

THE PLANETARY SYSTEM

Ideas, Formulas and Forms for a new Culture/Civilization

HARMONICS COMPENDIUM

**Extracts from the Italian edition by Enzo Savoini
(1980)**

This is a compendium of a free translation, summarizing with comments

“LEHRBUCH der HARMONIK”

by

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(ed. Occident Verlag, Zurich, 1950)

The parts of the text of this treatise are written in normal type.

The remarks which are printed in italics are the fruit of research of Enzo Savoini.

The frame of reference from which this research activity springs is composed of the Teaching of the Tibetan Master (A. A. Bailey, "A Treatise on the Seven Rays", Lucis Collection) and of the Master of Agni Yoga (Agni Yoga Collection).

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An infinite harmonizing process is perpetuated in the Universe.

(The phrases in bold which precede the chapters or parts of them are taken from the book ‘Infinity’ I of the Agni Yoga series.)

PRELIMINARIES

I do not think it is a good thing to write these considerations on Space, commenting on the text of H. Kaiser, in the usual way, which starts from premises to reach conclusions. One cannot treat Space, which is the Infinite, in this way. For what are the hypotheses, and what the conclusions?

If one wishes to explore that infinity called Space, one cannot ignore the essential fact that we are in it and live in it, and that in some way we occupy a centre of it; and it is precisely from this that we must start. From this point of view, the student and the field of research are not separate and distinct; but on the contrary one within the other, and the field has no limits. Therefore the propositions and the affirmations, principal or secondary, that we shall encounter are only provisional formulations, full of expectation, so to speak, and it is well to remember this, so as to keep the maximum liberty necessary for such an investigation. Already at the very beginning, concepts, opinions, rigid beliefs and forms consolidated by age-old habits of thought will have to be abandoned.

In fact Space, when it is explored without preconceptions in its intrinsic qualities, reveals properties which, if they appear immediately true to the intuition, are painfully opposed and denied by the evidence. So it is necessary to distinguish, with perspicacity and courage, between “evidence” and reality; and if many things, very large or very small, are shown to be only “evident”, they will need to be abandoned for those others, hidden and invisible, which show themselves to be real.

Thus ideas slowly come into existence which are at first unusual, but which soon group together and relate to each other to form systems and support each other and prove the validity of a whole.

The text of H. Kaiser offers a magnificent opportunity for exercises in thought, commenting on the rules and theorems of Harmonics. Elevated of themselves, these subjects are like launching pads for the person who wishes to try wings and leave below heavy things, “evidently” finite, for that which is spatial and infinite of itself.

In truth, if Harmonics and its laws are considered here, it is Space which is the real subject of this study.

We affirm that evolution is produced by the unceasing will for harmony.

1 – THE MONOCHORD

The great simplicity of the monochord legitimately places it among the human instruments (like the plumb line or the compass) which are marvellous. It seems to have the least possible measure of objectivity, in order to allow its particular usage.

In the final analysis, the monochord “expresses” a straight line. The latter lives in the Reality of Space and has no limits in its direction. Moreover, traversed by an infinite tension, it is qualified by two points (without end) of which it is the relationship. These two points, which in effect are its Origins, transmit their special qualities to all the points of the straight line. They also transmit their special rhythm. The straight line – in the reality of Space – is thus a channel of energy and it is the simplest expression of a relationship. “Around” the straight line, by induction, a field is created, which in its turn qualifies Space, to which it transmits the pulsation of its Origins. In other words, the real straight line resounds in Space.

What is valid for the straight line is valid for a segment. As in this study of harmonic Space nothing limited exists, the segment (or any other figure) is to be considered an entity as unlimited as a straight line: no longer by virtue of the Origins placed “without end”, but because of the substantial infinity of the points of the whole: thus the ends of the segment, which are by nature qualified in Space, placed in relation by a segment, repeat, as origins, the functions and qualities already described in brief for the straight line: tension, rhythm, induction of a field, sound.

It is necessary not to draw back from this continual appearance, everywhere, of the Infinite. For what else exists? On the contrary, precisely the opposite concept, of “finite”, which has for so many thousands of years subjugated humanity’s consciousness, is absurd. Yet, in any geometry of any kind, precisely the basic concept cannot be changed or discarded: the fact that the point has no dimensions (like the Infinite).

To descend from these absolute truths to considering geometries and mathematics which dedicate themselves to the study of the finite and even claim to exclude the Infinite from their systems is due to a lack of knowledge of Space but is also the expression of a ruinous inconsistency.

The human spirit lacks the courage to support the propositions which it nevertheless recognizes as true in an absolute sense. It gives in to what is evident and thus is prisoner of the dimensions.

From these first reflections one already sees that the term “spiritual” is appropriate for Space. We therefore do not hesitate to attribute the term to it; what would be the value of exploring the Infinite, if we did not accept its properties? But how much we will have to meditate on this first conquest! The consequent applications are such, and so immense, that by themselves they are sufficient to change the entire conception of human life.

So the monochord expresses a spatial reality. The elements of which it is composed are the string, its length and its tension. H. Kaiser, in his treatise, considers and studies only two parameters, according to whose changes the expressions of the sound vary: length and vibration. But a third certainly exists, and it is the tension of the string. When this is changed, other conditions remaining equal, the sound changes and can go up or down by octaves, fifths, etc., as with the variation of the other parameters. This third factor is still unexplored, but let us not exclude it from our thought! It can open the door to unsuspected kingdoms, perhaps to a new science of construction; it will one day be able to reveal to us the nature of what we call force or energy.

The maximum of creative power is obtained when sound radiates and colour sounds. Then the spheres vibrate in a superior harmony.

2 – SOUND AS VALUE AND AS NUMBER

These two expressions of the same reality are the beginning, the way and the method of Harmonics. Value and number coexist in sound. As number, sound can be measured (vibrations, lengths); as value it is perceived by the mind. The pitch height of a sound can be measured by comparing it with the vibrations of another sound established as a model, but it can also be recognized by hearing.

Here a material magnitude (number of vibrations in the unit of time) and a perceptual form (sound) are wonderfully united.

The exact and natural basis of sound as number permits the development of a science of Harmonics.

It cannot be doubted that the numerical aspect of sound is a material fact; perception of sound, that is the judgement of the value of sound, is on the other hand psychic, and must be ascribed to the spiritual kingdom. But, as everywhere in Harmonics, rigid definitions are not indispensable, but rather the correct penetration of the phenomenon. He who studies can, while the concept remains firm, coin his own definitions.

By sound is not meant any noise, but a sound perceived by the hearing as pure and of constant pitch height or depth. For these examinations of harmony the timbre and the strength of the sound are not as important as simply its pitch height or depth: precisely that which fashions a sound from a noise, that is a distinct resonant individuality.

For the numerical expressions we make use of the decimal system, even if, for the purposes of future Harmonics it will be well to provide for a numerical expression based on morphological concepts (sound directions). For the notation of sound values we adopt, provisionally, the common musical diatonic scale of seven notes, or the chromatic one of twelve, and their variants. But it will be necessary to think of an autonomous notation for a broader construction.

In sound, therefore, a synthesis between object and value, matter and spirit, outside and inside, the world and the “I”, is present “a priori”. And this is also the fundamental problem of the philosophies of all times.

Harmony... this basic principle of the structure will also be the principle of the entire creative activity.

EMERGING CONSIDERATIONS

The observations of Kaiser are not just applicable to sound. In effect, wherever number and value coexist, the laws of Harmony preside. This is true, as is immediately evident, for example, for light (number of vibrations; colour understood as expression of a value) and, an extremely important point, also for thought. In fact, vibration and value, that is form and content, coexist in this also.

If one wishes to rise to universal conceptions, it is therefore well to extend the concept of "sound" to much vaster wholes and realities than is normally done; and here too the impossibility appears of holding a concept in chains, whether great or small; as the Infinite does not allow any portion of itself to be limited.

It is true that – for light and thought, the examples cited above – the series of natural harmonics have not been experimentally traced; but we must advance these hypotheses as logical, even if awaiting proof. Besides, numerous applications, in various fields, which the Author will indicate in his work, imply precisely this assumption. Growth and form of plants and crystals, planetary movements, harmonious relationships in building and in art in general would be inadequately explained by the usual idea of sound. K. will introduce, for this fundamental motive, the idea of "figure of sound".

Here, in all this, is an example of the benefit of not defining rigidly. Let us leave the idea of Sound without surrounding walls. May light be sound, may thought be sound, and life itself be sound! Number plus value, here is the simple formula of that which is the object and domain of Harmonics.

Today man thinks he knows how to measure lengths and (a little less) also vibrations and the other physical sizes. In reality, it is not so, as finite things do not ultimately exist and so none of them is absolutely measurable by means of finite instruments. But the degree of approximation reached in the measurements comforts man in his belief. This, on close consideration, deprives him of communication with the Infinite, which means, simply, that it condemns him to die; but this death is no less illusory than his measurements.

So how does one "measure" exactly? The subject is of immense importance because man continually takes measurements, whether he knows it or not, and literally lives through

relationships. This in its turn shows, for the first time in these reflections, what a practical and active value the comprehension of Harmonics has, which is precisely the science of right relationships.

In ancient times man was considered, on deep reflection, as the measure of the Universe: and here the active side of his innate quality is revealed; since, in order to measure (exactly), he must “communicate” with the object of his measurement. In this way, “relationship” becomes synonymous with “connection”. It is a question of a direct communication; a faculty guaranteed to all by the omnipresent existence of the Infinite, where infinite measures “are lighted and extinguished”, provided that those invisible barriers which normally separate the human consciousness from the totality of space are knocked down.

If it is true that man, by his divine nature, is the measure of the Cosmos, the reply to the question can only be of this kind: one measures by communicating; and by measuring one communicates.

The science of exact measures is a real, exact science; and so one cannot, strictly speaking, honour with this adjective the human sciences of today; but one must keep it for that faculty by which the spirit communicates with the Infinite and knows it.

