.59.

¹³⁵ discussed below pp 142-145.


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De Musica
De Musica with the De Ordine in some detail. Professor O'Connell's first book, St. Augustine's Early Theory of Man, argues for the formative influence of Plotinus in Augustine's philosophical and theological development. He argues convincingly for an important Plotinian influence on significant passages in book six. A Plotinian theme of fall and return is skillfully attested with a comparison of texts and corresponding themes in the argument.

More specific sources for Augustine's arithmetic of relations or his prosodic theory are difficult to locate. The classic texts of Greek arithmetic, books two, seven to nine and ten of Euclid, Nicomachus' Introductio Arithmetica, and the Expositio Rerum Mathematicarum by Theon of Smyrna, were known and read in Augustine's day. Augustine seems to echo their terminology. For instance, Theon argues that ratio exists only between homogeneous things and that these may be divided into equal and unequal ratios. Nicomachus similarly classifies ratios and continues the subdivision to multiple, superparticular, and so on, although he simply calls them different kinds of subdivision.

Nicomachus' Theologumena Arithmeticae contains a description of the relation between one and dyad as well as arguments to support the view that ten is the natural articulation and climax of the number series. These latter are also presented in the Introductio. There, too, is a long section on the harmonious construction of the number series and the rationality of opposites. There is also in the same passage a treatment of numbers in terms of the arrangement of units. The idea of whole as

139. Marrou, op. cit., p 252.
140. Expositio ... (ed. Hiller) (Leipzig, 1878) p. 73.16.
141. ibid. p 74. The ratios are further divided on p 76; the division recalls Augustine's.
142. Introductio 117.6.
144. ibid. p 120.
145. ibid. p 120f and Introductio 16.2ff.
consisting of beginning, middle and end, which requires this view is also to be found in Nicomachus along with further speculations about the tetractys which Augustine mentions. 146

Augustine had not read these books. It is just possible that he had read arithmetical sections of Varro's lost Disciplinarum Libri, his De Principiis Numerorum, or Apuleius' De Arithmetica, a translation of Nicomachus. None of these remain147 although they may be the actual sources for Augustine's theories. A comparison with Martianus Capella's De Nuptiis is instructive on the general level of Roman (Latin) knowledge and its sources. 148 Harald Hagendahl notes that Augustine's distinction between reason and historical authority is probably derived from Cicero's Academica. 149 He also cites the Tusculanae Disputationes as a general source of Augustine's knowledge of Greek philosophy. 150 The arithmology of the De Musica is not at all unique in his corpus. 151 Some further sources (for his prosodic theory) will be noted in chapter three below.

In the De Ordine Augustine pays specific homage to Pythagoras and to the "eternal and unchanging truths which the study of numbers exhibits". 152 In other dialogues Augustine uses mathematical models to explain what is intelligible about the phenomena only so far as these models are useful for explanation. The De Quantitate Animae, for instance, employs some geometry to shew the importance of the mind's lack of extension in space
and its close relation to the eternal. In the second book of his De Libero Arbitrio Augustine leads the soul by stages away from the sense world to God via those "common" objects of the understanding which are the laws of number. In both cases he is developing an argument which requires a level of abstraction from sense such as number provides.

The numerical character of the liberal disciplines illustrates, for Augustine, their true unity. They are, as it were, exercises for the soul to prepare for its union with God. Diligent study cultivates the mind so that it can penetrate from space-time to the world of being which is its "true" home. This attitude was not original; it was formed by almost everything in his intellectual world: neo-Pythagoreanism, neo-Platonism, and the intellectual Christianity for which he strove in the early years of his conversion.

The extent to which Augustine was conversant with the details of number theory, mathematics or music theory is not clear. At time he seems at ease with numerical arguments but at others his reasoning goes astray. The uniqueness of his prosodic theory and the absence of any traditional harmonic analysis is some evidence that his knowledge of these subjects was haphazard. But number theory and musical imagery form the central focus of the De Musica and are never far from his thinking. This is where my interpretation begins.

153. De Quantitate Anima  esp. 4-25.
154. De Libero Arbitrio II esp. 2.5-15.40.
155. There is a considerable literature on this point. Marrou, op. cit., esp. Part 2 "Studium Sapientiae" and its final chapter "Exercitatio animi" (Chap. VI), Sapientiae.
156. cf. DMI12.20-26 discussed below pp 77-78 which seem particularly subtle in the pythagorean tradition. But the discussion of number relations at DMI9.15-10.17 is defective. Note also the peculiar numeric arguments at DMV7.14-8.16, De Trinitate IV4.7-6.10 and De Civitate Dei XI 30-31.
The first book of Augustine's *De Musica* introduces his subject, *musica*, as an intellectual discipline. With his discussion, first, of the definition and, then, the numerical structure of *musica* the framework for the next five books is set. Poetry, song and instrumental music all play a part in this study as they illustrate by way of the senses the numerical relations which form their structure. A strong pythagorean influence may be detected in this close correlation between the pleasure of the senses and the numerical patterns which explain (in rational terms) that pleasure.

The two principal elements of song are pitch and rhythm. Augustine opens the *De Musica* with a discussion distinguishing the origins of the rhythmic structure of words from the origin of their meaning. This is the substance of chapter one. The following chapters deal with the numerical foundation of music: musical proportions and the primacy of the first four integers. The question of the unity of number is discussed in terms of numbers as principles of musical activity. Finally, the thirteenth chapter summarises the connexion between numerical relations and the rhythmic structure of poetry as it is captured in the definition of *musica*. This will lead him in the sixth book to connect the rhythms of verse with more universal temporal patterns, explained in terms derived from the study of number itself.

Music as a liberal discipline

Augustine first identifies his subject by distinguishing its origins from those of grammar. This distinction performs two functions; it identifies the foundations on which the discipline *Musica* is built and at the same time it introduces a central theme of his discussion throughout the whole treatise. *Musica* is not just an human artifact but appears as a phenomenon derived from the ideas which transcend the vicissitudes of time and place. The grammarian studies words: their meaning, the rules for their meaningful interrelation, and the rules for their tasteful arrangement. These last, so called rules of prosody, are based on principles of rhythmic structure which derive not from historical convention but from the laws of number.

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For example, a simple two-pulse rhythmic unit is called a pyrrhic foot. Its name is an accident of history, but its form is not. A unit of two short pulses is one of many possible combinations of short and long pulses which themselves obey the principles of number. Anybody, at any time, it is argued, may observe that many words are made of the same rhythmic unit without ever knowing the name of that unit.

This fact, which Augustine seems to regard as self-evident, is the pivot of his distinction. Grammar is essentially a descriptive science which depends on historical "authority" for verification. Musica, on the other hand, proceeds from a priori principles. We are acquainted with these principles within ourselves because they are the principles by which anything at all may be properly said to be known, rather than being an object of acquaintance or belief. (Here "to know" means, of course, "know to be true").

In the De Magistro (written about the same time as the De Musica) Augustine notes that words themselves are not intelligible unless their signification is known through personal experience - that (perhaps) consists in being familiar with their use or their definitions.1 To know something in this strong sense in which scientia is used, is to know its derivation from universal principles apprehended via the direct relation between the intellect and divine wisdom.2

This distinction between facts gathered through the five senses, and knowledge gathered by direct intellectual apprehension, is fundamental to the whole discussion in the De Musica. Its corollary, that there are many things about which, strictly speaking, nothing (or very little) can be known, is accepted without question. Further, it provides Augustine with the means to distinguish between the "historical" disciplines, of which grammar is one, and those subjects through which the intellect comes to know itself and the God to which it most truly belongs.3

1. De Magistro 10.34.
2. ibid 11.38.
3. cf. ibid. 12.39. Scientia is discussed more fully below.
The conversation about the rhythmic unit of which both *modus* and *bonus* are examples depends on this background. Augustine takes a characteristically "experimental" line which he uses throughout the *De Musica*. He notes that anybody at all can discover that *modus* and *bonus* both consist of two short beats by speaking them or beating out their quantitative structure. This discovery is explained not by reference to an historical convention (like knowing that the name of the unit is "pyrrhic") but to the laws of number, specifically the generation of ratios, which are directly apprehended by the intellect. We find only their "traces" (as Augustine puts it later) in the sense-world.

In book one there are occasional attempts to explain this process of direct apprehension but none of them is entirely satisfactory. It is only when he returns to more fundamental philosophical questions in book six that a formal treatment is to be found. There the understanding is part of a greater psychological scheme which uses *numeri*, a word difficult to translate, as basic units which contain information in the soul.

In the *De Ordine*, Augustine notes that the study of Number constitutes a separate stage of learning from that of which grammar is an example because such study is of more general or universal principles. These can be discovered by industrious introspection and not from the opinions of others. This is the view represented at the beginning of the *De Musica*. From this elementary distinction, the text expands in a significantly pythagorean manner, exploring the implications of number and number relations for prosody and its effects.

People recognize and are affected by numbers in some way because their souls (minds) already "contain" these numbers. This recalls the Platonic doctrine of reminiscence, whereby what is recognized is already hidden within the soul (a sort of potential knowledge). Coming to know involves a

4. *nunc illud quaevo ut rump si tympanum vel chordam bis percuterem tam raptim et velociter quam cum enuntiavmus modus, aut bonus; agnoscerem et ibi eadem tempora esse, an non.* -Agnoscerem. (DMI1.1; p 22; M84).

5. DMI13.28.

6. Especially at DMI4.5-7 and 9.


8. cf. *Meno* 82B-86A

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turning inward to reflect on what is to be discovered there. The student needs only to learn that the rhythm is named pyrrhic for the purposes of communication.\textsuperscript{9}

My interpretation of chapter one has ranged far wider than the passage itself seems to allow. I have attempted to point out the underlying features of this dialogue about the difference between grammar and music because it contains vestigia of the whole argument in book one. Indeed the problems it raises are not fully solved until the treatise is complete. The conversation depends on both teacher and pupil understanding that at the heart of the intellectual life is a desire to penetrate beyond sensible experience to Being itself. The liberal disciplines are exercises for the soul which will lead it to its ultimate reunion with God. Aesthetic questions, like all questions, are to be answered by turning away from "opinion" and searching the foundations of thought itself.

In the \textit{De Immortalitate Anima}, Augustine also writes of \textit{musica} as \textit{scientia}. There, as one of the mathematical disciplines, music consists of number relations which are the principal objects of \textit{ratio}. These ratios are directly apprehended by the soul as rational. In that, the \textit{ratio} is itself formed of the objects which it apprehends.\textsuperscript{10} On this model cognitive activity is as much formed out of its objects as it may be said to form them. Ratios, which are the ground of Augustine's prosodic excursions, also become models of the understanding itself. \textit{Ratio} has a double meaning which is exploited throughout the treatise. A knowledge of numbers and ratios, and their expression in song, is used as a model for how the relations between things are to be understood. This is a typically pythagorean point of view. It is worth noting, finally, that in the \textit{De Ordine} Augustine pays specific homage to Pythagoras and to the "eternal and unchanging" truths which the study of number reveals.\textsuperscript{11}

\textsuperscript{9} cf. \textit{Confessiones} 18ff. Words are signs for the expression of inner thoughts and feelings. They are learned as conventionally established names for things. The distinction is to be drawn between this learning and the intellect's natural recollection of numbers (also \textit{De Libero Arbitrio} II8.20-24).

\textsuperscript{10} \textit{De Immortalitate Anima} 4.5ff. O'Connell (\textit{Early Theory}, op. cit., p 139) discusses this point and notes its Plotinian origin. On \textit{ratio} see below Ch. IV.

\textsuperscript{11} \textit{De Ordine} II20.53-54.
The Definition: bene modulandi

Augustine proceeds to define *musica*. The significance of his definition is teased out in the next five chapters to demonstrate the relations between delight in music and its rational content, between musical performance and musical knowledge, and the significance of that knowledge for the apprehension of Truth. *Musica* is defined as *scientia bene modulandi*.12 This definition resembles Varro's which in turn was derived from the many definitions of music in Hellenistic writings.13 The preoccupation of this section is a traditional one which identifies a knowledge of music theory as *musica par excellens*; Augustine's exposition of the definition places him firmly in the (pythagorean) tradition whereby the practice of music, and even its pleasures are accorded a lower status than knowledge of its theory.14 At the same time it must be noted that Augustine does not *divorce* practice from theory. They are still part of the same discipline; the latter is the more fundamental.

Each word in the definition is carefully explained. *Modulatio*, it is noted, is used only in musical contexts and is related to the word *modus* which means a standard of measure or limit.15 It would be easy to read this passage as just a neo-Pythagorean exposition. *Modus* associates musical movement with the movements of more general measured relations in the dynamic flux of the space-time world. However, the association of measure with limit, with ordered form, had a general currency, especially in writings on number and mathematics, in the ancient world. So a specific identification of pythagoreanism is not at all certain here.

12. DMI2.2; p 24.


Augustine himself was very struck by a half verse from the book of Wisdom: "You have ordered all things: their measure, number and weight." It refers, of course, to the structure of the cosmos as an ordered whole. This theme, which is pursued throughout the De Musica is briefly expounded here as modus is said to be a more general case of modulatio. Modus, in fact, becomes the term used throughout the treatise when measure and limit are discussed. The many associations of the term, especially those it has with unity and wholeness, lead Augustine to comment that it implies a "very great discipline" indeed.

All things which are fashioned well display this quality of ordered measure, modus. The unity of idea is exhibited by omnibus bene factis. These may be observed in all kinds of creative activity, from the Creation itself to the simplest of its parts. The whole universe he often described as a triad, related to the Wisdom verse, of modus, species, and ordo. These determine being at any level. And they are all interrelated in meaning. The form or species of a thing is given by its numerate structure, as the structure of number itself provides a model for the making of distinctions. Measure also implies a definite, finite number which distinguishes all things from each other, as cosmos itself implies order and is opposed to the formless chaos. This theme is more fully explored in the second half of book six. At this point there are only hints of the vision in phrases like vere divina ista disciplina ...


17. At this point there is a short excursion into explaining how in musical terminology modulatio is used in place of modus. The model is the relation between the refined speech of an orator and the ability which anyone has to speak: dictio is a special case of dicere (i.e. dicendo dictio nominata sit ...; DMI2.2; p 26 M90).

18. tantae disciplinae definitio continetur. (DMI2.2; p 24; M88).

19. cf. DMVI17.56-57; W.J. Roche "Measure, number and weight in St. Augustine" New Scholasticism 15 (1941) p 353.


Modulatio itself is musical measure. Augustine is not satisfied just with this explanation, important as it is, and turns to the question of how music is measured. He remarks that an exact quantity may be wanting or exceeded only when change takes place: as when things move in some way or other. If things remain static (unchanged) then their measure or quantity will remain the same. 23

It might be possible to read this passage as one where movement (change) is to be understood as dangerous in itself. Certainly that is how it has often been taken, in contrast to a stable, static, and fixed view of numerical pattern that is often conceived as an ideal of perfection. 24 But this contrast mistakes the image which Augustine develops in the rest of the chapter. He goes on to say that modulatio is a certain ability in moving, or in making something, or making something move well. Moving well means to preserve measure, order. 25

This, again, is a significant ancient idea easily missed by modern writers who assume that the numerate character of a musical structure 26 is to be understood as a static, unchanging, pattern. There is a tendency to connect this frozen, lifeless image with the immutable ideal world, making that world, too, static and lifeless. However, 27 the moving pattern which characterises musical structure is dynamic. It limns a living perfection of shifting patterns and rhythms which do not just strive after immutability, but are the very character of that immutable world. The harmony of its relations, of, indeed, its ratios, forms the basis of this dynamic unity as everything fits together within it. 28

23. DMI2.3.

24. This is certainly O'Connell's attitude throughout his Art (op. cit., e.g. pp 14f, 33f, 38f, 67f and esp. 148-150, but paseim) and to be found in many of his secondary sources.

25. Ergo modulatio non inaongrue dicitur movendi quaedam peritia, vel certe qua fit ut bene aliquid movatur. Non enim possumus dicere bene movere aliquid, si modum non servat. (DMI2.3; p 28; M90, 92)


27. As O'Connell himself notes, ibid.

28. See below Chapter IV, pp 102-105

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In this passage Augustine is speaking principally of music as it is found in the sense world. He makes quality of movement explicit by including in the definition a caveat that things only retain their modus when they move well, the implication being that it is possible for things not to be so harmoniously arranged and in that case there will be a defect in the product. Movement that is rhythmic pattern must be in accordance with the ideas of formal quantitative balance that distinguish a dynamic structure from some less well formed movement.29

Further, Augustine distinguishes between various kinds of movement, and this distinction illuminates further the aesthetic content of his definition.30 There are two kinds of action: one performed to some extrinsic purpose, the other performed for itself. The artist moves while fashioning the material of an aesthetic object. A dancer moves his limbs only in order to move gracefully and beautifully. In the former case there is an extrinsic purpose for movement - the manufacture of an object; in the latter, no other purpose is intended but participation in the idea of beauty and those ideas related to it. Augustine calls the former a "servile" and the latter a "superior" case. The rhetoric may seem a little strong but the point is made. A beautiful, harmonious relation is a pleasure in itself,31 not for its utility.32 Detached contemplation of an object is clearly distinguished from any other interest the mind may take in it. The distinction, which is drawn between knowledge and skill in the next few chapters, illuminates the radical distinction he draws in book six between understanding and all other activities of the soul. To use a thing is to work through it to something beyond; to enjoy, is to contemplate the thing itself. Aesthetic contemplation, then, is connected with the other modes of personal introspection concerned with the soul's relationship with God.

29. cf. the brief remark on modus and motus, Stefani, op.cit., p 12.
30. At DMI2.3.
31. ... per se ipse delectat. (DMI2.3, p 30; M92, 94).
32. Augustine had made this point in his lost first work, De Pulchro et Apto, where, as O'Connell notes (Apt, p 14f), there is a kind of detachment of attitude to the object, "... a temporary suspension of concern with profit...".

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De Musica
Augustine rewords the definition as *Scientia bene movendi*. Movement which forms a musical *modulatio* is a perfection of harmonious relations, a *modus* which forms *ordo*. This revised definition makes the dynamic character of quantitative (numerical) relations very clear. These immutable patterns of relations which are also "in motion" are also to be found in the "static" objects of aesthetic contemplation. Their parts fit together, harmonize, into an ordered whole, into one "eurythmic" structure, where regular measured movement is interpreted as a rhythmic dialogue between the whole and its parts. In more obviously dynamic objects, like a poem or a song, rhythmic and aural structure combine to form a constantly shifting pattern which later Augustine will interpret as a model for the world itself.

These patterns may be rendered well or badly, just as life may be lived happily (harmoniously) or not. Augustine turns explicitly to *bene* in the definition. He has already noticed that things must move well to keep their *modus*. Spontaneous delight is one indicator of this quality. The structure itself must exhibit these dynamic proportions.

But not only that, the structure must exhibit harmonious relations with its environment. Not only do the patterns relate to the divine, they must also bear harmonious relations with the whole of which they are a part. His argument is clear. It is possible to use some well-formed object, a song say, in a manner which is inappropriate to its surroundings or the occasion. *Modulari* refers simply to the harmonious construction of the work itself; *bene modulari* places the work in a wider environment with which is must bear equally harmonious relations.

33. DMI2.3; p 28.
34. Of Matila Ghyka's *The Geometry of Art and Life* (New York, Sheed and Ward, 1946) Ch.1 "Proportion in Space and Time".
35. Above p 600 (Bourke ref).
36. but not uninformed, see below ch.IV, pp 126f.
37. potest, quidquid numerose servatis temporum atque intervallarum dimensionibus movetur (iam enim deletat, et ob hoc modulatio non incongrue iam vocatur) ... (DMI3.4; p 30; M94)
38. ex eo quia numerosa est, dici potest, male ille, id est incongruenter utitur. Unde alius est modulari, alius bene modulari. (DMI3.4, pp 30, 32, M96)
Aesthetic qualities, then, are not found separate from the other qualities which might attach to an object, especially ethical ones. This integration both of personal contemplation and of quality itself is a significant epistemological and ontological position which Augustine attempts to explain using the device of number. In book six, he will argue that it is necessary to judge not only sensual (aesthetic) quality but also moral quality. Music as a liberal discipline must fit the wider context of philosophical speculation of which it is a part. Cultivated aesthetic detachment must be accompanied by a moral detachment so that the true value of sensibility may be determined.

The Definition: scientia

Finally Augustine turns to the principal term in his definition: that musica is scientia. Music is a body of rational knowledge: knowledge of the numerical relations which govern the harmonious structure of melody and rhythm. As such the subject matter is entirely to be apprehended by the ratio, the understanding. Musica is something ultimately comprehended as ordered structure. This is primary to whatever else may be said of it.

The three chapters devoted to this argument tease out the implications of scientia, in opposition to both music as performance practice, and as it delights. Chapter four considers the relation between music in nature, in performance and as pleasure, on the one hand, and as a body of knowledge on the other. Chapter five briefly distinguishes between kinds of mental activity: sensation, memory and intellect as they illuminate the preceding discussion. That distinguishes between music making (performance, composition) and music as scientia. The sixth chapter then comments upon the value of scientia itself in relation to other activities.

39. see his distinction between sensuales and iudiciales at DMVI9.24; below p 128f.
40. DMI3.4; See also Stefani, op.cit., pp 12-14.
41. Augustine does hedge a little in this passage as he claims that good movement may seem not good in some circumstances, though it is still harmonious. But this is quibbling and his sense is clear. On the general question of morality and the liberal arts, cf. De Ordine II.8.23-9.26.
42. thus making explicit what is implied by his argument at DMII.1.
In discussing at length *musica* as *scientia*, Augustine does not just make clear the locus of *musica* as a subject; there is a value attached to *scientia* which makes its acquisition an important step on the way to wisdom and true happiness. Frequently Augustine's rhetoric tends to contrast those things which facilitate the soul's journey with those which inhibit that journey. These contrasts depend on the perspective he has chosen from which to make his contrast. They are not absolute judgements of ontological status.

*Scientia*, leading as it does to happiness, has a moral sense which informs Augustine's judgements against certain kinds of entertainment and musical performance. In part, these disapproving have to do with an excess he thinks accompanies the public performance of some kinds of music; but central to the importance of *scientia* is the method by which it turns the soul back to itself rather than distracting it. *Scientia* is important not so much for what may be learnt about phenomena, but for its pivotal role in conversion and a subsequent revision of attitude to the universe and its significance. Despite the "contemplative" nature of *scientia*, it is never very far from questions of human behaviour. As a definition, *scientia bene modulandi* captures an ideological edifice which continually relates questions about how the universe is organized to questions about human behaviour and the values which should be attached to such behaviour.43

He begins with nature. Birdsong is an expression of the harmony of nature: it is both *numerousus* (that is well-ordered according to the laws which govern music) and most agreeable (*suavissimus*) as well as contextually appropriate.44 Birdsong, then, conforms absolutely to the requirements of *musica*. On the other hand, of this the bird itself is unaware. It simply participates in its *ordo*. Moreover, the effects of birdsong may be observed in nature as animals display their delight in it.

Similarly people who make music which delights (and is therefore harmonious) may not be aware of its structure. And, similarly, those who listen may just as naively enjoy its performance.45 At this level pleasure

43. cf. Stefani, *op.cit.*, pp 14-16.

44. DMI4.5.

45. ... *none tales tibi omnes videntur, qualis illa luscinia est, qui*
is had without thought or reflexion. It is simply taken and enjoyed (in moderation). Although, as Augustine points out, it may become even at this pre-cognitive stage, an addiction. 46

So far, no explanation of why the song is so affective has been attempted. He floats another idea. Perhaps it is possible to distinguish between human music-making and that found in nature. Human performers learn their skill by imitation and it may be that in this way ars is distinguished. However, again he argues that if performers learn by imitation how is the performance ars? Ars appears as a kind of reasoning 47 which, qua reason, must be distinguished from the manifestly pre-rational activity of imitation. Animals must sing by their own nature because they cannot reason.

Augustine's argument, to this point, has been to drive a wedge between song itself (ars itself) as a rational thing, and its performances which may be simply the result of learning the notes or words of a song by imitation. He is also careful to distinguish song from musica in this passage, 48 and to distinguish between song and its various performances. 49 Animals can copy human sound, just as their song reflects the archetypal patterns of nature. This is the crux of his argument: animals cannot reason and so their manifest ability to imitate must mean that imitation belongs to some faculty in the soul other than the ratio. It is pre-cognitive.

Augustine's argument is expanded in book six.


47. Videtur tibi ars ratio esse quaedam, et ii qui arte utuntur, ratione uti,... (DMI 4.6; p 36; M100).

48. DMI 4.6: Musica as scientia is quite separate from any cantus.

49. It is thought that in Augustine's day a performer ('singer') learnt a large body of melodic formulae which were then pieced together to make a song. It is easy, then, to see how he can claim that performers learn by imitation as what is to be learnt is the body of formulae. It would not be necessary to know any theory at all, even to compose or improvise. (cf. Higini Anglês, "Latin Chant before St. Gregory" in New Oxford History of Music, vol.II (London: Oxford University Press, 1954) esp. pp 69-72).
Augustine thus distinguishes sharply between kinds of mental activity. On the one hand, there is understanding via the ratio. On the other hand, there are other kinds of pre-cognitive activity which do not require such insight. The content of these is less well defined. They range from that innocent delight mentioned in chapter four to all kinds of skills learned by imitation. Augustine loosely characterized their mental content as a pattern inherited from nature because the soul is a part of the natural order, or a pattern acquired by habituation. In either case these abilities do not entail any evidence of explicit understanding.

Composing and performing require only a familiarity with the rules of musical practice. Learning consists in imitation. This is especially true of performance. In a climate where performance and composition were not nearly so distinct as they have become, it is also clearly true of composition. It is a skill, learned by becoming increasingly familiar with the method of the craft itself. Augustine calls this artes.

Artes is not to be identified with imitation. Augustine uses this term in a variety of ways and its meaning sometimes slips between them in a single passage. On the one hand he does use it in the sense of practical skill: the ability to make music. At times it also means liberal discipline, or the disciplines as a whole. In this sense the skill involved has to do with reasoning and also scientia. This sense is also evident here. Art involves both imitation and reason.

There is a peculiar tension between his use of artes and aptes here which leads him to conclude that art seems to be both rational and imitative. In a long speech, the master distinguishes clearly between using artes and possessing artes. Artes is a pattern, a structure with which the understanding may become familiar. This is to possess artes. To imitate that pattern does not require such explicit knowledge, one simply participates in that which the pattern describes. It is not necessary to possess it.

50. above p 40.
51. cf. O'Connell, Artes, op. cit., Ch.2 for a full treatment of this point.
52. DMI4.6.
As this is worked out, *scientia* itself is distinguished from imitation as having only to do with the understanding. Some *artes*, he claims, seem to have to do with both reason and imitation. But Augustine is not satisfied with this as it stands. It would seem that *musica* is at once a body of knowledge and also a practical skill in performing. He wants, of course, to distinguish these so that *musica*, properly speaking, is only the former and the latter is something else, an activity perhaps like singing. But the musical artifact, the song itself, has to do with both. Consider birdsong. The bird simply sings; it imitates the patterns of nature. The song itself has a structure which exhibits the numerical laws which are the subject matter of *musica*. The song as *ars* is both reason and imitation. The mistake the student makes is to think, still, that this is the subject matter of *musica*.

To make this clear, Augustine considers again the imitative skill of music making. As a learning process it seems that not only does imitation inform the bodily processes of performance, but also the necessary mental processes invoked by such disciplined activity. This imitative skill involves both mind and body. *Scientia*, on the other hand, is only of the mind. Performers may or may not possess it; they do not do so by virtue of their imitative habits.

Augustine needs to distinguish between kinds of mental activity to sustain this argument. He needs to class the practice of music as in itself less significant than knowledge of its structure. The psychological sketch which he offers is directed to this conclusion. The

53. *Aliud igitur putas esse artem, aliud scientiam*. Siquidem scientia et in sola ratione esse potest, artem rationi iungit imitationem. *Non video esse consequens*. Non enim omnes, sed multas artes dixeram, simul ratione atque imitatione constare. (DMI4.6; p 38; M104) of Augustine's distinction between kinds of delight - sensual and intellectual - at *De Ordine* III.34. Intellectual delight is in the harmony of patterns of *numeri* which are discovered through the senses but are not objects of the senses.

54. DMI4.6.

55. DMI4.7.

56. I gloss the rhetorical language here where he shudders "... *quom si omnes tibicines et fidicines, et id genus alii quotbet habemis, nihil etsa disciplina puto esse vilius, nihil abjectius.*" (DMI4.7; p 40; M106). This has as much to do with the low status of entertainers in his day as it does with his views on understanding.
sense of hearing involves both body and mind. Memory, which is informed partly by sensation, is confined entirely to the soul. Yet it appears to be common to both animals and humans. If, then, scientia is only of the soul and is cognitive, rational activity and not possessed in pre-rational soul states, it must be refused to animals. It cannot be placed in the memory, then, but must be an object of the intellect alone, which is peculiar to humans of all the animals.57

Imitation involves both sensation and memory - it uses both the body and soul - as it involves both remembering what to do and the doing itself. Such capacity in no way implies an intellectual grasp of the matter. That is another thing entirely to be tested by the reason alone, which the performer may or may not have.58 Scientia is knowledge about, as that is structurally conceived.

Augustine's dualism is at its most intense when he makes the final move: that scientia has not at all to do with activity or skill, even at their most elevated. It is not true that someone of remarkable dexterity has the greater amount of scientia. If it were the case then those who were best at practical skills would also be those who had the most scientia. The debate is an old one. It is between those who skillfully, even masterfully, practice their craft, and those who, while not exhibiting any great skill, certainly are learned in the craft.59

Significantly, Augustine's examples of craft are not specifically musical. He writes of carving wood and, finally, of surgery. In both cases it is possible, he argues, to know what needs to be done without actually being very good at doing it. He distinguishes between a habit "developed in the hands", and encyclopaedic medical knowledge.60 This is his point. He does not argue that practical skill is somehow incomplete. In its way it incorporates the most subtle of activities. But these activities are incorporated. They are not explicit in the intellect.


58. DMI4.8.

59. DMI4.9.

60. quo vocabulo estis significatur operaria quaedam in manibus medendi consuetudo. (DMI4.9; p 46; M114).
Such manual skills, whatever they are, are acquired through use, through habituation. They require practice to perfect them. The wood-carver must carve again and again in order to achieve an accurate likeness.

This distinction does not leave Augustine open to the charge that his theory does not permit of some dialogue between artistic activity (making, composing, performing) and the rational, reflective understanding. That certainly is one way the dualism could go. But Augustine has carefully noted that a practical musician can also know the subject of musica. Perhaps the most skilled manage a synthesis of practical know-how and scientia which affords them a significant role in their profession.

Cantor and musicus can be fused in an individual who confronts the elements of practice through the general picture which knowledge presents. Technical perfection, more, an ability to reproduce with absolute perfection whatever is required, is distinguished from a capacity to be critical of that technique. Yet this in no way divorces practice from the reflective knowledge of what happens, how it happens and why it happens in the way it does. It is not always clear, however, that Augustine is so sensitive to these possibilities.

Note, for instance, the equivocal meaning of ars in the passage: that which "joins imitation to reason". Ars and the artes stand separate from either side of the distinction, yet are involved in both. This is most true of the artifact which is both a copy of some ideal pattern, and itself a possible pattern for imitation.

It is not so clear how this may be applied to ars as skill and practice. Partly this problem has to do with the strict meaning with which Augustine invests scientia. This slips a little in chapter five where he does admit that what is in the memory is a kind of knowledge. There are some artes which are solely concerned with practical matters. Even those pre-cognitive mental states are formed so that an audience can feel (and through that, know) when a performance is well done. This level of critical awareness is a natural capacity to detect the quality of events. In the sense of hearing itself there is a "natural" judgement. This view is fully explored in book six; here, all Augustine says is that memory

61. This is discussed by Corbin, op. cit.; cf. Bubacz, op. cit., p V28.
62. DMI5.10.
follows this sense of correctness and then the body follows the memory.63

Sketchy as it is, the outline of his theory of pre-rational sensation and rational understanding is maintained. The circle of mental and physical activity is complete when memory is informed by sense and *vice versa*. There is no place for the intellect in this schema. That has a distinct function which I have roughly characterised as the critical. As far as practical matters are concerned, it has no place in the doing of them. At the same time, Augustine does not claim the memory as a blank slate on which the senses write their story. Stored there, as part of its very construction, are those patterns which allow it naturally to recognise those things which give it pleasure. A congruence between the inner and the outer worlds makes it possible for the untutored soul to feel (to know in this loose sense) one thing as better than another, although it does not, in a strict sense, know why this is so.64

*Scientia* is explicit knowledge. Aesthetic forms take their place within a context where personal introspection is preferred to activity, just as enjoyment is favourably contrasted with use.65 In chapter five he argues that as *musica* is *scientia*, it has nothing to do with performance. The value of *scientia* is distinguished from the uses to which it may be put. He thus locates the most important role for *scientia*: that it can be savoured for itself and it is, in itself, its own reward. The argument here adds to the discussion an intensity of moral tone absent from earlier chapters.

Those earlier chapters characterise the kinds of information and activity which do not involve use of the intellect.66 Such activities certainly involved a practical skill, an *usus*, which is distinguished from

63. Itaque cum sensum memoria, et articuli memoriam sequuntur, usu iam edomiti atque praeparati;... (DMI5.10; p 48; M116).

64. cf. the distinction in the *De Magistro* between sense-knowledge and intellectual knowledge (12.39-40), and the *De Ordine* II10.49 where measure is independent of human awareness of it. What sets humans apart is their capacity to become aware of the rational structure of the world, to "grasp the nature of numbers". This whole theory is reconsidered in chapter IV, below.

