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Music in Reality The relation of music, emotion and Pre-Socratic myth

CAPLETON, BRIAN

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Music in Reality
The relation of music, emotion and
Pre-Socratic myth

by

BRIAN CAPLETON

A thesis submitted to the University of Plymouth
in partial fulfilment for the degree of

DOCTOR OF PHILOSOPHY

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Brian Capleton

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ABSTRACT

This thesis is in two sections. The first critically examines the tradition of *harmonia mundi*. The earliest complete and developed account of *musica mundana* appears in Plato, but numerous fragmented references appear in the pre-Socratic sources. The notion that *harmonia mundi* originated as an idea of quantitative speeds and distances of the celestial bodies, is discredited. Rather, it is shown that it more probably originates as an expression of an 'esoteric spiritual' teaching in which *self-knowledge*, *death*, the concept of *harmonia*, and consequently *music*, are related. The idea that the greatest importance of music rests on the relationship of music and emotion, is undermined in this context, and the relationship of music, emotion and experience is examined in a way that supports much of what was asserted by Hanslick in the nineteenth century.

The interpretation of ancient sources is critically assessed in terms of common 'hermeneutic filters' which are shown to be inconsistent with the *content* and hence context of some of the sources. It is also argued that Plato should be approached not merely through the assessment of the arguments that appear in his discourses, but in the light of his portrayal of the life and death of Socrates. The discourses are treated as inexact, exoteric expressions of esoteric meaning, much of which can be gleaned from the 'symbol' and example of Socrates' own life and death.

The second section presents an original music philosophy that is an entirely contemporary exposition of the essential meaning of the harmony of the spheres tradition, as interpreted in the first section. In this contemporary exposition, some of the ideas that appear in Plato concerning the relationship of soul, world and *harmonia*, are re-expressed in terms of self, world, and an original contemporary 'parable' for *harmonia*. The background to the ancient tradition, of the macrocosm-microcosm relationship, is brought into contemporary terms, drawing critically on some ideas of the quantum physicist David Bohm, and questions raised by quantum theory in general. Finally, the nature of the macrocosm-microcosm is related to parts of Wittgenstein's *Tractatus logico-philosophicus*.

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AUTHOR'S DECLARATION

At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award.

Signed..... *B. Caple*

Date..... *1/8/02*

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Section 1

Introduction

The beginning of music

We can look for some point in the past, some point in our evolution, at which music appeared. We can theorise that music arose because somehow, in the natural or social conditions of the time, it had in some way survival value for the species, or perhaps for smaller organised groups of humans.

We might say that when it comes to psyche, everything about psyche, including the relationship of psyche and music, has its cause in the evolutionary process of survival. However, this would not be fully true within a theory that life and psyche evolved from lifeless matter, because at another level we still exist as chemical, mineral, molecule, atom, quantum, or star stuff, and all these things according to the theory of 'the evolution of life on earth', were around *before* what it calls 'life', evolved. We do not normally talk about a *survival process* in place before the appearance of life forms. The matter itself and the laws of physics, and any unknown laws affecting matter, must, in the context of this theory, be at least indirectly *causal* too.

Life forms and their attendant behaviours and features evolve because life forms are already in a survival situation, but we do not have an agreed theory on how consciousness, self or self-consciousness as it appears in humans, is created from chemical, mineral, molecule, atom, quantum, or star stuff. Evolution theory, with its principle of survival, is *not* a theory of how consciousness arises *now*, in so-called 'unconscious matter'. If we say that the relationship of mind and matter is something that evolutionary survival *brings about*, this does not displace the need of the mind-matter relationship to be a system within the laws of physics.

Current theories concerning physics and consciousness, particularly regarding quantum theory and relativity theory, sometimes involve the necessity to take a radical view of the nature of *time*, a view outside the 'intuitive' notion of it.¹ For example, it can be argued that in physics the *passage* of time is a 'feature of consciousness', with no 'objective' counterpart. This means that

although time is a co-ordinate relative to which evolution stages can be 'measured', the time co-ordinate is not something that of itself has a property of 'passing'. The time it is supposed to have *taken* for consciousness to evolve, is at another level of understanding merely a feature of that consciousness itself, that has been conceptualised as having passed. This of course connects with arguments about whether the world of matter, space, time and even celestial movement is what it appears to be from the sentient point of view. The physics of the relationship of consciousness and matter may be so radical that beside it, the concept of evolution *in time* is reduced to a theory of appearances only, and along with it, the notion of *survival* as the main dynamic for the arising of consciousness.

Such arguments are about systems. A system is a composite object in an object-orientated² process of understanding. This thesis may concur with these arguments in many respects, but it is not however an approach from this point of view. From the *subject-orientated* point of view, we shall talk about *psyche*, rather than consciousness, in the first instance. Psyche is experienced as self, and in this thesis from the subject-orientated point of view *self* is presented as involved in a process. The relationship of self and music, and hence the actual nature of music in relation to psyche, is understood in terms of this process. This means:

We address the reality of psyche from its own point of view, which is *subject-orientated*. Understanding the existence of music is not approached through the *concept* of evolution by survival, which is *object-orientated*. The scientific concern with evolutionary *survival* is a condition that happens to be current now, in the activity of object-orientated understanding. Whilst it is not wrong, it *is* limited. In a sense, to put *psyche* only in the context of evolutionary *survival* is to bring its potential down to the lowest common denominator – that of the material medium in which psyche appears.

The continual development of theory about our origins in terms of evolution can easily create an intellectual momentum in which it is easy to forget that *survival* is not an explanation of everything. The evolution and survival of birds, for example, does not explain gravity. We have to be free to see that music, like everything else, may arise as part of a *greater* process, possibly even one in which ultimately, nothing survives. We might even be able to see this however, from the

¹Lockwood, M, *Mind, Brain & the Quantum*, Oxford, 1992, esp. p. 251 ff.

² See appendix.

subject-orientated point of view. Then we might perhaps see another possibility – that it could be the effects of *this greater process* that manifest as the evolutionary world of survival that we physically occupy.

What I have just suggested, is not in essence a new or modern conception. The notion of a ‘higher’ process that produces effects in a ‘lower’ existence that Man occupies, occurs in the tradition of *the music of the spheres* and is documented in Plato’s Myth of Er, in the *Republic*. In its Platonic and later neo-Platonic forms the tradition is not concerned with evolutionary survival of the species as an explanation for the existence of music, but it is concerned with survival of another kind - self-survival through reincarnation. There has been so much concentration on aspects of the tradition involving arithmetical *harmonics* and quantification, that this aspect of the tradition has often not been properly acknowledged. In due course, I will explain why even this part of the tradition, with its concept of survival of the soul, actually still stands as the symbol for a process in which nothing survives, out of which comes what we call music. For now, we only need to acknowledge this aspect of the tradition as it stands.

The importance of the *music of the spheres* tradition lies in the *context* in which the tradition arose, and in part, continued. This discourse proposes that it did not originate as a speculation about physical, cosmic structure. The early transmission of communication was through what we have been mostly happy to call Greek ‘philosophers’, ‘scientists’ and ‘poets’, taking place from well before Plato, and stretching over a couple of thousand years before the renaissance neo-Platonists embraced and developed it. This transmission through all its ramifications, according to this thesis, can be properly recognised as including at its origin something often ignored - the descending transmission of an essentially *mystical* teaching through Adept, half Adepts, part Adepts, wranglers, phoneys, and finally, rejecters of the tradition like Aristotle. We should also recognise that in this kind of lineage, even the earliest *Pythagorean* part of the tradition itself may well have been a corruption or adaptation of an even earlier mystical teaching. We have also the possibility that Pythagoras himself, for all his mathematical ability, and despite the ‘Orphic’ powers attributed to him, *may* also have been the ‘chief of wranglers’ that Empidocles said he was.

The Contextual Background – music and self

We can consider the experience of music as *an experience of the feeling-emotional self*. To tackle the question of music's subjective effects via enquiry into *self*, might seem to be turning the question of the music-feeling relationship on its head, but if so, it is with good reason that we should do this. The Harmony of the spheres tradition itself places music in what we might now call 'Platonic' and 'neo-Platonic' contexts of the knowledge of self (or in Plato's terms, 'soul'), and its relation to the world or universe as a whole.

The tradition of the past however, in its concern with the existence of music and the reason for its being, does not centre primarily on the music-feeling relationship, but rather, gives music a status derived from its position in no less than a grand cosmic scheme based the idea of the harmony of the spheres. This notion of cosmic order can be seen not only in Ptolemy's model of the universe but also in many of the ideas of Boethius, and whilst it is claimed in the sources that it originates from Pythagoras, it could very well derive or connect with mystical influences from the East.³

The enquiry into the nature of self, or the idea of 'knowledge of self' exists in the backdrop to the *music of the spheres* tradition in the pre-Socratic sources, and appears as the admonition *Know Thyself* delivered by the oracle of Apollo at Delphi.⁴ It is an edict also attributed to many Greek philosophers including Diogenes Laertius, Thales, Solon, Socrates - who is one of the most important proponents of the *music of the spheres* tradition - and Pythagoras himself.

In the descriptions of the universe and its cosmogony, many of these pre-Socratic sources, and indeed some of Plato's works, contain discourse that in modern terms can be regarded as what purports to be *revealed knowledge* about things like the nature of Man, the nature of the universe, and the origins of the universe. Their content is usually referred to as doctrine, theory, or belief, but in their own context these discourses do not purport to be anything other than teachings of truth. Assertions that seem to be made on no other authority than the that of the philosopher himself, in which we can include many pre-Socratic sources and much of Socrates' teaching, can be regarded

³ Pythagoras is known to have connections with the East. The name appears in sources as *Pitagora* or similar. *Pitaghora* in Sanskrit derives from *pitr* (father) and *aghora* (fearlessness, and a reference to Hindu yogis).

⁴ Scholarly interpretation may translate this as 'know that you are mortal and not a god'. Even to know this, to genuinely *know* it, rather than be told it, is still necessarily self-knowledge, so 'know thyself' still remains an admonition to attain self-knowledge.

in a similar light as what was later called gnosticism. They implicitly purport to arise from self-knowledge rather than from deduction, dogma or any other kind of received authority.

Modern philosophy uses systematic rational argument and, it is said, begins by doubting. The ancient pre-Socratic philosopher began, it is implied, by knowing. This does not mean Greek philosophy is intrinsically flawed, but rather, that modern philosophy cannot include the *modus operandi* of the ancient. The lesson to be noted from this state of affairs is that the modern *modus operandi* cannot necessarily be expected to make sense of the ancient.

What looks like revealed knowledge or even just assertions of subjective knowledge often have a relationship with mysticism, and this is often connected with the aspiration of 'self-transcendence'. Some sources would thus be entitled to be regarded as possibly emerging from this point of view, and their meaning may be only relevant in the context of this aspiration. The failure to recognise this possible nature of what is said by a particular philosopher, is a possibility *at any time*, including the times at which the sources and attestations were written.

The concepts of self and 'absence of self' in perception also appear today, and are associated in philosophical aesthetics with things like 'aesthetic experience' and the creation of art. In this very sense, some of the Greek sources can indeed be seen to be *art* prose, rather than the expositions of *doctrines* that they otherwise appear to be. What they deal with is more profound than the term 'aesthetic' perhaps suggests, and they are certainly not writings merely created to be 'aesthetically pleasing'. They make sense as art, as an expression of a certain depth of perception. A mere fragment of text could be a fragment of an art form that penetrates right into areas like those we could call mystical beauty and *gnosis*.

The quantitative and qualitative tradition

The tradition includes ways of understanding the function and purpose of music in relation to its effects upon the listener, and this understanding is posited in the context of universal design in which Man is not an incident factor, but is at the centre of the scheme. The idea of a *geocentric* universe as Ptolemy envisaged, cannot be merely regarded as having arisen in response to observational appearances when viewing the heavens. Geocentricity is equally if not more important in its symbolic placing of *Man* at the centre of the universe.

The contemplation of the universe as an independent system that can be observed by a subject who is *incidental* to it, and not essential or central to the system, even if affected by it, would be an *object-orientated* contemplation. This is the observation of a 'universe object' outside and the self of the subject, which it is felt is important to understand in its own right, disconnected from the subject, *before* its relationship to the subject can be understood. This is the approach of classical science. Conversely the contemplation of the universe or any phenomena *only in its direct relation to the subject now*, or as a universe in which the subject is *essential*, and possibly even the contemplation of it *as the subject*, would be more in keeping with the subject-orientated approach of many pre-scientific sources.⁵

The ancient idea that Man is the microcosm of the universal macrocosm, is not important as an idea about objective structure, but is essentially *subject-orientated*, and occurs in a context that Man's knowledge of the universe is inseparable from knowledge of himself. The object-orientated and subject-orientated facets of the tradition, do not always appear independently. The qualitative tradition even includes the expression of metaphysical thought through the use of Number, as arithmetical expression.

In the quantitative tradition, the mathematical form in harmony is arithmetical harmonic ratio, and is projected onto the conception of the celestial system. Thus we are presented with harmonic ratios of celestial speeds and distances. However, as we shall see, the presence of quantification in ancient sources does not necessarily carry with it the meaning we would ascribe to quantified systems today, but rather, can be symbolic in subtle ways.

In the qualitative tradition, the 'structure' of the universe is metaphysical, and seen in a subject-orientated context, and in an embracing picture of a non-dualistic universe. In terms of *the duality of self and not-self*, the power of music which is supposed to align the 'soul' with celestial harmony, amounts to an aligning of the subject's self with the celestial 'not-self'. This alignment is supposedly possible because of the underlying *non-duality* of everything in the universe. There is in the pre-Socratic sources, and in Plato, the assertion that the vast multiplicity of objects in existence, all the multifarious aspects of the universe, and *time* itself, arise from a unity, the *Being* or *The One*.

Some previous ideas of the role of self and duality in relation to 'aesthetic experience' and altered perception.

The role of the self in relation to 'aesthetic experience', which includes the experience of music, has been given attention in modern philosophical aesthetics. The 'loss of self' from the duality consisting of perceiving self and the perceived 'not-self' art object, or surrounding circumstances, is particularly relevant. Whilst this has not necessarily been strictly understood as 'non-duality' it certainly includes notions of 'self-less perception', the overcoming of self in relation to the art-object, a 'becoming one with the art-object', the 'removal of separation from the art-object', 'disinterestedness', 'will-lessness', and the minimising of 'psychical distance', all of which have been argued to be important in 'aesthetic experience'.⁶

Aesthetic experience, it has been observed, seems to include both involvement in, and detachment or removal from, the object of contemplation or scene of action. It can be associated with 'impersonal perception' or a change in perception that affects the relationship between the observing subject and the thing observed. Bullough saw this change of perception in a way that does not require 'non-duality', but 'minimises' duality. He explored it in some degree through his illustration of a fog at sea. The fog can be terrifying from the position of practical self interest, but even whilst actually involved in the dangerous self-threatening circumstances of the fog, conscious awareness can suddenly switch to the perception of it with 'intense relish and enjoyment'.⁷ In Bullough's view this is achieved through a 'psychical distance', so that a non-involvement, or a transcendence from self involvement to 'aesthetic experience', is possible through a *separation* from the object of contemplation. However, to effect *aesthetic* experience this psychical distance must be reduced to the minimum without its disappearance. The complete loss of distance would result in actual self involvement and the attendant experience such as fear.

A change of perception that removes personal emotional 'involvement' in the scene of action has been fully and explicitly associated with non-duality by Schopenhauer. He spoke of a change of perception and a 'becoming one with' the object of contemplation. In Schopenhauer it is the idea of 'will-less' perception that is important, and it is this that represents the state

⁵ More on the object/subject orientation is found in the Appendix.

⁶ Collinson, Diané, 'Aesthetic Experience', *Philosophical Aesthetics: an Introduction*, ed. Oswald Hanfling, Oxford, 1995, p.111.

⁷ *Ibid.*, p.158.

transcendent to the condition of the world, and hence an intelligence above that which is still blindly identified and involved in the condition and circumstances of the situation. In this 'will-less' perception it is not a distance between the subject and the objective circumstances that is important, but a *removal* of distance. Paradoxically it might seem, this parallels Bullough's 'psychical distance' in that it also removes the self's total attachment to, and identification with the scene of action. This is so, because in Schopenhauer the world is a 'representation' of what he calls the *metaphysical Will*, which in his *non-duality* is *also* the Will of the subject. If there is a *separation* in Schopenhauer's 'aesthetic perception', it is not between the self and the circumstances (or the object of contemplation), but between the subject's *perception* now, and the Will, which is also his own self, and it is this that enables the subject to perceive the world as his own representation. Because the Will can be identified with the self, Schopenhauer is implying that a 'separation from self' is possible *in* the subject. This is in effect, self transcendence. In both Bullough and Schopenhauer the subject in different senses transcends or overcomes the *enmeshment* of the emotional self in the scene of action, in order to reach the *changed perception* that is from an impersonal position beyond emotional self. In Bullough enmeshment is overcome through *psychical distance*. In Schopenhauer, the enmeshment of one's self in the world is overcome by the realisation that the world is one's own Will.

The assertion of non-duality *in place of* the duality of self and not-self is something modern philosophy may well identify as 'solipsism', which is often argued to be philosophically and rationally untenable, and contrary to the morally and spiritually valued principle of what is called 'otherness'. Non-dualism is at the heart of Schopenhauer's philosophy of music expressed in *The World as Will and Representation*, and this, unfortunately, readily lays itself open to the charge of solipsism whether or not this is justified. Contemporaneously Hegel was more successful than Schopenhauer in his propounding of what is presented as a dialectical approach to dualism and non-dualism, which can more easily be understood without dependence upon any assertion that might be seen as solipsism. As different proponents of German federalism, Schopenhauer and Hegel represent two apparently different approaches, but they are essentially approaches to the *same* non-duality and duality. In both Schopenhauer and Hegel, it is asserted that there is only one 'I' or *Being*, which is the non-duality, whereas there are many instances of self-consciousness, or self, and the consequences and truths that arise from this conflicting condition in the world are

elaborated respectively in extensive philosophies. In both Hegel and Schopenhauer the philosophical dynamic comes from this basic dichotomy of duality and non-duality in the world, and the philosophies purport to explain much of what goes on in the world of duality of self and not-self in terms of an underlying (teleological) spiritual purpose or goal that is the individual's discovery of non-duality. In Hegel this is 'Absolute knowing' and in Schopenhauer it is Self Realisation as the discovery of the world as *Will*.⁸

The notion that *the world is my will* is central to Schopenhauer's idea of his meaning of music. According to Schopenhauer, it is the *Will* that pervades existence, for everything in the world is a 'grade of objectification or representation' of the metaphysical Will, which itself remains as a cause behind the existence of the world. Music is however above even the highest of the 'grades' (which Schopenhauer links to Plato's 'Ideas') as it is a 'direct copy' of the Will. There is then a direct parallel between Schopenhauer's *Will* and the Platonic or pre-Socratic *harmonia*. Each pervades the universe, and each manifests or is represented in various forms, including music. However, Schopenhauer makes one particularly important proposition amongst all those that distinguish him from Plato, whom he explicitly acknowledged. This is that the metaphysical Will is

⁸ Schopenhauer, A, *The World as Will and Representation*, Tr. EFJ Payne, New York, 1969; Hegel, GWF, *Phenomenology of Spirit*, Tr. AV Miller, Oxford, 1977. Both proponents of this nineteenth century 'Transcendental Idealism' present a philosophy that is based on certain tenets concerning consciousness, expounding the philosophy through assertions and arguments that can be rationally approached once the basic tenets have been grasped. Schopenhauer in particular asserts his answer to what Kant through his own somewhat 'abstract' argument had considered unanswerable – knowledge of 'the thing in itself', and each does this on the strength of the *Idealist* tenets like *The world is my representation*. However, in this lies a very important problem that must be highlighted. The basic tenets like Hegel's consciousness of Revealed Religion, or Absolute Knowing, or Schopenhauer's realisation that *The world is my representation*, are tenets representing a state of knowledge, realisation or consciousness that is supposed to be 'transcendental' both to the existential world of human affairs, and indeed, to physical existence. The implication in the philosophies is that this 'transcendental' state of knowing, realisation or consciousness is a possibility in Man, and, presumably, an *actuality* in the proponents of these philosophies. Now a detailed understanding, acquired through these works, of this 'transcendental' state of knowledge, realisation or consciousness (or what in mysticism or Eastern tradition is usually referred to in terms of 'higher consciousness'), is a theoretical or intellectual understanding of non-duality, and this, together with an understanding of the kind of 'world-view' that is likely to be associated with it, is not at all the same thing as the actual *possession* of that state of consciousness. It does not follow that the articulation of one indicates the presence of the other in its articulator. The critical tenets like *Revealed Religion*, *Absolute Knowing*, or a realisation that *The world is my representation*, are not even *supposed* to be derived from object-orientated observations of the nature of an objective world. They represent a *subject-orientated* world view. What these philosophies describe as the nature of the world would surely have to be immediately and effortlessly true in the experience of the subject, and not just in an intellectual system of understanding which demands considerable effort to acquire, if it is to be complete and real as an actual state of subject-orientated knowledge. In Hegelian discourse the experience of duality of self and not-self is *dialectically* opposed to the non-dual nature of the 'I'. However, there is a difference and distance between what is directly true in experience, and what is upheld in the intellectual understanding, and it is this that provides room for Hegel's dialectic, or the understanding of Hegel's assertions as dialectical. Understood in this way, what Hegel describes as the 'transcendental' truth of non-duality or its consequences, is never something that is complete in his work as a *description of that state of consciousness*, but exists only as the perceptive but dialectical *argument for it*.

identified with the subject's feeling emotionality. In Schopenhauer the world is a 'representation' and manifestation of human feeling emotionality, and it is really, as it were, this emotional form that pervades existence and determines the nature of the world. Music then not only represents the world, but being somehow a 'direct copy of the Will', is unsurpassed in its efficacy in connecting with the subject's emotional self, and in its ability to represent the emotional aspect of the world. Schopenhauer effectively developed the non-dualism he acknowledged in the Indian *Vedas* and *Upanishads*, and in Plato, and presented a view of music based on emotional form, through this.

No such declaration of all pervading *emotional* form is present in the Platonic and Pythagorean assertions of universal music or harmony. The message behind the tradition of *the music of the spheres* is that *something*, a *harmonia*, pervades music in an explicit way, that also pervades the whole nature of existence, but there is no implication that this, in itself, parallels human emotional feeling. The most explicit description of it in the earliest fragments is simply as a 'fitting together of opposites'. Schopenhauer's proposal of *Will* as a pervasive principle, but as something also connected to emotional form, is limited. The limitation of it is that there is no possibility of getting *beyond* emotion, or beyond the emotional self and a view of the world or reality as correlating to this emotion. The idea that a change of perception, or that a change of subjective condition can be associated with the absence of self, I have already mentioned. Schopenhauer's 'will-lessness' is effectively this absence, but the only thing according to Schopenhauer that is to be perceived as a result of this shift of perception is the 'emotional'-like Will and its representations. What is beyond the Will is for Schopenhauer, beyond knowing. He says in his Epiphilosophy at the end of *The World as Will* that what is beyond the *Will* is not open to investigation, because knowledge itself is part of the phenomenon of the world, which is itself a manifestation of the *Will*.⁹ This leads to a view of music that is limited, and assumes that *perception* cannot reach beyond what the world regards as *knowledge*. It is as limited as the perception of the world as *Will*, where the *Will* is understood in Schopenhauer's way, only in its connection with human emotional feeling. On the contrary, the idea of the overcoming or the absence of emotional self, would surely be more consistent with the idea of a perception that is *beyond* emotional self, and beyond emotional meaning.

⁹ Schopenhauer, A, *The World as Will and Representation*, *Ibid.*, Vol. 2, p. 642.

For *perception* to go beyond emotional self does not mean to go into abstract theoretical knowledge. As Bullough intuited, the overcoming of emotional and psychological self is very much connected with overcoming the psychological and emotional enmeshment in, or attachment to, the scene of action and its emotional causes. Bullough and others have suggested that this freeing from enmeshment can be brought about possibly as an act of will. If music is pervaded by something also pervading the nature of the world we occupy, then this thing, this *harmonia*, would have to be by implication vast, and it seems inconsistent that it could be perceived by a mere act of personal will. On the contrary, the overcoming of emotional self is much more likely to be associated with something vast and impersonal. The great cycle of life and death described in Plato's Myth of Er, the cycle itself, is impersonal, and this represents an unseen 'nature of the world', on a grand scale. On a lesser scale, we do approach the world *in terms of our self experience in it*. We either exist and experience for the sheer sake of experience (as in Schopenhauer's Will) or through experience we can reach something beyond that experience. In the latter case *passing through* the experience of emotional self in the world may provide the possibility of perception beyond emotional self. Passing intelligently *through* feeling experience, passing through the repeated experience of relating to existence through the feelings of the emotional self, which is the *personal interpretation* of the world and circumstances, may lead to an impersonal perception that no longer arises from the emotional self and its enmeshment in, or attachment to, the world.

Chapter 1 – The harmony of the spheres

The idea that Man and the cosmos are governed by 'harmony' appears documented in Western literature two and a half thousand years ago. It is found in the writings of two pre-Socratic philosophers, Heraclitus of Ephesus (fl. BC c.500), and Empidocles of Acragas (fl. BC c.450),¹⁰ as well as in the philosophy of Philolaus of Croton or Tarentum (fl. BC c.480), who was a Pythagorean and a contemporary of Socrates. Heraclitus described harmony as being related to opposing tension, and he drew an analogy between Life, and the tensioned bow or lyre.¹¹ In Empidocles' poem *On Nature*, Love is the uniting principle and Hate the dividing principle in what is obviously a *metaphysical* cosmogony. In his poem, those parts of creation that are alike and can be mixed, are 'united in affection by Aphrodite', whereas the 'unlike' and 'immiscible' have been 'wrought by Hate'. Nevertheless, the unlike can still be successfully mixed through the principle of *harmonia*. The poem also states that the elemental Sun, Earth, Heaven and Sea are all connected in harmony with their own parts.¹²

Most importantly, in the early sources the primary meaning of *harmonia* is usually a 'fitting together' of opposing elements rather than a specifically musical concord.¹³ This *harmonia* constituted a principle of universal order¹⁴ in a world whose many differing parts were derived from opposites created out of the originating *One*. Opposites played an important part in early Greek thought,¹⁵ and in Pythagorean cosmogony and cosmology, the opposites of *Limiteds*, and the *Unlimited*, appear to have been fundamental.¹⁶ Philolaus taught that *harmonia*¹⁷ gives order to the cosmos, and holds together the conflicting opposites of *limiters* and *unlimiteds* by attuning them.¹⁸ Thus, in the appropriate context where unlimited possibilities of sound become limited by *harmonia*, musical harmony would be created.

¹⁰ For a short synopsis on Heraclitus and Empidocles see Kassler, JC, *Inner Music*, London, 1995, pp. 30-33. Dates, and full translations of fragments relating to Heraclitus and Empidocles are in Diels, H, / Freeman, K (Tr.), *Ancilla to the Pre-Socratic Philosophers, A complete translation of the fragments in Diels*, *Fragmente der Vorsokratiker*, Oxford, 1971, pp. 24-34, and 51-69, respectively.

¹¹ Kassler, JC, *Inner Music*, London, 1995, pp. 31-32; Freeman, *Ancilla*, *op. cit.*, p. 28.

¹² Freeman, *Ancilla*, *op. cit.*, pp. 54-56. See also Kassler, JC, *Inner Music*, London, 1995, pp. 32.

¹³ Philip, JA, *Pythagoras and early Pythagoreanism*, Toronto, 1966, p. 123.

¹⁴ Lloyd, GER, *Polarity and Analogy - two types of argumentation in early Greek thought*, Cambridge, 1966, pp. 15-85.

¹⁵ *Ibid.*

¹⁶ Philip, JA, *Pythagoras and early Pythagoreanism*, Toronto, 1966, p. 47.

¹⁷ Huffman, CA, *Philolaus of Croton*, Cambridge, 1993, p. 73.

The ancient tradition of the harmony of the spheres¹⁹ is supposed to have originated with Pythagoras of Samos (fl. BC 530),²⁰ but the assertions within the tradition itself about its own origins, are uncertain and misleading. The Pythagorean sect was steeped in secrecy, and the only extant Pythagorean writings that are thought to have existed before the time of Aristotle (BC 384-322) are the fragments attributed to Philolaus, and those of Archytas of Tarentum (fl. BC c.375?).²¹ Furthermore, in its developed form the tradition's beguiling elements distract from the issues of real philosophical significance that surround the Myth and its supposed point of origin.

The tradition can be broadly divided into two notions. Firstly, there is the notion that actual 'sound' is produced from the movement of the celestial bodies, whether they be considered as the visible independently moving bodies, or as objects 'inherent in' celestial spheres or 'circles' from which they get their motion. This sound was supposed to be musically harmonious, following from the fact that the principal musical intervals are governed by simple mathematical ratios. It was

¹⁸ *Ibid.*, p. 328.

¹⁹ Boethius, AMS, *Fundamentals of Music*, Tr. CM Bower, Ed. CV Palisca, New Haven & London, 1989, p. 9, cites seven primary sources that deal with the harmony of the heavens: Pliny, *Naturalis historia* 2.22(20).84; Cicero, *De republica* 6.18.18; Plutarch, *De musica* 1147; Nicomachus, *Enchiridion* 3; Censorinus, *De die natali* 12; Macrobius, *In somnium Scipionis* 2.1.2 & 6.1-6; Ptolemy *Harmonica* 3.10-16 & 104-111.

Schavernoch, H, *Die Harmonie der Sphären*, Munich, 1981, pp. 132-165 contains synopses of sixteen scholarly or philosophic works treating the subject of cosmic music or the harmony of the spheres, whose authors include Kepler, Fludd, Mersenne, Kircher, Newton, Leibniz, Kant, Schelling, Titus-Bode, Thomas Ring, Victor Goldschmidt, E. Zederbauer, August Boeckh, Wilhem Forester, von Thimus, and Rudolf Haase.

The literary works of twenty are treated, pp. 165-184, including the authors Sir Thomas Browne, Milton, Friedrich Gottlieb Klopstock, Gottfried August Bürger, Johann Gottfried Herder, Jakob Balde, Matthias Claudias, Goethe, Schiller, Hölderlin, Novalis, Brentano, Karoline von Gunderode, Joseph von Eichendorff, Heinriche Heine, Gottfried Keller, Proust, Gottfried Benn, and Hermann Hesse.

Also pp. 184-186 gives coverage of the attention paid to the harmony of the spheres by many composers and composer-theorists since Bardi's "L'Armonia della sfera" in the 1589 Intermedi. Included are Buxtehude and Hindemith.

Moyer, AE, *Musica Scientia*, Ithaca & London, 1992, includes mention of Quintillian (p.28 ff., citing Quintillian, Marcus Fabius, *Institutio Oratorio*, Tr. HE Butler, London, 1921; *Quintillian's Institutes of Oratory*, Tr. JS Watson, {2 Vols}, London, 1903); Burtius (pp. 44 ff. & pp. 49-51, citing Burtius, Nicolaus, *Musices opusculum*, Tr. Clement A Miller, Musicological studies and documents 37, N.p.: American Institute of Musicology, 1983); Ramos de Pareja (p.52 ff.); Macrobius (p. 57); Martianus Capella (p. 57); Pliny (p.44); Tinctoris (p.65); Franchino Gaffurio (p. 73, & esp. pp. 86-9 on *De harmonia muisorum instrumentroum opus*, Milan, 1518); Pietro Aron (p. 121); Tartaglia (p.131ff.); Luigi Dentice (p. 147); Cardano (p. 160); Zarlino (p. 207); Pietro Caetano (p. 265); Pietro Ponzio, Frate Angelo, Poliziano, Lefèvre d'Étaples, Plutarch, Celio Rodigino (all p. 271); Fabio Paolini (p. 274); Gentile Riccio (p. 275), and Ercole Bottrigari (p. 278), who assumes in his *Il Melone*, Ferrara, 1602, that the tradition is already dead.

²⁰ Date taken from Diels, H, / Freeman, K (Tr.), *Ancilla to the Pre-Socratic Philosophers, A complete translation of the fragments in Diels*, Fragmente der Vorsokratiker, Oxford, 1971, p. 20.

²¹ Huffman, CA, *Philolaus of Croton*, Cambridge, 1993, p. 57. The older Pythagoreans are Cercôps, Petrôn, Bro(n)tînus, Hippasos, Calliphôn and Dêmocêdês, Parm(en)iscus. Nothing certain is known of any written works: *vide* Freeman, *Ancilla*, *op. cit.*, p. 20. Accounts of Pythagoreanism derive mostly from the Peripatetic School (Aristoxenus, Theophrastus, Eudemos) and from the neo-Platonists (Porphyry, Iamblichus, Proclus, Simplicus). There are also extracts in the compilers (Diogenes Laertius, Stobaeus)

believed that those mathematical 'harmonic ratios' existed in the quantified positions and motions of the celestial bodies, thereby determining that the sound produced was musically harmonious. Reports of this state of affairs in the heavens are usually accompanied by some 'rational' explanation for why the celestial sound is not audible to all. Pythagoras was believed not only to have discovered the ratios governing the principal harmonic musical intervals, but also to have had the unique and divinely ordained ability to hear the harmony of the spheres. These beliefs in a mathematically harmonic construction of the celestial system, and sounding celestial bodies, constitute what I shall call the 'pseudo-scientific' notion and the 'quantitative' tradition.

Alternatively, in the 'metaphysical' tradition, harmony or *harmonia* is generally held to be a cosmic, Divine, and originating principle, that broadly speaking is inherent in the visible heavens, the 'soul of the world', the individual human soul, and the phenomena presented to the senses. This notion does not necessarily demand that there be actual *sound* arising from the celestial bodies, and later in the tradition even accommodates the scientific necessity for describing the motions of the celestial bodies in more complex ways. The metaphysical notion is in essence, a specifically musical branch of a metaphysical cosmogony in which there is an originating One-ness or Unity of all things, and in which the principle of *harmonia*, operating at all levels, combines or 'fits together' the separate parts of the created, but divided universe. In this notion, the relationship between the harmony of the heavens and earthly music, is primarily one of *kinship*, recognisable in a very special context. That context is one in which there is *correspondence* between Man the microcosm, and the macrocosm of the physical universe. The ability of the human soul to respond to earthly music arises from the correspondence between the nature of the soul and the nature of musical phenomena, both being Divinely ordained, and ordered through the universal principle of harmony, or *harmonia*. Alternatively, the harmony of the spheres is taken to be something divine, that is normally only perceived by the soul before its imprisonment in the body. The soul's response to music is then seen as a 'turning to its source', and away from the body in which it is entombed.²²

and the lexicographers. But these accounts usually refer to the Pythagorean school rather than any particular member. *vide* Freeman, *Ancilla*, *op. cit.*, p. 82.

²² c.f. Guthrie, WKC, *Orpheus and Greek religion*, London, 1935, p. 223. The idea that the soul is entombed in the body is also found in the Philolaus fragments (c. 500 BC). See Freeman, *Ancilla*, *op. cit.*, p. 74 (14).

In these metaphysical pictures, mathematical order seems to indicate the presence of the metaphysical principle of harmony or *harmonia*. The relationship between the mathematical order that governs harmonic musical intervals, and their subjective musical effect, is evidence of the underlying kinship and correspondence between all things. The correspondence, in this sense, between the nature of the soul and the nature of music, arises only because both have an allegiance to the one divine principle of harmony, or *harmonia*. Iamblichus, for example, denied that the soul actually consists of harmony and rhythm, and stated that 'the soul, before she gave herself to the body, was an auditor of divine harmony; and hence, when she proceeded into the body and heard melodies of such kind as especially preserve the divine vestige of harmony, she embraced these, from the recollected divine harmony, and tends and is allied to it, and as much as possible participates of it'.²³

These two notions, the pseudo-scientific and the metaphysical, are not necessarily separated in any source. In Boethius, for example, the two are present simultaneously. Boethius appears to have believed in both the physical sound of the 'harmony of the spheres', and an underlying metaphysical kinship between microcosm and macrocosm, based upon harmony. The harmony of the spheres is a notion that in totality includes both metaphysical and physical notions and embraces the mythical, the mystical, the magical, and the proto-scientific. Its true philosophical status cannot be appreciated merely in the context of only one of these. On the contrary, the relationship between the mythical, mystical, magical, and scientific, or between the metaphysical and the physical, are themselves important questions for which the idea of *harmonia mundi* stands as a timeless monument. The harmony of the spheres is also a notion that connects the realm of quantitative astronomy and scientific endeavour, with the essentially metaphysical endeavour of musical art. We shall begin by examining some of the evidence for *harmonia mundi* as a quantitative, astronomical proposition, and shall then move to the metaphysical aspect.

The first, and perhaps most articulate²⁴ description of the harmony of the spheres, in which the musical and astronomical components of the tradition appear fully developed,²⁵ is in Plato's

²³ Taylor, T, *Iamblichus on the mysteries of the Egyptians, Chaldeans, and Assyrians*, London, 1821, 1968, pp. 133, 143.

²⁴ Maclaughlin, E, 'The conquest of time', *Diotima*, Vol. 11, 1983 p. 130.

²⁵ Philip, J.A, *Pythagoras and early Pythagoreanism*, Toronto, 1966, p. 126.

account of the 'Myth of Er' in the tenth book of *The Republic*.²⁶ The notion of quantifiable musical proportion in the order of the cosmos is again implicated in Plato's description of the creation of the 'world soul' in *Timaeus*.²⁷ The latter is the main source of the tradition's mathematical impetus, and although in it Plato describes harmonic proportions mathematically, he makes in it no *explicit* reference to music or *musical* harmony. Further allusions to cosmic music appear in *Phaedrus*,²⁸ and *Laws*.²⁹

The description in *The Republic* takes form within a story recounted by Socrates, about the Pamphylian warrior Er, son of Armenius, who was killed in battle, but was miraculously brought back to life on the funeral pyre, after witnessing the events in the death-world. Er was prevented from completing the death process which for the other souls ended in their reincarnation into a life of their own choosing. Unlike the other souls, he did not forget what he had seen in the 'other world', since he alone was forbidden to 'drink from the waters of the River of Lethe', the River of Forgetfulness.

In brief form, and avoiding some of the more ambiguous or contentious aspects of Plato's description, the elements of the myth most closely surrounding the harmony of the spheres are:³⁰

A rainbow-like shaft of light that bonds together the whole circumference or revolution of the heaven;³¹

The 'Spindle of Necessity',³² like the simple spindle used for hand-spinning on earth;³³

²⁶ Plato, *The Republic*, 616b - 617d, Tr. D Lee, London, 1955, 1987, pp. 388-393.

²⁷ Plato, *Timaeus*, 34-37, esp. 35a-36d, in *Timaeus and Critias*, Tr. D Lee, London, 1965, 1977, p. 46-49.

²⁸ *Phaedrus*, 246, E-247 C, see Heath, Sir Thomas L, *Greek Astronomy*, New York (originally London), 1932, 1991, pp. 42-43.

²⁹ *Laws*, 889B-C. The concept of harmony, harmonic proportion, or concord, also appears in *Symposium*, 188A, and *Timaeus*, 32C (in relation to the elements), and in *Symposium* 188A, in relation to the seasons. (Also cited in Boethius, AMS, *Fundamentals of Music*, Tr. CM Bower, Ed. CV Palisca, New Haven & London, 1989, p. 9, notes).

³⁰ The philological studies of the Myth consulted are given in Halliwell, S, *Plato: Republic 10*, Wiltshire, 1988, pp. 92 ff, & Richardson, H, 'The Myth of Er (Plato, *Republic*, 616B)', *CQ*, 20, 1926, pp. 113-133. Also consulted: Godwin, J, *Music, Mysticism and Magic*, London, 1986, pp. 3-8; notes pp. 295-299. The synopsis given here is my rendering based firstly upon the translation of Lee, *op. cit.*, with the selected alternative translations cited.

³¹ Lee, *op. cit.*, p. 388 = 'this light is the bond of heaven and holds its whole circumference together'; Halliwell, *op. cit.*, p. 93 = 'this light was the binding of the sky, holding the whole revolution together'; Stewart, JA, *The Myths of Plato*, London, 1960, p. 148 = 'this light is that which bindeth the Heavens together...[it holds] together the whole round of Heaven'; Richardson, *op. cit.*, p. 114 = 'holding all the revolving heaven together'.

³² Stewart, *op. cit.*, p. 150. Lee, Richardson, and Halliwell use a lower case 's' in 'Spindle'. Taylor, T, *The works of Plato*, London, 1804, Vol.1, pp. 466-475, reproduced in Godwin, *Music, Mysticism and Magic*, *op. cit.*, pp. 4-8, = 'distaff of necessity'.

³³ Lee, *op. cit.*, pp. 400-404.

The whorl or flywheel at the lower end of the spindle which in this case is composed of eight nested 'hollowed-out' whorls of diminishing size, which are hemispherical and fitted concentrically inside one another like a nest of bowls. From the largest to the smallest they are numbered 1 to 8. Their visible rims form a continuous surface of concentric circles, and are of varying breadth. The whole spindle revolves with the same motion, but the inner seven circles revolve slowly in the opposite direction, at various speeds;³⁴

The 'lap of Necessity'³⁵ in which the spindle turns;

Eight Sirens,³⁶ each of which stands on the top rim or circle of an individual whorl, being carried round with it, and singing a single note,³⁷ the eight together composing a single harmony.³⁸

Three enthroned Fates, the Moirae,³⁹ daughters of Necessity, Lachesis, Clotho, and Atropos, all in white, and garlanded,⁴⁰ who sit round about at equal distances⁴¹ singing to the Sirens' harmony.⁴² Lachesis sings of things past, Clotho of things present, and Atropos of things to come. The three Fates turn the whorls, Clotho from time to time turning the outermost rim with her right hand,⁴³ Atropos turning the inner rims with her left hand, and Lachesis turning the inner and outer rims alternately with her left and right hands.⁴⁴

³⁴ Lee, *op. cit.*, pp. 388-389; pp. 402-404.

³⁵ Lee & Stewart, *op. cit.*; Halliwell = 'on the lap of necessity'; Taylor, *op. cit.* = [on] 'the knees of necessity' (This is the lit. tr. - See Halliwell, p. 181).

³⁶ Lee gives 'siren' without capitalisation. Halliwell, p. 181, describes Sirens as 'particularly flexible mythological figures, often allegorically treated'.

³⁷ Lee = 'utters a note of constant pitch'; Halliwell = 'emitted the sound of a single note'; Stewart = 'uttering one note at one pitch'; Taylor = 'uttering one voice variegated by diverse modulations'.

³⁸ Lee = 'the eight notes together make up a single scale'; Halliwell = 'a unitary concord'; Stewart = 'one melody'; Taylor = 'But that the whole of them, being eight, composed one harmony'. The original (Halliwell, *op. cit.*, p. 94) is *harmonia*, the meaning of which is dealt with below.

³⁹ The goddesses of fate, in Halliwell only, *op. cit.*, p. 94; 95; 182.

⁴⁰ Lee, *op. cit.* & Stewart *op. cit.*; Taylor = 'having crowns on their heads'; Halliwell = wreaths.

⁴¹ Halliwell = 'seated around the rim at equal intervals'; Taylor = 'at equal distance from one another'; Stewart = 'at equal distances apart'.

⁴² Lee = 'they sing to the siren's music'; Taylor = 'singing to the harmony of the Sirens'; Stewart = 'they chant to the melody of the Sirens'; Halliwell = 'singing to the accompaniment of the Siren's concord'; original, Halliwell, p. 94, = *harmonia*.

⁴³ Lee = 'Clotho from time to time takes hold of the outermost rim of the spindle and helps to turn it; Taylor = 'Clotho, at certain intervals, with her right hand laid hold of the spindle, and along her mother turned about the outer circle'; Stewart = 'Clotho with her right hand ever and anon taketh hold of the outer round of the spindle, and helpeth to turn it; Halliwell = 'Klotho used her right hand to touch and help round the outer rotation of the spindle at intervals'.

⁴⁴ Lee = 'Lachesis takes inner and outer rims with left and right hands alternately'; Taylor = 'Lachesis touched both of these, severally, with either hand'; Stewart = 'Lachesis with either hand taketh hold of outer and inner alternately'; Stewart, p. 151, n.1 = 'she lays hold of outer...and inner...in turn, using her right hand for the former, and her left for the latter'.

The confirming of destiny, in which Lachesis provides new lives and Guardian spirits⁴⁵ that the souls themselves choose on the strength of their own virtue and ignorance; Clotho ratifies the choice by taking it into the revolution of the spindle beneath her hand;⁴⁶ and Atropos spins the thread of destiny or life, making it irreversible.⁴⁷

I have so far not mentioned the further details Plato gives suggesting the geometrical arrangement of the light and the heavens, or the details concerning eight whorls, linking them by allusion to the celestial bodies and their orbits. These details, together with those Plato gives in *Timaeus* regarding the construction of the 'world-soul', have long been plundered and compared, in numerous attempts to reconstruct an original Platonic or Pythagorean astronomical system that embodies a quantifiable celestial harmony.⁴⁸ A conclusive interpretation along these lines has been prevented by the fact that Plato's descriptions, and sometimes the Greek itself, are simply too ambiguous.

A purely quasi-scientific attempt to reconstruct a Platonic system of musico-astronomy from Plato's myths will tend to extract the mathematical and astronomical elements and treat them in relative isolation, and to ignore the import of qualitative symbols like 'the lap of Necessity', or the colour of the Fates' attire. Yet the story is actually a spiritual and moral myth about the meaning of life and death, and not merely a parable symbolising a proto-scientific system of astronomy. The details I have given so far deliberately portray the metaphysical, rather than the pseudo-scientific context of the Sirens' music. It should be noted that the music is not *in this context* an incidental factor, any more, say, than is the fact that the Fates are the 'daughters of Necessity'. It is integral to the myth both through its association with the whorls, and through the Fates themselves who sing to the sirens' harmony and spin the irreversible threads of fate with the spindle of Necessity. The musical part of the myth is nevertheless all too often treated as if it were a separate, added dimension, woven into the fabric of the myth, exclusively representing some

⁴⁵ Lee, *op. cit.*; Taylor = 'daemon'; Stewart = 'Angel'; Halliwell = 'daimon'.

⁴⁶ Lee = 'the Guardian Spirit first led it [the soul] to Clotho, thus ratifying beneath her hand and whirling spindle the lot it had chosen'; Stewart = 'taketh him [the soul] beneath her hand and the revolution of the whirling spindle, and ratifying the Portion which the man had chosen in his turn'; Halliwell = "the daimon first of all led the soul to Klotho, beneath her hand and the turning of the spindles' motion, thus ratifying the portion of life which the person chose".

⁴⁷ Lee = 'he [the Guardian Spirit] led it [the soul] next to where Atropos spins, so making the threads of its destiny irreversible'; Stewart = 'the Angel brought him [the soul] unto Atropos where she span; so did he [*sic*] make the threads of the man's life unalterable'.

⁴⁸ See, for example, Maclaughlin, E, 'The conquest of Time', *Diotima*, Vol.11, 1983, pp. 130-148.

quantitative Pythagorean doctrine about harmonic arithmetic proportion in what we now call the solar system.

The astronomical details in isolation, as given by Plato, are as follows. The associations with the celestial bodies are a generally agreed point of interpretation, rather than anything explicitly stated by Plato, and it is similarly assumed that the celestial system is geocentric:

1st whorl: Outermost. Broadest rim. Many-coloured, spangled⁴⁹ or sparkling.⁵⁰ Associated with the sphere of fixed stars.

2nd whorl: 8th broadest rim. Fifth in speed. Similar to 5th whorl and yellowish. Associated with Saturn.

3rd whorl: 7th broadest rim. Fourth in speed. The whitest. Associated with Jupiter.

4th whorl: 3rd broadest rim. Third in speed, appearing to move with a counter-revolution. Reddish. Associated with Mars.

5th whorl: 6th broadest rim. Second fastest speed. Similar to 2nd whorl and yellowish. Associated with Mercury.

6th whorl: 2nd broadest rim. Second fastest speed. Second in whiteness. Associated with Venus.