The kingdom of Harmonics is not, then, the physical, where exact measurements cannot even be conceived, but everything is taken by approximation; its “field” is Space, whether this is, or is not, occupied by bodies.

This is a fundamental affirmation, to which it will be necessary to return several times, to understand the nature of Space and the infinite and continual process of harmonization which is going on there.

Cosmic creativity tends to unison in perfect harmony with the greatest frequencies. When We entrust a mission, first of all We check the degree of harmonic tension. The scale of harmony has no limits and it is also unlimited in guaranteeing the supreme fusion.

3 – SOUND AS VALUE

When we speak of sound as an original phenomenon, we thus mean that synthesis of a material aspect, which can be expressed through number, and a psychic aspect, manifested through value, which is audible, of the corresponding sound. To study these two aspects separately, let us call the first component, the material one, “sound as number”, or simply number; and the second, the psychic one, “sound as value”, or simply sound.

In what way does one perceive sound as value? And in what relationship is it with number?

At the sight of a colour we immediately recognize it as red, or green, etc. We listen to a sound and immediately we classify it on the basis of its height or depth; the person who has a practised ear (“absolute pitch”) immediately ascertains the musical connotation: do, re, mi, etc.

We also know how to measure the wavelengths of colour and the acoustic frequency of sound in an indirect way. And here the expression in an indirect way should be noted; on seeing a colour, or hearing a sound, we are certainly able to recognize the corresponding frequencies; on the other hand, the physical methods of measurement are rather complex and are indirect.

Let us go a step further and observe two colours: a red and a blue, for example, and let us seek the relationship. This is already an aesthetic judgement: this red seems to suit that blue, or not. But one cannot speak of an objective order between different colours, in the sense of an “exactness”; nor of determining their respective wavelengths in a direct way; these can be known only through measurements, and so in an indirect way.

Everything is different, however, in the case of two sounds, for example in a relationship of a fifth (do-sol)! In fact we are immediately able to judge whether they “are in tune” or not; musical instruments can be tuned by themselves and between each other only and exactly through this faculty of hearing. Secondly – and this is decisive – with this “a priori” perception of the attunement a precise numerical proportion is established ($2/3$ or $1/3$ in the case of the example).

The hearing is quite distinct from the other sensory modalities precisely on account of this immediate judgement of the numerical relationship.

In this singular faculty of acoustic perception something wonderful, extraordinary should be seen, which allows one to pass directly from a psychic perception to a numerical relationship or, if you wish, to a number, which is the same.

The fact that number arises in acoustic perception transforms it, so that it is no longer only a sensation, nor a mere aesthetic judgement, but a value. On this basis one can speak of sound as value.

In these paragraphs, the term Value is used in a clearly defined way. Contrary to its usage in religion, philosophy and aesthetics, where it is used in a vague sense, in the harmonic concept of value, the ideas of “harmony”, “precision” and “certainty” come together; and a psychic peculiarity is inherent in it.

Absolute pitch

By “absolute pitch” we mean the faculty of identifying or recognizing, straight away, the various musical sounds or, conversely, of emitting a note at its right height.

If this gift is precious for a musician, it is not to be taken as a proof of effective “musicality”, as many possess it who are not at all musical.

For the studies and checks by means of the monochord, this faculty can be an obstacle, because it induces one to estimate according to the musical scale used at present, which is transitory. In Harmonics exact and pure sound relationships are considered, and more subtle distinctions than those known to the tempered music of today. The person who has this faculty will do well to tune the monochord to a sound which is intermediate between two tempered sounds and to take account only of the intervals, in order to lose the habit of following the notes of the tempered scale.

General validity of primary intervals

Interval means intermediate space, in music space between two sounds. Primary intervals are the octave and the fifth. Secondary intervals are the third, the tone and the semitone; tertiary the others, increasingly restricted.

This is true only following the criterion of purity of acoustic perception. The hierarchy of the intervals is different if one considers them in their intrinsic quality. This hierarchy is identical with the one above in the development of tonal coordinates (T); but if one starts from the “measure” of the musician composer, then the tone must be interpreted as the standard of everything. If on the other hand one seeks to clarify the psychic meaning of Space-Time (dualistic manifestation), the predominant interval is the third.

As far as the intervals of an octave and a fifth are concerned, they are and have been recognized by all peoples, which proves their general validity.

Among the different peoples the degrees of the musical scale have been noticeably different; however, people have always agreed in using the octave as the framework, to be subdivided into the intermediate degrees. The musical scales are different, according to the musical development of the various peoples, but they all have in common the perception that the sounds are repeated by octaves.

The fifth is also universally recognized: “The affinity of the fifth, and of its opposite, the fourth, with the tonic is so great that it is evident in all known musical systems” (Helmholtz).

The bases of the present-day system of sounds are the octave and the fifth or, more precisely, the relationships of octave and fifth; in fact, one can develop a complete diatonic system using only the numbers 2 and 3.

For Harmonics it is the same: octave and fifth are the primary intervals, and it is thus necessary to emphasize right from the beginning their general validity, as without them the whole structure of Harmonics would rest on shaky supports.

MUSICAL NOTATION

The notation followed by the Latin countries is different from that in use among the Germans. The correspondence of the names and the letters for the sounds and semitones turns out to be the following:

Ces	_____	flat		Do	_____	C
Cis	_____	sharp		Re	_____	D
Des	_____	flat		Mi	_____	E
Dis	_____	sharp		Fa	_____	F
Es	_____	flat		Sol	_____	G
Eis	_____	sharp		La	_____	A
Fes	_____	flat		Si	_____ 12	H
Fis	_____	sharp				
Ges	_____	flat				
Gis	_____	sharp				
As	_____	flat				
Ais	_____	sharp				
B	_____	flat				
Hies	_____	sharp				

Kaiser introduces into his treatise characters and graphic signs to indicate:

- fractions which involve 7, 11 and 13. They are indicated with the following signs placed to the top right of the notation: x, o, Ø. For example:

7/4B^x 9/11A^o 13/8A^ø

- the different octaves of a single sound. The dash is placed at the bottom right for the lower octave and above for the higher one and the number of the dashes corresponds to the height of the octaves. For example:

C,,--- C,---C---C'---C''
← →

- what surrounds a sound. The symbol ^ (with the point turned upwards) is used when the numerical value of the sound is higher with respect to the base sound and the symbol v (with the point turned downwards) when it is lower.

The spheres vibrate and resound, and harmonies are born in space!

EMERGING CONSIDERATIONS

It is indispensable to make a long and intense reflection on sound and number. They are two aspects of a single reality which remains hidden. At first sight they do not seem to be a couple of opposites, at least not in the "horizontal" sense of the term, not as complementary. They appear as two entities or two expressions between which a vertical hierarchy exists, like soul and body, and such that to be manifested they cannot be separated. Any number can be expressed by means of a relationship, and so of a sound. Any sound in turn can be identified by means of a number. There are no numbers without sound, nor sound without number.

It is true that a sound can descend beyond certain spheres, after which it remains unmanifest or not perceived; but to be born and to be manifested it must have a number. Thus, already at the beginning, sound and number are twins and opposites.

From these first, somewhat uncertain considerations, one deduces that sound and number are a pair of opposites, and therefore manifest aspects of a synthetic occult reality; and how can one refrain from taking them as a symbol of the relationship spirit-matter? After reaching this conclusion, it does not seem mistaken to insist on the universal value of Harmonics, but extended to any vibration of any kind, as already affirmed previously.

Some observations set out by H.K. in this paragraph of his Treatise involve a clear distinction between hearing and the other senses, sight in particular.

Sound and colour are contrasted in order to point out the excellence of hearing – a real mechanism of measure and relation. It is certainly so in the sphere of sensorial perceptions at this moment of human evolution. The precision with which a simple act of hearing allows one to judge a relationship is really wonderful; moreover, it is not the gift of individuals or single peoples, but a general characteristic. Nothing, however, prevents one from thinking that sight, touch or hearing can also evolve or be purified so as to be capable of an analogous function, that is the “measurement” of vibratory qualities.

The fact is that one is unable to distinguish precisely, for example, between the nature of light and sound vibrations. One is unable to identify where they are different. They are vibrations, or frequencies, which a single Energy arouses or manifests in Space. But if this is true and their fundamental nature is identical, they must obey the same laws: and therefore it must be possible to see sounds and hear lights.

According to this elevation of Harmonics, it must be possible to hear, but also to see, taste and touch any vibration, and nothing stops one from thinking of other senses which have been dormant in man up till now. As has already been noted, the architect or the painter who create according to right harmonic relations, that is relations of numbers and sounds, are guided by sight, not by hearing. Unless the general meaning of “measurement” is reserved for the term “hearing” (which probably is the best thing for these times), the usual understanding seems to exclude from the field of harmonics all that is not sound; that is, to limit a universal uselessly. To signify the field of Harmonics, the concept “number plus value” thus still seems the most valid expression, because it is the most general.

In this Treatise, as is natural, sound and number have preeminence; but this leads to distinctions which must be avoided, if one wishes to study the living Harmony of Space.

The infinite and venerated Being which we call Space here (and in the whole work of H.K.) cannot be considered complementary to time. Time only exists in the material spheres and in the present-day mental conceptions of man; “on high” time does not exist. But Space yes! Or rather, the more one rises in comprehension, the more it reveals inclusive, new and divine characteristics. That which yields and falls away is not Space, but “distance”, an illusory concept, a fictitious attribute. And it is precisely Harmonics, with its laws, that by itself overtakes and destroys this false understanding. In fact it presents and studies different levels of relationships which are pure numbers, purified of any dimension: and in this lies its general validity. The action of Harmony is

potent in that it eliminates very serious illusions and allows one to perceive intuitively and conceive Space as a Being capable of infinite pure relationships: in which the consciousness, instead of being isolated, communicates with the whole.

Thus time should not be understood as the complement of Space; it is, on the other hand, more rightly, the inevitable complement of the idea of distance. If one admits a separation between two points in Space, time, becoming and the concept of "finite" are invented. Now let us believe that real Space is independent of these and other errors, but contains them in itself, as it contains every thing, every thought, every life!