65. A distinction developed at *De Doctrina Christiana* I.4-37.

66. DMI5.10.
scientific. But even scientia may be used, put to work extrinsic to it. His model is a gold merchant. The merchant knows the worth (the measure or weight) of the gold as an essential part of his trade. But the point of such knowledge, which counts as scientia, is lost if the merchant does not engage in trade.67

Applying the model, Augustine argues that performers offer their skills in order to be rewarded by applause and a fee. Musica, on the other hand, as an intellectual discipline, is equated with the value of the gold. As scientia it is wholly intellectual. So public rewards are totally unrelated to it in itself as they depend on a public judgement, the chancy and fortuitous opinion of the audience.68 There is a similarity between this and earlier characterisations of scientia. Here is is infused with a new attitude. Before, the distinction between intellectual and natural was one between cognitive and pre-cognitive activity. Now pre-cognitive activity is valued against the cognitive, and found wanting. It is possible to read in this valuation a neo-Platonic distinction between activity, extended in space and time and distracting from the contemplation of divine ideas, and the redirected intellect which penetrates the world beyond time. Augustine notes that the life of opinion (which necessitates change and so time), uninformed by scientia, is impossibly unsettled and disconnected; this in turn disconnects the soul from patterns which do form the world.

Indeed, he argues that a singer learns the craft in order to become rich and famous. In doing that the singer values worldly gain above beauty itself, accompanied by a perfect order which reflects the divine. The valuation is mistaken and must indicate that the singer lacks the scientia necessary for correct valuation. If a singer had perfected the craft simply in order to exhibit the beauty of song then such a cantor would also possess (perhaps explicitly) the scientia which distinguishes the musicus. To know, in a strict sense, means to evaluate correctly. Augustine believes that few people have this wisdom, and that even those who study the liberal arts may so do to get public rewards.69

67. DMI6.11.
68. DMI6.11.
69. DMI6.12 (passim); cf. De Libero Arbitrio II 10.29-11.32.
The implication of all this is that the informed understanding is not, in itself, a desirable and rewarding state. It can be, if the right attitude is taken to what it offers. This evaluation even of *scientia* lies behind the discourse. His attitude, here, to forms of thought not rational is to be taken as one point of view among others which he takes at different times in the text. The comment that a performer may have *scientia* is consistent with his earlier distinction between kinds of knowledge. It admits, for instance, performances for the music itself, where contemplation and reflexion attend and are uninhibited by the expectation of entertainment. Augustine can, then, justify performance for itself in certain circumstances such as the Liturgy where music not only adorns the words but invests them with a deeper significance. 70

*Scientia* and *Number*: *integration and unity*

The locus of *scientia* is clearly drawn. It lies only in the understanding. It is distinct from imitative activity, and from any kind of manual skill. It is also distinct from *ars* as it only takes from that its formal content - leaving its effects to other parts of the mind. In the *De Quantitate Animae* Augustine has used the term *ars* in a similarly unqualified sense to designate the combinations of rhythms and harmonies - words, shapes and sounds - which constitute the material aesthetic object, the medium which affords possible pleasure and a possible glimpse of the eternal world. There his argument is directed to displaying various levels of soul activity. Art objects are products of that level (the third) which is peculiar to humans. 71 He speaks of the inventiveness of craft, of language and gesture, of music and the visual arts. All of these are symbols (*signa*) of human creativity which witness to "the power of reason and thought" in all human production. 72

Yet all this splendour is "the common heritage of good men and bad". Augustine demands that the soul look higher to the plane of goodness and genuine worth. In that he requires the soul to hold itself apart from

70. This is the substance of Stefani, *op.cit.*


72. *ibid.* I am indebted to O'Connell (*Art, op.cit.*, pp 59-61) for this insight.

Augustine

*De Musica*
these corporeal things and save its desire for the incorporeal to which it truly belongs.\footnote{De Quantitate Animae 33.73.} While he is aware of the obvious merits of human creativity, just as he is of nature itself, it all takes second place to the contemplating of spiritual and eternal values which should inspire creative activity.

\textit{Ars} represents, but only represents, the power of human thought. In that it does link imitation with reason. But to overvalue skills in performance is, as he argues in book six, to attend to the corporeal instead of the incorporeal. Augustine's location of \textit{scientia} supports this view. The separation of soul and body is most intense when he doubts that a performer can ever be said to have the correct attitude to performance. This position may, however, be rhetorical. His argument seems directed at views of human behaviour which devalue spiritual activity and spiritual sensibility. As the spirit is detached from the body it may more clearly contemplate the divine which is what the acquisition of \textit{scientia} is all about. On the other hand, there are moments in the argument where the vision seems different. It is worth noting that the logic of \textit{ars} affords several possible viewpoints, not all of which Augustine explicitly takes, but neither does he reject them.

I do not wish to debate the merits of the spiritual view. It is encountered again in book six. Augustine's definition of \textit{musica} is a product of presuppositions of which this "spiritual" view is the most significant. At the heart of such spirituality is an attempt at perfect unity of understanding where all things are comprehended at once and absolutely. Sense experience, located as it is at times and places, directs the attention away from such unity of thought. The attempt at unity is behind his introductory discussion of grammar and music, the importance of order in musical structure, the integration of object and environment, and the singular importance of knowing itself.

It seems crude to interpret this spiritual attitude in terms where absolute values may be ascribed to the various oppositions his discussion produces.\footnote{E.g. use - enjoyment, sense - intellect, skill - knowledge.} The values he ascribes depend much more on psychological \textit{attitude} than on the ontological significance of their objects, though this...
provides a ground for evaluation. One of the consequences of the attempt at unity is the necessity of demonstrating the relations between the parts of a diverse universe. Once an ontological unity is achieved, valuations between its parts relate to judgments of points of view which depend on the relative merit of part to part.

There are passages which reveal that Augustine's attitudes do not so firmly reject the world of the senses. Like Plato before him, scientia divests the attention of everything but those mental objects which seem so perfect in their timeless structure. Beauty is accompanied by ordered form and that is understood as numerical structure:

"Behold sky and earth and sea, and all in them that shines above, or creeps below, or flies or swims; all these have forms because they have numerical dimensions. From whom do they derive but from him who created number? And number is a condition of their existence. And the human artists, who make material objects of all forms, use numbers in their works ... if you seek the strength which moves the hands of the artist, it will be number." 75

In the De Quantitate Anima something is known when it is fully clear and transparent to the mind; when it is "seen" by it. 76 His example is knowledge of number; where the propositions of mathematics constitute indubitable truths which no amount of sense experience can make false. While numerical truth is not the only kind which is so transparent, moral and aesthetic qualities are often represented in the De Musica as accompanied by numerical qualities which describe quantitative states. This makes the treatise so pythagorean in tone.

His definition of musica is a synthesis of metaphysical, psychological and aesthetic ideas, expounded in terms of number. The unfolding of musical pattern (modulari) in rhythm indicates the form of his intellectual material: measure and order which determine structure. These structures are never isolated from their context in life. The order of the cosmos is not to be violated. They are formed of numerical relations which are apprehended by the intellect because they constitute objects of the

75. De Libero Arbitrio II24.42.
understanding. These objects are the ideas which appear in the world of being. *Musica* is essentially numeric structure. Like Plato, Augustine imposes on the way of understanding the whole weight of psychological apprehension so that it is not possible to distinguish clearly between kinds of understanding. This is the synthetic character of the definition: it is not possible to separate aesthetics from ethics or metaphysics. Yet there is a way of, at least, sorting the questions into their separate categories, even if they will be finally confused.

Consider the force of *ars*; it joins the imitative with the rational. The flute-player's skill is imitative, even when composing. The skill is not at all necessarily intellective or reflective. Augustine carefully points out the "natural" sensibility which forms the experience of pleasure, a feeling of order and completeness. The composer may simply set down feelings, moulding sound without any intellectual effort. All takes place according to the law (*ordo*) of nature.

There is an *aesthetic* category which analyses musical structure in terms consonant with that structure. This, in a sense, is just what books two to five are about. (How does rhythm work?) But such contemplation of rhythm also involves contemplation of its effects. Sensuous qualities invoke questions of value which seem so distinct from formal aesthetic qualities. Yet the intellectual attitude is not changed — a work must be seen in its fullest context. Many categories of the understanding are invoked to get a clear picture of a work's value. These categories employ models of understanding which shape intellection. The ideas are never alone, all categories are inseparable, just as they are mixed together in the work itself.

A danger is that one category is merged with other categories in the attempt at total vision. Without disputing its content, the aesthetic category — the numeric relations which form structure — seems all too readily merged into the others, especially the metaphysical. On the model of a work of art Augustine quickly moves to speculations about creation itself. There are reasons for this but just how much creation is formed

77. *cf.* Phaedo 64E-67B where Socrates distinguishes pure knowledge from all other kinds of apprehension. "... the soul by herself must behold all things by themselves ..." (66E). The model for such understanding is mathematical (eg. 75C).
aesthetically remains largely unexplored.

This problem becomes more intense when moral questions arise. With considerable facility, especially in book six, Augustine uses his psychological speculations as a means of discussing certain moral questions. The apparatus of numeri, which he constructs there is used to illustrate a precise relation between God and the individual soul, and between the soul and the material world. These relations are ethical as well as metaphysical. In book one ethical questions arise when Augustine considers human action. As soon as he begins to talk about what humans do with music, he asks, inter alia, whether what is being done is morally appropriate. Indeed, such a consideration is built into the definition itself. He seems, however, aware that these ethical problems are, in some ways, separate from metaphysical and aesthetic problems. They are, at the same time, inescapable. For a work to exist is for it to participate in all the categories of being and it seems important to Augustine that the right moral instruction be provided along with everything else. This is especially so since the whole object of learning is to purify the soul for its union with the divine.

**Numbers and Relations**

The reason for this merging of categories is metaphysical: the measured relations between all things form the cosmos, an ordered whole where (as Augustine notes) the ideas themselves are related to one another. Beauty is accompanied by harmonious structure and also Goodness. The model for the interrelations between ideas remains, in the De Musica, number and its laws. What affords pleasure, appears on inspection to be harmonious arrangement. Pattern is explained by exhibiting its numerical structure.

78. They are discussed below, pp 122-127

79. Stefani, op. cit., discusses this aspect of DM at length. A passage of particular note for this problem is the discussion of bene at DM14. The later preference for theory over practice is also infused with a moral tone which, at times, seems to direct its conclusion. I have tried to shew just how that may be tempered by more general speculation.

80. cf. De Ordine III.42; De Natura Rori 3.
So Augustine turns in the second part of book one to numerical theory. Number is not just a convenient way of characterising relations. It is the principle of rationality and forms the basis for any conception of reality. As it forms the understanding, number becomes an ontological principle which informs the space-time universe.

Augustine had no intention of presenting a complete number theory. He includes as much about numerical relations as will be necessary to explain the rhythmic theory in books two to five. But his discussion also indicates the way his numerical model is to be understood. He begins with the pair (of opposites) "long time" (diu) and "not long time" (non diu). This pair is similar to the contrary pair slow and fast.82

"Long time" and "not long time" denote periods of time which are long and short. Their difference is illustrated with numerical examples. Significantly these examples are ratios of numbers, 2:1, 3:2.83 At the beginning, then, of the discussion Augustine is interested in how these long and short lengths may be related in numeric proportion. His examples distinguish between actual lengths of time based on an arbitrary unit (so many hours, days, etc.) and the relation between these which is numeric proportion. These proportions consist of pairs of numbers, derived from the measure of time, but which bear the relations to each other of "equal to", "greater than", or "less than".84

This distinction is important. In the following chapter Augustine comments that measure and limits are placed before infinity and incommensurability.85 He goes on to explain that contrasted pairs, those which have a numerical measure, are placed before those which do not.86

81. On this model, value of a moral kind is similarly to be explained by the relation of a work or performance to its surroundings. Just how close this model of "fitting together with" works quantitatively is not explained. Yet the ideal of ratio does seem to be behind this kind of ethical judgement.

82. Quamobrem sic agamus, ut haec bina contraria appellemus hoc modo, diu et non diu, tarde et velociter. (DMI7.13, p 54; M128).

83. He omits 3:1 for reasons explained below (pp 84, 85).

84. DMI8.14.

85. Illud etiam, ut opinor, intelligie, ommem mensuram et modum immoderationi et infinitati recte aequiponi. (DMI9.15; p 58; M132).
For, a certain limit and measure in numbers unites them among themselves; and those without this unity are not joined in any ratio. Those things which among themselves are measurable will be called rational; that which is without measure, irrational. 87

The passage is particularly dense. The contrasts he draws are first between limit (modus) and measure (mensura), on the one hand, and infinity (infinitas) and the incommensurable or endless (immoderatus) on the other. Further, he distinguishes between measure and limit and the measuring out of things (dimensio) which may be numerical or not. Then he comments that limits and measure in numbers unites them into a ratio. Those numbers which are without limit and measure may not of themselves be so joined. This is a most puzzling remark. Given the contrast between modus, mensura and dimensio, I take it that numbers which are not of the same standard of measure are not in themselves united by ratios. If a ratio is itself a limit or measure, then its parts (individual integers) must share a common dimension, that is, be commensurate. These are what Augustine calls "rational".

The distinction between dimensio and modus, mensura, seems to be drawn carefully enough in the passage to indicate that Augustine is aware of the distinction between number as a collection of units, and as a limiting principle. 88 In the previous chapter he had illustrated pairs with ratios, said to measure the pairs, contrasting these ratios with actual lengths. Here that contrast is intensified as all ratios seem to be limits in themselves.

Relations: quantity and quality

This first distinction between rational and irrational is of fundamental importance to his argument. An ancient problem of commensurability is raised. Augustine contrasts the contrary pair slow and

86. Duo igitur motus qui ad eesse, ut dictum est, habent aliquam numerosam dimensionem, ies qui eam non habent anteponendi sunt. (DMI9.15; p 58; M132).

87. DMI9.15.

88. Above pp 7-17.
fast. As ideas, Slow and Fast are distinct but related. For one thing to be slow another must be fast (where 'fast' is construed as not-slow) and this ontological connexion between a pair of distinct ideas is indissoluble. If this were not so, the ideas Slow and Fast (or diu and non diu) could individually be postulated of some object without ever referring (even implicitly) to the other. This is not possible; even though some object may have a particular speed, if it is slow, it is that in contrast to some other object which is moving at a faster speed. It could even be both slow and fast but never under the same description because it would be slow in contrast to some faster-moving object and fast in contrast to some slower-moving object.

Augustine's hope is to introduce the idea of a contrasted pair exhibiting a kind of unity through their ontological interdependence. Their ratio is that which explains their interrelation.

A ratio, a pair of numbers which exhibits the exact relation between two related things, is itself the measure of that relation. The two parts of the ratio are mutually contrasted to shew the nature of the relation. This is ratio as a principle of relations. The octave, for instance, is a relation between two notes determined by the ratio 2:1. Unless the notes stand in this ratio they do not constitute an octave. On the other hand, each note is made with a particular length of wire (or number of vibrations) which will depend on the units chosen for the measure. These units do not in any way determine the octave, they merely provide the (logical) ground for the relation to occur.

Those pairs which may not be so contrasted are not of the same dimensio. To this point Augustine's argument need not be mathematically interpreted. It has very general implications. If two subjects can be shewn to have no common dimensio then they bear no relation to one another. That many things do seem to bear relations with one another must mean that there is some rational ground between them.

89. DMI7.13.

Augustine's immediate purpose is to classify ratios. His first classification is between the rational and the irrational. Irrational ratios are those with no common dimensio. They are strictly not ratios at all, but unrelated pairs which require no further determination. Such pairs, he has said, are not joined together of themselves. Some logical connexion is required. If there is no such connexion then there is literally nothing to understand about their juxtaposition.

Number ratios may be classified according as the parts of each ratio are equal or unequal. Unequal ratios may be further subdivided. This is the matter of chapters nine and ten. The text is difficult and the classification defective, as Marrou notes. That is of little consequence for my general point about relations between numbers as fundamental to the understanding. But it illustrates Augustine's haphazard approach to numerical detail. There seems little point in discussing the faulty classification. Clearly Augustine sees his subject as a separate discipline of relations.

What is striking are the remarks scattered throughout the two chapters how, of contrasting classifications, one is to be placed before (i.e. preferred over) the other. Augustine explains this in terms of significant relations (equality, a common factor greater than unity) which exhibit the relational structure of numbers. Whatever is closer to unity seems to be of greater importance: for equality, his idea is that things may be said to be the same, or have the same measure: numbers with common factors exhibit a greater similarity than those without. Once such connexions are established, the relation must exhibit itself according to rational principles which will provide an explanation for what kind of similarities obtain. This preference for numerical interconnexion informs

91. Above p 61
92. op. cit. pp 256-258; BA Note Complémentaire 17, "Mathématique et mètre" pp 492-494.

93. e.g. Iam illud attende, ut rum tibi videatur maius concordia in motibus rationabilibus eorum qui eaeque sint inter se, quam eorum qui sunt inaequales. (DMI9.15; p 58; M132) Illos mihi ratio videtur anteponendos iubere, in quibus potest dici, ut demonstratum est, quod a parte sui maius aut coaequetur minori, aut eum excedat, ets in quibus idem non event. (DMI9.16; pp 60, 62; M134)

94. e.g. Appellemus ergo istos auos praeponimus, communeratos; illos autem quibus hos praeponimus, dinumeratos: propter eam quia isti superiores non
the (aesthetic) judgement.

It was noted that such judgements depended on attitudes to the relations between contrasting pairs. Here his model for such evaluation is introduced. It is not absolute value which distinguishes slow and fast but their relative values under some description, some common dimensio. Even the nature of judgement itself is characterised by the relations between numbers. This illustrates the pervasive influence of the principle of number in our understanding of the relations between all things, sensible or ideal. Further, it demonstrates just how scientia is formed of numbers.95

Numbers themselves are not interconnected. This happens when the relations between them are described. They do not have relations, then, except as pairs. This pairing typifies the rational structure of the understanding. For instance, early experiments with musical intervals disclosed that certain numbers were of significance in the categorisation of concords. These numbers also seem significant in other connexions, such as the motions of the planets and the order of the seasons. When the principle of number itself was explored it seemed that its most general laws were also ways of coming to understand the order of the cosmos:

"Order and pattern ..., which the human spirit craves, are to be found not only in the form of conceptual rigor and neatly logical structure, but, at an earlier level, in the richness of mutual allusiveness and interconnection, where things fit together "symbolically". Thus the interrelation of number and music can be conceived earlier than any mathematically oriented natural science and quite apart from it, as an aspect of the universal orderliness of the cosmos."96

This interrelation is the essence of pythagoreanism and is to be found consistently throughout its history.

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95. cf. also the comments by Marrou (op.cit. p 259) and at BA Note complémentaire 19.

96. Burkert op.cit. p 399.
The ratio of number

The early experiments with concord led to the view that the first four integers, grouped into superparticular relations (2:1, 3:2, 4:3), described not only the basic nature of concord but also the fundamental order of things. Here pairs of numbers are exhibited in particular relations: the simple proportions of elementary harmony. Similarly Augustine describes the complexity of poetic metre in terms of these same relations between the first four integers. These numeric relations do not just make a concord, they are the concord. Similarly the relation between a long and short beat is one which depends upon the ontological connexion between long and short.

Order, pattern, structure are all concepts which are used to explain the nature of unity and completeness. The cosmos is an ordered whole as its parts fit together neatly and completely. Ratios of numbers are rational: they appeal to the ratio, the reason. Measure defines limits; to know the measure of something is to know the exact relations between its parts and its relations to other things. Augustine speaks of the "ratio of measurements and numbers"97 distinguishing between number in itself and as numbers reveal the dimensions of an object.

Measure, as a rational quality, itself depends on the rational structure of number. How are ratios themselves regulated?98 "Regulated" is used here in the sense that numbers need themselves to be limited by a ratio and to be "recalled" (revocare) to their own beginnings. Here the force of ratio is very apparent in the text. All pairs of numbers, ratios, seem to run on to infinity and whatever controls them must be a principle which measures even these infinite series, making them reasonable.

Augustine seeks a general principle which will comprehend the infinite series of ratios. They seem unlimited in extent. There always seems to be more. The important term here is seems. Aristotle distinguishes a potential infinite from the actual finitude of bounded magnitude.99 As unlimited the number series is potentially greater than any number to which one can count.100 This is the sense in which Augustine contrasts modus,

97. ... ratio dimensionum atque numerorum ... (DMI10.17; p 64; M138)

98. DMI11.18.

99. Physics 4, 204a5ff.

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mensura and infinitas, immoderatus. 101 He has yet to explain how numbers are limited in thought by their principles. At the moment ratios still appear unlimited. 102

In the Platonic tradition Augustine seeks a principle which will comprehend the series of ratios, and the natural numbers, and so provide for all the interconnexions between numbers. As with magnitude, he wants a principle which will literally hold the numbers together, and will be their measure. Such a principle demonstrates their ultimate completeness. This is an attempt to demonstrate the complete unity of scientia.

Augustine begins with the counting process. There are, in that process, articulations based on a return to one at ten, which order the number series. When people count, these articulations occur at proportional intervals (1:10:10:100:100:1000... ) as the numbers progress to infinity. 103 All is determined by the number ten. So that number must hide the ratio (i.e. reason and ratio) for these articulations. A modern explanation that these articulations depend on an arbitrary choice of a base ten system (any other would do as well) would not be good enough for Augustine, or any pythagorean. He invokes two numeric ideas, number as a collection of units and the principles of number (the "true and fixed laws" as he calls them 104), to develop an argument shewing how ten is the only true and absolute point of articulation for numbers.

First he makes an arithmetic point that all the articulations (points of recall) are determined as multiples of ten. So the pattern for counting units is to be found in the sequence of natural numbers between one and ten. 105

100. cf. Physics Γ6, 202a7: "A quantity is infinite if it is such that we can always take a part outside what has already been taken." (tr. R.P. Hardie. Oxford: Clarendon Press, 1930)

101. cf. DMI9.15.

102. cf. Physics Γ8, 208a20: "Time indeed and movement are infinite, and also thinking, in the sense that each part that is taken passes in succession out of existence." (ibid.)

103. DMI11.19.

104. ... leges certas fixasque ... (DMI11.19; p 68; M142)

105. usque ad decem progressus, et inde morsus ad unum reditus fiat.

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A principle is a foundation or beginning of something; its fundamental source. Likewise an end must be end of something. The next step in the argument relies on the interplay between principle as a generative rule (to produce a sequence) and its finite end (that which determines the thing as a whole). Between the beginning and end of something is its middle (medium) which joins the two. The interplay between the three parts of a whole makes a thing complete. At once it is determined, finite and measurable. Which is the first number that is whole in this way? It is, of course, three. As a collection of countable units the number clearly has a beginning, a middle and an end. Augustine explains this as he accounts for how three is odd. Its middle, the unit not at either end of the number, is an indivisible, single unit.

The image of number invoked is a spatial one which recalls the idea that each number is a collection or heap of units. The next whole number, four, is a heap of units where the middle consists of two units, the pair, which makes it even and divisible into equal parts. As Augustine argues, an even number is a collection of units such that when they are arranged in a row, the "middle" must always be a pair surrounded by equal numbers of units; an odd number similarly arranged will have only the single (and indivisible) unit in the middle.

The first two numbers are not wholes because they do not conform to this definition where whole is understood as beginning, middle and end. Again the spatial imagery is clear. One, being a single unit, is only a beginning, that is a principle of number. Two has no middle and consequently no end so it, too, must be a beginning or principle or number. The play on principium as meaning both beginning and principle is invoked when the first two "numbers" form the foundation for the classification of all determined numbers as either even or odd. The ideas of number as collection and their formation from principles (one and dyad) are fused in the argument.

(DMI12.20; p 68; M144)

106. DMI12.20.

107. Quare in ternario numero quamdam esse perfectionem vides, quia totus est: habet enim principium, medium et finem. (DMI12.20; p 70; M146)

108. DMI12.21.
The pair, two, is itself not an opposite of one because it is formed of two units, 'ones'. So the "second beginning" is made from the first. Numbers are to be understood as produced from one, the indivisible unit. As combination their principle is that of the first combination, two, the pair through which all numbers come to be. 109

So the arithmetic origin of three, as the sum of one and two, marks it as the first whole number. Its wholeness is perfect as it is the sum of its predecessors which are also its principles. This is not the case with any other number. So it is a great harmony (concordia) that the two principles of number produce at once the first whole number. 110 The unity of three is perfect (a 'true' unity) because the harmony of the numbers is so intimate. They are all next to one another in the number series. Three is a whole of parts, each an indivisible unit, and a product of its principles. Wholeness, as constituted of beginning, middle and end, is unity in the sense that its principles constitute its structure. 111 The description here plays on the dual role as numbers (countable units) and principles which one and two play in number theory.

The numbers one, two, three, succeed each other by one. Two, as the 'middle' between one and three is greater than one and less than three, in that, it bears one relation to one and another to two. So the sum of the possible relational descriptions of the first three numbers is the next number in the sequence, four. As the numbers one, two and three are

109. Bene faceret, si ex adverso sibi constituerentur duo principia: nunc autem hoc alterum principium de illo primo est, ut illud a nullo sit, hoc vero ab illo: unum enim et unum duo sunt, et principia ita sunt ambo, ut omnes numeri quidem ab uno sint; sed auta per complicationem atque adunctionem quaedam fluunt, origo autem complicationis et adunctionis duali numero recte tribuitur: fit ut illud primum principium a quo numeri omnes; hoc autem alterum per quod numeri omnes, esse inventantur. Nisi quid habes adversum ista quod disseras. (DM12.21; pp 72,74; M150)

110. Ergo haec duo principia numerorum sibi copulata, totum numerum factunt atque perfectum. ... Idem igitur numerus, ut fit ex uno et duobus, post utrumque in ordine sollocatur, ita ut nullus alius interponi queat. ... Magna haec ergo concordia est in prioribus tribus numeris: unum enim et duo et tria dicimus, quibus nihil interponi potest: unum autem et duo, ipsa sunt tria. (DM12.22; p 74, 76; M150, 152)

111. ... illud nullane consideratione dignum putas, quod ista concordia quanto est anctior atque coniunctione, tanto magis in unitatem quamdam tendit, et unum quiddam de pluribus efficit? (DM12.22; p 75; M152)

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related to one another, two plays a dual rôle in these relations. Augustine understands four as the sum of the possible descriptions of the numbers which precede it. Four units are arranged as the sum of one, two, and one. So it must follow three in the sequence.\textsuperscript{112} And it does in the series of natural numbers.

Again there are many close-knit harmonies to be discovered in this sequence one to four. The most significant of these is the idea of proportion which is another way of understanding the order of things, and by which they seem to form an intelligible whole.\textsuperscript{113} Firstly the sequence one, two, three has as extremes (beginning and end) the numbers one and three which sum to four. The middle number, two, when added to itself also makes four. As four falls in counting after three\textsuperscript{114} so it is constituted entirely of its parts such that an addition of the extremes is equal to twice the middle.\textsuperscript{115} Four is a whole and also the first proportion: the two principles are in similar proportion to two and four as the first whole even number.\textsuperscript{116}

The purpose of all this juggling with numbers is to shew how the sequence of numbers between one and four displays a uniquely complete set of progressions, sums and proportions of itself. Both the principles of number, odd and even, are found most eloquently in the oddness of three and the evenness of four. The generation of numbers from one and two

\textsuperscript{112} Nam cum unum, duo, tria dicimus, nonne quanto unum a duobus, tanto duo a tribus superantur? ... Dic iam nunc mihi, in ista collatione quoties unum nominaverim? -Semel. -Tria quoties? -Semel. -Quid, duo? -Bis.  
(DMI12.23, p 76, M154)

\textsuperscript{113} Recte igitur istos tres quaternarios numerus signitur; ei quippe tributur ista proportiones collatio. Quae quantum valeat, eo iam assueve cognoscere, quod illa unitas quam te amare dixisti, in rebus ordinatis haec efficit potest, cuius graecum nomen \textit{\delta\upsilon\alpha\mu\eta\gamma\iota\lambda\upsilon\epsilon} est, nostri quidam proportionem vocaverunt, ...  
(DMI12.23, p 76, M154)

\textsuperscript{114} Recalling Augustine's account of the generation of natural numbers.

\textsuperscript{115} Convenerat quippeinter nos superius, tum ex pluribus unum aliquid maxime fieri, cum extremis media, et medii cum extremis consentiant. ... ex uno et tribus quid conficiatur. -Quatuor. -...Quamobrem dic etiam duo bis quid conficiant. -Quatuor. -Ita ergo medium extremis, et medio extremis consentient.  
(DMI12.24, pp 78, 80, M158)

\textsuperscript{116} 2:1=4:2, Augustine does not mention this explicitly, but it may be inferred from "quae extremorum cum medio, et mediis cum extremis ... proportione consensio est."  
(DMI12.24, p 80; M158)
(archetypes of odd and even) as the “seeds” of number are most clearly seen in the way three and four are constituted from combinations of one and two.\textsuperscript{117}

Augustine concludes his argument. The problem was to account for ten as the first and only rational articulation which determines number, even as they proceed to infinity. The progression from one to four is clearly determined; the sum of that progression is ten. Ten is the first number to contain the whole sequence so it must be the first number which represents the unity of the sequence, the limit which determines all numbers.\textsuperscript{118}

Augustine does not argue that there is a finite number of numbers (the potential infinite is preserved), but that all numbers are finite and determined as they are formed within the articulations of ten. Any number may be named as the articulations are cyclic. In this case infinity is simply all those numbers as yet unnamed (or unmeasured). It is not indeterminate.

The determining sequence is defined by the two principles, one and two, odd and even. From the proportional relation between one and two, four emerges, \textit{elucesit et gignitur}.\textsuperscript{119} These are significant words. This imagery refers to a tradition that four represented life: a set of points when arranged as a triangular pyramid represented the three dimensions of space - length, breadth, depth.\textsuperscript{120} Four proceeds from its principles as the dawn or as birth presents life.\textsuperscript{121} These integers also contain all the fundamental musical ratios. These are used constantly in the metrical theory of books two to five.

\textsuperscript{117} DMI12.25 passim. The first natural numbers were used as “algebraic” expressions of number theory, including music theory. Ancient mathematics had no algebra: \textit{cf.} Marrou, \textit{op.cit.}, pp 262; McClain, \textit{Plato, op.cit.}, pp 7, 17. Klein, \textit{op.cit.} (p 63) illuminates the difference between ancient and modern uses of number and mathematical symbol, especially the relations between number and numbered thing.

\textsuperscript{118} Tune \textit{igitur} non \textit{vides}, ex uno et duobus, et tribus et quatuor quae summa conficitur? \textit{Videoiam, video, et minor omnia, et ortam quaestionem solutam esse confiteor: unum enim et duo et tria et quatuor simul decem sunt.} (DMI12.26; p 82; M160)

\textsuperscript{119} DMI12.25.

\textsuperscript{120} Nicomachus, \textit{Introduction} II.13.2 & 8.

\textsuperscript{121} \textit{cf.} \textit{Timaeus} 31C-32D; Ennead III.6.
The word for numbers, *numeri*, is used in many ways throughout the *De Musica*. It has been translated, or rather glossed as "rhythm", "numbers", and, as the philosophical reflexion of book six proceeds, it diffuses into a description of the structure of sensation in terms of "harmonies" where it might seem that the subject matter has little to do with numbers. None of these glosses manages to convey the resonances of number ontology, which form the framework for the whole treatise. I suspect that Augustine means just what he says, *numeri* are numbers wherever they appear. His ontology, where the 'weight' of number forms matter and thought, means that they are to be found at every level of the created order. I shall often leave the term untranslated to retain its allusive meaning.

Number ontology understands the nature of things by way of numerate structures: structures informed by the principle of number. All knowing is conceived in these terms, and in turn attributes to the structure of universal ideas themselves a general numeric form. To anticipate, in book six Augustine invokes a powerful image, the *carmen universitatis*, in one of the many passages dealing with the condition of the soul in the world. There the material and temporal world in which the soul lives is seen in *Timaean* terms as "the moving image of eternity".

Augustine considers that the soul, when properly oriented to the contemplation of the divine, will delight in that perfection. The patterned *ordo* is exhibited in the universe: the movement of the planets, the regularity of the seasons. They are part of the universal song because they can be understood in terms of *numeri*. Augustine proceeds in this passage to account for apparent disorder and confusion in the world as the soul's failure to apprehend the complexity of the order itself. The individual soul is, as it were, a syllable in a song, its life measured in the time taken to pronounce it. It is impossible for the syllable to comprehend the complex rhythmic structure (*numeri*) of the whole because it is a part of that whole. It is caught in the web of the *carmen universitatis*.

122. Catesby Taliaferro (FC4) consistently translates as "numbers"; Jackson Knight (*op.cit.*) generally uses "rhythm" which makes for some peculiar sentences; Marzi translates more carefully and often renders it as "numeri"; BA finally uses "harmonies" and other phrases depending on the context. (*cf.* BA Note complémentaire 76, "Sens complexe de *numeri*" p 513ff)

123. DMVIII.29.
The relations between parts and whole may further serve to illuminate the idea of number as ordering principle and archetype of knowledge (scientia). The insistent pythagorean character of Augustine’s argument as to how number is itself determined leads to an account of how it forms the structure of opposite pairs and holds them in one relation, thus affording the possibility that there might be something to understand even in the multiform world of space and time.