7th whorl: 5th broadest rim. Second fastest speed. The brightest. Associated with the Sun.

8th whorl: 4th broadest rim. Innermost and fastest. Illuminated by the seventh from which it takes its colour. Associated with the Moon.

In *Timaeus* Plato tells how God constructed the soul of the world out of three constituents, forming what from his description appears to be something like an armillary sphere.⁵¹ We will not here closely scrutinise the details Plato gives, other than to say that the process involves dividing something called 'the whole' into proportions determined by the series of numbers 1,2,3,4,8,9 and 27. These numbers are used in the discourse to produce 'intervals'⁵² in the harmonic proportions 2/1, 3/2, 4/3, 9/8, and 256/243, which correspond to the octave, fifth, fourth, whole tone,⁵³ and

⁴⁹ Halliwell, *op. cit.*, p. 93.

⁵⁰ Halliwell, *op. cit.*, p. 180.

⁵¹ See Plato, *Timaeus*, Tr. Lee, *op. cit.*, p. 47 & frontispiece.

⁵² *Timaeus*, Tr. Lee, *op. cit.*, p. 48.

⁵³ A large whole tone.

diatonic semitone of the old Pythagorean tuning.⁵⁴ This correspondence, however, is circumstantial as it appears in the text, and Plato makes no explicit reference to musical harmony. Cornford argued that the series was employed for reasons that have nothing to do with music.⁵⁵ Plato also describes 'circles' being made, whose motions correlate to the motions of the whorls in the Myth of Er.

The quantitative, physical idea behind the general form of the *harmonia mundi* concept as it appears in the later pseudo-scientific tradition is not dependent upon the metaphysical or mythical notion of singing Sirens or Moirae, but prosaically assumes that the celestial bodies, being large and fast-moving, must produce from their movements sounds whose pitches are associated with their size, speed, and position. This branch of the tradition held that the bodies move at speeds which are related to their distances from the centre of the system, generally with the slower moving bodies giving the lowest notes, and the fastest moving, the highest notes. In a further extension of this pseudo-scientific hypothesis, the radii of the orbits and the sidereal speeds of the celestial bodies are said to be somehow arithmetically arranged in harmonic proportions with the result that the sounds produced are musically harmonious, or correspond to a musical harmony or scale.⁵⁶ This sound was sometimes said to have been audible to Pythagoras, but not audible to everyone because from birth everyone was exposed to it, and in the absence of genuine, contrasting silence, everyone was adapted and unaware of it.

An Unlikely Story

It is Plato's pupil, Aristotle - assumed to have been the earliest important authority on the Pythagoreans⁵⁷ - who provides in his *De caelo* the first explicit exposition of this pseudo-scientific account,⁵⁸ and he does so with the intention of disputing it. Aristotle also purported to give metaphysical legitimacy to the notion of concentric celestial spheres. The concept of concentric spheres in the heavens had appeared much earlier, in the philosophy of Anaximander (BC c.610-546), and had later been developed by Eudoxus (BC c.390-340), who proposed a system 26 spheres

⁵⁴ The ratio of 256/243 which also appears in Eratosthenes' Diatonic tuning and Ptolemy's Diatonic Diatoniaion. See Murray Barbour, J, *Tuning and Temperament*, New York (originally Michigan), 1951, pp. 19-21.

⁵⁵ Cornford, FM, *Plato's Cosmology*, London, 1937, p. 68.

⁵⁶ Levin, FR, *The harmonics of Nicomachus and the Pythagorean tradition*, Pennsylvania, 1975. p.1.

⁵⁷ *Ibid.*, p. 69.

as a mathematical model intended to explain the combined motions of the stars and planets.⁵⁹ Eudoxus envisaged each inner sphere revolving on an axis attached to the surrounding sphere, the system thereby allowing complex motion. Eudoxus' pupil Callipus (BC c.370-c.300) improved the scheme by adding a further eight spheres.⁶⁰ Aristotle then brought the conjectured number up to 54, but for Aristotle concentric celestial spheres are also important as an essential part of his own system of 'metaphysics'. They are composed of 'eternal substance', 'immovable in itself', but which itself moves the planets and stars, since they are incapable of moving by themselves.⁶¹ The celestial bodies were, Aristotle maintained, 'fastened to' or 'inherent in' the spheres that move them,⁶² an idea confirmed by Theon of Smyrna and attributed to Pythagoras himself.⁶³ The inability of the celestial bodies to move by themselves, and their attachment to, or inherence in the spheres, was seen by Aristotle as a significant factor in demolishing the doctrine of the harmony of the spheres. The celestial bodies could not produce sound, Aristotle argued, since there was no relative motion, friction, or concussion. He argues that 'A thing moving in something which is not moved makes a sound; but a thing moving in something which moves continuously and causes no concussion, cannot possibly make a sound'.⁶⁴

Aristotle thus rejected the pseudo-scientific doctrine as he understood and described it. In *Metaphysics* he repudiated the whole idea of cosmic harmony based upon number,⁶⁵ and considered that the Pythagoreans had engaged in the spurious adaptation of 'numbers and harmonies' to the 'properties and parts of the heaven and its whole arrangement'.⁶⁶ Alexander confirmed Aristotle's position in his commentary on Aristotle's *Metaphysics*,⁶⁷ just as countless others must have rejected the idea since. But how authoritative was Aristotle's account in the first instance?

⁵⁸ *De Caelo*, II, 9, 289a 11-291b 23; Tr. in Heath, Sir Thomas L, *Greek Astronomy*, New York, (originally London) 1932, 1991, p. 73 ff.

⁵⁹ O'Neal, *Early astronomy from Babylonia to Copernicus*, Sydney, 1986, p. 61 ff; see also Heath, *Greek Astronomy*, *op. cit.*, pp. xlv ff.

⁶⁰ *Ibid.*, p. 65 ff.

⁶¹ *Metaphysics*, 8, 1073 a 23-b 17, Tr. in Heath, Sir Thomas L, *Greek Astronomy*, New York, (originally London) 1932, 1991, pp. 72-73.

⁶² Heath, *Greek Astronomy*, *op. cit.*, p. 79.

⁶³ *Ibid.*, p. 11.

⁶⁴ *Ibid.*, p. 79.

⁶⁵ *Metaphysics*, Book Alpha, 985b ff, cited in Moyer, AE, *Musica Scientia*, Ithaca & London, 1992, p. 19.

⁶⁶ *Metaphysics*, A 5, 986, a 1; Heath, *Greek Astronomy*, *op. cit.*, p. 34.

⁶⁷ Philip, JA, *Pythagoras and early Pythagoreanism*, Toronto, 1966, pp. 123-124; Translation of Alexander's description of the doctrine, (*Metaphysics*, A 5, p. 542 a 5-18 Brandis) appears in Heath, Sir Thomas L, *Greek Astronomy*, New York, (originally London) 1932, 1991, pp. 34-35.

Aristotle himself speaks of, but does not disclose the alleged quantified Pythagorean scheme defining a relationship between musical intervals and an astronomical system. According to Alexander, who also offers no quantified Pythagorean scheme but instead invents his own example,⁶⁸ Aristotle knew no details of Pythagorean cosmic harmony.⁶⁹ If so, was Aristotle merely reiterating an existing belief, perhaps widely held, but nonetheless based only upon ignorance and impression? The secrecy surrounding the early Pythagorean school would scarcely make it unreasonable to draw this conclusion. Iamblichus (250-325 AD) noted that there were very few Pythagoreans whose writings were then known, and said that 'their excellence in keeping secrets provokes admiration'.⁷⁰

Admittedly, Iamblichus does also mention three books published by Philolaus, a member of the Pythagorean fellowship. These were said to have been bought by Dion of Syracuse, on Plato's advice.⁷¹ The story thus infers that as Plato's pupil, Aristotle may possibly have seen a written, quantitative exposition of Pythagorean doctrine, if indeed such a doctrine existed. If we take Philolaus' birth to have been BC c.480, then Philolaus would probably have been in his seventies by the time Plato was eighteen years old. Given that we do not know when Philolaus died, one *could* argue the possibility that there is some truth in the story, and that Plato himself had seen a clear exposition of a quantitative doctrine by Philolaus. However, the quantitative doctrine Aristotle alludes to is not explicated anywhere in Plato. If we are to be pedantic, then it has to be said that if Philolaus' writings were in close circulation when Plato was a young man, it can be argued that Aristotle may have seen a written Pythagorean doctrine by Philolaus.

All this conjecture in support of Aristotle is arguably rather weak, and there still remains a glaring inconsistency within Aristotle's portrayal of the Pythagoreans. It was understood by Aristotle that in Pythagorean cosmology the Earth was not at rest,⁷² but revolved around a central 'fire'. This central 'fire' was not necessarily taken to be the visible sun, and Aristotle explicitly mentions the *motion* of the sun, in his description of the Pythagorean 'doctrine'.⁷³ Aristotle also

⁶⁸ Huffman, CA, *Philolaus of Croton*, Cambridge, 1993, p. 280.

⁶⁹ Burkert, W, *Lore and science in ancient Pythagoreanism*, Cambridge, 1972, pp. 353-354.

⁷⁰ Clark, G, *Iamblichus: On the Pythagorean Life*, Liverpool, 1989, pp. 85-86.

⁷¹ 'The notorious "three books", bought for one hundred minai, at a time when Philolaus was desperately poor', *Ibid.*

⁷² *De Caelo*, B 13, 293 a 15-b 30; Tr. Heath, *Greek Astronomy*, *op. cit.*, pp. 30-31; Also Heath, *Aristarchus*, *op. cit.*, p.96.

⁷³ *De Caelo*, II, 9, see Plato, Tr. Lee, *op. cit.*, p. 400; *Metaphysics*, A8, see Heath, *Greek Astronomy*, *op. cit.*, p. 78.

understood that Pythagorean cosmology included an invisible⁷⁴ 'counter-earth', which he says was only introduced in order to make the number of celestial bodies equal ten, a number that the Pythagoreans regarded as perfect.⁷⁵ However, including the sphere of fixed stars, a system with both the Sun and Earth orbiting a centre would have eleven and not ten celestial orbits.⁷⁶ The sphere of fixed stars was treated as an integral part of the rotating celestial system elsewhere in early Greek astronomy, and Aristotle makes no mention of the sphere of fixed stars being treated separately or differently by the Pythagoreans. There is no reason given in his report to suggest he understood Pythagorean cosmology as excluding the sphere of fixed stars from the pseudo-scientific scheme of cosmic harmony. Burkert has stated that Nicomachus proposed a system that contradicted the reports of Aristotle, specifically 'because it excluded the sphere of fixed stars and gave the moon the highest note'.⁷⁷ It might be argued that Aristotle made a simple oversight in mentioning the *movement* of the Sun, and that he actually understood the Pythagorean system as having the stationary visible Sun as the central 'fire'. However, if that was the case, then Aristotle's understanding would still be suspect, as it would in this respect then be at variance with the attestations of both Aëtius⁷⁸ and Simplicius,⁷⁹ in the description of the Philolaus' cosmology.⁸⁰

Aristotle's account of Pythagorean cosmology is thus questionable, and the assertion that the harmony of the spheres was a quantitative, quasi-scientific notion invented by Pythagoras - an assertion that seems to have originated with Aristotle - begins to lose some of its credibility on close examination. In the later tradition there appear a number of systems that are attributed to Pythagoras,⁸¹ and there seems to be no reason for ascribing absolute credibility to any one over another. The writings of the Pythagorean Philolaus do not help clarify the matter. Philolaus' astronomical system has been subject to what Huffman has described as 'the widest range of

⁷⁴ The counter-earth was said to be invisible because it was continuously obscured from sight.

⁷⁵ *Metaphysics*, A 5, 985 a 1; Tr. Heath, *Greek Astronomy, op. cit.*, p. 34.

⁷⁶ c.f. Kingsley, P, *Ancient philosophy, mystery and magic*, Oxford, 1995, p. 174.

⁷⁷ Burkert, W, *Lore and science in ancient Pythagoreanism*, Cambridge, Massachusetts, 1972, p. 353.

⁷⁸ Aëtius, II, 7, 7, (Diels, revised by Kranz, A16), Explicitly mentions the sun as one of the 'divine bodies' that move in a 'dance' around the 'middle'. See Tr. Heath, *Greek Astronomy, op. cit.*, pp. 32-33; Tr. Huffman, *Philolaus, op. cit.*, pp. 237-238; Aëtius, III, 13, 2, (Diels, revised by Kranz, A21).

⁷⁹ Philip, JA, *Pythagoras and early Pythagoreanism*, Toronto, 1966, pp. 113-114, states that Simplicius reports Philolaus to have held 'The middle is first in rank. Around it move in choral dance ten divine bodies: the sphere of fixed stars, the five planets, sun, moon, earth, and counter-earth'.

⁸⁰ Huffman, *Philolaus of Croton, op. cit.*, pp. 231-240, cites other attestations to the astronomical system of Philolaus: Aristotle, *De Caelo*, 2.3, 293a18ff; *Metaph.* 38.20, *De Caelo* 511.25, Simplicius, *Ph.* 1354.2, Diels, revised by Kranz, (DK) A16 (=Aëtius 2.7.7), DK A17 (=Aëtius 3.11.3), DK A21 (=Aëtius 3.13.2), Eudemus, F146(=Simplicius, *De Caelo* 471.4 = DK 12A19), Aristotle, *Met.* 342b30 & 345a14.

⁸¹ Heath, Sir Thomas L, *Aristarchus of Samos - the ancient Greek Copernicus*, Oxford, 1913, 1959, p. 107 ff.

assessments imaginable'.⁸² The first detailed account that seems to have been based upon something like Philolaus' system, is by Plutarch (c.50-c.120 AD), who contradicts Aristotle by describing the distances of the heavenly bodies from the central fire as increasing by powers of three.⁸³ Huffman was sceptical about Aristotle's attestations generally, stating that 'following the work of Cherniss (1935), many other detailed studies have shown that Aristotle is very prone to reformulate earlier philosophy in his own terminology and for his own dialectical purposes'.⁸⁴

Scepticism about the plausibility of a Pythagorean origin to the pseudo-scientific tradition is not difficult to find amongst scholars. Burkert states that a mathematical system of celestial harmony before Eudoxus is difficult to conceive, and dismisses as a misconception the view 'put forward again and again as virtually self-evident' that the notion of cosmic music was inferred from a scientific system. He also criticises the 'scale of the music of the spheres which in later times was most widely known and attributed to Pythagoras', as a 'botched version of Eratosthenes' exposition'.⁸⁵ He argues that it is only 'in pre-scientific conceptions of order that the idea of cosmic music has its roots',⁸⁶ and that the original doctrine was not a scientific system worked out in detail, and according to the earliest testimonia was not even based on any detailed astronomical system.⁸⁷

The other area of difficulty in alleging a Pythagorean quantitative or pseudo-scientific doctrine, concerns the mathematical ratios governing the musical intervals. The idea that it is arithmetic harmonic ratios inherent in the celestial system that are responsible for its alleged musically harmonious properties, is necessarily based upon a knowledge of the relation between musical harmony and arithmetical, harmonic proportions. The part of the tradition that ascribes to Pythagoras the discovery of the relation between the ratios 6:8:9:12 and the octave, fifth, fourth, and whole tone, is itself most probably spurious. Pythagoras is said to have listened to the hammers of four smithies, which were striking the metal and ringing out notes in the musical relation of a fourth, fifth, and octave. The story itself, as it is reported by Nicomachus, Iamblichus, and

⁸² Huffman, CA, *Philolaus of Croton*, *op. cit.*, p. 240.

⁸³ *Ibid.*, p. 281.

⁸⁴ *Ibid.*, p. 59; see also p. 202.

⁸⁵ Burkert, Walter, *Lore and science in ancient Pythagoreanism*, Cambridge, Massachusetts, 1972, p. 352.

⁸⁶ *Ibid.*, p. 357.

⁸⁷ *Ibid.*, p. 355; & cited in Huffman, *Philolaus of Croton*, *op. cit.*, p. 279.

numerous others,⁸⁸ is well known to be certainly fictitious because it explicitly asserts Pythagoras to have discovered the arithmetical ratios *via* acoustical laws which we know do not exist.⁸⁹

Levin put both the musical and astronomical parts of the tradition in perspective, emphasising that an inverse proportion exists between the quantity of extant documentation and its date of origin, and stating that 'despite the weight and centuries old persistence of the ancient tradition ascribing to Pythagoras such acoustical and astronomical discoveries as would provide a basis for the doctrine, it is impossible to discover any concrete evidence that might justify the attributions'.⁹⁰ Levin argued against both AE Taylor⁹¹ and Sir Thomas Heath,⁹² who accepted Pythagoras as the discoverer of harmonic ratios, and refuted the view of A Delatte⁹³ that the ancient reports are unanimous in ascribing the discovery to Pythagoras. She states that 'Despite the weight of these statements, the search for unanimity among the ancients reveals quite the opposite condition'.⁹⁴ JA Philip confirms Levin's view, stating that 'There are no good grounds for believing Pythagoras discovered the three intervals [fourth, fifth and octave]....It is more likely that the theory [of *harmonia mundi*] arose in connection with seven notes and seven planets....'⁹⁵ Philip suggests that the idea originated as a 'poetic insight'.⁹⁶

More specifically, it has been alternatively suggested that the source of the idea may have come from an association of the seven strings of the lyre with the seven planets in the geocentric celestial system.⁹⁷ According to Boethius, music 'in the beginning' was made on only four strings, and remained that way until the time of Orpheus, when more strings were added.⁹⁸ There is a traditional belief, traceable to Nicomachus, that Pythagoras added an eighth string to the seven-

⁸⁸ For a tr. of Nicomachus' account in *Enchiridion* 6, see Levin, FR, *The harmonics of Nicomachus and the Pythagorean tradition*, Pennsylvania, 1975, p. 70. For a tr. of Iamblichus' account see Clark, G, *Iamblichus: On the Pythagorean Life*, Liverpool, 1989, pp. 50-54. For citations of other sources see Levin, FR, *The harmonics of Nicomachus and the Pythagorean tradition*, Pennsylvania, 1975, p. 70 ff.

⁸⁹ The story occurs in numerous other sources and asserts that Pythagoras found the weights of the hammers to be in the ratios 6:8:9:12, and confirmed his findings by hanging weights in the same ratios on tensioned strings of fixed length. The ratios would only produce the musical intervals of a fourth, fifth, and octave, when applied as linear divisions of the length of a tensioned string, not when applied to the weights or tension in the string.

⁹⁰ Levin, *op. cit.*, p. 6.

⁹¹ AE Taylor, *A Commentary on Plato's Timaeus*, Oxford, 1928, pp. 164 & 489. Cited in Levin, *op. cit.*, p. 67.

⁹² Heath, *Aristarchus*, *op. cit.*, p. 46. Cited in Levin, *op. cit.*, p. 67.

⁹³ A Delatte, *Etudes sur la littérature Pythagoricienne*, Paris, 1915, p. 259. Cited in Levin, *op. cit.*, p. 68.

⁹⁴ *Ibid.*

⁹⁵ Philip, JA, *Pythagoras and early Pythagoreanism*, Toronto, 1996, p. 126.

⁹⁶ *Ibid.*, p. 128.

⁹⁷ Burkert, *Lore and science*, *op. cit.*, p. 351.

⁹⁸ Boethius, AMS, *Fundamentals of Music*, Tr. CM Bower, Ed. CV Palisca, New Haven & London, 1989, p. 29.

string lyre, thereby creating a diatonic octave.⁹⁹ A close qualitative association of actual musical instrument strings with the astronomical system is also evident in the thought of Claudius Ptolemy. Ptolemy is perhaps better known as a contributor to the quantitative tradition, and the originator of the geocentric celestial system that predominated for fifteen centuries until the scientific revolution,¹⁰⁰ but at the beginning of his extensive three-book treatise entitled *Harmonics*, he states that the student of *harmonics* must aim 'to preserve the hypotheses of the *kanon*' (a stringed instrument), and that the astronomer must aim 'to preserve the hypotheses concerning the movements of the heavenly bodies...'¹⁰¹

Whether or not Pythagoras did actually discover the harmonic ratios himself, the fact is that the earliest extant occurrence of the smithy story is the one by Nicomachus,¹⁰² and his account is described by Levin as 'a real fairy-tale version, complete with a "once upon a time" and a miraculous circumstance, a tale that quite possibly had its roots in near Eastern legends dealing with the origins of music'.¹⁰³

Circumstantial Evidence

There is thus a serious lack of solid evidence supporting the traditional claim that the *quantitative* notion and tradition of *harmonia mundi* is Pythagorean in origin. So, if the quantitative notions are connected to Pythagoras only through rumour, what kind of circumstantial fire is there in pre-Socratic writing, behind the vast amount of quantitative, quasi-scientific smoke that has been produced?

The earliest attempt to quantify the dimensions of the lunar and solar orbits is found in the reported philosophy of Anaximander,¹⁰⁴ who was not a Pythagorean, but a member of the Ionic School. The details known are related to Anaximander's cosmogony. The cosmogony involves the formation of at least three concentric 'circles or rings' about the Earth. These were formed when a 'sphere of flame (or fire)' that had grown 'around the air about the Earth', was 'torn off and closed

⁹⁹ Levin, *op. cit.*, p. 75.

¹⁰⁰ Ptolemy's system (late 1st or early 2nd century AD) was, however, heavily indebted to Hipparchus (BC c.190-c.120).

¹⁰¹ Taub, LC, *Ptolemy's universe*, Chicago & LaSalle, Illinois, 1993, pp. 125-126; Barker, A, *Greek musical writings*, Vol.2, Cambridge, 1989, p. 278. On the *kanon*, see Barker, *op. cit.*, pp. 278; 291; 319; 340-345; 362 ff.

¹⁰² Levin, *op. cit.*, p. 101.

¹⁰³ *Ibid.*, pp. 69-70.

¹⁰⁴ Kahn, CH, *Anaximander and the origins of Greek cosmology*, New York, 1960, p. 95.

up into certain circles'.¹⁰⁵ These 'wheel-like' circles of fire, are enclosed by 'compressed masses of air' [which by implication obscures the fire] that have 'pipe shaped passages', 'vents', 'nozzles' or orifices, through which the fire is 'exhaled'.¹⁰⁶ These form the visible sun, moon, and 'stars' [presumably including the planets], and eclipses occur when the vents are obstructed. According to Aëtius, something akin to this notion of 'air' obscuring an enclosed fire, occurred in Empidocles' cosmology, where the enclosing 'air' or 'mist' takes on an explicitly solid, crystal-like form.¹⁰⁷

Anaximander's astronomical quantifications begins with the Earth, which according to the reports, he held to be 'rounded, circular, like a stone pillar', or like a cylinder, one of whose plane surfaces is that on which we stand. The depth is one third of the breath.¹⁰⁸

Next, are the attestations by Hippolytus and Aëtius regarding the sun and the Earth. Hippolytus states in a corrupt passage¹⁰⁹ that 'the circle of the Sun is twenty-seven times as large as the earth, and that of the moon is nineteen times as large as the earth.'¹¹⁰

Aëtius states:

'The sun is a circle twenty-eight times the size of the earth...'¹¹¹

'The sun is equal to the earth and the circle from which the sun gets its vent and by which it is borne round is twenty-seven times the size of the earth.'¹¹²

'The moon is a circle nineteen times as large as the earth; it is like a chariot-wheel, the rim of which is hollow and full of fire, like the circle of the sun....'¹¹³

¹⁰⁵ Pseudo-Plutarch, *Stromat* 2. See Heath, *Greek Astronomy, op. cit.*, p.5; Kahn, *Anaximander, op. cit.*, p. 85; Conche, M, *Anaximandre - Fragments et Témoignages*, Paris, 1991, p. 193.

¹⁰⁶ Aëtius, II, 13, 7; 20,1; 21, 1; 24, 2; 25, 1 29, 1. Tr. Heath, *Greek Astronomy, op. cit.*, pp. 5-7; Hippolytus, *Refutation of all Heresies*, I, 6, 4, 5. Tr. Heath, *Greek Astronomy, op. cit.*, p. 5. See also Kahn, *Anaximander, op. cit.*, pp. 85, 87.

¹⁰⁷ Aëtius, II, 11, 2. Tr. Heath, *Greek Astronomy, op. cit.*, p. 21.

¹⁰⁸ Hippolytus & Pseudo-Plutarch, *op. cit.*, Tr. Heath, *Greek Astronomy, op. cit.*, p. 6; See also Kahn, *Anaximander, op. cit.*, p. 81.

¹⁰⁹ Conche, M, *Anaximandre - Fragments et Témoignages*, Paris, 1991, p. 209.

¹¹⁰ Hippolytus, *Refutation of all Heresies*, I, 6, 5. Tr. Heath, *Greek Astronomy, op. cit.*, p. 6. See also Kahn, *Anaximander, op. cit.*, p. 85.

¹¹¹ Aëtius, II, 20, 1. Tr. Heath, *Greek Astronomy, op. cit.*, p. 6.

¹¹² *Ibid.*

¹¹³ Aëtius, II, 25, 1. Tr. Heath, *Greek Astronomy, op. cit.*, pp. 6-7.

'The sun is placed highest of all, after it the moon, and under them the fixed stars and the planets.'¹¹⁴

The ambiguities and lack of consistency in these simultaneous statements are all too obvious.¹¹⁵ As far as his cosmology is concerned, it is not clear whether Anaximander's 'stars' are formed from more than one 'circle'. If the five planets each had a sphere, then the total of eight spheres would potentially be musically significant, but the extant attestations quantify only two circles and three celestial bodies. The three obvious musically significant ratios of 2:1, 4:3, and 3:2, for the octave, fourth, and fifth, cannot be found in Anaximander's figures, and could only be generated with a great deal of inductive imagination. It must also be said, that although Anaximander's cosmogony contains quantification, it need not necessarily be interpreted as pseudo-scientific in nature, particularly in respect of the spheres of flame. It could be just as well argued that this is a mystical description expressed in physical terminology. We will look at this argument more closely, a little later. We cannot be certain one way or the other.

Next, we come to Archytas.

Huffman has suggested that Philolaus should be regarded as the primary Pythagorean source for Aristotle.¹¹⁶ Philolaus would have been an important source of evidence, given that he lived about a century before Aristotle. But the contents of the fragments of Archytas, which are a Pythagorean source approximately contemporaneous with Aristotle, reveal an altogether more intriguing correlation with the assertions of Aristotle about the Pythagorean doctrine. However, what Archytas says in the Diels fragments¹¹⁷ falls significantly short of confirming Aristotle's account. Archytas begins by praising the discernment of mathematicians, saying that they have 'handed on to us a clear judgement' concerning the mathematical studies of astronomy, arithmetic,

¹¹⁴ Aëtius, II, 15, 6. Tr. Heath, *Greek Astronomy, op. cit.*, p. 7.

¹¹⁵ See, for example, Conche, M, *Anaximandre - Fragments et Témoignages*, Paris, 1991, p. 209. An interpretation that fits the statements consistently is:

- a) The diameter across the centre of the celestial system, of the circle that runs along the centre of the ring of fire, is 28 the diameter of the Earth.
- b) The width or diameter of the fire itself, which is the same as the width of the hollow in the air enclosing it, is the same as the diameter of the Earth.
- c) The diameter across the centre of the celestial system, of the line along the surface of the hollow containing the fire, that is closest to the centre of the celestial system, is 27 times the diameter of the Earth.

¹¹⁶ Huffman, *Philolaus, op. cit.*, p. 58.

¹¹⁷ *Fragmente der Vorsokratiker*.

geometry and music, which he says 'appear to be related'.¹¹⁸ He then says 'They are concerned with things that are related, namely the two primary forms of Being'. Very significantly, or so it seems, he then embarks on a lengthy exposition on the physics of sound production from moving bodies. Notably, he also offers explanations as to why some sounds cannot be heard by us, saying that this can be because they are too faint, too great a distance from us, or even because they are too loud. Next he explains why swift motion produces high-pitched sound, and slow motion, low-pitched sound, but in all of this discourse no mention is made of the celestial bodies producing sound.¹¹⁹ After this acoustical thesis, we have a short section on the mathematics of music. This speaks about the three 'means' - arithmetic, geometric, and 'harmonic' - and is no more than a statement about the arithmetic rules.¹²⁰ In the next section of discourse the attention has moved on to other matters. Here is revealed a very pragmatic and unmystical view on the acquisition of knowledge, and this leads on to asserting the place of *right reckoning* in civil order. Lastly, a fragment said to be from a work entitled 'Conversations', states that in regard to wisdom, arithmetic seems to be far superior to all other sciences.¹²¹

Thus all the basic elements of the Pythagorean doctrine as alleged by Aristotle, seem to occur *in isolation* from each other in the Archytas fragments contained in Diels, but we are confronted with a number of critical 'missing links' that would be essential in order to interpret the fragments as anything other than circumstantial evidence of the quantitative doctrine. Archytas is certainly a good witness to the importance placed upon mathematics in Pythagoreanism. He refers once to *Being*, but there is otherwise nothing mystical or mythical in what Archytas says. Whilst with an inductive leap it could be inferred from what he says that the celestial bodies might produce harmonic sounds if their speeds were suitably related, the extant fragments contain no such actual assertions.

And what of Philolaus?

To construe the quantitative doctrine as being inherent in the fragments attributed to Philolaus, would require an even greater effort of induction. The significance of Number is mentioned, as are harmonic ratios and universal harmonia, but there is no inference that musical

¹¹⁸ Freeman, *Ancilla*, *op. cit.*, p. 78.

¹¹⁹ *Ibid.*, p. 78.

¹²⁰ *Ibid.*, p. 79-80.

harmony is inherent in the heavens, either acoustically or through harmonic, arithmetical ratios.¹²² Philolaus, as we shall see below, is far more interesting for his qualitative, metaphysical notions, both in the fragments attributed to him and in the later attestations.

The pre-eminence of the metaphysical One and *Harmonia*

What we are confronted with in the sources is a mixture of what appears to be *quantitative*, or proto- or pseudo-scientific assertions, and *qualitative* or metaphysical discourse. The qualitative is mythical or mystical, and is couched in terms of the Divine, Being, Mind, soul, the creation of the world out of the One through opposites, and the principle of *harmonia*, binding together and ordering the opposing elements. The quantitative appears as the discussion of mathematical or numerical principles, or as quantitative and numerical assertions. It is not immediately apparent how a division between 'mystical' or 'mythical' thought, and 'scientific' thought, is to be made; nor is it clear how the two were connected. In the sources the two strands can be intertwined in one discourse.

It has often been supposed that in Pythagoreanism a mystical significance must have been ascribed to mathematical order. Dividing the length of a musical string by certain simple whole number proportions yielded musically harmonic intervals. Surely, it is frequently argued, this was seen by Pythagoreans as evidence of the mystical power and significance of Number? The Pythagoreans were reported by Aristotle to have claimed that 'all things are Number'. Does this not imply that Number is the Reality or substance behind the appearance of the world? Is this not the Pythagorean doctrine that makes the quantitative *harmonia mundi* so important? This is a common enough assumption about Pythagoreanism, but it fails to look beneath surface appearances. The Pythagoreans placed great importance upon Number and recognised its quantitative and predictive power. They saw that certain natural physical phenomena were governed by Number. But that does not mean that the original Pythagoreanism celebrated Number as an ultimate mystical cause or 'substance' in itself. Number can have more than one role in mystical thought, and its appearance in an ancient source is not necessarily to be taken only as an expression of what now seems like

¹²¹ *Ibid.*, p. 80-81. The argument in favour of arithmetic seems to be in refutation of the notion that geometry is superior, a belief that arises because of its ability to deal with functions that involve the irrational proportions that simple arithmetic is unable to express, without the aid of decimal convention.

¹²² *Ibid.*, pp. 73-77.

scientific, quasi-scientific, or mathematical thought. This is amply illustrated in the following outline of a dispute between the scholars Kahn and Dicks.

In *Anaximander and the origins of Greek cosmology*, CH Kahn asks if Anaximander's quantifications should be considered as 'part of a mythic or a scientific point of view',¹²³ and concludes in favour of considering Anaximander as the 'earliest known type of mathematical physicist' outside Babylonia.¹²⁴ This view was attacked by DR Dicks in *Early Greek astronomy to Aristotle*, as a distorted picture.¹²⁵ Distorted it may or may not be, but examination of the context of Kahn's comment reveals something far more important.

What Kahn was effectively asking, was if Anaximander's use of number in his cosmology was proto-, pseudo-, or quasi-scientific, or alternatively if he had introduced numbers as a mystical or metaphysical symbol. Kahn's description of Anaximander as a 'physicist', in the modern sense of the word, was a *relative* judgement made by comparing Anaximander's use of number specifically with the role of number in an explicitly mystical source - the Indian *Vedas*.¹²⁶ Sir Thomas Heath had previously suggested that Anaximander's three-stage cosmogony is little more than a reiteration of the three cosmic steps of *Vishnu* from Heaven to Earth.¹²⁷ Kahn's comment, the comment criticised by Dicks, was part of a negative response to Heath's assertion, a response that ran as follows. Kahn recognised that if Anaximander's quantifications are considered as having been made for *mythical* reasons, then something is profoundly lacking in Anaximander's mythology and viewpoint, when compared with the *Vedas*, which also use quantification.

That which Anaximander seems to be lacking, is clearly present and self-evident in the stature and profundity of the *Vedas*. Kahn's view is:

'One cannot reduce mythic speculation as it is practised in the *Rigveda* either to poetry or superstition. The finest *Vedic* hymns clearly represent an effort to give speculative unity to the world as it is known to the poet and to his audience.

There is, I think, nothing comparable in the Greek tradition,

¹²³ Kahn, *Anaximander*, *op. cit.*, p. 95.

¹²⁴ *Ibid.*, p. 97.

¹²⁵ Dicks, DR, *Early Greek astronomy to Aristotle*, London, 1970, p. 45.

¹²⁶ Kahn, *Anaximander*, *op. cit.*, pp. 95-96.

which is in some sense already devoid of myth in Homer'.¹²⁸

Kahn goes on to illustrate that in the *Vedas*, the number 3 is significant because it symbolises the descent from One-ness or Unity, to duality, and thence to the world of plurality in general. When it is raised to the second power, the number 9, the significance is increased in the way we might enhance the meaning of "forever" by saying "forever and ever".¹²⁹ The use of number in the *Vedas* is part of a language that is deeply metaphysical in meaning yet quantitative in form, that is used for 'expressing the grandeur and perfection of the universe considered as a whole'. In Anaximander, numbers are not used in this way, and are not symbols in a context of the Divine, but are prosaic figures relating to the diameters of concentric circles.¹³⁰

If one reads the Anaximander attestations one sees in them nothing that compares to other qualitative, metaphysical discourses, even of other *Greek* philosophers, for example Philolaus.¹³¹ The same thing can be said of the writings by Archytas. What Anaximander and Archytas say, appears to be primarily proto-physics, and has very little, if anything at all, to do with overtly metaphysical cosmogony, the mystical, or the Divine. It portrays an outlook very different from that of the ancient East, and distinct from that of say, Philolaus or Empidocles, who share in a perhaps diminished way, something of the mysticism of the *Vedas*.

This suggests that although the Greek sources, in common with the *Vedas*, contain mystical or mythical prose relating to the creation of duality, and thence the world of plurality, out of the originating One, they are already in some degree removed from the depth of mystical vision inherent in the *Vedas*, and have also begun to exhibit in some cases an intellectual pre-occupation with the quantitative structure of the universe, as a *separate* branch of their concerns. Nevertheless, both branches of concern co-exist in the sources. The only thing that could possibly *link* those otherwise separate concerns, would be a belief, taken for granted, that quantitative order is itself a manifestation of Divine order, and a manifestation of *harmonia*.

One of the hallmarks of Pythagoreanism (and of other pre-Socratics) seems to be the conjunct appearance of the mystical or mythical, with the quantitative. As we have said, many

¹²⁷ Heath, Sir Thomas, *Aristarchus*, *op. cit.*, p. 38.

¹²⁸ Kahn, *Anaximander*, *op. cit.*, p. 95.

¹²⁹ *Ibid.*, p. 96.

¹³⁰ *Ibid.*

would argue that the Pythagoreans ascribed a mystical significance to *Number itself*, usually in a numerological way. But even if they did, this would not conflict with an originating philosophy that saw Number as an important manifestation of *harmonia*, *harmonia* being the first mystical principle. Even explicit numerological mysticism need not automatically be interpreted as the belief that mathematical order in itself, *is* the Divine, the Real, or an ultimate structure or cause, rather than the working of Divinely ordained *harmonia*, fitting together and ordering the manifold parts of a universe created through opposites, out of the One.

Thus, the Pythagorean concern with Number, can be seen as partly a quantitative, predictive order, and partly as a qualitative, mystical symbol. This does not imply that Pythagoras must have held *Number itself* to be the highest mystical reality. There is no reason why 'The One' should be seen as having been demoted from this position. 'The One is the beginning of everything' says Philolaus.¹³²

Can we not argue that 'the One' is itself a numerical concept? Philolaus gives us no reason to assume this, and some very good reasons to reject such an idea. In one fragment Philolaus states 'The first composite, the One, which is in the centre of the sphere, is called the Hearth'.¹³³ 'The Hearth' is reported in the attestations that mention it, to be the centre of the Philolaic celestial system. If it is part of the celestial system then it is not an abstract numerical concept. It would still be safer to accept 'The One' as a metaphysical concept linked with Being, just as it is in other sources, East and West. We then have to ask the more interesting question 'how can 'The Hearth', or 'The 'One', if it is really a 'metaphysical' concept, also be a *physical* concept, with a physical position at the centre of the physical celestial system?'

An answer to this is that there is no reason why the 'One' should not be regarded as the 'Hearth' at the centre of the physical celestial system, *at the same time* as being the *metaphysical* 'origin of all', as long as the celestial system is not primarily seen as some 'Reality' in its own right, but rather, is regarded as merely a material representation, or symbol, of a more fundamental metaphysical reality. This is not some bizarre idea I have concocted in order to resolve the problem, it is an idea commonly found in mystical and metaphysical thought. In this sense, the

¹³¹ I have no reason to doubt the scholarship of the translators to whose work I make reference, all of whom are cited here.

¹³² Freeman, *Ancilla*, p. 74.

¹³³ *Ibid.*

Pythagorean view of the universe would be somewhat similar to the view presented by the ancient East, and it would certainly be consistent with Plato's view.

Did Philolaus perhaps merely mean that the universe *physically* came out of this originating 'One', or 'the Hearth', like planets out of a sun? Is this what he meant by saying 'The one is the beginning of everything'. We could argue this if we are looking for Philolaus the scientific cosmogonist. But if we look to Philolaus the mystic we could just as easily say that the 'Hearth' is a mystical entity. Its status as the origin or beginning of physical existence is then *symbolised* by the fact that the celestial bodies revolve around it. In this way, the system of celestial bodies is not so important as a physical system, but is important in that *symbolises* the metaphysical hierarchy behind it.

Confusion at source

Even though the early Greek sources may exhibit an interest in Number and quantitative structure that is often distinct from mythical or mystical ideas, the qualitative and quantitative faces of the philosophy are not separable in any clearly defined way. The existence or co-existence of apparently distinct kinds of discourse, for example the mixture of the proto- or pseudo-scientific, with the metaphysical, poses something of a hermeneutical problem if whole sections of discourse are not to be ignored in favour of others. 'Myth', 'philosophy', and 'science' can co-exist at source.

Generally speaking, there is understood to be a transition from Myth to 'philosophy' (from *mythos* to *logos*) that took place between the 9th and 6th centuries BC.¹³⁴ In the sixth-century BC we find Orphic mythology co-existing with Pythagoreanism, the earliest reference to Orpheus being by the poet Ibykos.¹³⁵ The apparent duality between myth, and mathematics as represented by the Pythagoreans, is enhanced by the fact that the Pythagoreans and Orphics do not seem to have been closely associated with each other in the 5th and 4th century evidence.¹³⁶ Nevertheless, Pythagoras is thought to have regarded Orpheus as a chief patron,¹³⁷ and there is evidence that the Pythagoreans even used Orpheus as a pseudonym.¹³⁸ Guthrie has argued that Pythagoras was

¹³⁴ Kirk, GS; Raven, JE; Schofield, M, *the pre-Socratic philosophers*, Cambridge, 1983, pp. 73-74.

¹³⁵ Guthrie, WKC, *Orpheus and Greek religion*, London, 1935, p. 1.

¹³⁶ Kirk, Raven and Schofield, *op. cit.*, p. 221.

¹³⁷ Guthrie, WKC, *Orpheus and Greek religion*, London, 1935, p. 220.

¹³⁸ *Ibid.*, p. 217.

'working on a mythical background',¹³⁹ and that the Orphics and Pythagoreans shared the same concern - the generation of the many out of the One.¹⁴⁰ The difference is that whilst Orphic cosmogony is mythical and expressed in terms of personal agents, marriage, and procreation, Pythagorean cosmogony was expressed in terms of numerical ratios.¹⁴¹ In many respects, Guthrie argues, one is the counterpart of the other.¹⁴²

This does not mean Pythagoras was attempting to express myth, mathematically. It means that something significant in human knowledge that finds expression through myth, later found expression in a quantitative 'language' used by Pythagoreans who had particularly noted quantitative order in the universe. If this is so, then the original *quantitative* expression of the harmony of the spheres, *even if it existed*, may not be important other than as a philosophical symbol, either to us, or in the original context of Pythagoras' own philosophy. It may have been introduced as a piece of inductive reasoning based upon the observation that there *is* mathematical order, and hence mathematical 'harmony', between the many parts of the manifest universe. The need to further the doctrine by describing actual sound coming from the celestial bodies, is then completely redundant *except as a further symbol* in the communication of the metaphysical philosophy behind the doctrine. So even if the original Pythagoreans did use this kind of description, Aristotle's objection would then amount to a case of inappropriately taking a metaphorical or allegorical description literally, and predictably declaring the pseudo-scientific thesis that it may later have been taken to be, as scientifically untenable.

Let us also propose for a moment that the 'missing links' in Archytas had existed, but are now lost, and that Archytas *had* confirmed exactly what Aristotle asserted the Pythagoreans believed about the celestial bodies, in respect of them producing actual sound. Would that alter the position? I suggest not. On what basis would we be ascribing greater authority to Archytas' account than to Aristotle's? Presumably it would be on the basis that he was himself a Pythagorean. But here we are beset with even greater uncertainties. Were all Pythagoreans perpetually in agreement with one another? Did the Pythagorean school continue to propagate the teaching of Pythagoras exactly as he had communicated it? Do we know that even Pythagoras' closest disciple had

¹³⁹ *Ibid.*, p. 219.

¹⁴⁰ *Ibid.*, p. 220.

¹⁴¹ *Ibid.*, p. 218.

¹⁴² *Ibid.*, p. 219.

absorbed Pythagoras' teaching without distortion? How can we be confident that the understanding of Archytas, a century and a half later, represents with any fidelity that which Pythagoras himself taught? The only part of Pythagoreanism that would be immune or resistant to change, corruption, or misunderstanding, would be the mathematical verities or numerological assertions. The square on the hypotenuse still equals the sum of the squares on the other two sides, and the ratio associated with the perfect fifth is still 3:2. But what of the original metaphysical or mystical part of Pythagoreanism, as taught by Pythagoras? Would it even have necessarily survived intact as part of Archytas' own understanding? Pupils do not generally follow their teachers blindly, indefinitely. Few are perfect disciples and most stand to develop a different outlook from their teachers, and propagate a different teaching. Plato and Aristotle are a prime example. Over a number of centuries in a changing civilisation the role of hermeneutics cannot be ignored, especially within an oral tradition.

Number as a symbol of *harmonia*

We thus have plentiful hearsay evidence, but no primary evidence for an original, quantitative, Pythagorean doctrine of the harmony of the spheres. If we do not interpret the Pythagorean emphasis on Number as an assertion that Number *is* the originating cause of everything, the Divine, or the Real, then the search for the details of an original quantitative *harmonia mundi* becomes questionable. For then Number is the manifestation of *harmonia*, which is itself not only an earlier, but a higher and more fundamental principle. Furthermore, *harmonia* can be *symbolically* represented by Number, without necessarily inferring that the thing Number relates to, is actually and measurably quantifiable. As it turns out, this is entirely necessary, since 'the soul' is primarily a metaphysical concept. Thus the soul can be 'joined to the body through number'¹⁴³ or the 'soul of the world' or a man's soul can be proportioned numerically, as they are in Plato, without inferring that 'the soul' is physically measurable. Alternatively, where Number is used as a *metaphysical symbol*, a physical thing predicated in numerical terms, is merely a physical symbol of *harmonia*.

¹⁴³ Claudianus Mamertus purporting to be quoting from the third volume of Philolaus' *On rhythm and metre*. See Freeman, *Ancilla*, *op. cit.*, p. 77.

Just as unmeasurable, metaphysical things like *the soul* can be predicated numerically, so numerical predication in a Greek source is not necessarily an indication of a proto-scientific viewpoint, a numerological viewpoint, or a viewpoint that upholds Number as an originating cause of all things. In the Greek sources mentioned, Number may not appear to be used in the way it is in the *Vedas*, but that does not mean its use cannot be metaphysical and allegorical.

Since the use of Number can be as a metaphorical symbol rather than an assertion that metaphysical things are literally predicable in numerical terms, Plato's quantitative description of the creation of the 'world soul' in *Timaeus*, is not necessarily most important as evidence of a physical cosmology. When it is interpreted as such, the details that appear to be quantifying the celestial system, may assume a proto-scientific importance that is irrelevant to the more important metaphysical message they are being used to convey. And yet it has been repeatedly plundered and analysed for evidence of 'Plato's mathematical system', even in the face of the fact that Plato is recognised as what philosophers call an *idealist*, and hence, fundamentally, a metaphysician! Plato's metaphysics is not a philosophy in which *harmonia* is an effect of Number.

Number may have been held by the Pythagorean Philolaus to be essential or even a prerequisite to physical existence, but even this does not mean that *harmonia* has to be *originated* by Number. We must also not forget that, as I have said, in a metaphysical cosmogony or cosmology, physical existence is often held to be secondary to the metaphysical reality behind it. *Harmonia* itself would be a metaphysical thing, behind the scenes of existence, as it were. Only through Number can physical multiplicity actually exist, so it would not be surprising to find Number as the essential ordering power of a physical existence whose nature is multiplicity. In this way, Number is always present as the servant, symbol, and reflector of *harmonia*. Just as the physical arrangement of the universe can *symbolise* the metaphysical reality behind it, so too, can the apparently autonomous laws of Number.

The laws of Number are none other than a Wittgensteinian *logical form* in action. The *logical form* of Number is the *logical form* of the physical universe, or *vice versa*. The *logical form* is something that *shows itself* in the operations of Number itself, in the physical universe, and in the relationship between Number and the physical universe. In Philolaus' philosophy this logical form is a symbol of something else, which *shows itself* subjectively at another level of intelligence – *harmonia*.

Number, Nature and Intelligence

Physical science grounds itself on Number, or mathematical laws, - the 'laws of nature'. Mathematics is now the adopted 'language' of physical science. The work of the physical scientist makes it look as though there is an abstract mathematical matrix behind physical existence, and that it is this matrix that the scientist is discovering. This can too easily be taken to be the divine or semi-divine thing that Pythagoras intuited, - Number. Some might even argue that this abstract mathematical matrix is what we should call Reality, parts of which are represented by the physical world. I say parts, because there are always exotic areas of pure mathematics that have not yet found an application in physical science, although there seems to be a constant and quite rapid 'movement' from new techniques in pure mathematics to their practical application.