Living Harmony and its practical study are supremely important, indispensable, because they dispel the illusion of time and distance in consciousness.

This aspect, fruit or action of concordance is of a luminous nature, undoubtedly celestial. Without doubt it is what men of every age have sought and obtained from it, when they have found the idea of universal relationship.

The spirit which is stimulated by the Magnet is linked to the great activity which builds the manifest and established Universe. This accordance leads to the greatest harmony. On the other hand, the spirit which tries to cut this tie, creating a little world of its own, departs from the path which leads to the Infinite.

4 – SOUND AS NUMBER

Consider now two experiments on the monochord. If we have reflected intensely on the content of the two last paragraphs, we can understand them well. They are equivalent in effect and significance but proceed from different premises.

First experiment

Let us resolve to hear an interval of an octave. Placing a bridge in any place under the string, we make it vibrate to the right and left and we move the bridge until we hear the same sound on one side and on the other; it is precisely the higher octave to the sound of the free string, or to that of any other string which is in tune with it. Let us now measure the length of the two sections of string. If we have heard well, that is if we have “balanced” the two sounds well, the respective segments are equal and so each one is equal to half ($1/2$) of the entire string. Thus the sound heard – the higher octave – stands to the base sound as $1/2 : 1$ ($C' : C$).

Second experiment

Let us seek the sound which is produced when we halve the free string, so that the relationship of the lengths is as $1 : 1/2$. Let us divide the string with the bridge into two equal segments and let us listen to the sounds of both. They are two octaves, equal and higher, of the tonic (= sound of the free string). One reaches the same effect as with the previous experiment.

Observations

To understand clearly the principle of Harmony, it is indispensable to realize the sense and the fact of these two different experiments. The first time we passed from sound to number, the second from number to sound.

With the first experiment, having tried out a relationship of values, we established it, through a measurement, in a number. With the second, after having established a simple numerical relationship, we transformed it, by means of a vibrating string, into an experimental value.

The person who, on reflection, succeeds in perceiving the fundamental, immense difference between:

- evaluating matter (a relationship of length) on the basis of his own sensation and giving it a numerical form (first experiment), and
 - seeing a figure or psychic form (the octave), capable of living, arise immediately in his own sensation (second experiment),
- understands the meaning of the principle of Harmony, as a new and promising synthesis between value and being, soul and world, “I” and nature.

If, for thousands of years, the spirit has been seeking the path assigned to it by the luminaries, and its essence aspires to harmony, the Magnet responds and the cosmos arrives at the best concordance. A universal chord is composed of these consonances!

EMERGING CONSIDERATIONS

The first experiment on the monochord, which goes from the value to the number, follows the direction which descends from the universal to the particular, from the Idea to its forms, from high to low. The creative acts, greatest and smallest, proceed thus in the Cosmos.

It corresponds, among human actions, to writing, that is to noting the idea with external, visible signs. It is said that the Creation is a Book.

The other experiment goes back from the number to the value. It corresponds to reading. The “reader” goes back from the sign to the living concept, communicates with it because it penetrates its space and transfers it, unharmed, with other signs to the consciousness of others.

One cannot say which of these experiments is more important. Reading or writing? They are branches of a single trunk, for which we do not have a name nor an experiment: and it is such that, if we were to name it, it would not be what we say. When one reads (and by this is meant the movement from number to value), the figure or the mark, penetrates into us through the senses in some way, where it deposits or pours out the energies which it contains – without exhausting them on this account. The quality of these energies varies from those typical of chaos and those which are daughters of Order. To represent Chaos can one write a balanced and regular form? No form, in the strict sense, is suitable for Chaos; as even the most disturbing form for disorder still always has a germ of equilibrium. Thus no form is suitable to represent perfect Order, as each one,

however luminous, still has always a germ of imperfection. But men must use forms contained between these extremes of the infinite; and so they rightly reserve the regular ones for the Light and the irregular ones for the Darkness. But from these two experiments on the monochord – and from other innumerable and different ones – one gathers that the forms, when they penetrate into man through the senses, communicate energy to him and this is qualified by their qualities.

It is therefore educational to surround oneself with objects which are as perfect as possible in form: as the harmony of their external relationships is a harmony of inner values, and this impresses itself on the psyche to advantage. But all that is said of form is said of Space, without which form does not exist; and a form, if rightly considered, is only Space variously enhanced and qualified: that is, in various states of tension of Fire. Thus it is inevitable to live, like each person, in Space; but it is wise to qualify it so as to emphasize order, not only geometrical, so that the Fire fertilizes it. It is inevitable to live in oscillation, but it is wise to endeavour to set these vibrations beside the great and simple rhythms of the cosmos.

Everyone sees the sun rise and set; but few accept it as a dance, with balanced measures of time and space. Everyone knows that the direction of the North is different from the South. But few look with wisdom at the Pole star, the only motionless point in the heaven. No-one denies that we live in Space; but few recognize it as the omnipresent Mother. So harmony lives in few people: earthly man neglects his task and condemns himself and his planet. He reads only brute forms, disconnected from the Whole, that is, ugly; and he can only express analogous, corrosive forms. He does not transmute. He only reaches the level of mechanical precision. Reading nature, reading the heavens or the harmonious forms created by others are not things for modern man, who has chosen a different destiny for himself.

The person who is really interested in Harmonics opposes this tendency, which puts out the Fire of Space. “He reads” and “he writes” according to exact measurements and endeavours always to put everything into proper relation. He understands the Earth as a cosmic form which must reflect its heaven in its Space, so as to ignite superior qualities.

It is this human task which must be defined little by little in our minds, with incessant labour. A new form of man must be born. Space conceives it, as Mother, if human fire fertilizes it. Much has already been done in ancient times; great minds have collaborated in this creation. But now the New Race is about to be born, which will know how to link Heaven and Earth, as is the duty and function of Man.

He is quite rightly a cosmic being and therefore he cannot be without a cosmic destiny. But Harmonics is the law of the Universe; and man cannot ignore it without destroying himself. With simple and powerful thoughts and actions man inculcates in himself and in his space a certain degree of harmony. Otherwise studying is not worthwhile: one only adds another philosophical system to the many sterile doctrines. To limit oneself to measuring relationships without listening to their sounds; to check the surface of the forms without endeavouring to take in their energetic content; to understand harmony as an aesthetic exercise and to ignore its innate magical and constructive property are qualities which mark periods of decadence, great or modest. Now, however disastrous and chaotic the present conditions are, one can say this: that it is no longer a time of decadence. The fall (and what a fall!) has already happened. This is a time of climbing up again. It is therefore necessary to listen to sounds within; to open oneself to living harmony, as if to a divine grace; to use its potent magic with love and science.

The study of this Treatise either tends towards this, or is useless. If one does not recognize that Harmony destroys Chaos and that a harmonious form is marvellously therapeutic in this sense, what is the use of putting things in proper relation? If one fears to introduce the Infinite into life, one should stay away from Harmony, which finds it in every place.

He who seriously applies himself, in the Pythagorean sense, to Harmony, thus learns to read and write. These two operations, with all that they imply, lead him out of his prison.

All the creative work of the universe lies in unlimited harmony.

5 – STRING LENGTHS – WAVELENGTHS

String lengths demonstrate the space aspect of the sound process. The monochord represents them in the simplest and most evident way. But every musical instrument makes use of its own spatial aspect: the length of the column of air in the flute and in wind instruments in general; the thickness of bells, and so on. One can say that for musical instruments the spatial aspect is an inevitable presupposition. High sounds require shorter strings, columns of air and oscillating instruments; low sounds require longer ones.

Let us speak in general of “string lengths” to denote this aspect of sound, as the acoustic spatial laws can be best examined by means of string lengths; hereafter we will reserve this expression to indicate the space aspect of harmonic theorems.

In Physics, this same aspect of any process of oscillation goes under the common name of “wavelength”. Besides sound waves there exist very many other waves: optical, electromagnetic, radio, telluric and water waves, etc. They are all measured with spatial instruments and, as far as observing them is concerned, they belong in the same category as sound waves.

The frequencies (that is the number of oscillations), which we will discuss in the next paragraph and which have a temporal character, are obviously coordinated to rhythm; the string lengths, on the other hand, do not immediately make an impression by rhythm and movement, but by their presence, form and figure. However, it is sufficient to represent any kind of waves graphically to derive a clear impression of rhythm from them. This “figuration” of the rhythm confers a special significance, in the sphere of Harmonics, on the phenomenon of the “string length”.

Observations of this kind have little sense for Physics, which seeks on the contrary to make no distinction between wavelength and frequency, through common and reciprocal formulae for both “aspects”, which make it possible to pass from one to the other. That this reciprocity is also of the greatest importance in Harmonics we shall soon see. But for Physics it has only a value of calculation and everything simply depends on whether the phenomenon is observed from one or other of the two aspects: space or time.

"When the spirit assimilates the forces of the Magnet for thousands of years it becomes supreme harmony itself."

6 – NUMBER OF OSCILLATIONS- FREQUENCY

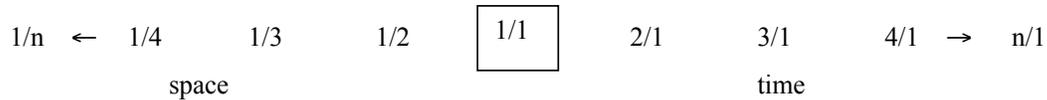
The number of the oscillations – called frequency in Physics – manifests the time aspect of the sound process. It is no longer a question of the string length, or of the column of air, or of the dimensions of the bell, but of their oscillation in the unit of time.

The oscillations of a sound are regular, that is they succeed each other, the tone being equal, always with the same interval of time or, which is the same thing, with the same rhythm. High sounds have greater frequencies (faster); low sounds have lesser frequencies (slower).