His argument, then, as to why ten is the only natural and rational articulation for the determination of natural numbers can only appear intelligible in its pythagorean context. His remarks as to how four appears as the completion of the sequence and the first example of proportion are to be read not as somewhat obscure arithmetic speculation, but as important ontologising about the determinate structure of all numeri. While these arguments appear as arithmetic speculation they are not theorems of arithmetic. At significant points they invoke ideas which fall outside arithmetic and are better thought to be speculations about arithmetic phenomena (meta-arithmetic, perhaps). The ancient concepts involved make this apparent excursion into number theory a significant part of his whole conception of order and rationality which needs to be noted by the modern reader. These arguments demonstrate just how far numerical thinking oriented one school of ancient ontology and epistemology.125

Augustine presents the reader with a kind of portmanteau word when he so easily slips, in book six, into talking of numeri as parts of the soul. There the use is intentional. Understanding itself, and the psychological processes for gathering and storing information, are formed in a rational, numeric way via the ratio. Numeri do not provide just for a conventional theoretical model. Numbers, as they appear immutable and unchanging, lead to the world beyond time. So the science of pure relations which is the characteristic of musica, offers a dynamic model of being. As the relations unfold (as the song is sung) many kinds of perspective may be taken. There are always alternative views as relations between parts themselves change (a view from within) and there is a view of the whole, which, being from without, is of that, not its dynamic parts.126

124. DMVIII.30.
126. Augustine remarks on the relations of parts to whole at De Ordine
Numbers, knowledge and music

Augustine concludes his first book by returning to the immediate subject of music and how it is to be understood. His final remarks are about how time is measured and comprehended. The delight that is taken in harmonious proportion depends upon the degree to which that proportion is comprehended. Durations of substantial length are measured by instruments which aid human comprehension by bringing the durations into focus. The measures used are numerical. Numbers provide a way of comprehending that which, because of the problems of scale, cannot be directly apprehended.

On the other hand, where these problems are absent, as in music and dance, it is possible to delight, even though the numerate structure is not known. Augustine recalls his earlier point that the apparatus of sensation is itself formed after the pattern of numbers. Rhythms themselves consist of discrete intervals of time woven into a pattern which can only be understood in numerical terms.

Knowledge (scientia) of that which affords pleasure consists in an apprehension of the measure, the ratios of the rhythmic structure. Augustine briefly reminds the reader of his account of scientia as an entirely rational subject. What delights is to be understood as bene modulandi. If the sense cannot comprehend the scale of an object then there will be no spontaneous delight, only that which comes from measuring the object itself - measurement which brings the object into scale.

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This final point brings into focus his vision of number as the archetype for \textit{scientia}, and thus that only the rational disciplines may be properly known and understood. This is the theme of book one. \textit{Musica}, as an intellectual discipline, to be understood in terms of its definition, is the subject of the book. The framework for the rest of the treatise is set. \textit{Musica} leaves only its "footprints" in the sense world. The epistemological task is to follow these to the "most secret" places where its true nature is to be found.\footnote{Qua
dobrem cum procedens quodammodo de secretissimis penetralibus musica, in nostris etiam sensibus, vel his rebus quae a nobis sentientur, vestigia quaedam posuerit; nonne oportet eadem vestigia prius sequi ut commodius ad ipsa si potuerimus, quae dixi penetralia, sine ullo errore ducamur? (DMI13.28; pp 84, 86; M164) cf. O'Connell, Art, op.cit., p 68.} This recalls an old pythagorean belief about true knowledge.\footnote{cf. Kirk and Raven, op. cit. pp 220,1.} It requires a special kind of attitude: a detachment from the distractions of space and time so that the being of things might be discerned. The model of undisturbed being is number. The principle of number pervades all the created order, so that its marks are to be found in the sensible world. With this image, he returns to the opening chapter's allusions to the pattern of \textit{numer}i as they may be discovered in the sensible universe. There his argument was directed to distinguishing the mathematical sciences from those which do not exhibit such transparent rationality. Here, the numeric quality of that rationality has been explored and the necessity for an epistemological journey inwards is more apparent. The double meaning of \textit{ratio} and its role in defining the content of \textit{scientia} make the path along which this journey is to be taken clearly that of numbers and their principles. Augustine concludes, then, with an invitation to examine measure and order as they are to be found in the rhythmic structure of song and dance.\footnote{DMI13.28}
Chapter Three  BOOKS TWO TO FIVE - The books on prosody

Book one demonstrates that musica is an entirely theoretic discipline. The next four books detail the numeric theory of prosody. Unlike Martianus Capella's *Harmonia*¹ Augustine includes no discussion of harmonics. He had, in his early life committed quantities of verse to heart and must have been familiar with the laws of prosody as he had worked as a rhetorician.² The laws of prosody are supposed to describe and govern the relations between syllables. These, as he has shown in book one, are numeric and are objects of scientia.

These books are arranged in a logical fashion to deal with prosody according to its various 'divisions'. First the rhythmic foot is analysed (book two) in terms of its syllabic structure; book three discusses the combination of feet in rhythm, then in metre, which is also the subject of book four, finally book five looks at the structure of verse. What is striking about this exposition is its attempt to deal with prosody in a logical, numeric way. Augustine's preoccupation is with prosody (rhythm, metre and verse) as it can be understood in terms of rational structure, completely transparent to the intellect. He shews no interest in defending or justifying the habits of poets if these do not accord with his theories. Whatever cannot be explained rationally is condemned.³

Yet his subject was common enough among grammarians. Harald Hagendahl⁴ has carefully documented all the textual correspondence between the text of the *De Musica* and various Latin grammarians and poets. Terentianus Maurus, who wrote several books on metre, provides many of Augustine's examples. Some of these derive from popular Latin poets such as Virgil or Horace, but are quoted alike by Augustine and Terentianus. All the verse examples are of pagan origin, or are composed extempore by Augustine himself.⁵ A favourite is the opening line of the *Aeneid*, used

1. Martianus Cappella *De nuptiis Philologiae et Mercurii* I. See pp 154-159.


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again and again to illustrate some technical point. Virgil, regarded as the model poet, is quoted frequently, as is Horace.

The sources for the prosodic sections, especially the definitions of metre, rhythm and verse, are various. On the subject of listening many grammarians had commented on its importance, notably Terentianus Maurus and Marius Victorinus. The definitions of metre, rhythm and verse were common property in Augustine's day. The discussion of verse, which also receives some attention in the De Ordine, mostly follows Marius Victorinus and, notably, Varro's Disciplinarum Libri.

Prosody was traditionally taught as a part of grammar. This is already clear from Augustine's opening chapter to book one and it is amplified in the first chapter of book two. This begins by noting that grammarians teach the difference between long and short syllables but as if it were an historical study, based on the poets and "ancient authority". He contrasts this with his own determination to discuss the scientia of music.

5. cf. DMIII2.22; note the lengthy discussion at DMV3.3.
6. first at DMII2.2 (p 98) but passim.
7. e.g. DMV6.12 but passim. See below p 101 on the significance of these verses.
8. Ter. Maurus De Litteris; M. Victorinus Ars Grammaticae. There are some Ciceronian passages cited at BA, note complementaire 33 (cf. notes 28, 31).
11. cf. BA notes complementaires 63, 73. See also Marrou, op. cit., p 268 n 3, for a list of modern studies of Augustine's sources. The various ancient definitions of rhythm are listed in Michaelides, op. cit., pp 291-293 (article 'rhythmos'); they are also reminiscent of Augustine's discussion of it as the motions of the measure of time.
12. above pp 37-40; Martianus Capella includes it in his book on harmony (De nuptiis IX).
13. ... As primum respondes, ut nun bene didiceris eam quam grammatici docent, syllabam brevi cum longa, brevi cum distanti; an vero sine ista nomis sive ignores, ralis ut ita quereamus, quasi omnia rudes harum rerum simus, ut ad omnia nos ratio potius perduxat, quam inveterata consuetudo, aut praesidicata sive auctoritas. (DMIII.1; p 94, M172)
This contrast is between the manner in which poetic habit and historical precedent confine and compel (cogat) the student rather than leading (perducat) to an understanding of the ratio of music, the rational and numeric measures of poetic utterance. Augustine's intentions are plain. He is not interested in prosody as grammar, but as a rational discipline. As he goes on to say in the second chapter, he is not interested in the authoritative reasons for metrical conversion, specifically the division of the syllable into short and long. He is interested in why the senses sometimes enjoy the short-long patterns, and sometimes not. That may be explained by exploring the numerical laws which govern the structure of poetry.

**The rational system**

These opening chapters of book two are indicative of the whole approach to prosody. The syllable combines into a foot, which combines into rhythm, which is limited as metre which is limited as verse. Numerical solutions are offered for all the ratios discussed. The principle of number (generally the 'quarternary rule') is invoked, as is the theory of relations (ratios), in order to explain how the structure is limited by reason (ratio) a double meaning which pervades the text. Scattered throughout, however, are less specific references to the difference between reason and authority, and that between sense and reason (expanded in book six).

It is not my purpose to detail the system of prosody which Augustine presents. My discussion, in this chapter, will be confined to those topics which intensify the arguments of book one and hint at an interpretation of book six. The pythagorean character of the treatise is never clearer than in these books. Augustine's system is presented in a manner reminiscent of

14. At vero musicae ratio, ad quam dimensio ipsa vocum rationabilis et numerositas pertinet, non curat nisi ut corripiatur vel producatur, syllaba, quae illo vel illo loco est secundum rationem mensurarum suaram. (DMIIL.1; p 96; M172)

15. DMIIL.2; Note reference to the discussion which opens his study in book one.

16. cf. DMIIL.1-2.

17. e.g. musicae ratio (DMIIL.1) see below p 87ff.
a mathematical treatise, detailing his argument with examples, and, where
that becomes trivial, presenting only the general principles. Often, the
student is able to continue a process himself according to the rules.

This is possible because the study is entirely numeric. The rules
themselves are not accidents of history but formed of the laws of number.
These laws are "implanted" in the mind and are common to all rational
beings. This universality is the guarantee of truth itself and is
contrasted with facts derived from historical authority or convention.
The student often disclaims any familiarity with the authoritative
tradition and is interested only in the system as it is derived from first
principles.

Some of Augustine's (rational) analysis is at variance with
traditional prosodic rules. In these cases he prefers his own because they
are (demonstrably) based on rational principles. The contrast is similar
to that drawn between scientia and other forms of mental activity in book
one. The rational system is transparent to the intellect and common to
all; systems based on tradition are not so well founded and are only
"opinion". This is a further example of the deeply held epistemological
principle that only those things which are immediate to the intellect can
be known. Sense-data are not immediately known because the senses
themselves interpose: the body stands between the mind and the world.
Further, things in the world are in a state of flux which makes them an
uncertain guide to what is. Truth must be independent of the soul, and
transcendent of individuals as it is the standard for judgement. Sense-
data, in themselves, do not offer the understanding anything more than
vestigia, marks or signs, which point to other, intellectual, ideas which
are the proper objects of the understanding.

18. e.g. the discussion of kinds of feet at DMII4.4-7.14 and summarised
(wITH examples) at DMII8.15.
19. e.g. DMIV7.8.
20. e.g. DMII5.8; cf. DMIV10.11.
21. DMIII2.3; cf. DMV10.20, 13.27.
22. cf. DMIII1.1, 2.2; III3.5.
23. e.g. DMV5.10.
24. Augustines's theory of signs is first developed in the De Magistro and

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This is what lies behind his distinction between belief and "seeing for oneself." To be "seen" are the patterns of numeri which constitute the structure of poetry, the "true and definite ratios" of its measure. These are the proper objects of the intellect. They are conveyed by words, objects of sense. Throughout the De Musica words are used as examples of rhythmic formulae. Augustine is careful to note that they are not those formulae, which are, rather, patterns of numeri.

Exactly which rhythmic formula is intended depends on the particular syllabic pattern displayed by some word. This information is entirely the province of historical usage (authority, precedent). But, as such, is is never certain (usage changes) and is therefore opinion or belief rather than, itself, scientia. Augustine distinguishes between the names for feet or particular metres and their numerical pattern. The former do not even form part of those activities constituting are but depend simply on historical precedent.

At work here is what counts as an explanation. He comments that many poets and grammarians are indifferent as to the quantity of the final

continued elsewhere, especially in the De Doctrina Christiana II-IV. The theory invests a special significance in words as they convey truth via the senses. See e.g. R.A. Markus "St. Augustine on signs" and B. Darrell Jackson "The theory of signs in St. Augustine's De Doctrina Christiana " in Markus' Augustine (Garden City: Anchor, 1972) pp 61-148, Clarence P. Walhout "On symbolic meanings: Augustine and Ricoeur" Renaissance 31/1(1979)115-127, and O'Connell, Art, op. cit., pp 69, 109; on words and knowledge see also Ch. II above, Gilson, op. cit., pp 14-18, Marrou, op. cit., pp 363-4 (on signs pp 247nl, 291f, 349), Bubacz, op. cit., Ch. 6.

25. DMIII.18.19
26. DMV.5.10
27. e.g. the discussion of canon at DMIII.1 and the names of metres at DMIV.16.30. cf. the footprints of DMIII.28.
28. Quare hic quidquid valet, auctoritas valet. (DMIII.1; p 96; M172)
29. e.g. DMII.8.15.
30. e.g. DMIV.16.30; cf. DMV.1; I17.14.
31. Cuius rei cognitio non arte, sed historia traditur; unde creditur potius quam cognoscitur. (DMIV.16.30; pp 274, 276; M392) Some metres are fixed by this precedent, not because they are so numerically but because that is how they are used - again, a received opinion.
syllable in a line of metre. But this must, *prima facie*, be incorrect. There is a rational explanation for why the ear is so indifferent, based on a theory of silences which complete the equalities of feet according to their ratios. This explanation involves only those principles transparent to the intellect.\(^{32}\) Again, the problem he recalls concerning the definition of verse is cleared up by examining its (rational) properties as verse is distinguished from metre. This has nothing to do with (historical) names or their (equally historical) definitions, but with the division of *ratio* itself.\(^{33}\)

Verse is "generated by ratio" as it is understood by the "reason".\(^{34}\) Authority simply confirms that such rational understanding has been an historical experience. Because the intellectual vision is clear, and because it is held in common, the mind is "conquered" by the explanation. Authority on the other hand, as it is often inexplicable, lacks a similar guarantee of truth and can often become "oppressive".\(^{35}\)

**Sense and Reason**

The very objectivity of rationality guarantees not only its truth, but also its sensual power. Poetry is attractive because it delights. It delights because the parts of verse are joined together in a manner that appeals to the mind and the senses. In book six Augustine explores the details of this phenomenon. In these books the singular fact that when a harmony is disturbed the rest "sounds" wrong is exploited again and again in order to stimulate discussions of the reasons why the disturbance is

\(^{32}\) DMIV1.1.

\(^{33}\) DMIII1.2-2.3, 9.20; VI.1-3.3. On this general point I think O'Connell overstates (at Art, op. cit., pp 69-70) DMIV16.31 in support of his assertion that as "authority bears upon intelligible matters, ..., its function is limited to the semi-occasionalistic operation of "admonishing" the soul to turn inward and upward to contemplate the eternal truth". There is no "admonishing" at all. It is possible simply to believe and get on with versification (this is what poets do). But if an explanation is required (to tell why verse is as it is and not otherwise) then some reasoning from the first principles is the only way. *cf.* DMII7.14.

\(^{34}\) DMII7.14

\(^{35}\) DMIII1.21; pp 138, 1409; M226, 228; *cf.* DMIII1.1.

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numerically incorrect.\(^{36}\)

Similarly the "judgement of sense" is used to generate a rational explanation for some initially puzzling, yet pleasing, effect. The most striking examples of this occur in the latter chapters of book three and all of book four - those sections of the treatise dealing with metre. The problem is to account for metrical forms which do not obviously display equality in their numeric structure, but appear to fall short. He considers an example which the student is unable to measure: it does not appear legitimate. Yet "by the ear's judgement" it works: it can be beaten out\(^{37}\) and it sounds "sweet".\(^{38}\) The master repeats a line, inviting his student to listen and be charmed by its "\textit{numerositate}".\(^{39}\)

The solution is to add, at the end of the line, a silent syllable which fits it to his theories of metre.\(^{40}\) These \textit{silences} are very important to the theory of metre and much of book four is devoted to their analysis. He adds that the listener feels these silences as the poetry is uttered.\(^{41}\) The principle behind this is clear: sensual response is formed in the same way as numbers themselves are formed and so is a guide to a well-formed rhythmic pattern:

"And so, when something is sung or pronounced which ... by a natural motion \textit{before} any consideration of numbers, charms the sense by a certain equality, it is already metre."\(^{42}\)

As the analysis proceeds in book four there are many references to this judgement of sense. Some examples run smoothly, some do not.\(^{43}\) The

\(^{36}\) DMII2.2

\(^{37}\) using the arsis-thesis method of DMII10.18f.

\(^{38}\) DMIII7.16

\(^{39}\) \textit{repeto, quae canitis subant ris, demulceoque ista numerositate sensum tuum; ...} (DMIII7.16; p 196; M296)

\(^{40}\) DMIII7.16; cf. DMIV9.10.

\(^{41}\) DMIII8.18

\(^{42}\) \textit{Itaque cum aliquid canitur sive pronuntiatur ... quod naturali motu ante considerationem numerorum sensum quodam aequabilitate demulceat, iam metrum est.} (DMIII8.19, p 200 - emphasis mine; M302)

\(^{43}\) e.g. DMIV2.3; cf. DMIV11.12.
metres may be detected both by sense and by rational thought.\textsuperscript{44} The ear rejects or accepts the examples presented, and in every case numerical explanations are provided.\textsuperscript{45} What is a wonder to the senses is explained by the reason,\textsuperscript{46} because the "duty" of sense is to stimulate reason.\textsuperscript{47} The ears detect naturally the dimensions of metre.\textsuperscript{48}

Elsewhere, too, similar sentiments are expressed. The true and fixed ratios are first detected naturally by the ear and then established rationally by considering their numerical structure.\textsuperscript{49} The pattern, which Augustine explicitly notes,\textsuperscript{50} is to tell if a line pleases or offends, and then to investigate its numerical structure. If it pleases there should be no reason (nulla ratio) for rejecting the formulation; analysis of the feet will reveal the patterns of numeri. The senses and reason should always agree as long as the lines are recited correctly and the hearing is not impaired.\textsuperscript{51}

The apparatus of this effect is fully explained in book six, but one hint is given: numbers are common objects of the intellect, common to all;\textsuperscript{52} they are the infallible archetype of truth; so if what is found delightful always has a harmonious structure, then the structure must be attuned in that way and not otherwise. Reason is the ultimate judge of what is harmonious structure because it has perceived the simple proportions which form harmonies. As the senses, too, are formed in the image of those patterns, they will in turn be delighted by congruent structures in the world.\textsuperscript{53} Such experiences are, indeed, prior to explicit,

\textsuperscript{44} DMIV1.11
\textsuperscript{45} DMIV1.1 (on the indifferent final syllable); 8.9; 11.13; 14.19, 21-23; 15.25; 16.30-32; 17.37 all contain such references.
\textsuperscript{46} Illud magis mirandum est, \textit{\ldots et ita ratio tollit admirationem.} (DMIV16.33; p 280; M398, 400)
\textsuperscript{47} DMIV16.34
\textsuperscript{48} DMIV3.4
\textsuperscript{49} DMV5.10; cf. DMI12.22-13.24; III1.1; VI.1; 13.28.
\textsuperscript{50} in the course of his analysis at DMI11.21.
\textsuperscript{51} DMIV17.37; cf. DMIV15.25.
\textsuperscript{52} DMI11.3; cf. DMI11.1; 11.21.

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intellectual understanding.

Rhythm and Number

The senses themselves are formed after rational patterns. The pleasure that verse induces may always be explained in numerical terms — terms which are therefore rational and intellectual. This attitude does not deny the immediacy of the sensual experience. Indeed Augustine often used that in order to begin an explanation. But in the De Musica Augustine is interested in what explains this pleasure.

In book two his explanations of why one kind of foot, the amphibrach (u-u) is to be rejected when combining feet exemplify the intellectual and numeric tone. He recites the rhythm and notes its unpleasant effect. Then he follows with an argument demonstrating that the amphibrach does not conform to that rational principle which all other feet exhibit in combination: equality. It is unequal according to the laws of number as it divides only into the ratios 1:3 or 3:1 which are neither equal nor superparticular. All other feet conform to these kinds of ratios.55

The rational principles invoked are the laws of number discussed in book one: the kinds of ratio and the limiting principle of the number four. Augustine’s discussion of the kinds of feet there are is, for example, formulated in terms of their numerical structure, beginning with the simplest possible combination, two short syllables (uu) and extending to the largest (limited by the “quaternary rule”), four long syllables (----). The names of these feet are simply conventional, they could be listed by

53. cf. O’Connell, Art, op. cit., pp 68-9. While I do not disagree with his point, “rationality can penetrate the judgement of sense”, I find this analysis unclear. As I have said elsewhere, the ratios are what is harmonious: that is how harmony is defined. It is also found to be delightful. But to know why some complex rhythm is delightful (and not that it is so) then analysis should reveal its complex structure. Augustine is writing a treatise on prosody. His purpose is to explain why metres, verses and rhythms are harmonious. Hence his insistence on rational explanation — the combination of analysis and synthesis.

54. DMII13.25. Note especially “Non autem idem fiet in amphibrachico, ubi sunt imparia medio latera, siquidem in illis singula, in illo duo tempora sunt.” (p 148, M240)

55. cf. DMII10.17 & 19.
number, or kind of ratio. This arrangement is displayed in the following table.56

<table>
<thead>
<tr>
<th>Kind of Proportion</th>
<th>Numerical ratio</th>
<th>Arsis/thesis times (u=1)</th>
<th>Syllabic structure</th>
<th>Name of foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1</td>
<td>uu</td>
<td>Pyrrhic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/2</td>
<td>uu</td>
<td>Spondee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/2</td>
<td>uu-</td>
<td>Dactyl</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/2</td>
<td>uu-</td>
<td>Anapest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/2</td>
<td>uuuu</td>
<td>Proceleumatic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>-uu-</td>
<td>Choriamb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>u-u-</td>
<td>Diamb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>u--u</td>
<td>Anapest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4/4</td>
<td>---</td>
<td>Disposee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:2</td>
<td>uu</td>
<td>Iamb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:1</td>
<td>uu</td>
<td>Trochee (Chorius)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(complicate)</td>
<td>2/4</td>
<td>Molossus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4/2</td>
<td>uu--</td>
<td>Ionic a minore</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>---uu</td>
<td>Ionic a maiore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:2</td>
<td>uu</td>
<td>Bacchius</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(sesquialter)</td>
<td>3/2</td>
<td>Cretic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2/3</td>
<td>Palimbacchius</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2/3</td>
<td>First Paeon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:2</td>
<td>uu</td>
<td>Second Paeon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(sesquialter)</td>
<td>3/2</td>
<td>Third Paeon</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2/3</td>
<td>Fourth Paeon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:3</td>
<td>uu</td>
<td>First Epitrite</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(sesquati)</td>
<td>3/4</td>
<td>Second Epitrite</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(sesquitertion)</td>
<td>4/3</td>
<td>Third Epitrite</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>---uu</td>
<td>Fourth Epitrite</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

56. based on DMII8.15 and 10.18. See Jackson-Knight, op. cit., pp 24, 26. This arrangement is developed at DMII6.9-13.
This table illustrates the manner in which scansion issues in a logical way from the number ratios. It also explains why the amphibrach is classified as "illegitimate". Its rhythmic structure \((u-u)\) does not conform to the principles of number ratio with which Augustine constructs his system. The two types of ratio which he admits are equal or superparticular which describe every other kind of foot. Equal ratios are, of course, perfectly balanced. Superparticular ratios are "close to equality" as they reflect the way each number issues from that preceding it as described in book one.\(^57\) Either ratio, 3:1 or 1:3, does not conform to these principles.\(^58\)

When feet are combined a rhythm results. It is at this point that the principle of equality is most evident. Only feet with equivalent arsis/thesis \(\textit{ictus}\) patterns may be combined.\(^59\) Augustine's discussion here involves an analysis of these ictus patterns during which it emerges that some are more primitive (prior) and play a greater role in defining rhythmic structure.\(^60\) Again, this follows from numeric principles.

The "quarternary rule" (that four limits the possible progressions to infinity), which was explained in book one, is invoked several times to discover a limit to prosodic structure. There are no feet with more than four syllables.\(^61\) Metre, which is limited rhythm, is characterised by a quarternary restriction and may contain a maximum of eight feet.\(^62\)

The language all the time recalls that of mathematics. Syllables progress to their maximum, metre progresses to its own limit.\(^63\) When it becomes difficult to decide just what kind of foot defines a rhythm, the difficulty is called an "infinity" which clouds the judgement - as rhythm

\(^{57}\) DMI12.20-25

\(^{58}\) cf. DMI10.19; also 5.7: "Nunc ergo dic qua numerorum regula isti quoque dividantur pedes, eorumque sibi partes conferantur." (p 110; Ml92.)

\(^{59}\) cf. the lists at DMI14.26 and III4.10; also the remarks at IV17.35.

\(^{60}\) DMI13.6-4.9

\(^{61}\) DMI4.5; cf. DMI5.11-6.14.

\(^{62}\) Argued at DMI9.20-21.

\(^{63}\) ibid.

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itself is indeterminate. The terms 'rhythm' and 'metre' are associated respectively with 'numenus' and 'mensio' or 'mensura'. The former is defined simply as the rolling over and over of feet, unmeasured and without end. The latter has a fixed number of feet determined by the 'quarternary rule'.

Augustine expresses wonder at the variety of metres, all of which exhibit on analysis the principle of equality. These feet all give pleasure because of their felicitous combinations. So these numerical patterns, which explain the rational structure of prosody, also admit an enormous variety of metrical patterns. Part of book three and all of book four are devoted to a detailed numerical analysis of these patterns and Augustine closes with a comment on their diversity, all of which can be shewn to have an equality of ictus pattern.

Reason and Ratio

The text is full of references to numerical structure. I have argued that such structure is the archetype of rationality. The word used for reason is also that used for ratio: ratio. There are passages in the text which exploit this double meaning to its fullest extent. It has been noted that the opening chapters of book two play on it. In order to explain the relations between syllables it is necessary to discuss the kinds or ratios they create. As the discussion of feet proceeds the word is used to mean 'ratio', 'reason' (opposed to authority) and there are places where

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64. ... nume vero et ipsum infinitum nobis conturbat iudicium, et si quando numerati quidem pedes, sed pari numero nobis proponuntur, sicut isti sunt decem. (DMIIII3.6; p 172; M264, 266) Note, too that it is associated with an even number.

65. DMIIII.2

66. DMIIII3.24

67. DMIV17.35; cf. DMIV17.37.

68. DMIII.1-4.4; esp. "Sed quousque pedem progregi ratio sinat, diligentem adventendum, est. Quamobrem iam dic etiam, brevis et longa syllaba qua ebi ratione conferamur?" (p 104, M182)


70. DMIIII5.8; 7.14; 11.21.
either meaning is possible.71

Ratio concerns a relation of group to group, each being the time measure of some syllable or syllables.72 A foot is defined as a collection of such measured groups.73 Every foot must have two parts which join in a ratio.74 There parts are later identified as the rhythmic pattern which is discussed in books three, four and five. Each ratio is a rhythmic unit, divided into arsis (levatio) and thesis (positio), which may be beaten out in order to make the rhythm clear.75

Rhythms, and especially metre, are made up of patterns of feet arranged so that the ictus is constant throughout, preserving the principle of equality.76 They balance one another so that the rhythmic beating of times remains constant.77 Within that equality of times, however, a considerable variety of foot substitution is possible. There is a preoccupation, then, not with particular feet arrangements but with the principles of such arrangement: the preservation of symmetrical ictus pattern together with a constant variety of feet of similar ictus. This is the ratio of metre. The double meaning is exploited throughout books three and four.78

71. DMII8.15 (... de versus tota ratione tractabimus. p 124; M208) 11.21 (... nulla erit ratio huius ... p 138; M226) 12.22 (... et videor mihi rationem ipsum videre: ... p 142; M230)

72. Cum ergo inter se syllabae conferuntur, motus quidam inter se conferuntur, in quibus possint numeri quidam temporis manura diuturnitatis inquiri. (DMIII3. p 100; M178) ... nam una brevis syllaba ad unam brevem syllabam quaero quam rationem tibi habere videat, vel hi motus inter se quid vocentur. (DMIII4.4, p 102; M180)

73. DMIII4.4
74. DMIII5.6
75. Sed hoc nobis considerantibus, opus est haec duo nomina mandare memoriae, levationem et positionem. In plaudendo enim quid levatur et ponitur manus, partem pedis sibi levatius vindicat, partem positio. Partes autem pedum dico illas ... (DMIII10.18; p 132, 134; M220)

76. DMIII13.24
77. cf. the list at DMIII4.26.
78. e.g. Sed cum pro longis breves duplicatur, etiam ad septimum atque octavam, ut iam ostendit ratio, syllabam pervenitur: ... (DMIII6.14; p 192; M290) Note also the use at DMIII1.2; 2.3; 4; 3.6; 4.7; 8; 10; 5.12; 13; 7.16; 9.20; 21; IV1.1; 2.2; 8.9; 9.10; 10.11; 11.13; 15.29,
In book four Augustine remarks three times that *ratio* teaches (docere) the possible arrangements of feet in metre. And there, to preserve his theory of equality of times, he introduces the theory of silences. Equality is the measure of inequality. Silences allow for a complex combination of diverse feet and metres while preserving the regular flow of ictus.

Perhaps the most interesting use of this double meaning is to be found in the opening chapter of book five. That begins the discussion of verse with its definition. Some metrical patterns exhibit a division into two parts which gives the line itself a ratio. These lines of poetry are called verse. The ratio they display gives them a fixed syllabic structure which in many cases means that the order of words, once set, cannot be changed. Reason, he notes, will make this clear as the discussion of ratios proceeds. Further, the phenomenon itself may be discovered rationally, not simply accepted on authority.

Verse, indeed, reflects a "perfect" arrangement of ratios. Feet themselves are structured according to simple ratios which are, in that, pleasing to the senses. (Similarly, the simple proportions which describe harmonies are pleasing.) So verse, as it were metre balanced into two concordant parts, similarly pleases through a symmetrical pattern. As the

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79. (DMIV12.14; p 250; M358) (DMIV16.30; p 276; M392) *Doceet sane ratio* ... (DMIV16.31; p 276; M394)

80. cf. *Sed quae est ratio est redeundi ad primum, eadem est ad aliam talem copulationem transeundi.* (DMIV17.36; p 284; M404)

81. *Nam inventa res est, et ad notitiam posterorum mandata litterie, gravi atque certa non tantum auctoritate, verum etiam ratione firmata est.* ...

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82. *Ut ergo in duas partes concinetes dividi pedem et eo ipso aurem...*
discussion turns to the details of verse structure, the double meaning of ratio is often exploited.83

In book five Augustine achieves a considerable synthesis of ideas. Not only are the musical ratios to be found between the parts of a foot, but also in a line of verse itself. The measure of the two parts of a line will exhibit the precise numerical ratio through which the student may come to understand the reason for sensual delight. The archetypal poetry of Virgil and Horace may be measured. So Augustine offers his explanation for its remarkable aesthetic effect which depends not only on its meaning, but also its prosodic structure. These ratios are themselves simple numerical relations which exhibit the principles of number.84

The pursuit of equality and simple numeric patterns is again engaged throughout the second half of book five.85 The arguments which demonstrate a correspondence between the parts of verse all depend on equating patterns of half-feet (either arsis or thesis): that is, noting the regularity of the rhythmic structure. Many combinations are rejected as verse because no equalities may be found.86 Others are accepted as their rhythmic pattern is shewn to be thoroughly integrated.87

The two most admired verse forms, the heroic hexameter and the senarius, are the focus for Augustine’s concluding remarks on prosody. These verses display the considerable variety of rhythmic pattern which may be deployed within their regular beat.88 Significantly the explanation

delectare comperimus; si etiam metrum tale inveniamus, nonne caeteris non talibus iure anteponetur? -Assentior. (DMV2.2; p 298; M416)

83. DMV3.3, 4; 4.5, 7; 5.10; 6.12; 7.13, 14; 9.19; 10.21; 11.23; 12.26; 13.27. Note especially Paciam, imo factet ipse ratio, quae mihi tibiique communis est. (DMV10.20; p 332; M460) which cleverly puns on the content of common rationality.

84. Martianus Capella’s distinction between rhythmus and numerus is further evidence for this distinction between the rhythm of verse and the materia numerorum which form that rhythm. Augustine’s concentration on numeri reflects his preoccupation with these intellectual objects.

85. DMV7.13-13.28

86. e.g. DMV9.17

87. e.g. DMV9.18-19

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offered for the equality of verse structure is again evidence for the pythagorean character of the whole treatise. 89

The explanation is geometric. After rehearsing the ancient method of squaring by counters, he identifies the half-feet used to measure verse with the counters. 90 Then he divides heroic verse into its parts: seven and five half-feet respectively. The seven half feet divide into four and three half feet. Squaring each in turn the classic pythagorean equation emerges: $3^2 + 4^2 = 5^2$. The excellence of the heroic hexameter and the senarius is that they are constructed in this classic proportion, 3:4:5. 91 The ratio which both master and student follow has produced an explanation which demonstrates the rational order of the measure of verse in numerical terms. 92

The Significance of Ratio

In the *Contra Academicos*, that part of the soul which controls "all the other parts" is called the mens or ratio. 93 It is the supreme regulatory activity of the soul because the happy life (which all desire) is equated with the pursuit of truth, that is, living according to ratio. 94 Here the term ratio is used in a more general sense than in the *De Musica*. But certain attitudes are clear: the happy life is an intellectual life; human activity is understood in terms of cognitive processes directed towards the goal of truth, which is the content of scientia.