But it is always the intelligence of the scientist or mathematician who beholds or finds this matrix, just as it is intelligence, coupled with the senses, that beholds and scientifically questions the physical world. Philolaus spoke of 'Nature itself' as being behind the appearance of physical existence. Existence itself, that is, the manifest universe of all existing things, is what Philolaus calls 'Nature in the universe'.¹⁴⁴ 'Nature itself', he said, requires 'Divine intelligence and not human intelligence'.¹⁴⁵ The abstract mathematical matrix, which seems to determine what we call the laws of Nature is not Philolaus' 'Nature itself', because it is grasped by human intelligence. Number is merely the law that holds together the manifest structure of existence, determined by *harmonia*. Number is not Nature. Although Number is necessary for existence and for existence to be intelligible, existence comes from the *Being* which is eternal.¹⁴⁶

Philolaus actually purported to know about *Nature itself*. So he implies that if Nature itself is to be apprehended, then the intelligence of the beholder, in this case Philolaus himself, must itself have changed, to touch upon the divine. Here, we are beyond *information*, we are back to an untheoretical metaphysics, to *gnosis*, and the mystical context of *harmonia*.

The transformation of the intelligence of the beholder through subjective knowledge, or through *gnosis*, was once a deliberate part of the 'alchemical' and Paracelsian study of matter. The scientific study of matter does not have this immediate, conscious aim. In this, finally, is the

¹⁴⁴ Ancilla, *ibid.*, p. 73.

¹⁴⁵ *Ibid.*, p.74.

difference between science and what can properly be called metaphysics. Both are concerned with knowledge. Science may even be concerned with improving subjective knowledge. But only metaphysics attempts attainment through subjective knowledge, rather than through the study, and gathering of 'objective' information about the world occupied.

We are talking about the belief that what Man discovers about the world he occupies is already within him, so that understanding the world occupied requires subjective knowledge as well as external observation. Alchemy and Paracelsianism were attempted methods of initiating this kind of knowledge of the world occupied, together with subjective change, even by 'studying' the world occupied.¹⁴⁷ The study of the nature of the world occupied through Number alone, the purely rational approach, is quite a different thing. According to Iamblichus and others, Pythagoras helped to bring about subjective change in his disciples through music, and the essence of this idea is also central to the Orphic tradition. This was not through the study of music as a science, something that we are told the Pythagoreans also did, but simply through the experience of music. Similarly, Pythagoras himself is supposed to have received some kind of higher knowledge by 'hearing' the music of the spheres. Again, this was not through scientific, astronomical study. Why could his disciples not hear it? The explanations offered are pseudo-scientific, and assume that this 'hearing' was physical, acoustical. The singing of the universe need not be acoustical, in the sense that it need not be a phenomena that was part of the world occupied. If it was, then the world Pythagoras occupied was a different world to the one we occupy, and different to the world occupied by his disciples.

The 'objective' aspect of harmony is the acoustical phenomena and form, that which we can measure and understand theoretically as harmony, whereas the subjective side is what we *perceive* as harmony. In Platonism and neo-Platonism harmony has a physical side, and a metaphysical side. The metaphysical side occurs where 'the soul' is said to be arithmetically 'proportioned', and is therefore in 'correspondence' with arithmetical proportion in the physical world. The implication is that 'the soul' is divided, that is, it is in a condition of conflict that is only stabilised by *harmonia*. Actual, audible, acoustical music can be an aid to this stabilisation. In a sense, music 'tunes the soul'.

¹⁴⁶ *Ibid.*, p.74.

But how does it happen? There must be a way in which 'the soul' is ordered or harmonised by the experience of music. Plato portrayed the soul's dividedness quite simply, saying it was in three parts, and that the parts needed to be harmonised rather like the three fundamental musical intervals. Ptolemy added further subdivisions, giving fourteen species of virtue corresponding to species of musical interval.¹⁴⁸ These 'virtues' are things like moderation, fearlessness and prudence, which are clearly to be encouraged in the subject, i.e. in the soul, and which contribute to the metaphysical harmony, within. The implication in the metaphysical or qualitative harmony of the spheres tradition, as in Orphism, is that music can help to bring about this inner harmony, or virtue.

The crude, quasi-scientific interpretation trotted out in so many accounts, is that the soul, being (or needing to be) arithmetically proportioned in literally the same way as physical or acoustical harmony, just 'responds', and appropriately orders itself or its parts when it hears the right music. But really this is no explanation at all, it is not clearly a metaphor, and it accepts that the 'soul', a metaphysical thing, is literally arithmetically proportioned, precisely like a physical thing. Literal, arithmetical proportion, must be predicated to something quantitatively measurable, which the soul is not. This kind of 'explanation' is naive, and its attribution to a pre-Socratic teaching, is merely retrospective.

The metaphysical soul cannot literally resonate like a physical body, or be brought into tune by exposure to acoustical vibration. The idea that it can, arises from conceiving the soul as an object, rather than as the reality of the subject. It is the subject who feels the benefits of music, and who seems to be affected by music. It is the subject who is affected by the object of music, or by his or her subjective experience of the objective, acoustical phenomena. What is missing from this quasi-scientific explanation is an account of how the subjective effect or experience is connected to the objective, acoustical phenomena. Only the more qualitative accounts like those of Iamblichus, are less naive, and treat the whole question more metaphysically, perhaps in terms of the soul's allegiance to divine harmony, from whence it came, and of which earthly music is a reminder.¹⁴⁹

¹⁴⁷ See, for example, Rattansi, PM, 'Art and Science: The Paracelsian Vision', *Science and the Arts in the Renaissance*, Ed. John W Shirley & F David Hoeniger, 3, pp. 50 – 57.

¹⁴⁸ *Harmonics*, Book III, Ch. 4; Barker, A, *Greek musical writings*, (2 Vols), Cambridge, 1989, Vol. 2, pp. 375-376.

Chapter 2 – Hermeneutics, the ever-present question of interpretation

Numerical principles and ideas that are either foundation stones of science, like Pythagoras' theorem, or stepping stones in the procession of science, like Anaximander's or Eudoxus' spheres, *are* an integral part of early Greek discourse. It is perfectly valid to approach the sources as examples of 'early science'. But how does *interpretation* affect our reading of the sources?

Modern interpretation in this field has generally used two common methods of attack in dealing with the sources, each of which involves effectively putting the evidence through a 'hermeneutic filter' that selects only those parts of the available discourse that are pertinent to the interpretation. There is nothing intrinsically reprehensible about doing this, providing the criteria or reasons for filtering in this way are broadly understood and declared. But, as it turns out, the adopted preferences for filtering can be based upon unchallenged, widely accepted conventions, rather than upon any consciously selected philosophical approach.

Kingsley has stated in his argument for a reassessment of the philosophy of Empidocles: 'Scholars have long been inclined to distinguish between the historical or 'important' and the legendary or 'appealing''.¹⁵⁰ In the case of Empidocles the distinction made has been between what we consider to be 'philosophy' and what we regard as 'myth' or 'magic'. In short, Kingsley argues, Empidocles has been studied as a 'philosopher' according to our preconceived standard of what a 'philosopher' is, or what 'philosophy' is about, and only those parts of his discourse that fit this existing structure of understanding and interpretation have been included in the study. Kingsley argues that a fragment known as 'fragment 111' which effectively defines the 'magical' context of Empidocles' discourse, has been hitherto disregarded for purely hermeneutical reasons. Kingsley states: 'Once the magical side to his [Empidocles'] activities has been granted, as it must, the possibility of being able to draw a neat dividing line between Empidocles the magician and Empidocles the philosopher immediately disappears'.¹⁵¹

¹⁴⁹ Taylor, T, *Iamblichus on the mysteries of the Egyptians, Chaldeans, and Assyrians*, London, 1821, 1968, pp. 133, 143.

¹⁵⁰ Kingsley, P, *Ancient philosophy, mystery and magic*, Oxford, 1995, p. 228.

¹⁵¹ *Ibid.*

The most widely adopted guiding light that has been used in the interpretation of the mythical or mystical parts of the discourses, is *historicity*. We do not give magic or myth *actual* credibility, and therefore the magical and mythical claims of the Greek discourses are not given credibility. There is only one way that they can be brought under the guiding light of historicity, and that is by trying to establish a historically and geographically traceable *lineage* of mythical tradition or magical ideas. But merely doing this avoids tackling the *significance* of the magical and mythical *except* in the context of the historical and geographical *lineage* of ideas. Any other dimension of the meaning of myth or mystical expression is evaded by this filter.

The second common hermeneutical method is to understand what appears in the discourses according to a history of science. This interpretation is bound to find a certain quantity of material that qualifies (especially with hindsight) as proto-science, together with much that must be dismissed as poetic or 'philosophical' discourse, or even just imaginative dross. Using this filter, for example, the Pythagoreans can be 'usefully' interpreted as having made a 'stab in the right direction' at least in as much as they asserted that the earth moved in orbit around a celestial centre. The preference and use of this filter may well indicate a tacit faith in science and scientific description, as an ultimate way of seeing the truth about the world, and as something towards which we have been progressing, in time.

It is true that these filters are not always used *exclusively* and under all circumstances, but they are ubiquitously present in the minds of interpreters, and are, sometimes, used exclusively. Great attention is usually paid to the construction of a historical, contextual picture that primarily respects the evolution or propagation of 'ideas' in a temporal and geographical order. This is the historicity filter in action, and in a sense this is the primary filter without which even the concept of 'temporal emergence' in the 'emergence of science' filter would make no sense.

The historicity filter

Historicity (in which we usually include the concept of the geographical propagation of information and ideas) and the 'emergence of science' filter generally enjoy an unchallenged status as valid hermeneutic filters no matter what other specific approach to interpretation is being adopted. Philosophically this rests upon two conventions, or convictions. Firstly, in the use of the historicity filter is the assumption that we can always understand Man's ideas about things as being

at least partially generated or modified through a cause-and-effect propagation in time. This rests upon the convention of accepting temporal order as fundamental to our *modus operandi* of understanding the world. Sometimes the sole attempt of an interpretational exercise in history, is simply to demonstrate or establish a temporal and geographical order of propagation. Yet too much emphasis on the context of the temporal order in which Man's ideas seem to occur can lead to superficial interpretation, that often actually obscures the philosophical import of what is being said in any given source. That import may, for example, be the expression of a 'timeless' philosophical question that recurs at different times, in different ways. The historicity filter purely in itself treats the philosophical content as not relevant to its interpretation. From where then, does a philosophical interpretation come, when one finds it accompanying a historical account? It comes via the assessment of the interpreter, which in the case of a Greek scholar means it comes through the hermeneutic filter of a scholar whose primary specialism may well be advanced philology and historicity, but not philosophy.

A method of historical categorisation and assessment of ideas contained in an ancient discourse is often considered essential to a proper understanding of the philosophical content, yet this method can be inherently unempathetic to some of the philosophies it purports to understand, precisely because it places them in an historical sequence. For example, we can say that Plato must have 'derived' some of his ideas indirectly, from earlier sources that speak of the same things as Plato. Empidocles, for instance, mentions the like and the different and the mixing of them in a harmony, long before Plato.¹⁵² (In my opinion the entire essence of 'Plato's' philosophy exists in the pre-Socratic sources). We could also say that indirectly Schopenhauer derived his ideas from the idealism of Plato. Schopenhauer pays full tribute to Plato in this respect, and it is Plato who escapes the penetrating criticisms Schopenhauer launches against the other philosophers he mentions. Yet at the centre of Plato's philosophy is the denial of time itself as part of the ultimate Good or Reality. Schopenhauer in *The World as Will* has a whole chapter devoted to the refutation of the view that historical understanding can contribute anything to real philosophical understanding.¹⁵³ In it he reiterates Plato, and effectively denounces history as being based upon an understanding that Plato would have called mere illusion, belief, or opinion. Plato and

¹⁵² Freeman, *Ancilla*, p. 55.

Schopenhauer would argue that believing *temporal order* is real or is the truth behind everything that happens, and believing that the truth of the world can be understood in terms of temporal order, is to be using a *modus operandi* of understanding that *does not understand* the truth of the world.

The notion of historicity is readily understood by everyone and is therefore an important structuring tool for the purposes of communication. However, the notion that a valid historical argument is more 'objective' than a philosophical interpretation, and therefore should automatically carry weight, is, hermeneutically, nothing more than the favouring of a philosophical position that rejects out-of-hand the assertions of philosophers like Plato and Schopenhauer, in respect of time and history. There is therefore, in this respect, a possible *impasse* between history and philosophy. History will judge philosophy according to a set of rules that justifies historical interpretation, but certain philosophies like those of Plato or Schopenhauer will deal with history according to quite another set of rules.

Ultimately, the question of how to interpret historical discourses that themselves throw doubt upon the meaning of the idea of 'the passage of time' or the meaning of historicity, is always a question of *philosophical* hermeneutics. Historicity is not a *hermeneutical* absolute except according to a set of assumptions that certain philosophies, like those of Plato or Schopenhauer, directly challenge. The mere existence of these sincere challenges to the assumption of historicity, removes any claim historicity can make to being a philosophically absolute method of interpretation, that everyone is obliged to respect, other than as a matter of chosen convention. In short, from the point of view of philosophy, all historians do have a philosophical agenda, even if they do not know it. Philosophy may, in certain circumstances, justifiably deny the validity of historicity, even if the historicity is demonstrably 'correct' *in its own terms*.

The merely relative status of historicity in interpretation has already been sensed in Greek scholarship itself. In *The unwritten philosophy and other essays*, Cornford argued that if, for example, the Jungian theory of the collective unconscious should prove to be valid, then the demand for a historicity of the appearance of certain mythical symbols in the ancient sources,

¹⁵³ Schopenhauer, A, Tr. EFJ Payne, *The world as will and representation*, New York, 1958, 1969, Vol. 2, pp. 439-446.

ceases to have any point at all.¹⁵⁴ Cornford states 'If the symbolism, for instance, of marriage with the Earth-Mother is actually present now in all our minds,we may assume that it was present in the mind of Sophocles, and probably much nearer the surface'.¹⁵⁵ The real question would then be one concerning the cause of such archetypal images, and their deeper meaning. This might involve a fully-fledged philosophical or even scientific questioning of human nature, or the question of the development of the human mind over the evolutionary time-scale, rather than the time-scale associated with the historical 'evolution of ideas'. It may even be argued, in Jungian terms, that the apparent 'propagation' or 'evolution' of ideas, is an illusion, and that what is really going on is a gradual manifestation or externalisation *in time*, of things that permanently reside in the psyche of the species.

The 'emergence of science' filter and the corruption of the metaphysical world-view

Scholarship which values the Greek sources only as examples of 'early science', is abundant. But the 'emergence of science' filter poses its own problems. This filter treats 'science' as a method or body of knowledge which continues, refines or increases *in time*. The ancient sources have probably been more plundered with a view to understanding the 'emergence of science', than for any other reason. For the purposes of tracing the 'scientific thinking' or development of 'scientific' ideas by the ancients, it is presumed that 'the world' is:

1. An object that we now know better than the ancients, thanks to science.
2. The same object that concerned the ancients.

In using the 'emergence of science' filter our position is, purposely, hermeneutically biased. But to the degree to which 'the world' (i.e. the object we know scientifically as the world) is *not* the object that concerned the ancients, we cannot claim that we know a common 'world-object' better than the ancients, by virtue of our science.

The interpretation of the ancients' 'world' as *having been* our scientifically recognised world *all along*, does not have any 'absolute' status as an interpretation. It rests upon the presumption that our current scientific world-view is both absolute and clearly understood, and also

¹⁵⁴ Cornford, FM, 'The unconscious element in literature and philosophy', Cornford, FM; Guthrie, WKC, *The unwritten philosophy and other essays*, Oxford, 1950, pp. 1-13; see p. 9.

upon the presumption that we fully understand how scientific world-views change *in time*.

Unlike the state of affairs that existed in the eighteenth and nineteenth centuries, when the universe was effectively seen as a 'clockwork machine' whose laws of operation simply 'remained to be found', it is now not at all clear or agreed what our received contemporary scientific 'world-view' is supposed to be, and what we do know of it in some areas such as the leading edge of modern physics, is radically puzzling or paradoxical.

We often hear about something called *our scientific understanding of the world*. We might assume that through this, we are progressively gaining more and more knowledge of something that in itself, is quite independent of our methods of understanding it. In 1962 Thomas Kuhn challenged this assumption. In his influential book *The structure of scientific revolutions* he presented the argument that scientists actually work in a different world before and after a scientific revolution, and that 'what occurs during a scientific revolution is not fully reducible to a reinterpretation of individual and stable data'.¹⁵⁶ A 'scientific revolution', according to Kuhn, involves the now much-quoted 'paradigm shift', a term that has become a 'catch-phrase' in many areas beyond the philosophy of science. Followed through to its limits the argument does not just assert that observations and interpretations are affected by, and relative to, adopted scientific paradigms. It threatens to undermine the very assumption that what science understands as the *object* appearing as the world, is anything truly *objective* at all. The scientific understanding is always an approximation, but an approximation to what? Science, the argument asserts, operates in the proximity of its own conceptual paradigms, and not in the proximity of any truly 'objective' conceptual structure. The principle of 'objective observation' in scientific method was once thought to be the guarantor that the absolute 'objective structure' of the world could be apprehended. But in modern physics even the very notion of an 'objective observation', or of phenomena that is intrinsically separable from the observation, or from the observer, falls down.

What we know *scientifically* as 'the world', we do know better than the ancients, but what we know *scientifically* as our world, is not necessarily their world at all. The assumption that it is, is the assumption that there exists something objective called 'the world' that is common to both the ancients and us. But the world we assume we must have in common, the physical part of which,

¹⁵⁵ *Ibid.*, p. 9.

¹⁵⁶ Kuhn, TS, *The structure of scientific revolutions*, Chicago & London, 1962, 1996, p. 121.

in the first instance is the world we perceive with the senses, is not to be entirely identified with the changing conceptual model of 'the world', 'the universe', or 'the cosmos', that science describes and understands according to its current paradigms.

In saying that as far as scientific understanding is concerned we occupy a different world to that of the ancients, we are saying two things. Firstly, we are saying that whatever we know scientifically, is necessarily couched in terms determined by the *modus operandi* of our current state of scientific understanding. The *modus operandi* is affected by what Kuhn called the 'scientific paradigm'. Secondly, because our scientific vision of the world is determined by the 'scientific paradigm', our scientific understanding is not so much knowledge of some objective absolute, as knowledge of our current paradigm, or paradigms. We are thus saying that there is no objective, *scientifically understood* and described absolute, called 'the world' or 'the cosmos', that is common to both us and the ancients.

We would, however, feel that there definitely *is* one thing in common called 'the world', occupied by both the ancients and ourselves. There is, but the physical universe is only a part of it. The totality of the world in which we find ourselves from birth also includes all our subjective observations, living, feeling, relating, knowing, experiencing, loving, and suffering, and their subjective significance - all the things that certain Greek Godmen-scientists could address simultaneously along with the physical nature of the universe.

Any understanding of the subjective, experiential side of the world would include an understanding of human experience and human nature. A *single, combined* understanding of both human nature *and* the physical nature of the universe requires an interpretation of the world that space-age scientists do not yet have, but that the ancient Greek Godmen-scientists *did* purport to have, since they addressed both aspects often in the same discourse. Whatever *physical* understanding of the world is purported, this *combined* understanding is in the first instance likely to be a metaphysical understanding, - it is likely to be built upon metaphysical foundations.

It should not surprise us to find that such an ancient *subject-orientated* understanding of the world, was communicated using allegorical models - metaphysical paradigms. The ancient concept of 'the soul' is itself one of these metaphysical paradigms, sometimes appearing symbolised physically as perhaps a bird or a winged personage, and other times being referred to with no overt symbol attached to it. We cannot assume that every time 'the soul' is referred to that we are dealing

with a quasi-physical or measurable object, even if sometimes this is how it is portrayed. The concept is fundamentally a metaphysical one, concerned with birth and death. We are in deep water indeed when the symbol for a metaphysical paradigm is also the kind of physical object, or physical system that is a prime target for mathematical, scientific assessment, like a celestial body or system. The reference to it is easily seen solely as quasi-scientific rather than metaphysical, especially if it is couched in terms lacking obvious metaphysical attributes. We can accept as a *myth* an idea that Mars is a god, because the notion of a 'god' is overtly metaphysical, but if we are told that the sun is an image of another, higher fire, we may tend to understand this as meaning only that the light of the sun is some kind of physical reflection, like that of the moon. We might be led confidently astray even further, if we are told that the sun is *like glass*, even though the truth may be that the whole paradigm, though deliberately physical in presentation, is but an allegory, or in other words an allegorical *metaphysical* paradigm. We may think through our 'scientific' hermeneutic filters that we can see scientific paradigms in an ancient discourse, but to the writer of that discourse what we are looking at may have been primarily a *metaphysical* paradigm - something that did not exist solely as some attempt to explain part of the physical nature of the universe for the sake of such an explanation, but rather, existed as a physical or conceptual model to communicate some essentially metaphysical *combined understanding* of the universe, human nature and human experience. We would be misled by the apparent 'physical' description in the discourse, in just the same way as we can be misled by a quantitative or numerical expression of ideas that are essentially qualitative. The sun, and fire, are mystical symbols as well as physical phenomena, and the use of physical presentation should be all the more expected where a *single, combined* understanding of both the metaphysical and physical aspects of the world is at hand.

We live in a world where there is a solar system with nine (or now possibly more) planets. The five-planet solar system of the ancients' world, is to us, *our* solar system when less well understood. By extension we say that this world we occupy was the world occupied by the ancients, except that they did not know it as well as we do. We say this as if we are confident that the nature of the world as we see it scientifically, is fixed once and for all, independently of anyone's knowledge of it. The philosophical difficulties with that assumption are part of an established minefield of philosophical problems that I have merely touched upon, but they cannot be simply ignored, and I trust I have illustrated that they are wholly pertinent to the question of

interpreting the ancient sources, and therefore the question of interpreting the notion of music of the spheres.

What we are emphasising now is that the paradigm-bound 'object' described by physical science, is not the world in its entirety. The world in its entirety as far as we can know it - the *whole* of the 'world' that we discover from birth - *includes* human intelligence, experience, and subjective understanding. It also includes *human nature*. Human nature is perhaps a surer part of the world in its entirety than what science understands as the physical world. In the light of what we know about the changing face of science, scientific paradigms, and scientific beliefs, we might justifiably say that the most static or unchanging thing about our world in its entirety is not the scientifically understood paradigm - not what we conceive scientifically as the nature of the universe, - but human nature.

In an age where scientific knowledge has not even begun, a *single, combined* understanding of both subjective and physical nature in subject-orientated terms, would naturally grow first around a subjective, experiential, 'metaphysical' knowledge of subjective human nature and experience, rather than around what is known about physical nature alone. It is an unproven and naive assumption that early men and women looked out into the night sky and made only physical or quasi-scientific hypotheses about what it is or where it came from. However, some probably did, and if they did, the drive for scientific knowledge had in a sense already been born.

As soon as scientific knowledge is in its infancy, a *single, combined* understanding starts to be pushed aside by the rise of separate understandings of the physical universe and of human nature. There may or may not ever have been a time when the drive for scientific knowledge was unborn. The drive is associated with a long but temporary movement that is mostly away from understanding the world in terms of human nature and the human condition, a movement that for a long time leaves the latter behind as a separate branch of knowledge.

Chapter 3 -The metaphysical *harmonia mundi*

Pythagoras is supposed to have been the first to use the word *Cosmos*, a word which signifies both order and beauty.¹⁵⁷ The double significance of the word reflects the two aspects of Pythagoreanism, the quantitative and the qualitative. I have suggested that the quantitative side provides useful material for our understanding of the emergence of science. For example, Pythagoras is perhaps most famous for his right-angled triangle theorem which is a foundation stone of mathematics, science and engineering. I have also suggested that this useful 'emergence of science' material had a concomitant, qualitative and metaphysical face at the time of Pythagoras. However, from a philosophical point of view, the usefulness of the 'historicity of ideas' filter on the qualitative face, is severely limited for the reasons I have outlined. I have described the quantitative tradition of *harmonia mundi* as a large but spurious plume of smoke, that smoke-screens the truth behind the origins of the metaphysical, *harmonia mundi* idea.

From what fire does this smoke arise? It is a fire started by making quantitative interpretations of the qualitative or metaphysical, and it was encouraged to start because one of the modes of expression of metaphysical ideas, was Number, or quantification. It was also catalysed by the simultaneous knowledge and use of Number as an actual quantitative tool, and by the fact that 'Number' includes 'proportion' in the wider context of geometry, which can express relationships indescribable by whole number ratios (irrational numbers). The creation of this quantitative smoke is not something for which only modern interpreters are responsible. Pythagoras' closest disciple may well have created it too, as far as we know. The qualitative or metaphysical, and the quantitative or 'scientific' are both present in the world, then and now. Both were expressed by the ancient sources collectively, often side by side in the same source, and both would probably have been expressed by Pythagoras.

We now turn to the qualitative side of *harmonia mundi*. The metaphysical side of the *harmonia mundi* tradition reports on how Pythagoras, who was himself 'fashioned by the divine spirit', 'heard' the harmony of the spheres and endeavoured to communicate to those he taught,

¹⁵⁷ Cornford, FM, 'The unconscious element in literature and philosophy', *The Unwritten Philosophy and other essays*, Cambridge, 1967, p. 19.

something of what the divine music communicated to him.¹⁵⁸ He also is supposed to have carried out somatic and spiritual healing with the use of music, and to have educated his pupils, and ordered their emotions by playing the lyre.¹⁵⁹ The closeness of these reports to the mythical Orphic tradition is notable. These reports are from much later sources, in particular, Iamblichus. The fragments of Archytas, as we have seen, throw no significant light upon the metaphysical, mystical, or qualitative side of Pythagoreanism. The cosmology of Philolaus, on the other hand, raises some rather interesting questions in this respect.

Before turning to Philolaus, it must first be noted that the authenticity of the fragments attributed to him have long been disputed.¹⁶⁰ However, Freeman indicates this is without justification,¹⁶¹ and Huffman states that the core of the fragments are now accepted as authentic.¹⁶² We will here treat the contents of the fragments themselves on an equal footing with the attestations by Aëtius and Achilles.

Thanks to Aristotle, Philolaus is much quoted for allegedly having said that everything is Number. But what he said was: 'Actually, everything that can be known has a Number; for it is impossible to grasp anything with the mind or to recognise it without this'.¹⁶³ Some have deduced from this that Number was for Philolaus and the Pythagoreans the fundamental 'stuff of the universe', or in some way the 'essence' of the universe.

This is an over-simplification. Number may be a pre-requisite of an existence that is intelligible to the human mind, for this existence consists of a multiplicity of things, and is hence, governed by Number. Number is thus an ordering principle governing the physical 'stuff' of the universe, which according to Philolaus is Earth, Water, Air, and Fire,¹⁶⁴ but Number is obviously not itself the physical 'stuff' of the universe. Is it the ultimate metaphysical or abstract 'essence' behind the physical stuff? Not at all.

¹⁵⁸ See Dillon, J and Hershbell, J, *Iamblichus On the Pythagorean Way of Life*, Atlanta, Georgia, 1991, pp. 89-91. The idea is perhaps traceable to Nicomachus - Porphyry's *Life of Pythagoras*, 30, claims Nicomachus to have stated that Pythagoras had the gift of hearing the music of the spheres, see Chadwick, H, *Boethius - The consolations of music, logic, theology, and philosophy*, Oxford, 1981, 1990.

¹⁵⁹ *Ibid.*

¹⁶⁰ See, as probably one of the earliest examples, Bywater, I, 'On the fragments attributed to Philolaus', *Journal of Philology*, Vol.1, 1868, pp. 20-53.

¹⁶¹ Freeman, *Ancilla*, *op. cit.*, p. 73.

¹⁶² Huffman, CA, *Philolaus of Croton*, Cambridge, 1993, p. 59.

¹⁶³ Freeman, *Ancilla*, *Ibid.*, p. 74.

¹⁶⁴ *Ibid.*, p. 75. A fifth element is also mentioned, the *δλκός* of the 'Sphere'.

Philolaus talks at length about Number, ascribing to it all kinds of metaphysical significance. He even states that the Decad (ten-ness) is the 'origin of divine and human life...'.¹⁶⁵ Nevertheless, Number or the Decad is not the highest point of Philolaus' cosmogony. He also speaks of The One, the eternal Being of things, Nature, the Non-limited, the Limiting, and *Harmonia*, - none of which are actually subordinated to Number. He makes it clear that there are 'supernatural and divine existences'¹⁶⁶ in which the power of Number operates, without suggesting that these 'supernatural and divine existences' are synonymous with The One, Being, or even Nature.

Most important is Philolaus' statements that Number is 'the cause of recognition',¹⁶⁷ and that it is 'impossible to grasp anything with the mind or to recognise it',¹⁶⁸ without Number. However, he also states it would be 'impossible for any existing thing to even be recognised by us', without the eternal 'Being of things'.¹⁶⁹ Does this perhaps mean that Number is the eternal 'Being of things', the highest principle behind everything? I think not, for the following reason.

Divine intelligence is not human intelligence, for Philolaus says 'Nature itself requires divine and not human intelligence'.¹⁷⁰ Yet when Philolaus says 'it is impossible to grasp anything with the mind or to recognise it'¹⁷¹ without Number, the mind he refers to is surely the human mind. He is asserting that Number is pre-requisite to existence as it is perceived and understood by the human mind. He says that no things in existence 'would be clear to anyone either in themselves or in their relationship to one another unless there existed Number and its essence'.¹⁷²

If there is such a difference between divine and human intelligence as Philolaus suggests, then we might suspect Number is necessary for human intelligence, but not for the divine. It is impossible for human intelligence to grasp anything without Number, but it is also impossible for human intelligence to grasp Nature itself. That requires divine intelligence. Number seems to be no help to the human mind in knowing Nature itself. Might it not be that Nature itself does not require Number, and only requires Number when it is 'fitted into' physical existence, and becomes 'Nature in the universe'? Philolaus is quite clear that there is a difference between 'Nature in the universe'

¹⁶⁵ *Ibid.*

¹⁶⁶ *Ibid.*, p. 75.

¹⁶⁷ *Ibid.*

¹⁶⁸ *Ibid.*, p. 74.

¹⁶⁹ *Ibid.*, p. 74.

¹⁷⁰ *Ibid.*

¹⁷¹ *Ibid.*, p. 74.

and 'Nature itself'. What we have here, again, is the notion of the physical representation or symbolism of something metaphysical. 'Nature in the universe' is the physical symbol of a transcendental, metaphysical 'Nature itself'. If this is the case, then Number also, as known by human intelligence, can be no more than a symbol of 'Nature itself'.

The inference is that the intelligence of the human species, the existence of the human species as sentient beings in a physical existence, and Number or plurality, are all interconnected. Physical existence literally 'makes sense' to human intelligence, through Number. The corollary to this interpretation is found where Philolaus says 'Number, fitting all things into the soul through sense-perception, makes them recognisable and comparable with one another....',¹⁷³ and perhaps even more so where he says of existing things that 'Number gives them body...'.¹⁷⁴ As Iamblichus later said, 'Number is the ruling and self-created bond which maintains the everlasting stability of the contents of the universe'.¹⁷⁵ True enough. But we cannot assume that Number is The One, or Nature itself, or 'higher' or more important than either of them.

As I have already indicated, although Nature itself requires divine intelligence, it is nonetheless 'fitted together' in the universe from the Non-limited and the Limiting, which make up existing things.¹⁷⁶ This, I am suggesting, is a transition from the metaphysical One, to the physical and the many, through Number, and through Harmonia. It is not clear from Philolaus whether *Harmonia* is a part of Nature or if it is Nature, or another principle.

What is the basic Being of things, if it is not Number, and where does it come from? Philolaus states that 'The One is the beginning of everything' and that 'The first composite...the One, which is in the centre of the sphere, is called Hearth'.¹⁷⁷ We are also told that 'The universe is one, and it began to come into being from the centre....'¹⁷⁸ These statements collectively conjoin the physical universe with the metaphysical One. Continuing our line of interpretation, the physical universe as it appears through Number, is really the metaphysical One, or the original Being, appearing in physical form, in plurality, intelligible to sense-perception, or sense-perception based

¹⁷² *Ibid.*, p. 75.

¹⁷³ *Ibid.*, p. 75.

¹⁷⁴ *Ibid.*, p. 75.

¹⁷⁵ Freeman, *Ancilla*, *op. cit.*, p. 77.

¹⁷⁶ *Ibid.*, p. 73.

¹⁷⁷ *Ibid.*

¹⁷⁸ *Ibid.*, p. 76.

intelligence.¹⁷⁹ Is this not basically the same kind of scenario found in the ancient Indian Vedas, dating from approximately the same era? Should we not also mention once again the three cosmic steps of Vishnu, for we have here firstly The One, with which we may associate divine intelligence and Nature, secondly 'supernatural and divine existences' with which Philolaus still associates Number, and thirdly earthly existence and 'human activities'¹⁸⁰ in the physical universe, also governed by Number?

Philolaus may have sung the praises of Number as a quantitative tool, he may even have indulged in numerology, and made what appear to be 'scientific' speculations, but Number in his philosophy was undoubtedly metaphysically significant. Philolaus' passage on Harmony¹⁸¹ is quantitative, but Harmony is something that also plays a fully mystical and metaphysical role in the discourse, at the same time as being expressed quantitatively through Number. In Philolaus' cosmogony, it is said, the whole universe came into existence through measures, weights, numbers, geometry, arithmetic and music,¹⁸² and in his cosmology he asserts that the Earth is not at the centre of the cosmos, but moves in a circular orbit like the other planets, around the mysterious fiery centre called the 'House of Zeus', 'Hearth of the World', 'Altar', 'Meeting-place', or 'Goal of nature'.¹⁸³ This 'Hearth' was the 'first thing harmonised'.¹⁸⁴ The Hearth is synonymous with The One, the beginning of everything.¹⁸⁵ In *De Caelo*, Simplicius tells us Philolaus maintained that the periphery of the universe was another fire 'at the highest point'. The centre was said to be 'first in rank', and around it move in a choral dance ten divine bodies: the sphere of fixed stars, the five planets, sun, moon, earth, and counter-earth.¹⁸⁶ A fragment by Claudianus Mamertus indicates that Philolaus is supposed to have written in a volume entitled 'On rhythms and measures' that the soul is joined to the body through number and harmony, and that Harmony is incorporeal.¹⁸⁷

Here we have a constant admixture of the metaphysical and the physical, of the qualitative and quantitative. The 'emergence of science' interpretation typically yields a cosmology with a

¹⁷⁹ In the broadest modern sense, this means the intelligence arising in the brain and body of the human animal.

¹⁸⁰ Freeman, *Ancilla*, *op. cit.*, p. 77.

¹⁸¹ *Ibid.*, p. 74.

¹⁸² Huffman, CA, *Philolaus of Croton*, Cambridge, 1993, p. 410.

¹⁸³ Philip, JA, *Pythagoras and early Pythagoreanism*, Toronto, 1966, pp. 113-114.

¹⁸⁴ Huffman, CA, *Philolaus of Croton*, *op. cit.*, p. 243.

¹⁸⁵ Freeman, *Ancilla*, *op. cit.*, p. 74.

¹⁸⁶ Philip, JA, *Pythagoras and early Pythagoreanism*, *op. cit.*, pp. 113-114; Huffman, *Philolaus*, *op. cit.*, pp. 237-238; Diels (revised by Kranz) A16 (=Aetius 2.7.7).

¹⁸⁷ Huffman, CA, *Philolaus of Croton*, *op. cit.*, p. 411; Freeman, *Ancilla*, *op. cit.*, p. 77.

'fire' at the centre of the celestial system, around which orbits the planets, sun, moon, earth and stars. Around the entire periphery would be the 'fire at the highest point of the universe'. This in the past was the usual interpretation of Philolaus' cosmology. But why is the Hearth at the centre called by its other names? What is the significance of these? Are these not metaphysical or mystical implications? Even if they are derived from previous 'mythology', what is their significance if not metaphysical? It is true that the oldest Greek mythology equates the celestial bodies with Gods, or 'living Beings', but what are such assertions if not metaphysical?

As it is reported, there were three 'fires' or suns in the Pythagorean universe as taught by Philolaus. This seems to be the earliest extant source for the many concepts and representations of a 'threefold sun' that subsequently appear in esoteric and 'mystical' literature. We have already seen the weakness of the argument that celestial entities were invented purely for numerological reasons. The three-fold nature of the 'fire' in the universe is commented upon by Aëtius and Achilles.¹⁸⁸ Huffman translates Aëtius as follows:

Philolaus the Pythagorean says that the sun is like glass,
receiving the reflection of the fire in the cosmos, straining
the light and heat through to us, so that in a way there turn
out to be two suns, both the fiery one in the heaven and that
which is from it and fiery in reflection; unless someone will
also say that there is a third, the light that is spread from the
mirror to us by reflection. For we call this latter the sun
which is, as it were, the image of an image.¹⁸⁹

Heath's translation is:

Philolaus the Pythagorean holds that the sun is transparent
like glass, and that it receives the reflection of the fire in the

¹⁸⁸ Aëtius in: 2.20.12; Diels, 348. Achilles in: *Isagoga excerpta* 19; Maas 46.13 (cited in Huffman, *Philolaus*, *op. cit.*, pp. 266, 267, respectively). Achilles appears in Diels, H, *Doxographi Graeci*, Berlin, 1874, pp. 349, 350.

¹⁸⁹ Huffman, *Philolaus*, *op. cit.*, p. 266.

universe and transmits to us both light and warmth, so that there are in some sort two suns, the fiery in the heaven and the fiery from which it is mirrored, as it were, not to speak of a third also, namely the beams which are scattered in our direction from the mirror by way of reflection [or refraction]; for we give this third also the name of sun, which is thus, as it were, an image of an image.¹⁹⁰

Achilles' report is translated by Huffman as:

Philolaus [says] that [the sun], receiving what is fiery and translucent from the aetherial fire above, sends it to us through certain pores. The result is that according to him the sun is threefold, one [sun] is from the aetherial fire, another is sent from that to what is called by him the glassy sun, and another sent from that sort of sun to us.¹⁹¹

Heath's translation of this is:

Philolaus says that the sun receives its fiery and radiant nature from above, from the aetherial fire, and transmits the beams to us through certain pores, so that according to him the sun is triple, one sun being the aetherial fire, the second that which is transmitted from it to the glassy thing under it which is called the sun, and the third that which is transmitted from the sun in this sense to us.¹⁹²

¹⁹⁰ Heath, *Aristarchus*, *op. cit.*, pp. 115-116.

¹⁹¹ *Isagoga excerpta* 19; Maas 46.13. Huffman, *Philolaus*, *op. cit.*, p. 267.

¹⁹² Heath, *Aristarchus*, *op. cit.*, p. 116.

Do these not sound like second-hand reports of something that had been heard or read by the attestors, but not really understood? There are certainly a number of things about these attestations that suggest an inadequacy in the frequently encountered, standard 'scientific' interpretation, which portrays a peripheral 'fire', an orbiting sun, and a central fiery 'Hearth', all as parts of a physical, celestial system.

The attestations state that there are 'three suns' or that 'the sun' is 'threefold'. The first kind of 'sun' is an 'aetherial fire' in the 'cosmos' or 'universe'. This is the 'fiery in the heaven'. There is no intrinsic reason why this need be interpreted primarily as a physical, rather than a metaphysical 'fire', but any quasi- or proto-scientific interpretation may of course treat it as physical, as the 'emergence of science' interpretation inevitably will.

The second kind of sun is 'transparent like glass', and it 'reflects' or mirrors the original sun, yet we are also told that it mysteriously 'strains' the heat and light through to us, 'through certain pores'. What does this mean?

And what of third kind of sun?

The third sun, if we are to read the attestations as an early 'scientific theory', can only be a virtual optical image. In other words, ignoring the mysterious 'straining' and the equally mysterious 'through certain pores', we can say the true aetherial, surrounding sun, is 'reflected' by the glassy object, and what we see, is the reflection. But this would not be an 'image of an image', would it? We would not call this reflection an 'image of an image' unless we are specifically talking about the optical 'real image' on the retina of the eye, and we considered the reflection at the 'glassy object' as an optical 'real image' (which no such reflection is). Are we really, in any case, dealing with this degree of sophistication of optical science? Aëtius thought that this third sun was 'the beams' which are reflected off the 'glassy' sun and 'scattered in our direction'. This seems to indicate he accepted the virtual image in the glassy object as the third sun, and the aetherial fire and glassy object itself as the first 'two suns'. But he is confusing about this because he says the second sun is 'from' or 'mirrored from' the first. This would not be true of the 'glassy object' itself. How does the glassy reflector itself 'come from', or how can it be 'mirrored from' the true aetherial fire?

We are saying that the aetherial fire is the first sun, the 'glassy thing' itself is the second, and the reflection of the aetherial fire, in the 'glassy thing', is the third sun. The first two of these

are real objects, and the last is a virtual image or reflection. In this scenario, how is it that this last sun can possibly be an 'image of an image'? Of course, it is not an 'image of an image' at all. It is just an image.

Achilles is perhaps more consistent with the 'scientific theory' interpretation because he at least seems to call the second and third 'suns' the actual beams which are transmitted or sent in two stages from the aetherial fire. The trouble here is that we would have four 'suns' including the glassy object itself.

The fact of the matter is that the translations do not make sense. I am not suggesting that there is anything philologically wrong or inaccurate about the translations. I am suggesting that perhaps Achilles and Aëtius did not themselves understand what Philolaus had taught, or that the translations have fallen foul of a 'scientific theory' hermeneutical approach that is misplaced, - or possibly both. If Achilles and Aëtius did not understand Philolaus, that could be either because they failed to grasp Philolaus' scientific theory, if indeed that is what it was, or much more likely because they were trying to understand as a quasi-scientific or physical system, something that had once been a wholly metaphysical, mystical, or mythical account. The tendency to interpret a discourse only as a physical theory is not exclusively ours.

Aëtius also concluded in the most pragmatic and quasi-scientific way that Empidocles thought of the sun as a 'reflection of the fire about the earth'.¹⁹³ Empidocles' poem *On Nature* does include apparently physical astronomical descriptions but the context of the poem is deeply metaphysical, its details often mythical or mystical, and its use of poetic allegory unmistakable. In *Katharmoi* (Purifications) Empidocles even declares that he himself is a 'god' who has overcome mortality.¹⁹⁴

The fact is that a 'scientific theory' interpretation of Philolaus' threefold sun, whether ancient or modern, is incomplete and unsatisfactory, quite apart from the unresolved problem of the 'pores' and the 'straining through'. The notion of a 'reflection of a reflection' or an 'image of an image' has about it a fascinating ring, and it is something that could easily endure many generations of repetition, without being understood in its original context. A metaphysical vision may be uttered, but when it falls upon quantitative ears, the result is always conflict and

¹⁹³ Aëtius, II, 20, 13. Heath, *Greek Astronomy*, *op. cit.*, p. 22.

¹⁹⁴ Freeman, *Ancilla*, *op. cit.*, p. 64.

senselessness, like the idea of the visible sun as a physical 'image of an image'. How many times does this kind of misunderstanding occur in the Greek sources themselves?

Is it not this problem of interpreting metaphysical allegory literally, that undermined Empidocles' sincere statement that the sun 'flashes back to Olympus with serene countenance',¹⁹⁵ a statement that Plutarch reported was a laughing matter?¹⁹⁶

Whatever physical celestial system Philolaus may have been describing, the notion that the visible sun is an 'image of an image', if taken metaphysically in the context I have indicated, simply means that the visible sun is two stages removed from its metaphysical Sire. In the metaphysical context I have outlined, each 'reality' or 'world' is merely an 'image' - pertinent to the intelligence associated with that 'reality' or 'world' - of a higher 'reality' or 'world' that itself requires some 'higher intelligence'. This is precisely the kind of interpretation that neo-Platonism would, and does make. In this way, the real sun is filtered through to human perception through the 'levels of mind' or intelligence, and each sun can be said to have 'come from' or to have 'sprung from' (ἀπὸ) its higher source. There is indeed now a sense in which 'sun' is 'sent from' the higher representation or source, and 'towards' the lower representation (πεμπόμενον & πρὸς).¹⁹⁷

The situation could be described as follows: The 'aetherial fire' or 'fire in the universe' is a metaphysical 'fire'. This may well have been allegorically described like a physical fire, whose symbolic position is surrounding creation. It may even have been thought to be physically present in some way, but if so, its physical presence would nonetheless have been seen as only symbolically significant or important. Beneath the aetherial fire ('beneath' in the metaphysical, rather than spatial sense) is its symbol or image, the Hearth at the centre. However, the Hearth, like an earthly fire-hearth, is not in itself fiery. It is metaphysically present as the origin of the celestial system, and an intermediary between the metaphysical 'aetherial fire', and what we perceive sentiently as light and warmth. Its status, by very crude analogy, is not unlike the black-body that the sun is considered to be in physics, when regarded as a perfect black-body radiator, except that in this case it is a kind of metaphysical window or filter, rather than a black body. The light and warmth that we see is not the real sun at all, but its appearance in sense, or in the intelligence of sentient beings - in human intelligence, rather than divine intelligence.

¹⁹⁵ Freeman, *Ancilla*, *op. cit.*, p. 58.

¹⁹⁶ Plutarch, *De Pyth. Or.*, 12, p. 400 B. Heath, *Greek Astronomy*, *op. cit.*, p. 22.

However, there is a further complication. The visible 'sun' is identified with the Hearth, which itself is metaphysically 'the centre' of the system, - and yet at the same time the visible 'sun' is observed in its appearance to move around the Earth. Both the visible 'sun' and the Earth are in later sources said to 'dance around the centre'. In this sense the visible sun cannot be at the physical centre of the system, where the Hearth is supposed to be. However, if the spatial positioning of the bodies is mystically symbolic, then the actual or speculated physical bodies in space and time are of secondary importance to what they signify. Thus, in terms of the mystical symbolism, the visible sun is not only describable as a reflection or image of the Hearth, but it could also be validly said that it *is* the Hearth (as it is perceived in human intelligence). In other words the Hearth itself is not directly perceivable in human intelligence, but it is perceived as the moving visible sun. In much the same way, it can be said that the entire universe, though appearing as a multiplicity, is The One, and yet at the same time it is not, for it is multiplicity. Apparent contradiction or paradox is not unusual in mysticism. On the contrary, this is one of its most obvious characteristics.

Similarly, there is a logical conflict between heliocentricity and geocentricity when each is considered in physical terms, but when the meaning of each is metaphysical, both states of affairs can in a sense co-exist simultaneously. In a metaphysical context this relativity of understanding is neither difficult to conceive, nor something only rarely found. McEnvoy has recognised an aspect of this, calling it 'valuational heliocentrism', meaning that the sun was understood to occupy a central position in every sense except the physical.¹⁹⁷ The inference is that the celestial system of Pythagoras, even though described in physical terms, is in effect a metaphysical paradigm and not a scientific paradigm.

Thus, if the final image of the originating One in the physical universe is the visible sun, then the 'image of an image' description indicates a three-fold metaphysical 'descent' from The One, to the visible sun. What we see as the sun is not the real sun at all, but the symbol or image of the real sun in physical existence. The real sun is not a 'thing' as we would know a 'thing', - it is *being* at a metaphysical level, in the eternal act of creation, a stage in the descent of intelligence from The One, to earth and sense-bound human intelligence, where it appears as the visible sun.

¹⁹⁷ Diels, H, *Doxographi Graeci*, Berlin, 1874, pp. 349, 350.

Even the Sire of the visible sun, called the Hearth at the centre, or later called the glassy object, requiring a higher intelligence to apperceive, is not the originating One itself, but a representation of the One. A similar three-fold descent, or ascent if you like, is found in Dionysian cosmology, where it appears as the three realms, the terrestrial, the celestial, and the supercelestial. The role of the sun in this context was, for example, recognised by Fludd's brilliant student Pico della Mirandola,¹⁹⁹ who says in *Heptaplus*:

....among us, fire is a physical element; the sun is fire in the sky, the celestial world; in the region [metaphysically] above man, fire is the seraphic intellect. But see how they differ: the elemental fire burns, the celestial enlivens, the super-celestial fire loves.²⁰⁰

Here are Philolaus' three suns, described in the neo-Platonic, metaphysical context. The lowest sun is the physical, visible sun, and above it are two higher, metaphysical fires, the highest of which is love. We should not be at all surprised to find ourselves confronted primarily with the metaphysical significance of the sun in Pythagorean cosmology. The correlation between the visible sun and the Divine is something that is frequently encountered across the whole gamut of times and cultures. It is only quasi-scientific opinion or the hermeneutic filters I have mentioned, that choose to explain the correlation on materialistic grounds alone. The common idea that the association of the sun with the Divine, originates as a cultural belief arising from our obvious physical dependence upon the sun, is shallow and naive. In Plato's *Republic* the sun is treated as the image of the good,²⁰¹ in a metaphysical context that cannot simply be dismissed or explained in this way. The presence of the ideas of light, heat, and fire, as metaphysical images related to both the good, and to purgatory, are ubiquitously encountered in theological thought. Zeno the Stoic is reported by Augustine to have thought that God Himself was fire, and reported by Stobaeus to have

¹⁹⁸ Dobbs, BJT, *The janus faces of genius. The role of alchemy in Newton's thought*, Cambridge, 1991, p. 158.