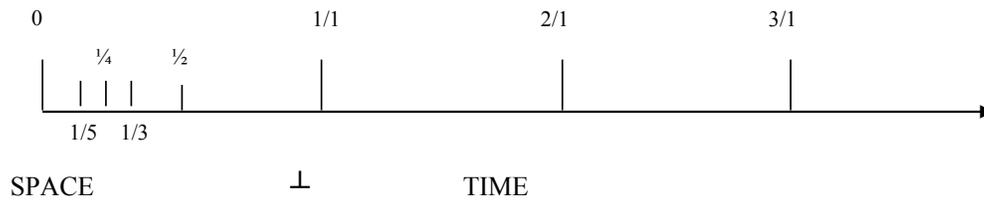
The physical unit for frequencies is called the Hertz and is equal to 1 oscillation per second. We will not use it because, in expounding the various theorems, it is sufficient to mention simply the frequency.

As regards the experimental representation of the sound frequencies, the problem is much more complex than for the lengths, which are shown with so much simplicity through the monochord. It is clear that the direct measurement of the oscillations in the unit of time is not easy, since they are so rapid just for medium sounds that the eye cannot assess them. Various indirect methods, especially electronic ones, exist today which allow an approximate measurement of the pitch of a sound, yet they are all rather costly and complex. But in Harmonics they are not necessary, since, as we shall see, the sound frequencies are reciprocal (that is in inverse relationships, like 2/3 or 3/2) to the wavelenths and therefore, with a simple "inversion", one can always find the corresponding length on the monochord.

As can be seen, whether their origin is spatial or temporal, the sounds and intervals are in perfect reciprocity, that is, the higher octave, c' , is expressed with the fractions $1/2$ and $2/1$, and the fifth with $1/3$ and $3/1$. But this reciprocity is surprising if we examine its form. The double series, when developed, is written thus:

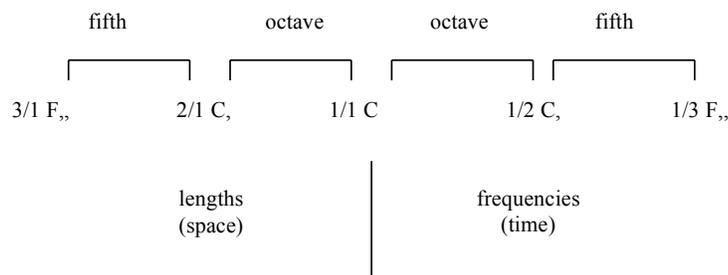


and shows that the left (or “spatial”) branch has quite a different aspect from the other: which is still more obvious if we represent them according to geometrical sizes:



The reciprocity between space and time thus has, like Janus, a double face and presents two forms, measurable but different: the temporal succession, which has characteristics of uniformity and equidistance, and the spatial one, which is not uniform and serial and is composed of points which come closer and closer to each other in perspective.

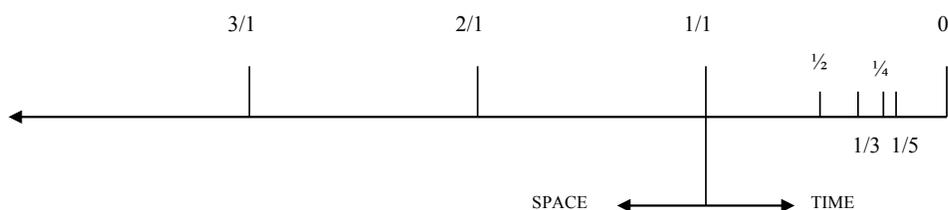
All this is valid, however, only if the string is divided into two, three or four parts – in brief, when we act in the direction of making the space aspect smaller. If, on the other hand, we double, treble, etc. the initial string, that is, we hear the lower octave, fifth, etc. the figure is reversed:



The two series then assume this expression:

$$n/1 \quad \leftarrow \dots \quad 4/1 \quad 3/1 \quad 2/1 \quad \boxed{1/1} \quad 1/2 \quad 1/3 \quad 1/4 \quad \dots \quad \rightarrow \quad 1/n$$

space time



To sum up: if we increase the lengths, the temporal aspect “contracts”, while the spatial one remains uniform and equidistant. If on the other hand we diminish the lengths, the space “becomes shorter” and the time remains uniform. It is a phenomenon of great importance, from whichever side one looks at it.

It must be said, naturally, that the same relationships, and the reversed ones, are obtained if the frequencies are taken as the basis. The sounds obtained are then complementary: F becomes G, As (A sharp) becomes E, etc.

In other words, for an observer immersed in a uniform, “equidistant” and “Euclidean” space, time will be unequal, in perspective, with closer and closer intervals. If, on the contrary, he is in a uniform temporal flow, the space, in which that time transpires, must become “perspectival” and “non-Euclidean” (that is, where the parallel lines meet).¹

The reciprocity between time and space, as one reads in any text of physics, is not the special concern of Acoustics, but is a general property of any oscillation. Harmonics, however, is the only science which is able to express this phenomenon in a psychic sense – a fact which validates consideration of the space-time problem in terms of harmonics.

¹ H.K. at this point refutes a critical objection. In brief, it concerns the affirmation that the reciprocity between time and space is not sustainable since, if the lengths are increased, the oscillations also get longer. That is, space and time are not reciprocal, but equivalent. The author points out that this reasoning considers, in the “growth” of the oscillations, their spatial aspect, that is their breadth, and not their temporal aspect, that is, the number of vibrations in the unit of time.

It is amazing that Physics has not pointed out the surprising form of this reciprocal relationship and has limited itself to the numerical expression $1/n : n/1$. Otherwise it would not have failed to note the correspondence that it has with the famous “contraction of Lorentz” in the Theory of Relativity.

With this theory, the analogy is evident, especially as regards the famous paradox of Einstein, that is, that the world is “finite” and nevertheless “unlimited”. To illustrate it, one resorts usually to the example of a sphere, on the surface of which one can crawl “without limits”, even if it is a finite space. If instead of this example one were to use the concept of reciprocity between time and space

$$0 = 1/\infty \quad \text{finite} \quad 1/3 \quad 1/2 \quad 1/1 \quad 2/1 \quad 3/1 \quad \text{unlimited} \quad \infty/1 \quad = \quad \infty$$

$$\text{time (or space)} \quad \perp \quad \text{space (or time)}$$

one would have, to begin with, the advantage of making use of a physical property and also of revealing the morphological foundation of that paradox: it is probably a question not of a simple spatial question, but spatial-temporal, in which one vector is labelled as unlimited and the other as finite.

Another analogy emerges from the foregoing, especially if one observes, on the one hand, the convergence and, on the other, the divergence of the two reciprocal series:

$$1/\infty \quad \dots \quad 1/4 \quad 1/3 \quad 1/2 \quad 1/1 \quad 2/1 \quad 3/1 \quad 4/1 \quad \dots \quad \infty/1$$

$$\text{finite} \quad \perp \quad \text{unlimited}$$

Since ancient times, the study of matter in the microcosm has sought a limit in the last indivisible particle (the atom). That is accepted as a likely hypothesis and, on the other hand, considering the macrocosm as a space without limits presents no difficulty. This is really surprising and one can only explain it by supposing that a prototype scheme exists in us, according to which that which is limited is small ($1/\infty$) and that which is unlimited is large ($\infty/1$).

One can raise the objection, in this regard, that the mathematical expression $1/\infty$ is not limited, that is, the series which tends towards this value is not convergent but divergent. This, however, is valid only in a purely logical-mathematical sense. For, if one represents it in some

geometrical way, for example by drawing segments successively equal to 1, 1/2, 1/3, and so on, one reaches the conviction quite soon that there is a tendency towards a limit, beyond which one cannot pass; and precisely this prospect, this progressive shortening contrasts with the fact that the other series: 1, 2, 3, ... $\infty/1$ is “really” unlimited. This is without saying that on the “divergence” of $1/\infty$ well-founded objections can be raised, even in a purely logical sense.

EMERGING CONSIDERATIONS

These brief comments, of an exploratory nature, aim as a whole to prepare the renewal of a superior Harmony, which little by little emerges from the depths and is revealed. Already the virtues of Heaven bring it back to earth: but first it must descend into the heart of man, which links the latter to the former.

Light and delicate wings support these uncertain and timid flights. But let the person who follows this commentary prepare himself to carry out other, much loftier and more courageous, flights towards other planets and constellations. He himself will have to fly, in adoration.

This then is not an acquired knowledge, set out in formulae. It is a spatial investigation which does not claim to put together a system. However, it has direction, rhythm and energy.

The cosmic Breath of the Mother of the World pervades everything. In truth, everything is impregnated with it ... life moves and breathes through that Breath.

Space lives, breathes and vibrates

So any length, whether physical or not, vibrates by itself; any region, whether circumscribed or not, is pulsating. Consider the various regions, heavenly, earthly, human, forms of geometry, forms of the mind, and all lesser impulses. All this is pulsating and vibrating.

In any point in Space all the infinite possibilities are latent.

Any form in Space is like a “resonator” which, if suited to the aim, emphasizes certain of its particular frequencies, to produce the effects desired by its builder.

“Any form of Space”. It is the introduction of a new and simplifying concept. Space exists, pervaded by Fire. With our senses we perceive forms of forms, that is types and classes of forms. But these are nothing but forms of Space, which yet contains them. However complex a form is, however numerous the ingredients of various kinds are, it can always be reduced to a grouping of

forms of Space. Its characteristics enhance Space, whether enclosed or external. Between these two regions, inside and outside, a relationship is established by form.

It is true that any separation is illusory and so the forms are creators of enchantment. But this illusion is still always the Cosmos, the infinite field of our experience.

By observing the laws of vibration (or of the cyclical variation of energy), man can make objects, instruments and thoughts suitable for selecting the desired frequencies. The limits of this prodigious faculty are only those imposed by his illusions. With a gesture he can evoke the forces or the humanity of distant worlds; with a thought, emphasize superior frequencies and introduce them as solutions into the environment; with a small object like a vase, or a large one like a temple, place in a state of resonance very powerful, if inaudible, vibrations. With geographical alignments, he can compose vast harmonies between Heaven and Earth and start luminous civilizations. In this he proceeds like Nature, which from within erects forms which enclose and open itself.