88. DMV10.21-22. Note Qui quanquam admittantur ad senarium modum, dignitati tamen et temperationi homin qui brevisque variantur, et ob hoc multo minus converti possunt, cedant necesse est. (p 336; M464)

89. His source may be Varro's *Disciplinarum* noted in BA note complémentaire 73, p 510f.

90. DMV12.25.


92. cf. Non te ergo fefellit polllicitatio mea, vel potius ipsa nos, quam uteque nostrum sequitur ratio. (DMV13.27; p 346; M478)

93. *Contra Academicos* 12.5

94. *ibid.* and 4.2

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Truth is then identified with wisdom (sapientia) which is the "knowledge of things human and divine." These things are in turn explained as God (divine things) and the human virtues. Ratio is central to this turning to wisdom as it is that process of the soul which directs and regulates the task:

[scientia] n’est pas nécessairement une possession totale, mais une compréhension lentement acquise de la vérité. La vie selon la ratio est la recherche de la vérité des choses humaines et divines, l’activité qui cherche et aboutit finalement à la sapientia, possession totale de la science des choses humaines et divines. La ratio, en tant qu’activité animée par un mouvement intérieur, fera place à l’intellectus, en tant que contemplation quiète de Dieu, et d’emblée l’âme possèdera la vie heureuse."

A more specific account of ratio can be found in book two of the De Ordine. There he offers two interrelated definitions, both in terms of mental activity:

"Reason is a movement of the mind, a capacity for distinguishing and connecting those things which are learnt."  

"Holding this order, therefore, the soul, now given over to philosophy, first looks into itself, and since that teaching has persuaded it that reason is either its own or its very self, and that either in reason there is nothing better or more powerful than numbers or reason is nothing other than numbers it will speak thus with itself: I, by a certain interior and hidden

95. ibid. 6.16
96. ibid. 7.20
97. L.J. van der Linden "Ratio et intellectus dans les premiers écrits de saint Augustin" Augustiniana 7(1957) 16. I am indebted to this article for some of these details of Augustine’s early use of ratio. In book six his preoccupation with the virtues and the ordo of the soul are consequent upon this attitude to the intellectual life. Intellectual processes as "mouvement intérieur" recalls the definition of music itself as movement. Nash (op.cit., p 64-65) also briefly discusses the meaning of ratio.

98. De Ordine III.30: "Ratio est mentis motio ea quae discuntur, distinguendi et conudiantes potens, ..." af.

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movement of mine, can separate or connect those things which are to be learnt, and this force is called my reason.\textsuperscript{99}

The identification of the \textit{ratio} with numbers is, in the light of its use in the first five books of the \textit{De Musica}, hardly surprising. Cognitive activity is associated with that archetypal form of rational thinking, the principles of number. This association preserves the dynamic character of rational thinking, and the relation between analysis (\textit{distinguere, discernere} - the exposition of parts) and synthesis (\textit{conecti, conectere} - the unity of parts in a whole) which is the essence of the dynamic, multidimensional character of thinking. To explain how rhythm works it is necessary to exhibit the various number-relations in which it consists. The final arrangement displays both the unity of structure and its variety of parts.

Analysis and synthesis, the two characteristics of \textit{ratio}, are two sides of the same process. As Augustine goes on to say at \textit{De Ordine} III18.48, that to synthesize is to look for an integrated unit, to analyze is to disintegrate the unit into its parts. The examples he uses of a population or an army, where the collective term unifies a number of distinct elements, recalls Plotinus' discussion of the 'one and many' problem in his tractate "On number."\textsuperscript{100} There, the principle by which analysis and synthesis takes place is the principle which orders the procession of ideas themselves - the principle of Number. This is also the principle whereby the soul can return to its own unity as it attends to the unity of all things in Being. So in \textit{ratio} there is "nothing more dominant than numbers" as they display both the parts of a line of verse and the integration of those parts into a whole.

The double meaning of \textit{ratio}, as it is used in these books of the \textit{De Musica}, seems to be quite intentional. \textit{Ratio} is a way of understanding

\textsuperscript{99} ibid. 18.48: \textit{Hunc igitur ordinem tenens anima iam philosophiae tradita primo se ipeam inipsiat et, cum iam illa eruditio peneuaest aut suam aut se ipeam esse rationem, in ratione autem aut nihil esse melius et potentius numeris aut nihil alius quam numerum esse rationem, ita seuun loquetur: ego quodam meo motu interiore et occulto eu, quae discedenda sunt, posseum discernere vel conectere et haec vis mea ratio vocatur.} (Tr. after Robert P. Russell FCI, p 324) cf. O'Connell, \textit{Early Theory}, op. cit., p 123ff.

\textsuperscript{100} Ennead VI6.13-14. Above pp 22-27
things both in themselves and as they fit into their environment. In the
_Soliloquia_ Augustine expands on this theme with an analogy between vision
and the source of light - the sun - and _ratio_ and the source of rationality
- God. _Ratio_ is the way the soul must look in order to see the truth, to
apprehend the true objects of knowledge.\textsuperscript{101} The moral life is a way of
purifying the soul of its disordered vision in order to gain the harmony of
understanding.

This theme is repeated in the _De Quantitate Anima_ where Augustine
distinguishes between _ratio_ and _ratiocinatio_. This latter term is used to
distinguish the state of rationality, a feature of its humanity, from the
activity of reasoning.\textsuperscript{102} That involves an act of seeing (_aspectus_) which
unifies the soul with its proper objects, the body of _scientia_.\textsuperscript{103} The
Plotinian cast of this description is clear. The soul’s vision is of
intelligibles in Nous which are related one to another according to the
principle of number.\textsuperscript{104} To the individual soul, the phenomenon of number
and its interrelations is the archetype of rational thought.\textsuperscript{105}

In the _De Immortalitate Anima_, _ratio_ is again used in a more general
sense. There is an explicit identification of _musica_ with a knowledge of
its numeric structure. That structure is the "truth" of _musica_ in the
sense that it is that which the soul can understand about _musica_. _Ratio_ is
a vision (_aspectus_), independent of sensible things, concentrated in a
contemplation of truth itself, which is objective and independent of the
mind as are numbers themselves.\textsuperscript{106}

The double meaning of _ratio_ which Augustine exploits in these books on
prosody is clearly an intentional manipulation of the general sense in
which _ratio_ is the soul’s capacity to analyze and to contemplate the unity
\textsuperscript{101} _Soliloquia_ 16.12-13. cf. van der Linden, _op. cit._, pp 22-25.
\textsuperscript{102} _De Quantitate Anima_ 28.53; van der Linden, _ibid._, p 26, esp. n 59;
_De Ordine_ III.31.
\textsuperscript{103} _De Quantitate Anima_ 28.53.
\textsuperscript{104} cf. O’Connell, _Early Theory_, _op. cit._, p 130f.
\textsuperscript{105} cf. _De Libero Arbitrio_ 118.20; O’Connell, _Early Theory_, _op. cit._,
pp 54-56.
\textsuperscript{106} _De Immortalitate Anima_ 4.5; cf. 6.10; van der Linden, _op. cit._, p
30, O’Connell, _Early Theory_, _op. cit._, p 139.

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of such analysis, together with that particular mathematical sense in which a ratio is a relation between two numbers which exhibit certain properties one to another. The cast of his rationality is numerical and its qualities are similarly numeric.

But, as Professor O'Connell points out, there is inserted into these books that other theme associated with ratio which is evident throughout the treatise. The various verse examples Augustine uses to illustrate his discourse are all infused with a moral tone which distinguishes between a soul toiling in the world with sensibles, and the inner vision of God which can only be discovered through a rigid application of ratio itself. This relates the study of ratios to the functioning of reason itself as it leads to the happy life, the life tuned to the patterns of the divine.

The laws of ratio are fundamental to the understanding. They guide it as it attempts to explain what it is that gives pleasure, which first prompts the inquiry into prosody. The double meaning of ratio, especially its association with numeri, runs deeply through Augustine's understanding of order. Those things which preserve order, which hold all together in one universe, which unify the ideas themselves, are the relations between all things. The model for those relations is numeric and, as it is described in book six, this model is fundamental to the dynamic structure of the human soul itself.


108. *e.g.* the verses at DMIII2.22 and the series at DMIV3.4-6.7.

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Chapter four  BOOK SIX - Feeling and Thinking

The double meaning of *ratio* is still evident in book six, but, as the word is less frequently used, it does not have the same pervasive effect as it has in the books on prosody. But the power of *ratio*, as the fundamental and most characteristic activity of the human soul, provides a core about which all other psychological activity takes place. For Augustine, *ratio* is at the centre of his thinking in this book, just as it should be at the centre of human life, guiding and informing it:

"come and consider now the force and power of reason, as far as we can consider it from its works. To speak especially of what pertains to the purpose of this work, reason itself first considered what good modulation [*bona modulatio*] is, and discerned it as consisting in a certain free movement, adapted to the end of its own beauty. Next, it saw in the motions of bodies one thing which would vary with the shortness and extension of time, inasmuch as it might be more or less prolonged, and another thing [which would vary] with the beating out of particular spaces in degrees of quickness and slowness. After making this distinction [it saw] that what consisted in a delay in time could, with measured intervals accommodated to human sense, bring about different rhythms, and it followed up their different kinds and order as far as the measures of verses. Finally, it considered how the soul (whose head reason itself was) should respond to the regulation, production, feeling and retention of these; it separated all these soul-rhythms from physical ones; and it realised that it itself could neither observe all these things, nor distinguish them, nor number them correctly, without certain rhythms of its own; and it placed these above the others of the lower order, according to its judicial decision."¹

This passage divides book six. Before it is a description of the psychological apparatus of sensation in terms of the relations between *numeri;*² after it comes a description of cognitive processes within the soul in terms of *ratio* and its objects.³ It sums up everything in the

¹. DMVI10.25; p 416 - my trans.
². DMVI2.2 - 9.24.
³. Augustin De Musica
treatise preceding it in terms of the activity of ratio, reasoning, seeing, considering and producing the numbers which form the principal elements of its structure. Numeri, themselves, are the patterns out of which the soul constructs its thoughts and which it compares with other patterns already in the soul. The double meaning of ratio intimately connects it to the term numeri, making that a device out of which Augustine constructs his theory of sensation, and, more tentatively, through which the soul comprehends the "movement" of space and time.

Numeri first appear in the De Musica as the proper objects of the science musica. As it examines the "movements of bodies" reason discovered number as the measure of these movements.4 Verse (a sensible, corporeal movement) is also constructed of numbers as it issues in a logical way from the principles of number.5 Turning inward to investigate the way in which the soul itself comprehends these ratios, numeri again are used as an explanatory device to identify and co-ordinate various processes collectively known as sensation. Identifying all these processes with patterns of numeri is partly prompted by imagery derived from musica itself. A soul with ratio invokes its own patterns of numeri which, as they inform the understanding, form its special ability to evaluate its other faculties both at a cognitive and a pre-cognitive level. By a journey inward from the sensibles to the seat of rationality, Augustine explains understanding in terms of those things by which the soul understands.

This is one of the central theses of book six. Its pythagorean character is unmistakable. At an important point the image of carmen universtitatis is introduced. While this is not a central image, I hope to shew that in combination with other images it becomes an important key to understanding the complexity of the numerical imagery which pervades the text. Further, the patterns to which Augustine alludes when using the term numeri are, at one level of interpretation, numerical ratios used in the construction of verse, and, perhaps, the melodies of the hymns he heard in Milan. These are, in detail, small fragments of rhythm (feet or, perhaps, half feet) combined with tiny fragments of melody.6 To make

3. DMVII0.25 - 17.58.


5. The prosodic books.

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musical sense, these fragments need to be combined in various ways. This is how music was composed and performed. On this model, numeri, which inhabit the soul, combine into patterns which reflect the structure of the space-time world (on the one hand) and (on the other) patterns of the ideas themselves as they are apprehended in God. It is this kind of image which I take to be implied by the notion, carmen universitatis.

None of this is explicit in the text. It is a reading of it based on various hints the text provides, and my general view that the whole treatise is pythagorean in character. Augustine does argue that the soul delights when it experiences a harmony between its expectations of numerical equality and a perfection of numerical arrangement which constitutes good verse. Such correspondence is the necessary and sufficient condition for the enjoyment of rhythm; enjoyment consists in just that. Further, he argues that the material universe as a whole is held together by the principles of number: the elements themselves exhibit unity and ordered (musical) diversity, and their spatial or temporal dimension are meaningless without numbers to define them.

So numeri are central to the construction of the soul because they are central to both the structure of ideas and the structure of the world. On this theory, ontology and epistemology merge. The world is constructed in the same way as it is conceived. It exhibits those formal relations which are at the heart of rationality itself. As ratio is the soul’s most characteristic feature, so it is ratio which holds all things together. While Augustine’s principal task is to explain the psychology of sensation, at times he strays into ontology in a perfectly natural way. In the tradition of much ancient thought, the macrocosm reflects the microcosm of the soul, and vice versa.

Understanding book six is not without its problems. This introduction is intended to provide a background to these difficulties and to suggest, perhaps, some tentative solutions. The text itself deals with the problem of the relation of soul to body. Another problem is the meaning and use of numeri as an explanatory device. A third problem in the text is underlined

6. see p 48.


8. DMVI17.56 - 58.
by the presence of two explanations (pre-cognitive then cognitive) of sensation and perception. Augustine, of course, had none of our modern psychological terminology with which to distinguish conscious from unconscious thought. Yet it seems that there is some attempt to distinguish between sensation as a pre-cognitive process which produces feelings, on the one hand, and on the other, a cognitive perception which involves the rational judgement and explicit, conscious, mental evaluation of the contents of memoria in order that the soul can decide in just what way it ought to behave, or what attitude it should take to the sensations it thinks it has.

Augustine is most concerned with his reader's spiritual life. As I have remarked before, the whole treatise is designed to demonstrate the significance of musica as it leads the soul to God. Unlike the other disciplines, musica is both a science and a practice which engenders feelings. At times Augustine's moral tone with respect to these (aesthetic) sensibilities is so intense that it appears as if nothing but contemplation of the divine matters; anything else is a distraction and a corruption which the soul must slough off in the face of God. I shall attempt to argue that this view of Augustine's aesthetic (that such things are, in fine, distracting and therefore corrupt and corrupting) is an extreme one which makes only one aspect of his own ambivalent attitude explicit, as several passages from the Confessiones might suggest. I do not wish to oppose, for instance, Professor O'Connell's opinions about the value of Augustine's aesthetic or his general interpretation of this book of the De Musica. However, I am inclined to take a more sympathetic attitude to Augustine's problem, and to claim for him more positive attitudes towards the universe and its, at times, marvellous works.

One of the strengths of book six is the arrangement of its subject matter. Topics dealing with psychology appear in a neat sequence. This is interspersed with remarks and digressions of a moral kind which lead to a more extended treatment of moral questions near the conclusion. It falls into two neat halves, one discussing pre-conitive sensation, then

9. and it is dangerous to allow oneself the luxury of these terms when trying to understand the text.
10. see below p 149f.
11. Art, passim, especially ch. 4.
following, the cognitive features of perception and moral judgement. Each of these falls again into two parts. The first begins with an introductory exploration of the problem of sensation\textsuperscript{12} before realising that the whole question of the relation between body and soul must be sketched before any serious work can be done.\textsuperscript{13} Then it concludes with a detailed exposition of the psychological apparatus which generates feelings and responses.\textsuperscript{14} The second half opens with a section dealing with cognitive responses to these reactions, and especially with the contents of \textit{memoria} as these are central to rational thought.\textsuperscript{15} This discussion leads naturally to some detailed remarks on the classical virtues and their part in the decision-making apparatus just described. These, and a general summary, conclude the treatise.\textsuperscript{16}

This plan facilitates the conflation of epistemological and ontological issues. It is dangerous to weave together so many different problems (soul-body, memory, sensation, perception, rational judgement, moral order, and so on) and sometimes confusing to a modern reader used to more disciplined discussion. Instead of following Augustine's plan, then, I shall discuss this book topic by topic. I have already indicated that the idea of \textit{ratio} is central to understanding Augustine's position and this theme will turn up constantly below. So, too, will its related term, \textit{numeri}, for in this book these are the units out of which the individual creates its world. An immediate problem, then, is in just what way the soul is located in the space-time universe and how does it make sense of that world? Clearly souls find themselves in bodies and it is through them that they deal with the extension of matter in time and space. The soul-body problem is, however, not only a psychological-ontological one, but is itself part of the general problem of how matter is related to form, or (more contentiously) how the universe is related to its creator God.

\textsuperscript{12} DMVI2.2 - 4.7.
\textsuperscript{13} DMVI5.8 - 15.
\textsuperscript{14} DMVI6.16 - 9.24.
\textsuperscript{15} DMVI10.25 - 12.36.
\textsuperscript{16} DMVI13.37 - 17.58.
Augustine begins and ends the dialogue in this book with a line of verse. His choice is pregnant with ontological associations: *Deus creator omnium*. It becomes clear, as book six unfolds, that as God creates the world, the order of *numeri* is imposed. This verse is the culmination, as Professor O'Connell notes, of his verses in the prosodic books. Its rhythmic structure is determined. In what way do these *numeri* subsist? In one sense the whole of book six is devoted to answering this and its related problems. Augustine begins by noting four possible ways: in sound heard, in the sense of hearing in the ear, in the act of reciting and in the memory where *numeri* are made known.

His assertion that *numeri* subsist in sound itself is curious. These *numeri* are physical vibrations of bodies (including, I assume, the moving air). They do not depend on being heard because these bodies vibrate willy nilly, not needing to be heard to qualify as sound. *Numeri*, then is not a term referring to any known quantitative values of particular vibrations, rather, such values and proportions could have been determined if they had been measured (*i.e.* heard), that is, *numeri*, here, refers to the physical patterns out of which such vibrations are made.

At the end of the treatise Augustine presents an argument to shew that God created all things *ex nihilo*. Just as an artist fashions wood through the complex psychological apparatus of *numeri*, and thus *via* the formal *numeri* in *ratio* itself so all created things are made in accordance with God's will out of elements which themselves are generated *ex nihilo via* the principles of number. The pythagorean tone is unmistakeable:

17. DMVI2.2; 17.58; the question of the opening and closing sections of book six is discussed above pp 31-33.


19. DMVI2.2

20. DMVI2.2

21. The naїve assumption that what is observed to happen happens when an observer is not present is unquestioned.

22. DMVI17.57 cf. DM15.10 which notes a formal relation between *scientia* and activity. The apparatus of psychological *numeri* are all mentioned in this passage.
"Can these [sensibles] be made from the elements, and these elements not be made from nothing? For which of them is more ordinary and low [vilium et abjectum] than earth? Yet first it has the general form of body, in which unity and numbers and order are demonstrated to be. For any part of it, no matter how small, is necessarily [necessa est] extended from an indivisible point into a length, thirdly it assumes breadth, and fourthly height, to fill up a body. Whence, then, is the measure of this progression from one to four? And whence the equality of parts found in length, breadth and height? Whence a certain corrationality [corrationalitas] (for so I have chosen to call proportion [analogiam]) of the ratio length has to the indivisible point, breadth to length, and height to breadth? Whence come these if not from the highest and eternal principle of numbers, likeness, equality and order? If you abstract [ademере] these from earth, it will be nothing. On which account the omnipotent God has made earth, and earth is made from nothing." 23

Form is not imposed on some primaeval material; rather, matter itself is generated from the extension of a point into the three dimensions of space, and persists over time. Not only, then, does Augustine invoke a Plotinian conception of time as succession but also a pythagorean conception of all extension in terms of the generation and interrelations of numbers out of their principles. 24

Numeri, then, are ontological as well as psychological or epistemological. They not only represent what can be known of vibrations in the air, they form them. The verse, Deus creator omnium, exhibits an aural numerositas, but also appeals because it represents as it is spoken the truth which it is about. 25 The argument itself at this point recalls many issues in the treatise: the significance of order, æqualitas, the principles of number, the apparatus of sensation, creative actions and the ratio.

23. DMM17.57; pp 472, 474; M636, 638 (tr. after FC4).
24. cf. Ennead VI6.6
25. eg. DMM17.57
There are various ways of interpreting this ontological device. The treatise ends, for instance:

"Above this [vital movement] the rational and intelligible harmonies of blessed and holy souls, receiving, without any intervening nature, the very law of God without which a leaf does not fall from a tree, and for which our hairs are numbered, pass on to [lit. as far as] the laws of earth and hell." 26

This passage, perhaps inspired by Plotinus, invokes a picture of the soul in perfection, contemplating the universe outside time and space. In this sense the pattern of the space-time world is fixed, designed and executed, like any created object, by the will of its creator. Such a vision stands apart from the vital movement (vitalis motus) of time and the kind of understanding which is part of the human condition (through which time is experienced as succession and all things measured). 27 I have called this the 'static' view of the created order. 28

It is helpful, when unravelling the text, to distinguish this from another attitude which Augustine also takes. I shall call it the 'dynamic' view. At times Augustine looks at movement (time and space) from his static point of view. He tends to pass harsh judgement on its imperfections when compared to the perfection of eternity. This judgement is tempered, however, by a vision from within the world of time and space. To this dynamic view attach several illustrative musical images.

The parts of creation are all interrelated according to the principle of number. Without these there is nothing. They include those of musica. The parts of the universe all bear proportional relations to each other and to the whole, just as the pattern of feet in verse bear proportional relations to each other and to the whole. 29

Two passages invoke this imagery. This final section of the treatise includes a reflection on the elements which indicates quite a different attitude to creation, its order and its unity. It is possible to live in

26. DMVI17.58
27. DMVI17.58
28. Above p 43f.
29. cf. the arguments in book five, above pp 90f.

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this created world using only the bodily senses. These work as they "receive and hold local numeri [locales numeros] in a kind of rest [in aliquo statu]"; the moving numeri of the universe are held within in silence. This difficult passage recalls his analysis of memory where it builds up pictures of the world on the basis of continuing information. These images of the world are "frozen" moments in a continuing process.

From the static viewpoint, human souls, too, do not contain the continuing process within, but construct images of that process which they contemplate as static. Unlike the static view, however, this process is part of the moving image which is the universe. In another passage, where Augustine is arguing for the temporal limitations of the natural judgement, the relation of parts to whole is explicitly discussed in proportional terms, again making the pythagorean features of a Plotinian system very apparent:

"... to each living thing in its proper kind, in its proportion to the universe [proportione universitatis], is given a sense of places and times; in that its body is so much in proportion to the body of the universe [proportione universi corporis], of which it is a part; and its age is so much in proportion to the age of the universe [proportione universi saeculi], of which it is a part; so its senses are fitted to [congruat] its activities, which it performs in proportion to the movement of the universe [universi motus], of which it is a part. In this way, by containing all things [omnia], this world, which is often called in the sacred scriptures by the name of heaven and earth, is great. If all its parts were diminished proportionally it would remain as great; if increased in proportion it would remain no less great. For nothing in the measure [spatia] of places and times is great of itself, but in relation to something smaller, and on the other hand nothing is small of itself, but in relation to something greater. So, if to human nature such a sense is given for the activity of carnal life, so that it is unable to judge greater stretches [spatia] of time than the required intervals demand which pertain to the use of each life, then, since such human nature is mortal, then I think such a sense is

30. DMVII.58

31. see below pp 131-136.
mortal. 32

The universe as a whole is the absolute extension of space and time. It is this whole which God creates and contemplates in the static, non-temporal vision. The human, its nature, its body, its age, its movements, are all to be understood in proportion to the whole cosmic order. So the senses and the understanding are subject to the limitations imposed by their part in the whole. This is what is meant by holding numeri within the soul as an image. Because these images are so limited they need to be constantly in touch with the external movements of other parts of the universe.

The static view is a view of the whole. The dynamic view is one from within, much more characteristically human and of necessity very complex. Both require the force of ratio for their operation but only the dynamic view uses notions of proportion and aequalitas as it attends to the detail of the moving universe - this, on the model of the way it distinguishes the moving parts of verse structure. Indeed, ratio itself distinguishes between the psychological apparatus of sensation, perception and understanding on the one hand, and the space-time universe which is its object, yet of which it is a finite part. 33

Ratio is itself formed out of the numeri which, in one context, are its normative principles. Chapter ten, of book six, begins a discussion of the cognitive aspects of sensible experience with the question: "What is it that we prize most in the sensible movements of numeri?" 34 Ratio itself can delight in the movement of time and its numerical measure. 35 That enjoyment consists in a kind of evaluative likeness (parilitatem) and intervals of equal dimensions (or measures - aequaliter dimensa intervalla). 36 Rational enjoyment, it seems, is

32. DMVI17.19; pp 398, 400; M544; tr. after FC4. cf. Guitton, op. cit. p 112.

33. DMVI10.25 (above).

34. quid est quod in sensibili numeroexitate diligimus? (DMVI10.26; p 418; M566)

35. Et nunc cum ipsa sua delectatione, quae in temporum momenta perpendit, et talibus numeris modificandis nactus suos exhibet, sic agit... (DMVI10.26; pp 416,418; M566)

36. Num alius praeter parilitatem quamdam et aequaliter dimensa intervalla? (DMVI10.26; p 418; M566) cf. DMVI8.20 where parilitatem is linked to numeri iudiciales.

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numerically conceived.

In book one it is asserted that the relation of *aequalitas* is an ideal in terms of which other number relations are to be understood.\(^{37}\) This relation becomes in book six an ideal form through which the beauty (*pulchritudo*) which feet, rhythm, metre and verse exhibit, and the delight they afford, are expounded.\(^{38}\) Its paradigmatic rôle is intensified as, by way of illustration, its perfection is thrown into stark relief against the patterns of syllables as they are actually to be found in the material world. A certain degree of imperfection is tolerated unnoticed by the sensitive soul.\(^{39}\) This is offensive to the intellect, in that it is both error and inequality, and beautiful to the same intellect in that it imitates *aequalitas* in its "kind and order."\(^{40}\)

This platonic tension between the beauty of sensibles in their due order, and their imperfection in contrast to their archetypes, the ideas, introduces those degrees of moral perfection which inspire the discussion of *musica* in terms of *scientia* and its objects, *numeri*, found in book one. These ideas are known to the soul directly, without the interposition of a body, and the intellect transcends time itself by contemplating them.\(^{41}\) The soul may contemplate ("see") them as they are illuminated by a "divine" light:

"There is a parallel between the eye's seeing corporeal objects and the mind 'seeing' incorporeal truth. God is to the soul what the sun is to the eye. ... He is ... the light in, by, and through which all intelligible things are illumined."\(^{42}\)

Their archetype, as *scientia*, is Number which exhibits all those properties.

\(^{37}\) DMII.15 - 16; above p 63f.

\(^{38}\) DMVI10.26 (feet), 27 (rhythm, metre, verse). The inequality of the amphibrach (\(\mu-\nu\)) is mentioned as well as the theory of silences.

\(^{39}\) *Num negari potest, fieri posse, cum haec delectatio ista non sentiat, et inaequalibus velut aequalibus gaudeat?* (DMVI10.28; p 422; M572)

\(^{40}\) *...pulchra esse in suo genere et ordine suo ...* (DMVI10.28; p 422; M572,574)

\(^{41}\) cf. the three 'meanings' of *ratio* given at *De Quantitate Animae* 30,58. This is one of its functions. Blumenthal, *Plotinus' Psychology*, op. cit. discusses the discursive reason (chapter VIII) and notes that, for Plotinus, it is the rational faculty which processes sense-data and identifies them.(pp 105-6)
of logical coherence so necessary for the guarantee of truth.\(^{43}\)

Further, this tension is to be found in the degrees of perfection that the entire order of creation exhibits. On the one hand the \textit{numeri corporales} are beautiful in their "kind and order." On the other, they distract the soul from its contemplation of the eternal \textit{numeri} just because they fall short of that perfection which they imitate. It is tempting to interpret, as has Professor O'Connell,\(^{44}\) this passage and much of book six in terms which exploit the Platonic/Plotinian tone of "fall" into time and toil, and the necessity of its "return" to the eternal, intelligible world. I do not wish to dispute this reading of the text. It is a characteristic theme. Augustine refers to the unity of the space-time universe in terms which reflect the immutable (numerical) order of the divine ideas ("above", "superior") and the universe ("below", "inferior") with which it connects through the body.\(^{45}\) In a perfect world, the soul would direct its attention to the ideas, contemplating their perfect \textit{aequalitas} with (equally perfect) intellectual delight. The body, inhabiting a world of (again equally perfect "in its order") sense could never distract the soul because its life would always be "healthy" and "peaceful."\(^{46}\) It is not clear just how feeling can be isolated in such an undisturbed life. Clearly the sensitive soul is still at work communicating the events of a material universe to the rational soul. Sensual pleasure, too, would take place, but always as a reflexion of intellectual or spiritual pleasure.

This is the static view. The soul is exhorted to delight in 'higher' things because their "undisturbed and eternal equality" will guarantee its well being (\textit{beatitudo}). From its place in the divine \textit{ordo} it can approach the eternal ideas which represent a kind of unchanging understanding

\(^{42}\) Nash, \textit{op.cit.}, pp 91-92. \textit{cf.} \textit{De Ordine} I.13.10; \textit{Sollicitudo} I.6.12; 8.15. (This last passage is quoted by Nash.) Also TeSelle, \textit{op.cit.}, pp 103-106.

\(^{43}\) \textit{cf. inter alia} Augustine's long passage on the perfection of Number at \textit{De Libero Arbitrio} II.8.20-24; 11.32.

\(^{44}\) \textit{Ant}, \textit{op.cit.}, ch. 4 "The \textit{De Musica}" esp. pp 70-90. He also interprets DMVI.13 in this light.

\(^{45}\) DMVIII.29

\(^{46}\) \textit{cf.} O'Connell, \textit{Ant}, \textit{op.cit.}, pp 73-75; also DMVI.8-15.

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without the limitations of time and place. The divine *ordo*, its "measure, number, and weight," is linked to a Timean universe regulated by eternity. Delight is a "weight" of the soul; it therefore *orders* the soul.\(^47\) Delight is the focus of the soul's return to the eternals as it engenders the impulse to understand.

The soul, caught between two worlds, is in contact with both. It also contemplates a different kind of eternity which is fundamentally dynamic: the eternal movement of the heavens, the regular motions of the planets. From a static eternity Augustine's imagery shifts to the space-time world:

"where there is no time, because there is no change, and from where times are made and ordered and changed, imitating eternity as they do when the turn of the heavens comes back to the same place, and the heavenly bodies to the same place, and in days and months and years and lustral periods and other revolutions of the stars obey the laws of equality, unity, order. So terrestrial things are subject to celestial, and the temporal circuits *orbis temporum* join together in harmonious succession like a song of the universe [*carmen universitatis*]." \(^48\)

This image of *carmen universitatis* is central to the dynamic view. Its derivation from a static position illustrates the important connexion between both perspectives. Plotinus, too,\(^49\) describes the soul's fall into time with all the apparatus of his metaphysical imagery and introduces a powerful musical motif which recalls many features of Augustine's own image.\(^50\) Unlike Plotinus, however, the pythagorean-inspired argument which

\(^{47}\) *Delectatio quippe quasi pondus est animae. Delectatio ergo ordinat animam.* (DMVI11.29; p 424; M574)

\(^{48}\) DMVI11.20; p 424; M574,576 (tr. FC4, slightly modified).

\(^{49}\) *Ennead IV3.12-13.* O'Connell, *Early Theory, op.cit.*, p 170-172; *Art, op.cit.*, p 75. Note at *Ennead IV3.13* (27-33) the identification of the universal pattern (Intellectual-Principle) as a "heavy burden, a painful longing to enter the realm which they are bidden from within." (Mackenna) This, O'Connell claims, is the origin of Augustine's simile of weight in the soul. If so, it makes an identification of that with the "weight" of *Wisdom XI.21* even more poignant.

\(^{50}\) Souls fall into time yet remain "in their higher part" in Nous. the kosmos is "carried foward to its purpose, everything in its co-ordinate place, under one only Reason-Principle operating alike in the descent and return of souls and to every purpose of the system." Further, "We
follows makes the *carmen universitatis* central to an understanding of the complex relations within the temporal world and weds that to a similarly complex atemporal pattern reflecting the *aequalitas* of verse-structure itself.

As Professor O'Connell notes, this dynamic view emphasises the temporal relations between the parts of the universe.\(^51\) Musical imagery is particularly apt for illustrating temporal patterns. Indeed, the imagery allows for both temporal and eternal points of view. Like Plotinus' "Kosmic Law,"\(^52\) the *carmen* is interior to each soul as each has been sewn into (*assevera*) the complex order without knowing the intentions of divine providence.\(^53\) In that, its vision is like that of a syllable in a poem: its life and perception last as long as the syllable sounds. It could never comprehend the numerical structure (*numerositas*) or the beauty of the connected whole, for it is part of that whole. Divine order is implacable, a divine law which, as Augustine argues, always works for the good. Evil is an aberration, the consequence of human will.\(^54\) The pattern is good as it is the divine order. Humans, as parts of that order, are consequently also good.

So much for the "Kosmic Law." Its interior force ("weight"), directed through delight, is to lead the soul to a less limited vision of itself in relation to eternity. The soul begins to reflect on its condition, to collect all "its own forces, multiplied in itself"\(^55\) through the power (*vis*) of memory. These forces are, of course, the *numeri* which form the apparatus of sensation.\(^56\) They collect in the memory (as may know this by the concordance of the Souls with the ordered scheme of the kosmos ... they stand henceforth in *harmonious association with the Kosmic circuit* ... and out of this concordance rises as it were one musical utterance: the music, the harmony by which all is described, is the best witness to this truth.” Ennead IV3.12 (Mackenna, italics mine).

\(^{51}\) AM; *, op.cit.*, p 75.

\(^{52}\) Ennead IV3.13.

\(^{53}\) DMVI11.30; p 424; the intentions are for *pulchrum*.

\(^{54}\) DMVI11.30; p 426.

\(^{55}\) ... *omnes impetus suos ... quasi multiplicat in seipsa* ... (DMVI1.31; p 426)

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numeris recordabiles) and, by virtue of the ratio which they reflect, they aid the soul in the business of life. The imagery of carmen universitatis also admits of a vision not interior but exterior to its structure as bits of the pattern may be gathered and comprehended. The "moving image" is transcended as it is apprehended by the soul through the "beauty of ratio".