¹⁹⁹ Huffman, WH, *Robert Fludd and the end of the renaissance*, London, 1988, p. 94 ff.

²⁰⁰ Dobbs, BJT, *The janus faces of genius. The role of alchemy in Newton's thought*, Cambridge, 1991, p. 159; citing Gombrich, EH, *Symbolic Images. Studies in the Art of the Renaissance, with 170 Illustrations. II.*, Chicago, 1972, 1985, pp. 152-153.

²⁰¹ Plato, *The Republic* 507e - 509c; See Plato, *The Republic*, Tr. D Lee, London, 1955, 1987, pp. 245-255.

said that the celestial bodies, endowed with mind and wisdom, were made of creative fire.²⁰² The role of fire and light both within Christianity and also in vigorous contention with it, is very much in evidence in the middle ages.²⁰³ In Christian Hermeticism there could even be an identification of Christ with the sun.²⁰⁴ The attributes of the sun can equally be metaphors of the good and of purgatory, representing as it does, benevolent light and warmth, and at the same time, burning heat and blinding light that cannot be directly faced. These metaphors occur frequently in patristic discourses that are deeply metaphysical or mystical, and are widely respected as having a content that cannot be dismissed as mere reiterations of mythic or cultural tradition, even though they may employ traditional images.²⁰⁵

The metaphor of light, and the idea of a descent from the metaphysical into the physical, i.e. from the One into matter, was highly developed by the neo-Platonists, by whom the number of stages seen in the descent was increased.²⁰⁶ Soul, sun, and elemental fire were all active causes for Marsilio Ficino,²⁰⁷ who wrote a treatise on both corporeal and incorporeal light, in which he discussed their relationship. He declared that '...The sun can signify to you God Himself in the greatest degree....and God's eternal power and divinity [are understood] through the sun'.²⁰⁸ In England the light metaphor was propounded by the Elizabethan magus John Dee, who in his *Propaedeumata Aphoristica* treated light as the first and most sublime creation, and circular motion as perfect. Although Dee assumed the geocentric celestial system of Ptolemy, it was the sun that was given the central symbolic status in both his *Propaedeumata Aphoristica* and the *Monas Hieroglyphica*.²⁰⁹

Johannes Kepler is today is a major figure in the 'emergence of science' way of understanding the past, as he was the discoverer of the three laws of elliptical planetary motion that put an end to the ancient ideal of circular orbits. But despite Kepler's 'scientific successes', he was

²⁰² Dobbs, BJT, *The janus faces of genius*, op. cit., p. 157.

²⁰³ *Ibid.*

²⁰⁴ *Ibid.*, p. 161;

Yates, FA, *Giordano Bruno and the Hermetic Tradition*, Chicago, London & Toronto, 1964, pp. 7-9, 23, 36.

²⁰⁵ An example is the work of the Spanish mystic St John of the Cross, perhaps best known for his treatise *Dark Night of the Soul*. For a short example, see, in particular, St. John of the Cross, *Living Flame of Love*, Tr. EA Peers, Tunbridge Wells, 1935, 1987, pp. 127-130.

²⁰⁶ See Kristeller, PO, *Eight philosophers of the Italian renaissance*, Stanford, 1966, pp. 120-121.

²⁰⁷ Kristeller, PO, *The philosophy of Marsilio Ficino*, Tr. V Conant, Columbia, 1943, p. 127.

²⁰⁸ *Ibid.*, p. 98; Also partially cited in Dobbs, BJT, *The janus faces of genius. The role of alchemy in Newton's thought*, op. cit., p. 159 (n.113).

²⁰⁹ French, P, *John Dee*, London, 1987, pp. 94-96.

immersed, like Newton and many other figures who are important in the 'emergence of science', in metaphysical thought, and he saw the celestial system in terms of its metaphysical and symbolic significance. Like the ancient Greeks, he dealt both in metaphysics and in the quantitative science that later divorced itself from its metaphysical companion. His metaphysical view of the celestial system, again, recognises the symbolic status of the sun, being at the centre, at rest, and the cause of motion. Motion of course occurs in Plato and in the Hermetica as associated with time itself, the unreal 'world of becoming'.²¹⁰ In the Hermetica (now thought to be largely derived from Plato) motion is associated with suffering. In Platonic terms, the world of motion, coming to be, and ceasing to be, is an unreal copy of the Real, The One, or God, which is eternally Being, but never becoming or ceasing to be. Kepler sees all this symbolised by the celestial system:

The sun in the middle of the moving stars, himself at rest
and yet the source of motion, carries the image of God the
Father and Creator.²¹¹

The full metaphysical significance of not only the sun, but the whole celestial system, cannot be touched upon by the 'emergence of science' interpretations, or even by the of 'history of myths and ideas' interpretations that pervade scholarship of the Greek sources, especially where they are coloured by a preference for quantitative or physical explanations. The preference for quantitative and physical understanding, whether that preference is shown by an ancient Greek, or by a space-age scholar, cannot acknowledge the metaphysical significance of 'aetherial fire' (with which the sun is of course associated), and will inevitably take an idea like 'fire above' to mean physically above, rather than above in the metaphysical sense. Similarly, 'fire in the earth' will be taken to be derived from a physical source like volcanic activity, rather than seeing volcanic activity as a living metaphor for something metaphysical, in relation to Man's mystical experience. In the mystical view, the entire physical universe is a metaphor.²¹²

²¹⁰ On Kepler and the Hermetic philosophy see Field, DIV, *Kepler's geometrical cosmology*, London, 1943, 1988, pp. 187-190.

²¹¹ *Opera Omnia*, Vol. IX, pp. 33 ff. 5; see Kestrel, A, *The act of creation*, London, 1964, p. 125.

²¹² Kingsley, *op. cit.*, p. 53, states that there is a nexus of Greek passages alluding to the idea that the fires of heaven, including the sun, had their origin in the depths of the Earth.

The traditional associations between fire, purgatory or hell, the 'black' or 'invisible' sun, and even the 'fire in the Earth' of the alchemical tradition,²¹³ are as much a metaphysical interpretation of the human condition, and the spiritual endeavour to overcome it, as they are about the physical structure of the Earth and solar system. Alchemical transmutation in this context is not merely about gold-production, but about the metaphysical transformation of the alchemist, the transmutation of the human spirit through gnosis.²¹⁴ Even if it is true that an imaginative metaphysical belief-system can be built upon observations of natural phenomena, any truly mystical understanding of human purgatory and transformation was arguably far more likely to have originated with the subjective experience of purgatory and transformation, or at least the search for it. In this context, a physical phenomenon like volcanic activity exists, like the universe as a whole, as merely a physical symbol of the inner search. It is the actual inner journey of the seeker-after-truth, that would, so to speak, determine the interpretation of natural phenomena.

Whilst the details of Philolaus' celestial system considered as a metaphysical symbol may remain obscure, the metaphysical interpretation of the Pythagorean Hearth is easy to see when it is acknowledged how much of what is said in the earliest sources is primarily allegorical in nature. It is very difficult to see through allegory without some foreknowledge of the possible meaning, but when we know what the story is really about, the allegory by which it is being told becomes relatively transparent. The problem with the 'emergence of science' and the 'history of myths' filters is that they can contain no such foreknowledge. The finer and even the more general points of the metaphysical philosophy are not exactly visible or tangible to science. Also, if it is an intrinsic part of that philosophy, that historicity is mere illusion, then what does the historicity filter have to offer towards seeing through the allegory, and understanding that philosophy?

Heraclitus said 'Harmony consists of opposing tension, like that of the bow or lyre...', but he also said 'The bow is called Life, but its work is Death'. This, again, is poetic allegory. The Greek word for 'Life' is actually punned with the Greek word for 'bow'.²¹⁵ The work of the bow and arrow, as we all know, is death. It is sheer negligence to appreciate the pun, but not to ask what Heraclitus meant by indicating that the *work* of Life is death, *and that both are related to harmony*.

²¹³ Kingsley, *op. cit.*, pp. 55-57.

²¹⁴ French, P, *John Dee*, London, 1987, p. 127; See also, for example, *ibid.* pp. 77-78 & footnotes, and Reedy, J, *Thomas Norton's Ordinal of Alchemy*, Oxford, 1975.

²¹⁵ Freeman, *Ancilla*, *op. cit.*, p. 28, footnote 1.

We could explain this in any number of rational ways if we really wanted to, but we should find ourselves running fast into confusion if we are too quick to avoid the metaphysical and offer only 'rational' explanations for everything that is said by an ancient Greek Godman-scientist. What are we to make of his assertion that 'When you have listened, not to me but to the Logos,²¹⁶ it is wise to agree that all things are one'?²¹⁷ Or what of the statement that 'Time is a child playing a game of draughts; the kingship is in the hands of a child'?²¹⁸ What we have in the source is the poetic allegorical expression of a connection between Time, Life, death, and Harmony, all of which are ingredients of Plato's metaphysics, all are ingredients of the Myth of Er. All are proper and correct ingredients in the metaphysical idea of the harmony of the spheres.

It is these elements that we should consider now, today, as relevant to our understanding of the meaning of music in the most profound sense, for they have nothing legitimate to do with mistaken ideas about the structure of the celestial system, but everything to do with music and the human emotional condition when it is understood in its full context.

It is assumed that Plato must have had an earlier source from which the Myth of Er was derived.²¹⁹ The true source of the Myth of Er is *the metaphysical world-view out of which it springs*. Can we understand the Myth of Er without understanding the philosophy from which it springs, a philosophy that challenges the common notion of time and historicity? We have to see that from the point of view of that metaphysical philosophy itself (a branch of which is *explicitly* represented by Plato), the meaning of the myth is incompatible with the opinion that the myth has its source somewhere in time. Anyone who sticks only to the historical facts and thinks, like so many scholars, that the myth must have its source in time, clearly has no empathy for, or understanding of its philosophical content and meaning.

In Plato's philosophy, the manifest, objective aspect of the world is seen as unreal, and veiling an underlying unity or Reality, identified as The One.²²⁰ This central idea of unity would be very much expected of any philosophy or tradition that was fundamentally mystical. As Combs has put it, in his tackling the problem of the meeting ground between science and spirit: 'most mystical traditions share the idea that while multiplicity and separateness are characteristics of manifest

²¹⁶ Tr. Freeman as 'Law'. Literally, 'word'.

²¹⁷ Freeman, *Ancilla*, *op. cit.*, p. 28.

²¹⁸ *Ibid.*

²¹⁹ Philip, JA, *Pythagoras and early Pythagoreanism*, *op. cit.*, p. 127.

reality, the deep order is one of mutual enfoldment and oneness'.²²¹ Only this unified world-view can support the assertion that the 'universe sings'.²²²

²²⁰ e.g. Plato, *Timaeus and Critias*, 30-32, Tr. D Lee, 1965, 1977, p. 43.

²²¹ Combs, A, 'The meeting ground of science and spirit: New themes for a new science', in Burner. *et. al.* (Eds.), *Holistic Science and Human Values*, Adder (Theosophical Science Centre), Madras, 1992, pp. 53-59; cited in Bags, S & J, *The Healthy House*, London, 1996, p. 89.

²²² Attributed to Pythagoras, for example by Hippolytus in *Refutations*, I, 2, 2, see Heath, *Greek Astronomy*, *op. cit.*, p. 34.

Chapter 4 - The strength and continuity of the *harmonia mundi* tradition

The mathematical study of musical intervals, and their combination to form modes and scales, is the basis of musical science as it was widely studied throughout most of the history of Western music. Before the 'scientific revolution' of the seventeenth-century, the science of music was not a mere adjunct to other intellectual pursuits, but rather, its place in the *quadrivium* indicates its status as an essential part of the learned man's studies. Musical science was important to the understanding of the world, and of Man and his place in the macrocosm. The importance of musical science, or the science of 'harmonics' as it was known, was supported by, and arguably derived from, the impressive strength of the quantitative harmony of the spheres tradition.

The idea of the harmony of the spheres has always had its opponents in one way or another, the first obvious example being Aristotle. Nevertheless, the celestial system that was accepted in Europe for fifteen centuries until the scientific revolution, was the system originated by Ptolemy, who was an important proponent of cosmic harmony. Ptolemy developed many ideas inherited from Plato, concerning both the quantitative and metaphysical faces of *harmonia mundi*. He could indeed be recognised by modern acousticians as a representative of the quantitative tradition, and even as what one scholar has described as a 'number cruncher',²²³ but at the same time he clearly accepted Plato's conception of the arithmetically proportioned soul, and that the effects of music were due to the kinship between the 'harmonics' of the soul, and the harmonic structure of musical phenomena.²²⁴ Ptolemy developed an extensive astrological correlation between the heavens, music, and the human soul.²²⁵ 'Harmonics' was for Ptolemy, not merely a quantitative science, but a manifestation of a predictable, divinely ordained order.²²⁶ Knowledge of this 'divine' order is both subjective and theoretical and it is a function of nature that allows

²²³ Solomon, J, *Harmony in Ptolemy's Harmonics*, Armadillo, NSW, 1990, p. 13.

²²⁴ Taub, LC, *Ptolemy's universe*, Chicago & LaSalle, Illinois, 1993, p. 127; Barker, A, *Greek musical writings*, (2 Vols), Cambridge, 1989, Vol. 2, pp. 375-376.

²²⁵ *Harmonics*, Book III, Chapters 4, 8-16; Barker, A, *Greek musical writings*, (2 Vols), Cambridge, 1989, Vol. 2, pp. 375-376; 380-391.

²²⁶ Solomon, J, *Harmony in Ptolemy's Harmonics*, Armidale, NSW, 1990, p. 16.

subjective perception of the divine order.²²⁷ 'The power of attunement is present in all things', states Ptolemy, 'but is revealed most fully through human souls and through the movements in the heavens', and thus 'The power of *harmonia* is a form of the cause corresponding to reason'.²²⁸

St Augustine, Pseudo-Dionysius and Boethius were important in transmitting Platonism and neo-Platonism to the middle ages.²²⁹ Boethius was instrumental in propagating the musico-mathematical concepts from Plato's *Timaeus* and ensuring that musical science occupied an important position in scholarship.²³⁰ He also made references to Philolaus' music theory and quoted definitions of musical intervals that he attributed to Philolaus.²³¹ His treatises *De institutione musica*, *De institutione arithmetica*, and the influential *Consolations of Philosophy* all present music and mathematics as necessary to the attainment of knowledge and virtue,²³² and in *De institutione musica* he emphasises hearing for its ability to influence the soul.²³³ Boethius helped establish music as one of the disciplines of the *quadrivium* together with arithmetic, geometry, and astronomy,²³⁴ and so to make it essential to what was considered a complete understanding of the world. Boethius' interpretation of Plato, and the theses he developed from him, emphasise 'reason' as an authority. Boethius seems to understand 'reason' as an intellectual, or even deductive faculty, that can be enhanced through intellectual study. In this he sides mostly with the spirit of the quantitative tradition, and the common belief that the teaching of Pythagoras was a celebration of Man's true authority, an authority that is a kind of abstract or God-given 'reasoning' power, over sense,²³⁵ a 'reasoning' power that is in general not distinguished from the intellectual faculty that is employed in the study of arithmetic or geometry. Boethius endorsed a metaphysical correspondence, at least theologically, between the various manifestations of *musica* with which his name is associated, but musical scholarship in the Boethian sense was primarily a scientific or quasi-scientific study.

²²⁷ *Ibid.*, pp. 15-16.

²²⁸ *Harmonics*, Book III, Ch. 4; Barker, A, *Greek musical writings*, (2 Vols), Cambridge, 1989, Vol. 2, p. 374.

²²⁹ Huffman, WH, *Robert Fludd and the end of the renaissance*, London, 1988, p. 80.

²³⁰ Moyer, AE, *Musica Scientia*, Ithaca & London, 1992, p. 29.

²³¹ Huffman, CA, *Philolaus of Croton*, Cambridge, 1993, p. 364.

²³² Moyer, AE, *Musica Scientia*, Ithaca & London, 1992, p. 29.

²³³ *Ibid.*, p. 30.

²³⁴ *Ibid.*, pp. 29-30; French, P, *John Dee*, London, 1987, p. 23.

²³⁵ See, for example, Boethius, AMS, *Fundamentals of Music*, Tr. CM Bower, Ed. CV Palisca, New Haven & London, 1989, pp. 16-17, 50, 165.

Later scholars continued to expand of the study of music as a science,²³⁶ and two thousand years after Plato, in renaissance cosmology, the notion that musical principles permeate the cosmos at every level, once again reached grand proportions. There now existed a strong movement of philosophers who used harmonic models of the cosmos and also pursued the study of practical music, but whose motives were distinct from orthodox musical scholarship.²³⁷ They not only studied the quantitative complexities of harmonic science, but also sought a qualitative, deeper metaphysical understanding of music as an affective power. In this pursuit there seems to have been a good deal of cross-fertilisation of the 'music cosmology' indirectly inherited from the Pythagorean tradition, with the occult, neo-Platonic and Hermetic philosophies. The latter had spread following the rediscovery of the *Corpus Hermeticum*, which was initially embraced as a source of ancient Egyptian wisdom, perhaps more authoritative than Plato, since it was held to contain esoteric teachings transmitted from the Egyptian god Thoth.²³⁸

By the height of renaissance, the Elizabethan magus and Hermeticist John Dee was treating music as a mystical art capable of putting Man in tune with the universal order,²³⁹ and in Jacobean England the metaphysical structure of the cosmos was documented in vivid detail by Robert Fludd, who disclosed the secrets of his music-cosmology in his monumental but unfinished *History of the Macrocosm and Microcosm*.²⁴⁰ Fludd's cosmology was built on an already thriving and complex foundation of ideas linking Man with the cosmos as a whole, in a metaphysical and symbolic way. Those ideas included the neo-Platonic concept of the 'Great Chain of Being'²⁴¹ in which everything that existed either physically or incorporeally, was linked in a hierarchy descending from God down through metaphysical levels into the material world. The universe was understood in the context of a macrocosm-microcosm 'correspondence', in which Man (the microcosm), and the universe (the macrocosm), were complementary symbols of each other.²⁴² The renaissance notions of macrocosm, microcosm, and harmonic relationship, were variants and elaborations on the

²³⁶ Moyer, AE, *Musica Scientia*, op. cit., pp. 100-103.

²³⁷ *Ibid.*, p. 7.

²³⁸ The *Hermetica* is now generally thought to be neo-Platonic in origin, even if ultimately derived from Egyptian teaching. Scott, W (Tr), *Hermetica*, (1924), Bath, 1992.

²³⁹ French, op.cit., p. 140.

²⁴⁰ *Utriusque Cosmi...Historia*, 1617 - 1626. See Godwin, J, *Robert Fludd*, London, 1979; Huffman, WH, *Robert Fludd and the end of the renaissance*, London, 1988.

²⁴¹ For a concise overview of the Chain of Being, see Tillyard, EMW, *The Elizabethan World Picture*, London, 1943, 1972, p. 33 ff. The classic study is Lovejoy, AO, *The Great Chain of Being*, Cambridge, Mass., 1936.

tradition inherited from the Greeks and transmitted by Boethius, who had reiterated them in his own musical theory.²⁴³

For magi like Robert Fludd or John Dee, the musico-cosmological world-view was part of a matrix of esoteric, mystical knowledge, but the notions of the Great Chain of Being and the macrocosm-microcosm correspondence were themselves expressed more broadly in a variety of ways through Elizabethan art and culture.²⁴⁴ This world-view was imbued with Platonism and neo-Platonism, drawing particularly on the fifth century Christian neo-Platonists Dionysius the Areopagite,²⁴⁵ and Plotinus. Music does not feature as prominently in the *Corpus Hermeticum* as it does in the writings of say, Iamblichus, but it was nevertheless given an important role in the Hermetic subculture that existed as an undercurrent to the neo-Platonic beliefs. Although no formal academy existed in England for the propagation of Hermetic or occult teaching, its influence reached high culture through the close association of the magus and the aristocracy.²⁴⁶

Many of the ideas held by the English magi were derived from earlier continental Hermeticists, who, influenced by the legendary Greek accounts of the marvellous effects of music, had developed their own ideas sometimes to fantastic proportions.²⁴⁷ Francesco Giorgi had taken the ideas of *musica mundana*, *humana* and *instrumentalis* that he had obtained from Boethius, and permeated them with cabalism.²⁴⁸ As in England, it had been held on the continent that the power of music to affect Man comes from the unity of Man and the cosmos, both of which are subject to, and related by, musical proportion. Again, this idea was not new. It is, as we have seen, implicit in the earliest Greek tradition, it is epitomised in Plato, and it is explicitly enunciated by later philosophers including Ptolemy and Boethius. Music was thus seen by the Hermetic or occult philosopher as a key to knowledge of the higher levels of being in the Great Chain, and as having the power to affect the inner being to such an extent that it could even induce some kind of higher cosmic awareness.

The correspondences that existed between all things, and between material and incorporeal levels of Being, assisted in the spiritual quest for union with God, and could even be called upon in

²⁴² Tillyard, *op. cit.* For an illustrated overview of Fludd's macrocosm-microcosm cosmology see Godwin, J., *Robert Fludd*, London, 1979.

²⁴³ French, *op. cit.*, pp. 139-140.

²⁴⁴ Tillyard, *op. cit.*

²⁴⁵ *Ibid.*, in particular pp. 49-50, 59, 96.

²⁴⁶ Especially through Sir Philip Sidney and his circle. French, *op. cit.*, p. 126 ff.

²⁴⁷ French, *op. cit.*, pp. 139-140.

the ritualised attempt to invoke assistance from the higher levels. Pico della Mirandola's teacher Marsilio Ficino, whom Cosimo de Medici had set the task of translating the *Corpus Hermeticum*, introduced a new hierarchy of correspondences which he developed from that of Plotinus.²⁴⁹ Ficino was himself an instrumentalist, giving frequent performances before a large circle of friends.²⁵⁰ Working with an occult system that invoked power from the correspondences, Ficino aimed to influence people and events through musico-magic.²⁵¹ He believed music to be the medicine of the soul,²⁵² and to be at its most potent when conjoined with words, enabling 'heavenly gifts' and 'celestial things' to be obtained.²⁵³ The perfect matching of words with musical sound affected the intellect as well as the spirit, thus influencing the entire human being.²⁵⁴ These ideas were later absorbed by John Dee, and adopted by Philip Sidney as the basis of his beliefs in the power of measured verse and music.²⁵⁵

Poetry was considered by Ficino to have its origins in the divine mind itself, whereas music had its origins in the harmony of the spheres. However the music of the spheres was held by Ficino to be something essentially divine or metaphysical. His understanding of the effects of music was based upon a metaphysical and astrological view of Man and the macrocosm, in which there is correspondence between earthly and divine music, that can raise earthly perception towards the divine. On hearing certain 'sweet harmonies and rhythms', the soul is 'exhorted and excited to consider the divine music with a more ardent and intimate sense of mind'.²⁵⁶ In Ficino we find again the neo-Platonic idea of a hierarchical descent of Being from unity (The One) to physical plurality, and the idea that the manifest physical universe is symbolic of a greater, metaphysical whole.²⁵⁷

As far as music is concerned, Ficino is arguably the most important philosopher of the renaissance, and more generally speaking, the most important writer of the Florentine

²⁴⁸ French, *op. cit.*, pp. 139-140.

²⁴⁹ Kristeller, PO, *Eight philosophers of the Italian renaissance*, Stanford, 1966, pp. 42-43..

²⁵⁰ Kristeller, PO, *The philosophy of Marsilio Ficino*, Tr. V Conant, Columbia, 1943, p. 307.

²⁵¹ French, *op. cit.*, p. 138.

²⁵² Lowinsky, EE, 'Music in the culture of the renaissance', in Kristeller, PO & Wiener, PP, *Renaissance Essays*, New York, 1968, 1992, p. 344.

²⁵³ Ficino, M, *The Book of Life*, Tr. Charles Boer, Dallas, Texas, 1992, pp. 158-164.

²⁵⁴ French, *op. cit.*, pp. 138; Godwin, J, *Music, mysticism and magic*, London, 1987, pp. 117-122.

²⁵⁵ French, *ibid.*, p. 138.

²⁵⁶ Kristeller, PO, *The philosophy of Marsilio Ficino*, *op.cit.*, 1943, p. 308.

²⁵⁷ *Ibid.*, pp. 74-120; p. 88 in particular.

awakening.²⁵⁸ He was for many years the leader of the Florentine Academy, which although perhaps hardly an academy in the proper sense,²⁵⁹ seems to have disseminated Platonism widely through those who became associated with it.²⁶⁰ Ficino was known and read across Europe, and was a major force in the spread of Platonism in sixteenth century thought.²⁶¹ When his philosophy did not meet with the approval of his clerical enemies, his influence seems to have been sufficient to avoid the hostile forces that befell his pupil Pico.²⁶² His *Book of Life* brought immediate accusations of demonic magic and necromancy, but by enlisting the help of friends from three of the most powerful families in Florence, Ficino succeeded in clearing his name, and averting a Papal ban.²⁶³ He wrote the first complete translation into any Western language of the works of Plato, and published in his *Theologia Platonica* a commentary on Plato's *Symposium*.²⁶⁴

The ancient idea of the macrocosm-microcosm correspondence, and the neo-Platonic 'Great Chain of Being' are models - particular ways of expressing a relationship between Man and the cosmos as a meaningful whole. The approach is one that sees the part only in the context of the whole. It is fundamentally a metaphysical interpretation of man's existence and relation to the cosmos, but one that often expresses itself in explicitly quasi-scientific terms. Unlike Pythagoreanism as a whole, a cosmology like Fludd's, though full of the use of Number and 'quantification', juxtaposes the mathematical and the metaphysical, and does not even try to grasp the full descriptive and predictive power of mathematics. Rather than seeking the objective fact or the quantitative laws governing the parts, it uses mathematical relations to express, symbolise and corroborate a qualitative, subjective view of the workings of the whole. It contrasts strongly to scientific reductionism and materialism which sees quantitative examination of the parts as the key to understanding the whole as a complexus. Conversely we can envisage even the earliest Pythagoreanism as setting out upon a road exploring the laws of Number and how they relate to the physical world, a road which soon becomes detached from the metaphysical path of which it was

²⁵⁸ Boer, C, *Marsilio Ficino's Book of Life*, Dallas, 1992.

²⁵⁹ Shorey, P, *Platonism Ancient and Modern*, Berkeley, 1938, p. 120.

²⁶⁰ Kristeller, PO, *Eight philosophers of the Italian renaissance*, op. cit., 41-42.

²⁶¹ *Ibid.*, 51-52.

²⁶² *Ibid.*, pp. 54-71.

²⁶³ Ficino, M, *The Book of Life*, op. cit., pp. xi-xii.

²⁶⁴ Kristeller, PO, *Eight philosophers of the Italian renaissance*, op. cit., 37-53. For the commentary on *Symposium* see Jayne, SR, *Marsilio Ficino's commentary on Plato's Symposium*, Columbia, 1944. (Vol. 19 of University of Missouri Studies).

once a part. The quantitative road soon becomes the sole occupation of enquiry, and a foundation stone of emerging scientific method.

The 'scientific revolution' of the seventeenth century signifies the dissolution of the musico-cosmological world-view, as musico-cosmology gradually becomes cast into the shadow of 'scientific' cosmology. One great cornerstone of developing scientific cosmology came in the form of the Copernican theory of heliocentricity. Copernicus' theory appeared in the previous century and asserted on empirical and mathematical grounds that the Earth should be considered as revolving around the Sun and not *vice versa*.²⁶⁵ Such a suggestion, which was contrary to the teachings of the Church, was first cautiously presented in the guise of a merely 'theoretical model' that happened to be useful for assisting astronomers' calculations. But eventually, assisted by the observations of Galileo, the idea gained acceptance as fact, and in the eyes of the progressive scientists, it cast all geocentric cosmology like Fludd's conclusively into the annals of the past.

Fludd, the last great representative of renaissance Hermeticism, died in 1637. In the very same year Descartes published his *Discourse on the method of rightly conducting one's reason and seeking truth in the sciences*...²⁶⁶ The Discourse asserted the independence of mind and body as two distinct 'substances',²⁶⁷ and in doing so provided a schema for an empirical scientific method based upon the principle of 'objective observation'. The mind could know itself through introspection, but it could also be the independent, objective observer and investigator of the material world. It was capable of being the independent, objective, scientific mind. In effect, Descartes' duality of matter and mind, succeeded for three hundred years or so in legitimising a separation between subjective knowledge and the pursuit of information about physical nature. Having accepted the duality as a basis for scientific understanding of the world, science now faces the task of ridding itself of that duality.

The scientific world-view, as it matured, offered little support for a cosmology that is founded on mystical principles or metaphysical symbolism, but in its earlier stages we can find examples of the two approaches to understanding the universe, coexisting within the protagonists of scientific method. One of the better known instances of this coexistence, relating to *musica*

²⁶⁵ The assertion that the Earth moves, and is not at the centre of the cosmos is at least as old as the cosmology of Philolaus.

²⁶⁶ Descartes, R, *The philosophical writings of Descartes*, Tr. J Cottingham, R Stoothoff, D Murdoch, Cambridge, 1985, 1994, Vol. 1, p. 109 ff.

mundana, can be found in the case of Kepler. Kepler was what we would now call a scientist.

Kepler's three laws of planetary motion are still used today, and are named after him - they not only confirm Copernicus' assertion of heliocentricity, but also, by showing that the planets move in ellipses around the sun, they destroy the ancient sanctification of circular motion. However, this destruction came about not as a direct act of scientific disregard for the echoes of Platonism, and not as a result of purely mathematical analysis, but actually as result of Kepler's attempts to prove that the orbits of the planets were determined by the shapes of the five Platonic solids.²⁶⁸ Kepler also continued to study and write on the subject of cosmic harmony²⁶⁹ and calculated a mathematical basis for the music of the spheres based upon the newly discovered law of non-circular motion.²⁷⁰

Even in the late seventeenth century the great Newton himself continued to write abundantly on alchemical and mystical matters. But it is not those writings that determined the course of things to come. In 1687 he published his *Philosophiae Naturalis Principia Mathematica*, which became the revolutionary basis of a new era in cosmology, and laid the foundation of what has become known as classical mechanics. The remnants of Greek cosmology were finally and firmly overthrown by a handful of relatively simple mathematical formulae that immediately explained a host of known, but puzzling observations. Newton's laws simultaneously explained Kepler's laws, the precession of the equinoxes, minor perturbations in the motions of the planets, and the complex variations in the motion of the moon.²⁷¹ The unequivocal scope of the *Principia* establishes it as a masterpiece, a *tour de force* in the process of disentangling fact from imagination, and more generally, the objective from of the subjective. It is one of the most prominent milestones in the evolution of physics. What it did, was to blow away centuries of accumulated, spurious quantitative smoke from the harmony of the spheres tradition. Above all, it fired a new intellectual optimism in the combined power of 'objective' empirical observation and mathematical description, an optimism that heralded the ages of reason and enlightenment.²⁷²

²⁶⁷ Descartes, Tr. J Cottingham, R Stoothoff, D Murdoch, *op. cit.*, Vol. 1., pp. 210-216.

²⁶⁸ This is well known in the history of science discipline, but for example, see Huffman, WH, *Robert Fludd and the end of the renaissance*, London, 1988, p. 56.

²⁶⁹ See Godwin, J, *Music, mysticism and magic*, *op. cit.*, pp. 148-152.

²⁷⁰ Godwin, J, *Harmonies of Heaven and Earth*, London, 1987, pp. 143-148; Walker, DP, *studies in musical science in the late renaissance*, London, 1978, pp. 34-62.

²⁷¹ Asimov, I, *Biographical encyclopedia of science and technology*, London, 1972, p. 139.

²⁷² *Ibid.*

Notwithstanding the new enthusiasm for scientific method, the echoes of macrocosm-microcosm style musico-cosmology continued, not least in the field of medicine. Whilst medicine has always had its share of mechanical philosophers who have chosen to see the human being as a machine, it has also always traditionally posed additional questions with which the physical sciences were not primarily concerned, questions concerning mind and the nature of its connection with the body. In this context, the use of musical principles in understanding Man's physiological, spiritual and psychological nature existed outside the boundaries of music-cosmology, and persisted in England into the eighteenth century, as Kassler has shown.²⁷³ In particular, the Baconic view that health is a harmony and that the body is like a musical instrument or consort of instruments,²⁷⁴ remained a guiding principle in parts of medical practice beyond the seventeenth century.²⁷⁵ Twentieth century medicine has witnessed a conceptual rift between body and mind,²⁷⁶ largely because of an unquestioned, tacit acceptance of a Cartesian-like duality of mind and matter, or mind and body, but also on the strength of its reductionist understanding of the body. This is now slowly changing in some areas. But in the eighteenth century respected medical writers in England frequently puzzled over the connection of mind and body,²⁷⁷ and acknowledged the effect of the mind upon the health of the body, and *vice versa*. The mind-body question provided a medium for the continued speculation on the effects of music upon the human organism, but without the need to endorse the concept of universal or cosmic 'music'. Nevertheless, these physicians were well aware of the Greek and later accounts of the marvellous effects of music, and were fond of quoting them. In addition to the idea that music could affect the vital or animal spirits in the body directly, the mysterious interaction and connection between body and mind, itself allowed a number of English medical writers and practitioners to endorse the medical efficacy of music.²⁷⁸ In this respect it was music's power to affect the passions that was held to be important, since the management of the passions was seen as being one of the physician's most valuable

²⁷³ Kassler, JC, *Inner Music: Hobbes, Hooke and North on Internal Character*, London, 1995.

²⁷⁴ Bacon, F, *The advancement of learning*, 1605, Ed. A Johnston, Oxford, 1986, p. 106; cited in Kassler, *op. cit.*, p. 211.

²⁷⁵ Kassler, *op. cit.*, p. 231.

²⁷⁶ Damasio, A, *Descartes' Error*, New York, 1994, London, 1996, p. 257.

²⁷⁷ These medical writers were not theorists, but invariably practising physicians. Scientific lecturing was based mainly on the work of London entrepreneurs, whereas medical lecturing primarily had a vocational aim. See Porter, R, 'Medical lecturing in Georgian London', *British Journal for the History of Science*, 1995, 28, pp. 91-99.

tools.²⁷⁹ The passions were understood to both exasperate and cause diseases, and the mutual influence between mind and body was considered of the greatest importance, especially in cases that we would now call psychosomatic, or cases of depression or anxiety.²⁸⁰ The English eighteenth-century acceptance of the medicinal efficacy of music, seems to be associated with the theory of vitalism²⁸¹ and on the unanswered question of the connection of mind and body, rather than on some deference to the Wisdom of the ancients. Nonetheless the use of music in eighteenth century medicine noticeably parallels the use of music by Pythagoras', as reported by Iamblichus.²⁸²

What appears to be repercussions of Platonism or neo-Platonism seems to have thrived in the environs of nineteenth and twentieth century theosophy, and new musical cosmologies have been proposed by Blavatsky, Steiner, Mathers, Jung, Gurdjieff, and Ouspensky.²⁸³ Composers of the twentieth century have continued to pay tribute the notion of cosmic music,²⁸⁴ and Jules

²⁷⁸ In particular, Browne, Richard, *Medicina Musica or, a Mechanical Essay on the Effects of Singing, Musick, and Dancing, on Human Bodies....*, London, 1729; Brocklesby, Richard, *Reflections on Ancient and Modern Musick, with the Application to the Cure of Diseases....*, London, 1749.

²⁷⁹ Browne, Richard, *Medicina Musica*, *op. cit.*; Brocklesby, Richard, *Reflections*, *op. cit.*, Ch. 4, p. 45 ff.; Elliot, Sir John Bart, *Elements of the branches of natural philosophy connected with medicine*, London, 1786, Ch. XIV, p. 259, especially p. 260 ff.

²⁸⁰ See, for example, Adair, James Makittrick, *A philosophical and medical sketch of the natural history of the human body and mind. To which is subjoined, an essay on the difficulties of attaining medical knowledge...*, Bath, 1787, p. 40; pp. 94-96; Buchan, William, *Domestic medicine: or, A treatise on the prevention and cure of diseases. 11th ed.*, London, 1790, pp. 60; 111-121; 428; Cogan, Thomas, *A philosophical treatise on the passions*, Bath, 1800, pp. 278-298; Duncan, Andrew, 'Observations respecting the use of music in cases of melancholia', *Heads of lectures on the theory and practice of medicine. 4th ed., corrected*, Edinburgh, 1790, p. 180; Gregory, John, *A Comparative View of the State & Faculties of Man with those of the Animal World*, London, 1765, p. 6.; Gregory, John, *Lectures on the Duties and Qualifications of a Physician*, London, 1772, p. 165; Mead, Richard, *The Medical Works of Richard Mead*, Edinburgh, 1792, ch. XVIII, pp. 425-428.

²⁸¹ Crudely speaking, vitalism held that living organisms were differentiated from inanimate matter by the presence of 'vital' or 'animal spirit', a mysterious 'substance' or 'fluid' that with some kind of connection to 'the soul', was responsible for a range of phenomena in the human organism, including movement and emotion. Much of the thinking relating to this paradigm derives from Descartes. It was opposed by the mechanical philosophers, but Bryan Robinson, in 1732, described the notions of vitalism as 'received opinion'. See Robinson, B, Robinson, Bryan, *A treatise of the animal economy*, Dublin, 1732, p. 84. On vitalism and the notion of vital or animal 'spirit' in the philosophy of organism, see Myers, CS, 'Vitalism: A Brief Historical and Critical Review', *Mind*, Vol.9, 1900, pp. 218-233; 319-331; Sutton, G, 'The Physical and Chemical Path to Vitalism: Xavier Bichat's *Physiological researches on Life and Death*', *Bulletin of the History of Medicine*, Vol.58, Spring 1984, No.1, pp. 53-71; Melzer, SJ, 'Vitalism and Mechanism in Biology and Medicine', *Science*, Vol.XIX, No.470, 1904, pp. 18-22; Haller, JS Jnr, 'The Great Biological Problem: Vitalism, materialism, and the philosophy of organism', *New York State Journal of Medicine*, Vol.86, No.2, February 1986, pp. 81-88.

²⁸² See Clark, G, *Iamblichus: On the Pythagorean Life*, Liverpool, 1989, pp. 48-49; Dillon, J, & Hershbell, J, *Iamblichus on the Pythagorean Way of Life*, Atlanta, Georgia, 1991, p. 89.

²⁸³ Godwin, J, *Harmonies of Heaven and Earth*, London, 1987, p. 167.

²⁸⁴ A limited commentary appears in James, J, *The music of the spheres: music, science, and the natural order of the universe*, London, 1995, pp. 219-220; 225-228.

Combarieu has even equated music with magic, and the composer with the magician, in a quasi-Orphic sense.²⁸⁵ The echoes continue unabated to the present day.²⁸⁶

²⁸⁵ Combarieu, J, *Histoire de la musique des origines au début du Xx^{me} siècle*, Paris, 1913-1930. See Dwight Allen, *Philosophies of Music History*, New York, 1939, 1962, pp. 187-189.

²⁸⁶ For surveys see Godwin, J, *Harmonies of Heaven and Earth*, London, 1987; Godwin, J, *Music, mysticism and magic*, London, 1987; James, J, *The music of the spheres: music, science, and the natural order of the universe*, London, 1995, especially pp. 219-220, & 225-228.

Section 2 – A Contemporary Exposition

Chapter 5 – Subject-orientated knowledge in Plato

Plato provides the first extant account of the Myth of Er, and it is presented as part of Socrates' teaching. There is the important question of how in principle, Pythagoras' or Socrates' knowledge - knowledge that does not purport to be a set of scientific facts - was supposed at the time to have come about in the first instance. Plato himself has something to say about this. Plato speaks of 'The Eternal Being', or 'That which always is and never becomes', which is, according to Plato, 'apprehensible by intelligence with the aid of reasoning, being eternally the same...'²⁸⁷ Plato may have meant this to imply that knowledge of the Eternal Being can be reached, through thought, as a reasoned conclusion. The interpretation of the word 'reason' is seemingly fraught with philosophical problems, but we can say that Plato's statement was not out of keeping with the Platonic dialogues generally, since they usually proceed *as if* conclusions were being reached with the aid of 'reason' as a deductive or connected sequence of thoughts or arguments. But this approach or method of communication is not present at the climax of the *Republic* where the Myth of Er is presented as the ultimate metaphysical explanation for the condition of the world. It cannot be 'reasoned' because it represents knowledge *beyond death*. Elements of the myth are also implied in *Timaeus*, and if Timaeus himself is supposed to have reached his extensive knowledge of the cosmos through such reasoning, Plato does not tell us how. It would be far more consistent with the spirit and presentation of the Myth of Er and of the discourse in *Timaeus*, to assume that Socrates' and Timaeus' knowledge is supposedly the result of a power of 'reason' which yields precognitive knowledge, and not deduced conclusions. Such a power of reason would at its extreme, perhaps be defined as:

²⁸⁷ *Timaeus, Ibid.*, 27-28, p. 40.

[Divine] Intellect personified; Faculty transcending the understanding and providing *a priori* principles, intuition.²⁸⁸

This would be a form of immediate or induced knowledge, as distinct from deduced or observation-based information, or rationally reasoned conclusions.

The spirit of the communication in *Timaeus* is much more one of the didactic transmission of knowledge by induction, than of 'reasoned' argument and verification, as in many of the other Platonic dialogues. Even the dialogue in the *Republic* that occurs prior to the telling of the 'Myth of Er', is plainly presented as Socrates utilising the process of question, argument and conclusion, merely as a tool for the purpose of authoritative didactic communication. In the 'Myth of Er', as in other sections of the *Republic*, - notably the beginning of the seventh book - the spirit is nakedly one of direct revelation, even if not at first-hand. Plato's world-view obviously takes the idea of authoritative subjective knowledge seriously, and recognises it as distinct from, and having a status above, what Plato calls 'opinion', which is concerned only with the unreal 'world of becoming'.

Plato's undercurrent of reverence for Socrates as an authoritative source of genuine wisdom is unmistakable to anyone who is not primarily concerned with the intellectually entertaining distractions of Socratic dialogue. One does not have to rely upon the legend of the Delphi oracle to see that Socrates symbolised the embodiment of wisdom. Socrates ultimately represents the voice of the original philosopher, the genuine 'seeker of wisdom' who is his own authority, yet well able to cite other recognised authority in support of his own teaching. The wisdom he seeks is what Pythagoras, according to Iamblichus, called 'knowledge of the truth which dwells in being'.²⁸⁹ This philosopher has been a disciple himself and perhaps still is, but his authority does not come from his knowledge of anything separate from himself that he has read about or heard about or abstractly thought about. He speaks, as Richard Tarnas has so succinctly put it, 'with an intellectual and moral confidence based on profound self-knowledge, rooted as it were in the depths of his psyche'.²⁹⁰

Where was this knowledge supposed to have come from? Socrates is supposed to have used the dialectic as a means of teaching, and whilst we do not need to dispute that, it is

²⁸⁸ The Concise Oxford Dictionary, 1976 (after Kant).

²⁸⁹ Clark, G, *Iamblichus: On the Pythagorean Life*, Liverpool, 1989, p. 71.

nonetheless misleading. The dialectic without the guidance of the subjective authority behind it, and that is not consciously aimed at the deepening of subjective authority, would be an anathema to the Socratic endeavour. The Socratic dialogue always had the guidance of Socrates' subjective authority behind the shammed ignorance, the 'Socratic irony'. Socratic irony was supposed to be necessary in order for the pupil to discover his own knowledge, rather than trying to acquire a merely mental or intellectual understanding of Socrates' subjective knowledge. Only the process of self-discovery of what is already potentially known, but not previously realised, could contribute to subjective authority, and only then, given that there has been some relevant experience. This is the *modus operandi* of the Socratic dialogues.

The world at large is a constant theatre of conflict and argument, and this is frequently upheld as necessary on the belief that truth, stability, solution or compromise can be synthesised from the conflict of opposites, without the necessity for one force to annihilate the other. Agreements, compromises and a balance of force are indeed often reached where forces conflict, and the new may indeed be born or synthesised out of the old. But as dialectical theory indicates, the new contains the seed of the old – which must grow again into conflicting force. Socrates is not a player in this game, even if he does use the same game-board.

What was the philosophical 'game' Socrates was playing when he chose hemlock in preference to hypocrisy?²⁹¹ The ultimate game for all of us is the total experience of existing as a human being, enmeshed in physical existence, through the reality of experience. Socrates, real or Myth, is a symbol of a man who was not just a thinker, a cogitator. He was an experienced man and the very paradigm of subjective authority. He is supposed to have experienced seventy years of living when the final demonstration of his subjective knowledge was called for. And the final trial of Socrates' philosophy was not a cogitative, intellectual one, tested and thought-out in the philosopher's arm-chair. It was a test in actual experience - that resulted in a cup of poison hemlock that Socrates cheerfully drank - and we who spend our time in great seriousness mentally analysing and discussing it over the philosophy table will never know if Socrates was a fool or not. As he is portrayed, Socrates knew perfectly well that philosophy as the genuine seeking of wisdom is not

²⁹⁰ Tarnas, R, *The Passion of the Western Mind*, London, 1991, p. 36.

²⁹¹ Socrates was condemned to death (for political reasons) on the invented charge of corrupting the young, and although he had opportunity to escape both the charges and imprisonment, accepted being sentenced to death by Hemlock, which he drank in the company of his friends, in a state of equilibrium

about proposition and refutation; it is not about water-tight persuasion or open minded discussion. It is not the endeavour to know *about* anything. The legend has it that in response to the Delphinian oracle's proclamation that Socrates was the wisest man in Greece, Socrates declared that if he was, it was because he alone knew that he knew nothing. The report of the life of Socrates is one version of a more universal symbol that appears in many other stories and myths. Socratic philosophy is the seeking of knowledge not as information about the world but as subjective knowledge of the subject-orientated 'world system' which itself is surely unattainable without self-knowledge, and self-knowledge is surely unrealisable without experience. Socrates' wisdom would not be wisdom unless it had some value beyond the appointment of recognised authority, or the personal success of its holder, and it is precisely that value that Plato portrays in his accounts of the death of Socrates.

The Myth of Er – which provides the context for the idea of *the music of the spheres* - is a myth about life, death and destiny. As Plato portrays through the symbol of Socrates, the contemplation of these things is not separable from the experience and self-knowledge that Plato indicates in Socrates. The *music of the spheres* tradition already embodies an attempt to provide a connection between these things and music on a most profound scale. The scale of the idea is so vast we may feel it can only be tackled as myth. The truth is, even outside this context of such a vast metaphysical cosmology, the tradition invites us even today to acknowledge the subject-orientated perception of the world, and to acknowledge that there is a dimension of music that relates to what is beyond this 'world'. It demands that we recognise there is a dimension of music that relates to the nature of the world and our involvement in it, but is somehow beyond it, and thus probably beyond the emotional feelings and psychology that comes from our enmeshment in the world.

The concern with the connection of music and emotion is associated with enmeshment. Enmeshment in the world means being conditioned by the world. The relation of music to something 'beyond the world' implies a position free of this enmeshment, from which the world and enmeshment can be seen, and this occurs in the Myth of Er in which Er is briefly given this position. Er had to pass through death to reach this, and from that position was visible the whole of

the existence of the world as a cyclic system of 'harmony'. We may not pass through death as Er did, but we certainly pass through experience in life, and we are going to look at the possibility that passing through experience in life can produce a perception that can similarly see the world from a position beyond it, even if not from a position of having passed through death.