Then if his work is harmonic and he seeks celestial harmonies, he lights fires in Space and collaborates with the Cosmos. Beauty is a form not of Space, but of Fire. Thus Space and Fire, united by beauty, reproduce in consciousness the Essence (that is the Tao) which generated them.

From this follows the importance of the purity of Space. It is not enough to compose figures according to rules of harmony, to obtain beauty and fire. This operation must be the sum of many others, preceding, following and simultaneous with it. It is not enough to copy the beautiful work of others in order to build in a celestial way. All gestures, thoughts, impulses and motives must be concordant, among themselves and with the universal aim. In this case, certainly, the work of man's hands, whether tiny or monumental, is lasting and acts in Space with the constructive power of its fire. In this case, its author presents himself as godlike in future epochs, with the authority of a messenger; he prepares, cultivates and composes forms of joy destined for appropriate times.

There are no limits to harmony; otherwise, after the drawing of a rectangle $1 : \frac{1}{2}$, everything would be completed. The forms of Space which issue from man are the fruit of an ongoing process, which originates in a distant past and passes through the present but is directed towards the future. He expresses what he has with forms; but he can vary its content if he unites his life to that of the Cosmos.

Space contains the threads which connect souls and cause attraction. When their call is understood, Space takes on an infinite beauty.

SPACE AND TIME

It is thought that space and time are difficult to understand: especially the latter. The greatness of these two elements disconcerts man. Without knowing where, many people unconsciously put limits either on one or the other. In a confused way they imagine an initial time, from which the ages are counted, and a far-off last instant; and the space of which they think is also in some way circumscribed.

The space which man imagines reflects in some way his concept of horizon. He seems to think that universal space finishes in a horizon, like the individual space of each person. That enigmatic line which is thrown around us is difficult to grasp, elusive but real; it moves with us and it expands or shrinks as we go up or down. Just as no-one can reach it, no-one can escape its enchantment. It will be good to reflect resolutely sooner or later on this concept of horizon. It is too important a symbol to be neglected, and perhaps the unbiased study of its qualities, whether constant or varying from point to point, will lead one to know many things, which were known in ancient times, about oneself and about life. That magic circle is the meeting point of the terrestrial forces, projected into Space, and of the celestial ones, lowered from their sublime heights. It must, therefore, develop many relationships and give direction and sense to the events and rhythms of human life. But today men do not care about these investigations and the horizon, though so fascinating and always present in every one of their manifestations, ends up by being the boundary, accepted and distant, of their space. This idea of a limit is thus projected also into cosmic Space; a very distant term, on which it is useless and inappropriate to speculate.

Time as a concept and a perception also weighs on human intelligence like a lid. In the way it is understood, as having an origin and an end, it places limits on man's experiences of life: it opens and closes, begins and interrupts. The birth and death of a man or a universe are within the limits of a temporal horizon. This, however – unlike the spatial one, which in some way can always be examined and can vary, without dissolving, according to the will of its prisoners – is mysteriously closed to interrogation. Death arrives as fatal, if not unexpected like birth. Time seems to be spent at a variable "speed"; and, in point of fact, every moment can be the last for everyone and everything.

Thus the men around us reason, in the kingdom of quantity. Massive prejudices have been built up regarding the duality of time and space. They are hard to shift, not because they are a solid construction, but because they are confusedly interconnected. But, in our opinion, as long as one

allows oneself to remain circumscribed by a visible but unexplored horizon and to succumb to limits of time, one will certainly not go far in space, nor will real, lasting fruit be left. It seems to us to be supremely important to attack these limitations spiritually, with one means or another: by studying the qualities of the horizon and the space which it seems to close around us, like conscious points of a figure; or with affirmations on the nature of time, which empty it of power. If then, as is legitimate, these affirmations and discoveries turn out to be only stages and pauses of little importance, still individual and collective thought will have been shaken out of an enormous lethargy.

In the treatise by H.K. the paragraph on space-time (para. 7) offers a suitable occasion to express, with some force and in brief, a reaction to the inertia of contemporary human opinions with regard to space and time.

Introducing his arguments, which aim to present in a harmonic sense the reciprocity between time and space, the Author, without wishing to enter into philosophical speculations, uses this phrase: “we are in space, we become in time”. It is the simple formulation of a little understood truth and it can be chosen in support of our affirmations. (It must be said that these do not claim to demonstrate what they assert: but they are directed to those levels of the mind which do not need proofs).

In reality, man is.

His becoming is illusory. And, as he is in Space, this is the very seat of reality.

Time is unreal, like becoming.

One must therefore deny that space and time are realities which are complementary or joined in a reciprocal relationship.

The more one rises by exploring, the more real and living is Space revealed: the horizon not only expands but lights up with wonderful qualities, and by a line of demarcation it changes into an instrument of contact. Time, on the contrary, does not take long to show its falsity, the source of numerous deceptions. There is no relationship between them, just as there is no relationship between reality and illusion.

As it has been stated – even if not demonstrated – that Space is a principle and time an unreal concept and that therefore no relationships of any kind can exist between them, it only remains to descend to the study of the forms of illusion, which yet are divinely capable of transmitting a real content.

In commenting on the third paragraph, we have already said that the concept of distance (or length) is the illusory element which introduces an unreal and finite space into human perception. This is a very powerful rampart, beyond which it is certainly not easy to pass. In reality, everything is infinite and nothing else exists. In human perception, on the other hand, everything seems finite or destined to an end. Only some geometrical or arithmetical concepts evade this norm, but only in appearance. The series of real numbers, for example, is said to be infinite, but this term is improper and it would be better to say “indefinite” – and reserve the name of infinite only for the Infinite.

Thus distance introduces dimensions and limits into the human concept of space. It is important to note that, this being so, every conquest becomes difficult; every journey dangerous; every movement tiring; every exploration uncertain. The cosmos, with its great fires, becomes distant, because consciousness is seized by the distance. The microcosm, with its lights, becomes distant because consciousness is perturbed by both the very great and very small distances – and man risks moving only in modest spaces, over “organic” distances, so to speak, in so far as they depend on the possibilities of a corporeal organism. But precisely this idea of distance expands the universe, and ends by suggesting the Infinite.

This is the situation regarding illusions, that is, forms. They hide, but only to reveal their precious content with immense potency. Distance, which at first ties down, closes and separates, is a sure sign of the infinity of Space. Closed in by the horizon, man discovers that, as he climbs, he compels it to expand and that there is no limit to its heights. Up above, there is no horizon for anyone. Truly, every consciousness can be gauged by its horizons!

Time is in the immediate charge of distance, and this, being a relationship of dependency, is unambiguous. In this way also time shows itself not to be a principle, but to descend from a form of Space, which is distance.

The offspring of these concepts are the made-up forms, like the physical values of speed, acceleration, potency and frequency, and in general all the sizes in which time appears.

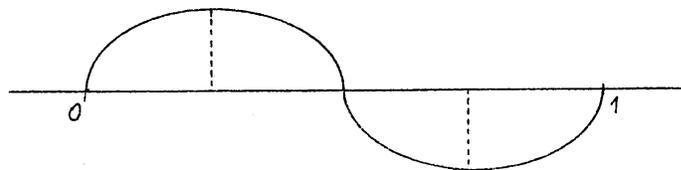
In this field, which is unreal but which seems practical, today’s science, which is profane, reaps victories and makes conquests. However, the day must not be far off (an ambiguous phrase!) when, instead of limiting oneself to measuring “how far” two objects are apart, one prepares to check “how” they are apart. Distances which are equal in quantity are not at all the same in quality. And this, naturally, also in a banal physical sense. A hundred horizontal kilometres are quite different, in quality, from vertical ones; and even among the horizontal distances innumerable

differences in quality exist. It follows that the “times”, and the combined and derived sizes, are also of essentially varying quality from case to case.

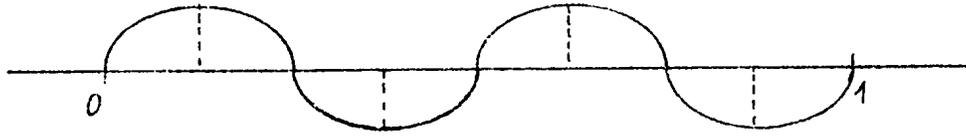
The study of Harmony, which is sacred, allows one in fact to perceive and appraise qualities and, working on pure relationships of numbers and sounds, to extract the reality enclosed in the forms. Its beneficial power is exactly this, as has already been said. In these studies one cannot leave consciousness out of consideration. For it is precisely harmony which, when achieved, allows one to react against the force of illusion and to eliminate, through the magical value of relationships and measures, the fictitious and unreal elements and thus liberate consciousness. Already the very word “relationship” or “measure” is synonymous of consciousness, provided that it allows us to introduce the qualities of the forms – without which the world, as can be seen, is only a wonderful, but stupid, mechanical device.

From the pages of H.K. and from the precise chain of his deductions, time and space appear as variable by nature and quality, and reciprocal, interdependent and complementary. Lengths and frequencies have, in a certain sense, an equal value and one can say that their behaviour is symmetrical. If these hypotheses are accepted – but without forgetting that they proceed from unreal concepts – everything unfolds and is disentangled.

It is however noteworthy, and not lacking in sense, that, while a very simple instrument exists for studying relationships of sound on the basis of lengths (the monochord), an instrument of corresponding clarity for examining frequencies harmonically is not known. Moreover, it must be considered that the studies of, and experiments in, harmony are for the most part based on relationships of length. The time, that is the frequency, is much more elusive. Besides, an oscillation of frequency 1:



and another of frequency 2:



in what do they differ? In the form. Once they are pictured with a form of Space, time disappears, and the values and qualities of Space are sufficient to describe them completely.

When the space aspect prevails in his consciousness, man is a nomad. Space appears to him as indefinite, yielding, in perspective. Then he lives with a sense of uniform time and constant "speed".