For the first time in the text not only do delight and pleasure appear in the discourse, but beauty also appears as a quality of verse,57 of the carmen universitatis,58 and of ratio. As a quality it remains an undivided attribute; but it is manifested in the aequalitas which represents its perfection. It seems that Augustine does not say that beauty is aequalitas, but only that the one always accompanies the other and is understood in terms of the other. The soul will apprehend the "beauty" of divine providence as it apprehends the order of that providence:59 as it begins to take a more cosmic view. The point of view is, however, not just non-temporal, but, significantly, numerosus. This spiritual vision is peculiarly pythagorean, as it is Plotinian and according to Professor O'Connell, Stoic.60

Soul and Body

God, as creator, is the composer of the carmen universitatis. The numeri of verse are the same numeri which pervade creation. Seen from within, these numeri collect into patterns of all kinds both inside the soul and in the exterior world. This is a general solution to the question of their subsistence. Clearly, too, the more these numeri approach their eternal principles, the more they are to be valued over less persistent forms. This attitude informs Augustine's view of the relation between soul and body. The soul, by virtue of its association with the eternals, is that which enlivens the body and is therefore superior to and master of it.

56. DMVII.31; passim.
57. DMVI10.26-27.
58. above p 108.
59. above p 107.
60. cf. O'Connell, Art, op.cit., p 75; Stefani, op.cit., pp 19f, 23f.
This relation of body to soul generates an analysis of sensation in entirely psychological terms, detaching it from the sensibles which the soul apprehends via the body. Augustine's problem, then, is how the body can affect the soul, as clearly it does.

For example, his opening speculation notes a second corporeal phenomenon where numeiri subsist: the "sense of hearing in the ear." The text appears to confuse the sense organ, the ear, with the sense itself. Augustine explicitly notes that he does not mean the capacity of the ears to receive sound, something they have even when there is no sound. Rather, does the ear have numeiri, even when there is no sound? In this case the numeiri "in" the organ correspond in some way to a natural (as distinct from rational) capacity to either approve or disapprove of the sound which persists even when a stimulus is not present.

He notices this confusion himself. As the explanation stands it is unsatisfactory. Augustine points out that it is by (numerical) ratio that sounds are more or less agreeable. On the other hand, the same ratio may be quickly or slowly produced and thus sensed. In this latter sense, the ear only receives what is sounded, and only for the length of time that it is sounded: like an impression in liquid which disappears when the object is removed. On the other hand the "natural" judgement which persists is not a capacity of the ears, but of the soul, or, at least the sense of hearing as distinct from its organ, and is persistent and independent of sound. The distinction is between kinds of numeiri. Those which are

61. DMVI 2.2

62. Non enim quaero utrum habeant illae aures vim persipiendi si quidquam sonuerit, qua utique non carent si desit sonus: non enim et cum silentium est, nihil a surdis different; ...(DMVI2.3; p 362; M494).

63. ...sed quaero utrum ipsos numero habeant, etiamsi nihil sonet. (DMVI2.3; p 362; M495).

64. Idipsum ergo quidquid est, quo aut annuimus aut abhorremus, non ratione sed natura, cum aliquid sonat, ipsius sensus numeirum voco. (DMVI2.3, p 362; M496). "Approve" and "disapprove" are used here in the context explained in book one, of "natural" judgement. (Above pp 50-51.) They correspond to the sensitive soul's capacity to distinguish between pleasure (those things of which it "approves") and pains (those things of which it "disapproves"). Augustine's language confuses his own (later) distinction between rational judgement and sensation (which is roughly characterised as the awareness of pleasure/pain).

65. DMVI2.3, passim; this last point is not explicit but may be inferred.

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impressions on the ears are those which come from the numeri of sound. They are totally dependent on these sound numeri, although not vice versa. The numeri of natural judgement have another source and are independent of sound. Yet they appear to be affected by sound.

Augustine has been careful to keep the discussion strictly corporeal. The numeri which are "the sense of hearing in the ear" are carefully located as those consequent upon sound, neither a capacity to hear nor a "natural" sense judgement. They are called a passion of the ear. Augustine maintains a general distinction, here, between corporeal activity (hearing "in the ear", sound) and activity in the soul consequent upon that in bodies. The latter involves both hearing as a feeling, and any possible knowledge of what is heard, including the knowledge that there is sound to be heard. A similar distinction is made by Plotinus, after Aristotle.

This distinction is made explicit in the next section. The two kinds of numeri now considered are those which are involved in some act of recitation, and those in the memory. Again it is the relation between these which interests Augustine. It is possible to run over, silently in the mind, as if they were being recited. This capacity is evidence that such mental activity can be independent of corporeal activity because it does not produce either sound or a passion in the ears.

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66. Ex quo colligitur numeros qui sunt in ipso sono, posse esse sine istis qui sunt in eo quod est audire, cum hi sine illis esse non possint. (DMVI2.3; p 364; M498).

67. below pp 127-131

68. ... qui sunt in ipsa passione aurium, ... DMVI2.3; p 364; M498. On this distinction see TeSelle, op. cit., p 95.


70. (DMVI3.4; p 364; M498), "act" is a rendering of "usu et operatione."

71. DMVI3.4
The independence of this kind of "reciting numeri" is intensified as it is distinguished from numeri in the memory. Augustine includes under this heading the soul's spontaneous generation of regular bodily activities such as pulse and breath, which are examples of regular (temperatio) bodily activity.72

There are clearly various ways in which this works. Augustine attempts to include in the one category all those activities which originate in the soul and which involve some kind of regular movement. Yet they appear to be of two distinct kinds. The first is associated closely with recitation, the second with regular bodily functions which do not require the kind of mental "review" that do the first. They are similar only in that they are both extended regular patterns. When the pulse or the breath are brought to mind, it is possible to think of them as if they were patterns like a line of verse. But this is not what Augustine intends here. These numeri are an act of some kind which takes place in the soul and which affects movements in the body. They are not themselves reflexions of that act. The psychological description does not involve any notion of conscious thought. Rather, a musical image is brought to bear more generally on the movements of soul and body. The natural motions of the soul are likened to regular, musical motions.

Awareness is always understood in terms of cognition. The line of verse is run over by thought ((cogitando peragere). The pulse or breath can be altered at will,73 which is again cognitive. The numeri here being observed, however, are not themselves cognitive. They are associated more with the soul's affections than its cognitive capacity. In that they are intimately related to the functions of the body and thus to the first two kinds of corporeal numeri.

Augustine wants all four kinds of numeri independent yet interrelated. Numeri in the memory are clearly independent of the other categories in that they may be hidden away and then recollected.74 Yet they depend on

72. Although it is possible by an act of will to alter these: ... ut etiam voluntate adhibita multis modis variari queant ... (DMVI3.4, p 366, M500)

73. This is at least true for breathing; it is also possible to alter the pulse at will, after some training.

74. ... nam si eos recordatione depromimus et cum in alias cogitationes

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which have been either heard or thought, as they are imprinted by them. 75

Again the numeri recorded in the memory are themselves not intended to be cognitive. Augustine attempts, with these categories of psychological numeri, to represent different modes of the soul's activity. His difficulty is that in thinking about them he invokes that singular activity, rational thought, which is cognitive. He needs to establish a variety of kinds of numeri, some corporeal, some incorporeal, some cognitive, some precognitive, which will help him to account for the many kinds of operations involved in sensation and perception. This distinction between cognitive and precognitive recalls his distinction between knowledge and skill in book one. Knowledge involves a reflexive, cognitive process; skill involves bodily movement - motor impulses which do not necessarily engage the intellect at all, but must engage these precognitive numeri, especially the "natural judgement". 76

Further, Augustine distinguishes the modes in which both kinds of numeri pass away. Those in the memory may be forgotten as they slowly distegrate over time. It is possible to have only a vague memory of something. 77 Acts of the soul simply disappear, new ones take their place continuously as the soul continues to act. 78

Augustine reminds the reader that five kinds of numeri have so far been distinguished. Those of sound, of hearing (in the ear), those acts of the soul, those in the memory and lastly those which "accept or reject by..."
some natural right." 79 These interrelate as follows. The last kind are independent of all the rest and do not derive from them as they are a standard of judgement upon the other kinds. 80 Those in the memory are dependent upon those acts of the soul which create numeri. And further those numeri which are in sound produce a passion in the ear which is sound heard in the soul and recorded in the memory. 81 This last relation introduces again a confusion between sense and sensation which, earlier, Augustine had attempted to avoid. 82 Some numeri in the soul are related to and consequent upon numeri in the body (in this case the ears) which are themselves consequent upon numeri forming independent sounds.

This is his problem. How can something corporeal cause a change in the soul if, as a general principle, the soul is ontologically superior to the body? The short answer is as follows. Some numeri made in the soul are reflexions of corporeal numeri detected via the senses. This does not imply that the body is (ontologically) superior to the soul. 83 If the soul has to do with a body, then it must feel the passions 84 in that body, not because the body dominates (is superior to) the soul but because the soul cannot make judgements about the external world without referring to that world. 85 The senses provide the soul with a pattern to which it adjusts in order to comprehend.

79. Siquidem alius est sonare, quod corpori tribuitur, alius audire, quod in corpore anima de eonis patitur, alius operari numeros vel producties vel correpuisse, alius ita memorisse, alius de his omnibus vel animando vel abhorrendo quasi quodam naturali ture ferre sententiam. (DMVI4.5; p 368; MS02, 504)

80. ... non enim de illis posset, nisi excelleret, iudicare. (DMVI4.6; p 368; MS04) I understand the relation of "excell" to mean that they do not derive from that which they excel.

81. DMVI4.6, 7.

82. DMVI2.2-3; cf. n68

83. DMVI4.7; This was a problem in the Platonic tradition generally, cf. Sophist 248A-249D.

84. above n67.

The Plotinian metaphysic which explains the soul's disordered relations in terms of a descent into the material world, and, through pride, to sin and privation, involves a return to greater perfection by withdrawing from the material world and the senses through attending to the \textit{numeri} of Divine wisdom.\footnote{DMVI4.7, passim. of O'Connell, \textit{Art, op.cit.}, pp 72-73.} It is easy to interpret Augustine in a strictly Plotinian way and understand his attitude to the body in these opprobrious terms. Yet for Augustine the body has a beauty and dignity of its own.\footnote{... quod tamen habet sui generis pulchritudinem, et eo ipso dignitatem animae satis commendat, cutuis nec plaga, nec morbus sine honore alcutius decoris meruit esse. (DMVI4.7; p 372; M510)} As it participates in material existence it quite properly responds to sounds in the world. So the soul as it is found in the body equally properly relates to those material \textit{numeri} which affect its body. Only when the soul becomes passive to those \textit{numeri}, ignoring the other proper objects of its attention, does it find itself in an improperly submissive relation to the body.\footnote{Quid si ergo forma ista numerorum decet in sonis, qui allabuntur auribus, et dedecet in anima, cum eos sentiendo ac patiendo haber, num magnopere mirandum est? (DMVI4.7; p 374; M512)}

References, here, to the "fall" and the "first sin", locate corruption in the material world, especially the body, which in its turn corrupts the soul. Is the soul affected by a body in this case? This puts the question too crudely. Nowhere in this section does Augustine say that \textit{numeri} in the soul are directly caused by \textit{numeri} in the body. He says at times that the latter are "worth more" or "to be preferred" to those in the soul either as they are prior to or as they verify those in the soul. \textit{Numeri} in the soul are "made in the soul".\footnote{DMVI4.7.} As the soul is planted in a body so it needs to attend to that body, and it may be distracted by such attention from its proper purpose. In these terms the soul is not affected directly by the body but affects itself as it attends to the body.

Augustine was no materialist. He argues that sensation is a pre-cognitive activity of the soul itself and not material action on a passive body. This is part of his general (Plotinian and pythagorean) view that a soul, as immaterial, is superior to and the master of its body and is never passive to it.\footnote{Augustine} This general view is not contrary to the explanation in
his chapter four of why sound is the cause of some \textit{numeri} in the soul.\footnote{This opposes O'Connell's interpretation at \textit{Art., op.cit.,} p 73.} There he carefully distinguishes between soul-body relations, and those between \textit{numeri} themselves. It is as \textit{numeri} that those in sound are prior to their counterparts in the soul; nothing there is said about the constitution of sensitive \textit{numeri} in the soul. How they are made depends on a general account of the relation between soul and body. This Augustine now gives.\footnote{The account is parallel to that in Plotinus, Enneads V8.11 and IV2.22 (O'Connell, \textit{Early Theory, op.cit.,} pp 167-168, on DMVI5.9-10). The whole passage at Ennead IV4.18-32 may provide the background for Augustine's inquiry as it moves from questions of pleasure and pain to a more detailed exposition of the relation between body and soul.}

The relation between soul and body can be illustrated in either a static or dynamic manner. For Plotinus the relation as dynamic involved an account of changes in the soul, of movement through the structure of Noûs. It contemplates the procession of ideas all at once and absolutely. It operates as Living Being emanating from Noûs and reflecting its structure.\footnote{cf. A.H. Armstrong \textit{The Architecture of the Intelligible Universe in the Philosophy of Plotinus} (Cambridge: Cambridge University Press, 1940) p 75f.} In this sense its extension into time and matter is an imaginary "stirring to a ceaseless succession, ... to the discrimination of identity ... an image of eternity ..."\footnote{Ennead III7.11; cf. Chapter I, p 29 and Blumenthal, \textit{op.cit.,} p 15.}

Augustine's soul is always accompanied by a body, but ideally a heavenly body which is quite unlike that which is the consequence of the fall.\footnote{O'Connell, \textit{Early Theory, op.cit.,} p 165.} The soul is co-extensive with the body, not simply "in" the body. As with Plotinus,\footnote{Blumenthal, \textit{op.cit.,} p 16; note the reference to Ennead IV3.9 and the subsequent discussion of the image of heat/light in air at Ennead IV3.22 (pp 18-19). My argument is based on this analysis of Plotinus.} the soul rules the body and is never subject to it. All activity may be viewed in corporeal terms, as the body itself operates...
in the world. (That activity was characterized by numeri "in the ear"). In psychological terms, however, it remains that body is animated by soul: the soul directs all the body’s activities. In psychological terms, however, it remains that body is animated by soul: the soul directs all the body’s activities. The soul is present in the world via the body and acts in the world through the body.

In this world of space and time, the soul is constantly the subject of change. So as it acts in the world it must deal with the recalcitrant nature of body which it finds more or less pliable. In this the soul is obliged not simply to be deliberately directing (intento) bodily activity, but also it must be attentive (attento) to the demands of the body.

Before investigating the ways in which Augustine expands his famous theory of attention it should be noted that his opening remark characterises the relation as intentio, as deliberately directing the body. In book six this term (and its cognate verb) is used to mean a deliberate direction of various bodily activities. As it is directed to God it will understand the eternal things, and as it is directed to the body (its servant) it feels movements in the body. Later, as it is involved in a variety of tasks its deliberate direction blots out an awareness of former ones. These may be recalled through a directing of the memory. Lastly, the soul is distracted by all these deliberate ‘directings’ from its contemplation of truth. In this sense, the relation of soul to body is strongly characterized as a relation between an active soul and a passive body. It recalls the example of artisan and tool at De Musica VI 5.8, the preamble to this whole passage.

97. DMVI5.9. cf. BA note complémentaire 78, p 517.
98. DMVI5.9
99. DMVI5.9
100. DMVI5.13.
101. DMVI8.21
102. DMVI8.22
103. DMVI13.42
104. DMVI5.8, passim. This, in turn, recalls a passage in Ennead IV3.26 (11.2-8) where Plotinus says that the soul uses the body as a tool. (Blumenthal, op.cit., p 20)
In contrast, the relation of *attentio* is far less specific in its distributing of active and passive roles between soul and body. Just as Plotinus had difficulty maintaining an absolute independence of soul from body, Augustine's relation does not, *in fine*, provide for a clear distinction between the soul as active and the body as passive. This is no bad thing as it allows him to discuss the interplay between soul and body with more freedom and sensitivity than would a theory based on deliberate actions of the soul; and it permits, at times, both soul and body to play an active rôle in their relationship.

The soul's continuing attention to bodily activity makes the relation between them essentially dynamic. This is clear from the way Augustine illustrates the relation. He wants to maintain that soul and body occupy independent worlds, the one immaterial, the other material. As the body acts and is acted upon in the (material) world it finds such effects more or less "agreeable". The soul becomes aware of this activity when the soul/body equilibrium is disturbed in some way. This is called feeling (*sentire*).

The passage at sections nine and ten is particularly dense. Augustine's teasing out of the connexion between soul and body involves a variety of examples and many images. An important theme, which dominates the examples, is the degree to which the body's processes take place with ease or difficulty. When the soul finds it easy to work the body in relation to another body then it feels pleasure; when it experiences difficulty, it feels "pain or trouble".

Feeling is a consequence of the relation of attention. It is a psychological state which represents to the soul activity in the body, or between the body and the material universe. It is not necessarily cognitive. It is one of the ways the soul is sensitive to the needs, desires and operations of the body. The soul directs the passions of the body through its continuing pre-cognitive, attention to the body and its


106. *Corporalia ergo quaecumque huic corpore ingemuntur aut obiciuntur extrinsecus, non in anima, sed in ipso corpore aliquid faciunt, quo operi eius adversetur, aut congruat.* (DMVI5.9; p 380; MS18)

107. DMVI5.9

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senses. The degree to which the soul is aware when the body sees, hears, smells, tastes or touches depends on the congruence between its expectations and some actual state of affairs. Augustine notes that the soul acts "quietly" when the things of the body are "in unity", but with greater attention when these corporeal things exhibit an "otherness". 108

Attention to activity, as a pre-cognitive state, is an act of the soul itself of which it may become conscious. Numeri of sound move those in the ear. Because the soul is so disposed, it is animating the ear itself; such animation may be inhibited by an external activity. The soul becomes aware of this interruption. 109 Because the soul "animates" the ears so that they can hear, it is aware of alterations in the ears. The soul marks itself with the form of the impression. 110 Such marks are intelligible to the soul by being already intelligible objects. The soul comes to sense the world through its "operations" on the organs of sense, and their passions. 111

All changes in both body and soul are called in general "movements". This recalls the temporal, extended, nature of the soul's relations with its (fallen) body as well as the definition of musica in book one. Just as health is a "stable" state of the body 112 so the soul, directed to eternal things, will experience a similar stability in contrast to that distracting instability it feels when it is "seduced by" the movements through which it directs the body. 113 The reader is reminded of the original state of body

108. DMVI5.10; note especially "... agit haec anima cum quiete, si ea quae insunt in unitate valetudinis, quasi familiaris quadam consensione ceaseament. Cum autem adhibentur ea quae nonulla, ut ita dicam, alteritate corpus afficiunt; exserit attentiores actiones, ..." (p 382; M522) cf. Ennead IV5 (especially sections 5, 8) and TeSelle, op.cit., p 94f; note, too, DMVI5.13.

109. DMVI5.11.

110. Cum autem ab eisdem suis operationibus aliquid patitur, a seipsa patitur non a corpore; sed plane cum se accommodat corpori: et ideo apud seipsum minus est, quia corpus semper minus quam ipsa est. (DMVI5.12; p 386; M526) cf. Ennead IV4.23 and Blumenthal, op.cit., pp 70-79, esp. 75.

111. In some cases (like cutting hair) the soul does not feel because there is no organ through which it can feel a change in the body, although in the course of things it does animate their growth. (DMVI5.15.)

112. Haec autem sanitas tunc firmissima erit atque certissima, cum pristinae stabilitati, certo suo tempore atque ordine, hoc corpus fuerit restitutum... (DMVI5.13, p 386, M526)
and soul, where the attention is never disturbed as it is directed elsewhere. The general atmosphere of turning from extended movement towards the quietude of knowing God's will, it is argued, liberates the soul from sensible distractions. Attending to corporeal pleasure is included in this general disapprobation of the things of sense. But no inconsistency is implied between this and his previous association of pleasure with congruent relations between the soul's attentio and the body's passions. Only as the soul becomes concerned with its body's passions does it becomes less able to control them in terms of what it knows to be the divine (rational) order. Again the Plotinian cast of his thought is clear, both in the exhortation to "turn back" to the divine, and in the identification of movement as the essential characteristic of temporal activity.

Attentio defines a general disposition of the soul towards its body. In general the relation is no more than that. It characterizes an essentially Plotinian attitude to the active rôle the soul plays in the way it feels corporeal movements. The structure of Augustine's discussion reflects Plotinus' own discussion of body-soul relations in Ennead IV3-4. Plotinus argues (in Ennead IV5) that "the basis of all perception is the sympathy which exists between the various components of the sensible world." The soul, whose mode of existence is quite other than that of the body, pays particular attention to the (particular) demands of the body through the organs of sense; in general it animates the body as it is disposed to every part of the total organism. The possibility for such an intimate relation between these radically different modes of existence is afforded by the presence of numeri which guarantee the unity of all existence.

113. DMVI5.13
114. DMVI5.13-14, passim.
116. cf. above pp 22,29
117. Blumenthal, op.cit., p 78; cf. Ennead IV5.2. Some correspondences between the contents of Ennead IV3-5 and Augustine's psychology are further noted below; cf. Nash, op.cit., p 43f, 47.
118. cf. Blumenthal's remark that Plotinus "accepted from Aristotle that sense-perception involves the reception of the forms of sense-objects without their matter." (op.cit., p 137) Augustine understands forms to

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The Apparatus of Sensation

The central chapters of book six use this general account of the relation between soul and body as a framework for a detailed description of the apparatus through which the soul deals with its life in the world. While many kinds of numeri are distinguished within the soul, the persistence of numeri at every level (material, sensual and cognitive) guarantees an essential unity to psychological movement which analogically corresponds to the unity of the material world located within the perfect unity of the divine ordo. Further, the Plotinian principle that like assimilates to like and is uncomfortable with what is unlike,\(^\text{119}\) which is such a feature of Augustine's body-soul relation \(^\text{120}\) is also neatly captured by the explicit relations between kinds of numeri.

Within the soul several pre-cognitive processes may be distinguished. There are those generated by the soul with respect to its body; and those generated by the soul when it detects numeri in the passion of the ears.\(^\text{121}\) And there are those previously mentioned in the memory, in judgement and in sound. These may be arranged in the following order:

- **Numeri judiciales** (those of judgement)
- **Numeri progressores** (those both "in actu" and "in silentio")
- **Numeri occurrentes** (those to do with hearing)
- **Numeri recordabiles** (those in the memory)
- **Numeri sonantes** (sound)\(^\text{122}\)

be numeri. Both Nash (op.cit., p 44-51) and R.A. Markus ("Marius Victorinus and Augustine" in A.H. Armstrong (ed.) The Cambridge History of Later Greek and Early Mediaeval Philosophy (Cambridge: University Press, 1970) p 378f) are critical of this theory. The difficulties they encounter are solved by taking account of the relations between numeri as distinct from the general relation between soul and body. Further, Markus says "Attention, in general, is the deliberate concentration of the mind ..." (my italics); if he means attentio then he is wrong. The heart beats regularly because the soul attends to it even though its conscious thought is directed (intentio) elsewhere. On soul/body relations cf. Gilson, op.cit., pp 58-65.

119. Noted by Blumenthal, op.cit., p 75.

120. And explicit at "hae sunt operationes quae adhibet anima praeecedentibus passionibus corporis; quae delectant eam associantem, offendunt resistentem." (DMVI5.12; p 384; M526)

121. An quod illi sunt moventia se se animae ad corpus sum, hi vero in audiendo moventia se se animae adversae passiones corporis sui? (DMVI6.16; p 392; M534)
This hierarchy is significant. Numeri in the memory are dependent on all other kinds of numeri, yet, being in the soul they must be superior to sound itself. Memoria, for Augustine, is like a warehouse of numeri; all other kinds are forms of mental activity, cognitive and pre-cognitive, by which the soul deals with both the material and the eternal world. When Augustine discusses cognitive mental activity, his remarks on memory are of first importance.

Before he deals with memoria and ratio, however, he considers the apparatus of pre-cognitive psychological activity. Only when he turns to numeri iudiciales does he begin to take note of the problems more cognitive (and, to some extent, more conscious) mental behaviour introduce. As usual, he begins with a question: are any of these numeri eternal? The only possible candidates are the numeri iudiciales, as the rest clearly disappear as soon as they appear, or may be forgotten. As it turns out the iudiciales are not eternal. The direction of Augustine's argument is an analysis of sensible or 'natural' judgement as it relates to sensation itself and to the ratio.

The text returns to the recitation of verse. While the numerical structure of a verse remains constant, it may be recited at various speeds. Numeri iudiciales are not (as are the numeri occureores and progressores) 'confined' to these speeds, they respond first to the ratio of a verse. They are, however, as a 'natural' judgement, confined by time as is nature itself.

This latter point is made in two ways. Firstly it is argued that certain undoubtedly rhythmic movements take place over such a long span of time that they cannot be felt as rhythmic movements. In this case,

122. Vocentur ergo primitir iudiciales, secundii progressores, tertii occureores, quarti recordabiles, quinti sonantes. (DMVI6.16; p 394; M536) There are slight differences between this list and those at DMVI7.18 and 9.23.

123. Iudiciales solos immortales puto; caeteros video vel transeire cum fiunt, vel de memoria oblivione deleri. (DMVI7.17; p 394; M536) cf. DMVI4.6.

124. DMVI7.17; indeed, Augustine might have added that they must needs evaluate the speed itself, to tell if it is appropriate to the ratio—an application of the bene modulandi principle.

125. DMVI7.18

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numerii iudiciales cannot be timeless and eternal because they are confined to certain spans of time. Yet what they evaluate, they always evaluate; it is still not clear in what sense they are mortal (temporal). This pre-cognitive, "natural", judgement associated with feeling is not to be confused with a cognitive judgement based in the reason. That kind of judgement, employing as it does universal ideas, is capable of a more comprehensive view. Here Augustine is only interested in the phenomenon that people, when they hear numeri, react, in varying ways, via the relations between the kinds of numeri that sensing and natural judgement involve.

In chapters eight and nine Augustine compares two modes of numeri: those which form a natural judgement and those others which the iudiciales measure. But all modes are part of a natural human capacity. Each is limited in proportion to the whole just as this "natural" judgement is limited to the individual's proportional part in the cosmic order. How are natural iudiciales to be characterised if they are another mode of psychologocal activity? As pre-cognitive response they seem to play an important part in the way humans feel. Feelings are of two kinds: properly natural (i.e. in due proportion) and customary.

Iudiciales, in this context, represent expectations the soul brings to other kinds of numeri. Numeri progressores, as they generate regular (numerosam) bodily activities, are informed by the regular (parilitatem) expectations of the numeri iudiciales. A congruence between the

126. In the sense described above p 119.

127. DMVI17.18

128. DMVI17.18; cf. DMVI17.19 and TeSelle, op. cit., p 96.

129. DMVI17.19, above p 104f.

130. So in its due order custom (or convention) is a second, artificial nature which can change as contrary custom alters the judgement itself. Non enim frustra consuetudo quasi secunda, et quasi affabricata natura dicitur. Videmus autem velut quosdam sensus novos in indicandis autuncemodi rebus corporis consuetudine affectos, alta consuetudine depereire. (DMVI17.19; p 400; MS44, 546)

131. DMV18.20, passim. Examples of (possible) irregular (imparis) movement are given (e.g. walking, scratching) which he assumes are normally regular movements. God, of course, is the source of the iudiciales' expectations.
structure, the movements, of the \textit{numeri occusores, recordabiles} and \textit{progressores}, and an expected structure which consists in \textit{numeri iudiciales}, constitutes the latter's examination of other \textit{numeri}. The consequence of such examination is a feeling.\textsuperscript{132}

Such a judgement is dependent on the soul's being somehow able to collect and review the patterns of \textit{occusores}, and project \textit{progressores}. This is the function of \textit{memoria}. Memory presents (offere) its contents, \textit{numeri recordabiles}, to the judgement as a pattern of instantaneous events, recorded in order that the pattern may be established in the soul itself. The \textit{numeri occusores} exist only for those instants of time which correspond to their generation from passion in the ears. Even a single syllable occupies a space of time capable of infinite division. Its end is never heard with its beginning. Unless the memory somehow preserves this minute passage it will be lost and nothing heard at all. Not because the soul has not attended to a passion, but because the direction (\textit{intentio}) of (cognitive or pre-cognitive) awareness is elsewhere. An even better example of this is when syllables themselves follow in sequence and the memory establishes their ratio. It is true, too, of sight as the memory pieces together the shape of the object.\textsuperscript{133}

This description of how the memory collects the \textit{numeri occusores} is structural. Memory records the (numeric) structure of syllables as they succeed one another with relatively short or long spaces of time. It records the spatial structure of solid objects by examining them over time as they turn in space. Memory gathers the extension of activity and presents as a pattern - a representation of diverse activity. It is a synthesis of experience which enables the soul to transcend its own temporal circuit.\textsuperscript{134}

\textsuperscript{132. Et illi occusores numeri, qui certe non pro suo mutu, sed pro passionibus corporis aguntur, in quantum eorum intervalia potest memoria custodire, in tantum his iudicialibus iudicandi offeruntur atque iudicantur. (DMV18.21; p 402; M548) Recordabiles vero numeros multo evidentius est, quod eadem ipsa offerente memoria, iudicamus his iudicialibus. (DMV18.22: p 406; M522)}

\textsuperscript{133. DMV18.21; cf. Ennead IV3.28-29; 6.3. The theory of sight offered here recalls Ennead IV5.2}

\textsuperscript{134. cf. TeSelle, op.cit., p 97f.}
Those patterns which are in the memory itself - the numeri recordabiles - are similarly presented when recalled by a direction of the soul. They are recalled in order that they might be examined - this is remembering. Remembering enables the soul to distinguish between present and past patterns of numeri. Sometimes recall is difficult and the soul needs to check the pattern with itself. Sometimes pattern comes easily, even without the soul's conscious attention. Similarly the soul may recognize that some new movement corresponds with an already established pattern of numeri.

So Augustine concludes his account of pre-cognitive activity: the apparatus of sensation. Numeri occursores and progressores are presented to the iudiciales via numeri recordabiles. All three, recordabiles, occursores and progressores, are informed by the iudiciales. The memory collects the occursores as recordabiles, which are also found in the memory itself; it projects itself as progressores which are also collected as recordabiles. Each kind of numeri stands for a complementary part of the pre-cognitive process: recordabiles are numeri preserved in the memory, occursores are numeri as they live in the instantaneous present. Numeri sonantes, of course, only exist in the soul as heard, as occursores.

Two things should be noted. Augustine does not anywhere here identify the numeri recordabiles with memoria. They live in the memory. They are presented by the memory to the numeri iudiciales for examination and verification. Memory itself is a gathering and recalling of information presented to it from various sources. It is called later a 'power' of the soul.

135. DMVI8.22
137. DMVI8.22
138. ... in ipsa memoria viviere ... (DMVI8.22; p 406; M552)
139. cf. DMVI11.31-12.35. Note that against Thonnard's claim that memoria acts here only as a sensible faculty. (BA note complémentaire 83, p 522) Its rôle is central to both cognitive and pre-cognitive activity. To this point only pre-cognitive activity is discussed.
Further, sensations produce feelings. Augustine’s analysis of sensation in terms of numeri is just that: analysis. There is no suggestion that as the soul senses and acts all these numeri are separate ‘faculties’ of the soul. A feeling is a synthesis of the working apparatus of numeri. Its unity is guaranteed by the unity of numeri themselves. So experience of feelings remains simply sensation: the experience of pleasure or pain, the delight in harmony and the avoidance of discord. On this account complex or conflicting feelings are the consequence of different sets of patterns working together, or not, as the case may be.

Rational judgement: Knowledge and perception

The soul plays a significantly active part in the experience of sensation. Its dialogue with the material world, while pre-cognitive, is a genuine dialogue because it forms itself around the ‘natural’ judgement of the senses. For Augustine, then, no sensation is direct or passive in fine. To feel is to evaluate, to interpret the world in some ‘natural’ way. There is no direct relation between the material world and the soul. But equally the soul is not cut off from that world. Material objects play their part in the production of psychological numeri as they themselves are so constituted, and so understood. Further the sensitive soul will always be directed towards maintaining the body’s activities, even though its conscious attention may be directed elsewhere. 140

The effect of the soul’s indirect relation with the material world, this peculiarly internal, psychological relation, is to be found not so much in the internal apparatus of sensation itself but in the manner in which those sensations erupt into the consciousness as images, as perceptions about which opinion and sometimes knowledge may accumulate, and through which the soul orders its life. Augustine has prepared the ground and now leads the reader into cognitive activity that involves the rational thought through which the soul understands.

140. cf. Bubacz, op. cit., pp 13-17. He discusses this section of DM with De Trinitate XI and forms similar conclusions: also TeSelle, op. cit., p 98.
**Numeri iudiciales** have a central rôle in the formation of feelings. They also form the understanding so that it evaluates (*aestimare*) what is presented to it. The verse, *Deus creator omnium*, is delightful as it is congruent with the *numeri iudiciales*, the natural judgement. But the analyses of verse-form which precede this book require that verse exhibit a still more fundamental congruence: a kind of judgement on the *numeri iudiciales* of still more hidden *numeri*.

At this point Augustine introduces a distinction between sensual delight and rational appraisal in order to introduce that activity of the soul which is central to all its other operations: the *ratio*. The centrality of *ratio* has been discussed above. It is significant that here in book six it appears both as that and as yet another kind of *numeri*. He explicitly notes that *numeri* form the central core of both sensual delight and rational deliberation. This integration of ideas derives from the integrated activity of the soul itself. The same soul "moves" in the way distinguished by the kinds of *numeri* so far denominated. As those others have been distinguished so the "still more hidden *numeri*" may be distinguished from the rest as properly *numeri iudiciales*; those formerly so called are renamed *numeri sensuales*.