The message delivered by Plato through the example of Socrates and his teaching is that the fear of death is transcended through knowledge of death, and whilst Socrates is able to engage in 'reasoned' dialogue about the nature of the soul and its relationship to the body, when it comes to knowledge of death itself, the path of 'reason' disappears,²⁹² but the knowledge does not, as adequately demonstrated in his last hour. Throughout Socrates' teaching he is clearly working 'top down', from knowledge already in place, and using the dialogue of philosophical argument almost as a trick with which to bring the other philosophers up towards him. What all the philosophers call Reason is as much about self control and the *actual* breaking of attachment to pleasure, pain, desire, and eventually, the body, as it is about the contents of the dialogues. This is all part of the agreed training of the philosopher, and what it amounts to is *experience*, and the breaking of attachment to experience or the desire of experience.²⁹³ In the case of Socrates, even though in good health, at his death he continues in a state of cheerful, yet unemotional equilibrium. We could say this is because in one sense *he is already beyond death*. Death of the body, which is part of the 'unreal world of becoming', is for Socrates not a problem – it is in effect irrelevant. Yet the other philosophers cannot contain their weeping – for them, his death is an emotional experience – *they* are emotionally attached to him.²⁹⁴

Socrates the Master, and the implications of music beyond emotion.

Now we may say that emotional experience in music is all part of the same enmeshment in existence from which the true philosopher seeks to escape. The symbolic scenario of death shown in the Myth of Er, which through the Fates does involve *musical* harmony, does not connect the 'music' or harmony itself with emotion. It connects it with something 'higher'. Plato does not show

²⁹² This happens where the account of the Myth of Er takes place in *Republic* 10, and in Socrates' account of death in *Phaedo*, 107d – 108d, Plato, *The Last Days of Socrates*, Tr. H Tredennick and H Tarrant, London, 1954, 1993, pp. 174-175.

²⁹³ For example, *Phaedo* 82e – 84b, Plato, *The Last Days of Socrates*, Tr. H Tredennick and H Tarrant, London, 1954, 1993, pp. 142-143.

²⁹⁴ *Phaedo*, 117c – 118a, Plato, *The Last Days of Socrates*, Tr. H Tredennick and H Tarrant, London, 1954, 1993, pp. 184-185.

us in Socrates any indication that the highest sensibility in the world is *emotional*. When viewed in the context of the life of Socrates and especially the last hours of Socrates, the Myth of Er is not likely to be any indication that the real purpose and value of music in existence is in its *emotional* aspects.

It is remarkable that so much attention has been paid to the isolated relation of music and emotional feeling when it is clear that emotional feeling is not an absolute but is mutable with experience. This happens where we pay more attention to 'emotional meaning' in our lives and thus in music, than to the fact that emotional feeling changes with age and experience. We accept that there are lessons to be learned from experience in coping and dealing practically with the world, and that this prevents us from circulating through the same mistakes too often. But what about the way we relate to the world through the personal and emotional interpretation of it, through the identification with it, and through the emotional and psychological attachment to it and enmeshment in it? Is it not so that experience is more than the accumulation of what we have learnt and remember about how to deal practically with the world? Experience is also experience of our own emotional feeling, and there is surely something amiss about simply accepting this at any time or stage of life just as it is, and then aspiring to greater knowledge of it, and music's relation to it. The grounds on which we ascribe reality and importance to it are self-referencing, they are the existing attachment to, and enmeshment in the emotional feeling itself. We surely cannot know what is beyond this except to the degree to which we are *not* enmeshed, identified and attached. All these things are elements of self, and the freeing from them is in effect a degree of loss of self, which is already recognised as being important in relation to a change of perception associated with 'aesthetic experience' or 'impersonal perception'. The implication in all this is that to the degree to which the person, the self, is removed from the equation, perception is not lost but heightened. This perception is of both the world and music, and the meaning of each changes in relation to it.

The picture we are forming is that as perception is altered through the 'loss of self' as the attachment to and enmeshment in the phenomena of the world, so what is seen as the nature of the world, changes. The implication in Plato is that the external (to the subject) world to which normal sentient intelligence relates, is 'unreal', or as Plato puts it, an 'unreal world of *becoming*'. Reality is as it were, outside the phenomena of it. Plato's *Republic*, the climax of which is the Myth of Er, is the discussion of an 'ideal State', but it is a *symbolic* State whose form or 'structure' corresponds to

the metaphysical 'structure' of men, or of the 'soul', or as we can say, of the self. It is in effect a State consisting of a multiplicity of the selves (souls), a State designed for the best guidance of self with regard for the various kinds of nature of self (soul), and the only candidate suitable for its control is the 'philosopher king' who has a profound knowledge of self, and, as we might now say, sufficient absence of self. The symbol of this 'philosopher king' in Plato, or the closest thing to it, is Socrates. The ultimate form of this self-knowledge, as explicitly depicted in the Myth of Er, and as implied in the life, teachings, and death of Socrates, is a knowledge already beyond death of the self, that perceives the whole cycle of life and death from a position beyond enmeshment in it. The *context* Plato thus gives to the so-called Pythagorean idea of *the music of the spheres* is not at all inconsistent with the Eastern tradition of non-duality in which the Master (the 'philosopher king') has already attained liberation from self and its repetition in the cycle of life and death, in the realisation of the *One* beyond existence.

Chapter 6 - The First Repudiation of Emotion in music – Hanslick

Beyond emotion

It is from the regarding of emotional feeling as a creditable high point of human subjectivity, that music's efficacy in this respect is seen as correspondingly important. Such a position is one that really can only be maintained from a position of the need of experience. The pursuing of the world and the emotional experience it offers, the willingness to become enmeshed in it, the emotional attaching to it, the continual personal and emotional interpretation of it in relation to the emotional self, - all these things are undeniably what the individual engages in for many years or maybe for a whole lifetime. If most of the population of the world is still attached to, and identified with emotional condition, and every member still engages in this as a perceived self reality, then we might expect that music's emotional effects should be widely considered important. But if we have experienced a connection between music and emotional self, then it is also conceivable that there is a connection between music and what is beyond the experiences of the emotional self. Also, we might see that there is something pervading the world that relates to our own nature beyond the emotional self. Rather than seeing music as an emotionally relevant representation or manifestation of emotional nature in the world and our selves, we might see it as connecting with some higher nature in the world, or what lies beyond emotional self.

It may then follow that it is not emotional form, or emotional 'expression' that music is really about. Hanslick is already well known for the rejection of the alleged importance of the connection of music and emotion. However, he argued the aesthetic form of music is something that can be understood in an object-orientated way, and investigated by science. Too much importance can be placed on this, and it is from his assertion that the beauty in music is in the note objects, and that this should be investigated by science, that he is understood primarily as a formalist. It should be remembered that this was said in an age when science was still regarded as something that would eventually, through empirical observation, reach a complete understanding of the 'Clockwork Universe'. His assertions regarding science were really just an expression of his time, and tend to obscure his greater and more important perceptiveness about emotion, feeling, and the 'spiritual' in music. However, despite this perceptiveness, what Hanslick did not say about

his implied distinction between 'emotional feeling' and 'feeling' of another kind, is how this distinction relates to the individual's experience in the world as a whole, how it relates to the nature of the world, and where it comes from in the first instance.

The insights of Hanslick

Hanslick's classic work *On the Musically Beautiful*²⁹⁵ is perhaps best known as a repudiation of the idea that the aesthetic value of music lies in its connection with feeling. Hanslick argued that musical beauty is a property of the purely musical art 'object' constructed of tones, and that the enquiry of musical aesthetics should be a scientific, or at least a quasi-scientific investigation of this beauty. In Hanslick's view, the methodology of musical aesthetics ought to be something akin to the investigations of chemistry or physiology.

Part of the dynamic behind Hanslick's refutation of emotion was a reaction against the music of Wagner, whose philosophy Hanslick saw as being diametrically opposed to his own. Wagner's own metaphysical beliefs about music were inspired by Schopenhauer's philosophy.²⁹⁶

Hanslick presented two main theses which are:²⁹⁷

The defining purpose of music is not to represent (or express or arouse) feelings.²⁹⁸

The beauty of a piece of music is specifically musical, i.e., is inherent in the tonal relationships without reference to extraneous, extramusical context.²⁹⁹ It is self-contained and consists simply and solely of tones and their artistic combination.³⁰⁰

These theses are a reaction against the use of music as an opiate, and the mistaken notion that its ability to intoxicate the feelings is some measure of its aesthetic quality. For Hanslick, the

²⁹⁵ (*Vom Musikalisch-Schönen*, Leipzig, 1854); Hanslick, E, *On the Musically Beautiful*, Tr. Geoffrey Payzant, Indianapolis, 1986.

²⁹⁶ Budd, M, *Music and the Emotions*, London, 1985, p. 76.

²⁹⁷ See Geoffrey Payzant's essay, Hanslick, *op. cit.* pp. 95-96.

²⁹⁸ Payzant, in Hanslick, *op. cit.*, p. 95.

²⁹⁹ Hanslick, *op. cit.*, p. xxiii.

³⁰⁰ *Ibid.*, p. 28. See also pp. 72-73, and Payzant, *Ibid.*, p. 95,96, & p.xxiii.

aesthetic quality of music is an objective aesthetic property of the music itself,³⁰¹ and it does *not* represent emotion or feeling, or anything extraneous to the music itself. Tones are the raw materials out of which music is made,³⁰² and Hanslick saw the *purely musical content* of music, as consisting of the 'artistic combination' of tones. It is this musical content, that is not only acoustically pleasing, but in some way actually spiritual.³⁰³ The content of music embodies in its 'concrete tonal structures',³⁰⁴ 'the creation of the artistic spirit, with which the contemplating spirit unites in complete understanding',³⁰⁵ This 'ideal content' and the 'specifically musical part'³⁰⁶ of music to which Hanslick refers, he says 'is a not inconsiderable spark of the divine flame, like the beauty of any other art'.³⁰⁷ It 'derives from its particular tonal structure as the spontaneous creation of mind out of material compatible with mind [i.e. the tones]'.³⁰⁸ We should note here Hanslick's emphasis upon *mind*, and its association with *the spirit* and metaphysical notions such as *the divine flame*.

Conversely, the 'feeling produced' by music happens mechanistically. It can be called neither its content nor form, but 'actual effect'.³⁰⁹ This effect largely 'conforms to physiological laws',³¹⁰ and the most important factor determining the 'intensity and immediacy with which music is capable of arousing feelings, is its powerful effect upon the nervous system'.³¹¹ The link between effects on the nervous system and feelings is unknown, but it has little or nothing to do with the 'purely aesthetical side of music'.³¹²

The effects of music upon the feelings was held by Hanslick to be dependent upon the merely 'elemental'³¹³ qualities of music, such as 'sound and motion', and 'sensuous rhythm',³¹⁴ which Hanslick called its 'material moment'.³¹⁵ The effect of music's 'material moment' can nevertheless be a powerful one because nature has endowed it with 'that unfathomable

³⁰¹ *Ibid.* pp. 1-2.

³⁰² *Ibid.*, pp. 68-72; also 28, 31, 35, 45-48, 83, 97, 98.

³⁰³ *Ibid.*, p. 83. Hanslick also says, *Ibid.*, p. 42, in connection with a refutation of the mathematical structure of composition, that 'What makes a piece of music a work of art and raises it above the level of physical experiment is something spontaneous, spiritual, and therefore incalculable'.

³⁰⁴ *Ibid.*, p. 60

³⁰⁵ *Ibid.*

³⁰⁶ *Ibid.*

³⁰⁷ *Ibid.*, p. 83.

³⁰⁸ *Ibid.*

³⁰⁹ *Ibid.*, p. 60.

³¹⁰ *Ibid.*, see also pp. 50, 53-57, 58.

³¹¹ *Ibid.*, p. 51, 57.

³¹² *Ibid.*, p. 57.

³¹³ *Ibid.*, pp. 58-61.

³¹⁴ *Ibid.*, p. 61.

³¹⁵ *Ibid.*, pp. 58.

physiological affinity',³¹⁶ by which it is able to affect the nervous system. Note now the emphasis upon an essentially 'mechanical' cause and effect pertaining to the basic physical phenomenon of music, and the *matter* of the body, as distinct from the mind. It is no accident that Hanslick calls the effects of music upon the feelings its '*material moment*'. Hanslick calls this process of cause and effect *pathological* rather than aesthetic. Conversely the 'artistic moment' associated with the beautiful or spiritual in music, is above this basic *material* and *physiological* level, for it 'comes from mind and addresses itself to mind'.³¹⁷

Hanslick refutes the importance of the traditional emphasis on the moral effects of music, and asserts that the effects of music upon the feelings is inversely correspondent to music's true aesthetical component.³¹⁸ Hanslick states; 'As is well known, music exercises the strongest effects upon savages', and 'the moral influence of tones increases with coarseness of mind and character'.³¹⁹ As for the Greek tradition of the 'marvellous effects of music',³²⁰ he says: 'There can be no doubt at all that, for the ancients, music had a much more immediate effect than it has now, since humankind only just in its primitive stage of development is much closer to and more at the mercy of the elemental than later, when consciousness and self-determination come into their own'.³²¹ For Hanslick, susceptibility to the elemental in music is a sign that the person is less developed,³²² lacking in musical training,³²³ or 'not in control of themselves'.³²⁴ In short, it is an intellectual and spiritual shortcoming.

The repeated underlying assertion behind Hanslick's position is that the things of the mind are above the emotions and the feelings, and that the former should have dominion over the latter.³²⁵ The idea that susceptibility to emotional influence is a mark of unevolution was overtly stated by Hanslick, and his concomitant thesis is that aesthetic appreciation requires the command of intelligent and educated judgement. The position he adopted is of course nothing new, - it is just a facet of the old religious and humanist moral assertions so often repeated, not least in the

³¹⁶ *Ibid.*

³¹⁷ *Ibid.*

³¹⁸ *Ibid.*

³¹⁹ *Ibid.*, pp. 61.

³²⁰ This phrase is a chapter title in Godwin, J, *Harmonies of Heaven and Earth*, London, 1987, p. 11.

³²¹ *Ibid.*, pp. 62.

³²² This is general inference of Hanslick, *Ibid.*, p. 61.

³²³ *Ibid.*, p. 65.

³²⁴ *Ibid.*, p. 61.

eighteenth and early nineteenth centuries, that *reason* or *the intellect* must rule over the passions, and not *vice-versa*. This belief was strongly represented in the didactic morality of eighteenth-century England, despite the fact that David Hume made assertions to the contrary, and despite the special status that *sentiment* came to enjoy. There is a covert preoccupation with the superiority of *the intellect* over *the passions* in Hanslick's work, a preoccupation that impedes the communication of his more original thoughts, and on a number of occasions causes him to subscribe to the very common practice of confusing the intellectual with the spiritual.

The alleged duality of the 'power of reason' and *the passions* is something that has been repeated throughout history with monotonous regularity, and must be responsible in many cases other than Hanslick's, for the distracting of attention away from the importance of feeling as a factor in human intelligence.

Following Hanslick's outright rejection of 'feeling', it may seem strange that 'feeling' is not in the final event actually banished by Hanslick from the *aesthetic perception* of the 'artistic moment' of music. In fact, in response to criticism, Hanslick specifically denied mounting a polemic against all feeling.³²⁶ In the Foreword to the eighth edition of his book he states 'I share completely the view that the ultimate worth of the beautiful is always based on the immediate manifestness of feeling'.³²⁷ But its role in purely aesthetic perception is limited, for aesthetic perception requires not just the ability to feel, but *imagination* through *contemplation*, that is, 'contemplating with active understanding, i.e., conceiving and judging'.³²⁸ Hanslick ambiguously informs us that *imagination* lies halfway between feeling and understanding,³²⁹ but as we shall see, this description is an attempt to legitimise what actually amounts to a simultaneous rejection and acceptance of what he calls 'feeling' as an important part of the aesthetic perception of music.

We can now refine this synopsis of Hanslick's ideas further, but before doing so I should mention Hanslick's argument that music cannot represent *definite* feelings or emotions. Hanslick constructs an argument to this effect in order to support his initial assertion that the aesthetic quality of music has nothing to do with the feelings. I address this only because the question of

³²⁵ As already illustrated Hanslick treats the 'spiritual' as being generally coextensive with what he calls the 'mind'. Thus, 'things of the mind' [my phrase] not only includes mental skills, but also 'the promptings of spirit' and moral will. See in particular, p. 61 of Hanslick *Ibid*.

³²⁶ *Ibid.*, p. xxii.

³²⁷ *Ibid.*, p. xxii; also see note p. 105.

³²⁸ *Ibid.*, p. 4; see also pp. 5, 30, 31, 41, 45, 64.

³²⁹ *Ibid.*, p. 4.

whether or not music can represent or arouse *specific* feelings or emotions has usurped a position of importance in aesthetics. About it I have only this to say: it is a red herring that at this stage distracts from more important issues. Hanslick's attempt, like all attempts to discover whether music can represent or arouse *definite* feelings or emotions, is necessarily dependent first of all upon the attempt to understand emotion, feeling, thought, and the relation between them. It is a subjective knowledge, or *praecognitum* of these, and their relationship, that is *prerequisite* to knowledge of the effects of music on them or in relation to them. One cannot work backwards from music to this. Hanslick does not address this area of knowledge, so his argument is inevitably superficial. Similarly, we should not be postulating mentally calculated *theories* about this aspect of our experience, when our theories amount to a substitute for a genuinely deep subjective knowledge or *praecognitum* of our own emotion, feeling, and thought.

Here then, is the refined synopsis of Hanslick's position.

As the sculptor might use bronze, or the painter oils and canvass, so the composer uses tones. The artistic arrangement of the tones is created by the genius of the artist, who in a spiritual activity pertaining to mind, creates the beautiful in the music. This beauty is not a representation of anything, but is beautiful in its own right, and in particular is not representative of human emotion. It is apprehensible by 'pure contemplation' on the part of the auditor. This is not the same as being emotionally moved by the music in the pathological way, - that is something that arises largely from the effects of the more elementary qualities of music upon the nervous system. However, pure contemplation does not necessarily give rise only to an exclusively abstract mental appreciation to which feeling in every sense of the word is entirely alien. There is an important difference between the *feeling* of the enjoyment of aesthetic content and the 'undergoing' of *emotion*. The nature of Hanslick's 'aesthetic experience' is highlighted in the following critical passages:

....pathological ways of being affected by a piece of music are opposed to the deliberate pure contemplation of it. This contemplative hearing is the only artistic, true form; the raw emotion of savages and the gushing of the music enthusiast can be lumped together in a single category contrary to it. To the beautiful corresponds an enjoying, not an undergoing, as

the term *aesthetic enjoyment* neatly signifies. Of course the enthusiasts consider it a heresy against the omnipotence of music if a person denies the association with the revolutions and riots of the heart which they encounter in every piece of music and in which they sincerely participate. Obviously that person is "cold", "unfeeling", "cerebral". Nevertheless. It is a splendid and significant thing to follow the creative spirit as it magically opens up before us a new world of elements....This is not a feigned emotion lacerating us with compassion. Joyfully, in unemotional yet heartfelt pleasure, we behold the artwork passing before us and realise better what Schelling so felicitously called "the sublime indifference of the beautiful." Thus to take pleasure in one's own mental alertness is the worthiest, the wholesomest, and not the easiest manner of listening to music.³³⁰

....The person who wallows in feeling is in most instances untrained in the aesthetical comprehension of the musically beautiful. The layman is most likely to "feel" when he listens to music; the trained artist is least likely to do so.³³¹

These passages are a general reiteration of Hanslick's arguments, but included within them is a concise encapsulation of his most important yet unsung contribution to musical aesthetics. I focus upon this particular instance for brevity's sake, as it conveniently reflects the essence of Hanslick's perception, the true distillation of his whole work. Even if here it is nothing but a fortuitous quirk of translation, or turn of nineteenth-century Germanic phrase, the words as they appear conveniently epitomise Hanslick's repeated, underlying observation, which is not dependent upon its expression in this one instance.

³³⁰ *Ibid.*, p. 64.

³³¹ *Ibid.*, p. 65.

Hanslick is describing an aesthetic experience, (which in a brief moment of unbridled *formalism* he is about to associate with the pleasure of one's own 'mental alertness', of all things) and he says that this happens 'Joyfully, in unemotional yet heartfelt pleasure'. We shall ignore the alleged context for a moment. Note that Hanslick's *Joy* and *pleasure* is *heartfelt* yet *unemotional*. Joy, the true pleasure of beholding aesthetic beauty, is *not* an emotional condition. But it is heartfelt.

Hanslick, not unusually, uses the terms 'feeling' and 'emotion' more or less interchangeably throughout his work. Generally, he does not aspire to any deeper knowledge of the nature of emotion than the common ability to merely refer to it in a more or less ambiguous way. The possible exception is when he asserts that only in conjunction with 'ideas and judgements' can feeling become specific.³³² Otherwise, Hanslick's description of the nature of emotion is mediocre and unenlightening.

But Hanslick has recognised, even if indirectly, something very important. His thesis could be described as asserting that not everything we feel, is *feelings*. We might do better to say that *all that can be felt is not necessarily emotion*. Of course, everything here depends on what is meant by that word 'emotion', and what is meant by the word 'feeling', - and that is the whole point. In other words, Hanslick presents his apparently paradoxical thesis without realising its true significance: that the lumping together of the different nouns 'feeling', 'emotion', 'joy', 'anger' etc. as if they were all *generically* the same thing differing only in *specification* is a primary error in the study of aesthetics.

What we *specify* with these words, what they mean, depends upon our understanding of our own inner experiences. But it also depends upon the efficacy of our language in communicating that understanding. What if the statement *all that can be felt is not necessarily emotion* is not pure nonsense? It implies that although the meaning of the nouns 'feeling' and 'emotion' is strictly speaking a matter of definition, we are able to contextually use these nouns, undefined, in a way that communicates something that we may recognise from experience. If we allow that *whatever we feel* may logically be called a *feeling*, then we can say Hanslick's central insight is about the difference between *feeling* and *emotion*, even before we define *emotion*. We could equally well say, as Hanslick effectively did, that in listening to music "there is *feeling*, but then again, there is

also *feeling*". We have no language structure or vocabulary to fully support what we are saying, but we use what language we have, in the attempt to communicate something we may perceive. Hanslick's discourse betrays that he perceived a fundamental difference between at least two kinds of felt experiences when listening to music. One is a base reaction, the other is 'spiritual'.

As we have already seen, Hanslick attached great importance to the principle that things of the mind are above the activities of the emotions and feelings, and hence that the intellectually skilled or 'trained' appreciation of music is above the 'feeling' of it. His underlying preoccupation with this principle simply eclipsed the opportunity to fully acknowledge that he had recognised a *generic* difference between what is 'felt' in the aesthetic perception of the beautiful, and what is 'felt' in 'emotional' experience.

Thus, Hanslick's motive was not to deny the connection of emotional experience with music, but to reject it as the basis of music's aesthetic value. In order to maintain consistency with this aim where he had no deeper knowledge or language to describe the nature of emotion, feeling, sensation, thought, and their relationship, he had little choice but to segregate anything *felt* in the *aesthetic* appreciation of music, from the collective whole of all that is felt, by asserting that it is *not* a feeling, but either cerebral activity, or as Hanslick had to compromise, halfway between understanding and feeling. We might well expect Hanslick's position to lead him into adopting double standards in the use of the word 'feeling', and this is precisely what he does.

The general association between spiritual creativity, what is *felt*, and music, features strongly in Hanslick's thought.³³³ Consider the following passages:

Take first the composer. During the creative activity, an
exaltation will fill him such as can scarcely be thought
superfluous for the release of the beautiful from the depths
of the imagination...³³⁴

Without spiritual ardour, nothing great or beautiful has ever
been accomplished in this life...³³⁵

³³² *Ibid.*, p. 9.

³³³ *Ibid.*, pp. 45-50.

³³⁴ *Ibid.*, p. 45.

³³⁵ *Ibid.*, p. 46.

An inner singing, not a mere inner feeling, induces the musically gifted person to construct a musical artwork.³³⁶

We often see the listener deeply stirred by a piece of music, moved to joy or melancholy, transported in his innermost being....the existence of these effects is undeniable, actual and genuine, often reaching the greatest intensity.³³⁷

As we have said, the effects *upon the listener* outlined in the last passage above are attributed by Hanslick mostly to the 'intensive influence of music upon the nervous system',³³⁸ the nerves themselves being 'obscure organs of the imperceptible telegraph service between body and soul'.³³⁹ However, this physiological explanation cannot be applied to the musical creation process in the composer. In this case, Hanslick speaks of the 'exaltation' necessary to 'release the beautiful from the depths of the imagination', and of the 'spiritual ardour' and 'inner singing' necessary to the creation process. In the case of performance, 'the emotionally cathartic and stimulating aspect of music is situated in the reproductive act, which coaxes the electric spark out of its obscure secret place and flashes it across to the listener'.³⁴⁰ The performer may 'fathom and reveal the spirit of the composer',³⁴¹ but 'in the instant of re-creation' this 'assimilation' is the work of 'the performer's spirit',³⁴² so there is no direct causal connection between the feelings of the composer and those of the listener.

Thus, Hanslick makes allowances for laudable metaphysical processes which are very much associated with *feeling*, in the acts of composing and performing, but still the main mechanism by which the listener is moved, Hanslick insists, is *merely* physiological.³⁴³ How is all this to be resolved, or are we to believe that the highest value of music is not in genuinely *feeling* anything, or that anything that is *felt* in connection with the aesthetic content or spiritual aspects of music is merely a product of the listeners mental alertness?

³³⁶ *Ibid.*, p. 47.

³³⁷ *Ibid.*, p. 49.

³³⁸ *Ibid.*, p. 51.

³³⁹ *Ibid.*

³⁴⁰ *Ibid.*, p. 49.

³⁴¹ *Ibid.*

³⁴² *Ibid.*

³⁴³ *Ibid.*, p. 45-57, treatment of the listener begins on p. 49.

Surely this is not what we are to believe, and Hanslick's discourse as a whole does not support this. Somewhere along the line Hanslick must be using double standards in his assessment of what 'feeling' is. This becomes glaringly obvious when he presents one clear synopsis, stage by stage, of the scenario he envisaged. A concise presentation of the synopsis is as follows:

1. All musical elements have 'mysterious bonds and affinities among themselves' which regulate rhythm, melody and harmony, and are *determined by natural laws*. These 'bonds and affinities' determine what are perceived as good musical qualities. Where composition does not comply to them, the music is absurd or ugly.³⁴⁴
2. The reason we require the obedience of music to these, is because they also 'reside instinctively in every cultivated ear'. This enables us to perceive the bonds and affinities in music without the need of any further conceptual standard of judgement.³⁴⁵
3. The bonds and affinities constitute a 'negative, intrinsic rationality in the tonal system by natural law'.³⁴⁶
4. The ability of tones to contain a beautiful musical content, is grounded in the above rationality.³⁴⁷
5. Tones are not like 'crude, ponderous stone', but are 'subtler and more ideal than the material of any other art, and 'readily absorb every idea of the composer'.³⁴⁸
6. Musical beauty is based upon the relationship of tonal connections.³⁴⁹

³⁴⁴ *Ibid.*, p. 31.

³⁴⁵ *Ibid.*

³⁴⁶ *Ibid.*

³⁴⁷ *Ibid.*

7. The composer's art is not in making these relationships mechanical, 'but by spontaneous activity of the imagination, the spiritual energy and distinctiveness of each composer's imagination make their mark upon the product as character'.³⁵⁰

8. 'Accordingly, as the creation of a thinking and feeling mind, a musical composition has in high degree the capability to be itself full of ideality and feeling. This ideal content we demand of every musical artwork. It is to be found only in the tone-structure itself, however, and not in any other aspect of the work'.³⁵¹

This 'feeling' which is associated with the 'ideal content' and the tone structure, and which 'we demand of every musical artwork', is clearly not the 'feeling' and 'feelings' that Hanslick sets out to reject, and which he denies can be embodied in the tone structure. After this synopsis Hanslick immediately goes on to reiterate that a composer intends to portray a particular melody, not a specific feeling.³⁵² Not only does Hanslick deny that it is possible to portray specific feelings in music,³⁵³ he also considers that we are 'even worse off' with the theory that music can represent unspecific feeling,³⁵⁴ dismissing it as a contradiction in terms,³⁵⁵ and making a cynical attack upon those who respond to music with unspecific feeling.³⁵⁶ So are we confronted with a paradox? No. We are confronted with Hanslick's confused use of the noun 'feeling', and an insufficient depth of knowledge, or *praecognitum*, of what we call 'feeling', 'thought', 'emotion', and their relationship. Effectively, Hanslick tried to propose aesthetic principles from a hotchpotch of motives, and was unable to give proper birth to his genuine insight concerning the difference between 'feeling'

³⁴⁸ *Ibid.*

³⁴⁹ *Ibid.*

³⁵⁰ *Ibid.*

³⁵¹ *Ibid.*

³⁵² *Ibid.*, p. 32.

³⁵³ *Ibid.*, p. 9.

³⁵⁴ *Ibid.*, p. 21.

³⁵⁵ *Ibid.*, p. 20.

³⁵⁶ *Ibid.*, pp. 58, 59.

associated with the aesthetic or ideal content of music, and the 'feeling' or 'emotional' experience associated with what he calls a 'pathological' response to the elemental properties of music.

Does the alleged difference between these two kinds of 'feeling' evaporate if Hanslick's theory of physiological cause and effect through the nervous system, is falsified? If there is no physiological causation then how can we say the response is pathological, and hence where is the essential difference between response to aesthetic content and response to elemental properties? The difference does not evaporate. The assertion that we should distinguish between aesthetic and what Hanslick calls *pathological* response, does not actually demand that Hanslick's theory of physiological effects upon the nervous system be correct. All that is necessary is that there are elemental properties of music that are capable of efficaciously producing effects upon the human subject, in such a way that without knowing better, the theory of physiological effects would be a reasonable guess as to how those effects come about.

Hanslick's theory of physiological cause and effect, even if it were proved to be correct, was, after all, only his hypothesis, partially corroborated by Helmholtz's *On the Sensations of Tone*.³⁵⁷ The theory conveniently supported Hanslick's essential observations about music, but those observations were not actually dependent upon the correctness of the theory. Like many scientific paradigms and hypotheses, it served to explain an observation in the absence of any deeper understanding. The 'observation' in this case however, was not a scientific one. It was Hanslick's awareness that there are base (elemental) properties of music which seem to have pathological-like effects.

Hanslick held that the study of 'aesthetics' should recognise only those effects of music which are a 'manifestation of the human spirit'. These effects are created in pure contemplation as a 'particular construction' of music's elemental factors.³⁵⁸ The elemental factors alone are a *cause* of effects in the listener, but from an *aesthetical* point of view, says Hanslick, music must be comprehended more as an *effect* than a cause.³⁵⁹ This is the essence of the difference between the pathological and the aesthetic, independent of the assertion of a physiological mechanism. The

³⁵⁷ *Ibid.*, p. 54. For a translation of Helmholtz's *Lehre von den Tonempfindungen* (2nd Ed.) 1885, see Helmholtz, HLF, *On the Sensations of Tone*, Tr. AJ Ellis, New York, 1954.

³⁵⁸ Hanslick, *op. cit.*, p. 66.

³⁵⁹ *Ibid.*

elemental factors can be judiciously and creatively used to create effects which according to Hanslick are spiritual in origin, but these effects are distinct from the alleged *affective force* of the elemental properties. The spiritual or aesthetic effect is distinct from the sum of its elemental parts.

The *essential* idea that Hanslick communicated is that music is made of an artistic medium with elemental properties that in themselves have a pathological-like ability to arouse feeling in the listener. This basic ability of the medium is not the art. The *art* is in the use of the medium in a spiritual, creative activity. Over-exploitation of the elemental properties reduces the artwork to a display of its elemental properties, and obscures the 'manifestation of the human spirit', in the music. What is perceived to be the aesthetic content of the music by the listener is this 'manifestation of the human spirit'. This is very simple, but very important. *Why* the elemental properties have a pathological-like effect is an important question to which Hanslick merely postulated his pseudo-scientific answer.

If it is possible to recognise both elemental 'causes' and aesthetic 'effects' of music, as Hanslick describes them, then we can do so independently of any postulations about *how* music affects the listener. This recognition would be in the first instance, subjective, or a part of our own subjective knowledge. Hanslick had not scientifically ascertained the bases of his observations - if he was sincere he was speaking according to the best of his subjective knowledge, but attempting to validate it by giving it a 'scientific' context.

The idea that *all that is felt is not necessarily emotional experience* may seem difficult to comprehend conceptually, or as a mentally understood thing, given the whole baggage of terms that are usually thrown unquestioningly under the same generic heading 'emotion', or it may seem like nothing more than a word-game. But like feeling and emotion itself, it is no game from which we can simply walk away. We have to face the fact that there is no absolute formality of definitions to fall back on here, simply because there is insufficient subjective knowledge, or no language structure to reflect that subjective knowledge or *praecognitum* of our inner psychological world - *the reality of experience* - to which the terms like 'feeling', 'emotion', or 'thought' apply. Hanslick entangles something called 'feeling' with something *else* he also calls 'feeling', and entangles both with something called 'emotion'. He is not alone. Modern aesthetics is just as confused. Even the Oxford English Dictionary makes no real distinctions other than to oppose 'feeling' to 'reason'. But distinctions must be made. Those distinctions cannot be made by using language as a tool of

analysis. They can only be drawn from actual first-hand knowledge of the inner world of human feeling, emotion and experience. The ability to distinguish must arise not from theory but from the *praecognitum* of experience itself.

The mere suggestion that there *is* a distinction of the kind Hanslick implied, can be subjectively tested for truth only against an individual's reservoir of direct knowledge-from-experience. Yet this testing is not a pre-ordained affair in which everyone can immediately participate simply by virtue of being an experiencing, emotional, feeling human being. A reservoir of experience is not necessarily a reservoir of knowledge. The experience of having existed as a being with emotion and feeling (as distinct from that thing called experience which is merely the acquired skill of surviving and protecting one's position in the world) is a potential resource, that may or may not provide the necessary conscious knowledge of the inner world, or *reality of experience*.

We are not dealing here with an 'objective' physical reality that can be represented by a nexus of abstract concepts, but the subjective inner psychical world, - a metaphysical world. It is not *theoretical* metaphysics that is required for the subjective recognition that there may be a difference between these aspects of musical experience, but subjective knowledge.

If we see through the tendency to 'intellectualism' that impeded Hanslick and confused his communication, we are left with a valuable distillation from his work: that what can be *felt* when listening to music ranges from the very basic to the very fine; that the basic is *like* a pathological³⁶⁰ affection, and is associated with base qualities of music; that the fine is associated with finer 'aesthetic' qualities in the music, which in turn are associated with a finer human receptivity, and a finer artistic or spiritual creativity and perceptive power. It does not follow from this that music's basic power of 'pathological-like' effect is reprehensible. What we must recognise is that we have within us a spectrum of possible experience. Not only is the spectrum connected in an integral whole, as spectrums are, but there may be a dynamic by which our experience in one part of the spectrum, may lead to a new sensitivity in the spectrum at another, higher, or finer level.

³⁶⁰ This word appears frequently in Hanslick, *op. cit.*, and pp. 58-67 is a chapter entitled 'Musical perception: Aesthetic versus pathological'.

Chapter 7 –‘Macrocosm-microcosm’ relationship in physics

‘The greatest advances in physics will only make the need for a system of metaphysics felt more and more, since the corrected, extended, and more thorough knowledge of nature is the very knowledge that always undermines and finally overthrows the metaphysical assumptions that till then have prevailed. On the other hand, such knowledge presents the problem of metaphysics itself more distinctly, correctly, and completely, and separates it more clearly from all that is merely physical. In addition the more perfectly and accurately known intrinsic essence of individual things demands more pressing the explanation of the whole and the universal, and this whole only presents itself as the more puzzling and mysterious, the more accurately, thoroughly, and completely it is known empirically.’

Arthur Schopenhauer³⁶¹

³⁶¹ Schopenhauer, A, *The world as will and representation*, Tr. EFJ Payne, New York, 1966, Vol. 2, pp. 177-178.

The macrocosm-microcosm relationship is essentially the relationship between 'conscious' humanity and the universe, and the relationship of the parts of the universe with the whole. The question of these relationships surfaces in modern science, and in particular as a result of quantum theory and quantum phenomena.

Whilst I make here my own comments on the overall *situation* of quantum theory, the basic critical assertions here about what quantum theory *means*, that is, what it *implies* about the nature of the world, or what has been referred to as 'the nature of reality', *are not my assertions*. They are the assertions of well recognised writers on the subject, and in particular of the specific world-leading physicists whom I cite *verbatim*.

The received 'interpretation' of quantum theory is known as the Copenhagen Interpretation, after Niels Bohr's physics institute in Denmark which he founded in the 1920's.³⁶³ As John Gribbin describes in *Schrödinger's Kittens*, according to this interpretation 'an entity such as an electron is neither a wave nor a particle, but something different, something we cannot describe in everyday language. But it will show us either a particle face or a wave face, depending on which measurements we choose to carry out on it....Indeed, it may have other properties as well, that we are not clever enough to measure at all, and know nothing about.'³⁶⁴ Furthermore, according to the Copenhagen Interpretation, the electron as a wave is not a wave of *something*, as it

³⁶² I use the terms quantum theory and quantum mechanics interchangeably, as does Gribbin, J, *Schrödinger's Kittens and the search for reality*, London, 1995. There is now in addition to the specialist body of material on this subject, many books written for the general readership of those interested in the sciences. The following is a selection closely consulted and from which material has been drawn:

Davies, PCW and Brown, JR (Eds.), *The Ghost in the Atom*, Cambridge, 1986

This is largely a transcript of a BBC Radio 3 documentary of the same title and is a good introduction to the subject.

Gribbin, *op. cit.*

This is a more detailed up-to-date account for general readership.

Penrose, Roger, *The Emperor's New Mind*, Oxford, 1989

Penrose, Roger, *Shadows of the Mind*, Oxford, 1994

The specialist introduction: Greenhow, RC, *Introductory quantum mechanics*, Bristol, 1990, includes programmes on floppy disc for simulating experimental results on a pc, which can be very illuminating, particularly in respect of the 'two-slit experiment' documented at the beginning of both Davies & Brown and Gribbin.

³⁶³ Davies & Brown, *op. cit.*, p. 11.

were, or a wave *in* some medium, but is an abstract wave of mathematical probability, - the probability of actually finding the particle at a particular location 'in space'.³⁶⁵

As Gribbin puts it: 'This interpretation of quantum theory is telling us that entities such as electrons are only real in so far as they are observed - that the measuring apparatus is, in some sense, 'more real' than the photons and electrons and all the rest....In other words, the atoms of which everything in the classical [macro-scale 'everyday'] world is made are somehow less real than the things atoms are made into!'³⁶⁶

A further profound consequence of quantum theory is the notion of 'quantum entanglement', or 'non-locality'. This means that particles which are well separated in space, or in principle even light years apart, can be intrinsically 'connected'. They may be at two distant 'locations' in space, but they can behave 'non-locally', as if they were not separate at all. If two particles are 'entangled', the attributes of one particle can depend upon which attributes a scientist chooses (even just on a whim) to measure on the other particle, even if it is well separated in space from the first particle. In principle, the 'fate' of one particle is dependent upon observations carried out on the other, even if it is light years away.³⁶⁷ This is a verifiable consequence of quantum theory and yet it is difficult to see how one particle could 'know' about the other remote particle unless there was some form of *simultaneous*, i.e. faster than light signalling between them. Yet faster-than-light signalling is not possible, according to Einstein's *theory of relativity*.

The objectively physical, spatially extended universe consisting of independent separate parts, is composed, it seems, of particles that are not necessarily independent and separable, even when spatially separated. Also these particles are not 'physically objective', independent of their observation. The universe, it has previously been assumed in science, is *local* and *real*. *Local* means a local part of the universe cannot be 'in contact with' a remote part, except through the transmission of information between the parts, which according to the Theory of Relativity cannot take place faster than the velocity of light. *Real* refers to the nature of the universe - it means that an observer of the universe is not a necessary part of the universe. Experimental testing of quantum theory seems to have shown that the universe is not 'local and real' *even if quantum mechanics is*

³⁶⁴ Gribbin, *op. cit.*, p. 16.

³⁶⁵ *Ibid.*, p. 10.

³⁶⁶ *Ibid.*, p. 15.

³⁶⁷ *Ibid.*, pp. 23-30.

completely wrong.³⁶⁸ Relativity theory, which is also a successful theory in its own right, shows that no signal can travel faster than light. So Gribbin describes the situation as one in which:

If you want to believe there is a real world out there, you cannot do without non-locality; if you want to believe that no form of communication takes place faster than the speed of light, you *cannot* have a real world, independent of the observer.³⁶⁹

There is no universal agreement about what quantum theory 'means' for our conception of 'reality', or how science should proceed in order to move beyond the current paradoxes and puzzles, or if indeed it needs to.³⁷⁰ Inevitably, some scientists understate the problems quantum theory raises concerning the 'nature of reality', or maintain that there is no real doubt over how quantum theory should be interpreted.³⁷¹ The truth is, that the scientific community is fraught with controversy and disagreement within itself, as Brown's book *The Ghost in the Atom* demonstrates. It is also manifestly clear from the general body of material pertaining to the subject, which begins early in the first half of the 20th century, that quantum mechanics consistently denies the so-called 'common-sense' notion that the universe is *real* (as defined above). The theory is repeatedly confirmed by the empirical investigations of quantum phenomena.³⁷² The theory cannot be easily doubted. As Davies and Brown emphasise, it is 'a truly remarkable theory - a theory that correctly describes the world to a level of precision and detail unprecedented in science.'³⁷³

This 'remarkable theory' and the experiments that have been prompted by it, undermines the traditional scientific notion of an 'independent' observer or questioner. Some physicists such as E P Wigner³⁷⁴ have already speculated that consciousness, or the mind of the observer play an essential role in creating the 'reality' we observe, a view paraphrased by David Bohm as 'saying that only

³⁶⁸ *Ibid.*, p 158.

³⁶⁹ *Ibid.*, p 159.

³⁷⁰ Penrose, in *Shadows of the Mind*, *op. cit.*, treats puzzles and paradoxes and two distinct kinds mystery (Z - mysteries and X-mysteries) that quantum theory presents.

³⁷¹ Davies & Brown, *op. cit.*, p. x.

³⁷² *Ibid.*, p. 4, state that 'No known experiment has contradicted the predictions of quantum mechanics in the last fifty years'.

³⁷³ *Ibid.*

when somebody becomes conscious of a phenomenon is it really 'actual'".³⁷⁵ As Heinz Pagels (President of the New York Academy of Sciences in 1981) put it: 'There is no meaning to the objective existence of the electron at some point in space....independent of actual observation. The electron seems to spring into existence as a real object only when we observe it!'³⁷⁶

Many physicists are endeavouring to develop new interpretations of quantum mechanics, some of which would perhaps support the 'intuitive' notion of an independent, objective reality or existence 'out there' at the quantum micro-scale. Physicists are prepared to go to considerable lengths in order to provide an alternative to the Copenhagen Interpretation. Some interpretations, such as the Everett theory³⁷⁷ which claims that there can be an infinite number of 'parallel' universes, would seem more bizarre or counter-intuitive than the implications of the Copenhagen Interpretation itself.³⁷⁸

Consciousness and the scientific world view

Wigner is by no means the only scientist to have recently drawn attention to the issue of consciousness, and its place in the scientific world view. Consciousness has now become a legitimate focus of attention for scientific enquiry, and, significantly, this has not arisen exclusively because of the implications of quantum mechanics. It is part of a wider movement towards the addressing of consciousness, mind, and intelligence. Today, it is generally to the brain that science looks when addressing consciousness, and the brain, although more complex, is sometimes compared with the computer.³⁷⁹ The rapid development of computer technology, and the promise of a continuing exponential increase in computer capability has contributed by catalysing the question "What is consciousness?" with the seemingly more pragmatic question "Is it possible to build an Artificial Intelligence machine that is conscious?". Science is no longer content to accept Descartes' edict, which would have mind remaining firmly outside the domain of scientific enquiry into the nature of the physical world. Questions concerning the nature of minds, brains, and consciousness, which were once reserved for philosophy, are now addressed in connection with the

³⁷⁴ Wigner, EP, 'Remarks on the mind-body question', in Good, IJ (Ed.), *The Scientist Speculates: An Anthology of Partly Baked Ideas*, London, 1962, pp. 284-302.

³⁷⁵ Davies & Brown, *op. cit.*, p. 119.

³⁷⁶ Pagels, H, *The Cosmic Code*, London, 1982, p. 144, quoted by Gribbin, *op. cit.*, p. 151.

³⁷⁷ Davies & Brown, *op. cit.*, pp. 83-105.

practical aspirations of some scientists, and the lack of answers provided by the current scientific world view is seen as a failing which must be rectified.

Roger Penrose describes the situation in the following passage from *Shadows of the Mind*:

A scientific world view which does not profoundly come to terms with the problem of conscious minds can have no serious pretensions of completeness. Consciousness is part of our universe, so any physical theory which makes no proper place for it falls fundamentally short of providing a genuine description of the world.³⁸⁰

The holistic universe

To sentient life (us) material objects at the everyday macro-scale seem to be substantial enough. But what *is* substantiality, and what *is* matter, objectively, and independent of our experience? What does it mean for matter to be *independent*? Independent of what? The idea that anything has independent existence from the rest of the perceived universe can itself be difficult to reconcile both with quantum theory, and the experimental confirmation of some of the theory's implications.³⁸¹ Quantum entanglement seems to imply that there is something wrong with our notion of a universe consisting of independent, separate parts. The proposition that the universe does not 'really' consist of independent parts, but is holistic in nature, was presented from a scientist's point of view in 1980 by David Bohm, an acknowledged world authority on quantum

³⁷⁸ One of the most accessible discussions of some of these is documented in Davies & Brown, *op. cit.*, in particular, p. 34-8 and p. 83 ff. on the 'many universes' interpretation, regarded by Professor John Taylor as 'bizarre' (*Ibid.* p. 116).

³⁷⁹ This continuing comparison can be traced back at least as far as 1958, when John von Neumann published *The Computer and the Brain*, London, 1958. A recent discussion of contemporary thinking can be found in Lockwood, M., *Mind, Brain & the Quantum*, Oxford, 1992, p. 240 ff.

³⁸⁰ Penrose, R., *Shadows of the Mind*, *op. cit.*, p. 8.

³⁸¹ This refers to quantum entanglement and the results of the Aspect experiment which implies 'non-locality' and denies 'separability' of particles. See Gribbin *op. cit.*, pp. 23-8; Davies & Brown, *op. cit.*, pp. 40-44. Penrose considers the opposition to this interpretation of the results of Aspect's experiment, to be unfounded. See Penrose, *Shadows of the Mind*, *op. cit.*, p. 248.

mechanics. In his book *Wholeness and the Implicate Order*³⁸² Bohm emphasised the inadequacy of a non-holistic world view:

....Science itself is demanding a new, non-fragmentary world view, in the sense that the present approach of analysis of the world into independently existing parts does not work very well in modern physics. It is shown that both in relativity theory and quantum theory, notions implying the undivided wholeness of the universe would provide a much more orderly way of considering the general nature of reality.³⁸³

But even if the universe is holistic in nature, how can it have an 'undivided wholeness', which means a one-ness or non-duality, with respect to the observer, the knower, the thinker, or the intelligence behind these questions? Bohm recognises that consciousness and thought itself cannot be ignored in addressing the question of reality, and asks:

What is the relationship of thinking to reality? As careful attention shows, thought itself is in an actual process of movement. That is to say, one can feel a sense of flow in the 'stream of consciousness' not dissimilar to the sense of flow in the movement of matter in general. May not thought itself thus be part of reality as a whole?³⁸⁴

Bohm's answer to his own question is the notion of a 'higher dimensional' reality, but this is *still* object-orientated. In the above passages Bohm *seems* to be conceding that there is not anything 'objective' that we should call 'reality'. However he goes on to develop the idea of the

³⁸² Bohm, D, *Wholeness and the Implicate Order*, London, 1980.