If on the contrary the consciousness of time predominates in him, inevitably space assumes different characteristics and becomes monotonous, uniform, stable and defined. It is today the vision of the great majority, composed of "residents". For them time is in perspective and they feel the variation of "speed" in every circumstance.

But the categories of human beings are not as rigid as those of the registry office. In every event, the nomad and the resident are in contrast in each person; and this perhaps has a rhythmic course, imposed by external and grander cycles, among peoples. But it is a fact that in the desert or on the high seas time and space have different qualities for the traveller than when he is in stable residence.

It is said that in consciousness man is "without fixed abode". If it is true, that is, if he is inwardly continuing a voyage, he is a nomad. Space conquers him; time vanishes. Space reveals to him ever new perspectives, which he learns to interpret and love as sounds and relationships, in other words as messages. Facing ever vaster horizons, in communion with Space which is pervaded with fire and life, he follows the ways of the distant worlds, without possessions and without time.

To vibrate with the rhythm of the Cosmos means to realize all the majesty of the Infinite.

8 – RHYTHM AND PERIODICITY

Rhythm and period are two great and important concepts which have a common origin, which is evident in sound as number.

A sound, that is an entity that can be experienced, can exist only by means of a rhythmic periodicity of an oscillating instrument (string, air, etc.),

The unilateral rule according to which rhythm is a property of the organic, the living, and cadence is a property of that which is without life, the inorganic, cannot be accepted. The very cadence of inorganic periods (such as the orbits of the stars or the times employed to traverse them) involves a certain tolerance, never completely respected, while the broad liberty of organic rhythms always has an ideal cadence as a rhythmic basis, as otherwise they would not be recognizable.

It is true that, in current use, the term “rhythm” is reserved especially for what is spiritual and artistic, the term “period” for what is natural, and the term “cadence” for what is technical, but it would be unjust to be rigid about these distinctions. A man, for example, can be rhythmic as regards movements, while he has an organism which is periodic in its various functions and, moreover, technically he can respect the most exact cadences.

Only the heart that embraces the whole world pulsates with the same rhythm as the Cosmos.

RHYTHM

In the figurative arts, in poetry and in music, the inner rhythm is the basis of any composition.

Ancient architecture, according to what distant sources (Vitruvius and others) report, was based on harmonic measures, and it was fundamental to proportion space according to a chord of three sounds. Poetry is ruled by the metre. In painting and sculpture, a certain rhythmic order of colours, design and form is indispensable. All this demonstrates that in art the “thing” is secondary with respect to the “how”; and the latter is nothing besides the inner rhythm of the figurative medium (colours, lines, spatial forms).

In music, rhythm has a twofold aspect: it is in a symmetry and correspondence between the elements of the musical form and also in a metrical measurement, the musical beat. It is curious that for musical rhythms the numbers 2 and 3 are sufficient; as we can perceive only times subdivided

into 2 or 3 parts. Five is already heard as the sum of 2 + 3, or of 3 + 2. We shall see, later on, that with these two numbers alone one can build a complete musical scale.

For the interpretation of rhythmicity in general, the first numbers are sufficient, as far as one can see. In this field also the senarius, that is, the numbers from 1 to 6, is sufficient.

When man's actions affirm the attraction of the spheres, it will be possible to establish a state of harmony based on the cosmic Magnet.

PERIOD

To understand this concept, it is a good idea to seek it in the three kingdoms of nature and also in the field where human will is expressed, that is, history.

The idea of cosmic periods has been well known since very ancient times. In harmonics, for example, the third law of Kepler is important, which he discovered as a result of harmonic research, and establishes a harmonic relationship between periods of space and time. Let us recall what is called the platonic year, which is a cycle of 25,920 years; the period of sunspots, of the elements, the periods of geological ice ages, etc.

Living organisms also, still very little studied, reveal periods in their development.

Harmonic research perhaps has as its most important task precisely a survey of temporal forms, especially of periods. To carry it out, it will be necessary to create, analogously to Geometry, also a harmonic Chronometry or, if you wish, a mathematics of temporal figure. In other words, the forms of time must find their discipline, analogous to that of the forms of space.

The introduction of psychic values into the numbers of forms of time not only allows one to understand them in a more penetrating way but uses a faculty of knowing which has the closest relationship with time: the temporal perception of sounds.

The study of historical periods also, just started, has already given the wonderful result of a kind of morphology of history (Spengler).

Rhythm is seen in the Cosmos as a rational renewal ... Accept with joy this eternal movement.

CADENCE

As already stated, the habit has become established of associating this concept with what is dead, sterile, mechanistic, opposed to rhythm.

Machines certainly show cadence in an extreme way. But it is not cadence which is responsible for their fury, but human devilishness, certainly not for the good, but for the evil of civilization. After all, the fundamental and persistent “inconclusiveness” of any cadence even in the sphere of a forced technique indicates a field which is precisely the opposite: that of an ideal sphere of laws and duties. The most precise machine is never precise enough; and this “imprecision” is inherent in the very idea of machine.

Polarity is that property which determines harmony.

MODERATION

Rhythm is in the whole and in every thing – this can be said without exaggeration. But it is well to remember that other great, primordial principles also have equal weight, such as: polarity, proportions, quanta, trinity, unity, etc.

Those spirits which go forward linking with each other are so well attuned that their analogy composes excellent and very pure harmonies.

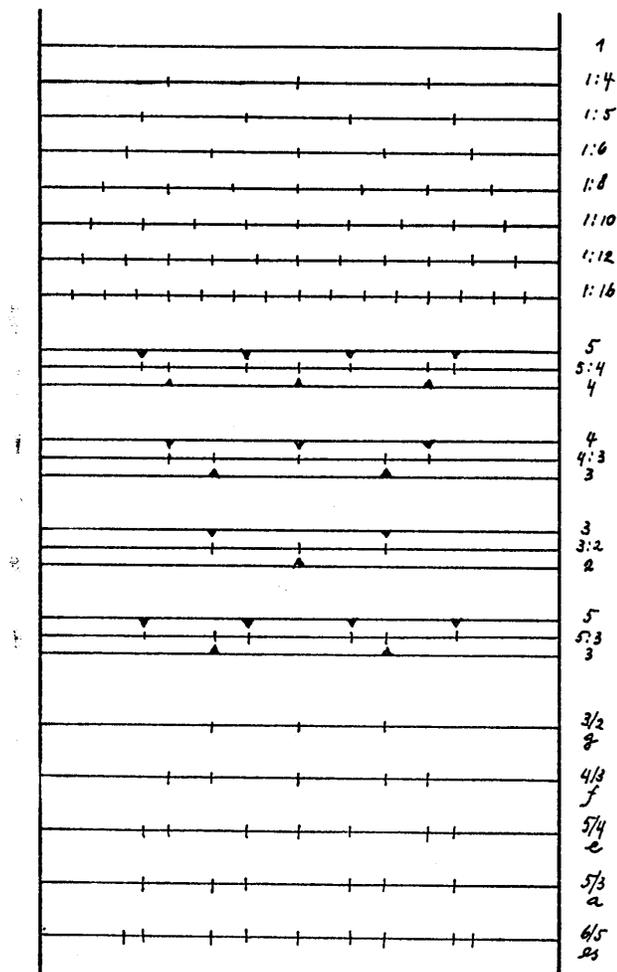
TRANSFORMATION OF RHYTHM INTO SOUND. THE SIREN

A very interesting experiment has been carried out and proposed by W. Opelt, with the aim of passing from rhythms to sounds, intervals and so to chords.

Firstly, he develops the system of the principal musical rhythms (composed with the 2, 3 and 5). A similar thing had already been done by Helmholtz, in his theory of waves and also by Euler.

On a segment established as equal to 1 are traced, as points, the rhythmical relationships of the simple numbers. The first eight lines of the figure represent the unit and the rhythmic subdivisions of $1/4$, $1/5$, $1/6$, $1/8$, $1/10$, $1/12$, $1/16$. Other lines follow, grouped three by three, each of which represents a combined rhythm, which is marked at the side in the last five lines also with

the corresponding sound or interval (be careful, it is still a question only of rhythms, not of sounds!)
 The figure which follows shows the foregoing.²



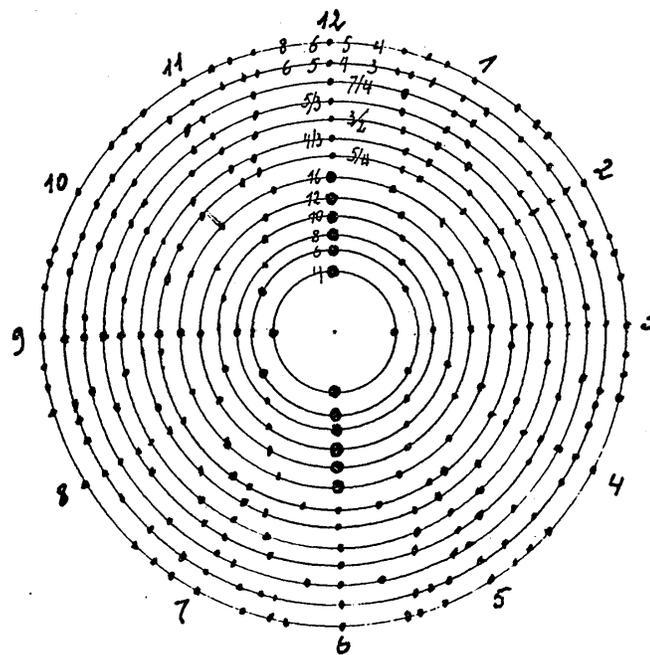
² The text continues in representing the simplest rhythms, and some combinations, by means of the customary musical notation. It is evident how much more complex it is than the very simple representation of Opelt.

With his drawing, Opelt makes it possible to bring back even the most complex rhythms to a common denominator, that is to understand their logic.

How can we transform these rhythms into sounds? It is easy, we say today. It is sufficient to transform the rhythmical numbers into frequencies, to hear the corresponding sounds. But this modern method accentuates so greatly the abstract relationship of frequencies, that too often one finishes by neglecting their rhythmical origin or one does not think of it all.