He further changes the name *numeri sonantes* to *numeri corporales*, as these denominate all physical activity, not simply sound. This summary

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141. *Sed ego puto cum ille a nobis propositus versus canitur Deus creator omnium nos cum et occurreribus illis numeris audire, et recordabilia reognosce et progressoribus pronuntiare, et his iudicialibus delectari, et nescio quibus alite aestimare, et de ista delectione quae quasi sententia est iudicialium istorum, aliam secundum hos latentiores certiorum ferre sentientiam.* (DMV19.23; pp 410, 412; M560)

142. *An tibi atque idem videtur delectari sensu, et aestimare ratione? — Divera esse fateor.* (DMV19.23; p 412; M560) cf. Nash, *op.cit.*, p 41f who discusses the difference between sensation and knowledge in *De Quantitate Anima*. 

143. above pp 96-102

144. DMV19.23

145. *Nos ergo in istis generibus numerandis et distinguendis unius naturas, id est, animas motus affectionesque dispicimus.* (DMV19.24: p 414; M562)

146. DMV19.24

147. *... quanquam et sonantium nomen mutandum putem, quoniam si*
of the discussion so far, and the changes of name, incline me to read chapter nine as the conclusion of his description of pre-cognitive psychological activity, rather than the beginning of the next section of text. Just as the next chapter opens with a summary of the whole of the *De Musica* to that point,\(^{148}\) so this ends with the *ratio* and its contents, the cognitive *numeri judiciales* as central to all the soul's activity.\(^{149}\)

The activity is divided into three stages:

I *numeri corporales* (the physical world)

*numeri occureores*

II *numeri progressores* (collecting and projecting)

*numeri recordabiles*

III *numeri sensuales* (pre-cognitive evaluation, feeling)

*numeri sensuales*

III *numeri judiciales* (critical judgement, *ratio*)

The human soul is distinguished by its capacity for cognitive awareness that it is acting (feeling, doing) of itself or by means of its body. This capacity is additional to the pre-cognitive processes which constitute sensation. The spontaneous exercise of evaluation which is at the centre of sensation (*numeri sensuales*) is represented cognitively as feeling. Such awareness distinguishes perception from sensation\(^ {150}\) just as sensitive activity in the soul is to be distinguished from the *numeri corporales* which inspire it. Perception, however, depends not only on the representation of feelings but further on those rational forms which enable it to identify and distinguish anything at all.\(^ {151}\) The spontaneous exercise of evaluation which characterises feeling is put to a further test by the reflective judgement of reason, not so much in order to displace its spontaneity but in order to clarify on what principles such behaviour rests, and to value its worth in these terms.\(^ {152}\)

Augustine's own analysis

\(^{148}\) above pp 96,97.

\(^{149}\) cf. Stefani, *op. cit.*, p 22f.

\(^{150}\) and, it seems, the higher mammals from other animals; cf. DMI4.6.

of sensation is itself an instance of such clarification. Its classes of numeri are, as classes, cognitive divisions which enable the soul to understand the pre-cognitive process of sensation.

Sensation takes place without reflexion, as in the lower animals. This similarity with animals is noted in book one and represents a feature of intelligence which is not uniquely human.153 Humans and animals also share the power of recall. This power is intentional in that what is recalled is built out of the soul's own material and consists only in that information which the soul has at its disposal. Pre-cognitive images may be only partially remembered, and thus only partly congruent with their counterparts in the world.154

The spontaneous exercise of evaluation which exhibits itself in reactions of pleasure or pain is peculiarly aesthetic in the De Musica. This odd conflation of vegetative and sensitive modes might be explained in Plotinian terms as the soul only becomes aware of its vegetative functions through the senses and sensitive activity.155 Similarly, although rational judgement may be detached from sensitive reactions, such a detachment is only to be understood via the ratio itself. Perception, the engaging of reflective thought, necessarily entangles the soul in some evaluation of pleasure or pain which attempts to discover a pattern which might explain the experience. As the soul refects so it interprets its experience in terms directed by the ratio. 156

The soul is caught in the flow of time. Its attention to that world involves it in a constant re-evaluation of its images in order that the flow itself may be comprehended. The information it generates about the world, as its consciousness tries to make sense of its extension, is collected and unified: held in the soul via the memory in terms of numeri which transform this flow as they represent it. The condition of time and


153. above p 50.

154. cf. the distinction between sensus and are at De Quantitate Anima 33, pp 70-6.


space is transcended by a synthesis of experience in terms of pattern. But the sensitive soul is limited by its capacity to generate information, and to be aware of the constant flux of time itself.

Ratio is essential to cognitive thought. The patterns of ratios which constitute verse are conceived in terms of those normative standards which define ratio itself - numerical laws. What is understood by the delight generated on hearing verse is those proportions which describe the rhythmic pattern in rational, numeric, terms. To know about the world requires two things: sensory experience and rational activity through which the soul itself comes to apprehend and distinguish that experience. This involves both reflexion (contemplation) and finally an apprehension of the structure which permits that reflective activity.157

Cognitive thought and the memory

The full extent of Augustine's theory of sensation and perception is to be found in the section of book six on the contents and function of memory, presented in terms of ratio. Just as memory plays a central rôle in pre-cognitive behaviour, its rôle vis-à-vis cognitive activity is central as it collects and projects images of both the temporal and eternal world. The contents of the memory, which correspond to passions in the body, are "movements of the soul" called phantasiai.158

Immediately as if to reinforce the point that phantasiai represent the numeri corporales felt via the passions, Augustine reminds the reader that these are in themselves no sure guide to the truth but are merely 'opinion'. There is a distinction between what is thought and what is perceived; in themselves, phantasiai can be wrong about what they

157. Augustine's distinction between sensation and perception may derive from a similar distinction in Plotinus between various levels of the soul. (Blumenthal, pp 137-138). These levels result, for Plotinus, in a theory which has two faculties which remember: one pertaining to the higher and another to the lower facilities, the former producing the latter. This is a consequence of the metaphysical division between Noûs and Soul. (Blumenthal, pp 87-93, based on Ennead IV3). Augustine does not require two memories for obvious reasons.

158. Haec igitur memoria quaeamque de motibus animi tenet, qui adversus paetiones corporis acti sunt, [phantasiai] graecae vocantur; ... (DMVII.32, pp 426, 428; M578, 580).
represent. Not only do they not contain what they represent, but they are peculiarly intentional images which depend as much on what the soul generates as what it collects from the world. Indeed, these images themselves generate further images, which not being primary representations of the world, he calls phantasmata.

Augustine's own example demonstrates the difference between phantasial and phantasmata very clearly. He thinks of his father because he has seen his father. He thinks of his grandfather perhaps because he assumes his father had a father, or because he has heard tell of him. Phantasial are formed in the memory, phantasmata originate from these prior memories (by extension). Both kinds are imaginary. The latter depend on the former in that without them, nothing can be generated. If he had never seen a human body, it would not be possible to think of one out of other visible forms.

It is a mistake, he argues, to take either of these images for the facts. The soul, by its own power, generates both kinds of image. Yet it must vigilantly remind itself that it deals with images and not actual states of affairs. It means that thinking is never directly connected with sensible objects. That does not, however, mean that thinking cannot be...

159. ... quas pro cognitis habere atque pro perceptis opinabilis vita est, constituta in ipso erroris introitu. (DMVII.32; p 428; M580).

160. Patrem deinque me habuisse et avum, non temere possim dicere: ipse autem esse quos animus meus in phantasia vel in phantasmate tenet, dementissime dixerim. (DMVII.32; p 428; M580, 582).

161. Sed sem sibi isti motus occureant, et tanguam diversis et repugnantibus intentionibus flatibus aestuunt, alios ex alis motus parint; ... (DMVII.32; p 428; M580, 582) cf. Blumenthal (op. cit., pp 87-88) who notes "there is no reason why the percept should not come to what remembers it as an image or representation...". This is based on Ennead IV.3.29.

162. passionum corporis impressi de sensibus, similis tamen tanguam imaginum imaginis, quae phantasmata dixi placuit. (DMVII.32; p 428; M580)

163. Horum primum phantasia est, alterum phantasma. Illud in memoria invenio, hoc in eo motu animi, qui ex ies ortus est quos habet memoria. (DMVII.32; p 428; M580)

164. Arbitror tamen, quod si nuncum humana corpora vidissem, nullo modo ea possem visibili specie cogitando figurare. (DMVII.32; p 428; M580)
factual. It is not absurd to say “I know I had a father and a grandfather.” Although “I know” in this case glosses “I have sensed” or “I imagined”.165

Augustine’s theory is representational. The soul has no direct experience of the space-time world. How is it then that the soul can ever know if its phantasiai and phantasmata are congruent with what they represent? The short answer is that it cannot, it can only have opinions about the world.166 But it is not that these opinions never represent ‘the facts’ for Augustine. He is neither a solipsist nor a skeptic. It is just that the memory by itself does not guarantee such correspondence, nor do the senses. It is the power of ratio which forms thinking such that it is not beguiled by its own imaginings, or its own intentions.

Throughout this passage Augustine speaks of movements (motus) in the soul. This term captures the essentially dynamic character of the soul’s activities. It also captures the temporal quality of that activity. The memory collects movements and presents them in a static form, as if they were present. Ratio then evaluates these forms in the light of its own numeri. These numeri are themselves motus, but of a different kind, spirituales, and are also contained in the memory.167

The soul’s activities of thinking, feeling, reasoning, deciding, and so on all take place over time. As these occur they are recorded in the memory. The memory makes the temporal flow, which is dynamic, into a static structure which it is possible to comprehend at once. The continuing flow of time makes such moments less useful in themselves. It is necessary for us to be constantly evaluating this static record of the past in the light of the present and vice versa. This was the point of his earlier discussion of the rôle of memory in sensation.168 It is central to his views on cognitive activity.

165. DMVIII.32
166. cf. DMVI13.42; p 14.44.
167. Excipit autem memoria non solum carnales motus animi, de quibus numeris supra iam diximus; sed etiam spirituales, de quibus breviter dicam. (DMVI12.34; p 432; M584)
168. DMVI8.22
For Augustine, to think about anything involves images. It also involves a continuing dialogue between the parts of the process of thinking. Images are the contents of that dialogue. They are constantly informed, however, by the operation of reason and the (further) operations of the senses in relaying information to the mind. Factual claims, as they are made about the world, need to be informed by whatever goes on in the world. The phantasai generated in the soul are checked against further phantasai and, after a while, the correspondences permit the further claim that something is a fact. It is 'known' to be true because of certain principles the soul holds about the continuity of objects, based ultimately on the experience of continuity itself. Even if the world were not as it appears to be, those appearances seem continuous enough, and they work well enough as the soul deals with the world; whatever the world might 'really' be is of no consequence to the irreducibly inner life of the soul.\(^{169}\)

This inner dialogue is also a feature of some remarks Augustine makes in the *De Magistro*.\(^ {170}\) There he is talking of learning. This process is, too, an inner activity:

"When we are asked about [sensible things] we reply if they are present to our senses, for example, if we are looking at the new moon and someone asks what it is or where. If our questioner does not see it he believes our words, or perhaps he does not believe them, but he learns nothing unless he himself sees what he is asking about. When he sees he learns not from words uttered but from the objects seen and his sense of sight. ... When the question concerns not things which are present to our senses but which once were, we do not speak of the things themselves, but of images derived from them and imprinted on the memory. ... These memorials belong to us privately. If anyone

\(^{169}\) Augustine discusses the role of memory in relation to cognitive activity at *Confessiones* X and *De Trinitate* XI. These passages are amply discussed, *inter alia*, by Bubacz, *op.cit.*, Ch. 4 "Memory", who also includes a lengthy analysis on the problem, for Augustine, of perceptual error. (esp. pp M14-19) cf. also Nash, *op.cit.*, pp 54-59 who notes a similarity with Descartes.

hears me speak of them, provided he has seen them himself, he
does not learn from my words, but recognizes the truth of what I
have to say by the images which he has in his own memory."171
In this case the learning process involves an experience of that to be
learnt. It is impossible to learn something without that experience. The
memory is involved as it holds as present a process which takes place over
time.

On the other hand:
"When we have to do with things which we behold with the mind,
that is, with the intelligence and with reason, we speak of
things which we look upon directly in the inner light of
truth..."172
Understanding is an inner activity which involves reasoning about the
images apprehended directly by the soul. In this case error involves
"taking part of the truth to be the whole truth."173 Memory, again, plays a
central rôle. As it collects what the soul immediately apprehends and
presents ideas for inspection, so it can not present those ideas complete.
Its vision is distorted by its participation in the *carmen universitatis*,
taking what it knows for the whole.174

The central rôle of memory in cognitive activity is at once most
necessary and most dangerous. As it collects the flow of images into
patterns it may distort that flow through its own inability to apprehend
the flow itself. As it transcends that flow its contents become
increasingly static structures, abstract and universal. They involve the
soul less and less with sensibles, apprehended *via* the flow, and more and
more with the abstract, characteristically numeric, contents of *ratio*


172. *De Magistro* 12.40 (tr., *ibid.*).
173. Bubacz, "*visio intellectus*, *op.cit.*, p 137.
174. This is a feature of Augustine's earliest writings. cf. O'Connell,
*Early Theory, *op.cit.*, pp 191-192 where he notes some early material
on learning in *Soliloquia* III14.25, 15.27, 19.33-20.34.

Augustine

*De Musica*
Augustine puts this last point with that characteristically moral tone which accompanies his (Plotinian) view of the relation between the temporal and the eternal. The soul is encouraged to "turn back" from a delight in the "carnal" senses to a delight in rationis numeris themselves. Delight locates the direction of the soul's attention. As it takes a more rational, universal view so it becomes more able to overcome those distortions of its inner vision generated by time.

That undistorted vision is also stored in the memory. The soul is acquainted with aequalitas not via the numeri corporales but via the eternal and unchanging ideas which originate in God. Indeed nothing is known or understood without these ideas which determine the form which the soul's images take. If, as Augustine argues, the space-time universe is largely formed of imperfection, then to detect an equality must involve the operation of some numeri which do determine whatever is equal.

I have argued that beauty, in the De Musica, is never identified with aequalitas and numeri, it is accompanied by them. Beauty, an intelligible quality, is simple and undivided. Beautiful things, however, exhibit that quality through their aequalitas. Numbers themselves, for instance, exhibit aequalitas not only as they may be paired together but also in themselves: even numbers may be equally divided; odd numbers have equal divisions about a central one.

175. DMVI1.33. O'Connell (Early Theory, op.cit., p 170f; Art, op.cit., p 77) discusses the Plotinian inspiration of this passage and its consequences.

176. DMVI2.36; passim

177. DMVI2.34; note esp.: Illam quippe aequalitatem quaero ubi esse arbitraris, quam intuentes cupimus aequalia esse quaedam corpora vel corporum motus, et diligentius considerantes eis fidere non audemus. (p 432, M586)

178. Above p 110

179. An aliud quam aequalitatem numerorum esse arbitraris, cum paria paribus bina membra respondent: quae autem singula sunt, medium locum tenent, ut ad ea de utraque parte paria intervalla serventur? (DMVI13.38; p 442; M596) This is a rather cryptic way of putting a simple pythagorean classification of numbers.
Colour is a quality discovered in bodies though light which may be either too bright or too dark. (Similarly sound may be either too loud or too soft.) The effect of too little or too much is not a consequence of a temporal change but a natural limitation (modo) of the senses. Other creatures have different natures. He argues that this natural capacity is an ability to become acquainted with aequalitas in a more subtle way. Sensibles please, of course, as like is matched to like. Even though colour remains a "simple" quality, it is still numerositas, either because of the natural aequalitas of intensity, or because it pleases as one is matched to one. 180

Augustine attempts to shew that even simple qualities exhibit aequalitas and it is that which pleases. The argument is characteristically numerical, but applies only to sensible qualities. It is in two parts. First, the effect of the intensity of light or sound on their respective sense-organs depends on those organs' natural capacity to be stimulated. Extremes of intensity are rejected as being unequal to the organs' capacities. Second, sensibles are perceived as like to like. Again this is a form of aequalitas as unity is equal to itself. The whole apparatus of sensation and perception depends on this principle as numeri match numeri, or fail so to do.

He has not explained, however, the details of such one-to-one correspondence. It is not clear just how an individual colour is perceived as it corresponds to some colour in the memory. The inner dialogue between numeri seems rather stretched when it comes to individual, simple qualities. Are there ideas of colours imprinted on the memory at birth? Does the soul simply apprehend colours in their eternal beauty? He offers no solution to these problems beyond arguing that the sensible pleasure of colour is a consequence of the numerositas of sensation itself. 182

180. DMVI13.38, p 442, passim, cf. O'Connell (Art, op.cit., p 16f) who claims that Augustine's theory of beauty is inconsistent. This passage attempts to overcome that alleged inconsistency by demonstrating that even simple unity pleases by being "like" itself: a numerical solution which invokes the principle of aequalitas as applying to the unity of individuals.

181. cf. DMVI7.18.

182. DMVI13.38

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To return to prosody: Number, there, is the archetype whereby verse is made and known as *verse*. These *numeri* persist in the memory of the poet as they form that capacity to produce (correct) verse. They constitute the skill. Augustine comments that the process is inner in that the soul, if it has forgotten some of the skill, "moves" itself as it recalls.183 Something it has completely forgotten, like last year's breakfast, can never be recalled. To recall is to recover *numeri* already possessed by the soul. The inner process of recall is invoked as evidence for the pre-existence of *numeri* which inform the understanding. The soul discovers them in the contents of its memory as it "moves within to God."184

External questions' prompting of an inner recall of information already recorded in the soul is, of course, a version of the Platonic doctrine of reminiscence. The memory contains *numeri* which were printed there not *via* experience but *via* its spiritual vision of the divine. In this case *numeri* *iudiciales* which form the contents of *ratio* are themselves an active form of *numeri* *recordabiles*. Once apprehended, *iudiciales* are imprinted in the memory and form part of the matrix of phantasias and phantasmata with which the soul operates.185

Augustine seems to have been undecided as to whether the unchanging *numeri* which form thought itself were contained in the memory, or simply apprehended with the aid of divine illumination.186 Whatever the case, the memory is central to the soul's cognitive activity as it collects and projects information gathered over time. Without it the soul would be unable to engage in any cognitive activity. It is the locus of that spiritual quality of timelessness which permits the soul to rise above its temporal condition and begin to understand and "to see as a whole" its condition. It understands by invoking those eternal *numeri* which are

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183. DMVII 2.35

184. DMVII 2.36; this whole passage recalls that at *De Magistro* 12 quoted above. cf. Edward Booth "St Augustine's *notitia sui* related to Aristotle and the early neoplatonists." *Pt. IV Augustiniana* 28 (1978) 184-187, who compares Augustine's distinction between memory and remembering to Aristotle's.

185. Nash (*op.cit.*, p 55) notes a passage at *Epist.* 7 which explicitly makes this comment.


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essential to all thinking as they form thought itself.187

Cognitive activity is explained, as was pre-cognitive activity, in an explicitly numerical way. Thinking involves the deliberate arrangement of the contents of the memory in the light of numeri iudiciales. It is an activity of the soul which transcends the flux of time as it comprehends more and more the structure of the space-time world. Thinking about sensation is perception: the generation of images about the world. These images will be more or less accurate representations as they are formed in the light of the soul’s vision of the intelligible ideas. That vision requires a retreat from temporal experience, an attempt at transcendence through which the soul comes to more complete apprehension. The soul delights in the congruence of its experience with its expectations. When it delights in the transcendent vision the congruence is complete.188

The Divine Order

Musica, among the disciplines, is the only one which has an immediate and discernible effect on creatures which are thought to have no ratio. It has a similar effect on humans, quite apart from the delight it engenders as an intellectual discipline. In order to explain how numeri corporales can have this effect, given the natural superiority of soul to body, the elaborate apparatus of sensual and cognitive numeri is introduced and examined. The focus, then, of Augustine’s treatment of mental apparatus is the relation of soul to the world it inhabits via the body.

This is not, in fine, a ‘natural’ home for the soul, which yearns to abide with God in a perfect timelessness. Yet, in its present condition,

187. cf. Nash, op.cit., pp 62f, 74; TeSelle, op.cit., pp 104-105; Blumenthal (op.cit., p 96) argues that for Plotinus the soul always lives among the intelligibles and so there is no need to explain their presence in the soul via the memory. The soul need only look to see, as its judgement conforms to an intelligible archetype. (p 105f)

188. Augustine reconsidered the whole question of memory at De Trinitate VIII-XV. That discussion is highly metaphysical and also discussed in terms of self-knowledge which is not at all considered in the De Musica; it follows from the more subjective discussion at Confessiones X. Here discussion is directed not so much to the persistence of a self over time as to the persistence of numeri over time and space informing the understanding. (See Booth, op.cit., passim)
soul is limited to places and times; it can only partially overcome this problem. As Professor O'Connell argues

"Both Plotinus in Ennead III, 7 and Augustine in the *De Musica* are explicitly concerned with the soul's temporal condition, with its capacity to measure time and what that implies. Both throw the question back to the soul's original condition in eternity. For both of them, being in time is, for the soul, a fallen condition..."189

He also suggests that the whole tone of Augustine's account of the temporal life is expressed in terms Plotinian in origin.190 The final chapters of book six are riddled with literary references which confirm Professor O'Connell's reading.

Of singular importance is the soul's "capacity to measure time". One image with which Augustine illustrates the manner of this capacity is his *carmen universitatis*. On the one hand the order of creation appears as an artifact in eternity; on the other it is still a word being spoken, or, perhaps, a poem composed as spoken. This dilemma is unresolved by talking of the song "in" eternity, as if there were before and after in its timelessness. My distinction between 'static' and 'dynamic' viewpoints is an attempt to resolve this problem. Augustine himself never successfully negotiates it, and the constant shifting from one to the other view is a difficulty encountered when trying to describe Augustine's views.

This difficulty is not resolved by choosing one viewpoint and interpreting remarks made from the other in its light. There is a genuine tension in the text of the *De Musica* which is never more apparent than in the closing chapters of book six. The soul is turned away from its contemplation of the eternal and unchanging as it contemplates its image over time. It recognises via its acquaintance with the eternals, a changing *(mutari)* sequence of equalities ("at one time this, at another something else") which itself produces a variety of times not to be found in eternity itself. Yet, in spite of its temporal condition, it should hold the eternals in greater regard than those things inferior to them. Such a disposition *(affectio)* or movement is prudence. It is a way of


dealing with the hazards of temporal existence.191

The soul becomes distracted from the eternals when it ceases to love them, and turns from that love to the succession of its body’s passions.192 The soul loves what is beautiful;193 however it interprets that beauty it is that which pleases.194 So beauty pleases via the aequalitas of numeri.195 This is true of both temporal movements and also visible forms like colours.196 As it cares for these numbers so it becomes curious about them, plunging itself into vanity away from the truth.197

A "general love of activity" turns the soul from truth. The soul prefers to imitate God rather than to serve: this is the sin of pride.198 Augustine explains the turning to activity as pride because, as Professor O’Connell notes,199 he understood a passage in Ecclesiasticus X (9-14) in Plotinian terms: "The beginning of man’s pride is turning from God."200 The soul "puffs up" with pride and moves away from the unity which

192. Facile id videbis, si animadvertiris quibus rebus maxime animam soleamus intendere, et magnum curam exhibere: nam eas opinor esse quae multum amamus: ... (DMVI13.38; p 440; M596) Amor igitur agendi adversae succedent es passiones corporis sui, avertit animam a contemplatione aetemorum, sensibilis voluptat is cura etiu avocans intentionem: ... (DMVI13.39; p 444; M600)
193. Dic, ore te, num possenum amare nisi pulchra? (DMVI13.38; p 440; M596)
194. Nam ea neminem amare manifestum est, quorum foeditate sensus offenditur. (DMVI13.38; p 440; M596)
195. Hae igitur pulchra numero placet, in quo iam ostendimus aequalitatem appetit. (DMVI13.38; p 442; M596)
196. See above p 137.
197. ...et ex his curiositas nascitur ipse curae nomine inimica securitat is, et vanitate impos veritatis. (DMVI13.39; p 444, M600) This section lists again all kinds of numeri but the iudiciales. cf. O’Connell, Art, op.cit., p 77f.
198. Generalis vero amor actionis, quae avertit a vero, a superbia profiatione quo vitio Deum imitari, quam Deo servire anima maluit. (DMVI13.40; p 444, M600)
200. "Initium superbiae hominis apostat are a Deo; ..." (DMVI13.40; p 444; M600, Ecclesiasticus X.14)
ensures the structural order of its thinking.\textsuperscript{201} Its \textit{numeri} and movements (\textit{motus}) are directed away from a vision of the truth.\textsuperscript{202}

The apparatus of sensation is perverted to selfish ends. \textit{Numeri progressores} become manipulative of the surrounding world rather than simply directive. The soul becomes self-absorbed in its \textit{numeri occurrentes}, blind to everything but its own. Its images are distorted fantasies. The soul's capacity to evaluate is clouded and \textit{numeri sensuales} become the arbiters of behaviour, examining what kind of behaviour is needed and how the soul will communicate with others.

Augustine began his argument with a puzzle. The soul knows that it ought to prefer the eternals, yet it is distracted.\textsuperscript{203} It lacks the power to turn back because it is entangled (\textit{implicata}) in its own directed attention (\textit{intentiones}).\textsuperscript{204} The temporal extension itself distracts as the succession of events fascinate the soul, stimulating its curiosity. The moral tone of the argument is embedded in the initial valuation of eternals over sensibles as the former orient the soul to God, which is truth. Such valuation takes a vision of the cosmic order, the \textit{carmen universitatis}, as essential to the true apprehension of reality. It is necessary to work within the laws of that universal structure. To attempt to be like God, to master other rational beings, is a breach of the moral law which is also formed such that eternal is superior to mortal.\textsuperscript{205} \textit{Aequalitae}, as a principle of divine \textit{ordo}, similarly enjoys a certain moral weight.

\begin{itemize}
\item \textsuperscript{201} \textit{... in ordine suo manente, ipsius Dei praesentia vegetatur in mente atque conscientia. ... Quare superbia intumesescere, hoc illi est in extima progredi, et, ut ita dicam transcere quod est minus minusque esse. Progredi autem in extima, quid est aliquid quam intima proietere; id est, longe a se facere Deum, non locorum spatio, sed mentis affectu?} (DMVI13.40; p 446; M602) The Plotinian tone is unmistakable; cf. O'Connell, \textit{Art., op.cit.}, pp 78-83.

\item \textsuperscript{202} \textit{Et his igitur numeris et motibus quibus animae ad animas agunt, honores laudesque appetendo avertuntur a perspectione purae illius sincereae veritatis.} (DMVI13.41; p 448; M604) This passage is fully discussed at O'Connell, \textit{Art., op.cit.}, p 81f.

\item \textsuperscript{203} DMVI13.37.

\item \textsuperscript{204} \textit{His tot et tantis intentionibus anima implicata, quid minum, si a contemplatione veritatis avertitur? ... Ex quo fit ut non simul habeat anima nosse in quibus consistendum sit, et posse consistere: ...} (DMVI13.42: pp 448, 450; M606) cf. O'Connell, \textit{Art., op.cit.}, p 82.

\item \textsuperscript{205} cf. Stefani, \textit{op.cit.}, pp 21f, 26-29.
\end{itemize}
Scripture admonishes that love of God and neighbour will direct all numeri and motus to that end. This returns the soul to its perfection. Love of God directs the attention away from the more laborious world to that where there is nothing unequal, nothing unlike, nothing extended in time or space. The soul seeks "constancy and eternity" as it attempts to make sense of temporal movement, attempts to transcend by love.

Numeri corporales may be directed to bodily well-being, rather than to carnal pleasure. Numeri in the soul may be directed not to pride but in more useful ways. Soul and body may work in harmony as the soul regulates its feelings in order to either "approve or disapprove" sensible things. Such activity does not involve the soul in its own operations, but leaves it free to pursue the good of its neighbour.

The intense moral tone continues as Augustine now argues that the soul must needs keep order rather than be kept by it. Even in its disordered love of inferior beauty it cannot escape the ordo. So it must learn its own rôle which is to love God and its fellow souls. It would also continue to deal with the sensible world without being disordered by it. In this context, the temporal circuit is a good place to be. Mortal numeri, created by divine providence, are taken in their kind, to use well, even for enjoyment. Each is like a plank in a flood, neither should it be discarded nor should it be thought particularly stable.

Numeri, which are extended in time, reflect those which inform the ratio. The soul understands by means of this fundamental integration between modes of being. Augustine turns once again to prosody when he notes that the numeric pattern of feet constitute their structure, that is,
a "bond of order" measured by the senses but only comprehended by ratio which originally discerned a structure apart from its many instances.\textsuperscript{211}

The spiritual life can only be fully experienced within a perfect, resurrected body oriented to the unchanging. The divine order is perfectly realised as the soul remains completely undistracted by temporal movement. The succession of events which constitute such movement involves the soul in a troubled busy-ness which induces it to neglect the order of universal law. Yet this movement is, itself, part of the universal law.\textsuperscript{212}

Vice, it was observed, is a turning to goods rather than to God.\textsuperscript{213} Only when the soul's desires are properly oriented to the divine order will it not be dominated by its own intentional imagery. The interior life is a constant struggle against beguilement. To overcome this interiority thought must be directed away from itself to the intelligible ideas. Tension between static and dynamic viewpoints may be discerned in this description of the perfected soul. It is able to deal with its body easily and naturally. Its mechanism works so well that the soul itself is not distracted by it.\textsuperscript{214} One of the advantages of the apparatus of numeri is that is provides Augustine with a way of accommodating the tension in a numerical structure which unites body, soul and God.

But this is an ideal. Augustine is concerned first to account for a life in the body. His sensitivity to this condition produces an ethical reflexion which invokes the classical virtues as dispositions which help to turn the soul's attention away from itself.

It is only prudent to direct attention to the eternals because they are the divine order. To maintain this orientation the soul must deal with its tendency to be distracted by living temperately. It rises above the mutations of temporal existence by exercising fortitude.\textsuperscript{215} Through its disposition to behave in accordance with the divine order it acts

\textsuperscript{211} DMVI14.47; passim.
\textsuperscript{212} DMVI14.48; passim.
\textsuperscript{213} DMVI14.46; cf. TeSelle, \textit{op.cit.}, p 111.
\textsuperscript{214} DMVI15.49 cf. TeSelle, \textit{op.cit.}, p 107f.
\textsuperscript{215} DMVI15.49, 50

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This life is sustained by the ratio. It takes as its proper object the numeri which characterize the divine order so that the virtuous life is one lived through reason. Augustine had previously given strong expression to that perfection in the De Ordine where he concluded that the unity of understanding is located in the ratio which allows the soul to analyze and synthesize:

"... by trustworthy reason ... the soul leads itself little by little to most virtuous habits and the perfect life. For, to the soul that diligently considers the nature and the power of numbers, it will appear manifestly unfitting and most deplorable that it should write a rhythmic line and play the harp by virtue of this knowledge, and that its life and very self - which is the soul - should nevertheless follow a crooked path and, under the domination of lust, be out of tune by the clangour of shameful vices. But, when the soul has properly adjusted and disposed itself, and has rendered itself harmonious and beautiful, then it will venture to see God, the very source of all truth ..."  

Augustine’s location of these virtues at the centre of the ordered life, creating and sustaining it, was probably suggested by Plotinian’s own description of their rôle in purification. As he developed his theory that the virtues are forms of love itself and will survive in the soul’s perfected state, he may have been influenced by Origen on the Song of Songs who defines virtue as well-ordered love. Such a view accords well with his structural account of the soul’s ideal state. The soul, by transcending the temporal round, seeks a synthesis of its activity. So his inclusion of some description of the virtuous life represents a moral perspective on the central problem of the relations between body, soul and God.

216. DMVI15.50

217. De Ordine II 19.50-51 (tr. FCl, p 327f); cf TeSelle, op.cit., p 87f.

218. Ennead 16.6 (cf. 12.4; VI 6.6); this is the opinion of O’Connell (Ant, op.cit., p 86 and n 94) who follows Thonnard (BA, note comp. 86, pp 55-520), and TeSelle (op.cit., p 111f).

219. TeSelle (op.cit., p 112) argues this point and notes a correspondence with Varro and the Stoics.
In its attachment to God the soul experiences its greatest pleasure. It is prudent, therefore, to get to know God.\textsuperscript{221} Fixing the direction of its love, its dispositions, towards God enables the soul to avoid privation and to act with rectitude, justly in accordance with divine \textit{aequalitas}, and thus temperately with respect to its distractions.\textsuperscript{222} As it is sustained by this communion it reacts with fortitude, a disposition which protects the soul from adversity.\textsuperscript{223}

It is difficult to see how the virtues themselves characterize the soul's contemplative attention. Augustine was aware of this problem and offers his vision of virtuous perfection tentatively.\textsuperscript{224} It serves, however, to clearly identify the moral position of his whole treatise. Participation in the divine order necessarily involves a participation in a perfect moral order which directs the relations between souls. All relationships of domination were strongly condemned\textsuperscript{225} as contrary to the injunction to love our neighbour.\textsuperscript{226} This spiritual vision turns the soul's attention away from selfish concerns and directs it towards sustaining a common life, itself ordered and peaceful.

Yet the logic of Augustine's position leaves some doubts. His synthesis of virtuous activity remains one for individuals rather than a moral life lived within a community. The tensions his Plotinian theme of fall and return create for a distinction between temporal and non-temporal viewpoints inhibit him from working out the full consequences of the pythagorean imagery suggested by the subject \textit{musica}. Augustine's soul is ultimately isolated in the divine order; at least, it cannot locate itself in terms other than its individual relationship with God. The psychological significance of virtuous behaviour remains similarly isolated.

\textsuperscript{220} cf. Stefani \textit{(op.cit.,} pp 32-35\textit{)} who also discusses the details of DMVI16, explored below; also O'Connell \textit{(Art, op.cit.,} p 86f\textit{)} who discusses this view in relation to community.

\textsuperscript{221} DMVI16.52; \textit{passim}.

\textsuperscript{222} DMVI16.53; \textit{passim}.