³⁸³ *Ibid.*, pp. xi-xii.

'multidimensional' reality of which space-time-matter existence and all aspects of it, are merely partial projections. The interconnection between the five facets of space, time, matter, thought and consciousness are accounted for by considering them as all lower-dimensional 'unfoldments' of the higher 'implicate order' already 'enfolded' in the 'immense multidimensional reality'.³⁸⁵ Everything, and everything that happens, at every level, is an unfoldment of order that is intrinsically enfolded in the multidimensional reality. This projects into the lower dimensional elements that make up the universe we know, and represents a 'behind the scenes' unity and order that accounts for things like quantum non-locality and the entanglement of the observer with the observed.

Bohm recognises some parallels between his 'implicate order' explanation, and the philosophies of Leibniz and Whitehead,³⁸⁶ but he is also shadowing Plato closely in some respects. In Bohm, both space and time are only projections of the higher dimensional reality. The 'implicate order' requires 'a fundamentally new notion of the meaning of time',³⁸⁷ since all time orders are dependent on the multidimensional reality.³⁸⁸ Moments separated in time are only what appears in a lower-dimensional unfoldment of what is already enfolded in the higher reality.

One is reminded here of Plato. In Plato, space and time are unreal representations of the higher reality he calls 'Being'. The world of space and time is an unreal moving image of Eternity or Reality.

The human individual, for Bohm, is a 'sub-totality of a yet higher dimension':

....It will be ultimately misleading and indeed wrong to suppose, for example, that each human being is an independent actuality who interacts with other human beings and with nature. Rather, all these are projections of a single totality. As a human being takes part in the process of this totality, he is fundamentally changed in the very activity in which his aim is to change that reality which is the content

³⁸⁴ *Ibid.*, p. ix.

³⁸⁵ *Ibid.*, p. 212.

³⁸⁶ *Ibid.*, p. 207.

³⁸⁷ *Ibid.*, p. 211.

of his consciousness. To fail to take this into account must inevitably lead one to serious and sustained confusion in all that one does.

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Bohm's higher dimensional reality encapsulates the order behind life, the universe, every thing, and everything that 'happens', just as Plato's 'Being' does. Order in lower-dimensional manifestation is derived from the implicate order in the higher. Mind and body are mutual enfoldments of each other, and both reflect the order implicate in the higher-dimensional reality.³⁹⁰ Also, 'the body enfolds not only the mind but also in some sense the entire material universe'.³⁹¹

One is reminded of the Platonic hierarchy in which the 'World soul' is the order behind the human soul, and the human body, and how even society or the state is modelled on the higher order. One is especially reminded of the neo-Platonic and Fluddian correspondences between universal order and order in the soul and body.

The qualitative correlation between Bohm's 'wholeness and implicate order' and the macrocosm-microcosm correspondence world-view of the Greeks and the renaissance philosophers is unmistakable. The difference is that in the Platonic or renaissance world-views the implicate order is explicitly Divine, reality is ontological (God or Being) and the structure of symbolic representation of the unfoldment of that order is explicitly 'musical', in the Myth of Er. In Bohm's picture there could be 'an infinity of further development beyond',³⁹² but the top of the hierarchy he presents is the 'immense multidimensional reality'. The structure of Bohm's presentation is not musical,³⁹³ but is explicitly scientific or quasi-scientific and related to physics in particular.

In all the world-views, the material universe as it appears is the fragmented manifestation in a 'lower' form, of a 'higher' order, and it is ultimately a holistic system in which the parts are more or less reflective of the whole.

Bohm's 'implicate order' even allows for 'multidimensional reality' to be musically structured in a quasi-Platonic sense, although Bohm is not particularly interested in exploiting this possibility. The existence of musical principles as something subjectively meaningful, and to which

³⁸⁸ *Ibid.*

³⁸⁹ *Ibid.*, p. 210.

³⁹⁰ *Ibid.*, pp. 208-209.

³⁹¹ *Ibid.*, p. 209.

humans respond in perception, could well indicate the enfoldment of musical principles in higher-dimensional reality, and explain their existence in other areas of our own dimensionality.

The collapse of the wave function

The Copenhagen Interpretation has not widely been considered as a cue to find an alternative to 'material realism' as an appropriate way to address ordinary everyday living, which takes place at the macro scale and not the micro scale of the quantum. There seems to be a fundamental difference between the micro world of the quantum, where it can be argued that particles don't exist as particles until they are observed as such, and the macro world in which we live our everyday lives, and make indirect observations of particles.

There is in quantum mechanics a concept which has come to be called 'the collapse of the wave function', or 'state vector reduction' which is associated with the point at which the deterministic quantum-mechanical description of the micro-world in terms of a wave function, is replaced by a probabilistic description in terms applicable to the macro-scale sense-perceivable 'reality'.³⁹² The quantum particle itself seems not to exist with any of the attributes by which the macro-world 'makes sense', as long as it remains 'unobserved' and represented by the wave function. But there will always have (conveniently) been a 'collapse of the wave function', by the time an observation has been made, so that the particle can then be described as actually having the same kind of fixed, definite, measurable, physical properties, as macro-scale objects.

However, exactly what causes the collapse of the wave function is unclear, and we are still left with an unresolved situation. On the one hand, people, observers, and everyday things are taken to have an objective existence and location in space, but on the other hand, we cannot say the same thing about the particles of which these objects are made. The trouble is, that one cannot simply say "obviously quantum theory is wrong", because this is clearly not the case, as is verified both by experiment and mathematical necessity. But it can be argued that the theory is somehow incomplete, as is our understanding of what we are observing empirically, on the basis that macro-scale existence *must* be 'real'. What does not receive so much attention currently, is the cause of the latter conviction, or the questioning of it. Anyway, the ordinary everyday world is, as it were,

³⁹² *Ibid.*, p. 213.

³⁹³ He does use a few musical analogies, *vide ibid.* pp. 21, 23, 120, 198-200.

for the time being seemingly protected from the vagaries of the quantum world by the collapse of the wave function.

Does this mean that 'objective reality' at the classical scale is assured, and that material realism need not be questioned. No, it does not. As long ago as 1935, Erwin Schrödinger, one of the founders of quantum mechanics, published a theoretical account of an 'experiment' that would bring the seemingly paradoxical aspect of the quantum world right up to the macroscopic 'everyday' scale. This now famous account is known as the Schrödinger's cat paradox.

In *The ghost in the atom*, Davies and Brown describe the implications of the Schrödinger's cat paradox in the following passage:

The paradox of the cat demolishes any hope we may have had that the ghostliness of the quantum is somehow confined to the shadowy microworld of the atom, and that the paradoxical nature of reality in the atomic realm is irrelevant to daily life and experience. If quantum mechanics is accepted as a correct description of all matter, this hope is clearly misplaced. Following the logic of quantum theory to its ultimate conclusion, most of the physical universe seems to dissolve away into a shadowy fantasy.

Among others, Einstein could never accept this logical extreme. Surely, he once asked, the moon exists whether or not somebody is looking at it? The idea of making the observer the pivotal element in physical reality seems contrary to the whole spirit of science as an impersonal, objective enterprise. Unless there is a concrete world 'out there' for us to experiment on and conjecture about, does not all science degenerate into a game of chasing mere images?

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³⁹⁴ Penrose, *Shadows of the Mind*, *op. cit.*, p. 258-9.

³⁹⁵ Davies & Brown, *op. cit.*, p. 30.

This does not actually mean that scientists are encountering a macro-scale 'ghostliness' as Davies and Brown call it, in the laboratory. We can carry out experiments showing that a quantum particle must have effectively been in two different places at once, which is paradoxical, but we have not yet shown a cat being in two places at once. We can even paradoxically control the apparent *history* of a particle *after* the event, as it were, according to what we choose to measure, but we have not yet managed to control or change whether or not a cat had breakfast by measuring his stomach in the afternoon. The Schrodinger's cat paradox is what scientists call a 'thought' experiment, rather than an actual experiment. It explores what could happen *in principle*. It is not so much designed as a way of bringing quantum paradox into the realm of macro-scale experience, as a way of highlighting the devastating contradiction between the laws of the quantum world and sensible physical reality as we know it. It seems to illustrate, for example, that in principle, according to quantum theory, a cat can be both alive and dead at the same time. This kind of extremely unacceptable implication has not overthrown quantum theory, but neither have the facts about quantum phenomena so far overthrown our basic assumptions about the nature of physical reality, especially the view that it is an independent objective reality, whose very independence and objectivity make it somehow more 'real' or worthy to be called 'real', than our subjective experience of it.

Many physicists at the current time do not accept the implication of quantum theory that the 'intuited', 'objective' nature of reality at the macro-scale should be doubted. As Davies and Brown put it, 'They tacitly assume that somewhere, at some level between atoms and Geiger counters, quantum physics somehow turns into classical physics, in which the independent reality of tables, chairs and moons is never doubted.'³⁹⁶ Brown astutely observed that 'There does seem to be a very powerful, even emotional, appeal for believing in concrete reality, or objective reality as Einstein would have it; that is, somehow to write ourselves out of the picture.'³⁹⁷

Nevertheless, there remains an intrinsic and unsolved problem with this belief as far as quantum theory is concerned. Brown put the question 'Do you think that the external world exists

³⁹⁶ *Ibid.*, p. 31.

³⁹⁷ *Ibid.*, p. 76.

in some sense independently of our existence, and independently of our observations?’ to David

Bohm. Bohm’s reply was as follows:

Every physicist really believes that. For example, he talks about the universe having evolved before there was anybody around to look at it, except possibly God. Now unless you want to attribute it to God, as Bishop Berkeley did (and most physicists don’t want to do that), you’re unable to solve the problem of how the universe exists without physicists to look at it - or without somebody else to look at it.³⁹⁸

The position was unequivocally echoed by John Bell:

One wants to be able to take a realistic view of the world, to talk about the world as if it is really there, even when it is not being observed. I certainly believe in a world that was here before me, and will be here after me, and I believe that you are part of it! And I believe that most physicists take this point of view when they are pushed into a corner by philosophers.³⁹⁹

These two replies actually have nothing to do with scientific fact. Nor do the scientific facts mean that there is anything wrong with the replies. The only reason Brown asks the question is because the scientific facts easily imply that the observable world is possibly not independent of observation. What the replies do plainly indicate is the importance attached by these scientists to what they themselves in their answers call belief, belief that obviously arises from their rational interpretation of their experience of the world. This is none other than an interpretation of the relationship of self and world. Penetrating into matter further and further in the object-orientated

³⁹⁸ *Ibid.*, p. 119.

³⁹⁹ *Ibid.*, p. 50.

study of physics, finally brings us face to face with the question of this relationship, as an end result. This is the question with which, I argue, the Greek philosopher mystics like Empidocles and possibly Pythagoras, began their philosophy.

Notions like quantum entanglement, and many of the other issues explored here, are indicative of a need to consider the universe as one complete system, rather than as 'object' and 'subject', 'observer' and 'observed', 'here' and 'out there', 'here now' and 'here before me'. As one complete system, even if viewed in an exclusively object-orientated way, we could well describe the universe as 'The One', which is indeed how some of the ancient sources do describe it.

Chapter 8 - Beyond 'loss of self' in perception – Art, Involvement, and Beauty

Brancusi once said:

It is not the external form that is real, but the essence of
things. From this truth, it is impossible for anyone to express
something real by imitating the surface of things.

I am no longer of this world. I am far from myself and
detached from my person. I am among the essential
things.⁴⁰⁰

This is an expression of an impersonal depth of *perception*. What is especially beautiful about Brancusi's utterance of this, is his simplicity of statement that is accessible by all, even if (and probably especially if) they have never heard of philosophers like Plato, Berkeley, Kant or Schopenhauer. What Brancusi said must, if we are to respect him, have come from his own perception, and the truth of it, recognisable by the individual alone, must resonate in all individuals from those who have merely sensed the truth of which he spoke to those who recognise it in their own experience.

Brancusi was not merely saying that the 'essence of things' is more important than the external form. What he said was that the external form is *not real*, and that the 'essence of things' is. This is extremely important, - and not because Plato or Socrates who are widely recognised as philosophers may have said it in their own way, first. It means that inner reality cannot be approached by representing external form. Nevertheless, the outermost expression in existence of the 'essence of things' is in external form, so external form deserves attention because it is the medium through which is symbolised the 'essence of things'. But it is the 'essence' that is real, according to Brancusi. What the sculpture communicates is the sculptor's *perception* of the essence, the real, through the medium of the unreal.

⁴⁰⁰ Spoken by Brancusi in 1926 during an exhibition at the Brummer Gallery in New York, and cited by Claire Stoullig, 'Symbols and forms' in Bertrand, Pascale (Ed.), *Brancusi*, Paris, 1995; Quoted by Harry Bellet, 'Brancusi and his time', in Bertrand, *ibid.*, p. 8.

Brancusi's reference to 'the essential things' is a reference to how the nature of the world changes according to the depth of perception that accompanies reducing enmeshment in the world and detachment from self. In as much as emotional self is the essence of the person, this detachment represents *impersonal* intelligence and perception, which is what Brancusi is talking about. The meaning and nature of the world from the point of view of personal or emotional self, is very different from the meaning and nature of the world from the point of view of impersonal intelligence and perception. One regards the surface of things, the other, the essence.

What has hitherto been regarded as any kind of 'loss of self'⁴⁰¹ in relation to aesthetic experience is a good recognition of the relationship between self and perception, but it does not generally go far enough. It could be argued that it relates to a correspondingly lesser depth of perception than Brancusi speaks of. Relatively speaking, there is no profundity whatever in the 'loss of self' where this depends upon the contemplation of an art object. No such contemplation is going to result in an actual diminution of self. The difference between this kind of 'aesthetic experience' of an art object and its relation to the self, and the true perception of aesthetic meaning beyond the 'surface of things', is that the latter relates to experience in the world beyond the art object, of a self-changing kind.

No one, not even Brancusi, becomes 'far from their self and detached from their person' only through the creation or contemplation of art. Such a suggestion would be immature. The experience or creation of art is only important as a part of life experience as a whole. It cannot be separated from it. In as much as the perception of life experience is deeper than the surface of things, so the contemplation or creation of the art form will also be, but contemplation of the art form itself, cannot create this depth of perception on its own. What creates the depth of perception able to see beyond the surface of things, able to see through the world of emotional self from a position beyond it, able to say that the world of appearances in *not real*, is not so much 'loss of self' as 'death of self'. This is not something mystical but it is on a level far more profound than the proposed 'loss of self' that is supposed to accompany 'aesthetic perception', and thus keeps the notion of 'aesthetic perception' as something relatively shallow. Everyone at some time has to face an impending 'death of self', not generally through the contemplation of art, but rather more

⁴⁰¹ See Collinson's essay in *Philosophical Aesthetics: an introduction*, *op. cit.*

commonly as the breaking of the attachment to, and freeing from enmeshment in, any part of the life circumstances of the person.

When this happens, there is often a temporary vacuum in the involvement and enmeshment in the world and its demands for participation and enmeshment in it. To begin with, any such breaking of attachment for anyone usually has emotional pain associated with it, and the only thing that prevents the 'death of self' I am talking about here is either the deliberate avoidance of this pain, through the destruction of the vacuum by reimmersion in the distraction of the world, or the cultivating of attachment to what is now the irretrievable past. But contrary to this, it will nevertheless be noted by some that the breaking of attachment or enmeshment is followed, sometimes even whilst the pain of this 'death of self' still persists, by an extraordinary stillness and perception of profound impersonal beauty in the world, and a state of considerably heightened perception well beyond the 'surface of things' in which the rest of the world and its participants are still busily engaged. As soon as self reasserts its effects in the subject, this is lost and now regarded as unreality against the reality of the surface of things, in which the self is now again engaged. The perception can nevertheless be highly informing about the 'unreality of the world'; that its true 'nature' is really all about enmeshment in it, or detachment from it, and ultimately, about living in it, and self dying from it. Only from the position of having died from enmeshment in it, is the *impersonal* beauty of the world perceivable. This *impersonal beauty* is the only real 'aesthetic perception' in which the beauty of both the parts of the world and the whole are seen together. In it they are gloriously and aesthetically resonant in 'proportion' and 'meaning', even where there is no rational proportion and no rational meaning. It is the perception from which all other 'aesthetic perception' in a lower condition, is derived.

In *the music of the spheres* tradition earthly music is seen, as it were, as a lower reflection of *the music of the spheres* itself, and this in turn is a symbol of a great impersonal process beyond living and dying. Whatever kind of perception creates this myth in the first instance, it is not a perception that is enmeshed and attached to the surface of things – the world of persons and emotional self. Rather, it is a perception associated *ultimately* with death of self. Any suggestion of a reflection of it in earthly music is the suggestion that music can relate to what is beyond the world perceived as self and not-self, beyond emotional self, beyond the personal. The higher function of music thus lies in its ability to reflect aspects of this perception.

Impersonal beauty, aesthetic perception and involvement

Despite the modern arguments that art no longer necessarily needs beauty, beauty remains a facet of art so important that we cannot ignore it. It is certainly an extremely important facet of music, and I have said it lies behind the power of music to increase *perception*, but it is sometimes misconceived. Beauty can be *perceived* without attachment to its object, but it is not something disconnected from involvement and enmeshment in the world. Also, beauty is not something superficial, weak, or *merely* 'aesthetic'. It is not an attribute. Beauty, I am arguing, is a power, that on its *perception*, can sometimes be so strong that it is capable of dissolving or expurgating emotion, stilling and freeing an individual from enmeshment in the past, and bringing the perceiver into greater perception of the present.

Plato suggests that love is the desire for beauty, or the desire to possess beauty, or 'the desire and pursuit of the whole'. In Plato's sense this is an equation between love and Socratic knowledge, or wisdom, so this desire of the whole, is for return to the undivided Being, and the desire of beauty is for the true Form of Beauty, beyond the appearance or surface of things, which gives 'complete and unifying knowledge of truth concerning the whole universe'.⁴⁰² What Plato is speaking of here is the impersonal Divine beauty of the whole that nonetheless can appear in the specific. However, there is another desire for beauty even where no such Divine beauty is realised.

The desire of beauty, actual beauty as seen in the world occupied, or the desire to love through involvement in the external world, is actually the need of experience – which is the 'desire', albeit perhaps unconscious, to enter more deeply into the *inner*, to have more self-knowledge, by entering experientially more deeply into the outer. The appearance of beauty in the outer hemisphere, in the physical world inhabited, and our attraction to that beauty, arises from the subtle desire to do just that - to enter more deeply into the subjective, through interaction with what appears as beauty in the objective. What Socrates called 'Beauty',⁴⁰³ the Form of it, is, like Plato's 'Ideas', not 'out there' in some abstract Reality – it is *in* the subject, beneath the self that the subject is not. All ideas of 'out there', like those that baffle interpreters of quantum phenomena, are only true at the evolutionary level of intelligence in which the logic of a self/not-self duality

⁴⁰² Plato, *The Symposium*, Tr Walter Hamilton, London, 1951, p. 24.

applies. The interaction towards which we may be moved, may be no more than a desired 'seeing', 'hearing', 'being there', or a 'being with'. It can be merely seeing nature or art, or listening to music, or it may be the need to *involve with* any of these, but ultimately, as physical beings with bodies, the desired interaction or involvement is physical union itself - which is only possible in coitus - and it is this that Plato must have recognised as the stumbling ground in the process, for the mere physical union of object and subject is not guaranteed to short-circuit time and separation, or to make beauty manifest, or to make love manifest. Mere sexual union, is not, as Plato recognised, the making of love. So it is that Platonic love comes about - the making or being of love *without* physical union, which is 'above' physical love. But we should not forget the context in which this idea appears.

Plato's exposition of love was written in a society in which homosexuality was apparently accepted as normal, in which women were very much subordinate, and in which the male gender and everything about it, including love and respect for the male, was considered naturally superior to their female-orientated counterparts. Why then - when Plato reports Socrates to have described the nature of love in the most expedient possible way, i.e. in terms of non-consummated love between men and boys - does Socrates (and of all Plato's characters Socrates always represents the epitome of wisdom) say *he was taught this nature of love by a woman, Diotima?*⁴⁰⁴ This highly symbolic aspect of the story is probably about as far as the significance of Woman could be taken by Plato. Plato endorses Platonic love in the homosexual context, but not *physical* homosexual love, as the highest form. Alcibiades' character-sketch of Socrates in the same discourse confirms Socrates as being above all temptation to stray from Platonic love into physical sexual relationship, but again, this is only in the homosexual context.

The notable, symbolic position of Diotima in the story seems to indicate that the philosopher's knowledge of love actually comes from a woman. Why was this necessary, given the subordinate position of women at the time? Is she supposed to have taught Socrates all about non-physical love through discourse? Does a woman teach a man about love through discourse? Much of what Plato says, has more than one level of interpretation. The idea that 'Platonic love' - which

⁴⁰³ e.g. Phaedo, 100c-e, Plato, *The Last Days of Socrates*, Tr. H Tredennick and H Tarrant, London, 1954, 1993, p.164.

⁴⁰⁴ *Symposium* 202a; The exposition can be found in Plato, *The Symposium*, Tr Walter Hamilton, London, 1951, p. 79 ff.

can also apply in the heterosexual context - is above physical relationship, something in which we are often subject to the greatest enmeshment, is Plato's way of associating 'higher perception' and 'Socratic wisdom' (Plato's highest form of love, the love of wisdom) with non-involvement and non-enmeshment. We do not know that Socrates did not *make love* with the woman who taught him love. In the context of Greek society's pre-occupation with male homosexual love this would probably have been seen as irrelevant.

There is a difference between saying this higher perception and knowledge is *associated* with non-involvement, and saying it can be *reached* through actual non-involvement in the ascetic sense. Socrates' behaviour is not a cause of his knowledge, but an effect, as we also see in Socrates' participation in the 'drinking parties', in which he drinks, but to the amusement of Alcibiades never appears drunk. The effects of Socrates' state of knowledge as equilibrium and detachment are indicated again and again up to and including the time of his death. Plato's real message is not the merits of asceticism - Socrates is not an ascetic, but drinks in the drinking parties - but the state of equilibrium and detachment whilst yet participating and involved in the world. The real question is how one attains this state, because it is certainly not through the exchange of reasoned dialogue.

The perception of impersonal beauty, I would argue, is attainable through involvement accompanied by loss of self, or involvement which *results*, eventually (through events) in loss of self, and is a state of *aesthetic experience* in which the emotional self is not involved, but it is a state that goes beyond what has been more generally discussed as 'aesthetic experience' in relation to art objects. The state we are talking about is akin to Bullough's 'psychical distance', but its implications are far more profound, and are *related* to Plato's indications of the state of Socrates' consciousness. As repeatedly indicated by Plato, Socrates is the 'true philosopher' who loves wisdom above all else, is immersed in it, and is thus detached from the world, whilst yet participating in it. We do not see anything like this in Bullough's 'psychical distance'. What we do see, is a certain 'loss of self', providing a certain detachment from self involvement whilst allowing involved perception to continue. But in the case of Socrates, we are surely dealing with something much deeper, with what I have already attempted to describe not so much as 'loss of self' as 'death of self'. Self is as it were, a 'mass' contained in the surrounding circumstances. Bullough's 'psychical distance' is a temporary withdrawing of the mass to create the distance that allows the

'aesthetic experience' to take place. It is primarily a psychological effect. On the other hand, the 'death of self' I have suggested is not a withdrawing but a change of dissolution. It is psychospiritual. The distance it creates may be only temporary in the sense that self can 'expand' again to contact and immerse in the circumstances surrounding it, but, by degrees, the distance could be permanent. What Plato implies for the highest perception and knowledge of beauty, and indicates in Socrates, is a permanent 'psychical distance' from the world. The resulting perception places 'aesthetic experience' in a much broader, and deeper context.

We might think we can talk about 'aesthetic perception' as though it is not related to perception as whole, and to wider consideration of the whole state of consciousness of the perceiver. We might want to consider it as ephemeral, and separate from the perception of beauty, which, according to Plato, *and* as inevitably demonstrated in the truth of our own experience, is related to love. This attempt to discuss and understand little bits of our experience and perceptions like this in isolation from the *whole* of life, the whole of its meaning, and the whole meaning of experience, and indeed perhaps *the universe*, I believe is great mistake, - one that Plato to his credit does not make.

It is traditionally thought that Man is somehow separated from his spirituality by his involvement in the physical world. He is in this view, as it were, a fallen angel. 'Spiritual' men and women have so often seen celibacy and asceticism as their task, their only means of withdrawing from the objective world, the world we all inhabit. 'Platonic love' seems to be a part of this wider belief. Yet where is the withdrawing to? To another metaphysical world, a spiritual world in yet another place, outside ourselves, like the world we inhabit? It is better recognised as a withdrawal within, into the subjective. Such withdrawal, might, as the mystics declare, reveal much about the unreality of the objective world. But what of the common movement towards more involvement in the physical, that so often accompanies the perception of beauty? Is this really all so negative and spiritually reprehensible? Or is there something in *involvement* itself, in the corporeal involvement in beauty, some way of being involved, that works towards the same end that the attempt to withdraw from it is supposed to? Can it be that the perception of beauty in the world, and the involvement with it, is an unrecognised part of the same movement towards freedom from enmeshment? Is it not possible to *pass through* experience, as distinct from going through it and gathering it?

One does not necessarily have to be lost in the world, or hopelessly enmeshed in it, just because one is *involved* in it. If beauty is known in the subject, but the subject is not involved in the world, what is the point of beauty, and what purpose does it serve in the world? Beauty appears in the objective world precisely because beauty is in the subject, and because the subject is involved in the world. Without involvement, beauty cannot be brought into the world, the world of appearances. The causal dimension of all art is *involvement*, and to the degree it is concerned with beauty, or any other state of the subject, it demands involvement, not just will-less-ness, or 'disinterestedness' (as aestheticians often argue), both in its creator and its perceiver. The involvement in the world is involvement in life as a whole, involvement in the subjective, through participation in the objective. The distillation of *perception* is served by this involvement and participation.

Art that reflects depth of *perception*, must reflect experience and involvement in life, even if not explicitly or overtly, both in its creator and in the spectator or auditor. Contrary to what Plato might *seem* to be presenting as Socrates' teaching, beauty and knowledge is very much brought into the world through *involvement*, through enmeshment itself, and especially through physical love, and I am now asserting that this involvement with beauty can also be a means of escape from enmeshment in physical existence, not least through what I have already described as 'death of self'. Similarly, art may be about something beyond our concerns with our enmeshment in the world, but at the same time it is not something to be put on a pedestal and disconnected from our condition of enmeshment in the world. Art can portray the world, and various perceptions of it from the position of enmeshment in it, or it can portray the world and its condition from a perception beyond enmeshment. It then says something about the world from a position beyond the world.

Beyond personal perceptions, two things are thus arguably *essential* to the development of intelligence capable of art, capable of seeing beyond 'reason', beyond the rational. They are active participation, or involvement in experiential living, and impersonal *perception* of a more permanent kind, according to what happens to the self in the world. Both together determine the value of experience in the world. In involvement that is limited only to the personal, experience is often sought for the sake of experience alone, but the point of experience is not really experience itself. The impersonal point of it all is for the distillation of an impersonal *perception* of something

beyond experience itself, beyond *what* is experienced, in the context of which things, experiences and circumstances in the world have a new aesthetic value that gives them significance in the whole. Within this, the true aesthetic value of music is detached from emotional form or feeling, yet is related to it, and is profoundly connected with impersonal beauty and dimensions of aesthetic meaning that reach out to the whole, and to the perceptions in the world from a position beyond it. Perhaps as Philolaus suggested, the individual may then be approaching knowledge of what he called metaphysical 'Nature itself', as the impersonal, subject-orientated principle behind 'nature in world'. The phenomenon and structure of music is part of 'nature in the world', but it is capable of communicating aspects of 'Nature itself'.

Chapter 9 - The purpose of music

We have examined in considerable detail the tradition of the *music of the spheres* and connected it in a contemporary way with the question of music's effects on the psyche. The claims in Orphism, Pythagoreanism, and in Plato, that music can be a benevolent influence that can increase the consciousness or depth of perception of the auditor, can also be put in a context outside the tradition, when the role of experience in the development of *perception* is recognised.

Music provides experience. Even in physical and psychical maturity, it may still be said to be associated with the need to experience, since the very existence of an individual is as it were, a manifestation of the need of experience. However, in maturity the experience of music is finer in the sense that there is less need in the auditor of the emotional spectrum that has already been experienced sufficiently. We only need to see that at its highest level, it is not the need of emotional experience that music finally provides for. At its apex, music begins to provide something quite different from anything related in any way to the emotional highs and lows of living in the world, or even to emotional feeling of any kind. Paradoxically, or so it seems, it still does this *through* experience, and the experience of the music can be seemingly profound, being as it were, a glass door to that which is beyond emotional experience and which could only be reached by passing through this final deeply felt experience.

At this level on the scale of musical possibility, what appears as the content of the music may seem profound to the mature recipient, but to experiential adolescence it is as nothing because there is simply not enough emotional experience in it. It lacks any excitement or excitation of the kind adolescence seeks. It certainly does not satisfy the lowest adolescent need of basic emotional experience – emotional highs of excitement (which of course are always followed by inevitable lows of negativity) and correlation to the stimulated hormonal and animal part of our being. It communicates only to the individual who is already looking beyond emotional experience of the kind adolescence of any kind seeks, and probably beyond emotional experience altogether. This does not mean looking for *intellectual satisfaction* of the kind Hanslick *said* he endorsed, although this may be present as part of another dimension of our aesthetic appreciation of music. Beyond emotional experience is 'feeling' experience of a less emotional nature and beyond that is

experience that can properly be said to be beyond emotion. Experience becomes finer and finer until its 'feeling' and 'knowledge' aspects are really two polarities of the same thing, for which we have no descriptive language. Neither pole has anything to do with our common emotional or intellectual life, nothing to do with what persons describe as their 'feelings' or their 'thoughts', except that they are reached by *passing through* that feeling, thinking, emotional and intellectual life.

What is left is not abstract or intellectual, as Hanslick at times imagined, because it is received by a sense that requires no attainment through abstract or intellectual learning. This higher sense is entirely natural – it does not require any additional effort of education. Many must encounter it at times without realising what it is. It is discovered in any case by any individual who reaches the point of having had enough emotional experience, both highs and lows, 'good' and 'bad', and who now seeks to be free of it all, and for what is beyond. Reaching this point is unfortunately not liberation from the emotional, but it is the beginning of the realisation of what is natural, though previously obscured by emotional self, it is the beginning of natural, *impersonal perception*. It is only the self's need of experience that separates the subject from this perception. It is this need that creates the reality of the emotional world, the personal world, and all art that reflects this, rather than what is beyond the world. It is this need that perpetuates *discursive thinking* as a way of relating to and understanding art and the rest of the world.

The most commonplace music is simply a symbol of the existence of the most commonplace emotional conditions. In other words the commonplace, 'collective' emotional conditions surface as the most commonplace and readily embraced music. Music is commonly listened to because it provides 'emotional' experience, even if only in the form of a background 'mood' or 'psychical ambience'. It is in effect a more or less weak or strong, sonic, psyche affecting influence, and its efficacy lies in its power to affect the psychical and even physical condition of the listener. Most music that is listened to, and not just the Wagner that Hanslick might have criticised, is 'emotional' in this sense.

As Hanslick recognised, perhaps the biggest mistake in the history of aesthetic enquiry into music is the assumption that music's main function or importance is its ability to affect, represent, arouse, etc., emotion. My argument is as follows. This ability is *not* music's basic *psychical* efficacy. It is something that comes causally later, at the causal stage where *we* become *emotional*.

Emotion itself is not something inherent by necessity in the relationship between Man and music. The *psyche itself* is not inherently emotional in nature, any more than nature is. Hanslick's emotion related 'base' effects of music are actually just the spectrum of effects that are now widely 'tapped into' in our *use* of music. The *fundamental* effects of music are purely psychical – they arise from the inherent impersonal integration of self-in-the-world with world-phenomena, an evolutionary self-reflexive duality that cannot be split apart.

'Emotional' music in our 'society' actually comes *from* this chosen emotionality, even though this emotionality is largely primal, or evolutionary. To all those identified with, or enmeshed and involved in this emotionality, music's main reason for being, is its relationship with this emotionality, and it will no doubt be used more and more as an acoustical form of recreational 'drug' to accompany and affect the favoured psychological state of the personality, which really means personal emotional condition, sometimes even in conjunction with chemical drugs, and never will it do anything but reiterate and amplify the same spectrum of emotional sensibility and perception from which it comes in the first place. Even a minority genre is not outside this scenario whilst the emotionality of its adherents is basically the same commonplace emotionality.

Despite this, there are of course other sensibilities. Emotional perception is everywhere, it is ubiquitous, but despite our identification with it, our high appraisal of it and our attachment to it, it is *not*, I have argued, our highest sensibility. In the emotional perception, 'happy', 'sad', 'exciting', 'depressing' and so on, all occupy separate 'comprehension centres', both in the way we perceive music and the way we interpret events in the world. In reality, that is, in the reality of experience, the human condition cannot have happiness without sadness, or excitement without depression, because it is all connected *in time*. The one truly valuable aspect of music in the world is not its ability to *reiterate* this scenario but its ability to take the perception *beyond it*.

We do not need the consciousness of Socrates to tap into the beginning of this perception. The most modest music, with or without intended 'emotional content', can sufficiently reflect the beginning of this perception. One way we can enjoy music is because its 'emotional content' correlates to what we know from personal experience in world, which allows self to identify with something in the music, but from a safe 'psychical distance'. The 'emotional meaning' then becomes 'aesthetic'. Or the experience of the music can trigger stronger emotions in the self which have a life of their own because they connect with real life experience to which the self is still

attached, *in time*. None of this is actually *necessary* to the enjoyable experience of music because the relationship of music and psyche does not hinge on this in the first instance. Music's *basic ability* to 'tap into' the psyche is unfettered in itself by the psyche's emotional content, and it is from this fact that 'psychical distance' from emotional content perceived in the music can be effected. The truly fundamental power of music is a purely psychical thing – music's *basic effects* are *psychical* in nature, and its efficacy comes from the fact that *we* are basically *psychical in nature*.

Where *perception* comes into music, is where the self is sufficiently absent for the higher *impersonal intelligence* to hear the reflection of itself in the music, which establishes it more, for a time, and keeps the emotional self from which arises all real sorrows, troubles, and attachment to the world, temporarily at bay. So music can be pleasing, purifying, and self-transcending. As soon as *emotional self* reflects off any emotional content in the music then *perception* vanishes.

Music is valued in the world as an entertainment, a communication, a recreation, an emotional experience, and even, quite commonly, as an emotional opiate. But among all the artful activities we have invented for ourselves music is capable of providing experience on the very edge of all need of worldly experience of this kind. The final point of acoustical music is to pass through this experience. This is the part of music that is above its place in the process of evolutionary survival. The *emotional* aspect of music relates to the evolutionary forces in our make up, that in human intelligence and self-consciousness, become our uniquely human emotionality. The *esoteric* part of music relates to a process in which nothing survives, and hence is only perceivable to the degree to which emotional self, the core and cause of *being something*, is absent. This process is the very thing that in music is 'not of this world', but is intelligible in human *perception*, and can manifest in the dimension of musical sensibility, as it can in other ways, because the potential of human *perception* goes beyond evolutionary emotionality.

How this happens lies inherent in the way the external physical world connects with the internal psychical. This is the macrocosm-microcosm relationship, which we will address in more detail below. The object-orientated representation of this relationship already exists in the textual and diagrammatic symbols of Plato, the neo-Platonists, and many other sources, but treated literally as information, these are useless, so they are inevitably either rejected as imaginative nonsense, or only accepted at an imaginative level. Nevertheless, this does not automatically mean there is *no*

truth in these symbols in the way they represent the relationship between the physical and psychical. If there is any truth in them, and I am not suggesting there is not, then we have to remember that none of this means there is no distortion and corruption in the symbols.

It seems to me that a great deal of what was accepted at various points in the past as esoteric information of this kind, including attestations concerning Pythagoreanism, and much, but by no means all of what appears in the *Hermetica* and *Corpus Hermeticum*, is merely repetition of what has been previously heard or read, that has only partially, if at all, been aligned in actual self-knowledge and experience, so that much of it, just like some of the pre-Socratic discourses, is confusion or nonsense in the trappings of the language of esoteric mysticism. On the other hand, it is probably true that much of what has been said by writers like Plato and Empidocles that are clearly genuine expressions of esoteric spirituality, have not always been recognised for what they are. Where similar material appears in sources labelled as 'patristic' or 'religious', they do not suffer the same fate.

There is one last, important facet of *perception* that should be mentioned. Perception particularly of something in music, can be confused with the emotion on which it can act. The 'Orphic' effects of music are in this respect not all myth from the past but a reality now, and are not so much an opiate power of music on the condition of the self, but lie in music's power to reflect back the potential depth of perception inherent in the auditor. It can be sufficiently powerful that it can result in the cathartic expurgation of the emotional energy of self, in a visible, physical form that to the merely mental understanding is indistinguishable from the *expression* of emotion itself. Thus it is that the true Orphic *lachrymae* of music comes into being, not by arousing or imitating the emotions, not because it is *sad*, but by dissolving and expurgating the emotional self. So it is we can indeed weep at beauty without being emotional. But emotional self and the thinking rationality that arises from it, seeing it in another, will call it emotion, and experiencing it in the self, will lose it by emotionalising it. The *physical* clue in either case, the 'presentational symbol'⁴⁰⁵ both in the auditor's response to the music and in the music itself, is the same.

⁴⁰⁵ Langer, SK, *Philosophy in a New Key*, Cambridge Massachusetts; London, 1942, 1979.

Chapter 10 – The Pythagorean Circle – a symbol of *harmonia*

The Pythagorean Circle, or Great Circle of Fifths, is a diagram representing the *harmonia*, or scale. The use of diagrams for communicating ideas and as a way of understanding things, implies and invites the use of what might appropriately be called our 'diagrammatical understanding' *modus operandi* of intelligence, that is a part of discursive, conceptual, object-orientated *thinking*. Object-orientated thinking relates readily to diagrams. Mathematical formulae are in effect abstract *diagrams* of quantity and relationship between quantities. If we can draw a diagram of something, then we understand it in the way that the diagram encapsulates the relationships between symbolised concepts. Conversely, subject-orientated understanding is not information about concepts and their relationships. It does not arise from concept structures. You cannot draw a diagram of loss of self, or death of self, or absence of self. Actually, you can, because you can draw a diagram of *anything* you can *conceptualise*, and anything that can be named, including *self*, can be conceptualised. But if you do it will be a diagram of a conceptualisation, which is object-orientated, and it will only relate to object-orientated thinking and the reality *it* creates.

Nevertheless, I am going to present some diagrams to illustrate a proposition for the connection of harmony, self, musical scale and universe. Diagrams of a mixed nature, that are supposed to represent something beyond the literal relationship of concepts that appear in them, are found in all kinds of sources especially those primarily concerned with subject-orientated knowledge. They appear in the form of magical symbols, hieroglyphs, mandalas, cabalistic and arcanic diagrams and symbols, in Hermetic manuscripts, quite frequently as pictures of labyrinths and spirals, and in many other ways.⁴⁰⁶ Diagrams that are part of the *music of the spheres* tradition, such as those of Robert Fludd, may in particular include numbers, mathematics, or quasi-mathematics.⁴⁰⁷ Plato's description of the creation of the 'world soul' in *Timeaus* is essentially such a 'mixed' diagram *in textual form*. The diagrams below are less profound in their implications than this. They represents how apparently separate 'elements' that we turn into 'concept centres' in

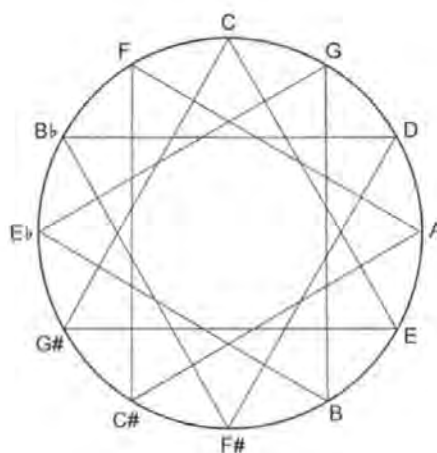
⁴⁰⁶ Surveys can be found in Godwin, J, *Robert Fludd Hermetic philosopher and surveyor of two worlds*, London, 1979, and Purce, J, *The Mystic Spiral*, London, 1974, 1980.

object-orientated thinking, can be interconnected not only because they are part of an overall 'concept-structure', but more importantly because they are part of the *subject-orientated* 'structure' of a whole. We connect the concepts through *thinking*, but in doing so, we arrive at an object-orientated 'structure' in thought. The diagrams I have used are derived from the Pythagorean Circle. Like the Greek textual 'diagrams', the Pythagorean Circle is not just an object-orientated diagram, because it has a another level of interpretation.

The early Greek *harmonia* is something that 'fits together opposites' and at the same time, or at least in later usage, refers to what we would now call the musical scale, in fact, a tuning or temperament. Roughly speaking, harmony itself, as the whole number ratios that appear in the science of *harmonics*, cannot be used to form the structure of a *harmonia* or scale of twelve intervals to the octave, without introducing disharmony between some notes. This is a consequence of the nature of the Great Circle, and the factual illustration of this is as follows.

Mathematically, harmonic musical intervals are expressed as certain integer ratios.⁴⁰⁷ It is said that Pythagoras discovered the harmonic ratios of the 'perfect' intervals and was responsible for calling them 'perfect'. The ratio of the Pythagorean or perfect fifth is 3:2 (or 2:3) and this can be 'circulated', using a 'Great Circle of Fifths' diagram with modern note names:

Diagram 1:



⁴⁰⁷ 'Like' mathematics in appearance, or inclusive of some mathematics, but not really the science of mathematics itself.

⁴⁰⁸ The harmonic ratio of a musical interval is the integer ratios corresponding to the ratios of the fundamental frequencies of the notes forming the interval. Traditionally the ratios were expressed as the ratios of the string lengths of a monochord required to produce the interval.

Clockwise progression round the circle represents ascending fifths (or descending fourths), and anticlockwise represents descending fifths (or ascending fourths).⁴⁰⁹ The distance progressed in each direction is arbitrary – there is no absolute rule.

Circulation in this particular instance is made clockwise from C round to G# and anticlockwise from C round to Eb. Even in terms of modern musical grammar an ‘imperfection’ now occurs in the interval from G# to Eb. This is a diminished minor sixth, not a perfect fifth. We could alternatively have continued from C clockwise right around the circle and back to the top, but we would then finish on B#, not C. Grammatically, the circle does not ‘close’ – if only one note occupies each position around the circle, then to close the circle it must contain at least one interval that is not a perfect fifth.

The discrepancy is not merely grammatical. Acoustically, the Circle represents the tuning of consecutive fifths (or alternating ascending and descending fourths and fifths within an octave). If eleven fifths are tuned ‘perfect’, the remaining interval will be smaller than a perfect fifth by an amount known as the comma of Pythagoras.⁴¹⁰ Similarly, if twelve consecutive ascending perfect fifths are tuned, the final note will not quite be seven perfect octaves above the starting note. It will be sharp from this, again, by the Pythagorean comma.

Mathematically the harmonic ratio of the octave is 2:1 and that of the perfect fifth, 3:2. A seven octave interval thus has the harmonic ratio 2^7 and an interval of twelve perfect fifths has the ratio $(3/2)^{12}$. The Pythagorean comma is an interval with the ratio $\{(3/2)^{12}\} : \{2^7\}$.

A scale of twelve intervals to the octave tuned by so-called ‘Pythagorean tuning’ respects only the perfect fifth (and its inversion the perfect fourth). Twelve fifths contained in the scale can be tuned perfect and the last must by acoustical and mathematical necessity remain a ‘wolf’⁴¹¹ interval, smaller than a perfect fifth by the Pythagorean comma.

Diagram 1 is the Pythagorean Circle but it also shows straight lines connecting notes defining (clockwise) what we would now call major thirds. Again, grammatically, four of these are

⁴⁰⁹ In the science of *harmonics* the ‘direction’, ascending or descending, of an interval, is merely relative. Intervals and their associated ratios can be handled in any way according to chosen convention. A fourth is merely an inverted fifth and *vice versa*, a major third is an inverted minor sixth, etc. Consequently the Circle can equally represent alternating ascending fifths and descending fourths, clockwise, and descending fifths and ascending fourths, anticlockwise. The entire Circle then represents a scale of twelve tones in one octave.

⁴¹⁰ A comma is a microtonal interval. The Pythagorean comma is also called the diatonic comma.

'incorrect' – they are grammatically diminished fourths. Any one of the straight lines subtends clockwise an arc of four fifths (or diminished minor sixths). The arc clockwise from C to E is an interval defined by four perfect fifths. This simultaneously defines two octaves and a major third C to E. Because the harmonic ratio of a perfect fifth is 3:2, such an interval has a ratio of $(3:2)^4 = 5.0625$. The harmonic ratio for two octaves is 4:1, and so the ratio for two octaves and a major third, is $(4:1) \times (5:4) = 5$. Thus the two octaves and a 'third' defined by the four perfect fifths in the arc of the Circle is an interval greater than two octaves and a harmonic (or 'pure') third. It is wider than two octaves and a harmonic third by the ratio 5.0625 : 5, an interval known as the syntonic comma (the comma of Didymus), which is more usually expressed as the harmonic ratio 81:80. Thus, a third defined by perfect fifths is greater than a harmonic third by the syntonic comma. This wide third has subsequently been called the *Pythagorean Third*. Although the syntonic and Pythagorean commas differ, for practical tuning purposes they can be considered the same size.

The other differences may look small, mathematically, but they are substantial, acoustically. The modern musical ear not versed in early music is conditioned to accept all major thirds considerably wider than a harmonic major third, because of the now widely accepted tuning convention called Equal Temperament. On a modern piano which is tuned this way, all major thirds are the same size, and all are wider than the harmonic third. However, *Pythagorean thirds* would be unacceptably wide even to modern ears, if they were tuned on the piano.

In modern terms, a Pythagorean scale contains three perfectly good, harmonic triads related as I, IV, V, in the major key whose tonic is two semitones below the lowest note of the wolf diminished minor sixth. However, this I, IV, V relationship of modern major tonality is not likely to have been *musically* significant to Pythagoras, as it is to us. It only arises because the diminished fourths that fall across the 'wolf', which in our diagram is placed between G sharp and E flat, each have practically the same ratio as a harmonic major third.⁴¹² They are acoustically, for all practical purposes, harmonic major thirds, otherwise known as 'pure' thirds. The other thirds defined by the straight lines are Pythagorean Thirds. There are no attestations that the Pythagoreans ascribed any particular significance to this duality in the 'thirds'. It seems thirds were relatively unimportant to the Pythagoreans.

⁴¹¹ It 'howls' unpleasantly 'out of tune'.

Thirds, however, became important in time, in musical practice. The size of the wide thirds in a scale can be reduced, and even the unpleasantly narrow 'wolf' can be widened, by deliberately 'tempering' some or all of the 'fifths' so as to 'absorb' some of the adverse effect of the commas. If, for example, each of the twelve intervals around the circle were to be narrowed by $1/12$ of a Pythagorean comma, no 'wolf' interval would appear, and all the thirds would be wider than a harmonic third by only $2/3$ of the Pythagorean comma. This is precisely the strategy adopted in the modern convention of Equal Temperament.⁴¹³ I have said *only* $2/3$ of a Pythagorean comma, because this is a improvement on the size of the Pythagorean third, which is a whole syntonic comma wider than the harmonic 'pure third'. However, many experienced performers or lovers of early music would declare that this equally tempered third is ugly because it is too wide.