It is therefore appropriate to learn a system of conversion, which transforms rhythms into sounds in a way which is both visible and exact. The simplest instrument to this end is the siren.

Opelt used a disc of cardboard about 30 cm in diameter and marked on it concentric circles which he subdivided with holes corresponding to the primary rhythms. The following figure represents this experiment:



Placing the disc in rotation, one blows with a pipe on the circles thus perforated. It is evident that higher or lower sounds are obtained with greater or lesser speed of rotation; however the tonal relationships between the various circles remain unchanged. Today, it is easy to have at one's disposal motors which guarantee a constant speed of rotation. If then one supposes that the disc turns at a constant speed, the circles, for example, which are subdivided by the holes into 4, 8 and

16 parts sound the three octaves of Do, which in fact occurs. The second circle (starting from the inside) then sounds the fifth of Do, that is So, as it is divided into 6 parts (2 x 3) and in a similar way the other intervals are obtained.

So by means of the siren the monotonous rhythms are transformed into the corresponding sounds, that is, one passes (and it is really marvellous) from a series of equidistant holes on a circumference to a determined sound. The holes set at these intervals are seen and the sounds are heard! When, by the rotation of the disc, the rhythm disappears, that is when the single beats are no longer heard as detached, sound is born – as was to be demonstrated.

The research, with the same system, into combined rhythms is perhaps still more interesting. Opelt subdivided the external part of the disc into twelve sections, and the circles in a similar way to what was done with the linear segments of Figure 13.

In this way the intervals are heard, for example those of $5/4$ or $4/3$ or $7/4$, which are real chords, that is sounds composed of two sounds.³

EMERGING CONSIDERATIONS

In this chapter, H.K. defines and illustrates three different qualities of the temporal concept of the cycle: rhythm, period and cadence. He then expounds a system for passing from rhythms to sounds, which is so simple and easy that it recalls the monochord.

Each one of these subjects is so inclusive that one certainly cannot think of giving them enough space in written pages. But in our opinion the Author did not enter with sufficient vigour into these essential values of creative life. After these pages, in all his monumental work, the idea of the rhythmic cycle reappears only rarely and hazily. There is no balance between the study dedicated to the properties of the forms and that reserved for the movement and the fundamental cycle of energy. He seems to think that, as rhythm can be transformed into sound, it is enough to consider the latter.

We do not intend to make criticisms of a work which is so precious and so beloved. This is only the finding of a door which remained half closed, through which the Author did not pass. Yet only through it one enters into the kingdom of Fire which burns eternally in Space. In the whole Treatise, not a phrase is reserved for dance, which is the poetry of movement. Likewise the creative

³ This chapter concludes with mentions of the metric system in classical poetry and to the different value given in ancient times to vowels and consonants, according to harmonic concepts.

It is difficult to understand that the thread of spatial Fire extends to Infinity, but the thinking of person who accepts this concept is beautiful.

values of the gesture and the magic potency of rites are ignored. The figures, the diagrams and even the tonal coordinates of space are not thought to be animated by a rhythmic motion, according to the great cycles of energy, which yet produce the qualities of all forms. The failure to see this door cost the Author a superior level of spiritual comprehension.

The energies of Space reach us on the waves of cosmic rhythms. The sensitive perception, study and observation of these pulsations and lastly concordant (harmonic) action with them, that is the precise correspondence introduced into life between the cycles of man and of the universe, destroy the forces which prevent free communion with Space and Fire. All this, in a few words, means living and lived astrology. This science is really inevitable on man's way!

If it is true, as it is true, that in a musical form what counts most is not the melody, nor the tonality, nor the instrumentation, but the rhythm, to which the work owes its creative effectiveness and which, so to speak, supports it on sure and invisible wings and predetermines all its future "dates", what must be the value and importance of a cosmic, or solar, rhythm! If the perception of sound brings one back to the psyche, rhythm brings one back to the spirit. It is a more subtle being than sound: it is its very soul; and nothing higher can be found which can still be expressed in thoughts and words.

We do not see that it is necessary, nor that these are times, to reduce the drive to study rhythm, despite today's evident distortions and the dangers they involve. If the cycle of this manifestation is now, as is believed, in the phase which corresponds to its winter solstice, that is in its most dark and dense section, this is really the most propitious hour for investigating and supporting the signs of the great return of the light, and for starting great beginnings with small actions.

It is the sacred epoch of the heart and of Space.

For the doctor of today, the human heart is only a pump. But who can say that its pulsation is an inconclusive mechanical cadence? On the contrary, it is a very variable rhythm, which reflects exactly and faithfully the changing relationships between man and the cosmos. Many people know and experience the fact that the movements of the heart vary mysteriously and continuously. The consideration of this evidence is sufficient to "dismantle" that pump for ever. In its place we see a psycho-physical organ, rhythmical and of a kind that adjusts other organs to the variable

conditions of environmental energy and at the same time reveals these conditions so that they can be interpreted and suitable “measures” can be taken, if necessary.

Besides, if rhythm is of such sublime value in the Cosmos, the most suitable organ for studying it can only be the most rhythmical and sensitive human organ. For this investigation the brain is not adequate. The continual vigilance and interpretation of the very changeable cardiac rhythms, with the subtle sensations which accompany them, must in some way favour the understanding of the relationships which link us to infinite Space. The very form of the heart, which encloses a changing space traversed by continual currents, varying from moment to moment, must be fundamental in the Cosmos.

Modern western man has discovered many physical energies and how to transform one to another with the most diverse means. But he has not yet recovered the idea, majestic and simple, that all the energies, physical and non-physical, are forms or aspects assumed by a single Energy, to which the name of Fire is well suited. The ancients knew it, who also knew its fundamental cycle.

Here is a famous symbol which represents it:



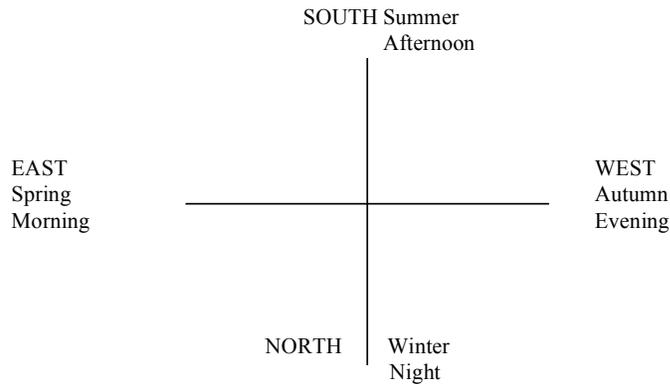
After a brief, elementary study of the horizon, it is concluded that man lives closed in this cycle which conditions him in all his acts and qualities.

** * * * **

The fire of the Sun and the spiritual one are our creative forces. The heat of the Sun and of the heart infuse life into us.

ELEMENTARY STUDY OF THE HORIZON

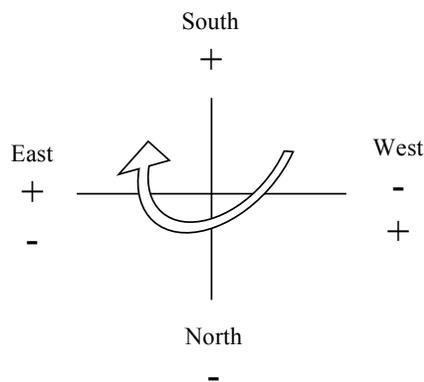
The sun rises in the east and sets in the west. Its course in the heavens divides the space into two parts, south and north. Thus the directions of space have different qualities and energetic conditions, which everyone knows [in accordance with their hemisphere, assumed below as northern, Ed.].



This cycle of energy is the solar year and it is also the day. The year and the day thus repropose the same, identical rhythm. This is a first consideration which considerably erodes the idea of time.

Then larger solar cycles exist, in each of which can be found the four cardinal directions, with the corresponding qualities.

According to the energetic variations, the cycle can be represented thus:



To the south Space is positive, to the north negative.

These conditions come to a point of balance twice in every cycle, to the east and to the west.

However, these points of balance are very different in nature! To the east, the space is rich with the promise of the future, it is springlike: the positive force is growing. The west is the signal of the night: its energetic balance tends to the negative. For this reason its symbol is –/+ since the – is dominant.

Every man in every place (even at the poles) can confirm these elementary statements and recognize that a rhythmic cycle of energy exists, to which one can give the name of day, year or platonian year, according to the movements considered.

Moreover, this cycle is binary, day and night, wakefulness and sleep, and one can consider it also as divided into four phases.

It is important to note that this variation in the quality of the horizon is so real that everywhere the particular meridian can materialize, which is analogous to the axis of the solstices (and similarly for the line of the equinoxes which is perpendicular to it). The whole of astronomy, and in our opinion also astrology, is based on these elementary observations.

Naturally this cycle is only relative. If the observer disregards his own horizon, he recognizes that the sun emits energy of a constant quality, which is unaware, so to speak, of the earthly cardinal directions, and in brief of a kind that it is neither spring nor winter.

The fundamental cycle is thus the effect, and demonstration, of a relationship. As a prism splits solar light into its seven component colours, so the presence of a horizon splits energy into its fundamental qualities. Moreover, to these it adds its own characteristics, which vary from place to place and from one planet to another.

Lastly, the sun is in its turn in relationship with other great centres in Space and so the energy which it emits is not constant, as was supposed just now, but certainly pulsates with a superior rhythm, of similar form but of different strength and qualities. Thus its energy changes continually, but in an ordered way, and it radiates into the system the fruits of its celestial relationships.

As the prelude to this brief study of the horizon, it was said that man is the prisoner of the rhythm of energy; and this can be verified in thousands of ways.

But it is right to remember, in conclusion, that man lives in the hope of fleeing from it; and that it is precisely Harmony which leads him to those gates through which he passes from becoming to being.