\textsuperscript{223} DMVI16.54; \textit{passim}.

\textsuperscript{224} DMVI16.55; \textit{passim}.

\textsuperscript{225} DMVI13.41.

\textsuperscript{226} DMVI14.45.

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These tensions are met again in the concluding passages of the treatise. He begins his synthesis of divine order with an exposition in terms of number reminiscent of Ennead VI 6. Number begins with one and is beautiful in its equality, bound by order.227 Everything desires unity. Sensible things are made from their originals, which are principles equal to them, and are related to one another as the numbers relate in unity.228 Similarly all things are beautiful, but in their order less and less beautiful according to their place.229 At the same time the soul is moved by numeri (and moves them) even in the "lowest corruption of the flesh," even to the soul's "damnation."230 The abstract and dispassionate numerical discourse is pervaded with terminology which values spirit over flesh, eternal over mortal in absolute terms. Such a valuation betrays the vision for Professor O'Connell,231 as throughout the text "more excellent" is taken to be a flight from all that the temporal condition implies - distrust of the unfolding, distended universe.

How this tension is resolved depends on which point of view is taken. It appears, though, that something like this tension is necessary for the soul to work best in its present body. The apparatus of sensation, and the cognitive images which the soul employs to deal with it, form, in the best sense, an undisturbed flow of spiritual activity which enables the soul to lead a fulfilling life. Tentatively, feeling is added to reason to complete a life of soul-in-body with which Augustine is confronted when he

227. Numerus autem et ab uno incipit, et aequalitate ac similitudine pulcher est, et ordine copulatur. (DMVI17.56; p 470; M634)

228. Quaobrem quisquis fatetur esse naturam, quae mens ut sit quidquid est appetat unitatem, surque similes in quantum potest esse conceptus atque ordinem proprium vel locis vel temporibus, vel in corpore quodam librantem salutem suam tenet: debet fateri ab uno principio per aequalem illi ac similem spectem divitias bonitatis eis, qua inter se unum et de uno unum charissima, ut ita dicam, charitate junguntur omnia facta esse atque condita quaeque sunt in quantumcumque sunt. (DMVI17.56, p 470; M634)

229. ... qui certe numeri minus minusque pulchri esse possunt, penitus vero carere pulchritudine non possunt. (DMVI17.56; p 470; M632)

230. ... ad infirmam carmis corruptionem ... sive damnatione animae ... (DMVI17.56; p 470; M632, 634)

231. O'Connell, Art, op.cit., ch. 4, passim, esp. p 87f.
reflects on the overwhelming experience of hearing the hymns and canticles of Ambrose's church. As much as he desires to "confess" his sensitivity, it remains an indissoluble factor in his life. The process of living is explained through the device of *numeri* which provide for a continuity between the separate parts of his ontological system. Numbers, their laws, their structure, their relations, which display the unity of ideas, their order and diversity, not only explain the thinking process, but also form the All about which it is possible to think.

232. *Confessiones* IX6-7, 13; X33.
The solitary struggle to understand its condition is overcome when the soul turns away from its selfish isolation, opening to both the world it inhabits of itself and that which it inhabits via the body. Mother Mary Clark asserts:

"Unity is not to be achieved by any reduction of matter to spirit, of the many to One, but by an enlargement of personal existence through identification with others. ... An earth is given, a cosmos is made. The great Augustinian theme of imaging God, which is man's approach to God by likeness, implies an involvement in the interpersonal process of self-communication and not a Porphyrian flight of the soul from matter or the body."\(^1\)

Such an involvement in the process of living is at the heart of Augustine's experience in Milan when he heard Ambrose's hymns sung so beautifully:

"I wept at the beauty of your hymns and canticles, and was so powerfully moved at the sweet sound of your Church's singing. Those sounds flowed into my ears, and truth streamed into my heart: so that my feeling of devotion overflowed and the tears ran from my eyes, and I was happy in them."\(^2\)

This integrated and powerful experience left its mark. The power of music to seduce the soul is one of the most profound phenomena known in the ancient world.\(^3\) It was a power to which Augustine was very sensitive yet with which he struggled as he strove to overcome the distractions of sense in order to contemplate the divine. He also writes:

"The pleasures of the ear did indeed draw me and hold me more tenaciously, but you have set me free. Yet still when I hear those airs, in which your words breathe life, sung with sweet and measured voice, I do, I admit, find a certain satisfaction in

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them, yet not such as to grip me too close, for I can depart when I will. Yet in that they are received into me along with the truths which give them life, such airs seek in my heart a place of no small honour, and I find it hard to know what is their due place."

He complains that his reason is overcome by an "enervating" bodily pleasure, and at other times he is too severe with himself when he wishes that:

"... the reader of the psalm utter it with so little modulation of the voice that he seemed to be saying it rather than singing it. ... Thus I fluctuate between the peril of indulgence and the profit I have found. ..."⁴

While he ends this passage with the complaint that this condition is an "infirmity", the freedom he seeks is not simply the excision of sensation. Rather, it is an avoidance of the interior beguilement of imagination derived from feelings; the soul moves away from its interior self towards the divine and its creation.⁵ This intellectual altruism guarantees that the interior life will remain attuned to the divine cosmos. Both thinking and feeling are part of that interior life. Thinking, unlike feeling, is directly informed by divine ideas. Feeling remains interior and largely imaginative. That is the source of beguilement. In order to overcome that isolation, Augustine recommends a rigid application of the rational principles which form cognition. And this is his dilemma: thinking is a dry and isolated activity. It needs the "enervating" power of sensation. The individual, that integration of body and soul, is located both in its relation to the divine and in relation to its friends, and to the world they inhabit together.⁶

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⁴ Conf. X. 33 (tr. F.J. Sheed).
⁶ Clarke, op. cit.
It is sometimes difficult to distinguish the way understanding takes place from what is to be understood. Augustine’s analysis of music in terms of the ascent of the soul via reason in the De Ordine is a case in point. The task of ascent is paramount. There is nothing in the ears but sound. The material for ascent is, rather, the “fixed measure of time and ... modulated variation of high and low pitch.” Reason follows sense only in order to determine in its own way the “fixed measure” and so extracts from sense number ratios as the “true” nature of music. Reason only “reluctantly endured their splendour and serenity to be clouded by the material stuff of vocal utterances.”

Despite his concession that “this branch of learning partakes as well of sense as of intellect”, the direction of learning forms utterly his perception of its “nature”. There is no attempt to confront the senses in order to understand sensation; they are forgotten, or rather, ignored, in the intellectual task. Sound is a symbol of the “splendour and serenity” of numbers as divine and eternal.

Augustine returns to the problem of sense and intellect in the De Musica. Again he is confronted by their integration and again he opts for an intellectual, and numerical, explanation. His task is to understand the phenomenon of musica in the context of the soul’s journey to the divine. That journey is still, fundamentally, an intellectual one. But it is intellectual because it is an attempt to understand, an attempt to penetrate the integrated experience. In order to understand the soul must engage in a dialogue not just with itself but with the larger world which it inhabits.

He must deal with the experience of music. That hymn by Ambrose, Deus creator omnium, has an effect which he is at pains to explain and justify. At the end of the sixth book it is clear that he feels he has explored all its significance. Further, notice the care with which Augustine expresses his experience in the Confessiones. Sounds flow into his ears; truth streams into his heart. His feeling of devotion overflows,
in the body it produces tears. And, as a consequence of all this carefully dissected activity, "I was happy ... ".9 This dissection conforms to that analysis of sensation and perception which forms the substance of De Musica VI. Sound in ears, truth in heart, feeling overflowing into (corporeal) tears, all explain the experience without ever betraying its powerful integration in happiness.

The direction of understanding forms the material to be understood in its own likeness. In the De Ordine that direction is the Varro-inspired journey of reason via the disciplines. In the Confessiones it is partly (and especially in the passages quoted above) the painful discovery of the disintegrated self and its integration through confession and conversion.10 In the De Musica his intention is to explain the apparatus of musical activity, and its effects, in terms which will both distinguish its parts and demonstrate their integration.

These terms are characteristically numeric. The harmonious relation of parts and whole is explained in terms of the numerical theory of relations, terms characteristically pythagorean. As an intellectual tradition, this theory provided many philosophers with a single device which explained the fundamental unity of an apparently diverse universe, and similarly the unity of ideas themselves. For Augustine, numbers are those objects of the intellect which first appear as "outside" the soul itself. They lead the soul away from its interior, imaginative life to one which guarantees that its contents will represent the structure of reality itself. Number forms the pattern of ideas which the soul discovers as it contemplates the divine.11

My reading of the De Musica has been based on this pythagorean attitude to understanding. The manner in which Augustine interprets his experience of musica is very complex, but at its centre is this pythagorean integration of ideas and world through number. This tradition is communicated by means of a Platonic/Plotinian distinction between the

9. Conf. IX.6

10. This assertion is made in full knowledge of the baffling complexity of the Confessiones. It is not meant as anything more than a hint at the reasons for his anguish at X.33 and his joy at IX.6.

eternal world of ideas which form the rational structure of the other world of space and time which the soul inhabits through its body. As a Christian Platonist, Augustine's soul is entirely a part of the created order. That order is itself part of God's plan and so he would partly reject the Platonic (and pythagorean) belief that the material world is in itself a source of evil.12

Rather, evil is located in the soul's rejection of altruism in favour of its interior life. As the soul thinks, it constantly forms its thought on the model of divine ideas. Any other attempt at understanding will fail because only these ideas inform the structure of reality. Thought cannot be formed on the model of the mutable world because then understanding would be subject to the very flux it attempts to comprehend. It must be founded on the determinants of being which are, significantly for Augustine, related to questions of unity, measure and order.13

These ideas invoke some numerical speculation. The soul's conception of being arises from its experience in time and the consequences of that experience. Time, here, is the soul's psychological conception of both the continuity and the discontinuity of the mutable world. As the soul attempts to understand its experience it is confronted with the mutable nature of its own reflexions. Understanding is one attempt to measure this process, to review it (via the memory) and to determine its worth. Numbers are the means of representing the extended flow of time and events in images which transcend the flow as they represent its structure.

The empirical question, how is a line of verse to be understood, is answered by invoking the (timeless) quantities which communicate its rhythmic pattern. Augustine's acute analysis of the means of communication, the psychological theory of De Musica VI, is a theory based on the interrelations of these patterns. Musica is a model for time itself. The rhythmic patterns of verse are collected in the memory and fitted together through an application of the laws of number. The soul's processes of judging, comparing and measuring are all formed on the model of number.


There are two ways of interpreting this model of integrated experience. As static, numbers transcend temporal movement in order to capture and represent its structure. They are the blueprint for what happens. As dynamic, numbers pattern what happens by their immanence to it. The relations between the parts of a line of verse are determined as they are measured by numbers. In this case it is the quantitative pattern which is immanent to the experience of sound. But to understand this is to leave that experience and take a more comprehensive view. The experience itself remains unimpaired and unique in the flow of time. So, numbers, as the model for understanding in the De Musica, are also the means by which the soul understands. Just as they are the objects of that understanding at whatever level to which it is directed. Augustine’s use of the term *numeri* to describe sensation provides him, then, with a complex apparatus capable of accommodating different perspectives and interpretations.

By way of further illustration, the centrality of pythagorean ideas in the De Musica is also evident when compared with Martianus Capella’s *De nuptiis Philologiae et Mercurii* and Boethius’ *De Institutione Musica*.

**Augustine and Martianus**

Like Augustine, Martianus Capella was born and lived his life in North Africa, in his case at Carthage. While it is not possible to accurately date his life, or the composition of the *De nuptiis*, it is probable that it was composed in the early part of the fifth century, contemporary with Augustine’s late writings. His education, which is reflected in the contents of the *De nuptiis*, was probably similar to Augustine’s. The loss of Varro’s *Discretinamem*, Apuleius’ Latin version of Nicomachus’ *Introduction*, and various compilations of these and Euclid’s *Elements* which were in circulation at the time, has made exact identification of Augustine’s sources for the *De Musica* (and Martianus’ for the *De nuptiis*) difficult. These books were the fundamental sources of later Latin authors’ knowledge of Greek science and mathematics and were important in


15. Ibid. pp 12-16.
the transmission of the pythagorean tradition to the Latin west.

I do not wish to claim that Augustine knew or used the De nuptiis; but rather, that there are significant similarities and differences between the relevant matter in it and the De Musica which intensify the evidence for Augustine’s own sources, and also the originality of his programme of providing a logical foundation for rhythm. The similarities also illustrate the continuity of the pythagorean tradition in numerical and musical contexts which at times spills into metaphysical speculation. 17

The opening hymn 18 indicates a general philosophical context heavily influenced by pythagorean and neo-Platonic cosmology:

"Sacred principle of unity amongst the gods ... You bind the warring seeds of the world with secret bonds and encourage the union of opposites by your sacred embrace. You cause the elements to interact reciprocally, ...; through you, Mind is breathed into bodies by a union of concord which rules over Nature, as you bring harmony between the sexes and foster loyalty by love."

The story of Mercury’s search for a wife bears this out, although it also contains many elements derived from other sources. Into this context the liberal disciplines are placed (as they were for the young Augustine) as a way of attaining the ideal of Wisdom, which Mercury most desires. 19

Philology’s apprehension about her marriage, which opens book two, 20 leads her to seek some sign in the numerological union of her name with Mercury. On calculation it turns out that her name reduces to four and Mercury to three. 21 Martianus then comments:

16. Ibid. pp 4-8, 44-53.
17. Ibid. pp 48-49; see also the description of Martianus in Part III "The Quadrivium", which explicitly details some possible sources.
18. De nuptiis II; Stahl, II pp. 3-4 (noted hereinafter simply by S with arabic numerals); cf. Ibid. pp 86-89.
19. De nuptiis 16 (S6).
"For the number three is certainly perfect, because it may be rationally arranged as a beginning, a middle and an end; it alone makes a line and defines the surfaces of solids ..."22

and so on with a list of the attributes of three. The perfection of three as having "a beginning, a middle, and an end" recalls Augustine's similar assertion.23 Philology's own number, four, follows in the number sequence and completes it. Martianus briefly notes those attributes which Augustine also uses in his passages on the tetractys:

"For the number four with its parts makes up the whole power of the decad itself and is therefore perfect ... Within itself it contains the one, the dual, the triad, and is itself the square of two, within which proportions, the musical harmonies are produced ... together with the whole range of songs."24

Philology's union with Mercury represents a union of "true proportion"25 as the numbers three and four are, with one and two, a complete numeric sequence and the foundation of all numbers.26

The two books relevant to this study are books seven (Arithmetic) and nine (Harmony). Stahl comments27 that Martianus' source for book seven may have been a digest or compilation of Apuleius' translation of Nicomachus and some other compilation of Euclid. His source for book nine appears to be some compilation of Aristides Quintilianus' Peri Mousikes, book one, which includes a section on rhythm and metrics.28

It is notable that arithmetic has two principal divisions: arithmetic proper and arithmology. Arithmetic proper is about the "nature of number" itself.29 On the relations between numbers, that of equality is "considered

22. De nuptiis II105 (S36).
23. DMI12.20.
24. De nuptiis II106, 107 (S36-37); cf. DMI12.23 (Augustine does not tease out the harmonic proportions as explicitly as Martianus).
25. De nuptiis III109 (S37).
27. op. cit., p 151f, esp. n 9.
superior to others”, as it is in the *De Musica*.30 Then come multiple ratios and lastly ratios of difference where the greater is not a multiple of the smaller. These may be divided into superparticular and superpartient ratios.31 This (correct) division follows Nicomachus and may be contrasted with Augustine’s (faulty) division.32 Martianus also notes that the number series is articulated into periods: 1 – 9, 10 – 90, 100 – 900, 1000 – 9000; and perhaps one beginning at 10000.33 Stahl notes34 that Martianus means these series as “turning points”. The subsequent discussion35 emphasises the primacy of the first decad. (“The only numbers that find favour with me are those that are counted on the fingers of both hands.”) In contrast to Augustine there is no attempt to demonstrate that the decimal pattern is the only possible one. But it would follow naturally from the primacy of the first decad. The assumption is that these numbers “contain” all the others.

Book nine, on harmony, opens with a long section in praise of Harmony and, therefore, the power of music. One passage reflects a specifically neo-Platonic view:

“But when the Monad and first hypostasis of intellectual light was conveying souls that emanated from their original source to earthly habitations, I was ordered to descend with them to be their governess. It was I who assigned the numerical ratios of perceptible motions and the impulses of perfect will, introducing restraint and harmony into all things.”36

Harmony is the twin of Arithmetic and uses the number ratios to "govern" the material world ("perceptible motions"). This attitude is also that of

29. *De nuptiis* VII743 (S285).
30. *De nuptiis* VII758 (S293).
32. DMI9.15-10.17.
33. *De nuptiis* VII745 (S286).
34. *op. cit.*, p 157 n. 46.
35. *De nuptiis* VII746 (S287).
36. *De nuptiis* IX922 (S357).
the *De Musica*. It is notable that this pythagorean tone is to be found at this specifically musical part of the treatise.

Harmony defines her subject, and its two main divisions, as follows:

"officium meum est bene modulandi sollicitia, quae rhythmcis et melicis astructionibus continetur."

The reference to *bene modulandi*, which is found in Augustine and Cassiodorus, may have been Varro's. Here there is no reference to *scientia*. Unlike Augustine, Martianus reports a tradition which, while based on numerical relations, is not bound to them and has its own conventional rules.

For instance, the definition of *modulatio*, which also occupies Augustine, is given only in terms of pitch:

"All musical movement [*modulatio*] consists of lower- or higher-pitch tones [*tonoi.*]"

This contrasts with Augustine's more thorough explanation in terms of *modus* and *ordo*. Augustine's idea, of course, is to locate music as an intellectual, rational discipline, not simply to rehearse the traditional facts of music theory.

A similar contrast may be observed between Martianus' explanation of rhythm and metre, apparently derived from Aristides Quintilianus. Rhythm is rendered both by the Greek *rhythmos* (defined as "a grouping of times that are perceptible to the senses and are arranged in some orderly manner") and the Latin *numerus* (defined as "the orderly arrangement of difference measures. ... subordinate to time, in accordance with a proper control of modulation by which the voice is raised or lowered ... ").

37. recalling the *carmen universitatis* (DMVII.29.30), note also DMVII.56-58.

38. *De nuptiis* IX30 (S359) and Stahl, *op. cit.*, p 206 n 13.

39. DMI2.2-3; *De nuptiis* IX32 (S361); cf. Stahl, *op. cit.*, p 207 esp. n 20.

40. Stahl, *op. cit.*, p 210 but see his n 25; *De nuptiis* IX966-967 (S372).

41. *Rhythmos* is *compositio quaedam ex sensilibus collata temporibus, and numerus, est diversorum modorum ordinata conexio, temporis pro ratione*.
This distinction is intensified by Martianus's further remark that for something to become rhythmic it must be infused by *materialia numerorum* whereas rhythm itself is *artifex aut species modulationis*. Rhythm, too, has to do with motion, now of time as well as pitch. The rational qualities are distinguished as *numerus*, whose definition contains phrases which recall Augustine's own preoccupations (*modorum ordinata conexio, ratione modulationis inserviens*). Rhythm itself, and rhythmic things, are the *materialia numerorum*. This is Martianus's subject, in contrast to Augustine who is more interested in a rational analysis of rhythm which will lead to the philosophical discussion of sensation and perception where *numeri* play such an important part.

Despite this difference, there are several correspondences between the details of Martianus's and Augustine's systems. Each has an indivisible unit of time (*tempus*) on which the rhythmic patterns are built, based on the short syllable. The foot is the primary rhythmic unit and has two parts, arsis and thesis. Feet themselves are numerically related. All of this is the common property of any system describing rhythm and metre.

But Martianus's discussion does not follow a strictly *numerical* division of feet, metres, and through them, to verse. It describes metrical device in terms of basic rhythms, or *genera*, although there is a constant reference to the numerical ratios involved. There is no overall programme to codify the many kinds of feet into a complete rational system based on aequalitas. And there is no discussion of verse forms, only of the varieties of feet.

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42. *De nuptiis IX*967–968 (S373).
43. *De nuptiis IX*971 (S373–374); DMII3.3.
44. *De nuptiis IX*974 (S374).
45. *De nuptiis IX*975 (S374).
46. cf. *De nuptiis IX*977 (S375).
Augustine and Boethius

The *De Musica* is notably free of the usual cosmological speculations and associations in which many pythagorean authors indulged. However, its form of numeric rationalism is also apparent in Boethius' treatise on music which was so influential in the middle ages. The explicitly pythagorean rationalism of that treatise, compiled as it is from Nicomachus' *Harmonica*, is undeniable. Some comparison between Boethius' view and Augustine's may serve to strengthen the case for a strong pythagorean influence on the *De Musica*.

The *De Institutione Musica* is incomplete. The promised treatment of *musica mundana* and *musica humana*, briefly discussed in book one, is missing. Calvin Bower argues that had Boethius completed his translation of Ptolemy then some further discussion of these divisions would have been included. Those remarks that remain are brief and largely undefended but they demonstrate that Boethius' opinions on psychology and the understanding as well as the orderliness of the cosmos, are in agreement with Augustine.

Boethius begins the treatise with the following question, one which also prompts the inquiry in *De Musica* VI:

"It is obvious that we use our senses in perceiving sensible objects. But what is the exact nature of these senses in connexion with which we carry out our actions? and what is the actual property of the objects sensed?"

He goes on in the same chapter to note that:

"... the sense of hearing can apprehend sounds in such a way that it not only judges them and recognizes their differences, but it often takes pleasure in them if they are in the form of sweet and

47. e.g. Boethius *De Institutione Musica* 128. Calvin Bower's translation (op. cit., p 94) notes various ancient authors' identification of notes with planets. Also Robbins and Karpinski, op. cit., ch. VII "The philosophy of Nicomachus" esp. pp 104-107.

48. Calvin Bower, "Boethius and Nicomachus" op. cit.

49. ibid. p 44.

well-ordered modes, whereas it finds displeasure if the sounds heard are unordered and incoherent."51

The sense itself judges, as it does for Augustine, both the kind of sound heard and takes pleasure in the orderliness of sounds, the pre-cognitive judgement of numeri sensuales. So Boethius adds

"... music is related not only to speculation but to morality as well."52

Indeed, delight is a "spontaneous affection" of the soul as it reflects "the universe ... united by a single concord."53 The principle of delight is similarity:

"For similarity is pleasing, whereas dissimilarity is unpleasant and contrary."54

The whole apparatus of sensation and perception is left largely unexplored but

"... the total structure of our soul and body consists of musical harmony. For the very pulse of the heart itself is determined by the state and disposition of the body."

and

"... the unity of body and soul seems to be somehow determined by the same proportions that join together and unite the harmonious influences of music, ..."55

In Augustine this unity (and despite his dualism it is a unity in the sense that the person is a mixture of body and soul) is explained through the apparatus of numeri and the relation of attentio.

In the Philosophiae Consolatio Boethius sketches how the soul will respond to sensation. It possesses the "hidden" forms within itself which respond to those received by the body.56 That sketch is included in a

51. ibid. (B32).
52. ibid.
53. ibid. (B33).
54. ibid.
55. ibid. (B41-42).
56. Consolatio V prose 4; cf. David Chamberlain "Philosophy of music in Augustine
section which distinguishes cognitive, rational contemplation of knowledge from the apprehension of the senses. The following poem speaks of the soul’s active power to understand, distinguish and then pursue a course:

"But, if the active mind can discover nothing by its own powers, and merely remains passively subject to the impressions of external bodies, like a mirror reflecting the empty shapes of other things, where does that power come from which dwells in souls and sees all things? What is the power which perceives individual things and, by knowing them, can distinguish among them? What is the power which puts together again the parts it has separated and pursuing its due course, lifts its gaze to the highest things, then descends again to the lowest, then returns to itself to refute false ideas with truth?"57

The movement from highest to lowest and back again to discern truth recalls Augustine’s pattern of numeri, from corporales to judiciales, which, apprehended in their due order, guarantee the truth of the soul’s speculations. Elsewhere in the Consolatio Boethius speaks of the soul as motus and further, assumes a Timaean harmony within the soul and in the world itself.58 All this characterises the musica humana, which is left unexplained in his Musica.59

Music affects and moulds the character by its influence on the soul.60 The influence is notably numeric:

"... a high sound consists of more motion than a low one. However, the plurality makes the difference in these matters; for the plurality necessarily consists of a certain numerical quantity, ... Now of these things which are compared according to number, some are equal, others unequal. ... in these sounds which


59. cf. Musica I2 (B47).

60. Musica I1 (B34, which notes the obvious influence of Plato’s Republic III 399C and IV424B-C).
do not harmonize by any inequality, there is no consonance at all. For a consonance is a concord which reduces mutually dissimilar voices into one."61

While consonance depends not on equality but in the relation of unequal pitches "into one", it also depends on a uniform mixture of high and low. Where the mixture is not uniform, the sound is unpleasant and dissonant as the sounds "strive" together.62 The concept of collectivity also plays a part as many pitches are made one by their numerical consonance.

These affects on the senses are
"... an exhortation; ... for although the movements of almost every art, and life itself, are introduced by impression of the senses, no certain judgement, no comprehension of truth is in these impressions if the arbitration of reason is lacking."63

Like Augustine, what is known forms the "reality" of sound heard:
"For this reason the power of the mind ought to be directed toward fully understanding by knowledge which is inherent in us by nature."64

So, Boethius asserts,
"... Pythagoras, having foresaken aural judgement, turned to reason. He did not trust the human ears ... he sought a way to establish in his mind, by reason, ... the principles of consonance."65

and, by discovering the ratios of the perfect intervals, he turned to number. Character is moulded by the fluctuations of numeri within the soul, attuned to either or both sense and reason.

61. Musica I3 (B50f).
62. Musica I8 (B57 and op. cit., p 391).
63. Musica I9 (B58f).
64. Musica II (B43).
65. Musica II0 (B59f).
I do not agree with E.J. Denhert\textsuperscript{66} who argues that there is a clear distinction between Augustine's approach and Boethius' to the place of music. Both authors offer an integrated approach to the effect of music, and both authors assert that the feeling generated is a psychological effect. They further assert that in order for the soul to properly understand this effect, reason and the principles of number must be invoked. Music as it is understood must be scientia, a liberal discipline.

Boethius, again, argues, similarly to Augustine, that without scientia there could be no skill or practice of music\textsuperscript{67} And so the musicus is of a superior intellectual order to the cantor. However, the integration of the art of music, via the integration of sense and reason, is not denied. Again, like Augustine:

"I will demonstrate all these things later both by mathematical logic and aural judgement."	extsuperscript{68}

For Boethius sense is a kind of reason, which needs to be informed by the understanding to make its judgements certain\textsuperscript{69}

It is, perhaps, a lucky thing that Augustine was substantially ignorant of, or uninterested in, the details of harmonic theory and its vast Greek literature. Unlike the De Institutione Musica, Augustine presents not a compilation but a synthesis of earlier views, notably Plotinian and pythagorean. The synthesis represents in itself, as it proceeds from scientia and numbers, via a prosodic treatise, to its carefully detailed psychology with cosmological overtones, the Augustinian journey into the soul itself, an introspective attitude for which he is famous. In the De Musica that attitude is expressed in terms decidedly pythagorean in tone. Its congruence with Boethius' confessedly pythagorean treatise is my final evidence for this interpretation.

\textsuperscript{66} "Music as liberal in Augustine and Boethius" in \textit{Arts Libéraux et Philosophie au Moyen Age} (Montréal: Institut d'études Médiévales, 1969)

\textsuperscript{67} will of reason, the thing is done in vain." Musica I34 (B102).

\textsuperscript{68} Musica I33 (B101, italics mine).

Musical treatises in the middle ages present two distinct attitudes to music. On the one hand it is treated as a mathematical discipline, a division of the quadrivium. On the other, it is treated as a practical subject. In this case the details of current musical practice take precedence over the logic of any theory which the mathematical sciences might dictate. Both views might be found expressed in the same treatise, but they remain ultimately distinct as, at times, practice was at variance with contemporary theory. The practical treatises were, however, shaped partly by the rationalism of the quadrivium. This rationalism had its roots in the opinions of authors like Augustine, Martianus Capella and, importantly, Boethius.

Hans Eggebrecht has noted that Augustine's definition of music was often repeated in various forms and that the preoccupation with modus and numerositas as understood by ratio was one which influenced both speculative and practical treatises. A preoccupation with number-symbolism, too, in musical composition is one persistent example of incipient pythagoreanism which has waxed and waned throughout the history of western music. Augustine's preoccupation with rational, numeric analysis, with "measure, number and weight", is one important source for the tradition found not only in musical treatises but in philosophical ones as well.

The De Musica was read throughout the middle ages and there are many references to it in later authors. Cassiodorus, in his encyclopaedic Institutiones, refers to it and also includes Augustine's definition.


71. Eggebrecht (op. cit., pp 314-318) makes some general remarks about mediaeval musical literature and its relation to Augustine's definition.

72. Cassiodorus Institutiones 5.10: "Also St. Augustine, ... wrote six books De Musica, in which he shewed that human speech naturally has rhythmical sounds and a measured harmony in its long and short
relating it to both moral and cosmological ends. Neither Boethius nor Isidore of Seville refer to it explicitly. Boethius' affinity with the work has been discussed. Isidore's definition of music follows that in the De Ordine, although he mistakes Augustine's argument, as do other parts of his analysis.

John Scotus Erigena, in his De Divisione Naturae, attempted a synthesis of Augustinian, Aristotelian (via Boethius) and Greek theories which includes important pythagorean insights. I have identified two references to the De Musica in this work. The first is included in a passage which distinguishes between kinds of numbers: eternal, and those distributed in space and time. They form the universe, thus making it rational and comprehensible via the structure and movement of numbers. The second is more extensive and includes a complete summary of the psychological apparatus of De Musica VI. In a passage on sensation and perception, John cites Augustine as the author of the theory of light in the eyes and movement of air creating sound in the ears. He then turns to the soul, which forms images (phantasias) derived from the sense-organs. The passage which follows this assertion explicitly uses Augustine's apparatus of numeri to explain how the images are created and analyzed using the "secret" and "natural" ratio of the soul. He notes that all this is derived from Augustine's De Musica, the Confessiones, and Gregory of Nyssa's Sermone de imagine.

73. ibid. 5.2 (Strunk, p 88).

74. Etymologiam Libri III15 (Strunk, p 93f); De Ordine III14.39-41.


77. ibid. III38: Est enim, ut ait Sanctus Augustinus, luminosum alicud in oculis; aerenum quiddam mobile et somnum in auribus. (p 153).

78. ibid. III38; I refrain from quoting this long passage, it may be found

Augustine De Musica
A musical treatise contemporary with John, the Musica enchiriadis, which contains a theoretical section, the Scholia enchiriadis, makes no mention of the De Musica although it follows Cassiodorus in its more theoretical sections. It does quote a lengthy section from the De Ordine to defend the view that music can only be explained by arithmetical ratios. It is notable, however, than an identification of music as a science of numbers in itself is lacking and it is called only a rational discipline concerned with things as they are found in sounds.

Turning to the philosophers who formed the great intellectual renaissance centred on Paris in the late twelfth and thirteenth centuries, there is abundant evidence that the De Musica was a familiar text, especially among franciscan thinkers. There is less evidence that it was familiar to music theorists.

Brief references to the De Musica are made by both Alexander of Hales and Albert the Great. Alexander, in his Quaestiones Disputatae, cites Augustine's dictum that the soul is superior to the body in an argument about the state of Adam's soul before the fall. Later, in the same disputation, he refers to Augustine's image of the correct body-soul relation as one where the soul, turned to its Lord, will facilitate the working of its servant, the body. There is at least one reference from Albert. It is to be found in his De boni in the tractate on temperance. He cites Augustine's definition of temperance in the De Musica along with others from Cicero, S. Matthew, Augustine (De Moribus Ecclesiae) and Macrobius. The quotation is repeated during his discussion and at p 154 of the Oxford ed.


80. Alexander of Hales Quaestiones Disputate Q. 14. Disp. 1.4: Et in VI Musicae dicit quod non potest anima passionem recipere a corpore quia superior est eo, id est nobilior." (Quaracchi ed. p 266.19-21); cf. DMVI5.8.

81. Ibid. Q. 14. Disp. 1.66: Et huius modi passio venit ex conversione a Domino ad servum, ... (p 255.9-10) Disp. 1.70: Dicit enim Augustinus ad Dominum suum ex parte affectiva facilliima vita est; ... (p 257.21-25); cf. DMVI5.13. These references are repeated in his summary (Alia reportaciones, redactiones, abbreviations) at Q.10 (p 1416.27, 1418.17f). Note there are no references to the DM in his Sentences.
criticized. 83 Both Alexander's and Albert's quotations are, in fact, glosses on the passages cited, although they use Augustine's language exclusively.

Roger Bacon had a more intense interest in the *De Musica*, and not only in the "philosophical" book six, but in its rhythmic theory as well. In his three treatises he displays a modest acquaintance with music theory. He is aware of its division into practice and speculative theory and mentions both. As practice he notes that it is an accomplishment of great skill; as a speculative discipline he regards it as an important branch of mathematics, that which provides for the unity between art and science. The extensive use of Augustine's language, his distinction between practice and scientia, and the latter's importance as mathematical may be found in most of his works. 84

For example, several references are made to the *De Musica* in his *Opus Tertium*. Bacon's chief preoccupation is to demonstrate how a study of the mathematical disciplines is useful for the study of scripture. He notes, rather cryptically, that Augustine sanctions the necessity of numbers for a study of scripture, firstly arithmetic, 85 then in the following chapter on music, the *De Musica* is cited in relation to sacred scripture along with other Augustinian texts and Cassiodorus. 86 Pythagoras is cited for the theory of the harmony of the spheres, which Bacon defends against Aristotle. Later in the same chapter (which discusses music according to the Boethian divisions) the *musicus* is defined and opposed not to the *cantor* but, following Augustine, to the *grammaticus*, as a geometer is to a carpenter. 87 The scriptural preoccupation is very clear in the

82. Albertus Magnus *De bono* Tr. III.Q.1.art.1: *In Musica autem intellectuali dicit Augustinus: 'Temperantia est amor ab amore inferiori pulchritudinis nos removens et elevans ad superiorem.'* (Kühle ed., p 114.22-25); cf. DMV16.51.