Once one has been initiated into the substantial physical sonority and beauty of true harmonic intervals (which one cannot be whilst confined only to equally tempered musical practice), the significance of all intervals and their intonation shines through to a sensibility now lost to the modern ear conditioned to accept Equal Temperament. To this sensibility there is a place for the piquancy and colour of tempered intervals, but only in relief against the sonority of true harmonic intervals, or intervals that are close to this. True harmonic intervals are said to be *Justly Intoned*. Just Intonation is a performance possibility for any given interval or vertical harmony, but it is not (as often misunderstood), a method of tuning 'the perfect scale' or a temperament, and no Great Circle or scale of twelve fixed notes can be constructed in which *all* the relations of the notes are Justly Intoned harmonic intervals. As a performance possibility for music involving free harmonic progression, polyphony or counterpoint, it requires the use of more than one note per position in the scale or Great Circle, or more than one possible pitch per note. The pursuit of Just Intonation using a fixed pitch scale is the reason why Western microtonal scales for practical use are not an invention of the twentieth century as might be supposed, but were of interest even in the sixteenth century.⁴¹⁴

⁴¹² The difference between these thirds and true harmonic major thirds is the difference between the syntonic and ditonic (Pythagorean) commas – about 2 cents, or a 50^{th} of a semitone.

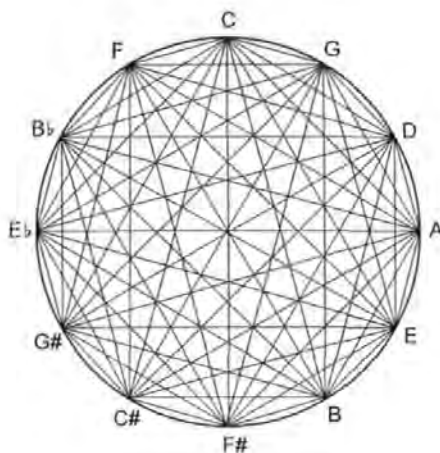
⁴¹³ Equal temperament, as a proposed system of tuning, is not a modern idea, but its adoption as a 'universal' standard is modern.

⁴¹⁴ For example, Vicentino's 31 note Equal Temperament, Vicentino, Nicola, *L'antica musica ridotta alla moderna prattica*, Rome, 1555.

Now we can address the Circle in a less objective way, to glean its symbolic properties.

The Great Circle showing the full complexity and interdependence of all the note pitches and every interval in the twelve note scale is shown in Diagram 2 :

Diagram 2 :



The lines are also lines of *cause and effect* in the *harmonia*, the scale or temperament. No note can be altered without affecting its relationship to every other note, and this affects the *harmonia* or temperament. The diagonals across the circle, are the tritones – the augmented fourths or diminished fifths, the *diabolus in musica* of early theory that was studiously avoided in practice. In modern music of course, every interval is equally acceptable including that of the *diabolus in musica* which simply becomes another discord that can be prepared and resolved. Nevertheless, in terms of early theory the greatest symbolic disharmony lies in the opposites. Turning the theory on its head, and looking at the circle in an unconventional way, we can see *it is constructed of disharmonious opposites*, arranged such that the result creates harmony along the other lines of relationship, according to the *harmonia*, the tuning or temperament employed. In keeping with the pre-Socratic notion, *harmonia* creates the harmony by fitting together the disharmonious opposites.

The *whole* circle represents the perfection of the unison or octaves, on which the other relationships depend, and without which the Circle would lose its meaning. The unison, the octave, the multiple octave, and the fifths, before arrangement in the Circle, are 'perfect'. But the Circle is not. As a consequence of the mathematics behind the structure it *must* contain the commas – 'imperfection' in the relationships is inherent in the *harmonia*. Some relationships may be perfect

or pure, but it must always be that some will not. Perfect harmony, where it occurs, is the direct result of the *harmonia*, but it is not the *harmonia* itself. The *harmonia* itself, as a means of tempering, applies to the *whole*, and is *necessary* in the first instance because the whole Circle of perfect fifths in actuality cannot ever be the perfect unison or octave that it represents. Starting with C, it circulates not back to C, but to notes of actual, different pitches, B# or D double flat, depending on which way we go.

Why is there discrepancy or imperfection in the mathematical structure behind it all? It would have been very *elegant* of nature if twelve perfect fifths could have exactly equalled seven octaves, and very convenient if four perfect fifths could have exactly equalled two octaves and a harmonic major third. The inelegance and inconvenience is not of nature – it comes from the fact that the scale, or Circle, is *not* natural. Harmony, as intervals governed by integer ratios, is a part of natural phenomena, complete with its own imperfections and complications that arise when it is exhibited in physical media. Mathematically, Western harmony begins with the harmonic number series – 1,2,3,4,5,6 etc. The attempt to *arrange* harmony in a *scale* or Circle is Man's. The scale itself, if all the notes are heard simultaneously, is a cacophony. In contrast, the harmonic series itself, exhibited in say the natural behaviour of the monochord, even with all its physical imperfections, inharmonicity and complications, is unmistakably heard as both harmony and unison. The acoustical harmonic series has been called 'the chord of nature', and it occurs *everywhere* in nature that there is complex periodic phenomena, though not always acoustically. There is no equivalent twelve interval to the octave 'scale of nature' in natural phenomena.

The cacophony of the scale whose notes are sounded simultaneously is a reminder of the Man-made function of the scale. It is not designed (originally) to be sounded simultaneously. It is designed to diffract natural vertical harmony through *time*, to provide a set of acoustical reference points for the activity of extending harmony through time, in what we call music. When we study acoustical harmony in the scientific, object-orientated way, we deal with it in the context of space and time, and say it is oscillatory phenomena in time. But really, from the musical point of view, any given vertical harmony itself is not in time at all. Unlike melody, unchanging continuous harmony is not a musical function of time. From the subject-orientated position, pure unchanging continuous harmony does not have an 'objective' time element to it. Any change in it introduces

time, not as the clock implies, but as persisting relationship in the awareness, of what was, to what is.

In order to 'crystallise' harmony into a set of fixtures, in order to *condition* it so that it can be recreated across *time*, a *harmonia* is necessary, whether deliberately 'worked out' or not. *Harmonia* is a static principle of the whole, that fits everything together, allowing harmony that constantly changes, in time, and necessarily includes disharmony. This much about both senses of the word *harmonia* is clearly present in the symbol of the Pythagorean Circle.

Chapter 11 – *Harmonia*, the universe and the soul⁴¹⁵

It is reported that the Pythagoreans considered the soul to be a kind of *harmonia*, or an 'attunement'. It was said to be 'in' the body as the *harmonia* is 'in' the lyre, when the lyre is in tune. This raised questions concerning other arguments for the immortality of the soul. If a *harmonia* is a consequence of right relationship (proportion) between the strings, then it vanishes when the lyre is destroyed, or the strings go out of tune. Thus, by analogy the soul must be destroyed when the body, or the condition of right relationship between its vital parts or elements is destroyed, in what is called death. On the other hand, the Pythagoreans are supposed by some of their interpreters to have held there to be a mathematical Reality that is transcendental to the material world. On this basis, the *harmonia* survives unaffected in mathematical Reality when the lyre is detuned or destroyed, and consideration of the soul as a *harmonia* does not affect its immortality.

In *Phaedo* Socrates argues that the soul is immortal and is not a kind of *harmonia*. The argument rests on the notion that a lyre can be more or less in tune, and contain more or less of a *harmonia*, whereas a soul cannot be more or less of a soul.⁴¹⁶ Also, different souls can possess different qualities of intelligence, goodness, ignorance and wickedness etc., whereas this kind of differentiation and combination of qualities does not exist between *harmonias*.⁴¹⁷ Clearly the meaning of *harmonia* in the musical context here is that there is but one *harmonia*, one tuning.

This does not mean that Socrates did not relate the concept of *harmonia* to the concept of the soul. He did so but in another way. The idea of *harmonia* occurs in the Myth of Er related by Socrates, but here it is 'transcendental' to the material world, in that it is beyond death - it is not of this world - but rather, it is depicted as the 'harmony' of the great system in which souls are by necessity involved in the cycle of life and death. However, since it is generally not sensible to take the content of myth literally, and for the reasons I have already argued, we are at liberty to say that in the Myth of Er the transmigration of the soul as a continuing entity from one incarnation to the next, is not a literal 'diagram' of the truth that the myth supposedly stands for. The actual

⁴¹⁵ For this chapter, cf. Plato, *Phaedo* 84a – 95a, Plato, *The Last Days of Socrates*, Tr. H Tredennick and H Tarrant, London, 1954, 1993, pp. 143 – 157.

⁴¹⁶ *Ibid.*, 93b-c.

⁴¹⁷ *Ibid.*, 93c-d.

transmigration of the soul as a continuing entity is not really what reincarnation in the Myth necessarily means. What stands unaltered from Socrates is that there *is* a connection between the idea of *harmonia* and death, and that the difference between a living body and a dead one is that there is *life* 'in' it. What should we say is the relationship between life, death, *harmonia* and 'soul'?

I have already argued that the source of Socrates' wisdom is not discursive thought, and that his engagement in this as a means of communication is a 'top down' activity of attempting to express self-knowledge in the logical space of thinking. Whether we credit Socrates, Plato, or both for this, matters not – it is the principle that is important. Unfortunately, Plato is usually interpreted in terms of his 'theories' and 'arguments' and the tenability of the relationships between them. It seems perfectly clear that in Plato 'Reason' as practised by the philosophers, is not merely an intellectual search for knowledge, but includes the practice of self control, self responsibility, the pursuit of self-knowledge, and ultimately is about finding the truth of death. In the arena of discursive argument Socrates utilises all kinds of ideas and pre-existent beliefs as the medium of communication. When the discussion enters the area of knowledge beyond death, the discursive method in Plato is abandoned, and communication through direct mythical discourse takes over.

In *Phaedo* Socrates' argument that the soul existed previously to its current incarnation stands fast in Plato's discourse, in that it is accepted by the other philosophers. Socrates' *reasoned argument* for the *immortality* of the soul also stands – but only in that the soul is 'un-dying', *not* in that it continues after death.⁴¹⁸ The nature of 'the soul' as a continuous surviving entity that *transmigrates* from one incarnation to the next is still not established as a consequence of its immortality. This is never satisfactorily confirmed outside the context of mythical discourse. The reason this state of affairs is patched together by Plato's interpreters into a scenario in which Socrates is supposed to believe souls circulate intact in and out of bodies in a manner akin to taking the Myth of Er⁴¹⁹ quite literally, is, I propose, a consequence of understanding Plato in an object-orientated way, that does not befit the implied subject-orientated source of Socrates' wisdom.

⁴¹⁸ *Ibid.*, 100b-106a, pp. 163 – 172.

⁴¹⁹ And Socrates' account in *Phaedo*, 107e-d.

Now for a contemporary reflection on this. To begin with, from the *subject-orientated* point of view there is no meaningful *object* called 'the soul'. The thing called 'the soul', is a mentally postulated *proposition*. The 'soul' may be meaningful but if it has any subject-orientated meaning it has to be known from the subject-orientated point of view *as* the subject, through self-knowledge. In this case, we might as well talk about *self*. There are numerous different ways one could translate the contents of Plato or earlier sources into more contemporary terms for a relationship between *harmonia*, universe and soul. I offer one in what follows, but rather than addressing *soul*, what we address here is *self*. If anything about 'the soul' is to be known through self-knowledge, then we have to address self first.

Self and thinking are related. For thinking to take place there has to be a self. The first thing to be said is that the knowledge beyond death mentioned above is observed by Socrates in the intellect, but unlike everything else, it evidently will not lend itself to demonstration in dialogue with the other philosophers, through the apparent process of reasoned deduction. The scenario for the truth of death Plato indicates, especially in the Myth of Er, certainly does not pass the test of *Occam's Razor* – for example as a 'logical' extension of what is otherwise established by the philosophers in so-called Reason, we do not *need* the *harmonia* between the Fates and the implications about planets and planetary characteristics. This is an unnecessary proliferation of entities. At the same time, it would be wholly out of character for Socrates to have merely accepted these details from pre-existing beliefs as correct. He soon rejected the popular belief that the soul is like a *harmonia*!

The 'logical space' of the developing dialogue is, in effect, the employed 'logical space' of thinking. Plato is implying that not everything that can be observed in the intellect can be arrived at through the 'logical space' of thinking, although it can expressed in the logical space of thinking, once observed. In dialogue, the other philosophers test what Socrates says against experience and the intellect, approached through the logical space of thinking in which the dialogue takes place. Why does Socrates see more readily solutions in the intellect than the other philosophers?

If Socrates *has* a superior intellect, why does he say that he alone knows he knows nothing? If what he sees is only of *his* intellect, why do the other philosophers come to agree with

him? Presumably because they share the same 'logical space' of thinking as Socrates, and agree what he says makes sense in the 'logical space' of thinking.

What I want to lead onto now is this - and it requires abandoning the mental association of the concepts 'logical space of thinking' and 'the intellect', with individual, organic animal brains. Rather, we have to consider something more universal, at least at the scale of the species that we constitute. What I now propose is this - the philosophers share the same *intellect* as Socrates.⁴²⁰ If we feel an immediate objection to this it is because we consider the intellect to be an individual faculty of thinking in 'logical space' (the space of thinking in which things 'make sense'). But I suggested above that things can be observed in the intellect that cannot be approached through the 'logical space' of thinking. In this sense the intellect is not itself the faculty of thinking in 'logical space'. The idea that there is one intellect is not so far removed from the idea that there is only one logical space for the behaviour of natural phenomena, or only one species that we can be.

However, if the philosophers share the same intellect, as I have just proposed, why is Socrates more able than the others? The answer, as this thesis proposes, is twofold. Firstly the ability to *think* in 'logical space' of any kind is *individual*, and the intellect is, in the case of evolutionary self, normally approached through thinking. Secondly, the intellect can be 'looked into' directly without the need of thinking in 'logical space', and the impediment to this is actually the action of evolutionary self thinking. Socrates knows he knows nothing, yet he is the wisest man in Greece. This does not just mean he alone has sufficient self-knowledge to know his own ignorance. It means he has the power to know nothing - which is the power to look into the intellect without the impediment of evolutionary self, and its need of evolutionary thinking and knowing, based on the evolutionary self/not-self duality. This is where Socrates, with his *immediate* self-knowledge of The One, or Being, differs from the other philosophers. Plato does not indicate this power comes from cogitation. It comes from the *practice* of 'philosophy', which is not to be confused with the *discussion* of philosophy or the *discursive* arguments for what it reveals, as it occurs in Socratic dialogue. The power is distilled from the reducing need of experience in, and reducing attachment to the material world. This is participation in a process in which already nothing survives, and it correlates to the reducing need to fear evolutionary death -

⁴²⁰ This is not an original proposition of mine. c.f. Long, B, *The Origins of Man and the Universe*, London, 1984, 1998, p. 105.

the end of involvement in the material world - self in form. It is no wonder Socrates has no fear of death – he already knows his self, the world in form, and knowing it, with sufficient self-knowledge to know the truth of it, he sees through it. He sees through his evolutionary self, through the evolutionary world, and through evolutionary death. The intellect is the ability to perceive the truth of the universe through whatever impeding medium evolutionary intelligence provides. The result does not approach the truth of the universe or knowledge of the intellect itself, until the impeding medium is sufficiently aligned with the intellect, sufficiently ready to transcend its own evolutionary position and see through itself, and through time. We can say the intellect does not 'belong' to Socrates, to any of the other philosophers, or to the reader of these words – it is free of human self, it 'belongs' to humanity, or if we like, the universe.

In subject-orientation the experience of *life* is as self. We know that the evolutionary survival principle out of which the brain-body system arises, requires instinctual 'drives' for *self survival* at the individual animal level – survival and protection of the body – as a *pre-requisite* at least for a time, before other mechanisms such as self sacrifice for the propagation of the species could possibly take place. The survival instinct transposed up into self-consciousness becomes the urge for self survival, but self in this case is now no longer just the body. It is a psycho-emotional entity also. Nevertheless, it is identified with the animal body.

The human self does not just see other human bodies – it sees other human selves like itself. Not questioning its own reality, it sees the death of other bodies as the death of other selves, and the threat of death to its own body, as the threat of self-annihilation. It is not really the death of body that self fears, but rather it is a) the death of self, and b) the loss of the world. The two amount to the same thing from the subject-orientated position, but self, thinking in 'logical space' often denies that it fears its own death, whilst it still fears anything that threatens the end of the world. This is the taking of an evolutionary position, it is a lack of knowledge of self beyond its evolutionary position in time.

This situation creates the psychological and emotional need of the idea of survival of *self* beyond physical death. But in humans, it is not just fear of self annihilation that creates this need, or this need of belief in endless survival. It is also the unconscious knowledge that the appearance of the necessary, evolutionary event of annihilation by death, is actually an illusion. This

knowledge comes from unconscious but direct, natural contact with the intellect, in which it is possible to see that evolutionary self is entirely illusory, and that therefore death of evolutionary self is possible without annihilation of the consciousness on which it depends. However, consciousness as evolutionary self knows it, is obviously not what consciousness is, without evolutionary self.

The attempt to escape death by inventing in thinking, self-survival after death, is not necessary, because the death we are trying to escape only relates to the evolutionary scenario of psychical and physical survival of the person, which is not real anyway. It obscures the intellect, which is outside time and evolution, and prevents consciousness of the time-independent process in which nothing survives.

That death of self is annihilation, is a deduction in the (self-conscious) evolutionary logical space of thinking, that arises out of evolutionary self. It is not a part of self-knowledge. The object-orientated thinking processes are movement and activity that tend to obscure the subject-orientated potential to observe that even in life, in time, death of self already *happens by degrees*, especially when the subject consciously participates in a process in which nothing survives. When self is involved in a process in which it is constantly changing by not surviving, then it is seen that the burden of ensuring survival of self is actually not necessary because there is no 'annihilation of life' to avoid – there are only physical processes of living and dying, and the greater process in which nothing survives – the process of coming to know what is not of this world. This is seen using the intellect. At the same time it is seen that the intellect on which all thinking relies is not a consequence of self thinking, but is transcendental to thought.

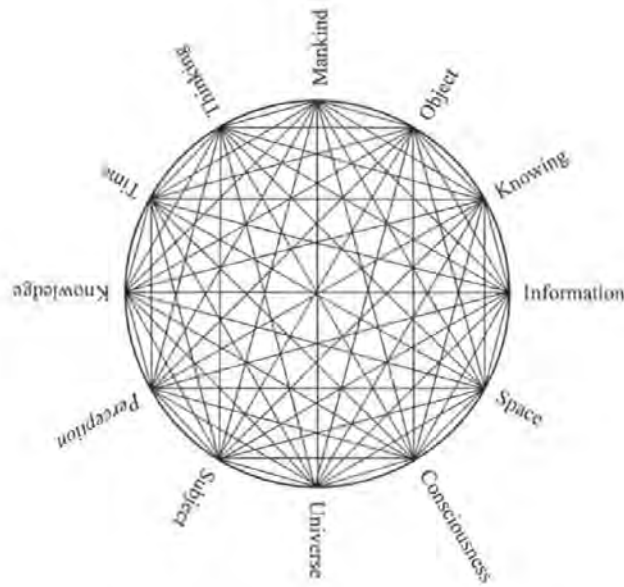
Nothing surviving in the Myth of Er

The *content* of Plato's Myth of Er can be related in the following way. Like all Myths, the Myth of Er can be considered as an example of what Schopenhauer called a 'comprehensible substitute for the truth'. Every element in the story is a mythical symbol. In particular, the myth as Socrates tells it appears to be a scenario of *metempsychosis* – the transmigration of the 'soul' from incarnation, through a process between incarnations, and back again into incarnation. Thus, in the scenario as it appears, there is a self-entity, the 'soul' that *survives* throughout the process. The elements of the story dealing with this correspond with the general principle of the Buddhist and

Hindu religions, in which life and death are cyclic. The doctrine of reincarnation as it is widely understood allows for this survival of self as 'soul', the form of each life being determined by the actions in the previous life.

I have asserted that music is ultimately part of a process of which survival is not the point. Thus, it could be argued that this thesis is fundamentally at variance with the account of the music of the spheres encapsulated in the Myth of Er. My answer to this is that as Schopenhauer perceptively recognised, the notion of ultimate self survival in the doctrine of reincarnation, is itself, like any doctrine, also supposed to be a comprehensible substitute for the truth, all the more appealing because it promises self survival. The Myth of Er is in the class of the general doctrine of reincarnation, which Schopenhauer adequately addresses. The doctrine of reincarnation as the transmigration of a surviving self from one incarnation to the next, can be understood as merely a simple conceptual representation of a process in which reincarnation, as Schopenhauer puts it, is really through a *psychical* version of *palengensis*. In biological palengensis no individual self survives – the species which we say survives, is a concept whose reality in matter at any time is only through the physical individual members who ultimately *do not survive*. The reality of 'the species' outside material form, is abstract. Only in as much as a member's *identity* is with the abstract thing called *the species* does that member 'survive'. No individual member passes from death to birth, but births continue to arise. By analogy, in reincarnation, only in as much as the identity of a 'soul' is not with a given 'incarnation', but with the great process in which nothing 'survives', governed by *harmonia* and the Fates, does the notion of 'survival' in continual incarnations, have any meaning. To put it another way, only when a soul enjoys a state of consciousness in which nothing survives, and in which reincarnation is obvious, but an illusion, does reincarnation have any truth in it. Where there is no such consciousness, there is only the *notion* of survival from one birth to the next, and no truth in it.

Diagram 3 :



The nature of the Pythagorean Circle and its relationship to harmony can be used as a symbol in a more extended context than that related to musical scales. Each element round this circle in diagram 3 now represents a concept in thought. Everything round the circle is related to everything else, either round the circle or along the straight lines of connection. Like the Great Circle of fifths, it is a diagram of a *harmonia*, in the sense that something fits it all together, but here, the *harmonia* fits together the concepts in thinking. It is a *harmonia* of thought – of understanding in human thought. The diagram could equally well have had *any number* of elements. The twelve it has are not special. The diagonals connect conceptual pairs or opposites, as I have presented them in this discourse, but this is not important.

The *harmonia* the circle represents can be whatever ‘temperament’, that is, theory, science or philosophy, that *thinking* applies to the conceptual elements – it depends on the philosopher, the scientific theories, or the chosen arguments. All kinds of conceptual equivalents of ‘commas’ may be introduced as a result of the way the concepts relate, sometimes confirmed by observation of natural phenomena – all kinds of puzzles, paradoxes and problems - but that part of the universe itself, the part the Circle purports to represent, like the natural harmonic series, has, so to speak, no ‘problem’ or ‘puzzle’ in itself.

The whole thing is a diagram of thinking relationships between the elements. We can say it is the human brain that does this *thinking* – but we can also view that as only one of many working

hypotheses, given the complexity and variety of object-orientated theoretical possibilities for explaining things like consciousness, human intelligence and thought. We can just as validly say, from the subject-orientated point of view, that it is *self* that thinks.

So the whole thing is a diagram of *something self does*. It is a diagram of all the elements, the relationship between the concepts, from the point of view of self. What I said above could 'not be drawn' - the absence of self - *could* be diagrammatically 'drawn' as the disappearance of this diagram. This might seem rather *Zen*, but it is not *Zen*, because unlike *Zen* I have more to say about what it *means*, but it certainly shares with *Zen* a relationship to what is intelligible, but unapproachable through rational thinking.

The disappearance of the diagram would not necessarily mean the disappearance of self, but it would represent the disappearance of the self thinking. The disappearance of the diagram would represent the disappearance of the elements as concepts, like the disappearance of the implied scale design and its notes from a vanishing Great Circle. The harmonic series behind the notes of a scale still remains in nature as a natural 'structure' when all *scales* and Circles made in human thought vanish, but this remaining 'structure' is *not the same thing* as the notes of any scale or temperament - it is just the natural *harmonic series*. If we now, metaphorically speaking, jump to the next octave, the 'structure' I am proposing to which the concepts round the circle actually correlate, still remains when the diagram vanishes and the thinking stops. But this 'structure', again, is not 'made' of the concepts, just as at the lower metaphorical octave the natural harmonic series is not made from the temperament or scale. The structure the circle represents is not *necessarily* an objective thing, but we objectify it in thinking, because we *necessarily* make it a *concept-structure* in order to think about it.

Let us say that *in principle* we could put round the circle *all* the concepts we need to map out the entire universe conceptually. It would have to include things like mind, consciousness, gravity, self, life, quantum, love, matter, death etc, and unless the *harmonia*, so to speak, really was a 'theory of life the universe and everything' we would expect some connecting lines to have zero 'knowability'. Again, this would be a concept-structure, but one that is supported never more than a part at a time by actual observation. The whole conceptualised universe, is never observable at once.

The very term 'whole universe', meaning absolutely and completely *everything*, is a presumption in the first instance. It begins as a concept in thought, and then ends as a concept in thought. In between, it is partially supported by observations of the behaviour of *parts*, but the conviction that there is such a thing and that we should gather data on the basis of this presumption is only psychological in the first instance – the object in thought named 'the universe' as implying the inclusion of the unobserved, the possibly unobservable, the unknown, and the possibly unknowable, is a proposition, not a fact. It is felt to be the 'logical' extension of the immediate world perceived by self-consciousness occupying a world of not-self, but it can only be only *presumed* in thought, that such a thing is either known now, or remotely knowable.

The word 'universe', as we know, means *everything turned into one*, and in *object-orientated* thinking this is a *thought*, a concept, named 'the universe', that is equivalent to $\mathfrak{U}$, the *Universal Set*, the concept in mathematical thinking. The whole process works as follows:

As soon as we *think* about 'the universe' we instigate object-orientation – the object called 'the universe' is literally instantiated in thinking. Having instantiated the object we can talk about its properties and 'methods' etc. In this respect the analogy with object-orientated computer programming is quite close. The actual instantiation of the object in thinking can be *observed* in practice, at the moment *thinking about the universe* begins. It may begin as an 'empty' object with no properties, on some suggestion like 'let's think about *the universe*', or it may begin with all kinds of pre-conceived ideas as its properties and 'methods' etc. It may or may not include the thinking subject. The critical step is the tacit ascription of the unique property $\mathfrak{U}$, which is that the object 'the universe' has the property of being the set of everything. We do not have to take this step, but generally, if we are employing critical thinking, we do.

The concept $\mathfrak{U}$, is 'intuitively compelling' in thinking, and arises, let us say, as an extension of a subconscious knowledge from practical experience, which when made conscious is the notion of *sets*. The basic relational principles of sets, *seem* to be an incontrovertible pillar of reason itself. However we now know that the principles of sets inevitably contain *antinomies* such as Bertrand Russell's famous paradox, and that sets are not an axiomatic foundation for a system of certainty, even after a theory is formalised in a way that attempts to avoid antinomies.

We can *observe* the mind in action, that is, in the action of object-orientated thinking.

Consider the Russell paradox itself. We define an *R* set as a set of sets that includes itself. For example, *the set of all objects describable in exactly eleven English words* is an *R* set.⁴²¹ Now we define a set *M* as the set of all possible sets except the *R* sets. Now we ask is *M* an *R* set?

It is not the paradox that is important here, it is the *observation* of *what the mind does* as it attempts to 'work out' the answer to that last question, and the quicker it answers, the quicker one has to be to see it in action. I am assuming one tackles the problem as one of 'intuitive logic' and not as one of mere algebraic operation. Even if one already knows the answer, it is necessary to actually watch what the mind does in *checking out* the answer again. The action of the *logical process* in the thinking, takes place in a pre-existing 'logical space' in this part of the human mind, in which this kind of *thinking logic* 'makes sense'. One needs to watch it. Once *observed* in action, the process could almost be called mechanical.

The process of creating the concept 'the universe' to mean absolutely everything (rather than just the observable cosmos), is observable as another process, but one that happens in the same, or similar 'logical space', with a similar mechanicalness. This logical space is *in the mind*, determining 'reason' and 'what makes sense', in the current field of thought-objects. The mind, connected with the brain, connected with the physical senses, connected with the animal, evolutionary body, is connected with existence and survival in the sense-perceived physical world, and so there is a certain correlation between the 'rules' of this logical space and the 'rules' of local phenomena in the sense-perceived physical world. This logical space we can observe in consciousness, is part of self. The sense-perceived physical world for the survival purposes of the evolutionary animal is not-self. The experience of this state of affairs in human self-consciousness is a duality between self thinking in logical space, and the sense-perceived physical world of not-self.

Human enquiry into natural phenomena is a process that uses experiment, study, education and learning. Through these we change our concept structures and thinking methods in logical space, and attempt to improve their correlation with natural phenomena. Study, education and learning shortcuts the need to repeat the experience that produced the information now available for

⁴²¹ Davies, JD; Hersh, R, *The Mathematical Experience*, Middlesex, UK, 1981, p. 332.

learning. At the same time this has been a process towards emphasis on object-orientation, and elimination of self from the enquiry. This has the effect of putting an increasing *psychical distance* between logical space and other aspects of self, so that conscious attention can generally only be in one or the other. Thus mathematical thought *appears* abstract and 'objective', and not related to say, emotional self and thinking consideration in this area. This is an illusion due to this psychical distance, because emotions, emotional thinking and syllogistic logical thinking are all proximate in self, all being part of self's activity. Nevertheless mathematical thinking does take place in logical space remote from the space pertaining to say, emotional thinking.

This psychical distance is necessary. Without a good psychical distance between logical space and the rest of self, logical space becomes easily infected by other aspects of self, especially emotion. So without this distance, the rational and reasonable nature of logical space becomes corrupted by active emotions, and the capacity to think rationally and reasonably is lost. Perhaps because of a *survival advantage* offered by the capacity to think rationally and reasonably despite emotional activity, the potential in us to increase this psychical distance through applied effort, exists in us in the first instance.

Homo sapiens, the physical animal with the amazing brain, the vehicle of self-conscious self, is itself, brain and all, a part of the sense-perceived physical world from which, so to speak, it is actually made. There is only one physical system, one set of matter, one set of natural phenomena, but there is duality of self and not self, from the subject-orientated position. From the point of view of the universe, there is no such duality.

Logical space can be explored away from the physical senses, 'in the abstract', which really means *in thinking*. Thinking is not really *abstract* at all, we only *think* it is. Thinking *takes place in self* (which is not 'abstract' at all) including this kind of thinking in logical space that instantiates objects of thinking, and assists the thinking processes by using symbols to stand for the objects, as in mathematics. The 'rules' of logical space then become 'externalised' in symbols, and logical space can be explored beyond its natural presentation in sensory experience. So it is we can explore things like the topological properties of 'exotic spheres' with multiple dimensions, that we have never experienced except in remote logical space. It seems that the contents of this part of logical space are 'abstract', - that we discover them outside self, through this tool called mathematics that is outside self, that deals with what some mathematicians think of as an abstract

'Platonic Reality' (Plato never said Reality was mathematical, or abstract. What he said was that Reality is Being).

What we actually do is externalise or 'discover' what is inherently already present, but unrealised, in unbounded logical space in the mind. Because what we *learn*, has been externalised through the process of accumulative objectification (mathematical and conceptual 'discovery' over thousands of years), we first *consciously* encounter it in the objectified external form, usually expressed in object-symbols like those of mathematics, and think it is absolutely not-self. The truth is, that as long as we understand it, it is just as much self as it is not-self. Otherwise it is nothing more than a lot of meaningless symbols.

Now the 'universe' that my Circle of concepts, or any nexus of concepts represents, consists of facts and relationships in logical space, but this logical space is as much a part of self as a part of not-self. Neither exotic spheres or quantum phenomena 'break the rules' of logical space, which is well separated from the rest of self. They are both logically sound. Quantum phenomena is perfectly consistent with mathematical logic. But this *logic* is the logic of remote logical space, space well psychically distanced from the rest of self. Exotic spheres in logical space do not (as far as I know at the time of writing) correlate to physical phenomena, but at some time they may, because logical space and physical phenomena are all part of the same, single system, and there are many examples of esoteric areas of pure mathematics subsequently finding application in physical science and thus becoming better known. Quantum *theory* however does correlate to quantum *phenomena*. Quantum *phenomena* is observable by self, as a part of not-self, but not *directly* through the senses. It is observable in phenomena through its effects, through apparatus, which is in correlation with thinking in lower (not remote) logical space, space that correlates well to everyday phenomena in the world of animal survival. Exactly the same thing can be said of Relativity Theory, which occupies a different part of remote logical space. Quanta, large gravitational fields, and things moving close to light velocity, have not been pertinent in the scenario of sense-perception and animal evolution. This is something to which only lower logical space is required to correlate. The so-called 'collapse of the wave function' in relation to quantum theory is actually a 'quantum jump' from remote logical space to lower logical space.

The lower 'logical space' correlates to the world as presented through the animal senses but with no appreciable psychical separation from the rest of self-space. Its 'logic', the 'logic' of

thinking in it, correlates to the logic of local natural phenomena, but it is also the native space of the 'logic' of the self to not-self relationship. This 'logic' is mutable, depending on the emotional and psychological condition of self. This is a most unreliable space, in which even the perception of the nature of natural phenomena is easily distorted. Only to the degree to which the 'logic' of the self to not-self relationship is distanced or absent does thinking in logical space become less troublesome, tricky, and liable to mislead. The greatest distancing is achieved by thinking in *remote* logical space, and externalising the 'logic' in algebraic symbols. However, this all still takes place in logical space, which is still in self. The whole scenario, the whole 'world' that is being 'understood' is a 'universe' of logical space accessible only in the evolutionary mind, and natural physical phenomena.

This is not yet *everything*, because there is also the rest of *psychical* space, in self. In a sense, if we want to say that animals *think*, then we can say they do so in a 'logical space' that pertains to the 'logic' of animal behaviour, survival, etc. This psychical space exists as an underlying area in our own psyche to the extent to which the human brain includes the animal past in its structure. However, because we humans have self-consciousness, we also have the area of psychical space pertaining to our own 'self-logic', the 'logic' of self-conscious self that the animals do not have. This is the 'logic' of human psychical self, the 'logic' of the world of *persons*. 'Person' is our rational word for human psychical self. The 'logical space' of the *person* is at its base, the 'logic' of animal self in the world of survival 'projected' or raised into the higher psychical space created by our ability for self-reflection – the space of self-consciousness. Its principles are an 'image' of those in the lower logical space that serve the world of animal survival. One of the effects of this is that all kinds of scenarios and behaviours that occur in the world of animal competition for survival, now occur again in the uniquely human world of persons. However, here it is no longer just the survival of the animal that is being served, but the survival of the *person*, the human psychical self. The world of *persons* is operating on a bed of principles derived from those pertaining to the survival of animals in the wild, but it becomes complicated by self-consciousness and our ability to think in higher logical spaces. This thinking is often used as a tool in the struggle for survival of the *person*, against the competition of other persons, as quite distinct from survival of the body. This might manifest climactically as what is colloquially called a

battle of egos, but really, *ego*, literally meaning the individual 'I' necessary for the body's protection, is not the cause. The cause is self.

Not all of these logical spaces are remote like the logical space of mathematics. There is, for example, the 'logic of law', not the laws of natural phenomena, which pertain to a more remote logical space, but human laws, both unwritten sociological 'laws' and formal statutes. The 'logic' of the nature of this space is of course *related* to higher logical space, but at the same time its nature is so different to that of remote 'logical space' in which we think about pure mathematical problems, that it can hardly be called 'logical' at all. It is the 'logic' of the collective world relative to self-reference, self interest and self protection. In it, the 'logical' relationship of self and not-self is highly pertinent.

Then there is the 'logic' of dreamstuff – only very partially does it correlate to natural physical phenomena, and sometimes not at all. Deeper down even all *concepts* and *objects* disappear, and there are only presences or 'energies', the stuff of nightmares or ecstasies. In object-orientation we would call this deep brain phenomena, the phenomena of the subconscious or *id*. From the subject-orientated position, it is just what it is experienced to be. In here, the 'psychical distance' from lower self we achieved in remote logical space is lost, although the 'dream' image of it can remain – we can do algebra in a dream but the results may not correlate so well. We are now immersed in self. All this, from the very remote to the unconscious *id* is the only 'universe' we can conceive and *think* about. Even the *conception* of God or any 'other world', or the *thinking about* it, is all in *this* 'universe', this 'set of *everything*'.

Diagram 3 is an object in logical space. The form of my diagram may not truly represent how the concepts of the nexus would be related for describing a given aspect of the universe. However, we could say the general form of the diagram is F . F may even be non-integral, unrepresentable or unknown or unknowable, for we do not necessarily know in thought the form or complexity of our own concept-structures and mechanisms of thinking. The 'structure' that lies behind F , the 'structure' that is independent of F , is a part of whatever it is that we give the object name 'the universe'. We could 'object-orientate' it, objectify it, give it a symbol, and call it U_p . U_p does not 'exist in logical space', or include things like Euclidean space, Hilbert space or

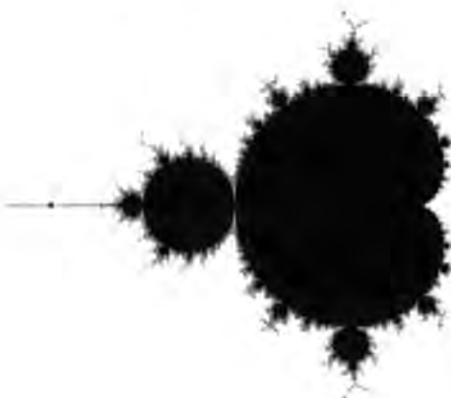
Relativistic space-time, because these are all parts of the object-orientated concept-structure. It does not exist in any kind of mathematical space which makes sense in the processes of thinking.

Without the diagram, the space in which this 'structure' U_p still exists, is the space I have called *perception*, that distils in the subject, from the disappearing need of experience, and the consequent disappearing need of thinking as a process with which to try to work it all out. The relationship of the *subject-orientated universe* to the object-orientated concepts used in describing and understanding the universe in human thinking, would then be like the relationship of the Beauty of the harmonic series to notes in objective scale tunings or temperaments. It would also be like the relationship of Socrates' knowledge, to the apparent flow of thinking in the Socratic dialogues. This U_p is the universe that is appearing as both macrocosm and microcosm.

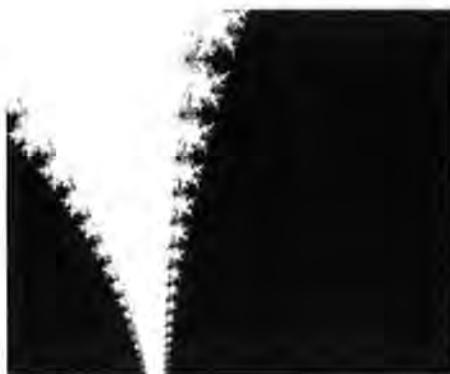
Chapter 12 – Symbols of macrocosm-microcosm correspondence

An object-orientated macrocosm-microcosm ‘correspondence’

The concept of a whole (macrocosm) that contains parts (microcosm) that themselves contain the image of the whole, is encountered in an object-orientated way in fractals. The well known Mandelbrot set figure is an example of fractal geometry:



The figure is actually a mathematical mapping of a set of complex number values on the complex plane, so in principle the figure itself has no limit of resolution determined by reprographical considerations like raster (pixels per cm). In principle it is possible to ‘zoom in’ on any part and examine it in more detail. In practice this is achieved by computer regeneration of any chosen part. It is already possible to see that the whole set contains parts that look rather like the whole set itself. A close-up of one particular area between two dark areas looks like this:

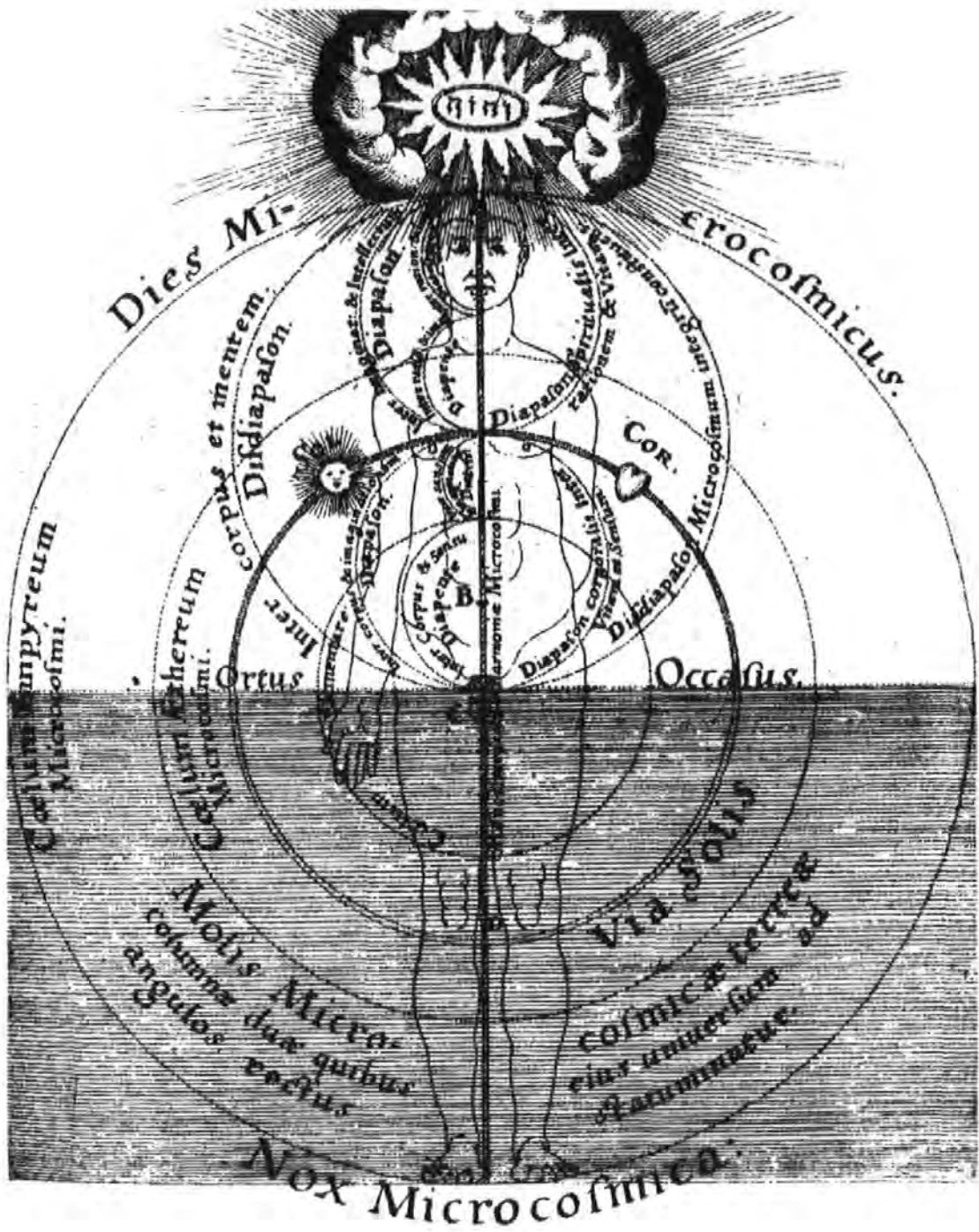


Again, the ‘buds’ on the side of the large curves resemble the entire set. Many examples of fractal geometry also occur in nature, and are frequently seen in sea and plant life where fractal spirals are

common. This kind of microcosm-macrocosm relationship exists in logical space but is one sided - it is object-orientated only. The figures above are object-orientated diagrams of an object-orientated relationship between quantities. A diagram conceived from the subject-orientated point of view would be in essence, quite different, even though it might be presented in terms of object-orientated relationships between the objects that appear in it. We come next to this kind of diagram.

Subject-orientated correspondence

The macrocosm-microcosm relationship that provides for the relationship of music with *perception* that this discourse has explored, is a relationship in logical space, but it is of a different kind, because it is fundamentally subject-orientated. The relationship of microcosm to macrocosm from the subject-orientated position can also be drawn in diagrams, and was, by the neo-Platonists. We look at an example here by Robert Fludd:



This is one of a number of diagrams by Robert Fludd (1574-1637), from his *History of the Macrocosm and Microcosm*.⁴²² Fludd is one of many proponents of Christian esoteric spirituality including Origen, Hildegard, Eckhart, Ficino, Boehme, Emerson and Steiner.⁴²³

⁴²² *Utriusque Cosmi majoris scilicet et Minoris Metaphysica, Physica Atque Technica Historia...*, Tomus Secundus De Supernaturali, Naturali, Praeternaturali Et Contranaturali Microcosmi historia, in *Tractatus tres distributa*, Oppenheim, 1619, p. 275.

⁴²³ Godwin, J, *Robert Fludd*, op. cit., p. 19.

This is a diagram with *metaphysical* meaning that appears to show how the macrocosm is contained within the microcosm. At the top of the diagram is the Hebrew Tetragrammaton, the mystical (and unpronounceable) Word or Logos. From it extends a harmonising monochord string through the 'light microcosm' (consciousness, knowledge), down to the bottom of the 'dark microcosm' (relatively unconscious matter). The legs are a 'mass of microcosmic earth...by which the universe is supported at right angles'. The microcosm is encompassed by three concentric spheres corresponding to the Empyrean, Aetherial and Elemental heavens (c.f. Philolaus' three suns). The sun and heart divide the aetherial microcosm on their clockwise paths. The 'light microcosm' is proportioned (right relationship) as the harmonic proportions of the monochord.

The node points on the monochord correlate to the same positions on the body associated with the *chakras* (psychic centres in which the attention is immersed in Buddhist, Hindu, and other forms of meditation), except that the Eastern *chakras* include the *Muladhara chakra* at the base of the spine and the *Swathisthana chakra* at the genitals, whereas in Fludd's diagram there is a single point at C. The relationship between the Sun and Heart (at the heart position, the *Anahata chakra*) is one that occurs in Western astrology. There is a certain amount of confusion over Sun, heart, and positions represented in the external body, both in Fludd and between more modern systems like theosophy and Eastern tradition. The *Manipura chakra* is sometimes located at the navel and sometimes at the Solar Plexus, but navel and Solar Plexus are always two distinct centres with distinct associations and qualities. We could also ask 'why is the Sun not associated with the *Solar Plexus*'?

We are dealing here with a quasi-science and as is also the case with astrology, this means the understanding of the quasi-science should not be solely object-orientated. If there is any truth at all in the representation, it is not supposed to lie in the informational objects. The centre of this system of concepts is not an object – it is the subject, the microcosm, which in external sensory form appears as the material symbol – the body in the diagram.

The diagram is not specifically about the *effects* of harmony (and music) on the psyche, but it demonstrates in diagrammatical form the means, which is that the microcosm already 'contains' the macrocosm. What appears as a *cause* in the macrocosm is already *in* the microcosm itself. The *correspondence* is not the mere correlation of symbols, any more than is Schopenhauer's *representation* (*Vorstellung*). The microcosm is self, and as Fludd depicts in the diagram, it is an

ascent of self-consciousness from *Nox Microcosmica* upward to the unnameable Absolute or One, the Tetragrammaton always above even the highest *Dies Microcosmicus*. The self-conscious microcosm, harmonised in this ascent by the monochord of the Tetragrammaton that holds it all together and draws the microcosm up towards itself, aspires in the ascent, to become the conscious macrocosm, the Tetragrammaton.

The harmonic proportions between the *chakras* represent 'harmony in the microcosm', and if this seems rather abstract, it is only because the diagram does not explicitly state in words what is *implicit* in it. The *chakras*, the positions on the body and the monochord, are not part of abstract theory but are practical positions used for conscious entry into the psyche (the microcosm) in many meditation practices. Every instance of psyche begins with a body-brain system, through which the subconscious and unconscious is *naturally* entered in every case, in a cycle corresponding to the rotation of the Earth (or Sun, if you use a geocentric system), in sleep. Thus we can see without any kind of esoteric meditation practice that our *ordinary* knowledge and encountering of psyche *already* corresponds to the celestial system in some way. The 'psychic centres' or *chakras* as positions inside the body into which attention can be immersed, are foci for *conscious* entry into the psyche 'through the body', whereas in sleep attention withdraws away from the externally focused senses and into the body, in a manner of 'freefall' so to speak, that allows mental and dream activity to take over.

This aspect of the diagram is not in itself mystical. There is nothing 'mystical' about sleep, nor is there about the fact that one can make a similar descent of awareness into the body, consciously, without allowing dream activity to occur. In Eastern disciplines the relationships between *chakras* are in terms of such things as mantric vibrations, elements, colours, etc. Fludd's labelling of the relationships between these centres in terms of the octave, perfect fifth and perfect fourth, indicates a relationship of musical harmony and psyche, according to his own discipline of esoteric spirituality, and no doubt, his own neo-Platonic beliefs.

The diagram as a whole is Fludd's description of the microcosm being one with the macrocosm. This correlates to the non-duality of subject and universe in Eastern religion and meditation disciplines, such as *advaita*. However, the diagram is a form that is itself *object-orientated* in appearance to the degree that it can even be mistaken for a theory of objective structure. Fludd's expression of his 'theology' in diagrams and symbols, many of which contain

quantification, led to his dispute with Kepler, in which Fludd said he held the head of knowledge, whilst Kepler with his scientific quantification, held only the tail.⁴²⁴ More poetical expressions of Fludd's philosophy appear in his *Tractatus Theologo-Philosophicus*.⁴²⁵

⁴²⁴ See Pauli, W, 'The influence of archetypal ideas on the scientific theories of Kepler', in CG Jung & Pauli W, *The interpretation of nature and the psyche*, London, 1955.

⁴²⁵ Fludd, R, *Tractatus Theologo-Philosophicus*, Oppenheim, 1617.

Chapter 13 – Further contemporary considerations on the macrocosm- microcosm

Reality

The questions raised in the earlier discussion about the implications of quantum theory regarding 'reality' can now be re-assessed. Bohm's 'multidimensional reality' is an object in thinking. We can approach this, and the situation regarding the interpretation of quantum theory, in another way.

Let us return to Bohm's question about *thinking* and *reality*. Bohm asked:

What is the relationship of thinking to reality? As careful attention shows, thought itself is in an actual process of movement. That is to say, one can feel a sense of flow in the 'stream of consciousness' not dissimilar to the sense of flow in the movement of matter in general. May not thought itself thus be part of reality as a whole?⁴²⁶

Bohm is talking here about thinking as a mentation – a deliberate mental contemplation and cogitation over a problem. This thinking, like the endeavour of science, is *object-orientated*, even though it reflects on the self's activity of thinking. This means the 'reality' in Bohm's last sentence is an object in thought. But it also means trying to use thinking to see behind thinking, and it cannot be done. It is like trying to make stillness through movement. Referring to this same *thinking*, one *subject-orientated* answer to Bohm's question is as follows :

'Reality as a whole', includes thought and self. The relationship of thinking to reality is that any such 'whole reality' that thinking can know, includes the thinker thinking about it. This 'reality' is never fully understood as a whole, unless that understanding includes understanding the

thinker. Trying to understand the thinker by first understanding this so-called 'reality as a whole' that arises in thinking, is a tail-chasing exercise. It is like trying to understand the computer code writer, through the code itself. What is needed is not a concept of 'reality as a whole' but self-knowledge of the nature of thinking.

Bohm's 'careful attention' that he mentions, and what it reveals about thought and movement, is not itself a product of his thinking. It is a form of his self-knowledge. If Bohm had realised this, he would have realised that thinking is not necessary for the solution to the question. Also, his description lacks accuracy. It is thought that self-evidently flows, not consciousness. Consciousness is not thought. *Cogito ergo sum* does not mean *I am because I think*. It does not mean consciousness is thinking. The closest ally the thinker has to knowledge of consciousness, is knowledge of self. The 'stream of consciousness' to which Bohm refers, is actually a stream of thought, and the similarity of its 'flow' to the movement of matter in general is because both happen *in time*. Time is fundamental to the nature of physical reality, or existence, as presented to the evolutionary brain. The only 'reality as a whole', as Bohm calls it, that thinking can know, must still include time and self, and thus movement, even if only as the thinker thinking it. Only if thinking stopped and self ceased could we get beyond this.

As I have proposed, the only thing available to us outside the evolutionary survival system of which we are a part is the intellect. Only the *concept* of the intellect, the object instantiated in thinking, is part of the thinker and thinking. The intellect itself has to be *discovered*, not deduced in thinking. While approached through thinking, it is being used without being discovered. It is a 'quantum jump' from the evolutionary part of intelligence associated with the animal brain of the species, to direct perception of the intellect through the medium of the phenomena that the intellect itself produces, without the need of any movement of thinking in logical space.

My suggestion about how this can happen, has been simply presented as follows: It happens through experience, which is subject-orientated. The only subject-orientated reality we know is the reality of experience. The perception I am talking about begins to arise when the need to experience is sufficiently reduced by having passed through sufficient experience in time, in the physical.

⁴²⁶ Bohm, D, *Wholeness and the Implicate Order*, London, 1980, p. ix.

All the noise about 'reality' is really nothing more than entertainment. The emphasis in Bohm's discussion is about the 'reality' of the world, or what is observed. What we should be doing is questioning the assumed 'reality' of the observer. The 'observer' is self, and from the point of view of the evolutionary intelligence identified as self, what this intelligence is studying in physics is 'not-self'. The concept of the duality of 'observer' and 'observed' is an object-orientated description of the evolutionary experience of self and not-self. It is, in effect, a concept produced by an evolutionary brain-body system, based on its experience of its own existence in the evolutionary world. This is no way to understand the impersonal, natural world as a whole, which is what science is aiming at, because from the point of view of the impersonal, natural world as a whole, this duality of self and not-self is non-existent.

Why should we be uncomfortable with knowing that the world is non-local, such that there can be instantaneous communication between parts? Only because the theory of relativity forbids it. If relativity is 'correct', then, says Gribbin, the world is not 'independent of the observer'. Why should we be uncomfortable with this? Only because it means that if the observer disappears, the world disappears also, and that seems to conflict with our understanding of the world. It does not actually conflict with simple, subject-orientated experience, in which the world *does* disappear when the observer disappears into deep dreamless sleep. The conceptual problem arises because of the way Gribbin, and we, *think*. We *think* the way the evolutionary survival system has made us think and experience, that is, egocentrically, as self in a world that is not-self, which when we conceptualise and objectify this in thought, becomes the duality of a) 'the observer' and b) the world that is 'independent of the observer'.

If relativity is 'correct' then we must put the conclusion the other way around, with 'observer' first. We must give up the 'logical' need of self or 'observer' to *be* independent of the world. We must say the *observer* is not independent of *the world*, which is simply that self and world are one system. Now the original statement that 'the universe is not independent of the observer', is the same thing as saying the *observer* is not independent of *the universe*.

We feel this explains nothing and does not address 'the problem of consciousness' because we demand special status for *our* consciousness, and consider that the mineral universe, for example, is not conscious. Out of our own knowledge from experience we quite rightly demand this special status, but for the wrong reasons. Our consciousness *does* have a special status in the

universe but this special status does *not* lie in any fact of us being *independent* of the universe, or the universe being independent of us. *That* is not a consequence of consciousness – it is a consequence of evolutionary self-consciousness.

The notion of a ‘real world out there’, implying a duality of self *here* and not-self *there*, is meaningless except from the evolutionary egocentric point of view, where it is important in the system of conflict, survival and hence evolution, in time. In physics there *is no* ‘real world out there’, there are just the mathematical facts and physical phenomena with which physics deals.

The world of phenomena that we can perceive and study in physics is not ‘real’, nor is it ‘unreal’. The judgement of ‘reality’ is not a part of the remit of physics. The world of phenomena creates the evolutionary human subject, the observer, the self, which then *thinks* it is independent of the world, and gets disturbed when the nature of the world suggests that it is not. It then invents the concepts ‘real’ and ‘unreal’, based on its evolutionary ego position, and applies them to the world. But as Wittgenstein said, *the thinking, presenting, subject, there is no such thing.*⁴²⁷ Only in self-knowledge can the subject, observer, or self, discover what is unreal about itself - only here does ‘real’ and ‘unreal’ have any meaning. Only from here comes the knowledge that our consciousness *does* have special status in the universe.

In relation to the interpretation of quantum theory ‘Reality’ is the name of an object we have invented. When we question the sense perceived macro-scale world to ask if it is ‘reality’, we are testing the sense perceived world against an object called ‘reality’ that so far has no properties different to what we are testing. Unless, that is, we have given ‘reality’ the property ‘not-self’, and have also given ‘not-self’ the property of persisting in time when not observed by my self. If we do this, then quantum particles must be called ‘not real’. The macro-scale world behaves perfectly in accordance with this persistence when not observed, and so must be called ‘real’. And yet the macro-world is supposed to be made from quantum particles. The reason for this apparent discrepancy is simply that we are approaching what *is*, through thinking about it, in inappropriate logical space, rather than using the intellect.

⁴²⁷ Wittgenstein, L, *Tractatus Logico-Philosophicus*, 5.631.

Beyond thinking – the intellect

Thinking, of course, is not necessarily an *a priori* process. The relationship between objects in thinking is not necessarily *a priori* in nature. However, if thinking makes sense, then the sense comes from the relationship between the objects of thought. The relationship between the objects is the 'logical space' of thinking. When what we think about does not make sense, the relationship between the objects does not conform to the current logical space of thinking, 'set up' by other object relationships, or previous object relationships. We do not normally think a tree can be in two places at once – it does not make sense. The logical space of thinking we are using here is founded on the logical space of the material world. If, hypothetically, we could find a logical space of thinking in which it makes sense for a tree to be in two places at once, our understanding of the material world would have changed. The change from accepted geocentricity from heliocentricity, against the logical space of religious and political conviction (for at the time the Church was of course a political force), was most important as a change in the logical space of thinking. The universe did not change, *in retrospect*. However, the universe *did* change. The nature of the universe as we know it is only ever how we conceive it in the current logical space of thinking. We can never know what it is beyond this, unless the universe has some meaning beyond thinking.

The deductive process can of course only explore what follows *a priori* from what is already presented to intelligence. *A priori* reasoning is a limited method of extending knowledge of logical space from what is already known. Even in science operating in remote logical space, we have to break out of this limitation. So in science, it is not always deduction, but also postulation that is important, as in the case with the wave equation of quantum theory, which cannot be derived from the evidence but has to be postulated. Once postulated it leads to a theory of real predictive power.⁴²⁸ *Philosophical* statements cannot necessarily be tested empirically like scientific postulates, or judged on the basis of their predictive power. Nevertheless statements in philosophy are frequently not derived *a priori* from what is already known, and do not necessarily have to agree with what is already considered tenable by consensus.

Schopenhauer's *The world is my representation* is an example of such a statement, but one that requires considerable 'explanation'. Other statements seem not to need 'explanation' because they are 'intuitively compelling'. We have, however, no certainty that what is 'intuitively

compelling' is not misleading. Another measure of philosophical assertions is whether they are true in our experience. Descartes' *cogito ergo sum* follows *a priori* from experience, and seems to be straightforward and compelling. However, as is often the case, all it not what it seems. As stated earlier, *cogito ergo sum* does not mean *I am because I think*. It means *I think therefore I am*. It is the *deduction* of being from the fact that there is thinking taking place. This does not *necessarily* make thinking the *cause* of being. If thinking is not the cause of being then it might be possible to *discover* being without thinking. *Discovery* is not the same thing as *deduction*. This being is not necessarily dependent upon thinking. If however thinking *is* the cause of the being that thinking deduces, then this being is dependent upon thinking. And so on. *Cogito ergo sum* is not as straightforward as it seems.⁴²⁹

Wittgenstein's *Tractatus logico-philosophicus* begins with the statement *The world is all* that is also 'intuitively compelling', but not necessarily as straightforward an axiom as it seems. The *Tractatus* concludes that the 'problems of philosophy' expressed in language evaporate into the problems of language, limited by the logic of thinking and the logic of language. I now refer to the *Tractatus* because despite certain conflicts, I see its conclusion as being in essence concurrent with this thesis. The difference is that whilst the *Tractatus* asserts we should remain silent on the issues with which I deal, I have not remained silent, but like many others, speak of them. In this sense I go beyond the *Tractatus* but still respect its conclusion that the logic of thinking is limiting. To a great extent thinking in logical space prevents *discovery*. We *need* to include discovery in philosophy.

Language should be a servant in communication. The same is true of thought, which it is possible to use to communicate what does not require *a priori* thinking to reach. The entire lexicon is a finite set of words with the consequence that there is a vast but finite number of word combinations and permutations that obey the logic of language. Any word can only be defined using other words. This does not mean that *what* language can communicate is finite and ultimately

⁴²⁸ Greenhow, RC, *Introductory quantum mechanics*, Bristol, 1990, p. 17.

⁴²⁹ What Descartes declared as the single, indubitable starting point for philosophy, 'I think therefore I exist', appeared in the *Discourse* published in French in 1637. It was not until 1644 that the Latin version was published at Amsterdam. In *Principles of Philosophy* published in Latin in 1644, Descartes states (Part I, 9) "By the term 'thought', I understand everything which we are aware of as happening within us, in so far as we have awareness of it..." Retrospectively we can say Descartes' meaning was 'I am aware therefore I am', or even 'I am aware that I am aware, therefore I am'. This effectively means that Descartes was saying: "The indubitable starting point of my philosophy is that I am", which is not a deduction at all. This does not

nothing more than recursive in terms of the lexicon. Meaning is apprehendable from the context of word usage rather than from the 'logical' structure of what is said. Language does not paint a picture of the world, it paints a picture of how we interpret the world presented to our intelligence, and that interpretation and intelligence is part of psyche. Language is primarily an indication of the nature of psyche.

Wittgenstein concluded in the *Tractatus* that 'the philosophical I' is not a part of the world. In the terminology of this thesis, that means the 'the philosophical I' is 'not of this world'. This is why the philosophical I lies behind every endeavour of self to express through art, anything that is not merely a reiteration of the world. The philosophical I is the reflexive corollary of the intellect – it is necessary before you can have an evolving intelligence that understands its world. In a manner of speaking, the world creates the philosophical I at the centre that comes to know the world, and then when it comes to knowledge of its self, sees through it.

In column 1 below is a pertinent statement from Wittgenstein's *Tractatus*. Column 2 contains a commentary on the statement, or an alternative that is consistent with this thesis.

1 The world is everything, that is the case.	1. This defines 'the world' as everything. As a proposition it comes from what amounts to informal, 'set logical' thinking. It effectively <i>defines</i> 'The world' as <i>the universal set</i>, which is itself a conceptual object in the logical space of thinking. 2. The whole world presented to intelligence includes everything in thought, and all our concepts. 3. The concept of the universal set is part of the whole world presented to intelligence, but the whole world presented to intelligence is less than everything 'the universal set' is supposed to include. It is supposed to include also what we do not know and cannot know – that which is not presented to intelligence. 4. At any time, the whole world presented to our intelligence is only the totality of what we know and what we think we know (e.g. through sense and knowledge of logical space), plus the total of our conceptualisations of our ignorance. This is the whole world presented to intelligence at any time. 5. The universal set cannot be <i>found</i> anywhere outside the world presented to our intelligence. 6. <i>The world</i> is everything presented to our intelligence, <i>that</i> is the case. 7. What is not presented to our intelligence, is not of this world. It is of a world we do not occupy, or do not yet occupy. 8. There is no Kantian world 'in itself' – the world is only a reflection of the condition of our collective knowing, made possible because of the one intellect, that cannot be deduced in thinking. 9. Only when we break out of the condition of knowing, knowing through <i>the world presented to intelligence</i>, can we perceive what is not of this world. 10. The intelligence to which this world is presented, is actually a condition of knowing that is maintained by the activity of thinking in evolutionary logical space.
1.1 The world is the totality of facts, not of things.	1. 'Fact' is the name of a thought <i>object</i>⁴³⁰ we instantiate in the logical space of thinking. The thought-object 'Fact' is always instantiated with the condition 'true'. 'There are no 'false' facts, only propositions purporting to be facts when they are not. 2. Facts are the class of <i>relationships</i> of objects and conditions in the world

⁴³⁰ See appendix.

	presented to intelligence, that can be labelled 'true'. 3. The label 'True' is a condition in the logical space of thinking. 4. The logical space in which we think the 'fact' object and its 'true' condition is part of psyche. 5. The facts of the world are relevant only to the relationship of psyche and world – not to a world without psyche.
5.6 The limits of my language mean the limits of my world.	1. The logic of language as used, reflects the nature of the logical space in which the mind using the language is operating. 2. The logic of language or the evolutionary world, is only part of the logical space in which the mind can operate. 3. The limits of language are not fixed by the logic of language. They are more like the limits of stone for the sculptor. The physical properties of stone are its logic. One cannot do with it what does not work physically - its physical limits are the limits of its logic. Despite this, stone is not limited by its logic, because it can convey something of the sculptor's world, and the sculptor's world is not limited by the limits of the world of stone.
5.621 The world and life are one.	The world and life are one. We do not know how vast life is. The conception in the evolutionary mind of 'everything', is not a true conception of life, or the world. The world is the diminishing ignorance of life presented to evolutionary intelligence.
5.63 I am my world (The microcosm).	1. I always arise from what surrounds I. Only in the world am I the self in the world. I always take my identity in the world from what is not what I am, but as I come to knowledge of this I see through my self and by necessity the world then changes. Even in the microcosm this is true. Thus in both the microcosm and the macrocosm I am my diminishing self. The statement <i>I am my world (The microcosm)</i> just means I am my self. 2. The macrocosm-microcosm correspondence of the ancients does not mean the microcosm is the representation of the macrocosm. It means the macrocosm is the microcosm presented to intelligence. Intelligence is always trying to connect with the intellect, through the impediment of thinking and self. 3. Schopenhauer's position <i>the world is my representation</i> or <i>The world is my will</i> means the macrocosm is my self (the microcosm); what he calls <i>Will</i> is actually self and necessity. This is one 'quantum jump' above the position of evolutionary self-consciousness, but it is only the beginning, and not the end of the matter or the end of necessity as Schopenhauer presents it. When

	I see <i>the world is my will</i> I have not yet escaped my self. The new closer proximity to the intellect reveals this, despite the fact that self and its attendant self-consciousness, the evolutionary thing, remains.
5.631 The thinking, presenting subject, there is no such thing...	This is true, as the intellect reveals. The thinking, presenting subject, is self. This self is part of the evolutionary self/not-self duality, which is a necessary function of the 'soil' out of which springs intelligence able to use the intellect, before realising the intellect.
5.633 Where in the world is the metaphysical subject...?....from nothing in the field of sight can it be concluded that it is seen from an eye.	(Logically) the metaphysical subject, self, is <i>not anywhere</i> in the world of not-self. In studying a world that is not-self, we find it does not exist there. Also, it is correct that self cannot be <i>deduced</i> (concluded) from the world of not-self (the field of sight). However, self does not need to be deduced from the world of not-self because it is already psychically substantial. It is this that creates the <i>reality of experience</i> .
5.64 ..solipsism strictly carried out coincides with pure realism. The I in solipsism shrinks to an extensionless point and there remains the reality co-ordinated with it.	The I in actual solipsism is not real because it is self. Solipsism is self declaring it is the only self. The 'I' in solipsism does not spontaneously 'shrink to an extensionless point' because it is <i>ego</i> surrounded by self. The psychical reality of self always remains as a substantial body at the centre of the surrounding world-phenomena, unless it is escaped in some way. Solipsism is incorrect, but not because self cannot be concluded or deduced from the world of not-self (the field of sight). It is untrue, because despite self's psychical substantiality, it is ultimately unreal, from the point of view of I, and even from the point of view of the pure <i>ego</i> , the evolutionary I. The I in solipsism, like the I in the person, could only shrink as a consequence of participation in the process in which nothing survives. What remains after the 'I' in the person shrinks, is <i>the phenomena</i> co-ordinated with it. We cannot call this 'reality' because it is then seen to be the reflection in the intellect of the unreal self.
5.641 The I occurs in philosophy through the fact that the "world is my world". The philosophical I is not the man, not the human body or the human soul of which psychology treats, but the metaphysical subject, the limit – not a part of the	1. The I in philosophical <i>thinking</i> is self. It occurs because the experience of the world is 'my experience' of the world. 2. When 'philosophy' is a 'coming to knowledge of the process in which nothing survives' (including self) then the philosophical I is not self, and the second sentence is absolutely correct - I am in the world but not of it. Experience, even past experience, is then just experience, and not 'my' experience, even though I am still subject to it (because of my continuing self and enmeshment). 3. If 'the philosophical I' means the deductive thinker, then what the second

world.	sentence says, is not so, because the I is then in effect the Cartesian <i>mind</i> , which is not abstract, but part of self which is a psychically substantial part of the world.
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Thinking in logical space is intelligence operating in, or understanding the world or parts of it. Our intelligence thinking is evolutionary. ‘Evolutionary’ is a contemporary word that corresponds to the Platonic concept that this world is a world that is ‘always becoming but never is’, and happens *in time*. This is, ultimately, a process of intelligence moving towards knowledge of eternity or Reality (the intellect). In Plato *Timaeus* says that knowledge of the Reality, the eternal, changeless world that ‘always is and never becomes’, is reached through ‘intelligence with the aid of reasoning’.⁴³¹ However there is a confusion that arises because of the use of the word ‘reason’, with which I have already dealt. What *Timaeus* surely should have said, was that knowledge of it is reached through *philosophy*, which is what Plato’s characters are supposed to be engaged in. Philosophy, as demonstrated both by what Socrates says, and in Plato’s portrayal of Socrates and his life, is more than its exoteric expression in reasonable dialogue. Reason is not mere syllogistical thinking, but is better understood as that which transcends the soul’s enmeshment in the ‘world of becoming’, which I have said is evolutionary and emotional self. This is the ability to observe directly in the intellect without evolutionary self, or at least the ability to think in logical space unaffected by the logic of the evolutionary self/not-self duality. In *Timaeus* all evolutionary beings *in time* are resemblances of the ‘perfect Living Creature’, which is the universe,⁴³² but they live in a world of duality and multiplicity whereas the *Being* or the universe is One.⁴³³ In other words, all creatures are selves, but ultimately each is the universe, which Plato indicates is the one supreme Being. In this is implicit the macrocosm-microcosm correspondence.

More than two thousand years before Hanslick, Plato said in *Timaeus*:

...musical sound is given us for the sake of harmony,

⁴³¹ Plato, *Timaeus*, 28, in *Timaeus and Critias*, Tr. D Lee, London, 1965, 1977, p. 40.

⁴³² Plato, *Timaeus*, 31-40, *Ibid.*, 43-55.

⁴³³ *Timaeus* 31, *Ibid.*, p. 43.

which has motions akin to the orbits in our soul,
 and which, as anyone who makes intelligent use of the arts
 knows, is not to be used, as is commonly thought, to give
 irrational pleasure, but as a heaven-sent ally in reducing to
 order and harmony any disharmony in the revolutions within
 us...⁴³⁴

Timaeus's 'order and harmony' is psychical. What can 'disharmony in the revolutions within us' be other than disharmony, or disturbance of self? This may very well be physical disharmony as well as psychical. In my interpretation the reduction to 'order and harmony' amounts to the aligning of self with what is beyond it, through its dissolution, even if only temporarily. This dissolution is synonymous with the increasing presence of what I have called *perception*, associated with simultaneous detachment from, and involvement in, the world. Using music to give what Timeaus calls 'irrational pleasure' is the exploitation of what Hanslick called the base effects of music – its 'pathological', 'material moment'. This, I have said is the use of music, in effect to satisfy of the need of experience.

Much of what makes music subjectively meaningful to self might in principle be expressed in the logical space of thinking and understood in terms of relationships between concepts. But not all, because music, and other art forms, also connect with what is *not of this world*, that is, it connects with what is not presented through evolutionary intelligence.

Intelligence thinking, is the evolutionary method of our coming to knowledge of the world, *using* the intellect. 'I' and the intellect are mutual – there is no I without intellect and no intellect without I. Like Wittgenstein's 'eye', the intellect cannot be deduced from what is in intelligence's field of sight. The intellect is not of this world, but it is what enables this world to be presented to intelligence. Being not of this world the intellect can also reflect what the evolutionary intelligence cannot relate to, because evolutionary intelligence, represented by our animal brain, only 'fits' the reality of the world in which it arises. Nevertheless, the intellect is *our* intellect, as the universe is *our* universe. The universe, or great process in which nothing survives is seen in the intellect, and subsequently *interpreted* by intelligence.

Behind musical sensibility (and the sensibility in any art) is the intellect. Looking straight onto the intellect without passing through evolutionary intelligence, and reflecting from the intellect back into the world and into intelligence, produces what above I called *perception* – sensitivity to the world and its conditions beyond the evolutionary and emotional interpretation. It can only happen to the degree to which self is not an obstruction. As self is always present in some degree, this then *relates* to what *is of this world*, including our emotional attachments, relationships and experiences, from a position beyond the world, communicated through a position still in the world, but not one unconsciously enmeshed. In art presenting concepts, the artist's *perception* can then present concepts as *symbols* for 'higher' meaning or *essence*, in literature or visual arts, according to the artist's depth of *perception*. In music, as in some more 'abstract' forms of art, we are not necessarily dealing with presented *concepts*. The form must 'speak directly to the intellect' and although the form is entirely of this world, which means it may be 'emotional' in content, it may highlight the recipient's potential of conscious connection with what is not of this world, as seen *through* aspects of the world and self. This means that in music, what is beyond emotion, and is 'not of this world', is approached through the evolutionary connection of music and psyche, and therefore in some degree through music and emotion, where these connections are the medium, but not the message.

In any art form, whatever is presented, or represented, is the artist's or composer's presentation of what he or she *perceives*, through the mediums of technical genius, sensory phenomena, representation, and personal self. The expression from the genius of *perception* has to come through all these mediums.

Hanslick's 'pathological effects' are a consequence of the evolutionary connection between musical phenomena and psyche, which in turn is a consequence of the connection between *all* phenomena and psyche. We have to remember that if mind has evolved, then its evolution *includes* psychical evolution. What is 'in' psyche is as much a consequence of what psychical self 'puts there' as of what 'the universe' or 'the world' has 'put there' through the principles of physical evolution and survival of the species. Our psyche includes all the emotion and all the music we have ever made or experienced.

⁴³⁴ *Timaeus* 31, *Ibid.*, p. 65.

Plato's Myth of Er, and his portrayal of Socrates, each symbolise a state of harmony that is in the world but not of it. The cycle of life and death, and the life of a man on Earth, is 'held together' in the Myth of Er by the cosmic *harmonia*, the harmony of the spheres. Socrates' equilibrium is the harmony of his knowing nothing. In both cases, there is *harmonia*. The effects of the cosmic *harmonia* which must also include Socrates' own destiny, comes to be seen as it is, by both Er and Socrates by the passing through of its effects. Er's passing through is magical, Socrates' is through experience coupled with the practice of 'philosophy'. In both cases, to see *harmonia* as it is, is to see through death, which is to perceive what is 'not of this world'.

The evolutionary effects of music and emotion, the 'pathological effects' of music that Hanslick speaks of, are a long way from the harmony and equilibrium of Socrates, or of the cosmic system in the Myth of Er that Socrates communicated. They do not need to be relished for their own sake, because they are only the effects of *harmonia* on evolutionary self, in their specifically musical manifestation. They are only 'there' as a medium through which what is beyond them, what is not of this world, is approached. What is beyond them, is the perception of *harmonia* itself, which never appears in the music, just as it never appears in the actual structure and movement of the universe, but it connects them both, through the *perception* in the auditor.

Appendix on 'object-orientated' and 'subject-orientated'.

Object orientated knowledge in the discourse means what we know of, or know about, objects. An object is not only physical. To illustrate this an analogy with *object orientated* computer language is useful.

In current *object orientated* computer programming languages any 'object' in addition to those 'built in' to a given programming language can be *instantiated*, which in effect means *created* in the code, at the will of the programmer even before any properties or methods are ascribed to it. The act of instantiating an object may involve no more than naming it, with correct syntax. Once instantiated an object could have any number of properties and methods subsequently ascribed to it. Objects can be derived or invented at will and will be successfully handled by the language as long as the rules of the language are observed. An object could be anything – a section of code that handles a physical event or a data condition, code representing a connection with another data source, or perhaps code representing a visible object on a monitor screen. The *object* does not necessarily have to *represent* anything physical like a printer or a screen object, but it might. The language is a powerful data management environment in which objects are manipulated and handled within the *logic of the language*.

Apart from certain aspects of syntax the only generic thing that all the objects actually have in common is *code*. The *concept* of *code* itself is something with which the programmer is familiar, and as a *concept* she may frequently refer to it in communication with other programmers. However, in most simple programming the actual *concept of code* is meaningless or irrelevant within the environment of the language itself, or in the *execution* of that code.⁴³⁵ The *concept of code*, as distinct from the code itself, is meaningful to the programmer because she not only understands the code, but also the code in a context beyond the code – the context of the whole, the context of programming in general, the context of *other codes* with which she may not be familiar but would still recognise as code, and the *purpose* of the whole programme that she is endeavouring to develop and has probably already *conceived* before it has been developed.

⁴³⁵ In some kinds of 'artificial intelligence' and more advanced software this is arguably not the case, since one of consequences of code execution may be the writing of more code or the modification of a programme by itself.

The human mind, it can be argued, is incomparably more complex in its operations than computer code, and I certainly would not want to imply that human thought is analogous to the execution of a *Java* programme. Nevertheless a potentially helpful analogy may be drawn regarding *objects*. In the execution of computer code the objects are addressed by the code. Objects are a part of the code – they are code objects, even when the objects do represent something beyond code itself. As I am using the word ‘object’ in the context of thinking, *anything* that the thinking mind addresses is an *object* in the thinking mind, whether single or composite.

Human thinking is not fixed like computer code, but there *is* a limiting factor determining what *makes sense* in any area of thinking. For any area of thinking, or for any set of objects, what *makes sense* in terms of the relationships that could be expressed between the thoughts or objects, are relationships that conform to the ‘logical space’ of this given area of thinking. The relationships themselves, as seen in the intellect, are not limited by the logic of the human language used in the attempt to express them. Human language can only limit the expression and communication. Being in contact with the intellect, the intelligent recipient often tries to get ‘behind’ the human language expression back into the relationships themselves.

The nature of this ‘logical space’ is not necessarily fixed and may change as the relationships are explored. By analogy, it is a mutable version of the logic and syntax of an object-orientated computer language. The object-orientated computer language is a ‘logical space’ in which the language objects have relationships. The relationship of thinking to the objects in thinking, which are the things in thinking that can be *named*, would be roughly like the relationship of a mutable object-orientated computer language, to its objects.

The logical space of language is not the same as the logical space of thinking. The logical space of language evolved long before we entered some of the logical spaces in which we can now think. We constantly change language to align it with the logical space of thinking, and even invent new language. Human thinking is *not* the same thing as human language, or thinking *in* language. Human thinking is thinking not in the logical space of language, but in the logical space of thinking. Nevertheless, *all* the logical space of thinking is part of evolutionary intelligence, and *all* logical space is connected in psyche.

Any so-called ‘subject of thought’ is in this context actually an *object* of thought. Even if I think about *myself*, the *subject*, I have made an object of the subject I am in order to think about it.

However it can be perceived from experience that even when making an object of the subject the mind can subtly *connect with* something that is not the object in thought. For example, the subjective *accumulation of experience* that my self is or includes, is not a thought object until I think about it. Indeed, the very experience *I am* is not an object, as long as I do not think about it. Similarly if I am emotional, the emotion is not an object in thought until the instant I think about it, even though I may then *think* it was always an object before I thought about it. In the first instance the emotion is *myself* or a part thereof – it is a part of self. When I am angry I am in effect *being* that anger even if I may say I am just *expressing* it, except to the degree there is something else by which the anger is observed, and perhaps contained and not allowed to fully have its way, through which I may well then ask whether this emotion really *is* what *I* really am, or a part of what *I* really am. This question of *the reality of myself*, is in this context a question of what my *self* is, which, precisely, is a question of *self knowledge*. Object-orientated thinking begins when I begin to *think* about anything, including my self, conceptually or discursively, the act of thinking being distinct from what I know in my own experience, without having to think about it. As soon as I *think* about any of this or try to *work anything out*, I enter *object orientated* thought and knowledge which often leads into a ‘philosophical’ labyrinth of thought, which is again not the same thing as self-knowledge. The labyrinth arises from the attempt to reach self-knowledge through the act of *thinking about*. It is the attempt to reach *subjective knowledge* through *object orientated* mental procedures. Object orientated thought proceeds towards *object orientated* ‘knowledge’, but not towards *subjective* knowledge.

Subjective knowledge on the other hand, is the subject’s knowledge of the subject and subjective experience without the absolute *need* of object reference, even though it may be communicated about using *object orientated* terms of reference. Subjective knowledge of emotion is knowledge of emotion arising from the subjective (subject-orientated) experience of it. Those who have *experienced* that there is a connection of music and emotion in themselves have subjective knowledge of this connection as a ground to any *object orientated* thought or knowledge of it. Those who have never experienced it may know about it through what they have read and heard, but they will have no subjective knowledge of it.

Subjective knowledge and thinking, or subjective knowledge and object-orientated knowledge, are related, even connected. Saying “whatever we *think about* is an *object* ” does not

mean thought itself is an object. Thought is movement in the mind. Even though computer code does not move and thought may not work in the way computer code does, thought is still *like* the computer code in another way. However, the relationship of the *subjective knowledge of thought* to *thought itself* is *not* normally like the relationship between the programmer and the programme or code. The programmer usually knows far more about the details of code operation than the subject knows in subjective knowledge about the mechanisms of his own thought. It *is* like the relationship of the programmer's knowledge of the *concept* of code, to the code itself. The programmer does not need code itself to recognise what is code or not code, but as soon as she starts the activity of coding she 'gets into it' and its logic and ways, and is dealing in problems that code is needed to solve. Similarly, we do not need thinking to recognise thinking and no thinking, and the instant we think about it we *are* thinking.

There is surely only one way to have real subjective knowledge of thinking and how it works, and this cannot be through thinking itself. It can only be by observing the movement of mind from a position where thinking has stopped, a position in which, like Socrates, we know nothing.

Bibliography

- Adair, James Makittrick, *A philosophical and medical sketch of the natural history of the human body and mind. To which is subjoined, an essay on the difficulties of attaining medical knowledge.*, Bath, 1787
- Allen, W Dwight, *Philosophies of Music History*, New York, 1939, 1962
- Asimov, I, *Biographical encyclopedia of science and technology*, London, 1972
- Bacon, F, *The advancement of learning*, 1605, Ed. A Johnston, Oxford, 1986
- Bags, S & J, *The Healthy House*, London, 1996
- Barker, A, *Greek musical writings*, (2 Vols), Cambridge, 1989
- Boethius, AMS, *Fundamentals of Music*, Tr. CM Bower, Ed. CV Palisca, New Haven & London, 1989
- Bohm, D, *Wholeness and the Implicate Order*, London, 1980
- Brocklesby, Richard, *Reflections on Ancient and Modern Musick, with the Application to the Cure of Diseases....*, London, 1749
- Brockman, J & Rosenfield, E, *Real Time*, London, 1973
- Browne, Richard, *Medicina Musica or, a Mechanical Essay on the Effects of Singing, Musick, and Dancing, on Human Bodies....*, London, 1729
- Buchan, William, *Domestic medicine: or, A treatise on the prevention and cure of diseases.* 11th ed., London, 1790
- Budd, M, *Music and the Emotions*, London, 1985
- Burkert, W, *Lore and science in ancient Pythagoreanism*, Cambridge, Massachusetts, 1972
- Bywater, I, 'On the fragments attributed to Philolaus', *Journal of Philology*, Vol.1, 1868
- Clark, G, *Iamblichus: On the Pythagorean Life*, Liverpool, 1989
- Cogan, Thomas, *A philosophical treatise on the passions*, Bath, 1800
- Combarieu, J, *Histoire de la musique des origines au début du Xx^{me} siècle*, Paris, 1913-1930
- Combs, A, 'The meeting ground of science and spirit: New themes for a new science', in Burner. *et. al.* (Eds.), *Holistic Science and Human Values*, Adder (Theosophical Science Centre), Madras, 1992
- Conche, M, *Anaximandre - Fragments et Témoignages*, Paris, 1991
- Cornford, FM, 'The unconscious element in literature and philosophy', Cornford, FM; Guthrie, WKC, *The unwritten philosophy and other essays*, Oxford, 1950
- Cornford, FM, *Plato's Cosmology*, London, 1937
- Damasio, A, *Descartes' Error*, New York, 1994, London, 1996
- Davies, PCW and Brown, JR (Eds.), *The Ghost in the Atom*, Cambridge, 1986
- Davies, JD; Hersh, R, *The Mathematical Experience*, Middlesex, UK, 1981
- Delatte, A, *Etudes sur la litterature Pythagoricienne*, Paris, 1915
- Descartes, R, *The philosophical writings of Descartes*, Tr. J Cottingham, R Stoothoff, D Murdoch, Cambridge, 1985, 1994
- Dicks, DR, *Early Greek astronomy to Aristotle*, London, 1970
- Diels, H, / Freeman, K (Tr.), *Ancilla to the Pre-Socratic Philosophers, A complete translation of the fragments in Diels, Fragmente der Vorsokratiker*, Oxford, 1971
- Diels, H, *Doxographi Graeci*, Berlin, 1874
- Dillon, J and Hershbell, J, *Iamblichus On the Pythagorean Way of Life*, Atlanta, Georgia, 1991
- Dobbs, BJT, *The janus faces of genius. The role of alchemy in Newton's thought*, Cambridge, 1991
- Duncan, Andrew, 'Observations respecting the use of music in cases of melancholia', *Heads of lectures on the theory and practice of medicine.* 4th ed., corrected, Edinburgh, 1790
- Elliot, Sir John Bart, *Elements of the branches of natural philosophy connected with medicine*, London, 1786

- Ficino, M, *The Book of Life*, Tr. Charles Boer, Dallas, Texas, 1992
- Field, JV, *Kepler's geometrical cosmology*, London, 1943, 1988
- French, P, *John Dee*, London, 1987
- Godwin, J, *Robert Fludd*, London, 1979
- Godwin, J, *Harmonies of Heaven and Earth*, London, 1987
- Godwin, J, *Music, Mysticism and Magic*, London, 1986
- Gombrich, EH, *Symbolic Images. Studies in the Art of the Renaissance, with 170 Illustrations. II.*, Chicago, 1972, 1985
- Greenhow, RC, *Introductory quantum mechanics*, Bristol, 1990
- Gregory, John, *A Comparative View of the State & Faculties of Man with those of the Animal World*, London, 1765
- Gregory, John, *Lectures on the Duties and Qualifications of a Physician*, London, 1772
- Guthrie, WKC, *Orpheus and Greek religion*, London, 1935
- Haller, JS Jnr, 'The Great Biological Problem: Vitalism, materialism, and the philosophy of organism', *New York State Journal of Medicine*, Vol.86, No.2, February 1986, pp. 81-88
- Halliwell, S, *Plato: Republic 10*, Wiltshire, 1988
- Hanslick, E, *On the Musically Beautiful*, Tr. Geoffrey Payzant, Indianapolis, 1986
- Hanslick, E, *Vom Musikalisch-Schönen*, Leipzig, 1854
- Heath, Sir Thomas L, *Aristarchus of Samos - the ancient Greek Copernicus*, Oxford, 1913, 1959
- Heath, Sir Thomas L, *Greek Astronomy*, New York, (originally London) 1932, 1991
- Hegel, GWF, *Phenomenology of Spirit*, Tr. AV Miller, Oxford, 1977
- Helmholtz, HLF, *Lehre von den Tonempfindungen* (2nd Ed.) 1885
- Helmholtz, HLF, *On the Sensations of Tone*, Tr. AJ Ellis, New York, 1954
- Huffman, CA, *Philolaus of Croton*, Cambridge, 1993
- Huffman, WH, *Robert Fludd - essential readings*, London, 1992
- Huffman, WH, *Robert Fludd and the end of the renaissance*, London, 1988
- James, J, *The music of the spheres: music, science, and the natural order of the universe*, London, 1995
- Jayne, SR, *Marsilio Ficino's commentary on Plato's Symposium*, Columbia, 1944 (Vol. 19 of University of Missouri Studies)
- John von Neumann, *The Computer and the Brain*, London, 1958, 1974
- Jung, CG & Pauli W, *The interpretation of nature and the psyche*, London, 1955
- Kahn, CH, *Anaximander and the origins of Greek cosmology*, New York, 1960
- Kassler, JC, *Inner Music: Hobbes, Hooke and North on Internal Character*, London, 1995
- Kestrel, A, *The act of creation*, London, 1964
- Kingsley, P, *Ancient philosophy, mystery and magic*, Oxford, 1995
- Kirk, GS; Raven, JE; Schofield, M, *the pre-Socratic philosophers*, Cambridge, 1983
- Kristeller, PO, *Eight philosophers of the Italian renaissance*, Stanford, 1966
- Kristeller, PO, *The philosophy of Marsilio Ficino*, Tr. V Conant, Columbia, 1943
- Kuhn, TS, *The structure of scientific revolutions*, Chicago & London, 1962, 1996
- Langer, S, *Philosophy in a new key*, Camb. Mass. & London, 1942, 1993
- Levin, FR, *The harmonics of Nicomachus and the Pythagorean tradition*, Pennsylvania, 1975
- Lloyd, GER, *Polarity and Analogy - two types of argumentation in early Greek thought*, Cambridge, 1966
- Lockwood, M, *Mind, Brain & the Quantum*, Oxford, 1992
- Long, B, *The Origins of Man and the Universe*, London, 1984, 1998

- Lovejoy, AO, *The Great Chain of Being*, Cambridge, Mass., 1936
- Lowinsky, EE, 'Music in the culture of the renaissance', in Kristeller, PO & Wiener, PP, *Renaissance Essays*, New York, 1968, 1992
- Mead, Richard, *The Medical Works of Richard Mead*, Edinburgh, 1792
- Maula, E, 'The conquest of Time', *Diotima*, Vol.11, 1983, pp. 130-148
- Melzer, SJ, 'Vitalism and Mechanism in Biology and Medicine', *Science*, Vol.XIX, No.470, 1904, pp. 18-22
- Moyer, AE, *Musica Scientia*, Ithaca & London, 1992
- Murray Barbour, J, *Tuning and Temperament*, New York (originally Michigan), 1951, 1972
- Myers, CS, 'Vitalism: A Brief Historical and Critical Review', *Mind*, Vol.9, 1900, pp. 218-233; 319-331
- O'Neal, *Early astronomy from Babylonia to Copernicus*, Sydney, 1986
- Pagels, H, *The Cosmic Code*, London, 1982
- Pauli, W, 'The influence of archetypal ideas on the scientific theories of Kepler', in CG Jung & Pauli W, *The interpretation of nature and the psyche*, London, 1955
- Penrose, Roger, *Shadows of the Mind*, Oxford, 1994
- Penrose, Roger, *The Emperor's New Mind*, Oxford, 1989
- Philip, JA, *Pythagoras and early Pythagoreanism*, Toronto, 1966
- Plato, *The Republic*, Tr. D Lee, London, 1955, 1987
- Plato, *The Symposium*, Tr Walter Hamilton, London, 1951
- Plato, *Timaeus and Critias*, Tr. D Lee, 1965, 1977
- Plato, *The Last Days of Socrates*, Tr. H Tredennick and H Tarrant, London, 1954, 1993
- Porter, R, 'Medical lecturing in Georgian London', *British Journal for the History of Science*, 1995, 28, pp. 91-99
- Rattansi, PM, 'Art and Science: The Paracelsian Vision', in *Science and the Arts in the Renaissance*, Ed. JW Shirley & FD Hoeniger, London & Toronto, 1985, pp. 50-58
- Reedy, J, *Thomas Norton's Ordinal of Alchemy*, Oxford, 1975
- Richardson, H, 'The Myth of Er (Plato, *Republic*, 616B)', *CQ*, 20, 1926
- Robinson, B, Robinson, Bryan, *A treatise of the animal eoconomy*, Dublin, 1732
- Schavernoch, H, *Die Harmonie der Sphären*, Munich, 1981
- Schopenhauer, A, Tr. EFJ Payne, *The world as will and representation*, New York, 1958, 1969
- Scott, W (Tr), *Hermetica*, (1924), Bath, 1992
- Shorey, P, *Platonism Ancient and Modern*, Berkeley, 1938
- Solomon, J, *Harmony in Ptolemy's Harmonics*, Armindale, NSW, 1990
- St. John of the Cross, *Living Flame of Love*, Tr. EA Peers, Tunbridge Wells, 1935, 1987
- Stewart, JA, *The Myths of Plato*, London, 1960
- Stoullig, C, 'Symbols and forms' in Bertrand, Pascale (Ed.), *Brancusi*, Paris, 1995
- Sutton, G, 'The Physical and Chemical Path to Vitalism: Xavier Bichat's *Physiological researches on Life and Death*', *Bulletin of the History of Medicine*, Vol.58, Spring 1984, No.1, pp. 53-71
- Tarnas, R, *The Passion of the Western Mind*, London, 1991
- Taub, LC, *Ptolemy's universe*, Chicago & LaSalle, Illinois, 1993
- Taylor, AE, *A Commentary on Plato's Timaeus*, Oxford, 1928
- Taylor, T, *Iamblichus on the mysteries of the Egyptians, Chaldeans, and Assyrians*, London, 1821, 1968
- Taylor, T, *The works of Plato*, London, 1804
- Tillyard, EMW, *The Elizabethan World Picture*, London, 1943, 1972
- Von Neumann, J, *The Computer and the Brain*, London, 1958

Walker, DP, *studies in musical science in the late renaissance*, London, 1978

Wigner, EP, 'Remarks on the mind-body question', in Good, IJ (Ed.), *The Scientist Speculates: An Anthology of Partly Baked Ideas*, London, 1962

Wittgenstein, *Tractatus Logico-Philosophicus*, Tr. CK Ogden, London, 1922, 1981

Yates, FA, *Giordano Bruno and the Hermetic Tradition*, Chicago, London & Toronto, 1964

The following works were also consulted:

Chomsky, N, *Language and Mind*, London, 1972

Cooke, D, *The Language of Music*, Oxford, 1959

Copernicus, N, *De revolutionibus orbium caelestium*, 'On the revolutions', Tr. E Rosen, London, 1992

Ferguson, J, 'Sun, Line and Cave again', *CQ*, 13, 1963, pp. 188-193

Godman, D (Ed), *Be as You Are - The Teachings of Sri Ramana Maharshi*, London, 1985

Gorman, P, *Pythagoras A Life*, London, 1979

Grayling, AC, *Wittgenstein*, Oxford, 1988

Kassler, JC, 'Music as a model in early science', *History of Science*, Vol. 20, 1982, pp. 103-139

Kathi, Meyer-Beer, *The music of the spheres and the dance of death. Studies in musical iconology..* Princeton, 1970

Kivy, P, *Music Alone*, New York, 1990, 1994

Lloyd, GER, *Early Greek science - Thales to Aristotle*, London, 1970

Lloyd, GER, *Magic, Reason and Experience - studies in the origin and development of Greek science*, Cambridge, 1979

Massey, R & J, *The Music of India*, London, 1976, 1993

Meyer, LB, *Emotion and Meaning in Music*, Chicago, 1956

Murray, J, *Artists on Art*, London, 1976

O'Meara, D, *Pythagoras Revived - Mathematics and Philosophy in Late Antiquity*, Oxford, 1989

Pagel, W, *Paracelsus. An introduction to philosophical medicine in the Era of the renaissance*, Basel, NY, 1958

Popper, K, *Objective Knowledge*, Oxford, 1972, 1981

Popper, Sir Karl R, *The Logic of Scientific Discovery*, London (& international), 1959, 1977

Pratt, C, *Meaning and the Language of Emotion*, Washington DC, 1952

Rajchman, J, & West, C, *Post-analytic philosophy*, New York, 1985

Sagan, C, *Demon Haunted World: science as a candle in the dark*, London, 1996

Scruton, R, *Modern Philosophy*, London, 1994, 1996

Schopenhauer, A, *On the Fourfold Root of The Principle of Sufficient Reason*

Seznec, J, Tr. Barbara F Sessions, *The survival of the pagan gods*, Princeton, NJ, 1972

Steiner, G, *Real Presences*, London, 1989

White, NP, *Plato on knowledge and reality*, Indianapolis, 1976