83. *ibid.* art.1.28-30 (p 116.61-75).


85. Roger Bacon *Opus Tertium* ch.58: *Quia Augustinus dicit quod ad Divinarum Scripturarum cognitionem nemo debet accedere sine potentia numerorum.* (Brewer ed., p 228)

86. *ibid.* ch. 59 (Brewer ed., p 229)
text, but so is Bacon’s familiarity with the *De Musica*. The second book is cited for the *musicus*/*grammaticus* distinction and for the difference between sensible pleasure and the science of music. Pleasure is produced by the motion (the pulse) of music itself.88

A further chapter specifically deals with rhythm and metre. Bacon cites the *five* books of the *De Musica* as distinguishing between grammar and music proper.89 Virgil’s opening line, which Augustine is so fond of quoting, is mentioned. Augustine is cited as a specific authority for the long and short lengths of syllables.90 The scriptures’ very verbal arrangement is supposed to reflect the rational music of God, at least in its original Hebrew and again Augustine is cited,91 as he is for his use of aural examples to demonstrate mathematical rules.92 Metre and rhythm in the services of the church are discussed with reference to Augustine’s views on scansion and an argument about the beauty of rhythm and metre leading to devotion so that it ought to be got right.93 Finally, in a fragment of the *Opus Tertium* not in Brewer’s edition, Bacon mentions, *inter alia*, the *De Musica* in discussing the sensitive powers of the soul and its relations to the eye, and how the eye operates.94

St. Bonaventure also makes extensive use of the definitions and terminology in the *De Musica*. There is not the space to do justice, here, to the all-pervasive influence of parts of the *De Musica* on

87. *ibid.*: *Musicus igitur,* cum *sit demonstratus eo quod *sit* mathematicus,... *ergo* grammaticus, *qui* *per* *viam* narrationis *laborat,*... *se* *habet* *ad* musicum, *siuit* carpentor *ad* geometricum. (Brewer ed., p 231)

88. *ibid.*: *Ex* *Augustinus diit hoc secundo musicae. Alii vero motus,* *qui* *non* *possunt* conformari *sono* *proportionibus convenientibus,* *ut* *fia!a!-completa* *delectatio* *sensibilis,* *non* *sunt* *de* *scientia* *musicae.* (Brewer ed. p 232)

89. *ibid.* ch.63: *Sed specialiter accidit certitudo de hoc per Augustinum in libris quinque De Musica* ... (Brewer ed. p 256); cf. DMIII.1.

90. *ibid.* (Brewer ed. p 257)

91. *ibid.* ch.64 (Brewer ed. p 267)

92. *ibid.* (Brewer ed. p 268); several scriptural references are produced to support this view.

93. *ibid.* ch.74 (Brewer ed. pp 301-303)


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Bonaventure's thought but two cases will be noted. Edgar de Bruyne writes:

L'esthétique de Saint Bonaventure nous paraît absolument unifiée; elle affirme l'aequalitas numerosa dans l'objet, dans le sujet, dans l'harmonie qui unit ces deux pôles en s'épanouissant en plaisir. L'aequalitas numerosa rend compte de la beauté de l'image expressive qui tend à "égaler" le modèle et de la beauté formelle du modèle qui réalise l'harmonie."95

Beauty is universal96 as it belongs to form itself. Beauty consists in order, similarly.97 Finally Beauty is a numerate equality, or equality of parts.98 This final definition derives from, but is not directly taken from, Augustine's De Musica. Sister Emma Spargo remarks that

"The unity achieved by the ordering of parts to a whole conforms to Saint Augustine's definition of beauty which Saint Bonaventure frequently repeats: ...

Bonaventure's gloss is, of course, fatal to any attempt at maintaining a formal Platonic (and Augustinian) ontology. (Augustine never says that beauty is any kind of aequalitas, but that one accompanies the other.)

Bonaventure's attitude to the universe in its relation to the divine is infused with the same pythagorean tone that can be found in the De Musica .100 Beauty is rational and is understood in rational terms. In attempting to understand the world it is necessary to attempt an analysis based on the dictum from Wisdom which Augustine had found so pregnant with

95. Edgar de Bruyne Études d'Esthétique Médiévale (Brugge: "Der Tempel", 1946)p 199

96. Sententiam II dis. 34, pars 2, art.3, q.6 (Quaracchi ed. Vol.II, p 814): Omne quod est ens, habet aliquam formam; omne autem quod habet aliquam formam, habet pulchritudinem.

97. Sent. 119.1.6 (Quaracchi ed. II, p 252) "Pulchritudo constitit in ordine".


meaning. Further, the relations between all the parts of creation Bonaventure compares to a *pulcherrimum carmen* which exhibits the rationality of creation, its order and its purpose, as reflecting the beauty of God.

I do not mean to argue that the whole inspiration for this attitude is Augustinian, or derived from the *De Musica*. But there are significant correspondences between this superficial outline of Bonaventure on beauty and Augustine to warrant a specific claim. This is intensified by Bonaventure’s use of the apparatus of *numeri* found in *De Musica* VI in the *Itinerarium Mentis ad Deum*:

"... so that God may be seen in all. For he [Augustine] says that numbers are in bodies and especially in sounds and words, and he calls these *sonantes*. Some are abstracted from these and received into our senses, and these he calls *occureoires*. Some proceed ... he calls *progressores*. Some are in the pleasures of the senses which arise from attending ... he calls *sensuales*. Some are retained in the memory, and these he calls *memoriae* [sic.]. Some are the bases of our judgements about all these and these he calls *judiciae*, which, ... transcend our minds because they are infallible and inconvertible. By these there are imprinted on our minds the *numeri artificiales*, which Augustine does not include in his classification because they are connected with the *judiciae* from which flow the *progressores* out of which are created the numerical form of those things made by art." The new category, *artificiales*, significantly amplifies Augustine’s apparatus and may be an attempt to accommodate the distinction in *De Musica*. The *Itinerarium Mentis ad Deum* details how suche categories are connected with the *numeri artificiales*.

101. e.g. Sent. I3.1.3 (Quaracchi ed. I p 79)
102. Breviloquium Prol.4 (Spargo, *op.cit.*, p 75)
104. Spargo makes an interesting suggestion about John Scotus Erigena (*ibid.* pp 5-7) and the Pseudo-Dionysius (pp 7-8), as well as a point about S. Francis’ attitude to creation. J.F. Quinn, in his learned *The Historical Constitution of St. Bonaventure’s Philosophy* (Toronto: Pontifical Institute of Mediaeval Studies, 1973) details many sources and concludes, tentatively, that Bonaventure’s synthesis is just that, like Aquinas’, a personal blend of many views. (p 896).
105. *Itinerarium* I110. (tr. after George Boas) Note that in this passage Bonaventure gets the relation between beauty and *aequalitas* right; and he cites the *De Musica*. He replaces *recordabiles* with *memoriae*.

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Musica I between birdsong and human music. 106

Bonaventure makes many references to the *De Musica* throughout his writings, too many to discuss here. Some are quite general, like those noted by Alexander of Hales and Albert the Great. Many are more specific. They indicate a familiarity with the *De Musica* which is equal to his acquaintance with the whole of Augustine’s *corpus*. In general they demonstrate a detailed knowledge of the ‘philosophical’ book six. 107 This accords with that of Alexander and Albert.

That the first five books were also studied in only evidenced by Roger Bacon’s familiarity with them, generated, I suspect, by a special interest. It is possible to compare Bacon’s work on rhythm, distinctly literary and mathematical, to his contemporary Walter Odington’s *Summa de Speculatione Musicae*. 108 The fourth book on rhythm (*De inaequalitate temporum in pedibus*) is based on Isidore and repeats the latter’s reference to the *De Ordine*. But nothing is said of Augustine’s treatise which suggests that Bacon made a special study of it.

Indeed, musical treatises, even of the most comprehensive kind, ignore Augustine’s *De Musica*. Jacobus’ of Liege *Speculum Musicae* is devoted to the study of number as it relates to the theory and practice of music. The first book which contains the mathematical theory necessary for the study constantly refers to Boethius and Aristotle, and several times to Augustine in a general way. There is no mention of the *De Musica*. After

106. cf. Spargo, *op.cit.*, pp 126-129 who has another explanation; also Calvin Bower’s “Natural and Artificial Music; the origins and development of an aesthetic concept” *Musica Disciplina* 25 (1971) 17-33, who fails to notice Augustine’s distinction (at DMI4.6) between musica made *via* (pre-cognitive) are (related to *ratio*) and the song of animals (which is irrational).

107. e.g. ... *Innuit enim Augustinus, in secundo libro De libero arbitrio, et De vera religione, et De magistro, sexto Musicae et octavo De Trinitate, huic modi rationes. De scientia Christi* 9.4.17. On the question of intellectual knowledge of sensibles discussed in this passage note Quinn, *op.cit.*, p 526ff. The reference may be to DMI12.35f; cf. a similar quotation (which may be from this passage in Aquinas’ *Summa Theologiae* I q.84, art.6 who criticises Augustine but also displays an encyclopaedic knowledge of him. cf. also *Collationes in Hexaemeron* 6.7 (a reference to beauty).

the manner of musical treatises there is a lot of mathematical speculation and very little philosophy like Augustine's sixth book. 109

A more extensive study of the philosophical and musical literature from the thirteenth and fourteenth centuries would be necessary to conform the significance (or lack of it) of the De Musica. I suspect the treatise was not much read after the ascendancy of Aristotelian thought, but by Augustinian scholars, and that is only finding redress in this century.

**The De Musica revisited**

It is easy to weed out those passages in the De Musica which are positively pythagorean. The identification of knowledge (scientia) with numerical structure 110 and the double meaning of ratio throughout the treatise are the most significant examples of his preoccupation with number. The curious prosodic theory, offered as an attempt to give it a rational (i.e. numeric) structure so that it is as much like harmonic or numeric theory as possible, forms the substance of the work. More specifically, the argument that the limit of number is the tetractys sequence, 111 the passages in which the universe is characterised as a unity of parts all having proportional relations, 112 the attempt to account for the affect of colour and light in terms of numeri 113 indeed, the whole theory of perfection as aequalitas 114 the attempt to identify the classical virtues in that perfection, 115 the explanation of creation ex nihilo, 116 and finally the whole apparatus of sensation, perception and

109. These negative arguments are difficult. Speculum Musicae (ed. R. Bragard, Corpus Scriptorum de Musica, 3) (American Institute of Musicology, 1955 et seq.)

110. DMI4.5-6.12.

111. DMI11.18-12.26.

112. DMVI7.19; 11.29-30.

113. DMVI3.38.

114. DMVI0.26-28, but passim.

115. DMVI6.52-55.

116. DMVI7.57.
understanding in terms of numeri, are all evidence for the claim that Augustine’s central preoccupation in the De Musica is pythagorean.

If this were all, however, then Professor O’Connell’s opinion that: "The dominant logic of the De Musica presents man as a fallen soul, whose central ethical preoccupation must be to return from the temporal life of action to the heavenly bliss of contemplation." would remain the focus for interpreting the treatise. But, on my reading, the “dominant logic” is not so clearly focussed. Certainly the Plotinian (and as some have argued Porphyrian) element of fall and return is a central preoccupation. How else can much of the terminology of more and less “excellent”, the identification of musica with scientia in terms of a valuation over performance practice, or the temporal/eternal dichotomy, be fully explained? But the element of number in the discourse should not be ignored. Its effect is to dampen this preoccupation with return to a transcendent God by bringing together the apparently distinct activities of feeling and thinking into one unit of being, the carmen universitatis.

Ontology and epistemology merge in this attempt to explain the integrated experience which music presents. Again and again Augustine’s discourse returns to the recitation of verse as an inspiration for further speculation about its structure and effect. The distinction in book one between knowledge, on the one hand, and practical skill and pleasure on the other, is pursued in book six by his distinguishing between cognitive and pre-cognitive activities of the soul. But this distinction is not meant to separate one activity from another. Despite his identification of musica with scientia it is not possible to finally rigidly distinguish the practical from the theoretic. Throughout the books on prosody, thinking and feeling are both used to interpret the illustrations he employs. Interpretation is via the understanding so that rational thought dominates the discussion, but the integration of experience is never denied. The cantor’s place is assured, just as is the surgeon’s. Yet neither surgeon nor singer could undertake their appointed tasks without there being numeri which inform their activities. (These would be numeri progressores,

117. O’Connell, Art, op.cit., p 86.
119. DMI4.9-10.

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according to the theory of book six. These are again informed by numera further along the chain, although in the case of a practical skill this does not pre-suppose any cognitive process.) In both cases, however, any discovery about what can be known of medicine or song involves study of those transcendent numera which are the objects of knowledge. It is possible to know without doing, however sterile such knowledge may be, but it is not, on this account, possible to do anything without there being something to know, something to inform the activity. Again, the apparatus of numera integrates knowledge and skill without collapsing the distinction. Further, both knowledge and skill can form a creative dialectic, a process of critical adjustment to times and circumstances.

This dialectic is neatly captured in Augustine's brief comments on ars, which, he remarks, seems to be both cognitive and pre-cognitive. The apparatus of sensation and perception in book six illuminates these remarks in book one. To understand an art the soul must detach itself from the practice and view the activity itself as a whole. Imitative practice is imitation of something which the inquirer apprehends not in doing but upon reflexion. Again, too, this links ontology with epistemology as the doing is informed by an ontological structure which is not necessarily known to the doer. The distinction between memory, which is involved in learning to do something, and the intellect, which apprehends to object of scientia, in book one is amplified in book six as he explains that the contents of memoria are numera obtained from both the divine ideas and passions in the body. Without both kinds of information the soul cannot attend properly to its life in the body. Musica could never become ars without first being scientia.

Augustine does, of course, accord a higher status to knowing over doing because he grades the numera which describes the soul's activity hierarchically. Skill and pleasure are all very well, he argues in book one, but they are nothing without reason. In book six the tone of ascent to a divine apprehension to the exclusion of sensitive activity is one of the themes which has so disturbed commentators like Professor O'Connell (as, indeed, it did Augustine himself). My own more kindly interpretation of this theme is, confessedly, an interpretation based on a more

120. Bubacz, Mind, op. cit., p V28; Corbin, op. cit.
121. DMI4.6-7.
sympathetic view of number as an explanatory device. There does seem to be, however, justification for my sympathy in many of the numerical images which Augustine presents, especially those in book six.

A dancer dances and a singer sings to give expression to the pattern and order of the dance or song. Both are cases of expression which has no further purpose but to express. 122 This is artistic activity *par excellence*. It participates in the created order by forming part of that order, and representing the pattern of that order. The image of *carmen universitatis* which serves to locate the soul in the created order has wide implications. Music, perfectly attuned to its patterns, is formed *bene modulando*. The *aequalitas* of pleasure is captured in the sympathetic relations between pre-cognitive (and even cognitive) *numeri* and the movements which generate it. The pattern is set by the moving image itself as the soul both participates in and reflects upon the order of the *carmen universitatis*. This intensely musical image provides Augustine with a multidimensional tool with which to integrate the various parts of his *rapprochement* between the divine, the soul, the body and the world. It is an image which captures both time and eternity: time, in that as the song must be sung, it generates the dimensions of time and space which the soul struggles to comprehend; eternity, in that the image is complete in its parts, neither more or less than itself, 123 and remains perfectly whole in the divine mind.

The soul stands between the extension of time and space and the unity of God. It uses that unity to comprehend the multiplicity of temporal experience. Elsewhere, notably at *Confessiones* XI, Augustine offers an analysis of the concept of time which is notably psychological. Time is the measure of events as they are recorded in the memory and perceived as present by the intellect. Its extension is the image of collected experience and the expectation of future experience captured in the patterns of the mind itself. 124 In the *De Musica*, too, the locus of attention is the memory and its images. 125 The body, like all matter,

122. DMII.3; 5.10-6.11.
123. *cf.* DMVI.17.19.
exists only in the instant. As the pattern changes, flows from instant to
instant, the order itself changes and fluctuates as it attempts to reflect
the divine. The soul collects these fluctuations and fits them together
according to its own apprehension of the divine order. To attend properly
to the fluctuations of the cosmos it must be totally open to the order of
the divine ideas which inform the cosmos. Its attention will then be fully
integrated into the divine carmen. When it directs its attention away from
the order to the fluctuations of its parts then it is caught up in the
incomprehensible multiplicity of its activities.

The soul transcends its condition in time through its images of order
and pattern, bene modulandi captured in the carmen universitatis. The
life of the soul is irreducibly inner; it needs to transcend its own
imaginings by generating images which, while caught in the instant of their
generation, transcend it through their dependence on number. The many
perspectives numeri afford are all taken, from time to time, by Augustine
himself. After his extremely unfavourable analysis of the disturbed and
selfish life126 he then describes the ordered life in terms which seem to
contradict his former view.127 But, of course, both are legitimate ways of
interpreting experience from different perspectives. Similarly, his
remarks on the classical virtues also give him an opportunity for two
points of view: one located within the business of society and the other on
their role in the inner, contemplative life.

The constant weaving in and out of various levels of numeri forms a
dialectic with which the understanding must engage in order to direct the
soul's life in a body. The images of the world which the soul generates as
phantasai and phantasmata128 need to be constantly informed by the
intellectual altruism which guarantees truth. The imagination is a
powerful tool in the task of comprehending but it remains a tool. It is
dependent on the sequence of events and grows and changes as the soul
constantly reformulates its images. Significantly, these images, even
those which attempt transcendence, are events like sensations. The soul

125. DMVI18.21.
126. DMVI13.40-42.
128. DMVI11.32.

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needs to be sensitive to the validity, the orderliness, of its own activity. 'Objective' knowledge is a kind of artifact generated by this process of formulation. It is possible, for instance, to discover a lot about the world through an application of the principles derived from experience of the world and the ideas which illumine that experience. But such understanding in no way contains the dynamic complexity of creation itself. In the end there is just succession itself.

So Augustine's aesthetic in the *De Musica* is bound up with these views on the process of thinking and feeling. It is not possible to come to a correct understanding of beauty without examining the process of apprehension and comprehension. Beauty depends on how it is understood; it is never simply passively apprehended. It involves all the activities of soul as it is discovered in the temporal flux. Such a capacity to apprehend is buried in the flux itself, so that beauty can go unrecognized because the soul has no way of noticing it. For instance, unfamiliarity with the forms of a foreign culture's art often means that their aesthetic value will go unnoticed. But these forms are those intellectual abstractions which the soul must understand to recognize anything at all. As an idea, then, beauty is not alone. It is accompanied by other ideas, notably aequalitas and unity, which are related to it. It remains a single undifferentiated quality but it is only to be discovered through a process of feeling and thinking which involves the complexity of ideas themselves.

Beauty carries with it the whole weight of the intellectual world. It is not possible to distinguish it from its companions in order that it may be cultivated apart from them. It is not possible just to apprehend Beauty. Whenever and wherever it is discovered, order and aequalitas, and a moral aequalitas (the meaning of bene modulandi) are to be found. What is reprehensible and evil is also in its turn ugly and discomforting. Augustine's varied perspectives on the process of living are caught here by the many kinds of evaluations life receives in the *De Musica*. Things taken "in their order" are good and beautiful. As they distract the soul they become ugly, distorted shadows of the divine. The perspectives themselves make the valuations relative to the direction of the discourse. In this sense art is never condemned. The artistry of Augustine's numeric imagery sees to that.

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*De Musica*
Nowhere have I attempted any fundamental criticism of Augustine's approach. Without the guarantee of ontological stability which the divine provides it is difficult to see just how truth is to be understood apart from the machinations of the intellect. Perhaps, though, it is always a function of patterns to be discovered through reflexion and introspection and not in any objective reality at all. To invoke numbers in order to *exorcise* experience is futile, and well Augustine knew it. The fundamental pythagorean difficulty of relating quantity to quality remains unexplored except in the general claim that qualitative ideas are always accompanied by quantitative ones. So in order to understand experience, and the relations between experiences, quantitative ideas are studied. For such study the musical image is peculiarly sensitive.

129. There is an interesting article by Michael Jubien, "Ontology and mathematical truth" *Noûs* II (1977) 133-150, which concludes that mathematical truth is to be understood in terms of abstract structure *per se* where all the parts of the structure are fundamental to its interpretation.
Primary sources (excluding texts by Augustine, Plato and Aristotle)


Tria opuscula ... Breviloquium, Itinerarium mentis in Deum et ... (Quaracchi: Collegio di S. Bonaventura, 1938).

The mind's road to God (tr. George Boas) (Indianapolis: Bobbs-Merrill, 1953)

JACOBUS of Liège Speculum Musicae (ed. R. Bragard) (Corpus Scriptorum de Musica, 3) (American institute of musicology, 1955 et seq.).

JOHN SCOTUS ERIGENA De Divisione Naturae, libri quinque (Oxford: Sheldonian Theatre, 1681) (Minerva, 1964)
Bibliography


Secondary material

ABERT, Hermann Joseph Die ästhetischen grundsätze der mittelalterlichen melodiebildung. Ein studie zur musikästhetik des mittelalters ... (Halle a S.: Hofbuchdruckerei von C.A. Kaemmerer & Co., 1902)

Die Lehre vom ethos in der greichischen Musik. Ein beitrag zur musikästhetik des klassischen altertums. (Leipzig: Breikopf & Här tel, 1899)

Die musikanschauung des Mittelalters und ihre Grundlagen (Halle: M. Niemeyer, 1905, repr. Tutzing: verlegt bei Hans Schneider, 1964)
ADANK, Thomas "Roger Bacons Affassung der Musica" Archiv für Musikwissenschaft 35(1978)33-56

AMERIO, Franco Il 'De Musica' di San Agostino (Turin: Società editrice internazionale, 1929)


APEL, Willi Gregorian Chant (London: Burns & Oates, n.d.)

APFEL, Ernst and Carl DALHAUS Studien zur Theorie und Geschichte der musicalischen Rhythmik und Metrik (München: Musikverlag Emil Katzibicher, 1974) (Musikwissenschaftliche Schriften, I)


St Augustine and Christian Platonism (Villanova: Villanova University Press, 1967)


"Music and perception - a study in Aristoxenus" Journal of Hellenic Studies 98(1978)9-16

"Symphoni - arithmoi - note on Republic 531C1-4" Classical Philology 73/4(1978)337-342


Plotinus' Psychology. His doctrine of the embodied soul (The Hague: Martinus Nijhoff, 1971)

"Neoplatonic interpretations of Aristotle on phantasia" Review of Metaphysics 31/2(1977)242-257

BOOTH, Edward "St Augustine's 'notitia sui' related to Aristotle and the early Neo-Platonists" Augustiana 27(1977)70-132, 364-401; 28(1978)183-221

BORGHIEZO, Gino La musica in Saint Agostino (Roma: Studium ed., 1931) [unseen]

BOURKE, Vernon J. Augustine's view of reality (Villanova: Villanova University Press, 1964)

BOWER, Calvin M. "Natural and artificial music: the origins of an aesthetic concept" Musica Disciplina 25(1971)17-53

"Boethius and Nicomachus: an essay concerning the sources of De institutione musica" Vivarium 16(1978)1-45

BOYER, Charles Christiansme et néoplatonisme dans la formation de Saint Augustin nouv. ed. (Roma: Officium Libri Catholici, 1953)

BROWN, Peter Augustine of Hippo: a biography (Berkeley, University of California Press, 1967)

de BRUYNE Œtudes d'Esthetique Médiévale 3vols (Brugge: "De Tempel", 1946)

BUBACZ, Bruce Stephen "Augustine's account of factual memory" Augustinian Studies 6(1975)181-192

"Augustine's visio intellectus and perceptual error" Augustiana 27(1977)139-150

The Creating Mind: and analysis of St. Augustine's Epistemology (unpublished draft, University of Missouri)


BURNLEY, Charles A General History of Music (1789) (New York: Dover, 1957)

Caldwell, John Medieval Music (London: Hutchinson, 1978)

Callahan, J.F. Augustine and the Greek Philosophers (Villanova: Villanova University Press, 1967)


Castaneda, Hector-Neri "Plato's Phaedo theory of relations" Journal of Philosophical Logic 1(1972)467-480

Chamberlain, David S. "Philosophy of Music in the Consolatio of Boethius" Speculum 45(1970)80-97

Chapman, Emmanuel St Augustine's Philosophy of Beauty (New York: Sheed & Ward, 1939)

Cillerueño, L. "Numerus et Sapientia" Estudio Augustiniano 3(1968)109-121

Clark, Mary T. Augustinian Personalism (Villanova: Villanova University Press, 1970)

CORNFORD, F.M. Plato's Cosmology (London: Routledge & Kegan Paul, 1937)

COURCELLE, Pierre Late Latin Writers and their Greek Sources (tr. Harry E. Wedeck) (Cambridge, Mass.: Harvard University Press, 1969)


Della musica libri sei (tr. Raffaello Cardamone) (Firenze: Barbèra, 1878) [unseen]

DENHERT, Edmund John "Music as liberal in Augustine and Boethius" in Arts Libéraux et Philosophie au Moyen Age (Acts du IVe Congrès International de Philosophie Médiévale: University of Montréal) (Montréal: Institut d'Études Médievales, 1969)


EDELSTEIN, Heinz Die Musikanschauung Augustins nach seiner Schrift "De musica" (Ohlau: Dr H. Eschenhagen, 1929)


ELLINWOOD, L. "Ars musica" Speculum 20(1945)290-299


GALIGARI, D. "Concept of number in doctrine of pythagoreans" Historica 31/1(1978)30-33 [unseen]
GEORGIADES, Thrasybulos Greek music, verse and drama (tr. Erwin Benedikt and Marie Louise Martinez) (New York: Merlin Press, 1956) (Merlin music books, v.5)

GÉROLD, Théodore Les Pères de l'Église et la Musique (Strasbourg: Imprimerie Alsacienne, 1931)

GHYKA, Matila The Geometry of Art and Life (New York: Sheed & Ward, 1946)


del GRANDE, C. "S. Agostine e la Musica" La Rassegna Musicale 4/8 (1930) 269-277

GROUT, Donald Jay A History of Western Music (London: Dent, 1960)

GUITTON, Jean Le Temps et l'Éternité chez Plotin et Saint Augustin (Paris: Bovin et Cie., 1933)


HAGENDAHL, Harald Augustine and the Latin Classics (Stockholm: Almqvist & Wiskell, 1967)

HANDSCHIN, J. "The 'Timaeus' Scale" Musica Disciplina 4 (1950) 3-42


HIRATA, Kimiko "Sei Augustinus no ongakuka" unpublished diss. MA, Tokyo University of Arts, 1974 [unseen]

HOFFMANN, Wilhelm Philosophische Interpretation der Augustinussschrift de arte musica (Marburg: Inaugural dissertation Marburg a.d. Lahn, 1938) [unseen]
HURE, Jean Louis Charles (ed. & tr.) Saint Augustine, musicien, d'après le De musica et différentes pages, de ses œuvres, consacrées à la musique (Paris: M. Senart, 1924)

HÜSCHEN, Heinrich articles "Artes liberales" and "Augustinus" in Die Musik in Geschichte und Gegenwart (Kassel, 1949-68) 1: cols 737-742, 848-857

JACKSON, B. Darrell "The theory of signs in St. Augustine's De Doctrina Christiana" in R.A. Markus' Augustine, q.v.

JACKSON-KNIGHT, W.F. St. Augustine's De Musica: a synopsis (London: Orthological Institute, n.d.)

JUBIEN, Michael "Ontology and mathematical truth" Nous 11(1977)133-150

KEIDEL, Wolf D. "Der Harmoniebegriff des Pythagoras aus sinnesphysiologischer Sicht" in Schnitzler, q.v.


KHLENTZOS, Drew "The significance of number within Plotinus' metaphysics" unpubl. thesis, Macquarie University, 1979

KOLK, Dieter "Eine harmonikale Analyse des pythagoreischen Dreiecks" in Schnitzler, q.v.

KRESTEFF, Assen D. "Musica Disciplina and Musica Sonora" Journal of Research in Music Education 10(1962)13-29

LANG, Paul Henry Music in Western Civilization (London: Dent, 1942)

van der LINDEN, L.J. "Ratio et intellectus dans les premiers écrits de Saint Augustin" Augustiana 7(1957)6-32

Musical Thought in Ancient Greece (New York: Columbia University Press, 1964)


LITTLE, A.G. Part of the Opus Tertium of Roger Bacon (Aberdeen: The University Press, 1912)

LITTLE, P.L. "The place of music in the mediaeval world-system" unpubl. thesis, PhD, University of Otago, 1975

LOHMANN, Johannes Musik und Logos: Aufsätze zur griechischen Philosophia und Musiktheorie (Stuttgart: Musikwissenschaftliche Verlagssges, 1970)


The Pythagorean Plato: prelude to the song itself (New York: N. Hays, 1977)

MANFERDINI, Tina L'estetica religiosa in S. Agostino (Bologna: Zanichelli, 1969)


"St Augustine on signs" in his Augustine (Garden City: Anchor, 1972) pp 61-91


MARTI, Fritz "Theological epistemology in Augustine, Kant and Schelling" Modern Schoolman 55(1977)21-35
MASSA, Eugenio Ruggero Basone. Etica e poetica nella storia dell' "Opus Maius" (Rome: Edizioni di Storia e Letteratura, 1955)

MATTHEWS, Gareth B. "Augustine on speaking from memory" American Philosophical Quarterly 2(1955)157-170


MERLAN, P. "Greek Philosophy from Plato to Plotinus" in Armstrong, Cambridge History, q.v.

MEYER-BAER, Kathi "Psychologic and ontologic ideas in Augustine's De Musica" Journal of Aesthetics and Art Criticism 11(1952)224-230

MICHAELIDES, Solon The music of Ancient Greece: an encyclopaedia (London: Faber, 1978)

MONTICO, Giorgio "Il valore psicagogico ed anagogico della musica nel pensiero di S. Agostino e di altri filosofi cristiani" Miscellanea Francescana 38(1938)389-410


MUNKELHAUS, Barbara Pythagoras Musicus: Zur Rezeption der pythagoreischen Musiktheorie als quadrivialter Wissenschaft im lateinischen Millelalter (Bonn-Bad Godesberg: Verlag für systematische...
Musikwissenschaft GmbH, 1976)

NA´DASI, Alfonz "Quelques éléments de la reflexion musicale d'Augustin" Acta Classica Universitatis Scientiarum Debreceniensis 13(1977)77-79


NOWAK, A. "Die 'numeri judiciales' des Augustinus und ihre musiktheoretische Bedeutung" Archiv für Musikwissenschaft 32(1975)196-207


OTT, W "Der hl. Augustinus Lehre über die Sinneserkennnis" Philosophisches Jahrbuch 13(1900)45-59


PAZZAGLIA, M. Il verso e l'arte della Canzone nel 'De vulgari eloquentia' (Firenze: La Nuova Italia, 1967) (Pubblicazioni della Facolta di magistero dell'—Universita degli studi di Bologna, 2)

"Pensées de Saint Augustin sur la musique" Dissonance, Revue musicale 15/5,6(1942) [unseen]

PEPIN, J. "Platonisme et antiplatonisme dans Plotin VI-6-34" Phronesis 24/2(1979)197-208
PERL, Carl Johann "Augustine and music" *Musical Quarterly* 41(1955)496-510

PIZZANI, Ubaldo "Spunti escatologici nel 'De Musica' di S. Agostino" *Augustinianum* 18(1978) fasc.1.209-218

PUGLIATTI, S. "S. Agostino e l'estetica musicale dei Greci" *Teoresi* (1947) [unseen]


REITZENSTEIN, R. "Augustin als antiker und als mittelalterlicher Mensch" Institute. Vortrage der Bibliothek Wurzburg 2/1(1922-23)28-65

ROCHE, W.J. "Measure, number and weight in St. Augustine" *New Scholasticism* 15(1941)350-376

ROETZER, W. *Des heilige Augustin Schriften als liturgiegeschichte Studien* diss. University of Freiburg, 1930


SCHÄFKE, Rudolf *Geschichte der Musikästhetik in Umrissen* (Berlin: Tüting, 1964)

SCHERER, W. "Des hl. Augustinus 6 Bücher 'De musica'" *Kirchenmusik Jahrbuch* 22(1909)63-77

SCHMIDT, Gerhart "Die Rolle der Musik in Platons Staat" in Schnitzer, a.v.


TUESTA, P. Víctor "Efficacia del número según San Augustín" Estudio Augustiniano 3(1968)82-107

UNGRU, Sabetai "On the need to rewrite the history of greek mathematics" Archive for History of the Exact Sciences 15(1975-76)67-114

VANNI ROVIGHI, S. "La Fenomenologia della sensazione in Saint'Agostino" Rivista di filosofia Neo-scolastica 54(1962)18-32

VINCENT, A.J.H. Analyse du traité de métrique et de rhythmique de Saint Augustine intitulé 'De Musica' (Paris: 1849) [unseen]

VLASTOS, Gregory Plato's Universe (Seattle: University of Washington Press, 1975)


article "Augustine of Hippo" in New Grove Dictionary of Music I:695-696

WALHOUT, C.P. "On symbolic meanings: Augustine and Ricoeur" Renascence 31/2(1979)115-127


WALLIS, R.T. Neoplatonism (New York: Scribner's, 1972)

WEDBERG, Anders Plato's Philosophy of Mathematics (Stockholm: Almqvist & Wiskell, 1955)

WENIG, Karel "0 pramenech Augustinova spisu De musica" Listy filologické 33(1906)1-17, 81-95, 161-182