The first men who – called cosmonauts – went out of the gravitational field of the earth saw the sun rising and setting several times in twenty-four hours. Thus they lived 4, 5 or 6 “days” in a single one. This experience also breaks down the concept of time as it is understood today. In truth, the day, or the year, are not measurements of time, but rather units or quanta of energy of the great solar rhythm. Those few men are, to all intents and purposes, “older” by four, five or six days; but this means that they have had at their disposal more cycles for experimenting, loving and understanding.

One cannot speak of rhythm without going back to the fundamental cycle of primary energy, which the universe puts forward again for our attention. The rhythmic unity or the beat of that energy is composed of differentiated phases, which can be represented, provisionally, with the terms spring, summer, autumn and winter, or other associated terms. In everything that lives one must be able to find this cycle; in all the functions of organisms; in all cosmic modifications.

It is important to recognize that in every living being there exists a rhythm and a rhythmic unity, with multiples and sub-multiples, that is with octaves, fifths, thirds, and so on. But it is still more essential to recognize that in the very unity of the rhythm the same phases and qualities that are those of the horizon can be distinguished.

We insist on the concept of horizon, both as a symbol and as evidence. In it the cosmic environment meets with the earthly and human one. Its very variable energetic qualities are strictly rhythmical, and one is tempted to compare it to the human heart. In that case, if it were comparable, the study of one should assist that of the other, mutually. This is at all events a hypothesis which appears worthy of consideration: heart and horizon in a mutual rhythmical exchange of energy. It is certainly true that every other organ of the human body has its own functions, with daily and seasonal cycles. But they are dependent on the heart; which, from this viewpoint, is the organ, or rather the function which transforms the inside into the outside and viceversa. Lastly, if these hypotheses or other similar ones are accepted, it follows that every cycle necessarily has a centre, without which it would not exist, like every circumference. However this centre has a psycho-spiritual value, like the whole of Space, of such a kind that it determines the diameter, the radii and the curvature of its external form.

All this is preliminary to living harmony as, if it is true, the absolute necessity follows of fitting action to the cycle, which is in fact a science of harmonics applied to life. To carry out right actions in the “right” time; to subdivide action into its fundamental qualities – beginning, peak,

harvest, preparation – and to adjust them to the external solar and cosmic cycles. To give rhythm to actions and to adapt them to the time and the place.

These are concepts which will have a long and luminous future in the story of humanity and contain a living ethic, which includes the veneration of the beautiful, the religious observance of the laws of the universe and the scientific use of harmonic rhythm. These principles appear in writing on these and other pages, because the hour is fitting; but they always live in the heart of each person, who sends them out into Space.

The supreme concordance is a sacrament of Being ... If even on Earth concordance gives marvellous forms to colours, to sounds and to man himself, what cannot be achieved with superior harmony?

9 – RESONANCE

This important subject can now be dealt with because one can check it with the simplest means. One touches a string of the monochord and observes that the others also (tuned to the same sound) enter into a more or less accentuated vibration, according to the force of the first touch.

Any vibrating body enters into resonance when “it feels” its own sound. The most well known and disseminated technical use of this principle is the radio-receiver apparatus. It contains an oscillating electrical circuit, which is regulated so as to pick up the wave of the desired broadcasting station; this occurs when the two vibrations enter into resonance. With the monochord one can also verify the precision of sound resonance, by varying the tension of the initial string. It can be noted that very little is needed to lose the resonance of the other strings, which remain mute and as if dead, because they do not “hear” that sound which is intimately connected with them.

The principle of resonance is recognized as valid in many fields, and thus not only in acoustics but in Physics as a whole and in Electricity; and it is present, as we shall see, also in many branches of learning and art. In a purely material sense, it is explained by saying that resonance is produced when the oscillations of a body are transmitted to another of the same “period”, through a form of combination. If we leave aside the question of combination – (air, ether, etc.) – which still conceals many enigmas and has not been clarified at all, nor is it as simple as explanations of this kind would have one believe – the fact that “different bodies of an equal period” exist is worthy of the most lively interest. This at first seems evident, but it becomes extraordinary when one considers the phenomenon in an absolute sense, by itself, that is when one investigates the how and the why. Then it acquires a far greater value. In Physics, and in its technical applications, a copious use is made of it. In Chemistry, it is called catalysis: in fact resonance alone is able to explain the enigmatic catalysts. The same holds good for enzymes and ferments in vegetable and animal bodies; they can be explained only as entities of resonance present in the material cycles of life, that is able to increase or reduce oscillations and to preserve the general equilibrium of the organism.

But resonance is revealed also in the psychological field. From the phenomena of sympathy and antipathy, to the appearance of similar ideas, to the contemporary discoveries in different

places, to end with the great historical resonances, which can certainly be interpreted in a positive or negative sense as gigantic effects, it shows that it is a universal principle.

Equilibrium is lost when energies do not correspond and are not sufficiently harmonized.

VARIOUS NOTES

On 16 April 1850 a battalion of French infantry was marching on the suspended bridge of Angers, with a span of 102 metres. The mooring ropes broke and 236 soldiers perished. The cause: the period of oscillation of the bridge entered into resonance with the cadence of the marching step.

When a substance, by its presence alone, without changing, favours or hinders the combination of another two substances, it is called a catalyst. For example, water and nitrogen do not combine at all. But if one adds platinum, a reaction is produced and ammonia is derived. It is surprising that the catalyst is not damaged by the process and remains completely "neutral", which can only be explained by considering it to be in internal resonance with the other two substances.

According to what Sir John Barrow, who travelled in 1800 in the Far East, reports, "the Chinese doctors consider that every part of the human body has a pulse of its own and that from this beat all the illnesses can be discovered. For them the science of pulsation is the major one and the doctor not only studies the various pulses for hours at a time, but gives the patient precise prescriptions ... For every pulse quality they have an expression or a name which characterizes it ... In substance, their manner of touching the pulse is in effect like comparing it to a musical score, which matches their conception of a living body, which they compare to a well tuned lute."

Robert Fludd, a Rosicrucian, considers that men are resounders, who reproduce cosmic "music"; the human organs are in proportion to the cosmic resonances and every man has his own "base note", which corresponds to a cosmic configuration.

Only the currents, stretched out like vibrating cosmic chords, give the formula of the revealed Magnet of the Infinite.

EMERGING CONSIDERATIONS

Resonance is one of the essential principles of Space.

Let us imagine a cosmic source, which transmits its peculiar quality in Space by vibration. All the other sources which are still inactive, but distinguished by the same quality or containing it, are induced to vibrate by resonance.

It is an immense process, spatial par excellence, which one must study with the most profound attention, remembering that the Space considered here is “That in which we live, move and have our being”; it has no extension nor distances and offers no intervening resistance.

The starry heaven is perhaps the figure which best assists in understanding this principle. The stars, like worlds and systems, are sources of energy which is propagated by vibration in the universe. Wherever it meets similarity or attunement, it is picked up, assimilated and relaunched into Space. In other words, all that is “in obedience” to a certain signal receives it, identifies itself with it and retransmits it, as long as it lasts, to its source.

From this cosmic miracle infinite considerations, corollaries and applications derive.

Everything is transmitted, in Space. There is no knowledge, nor consciousness, nor sound that cannot be extracted from the invisible and manifested in a form. That which belongs to Sirius, Jupiter and Venus can be expressed in earthly ways. It is the universal Science. The Cosmos knows, and every particle of it mirrors all its wisdom.

When such subjects are touched on, one is distressed and as it were oppressed by their very greatness, so that what one devotedly perceives and describes seems less than a grain of sand. The infinite cyclical modulations of the innumerable sources of energy, their power, the activity which they induce in the most hidden spaces, the ready, spontaneous and perfect obedience of their similars, and the stupendous and simultaneous interweaving of all the vibrations are conceptual forms of such force as to seem unbearable to the heart. But the resounding Space contained in the heart is precisely the place of reception and transmission of all the signals. It must be purified and kept in such a state of selective tension as to react to the most distant messages and to recognize their origin.

It is a process of education and discipline which are easy to understand, through which one day earthly humanity will rise to the glorious consciousness of the Cosmos, distilling knowledge by resonance.

The unity of the Cosmos appears to be ordered by degrees, distinguished by the quality of consciousness, each one capable of responding to tones of cosmic vibration and of reflecting them within its own hierarchy. From this it appears that the process of resonance is twofold in its effects. A receiving centre receives the signal which arrives from outside and sends it out again into Space, amplified by the spontaneous concordance induced; but it also absorbs part of the energy and distributes it, within its sphere, to all those component individual parts for which it is rightfully responsible and which are of such a nature as to correspond to the sign.

Thus in particular earthly humanity receives from Space the waves which, through quality of consciousness, it can “understand” or, in other terms, which it obeys. And it not only relaunches them but absorbs and spreads them within itself among all those individualities of which it is composed and, where they arouse “comprehension”, the twofold process is repeated in the individual, who takes possession of the signal, repeats it in the human group and absorbs it in his own parts.

This means correspondence between the individual and the whole and between the parts and the individual, in an orderly and hierarchical way. A signal of solar origin received by humanity stirs certain men and certain physical and non-physical organs in them. Received by the vegetable kingdom, it stirs certain families and certain parts in them, and so on. It is an incessant exchange of energy and intelligence, which links every point in Space and depends on consciousness. In ancient times, for example, diseased organs were cured with “corresponding” herbs or rays, or the quarters of cities and the cities of a region were laid out according to geographical alignments which would favour the reception and resonance of particular, desired cosmic vibrations; lastly, these were amplified by appropriate instruments, either complex, like a temple, or simple, like a religious vase.

This demonstrates the knowledge and application of the principle of resonance. The most splendid human cultures were prepared through such measures, and when there is a return to these principles, true culture will be rediscovered.

The more complex an organism is, the clearer and more numerous the correspondences show themselves to be which link the external Space by resonance to that enclosed within it. A vital, noble and complex whole like the human being must thus respond to an immense range of cosmic vibrations, of which it assimilates a part for the benefit of the inner environment. According to the consciousness, this resonance varies, in quality, from that of the savage to that of the genius. Moreover, it varies with people, places, worlds and systems.

From the thoughts expressed up till now it follows that the primary energy is transmitted in Space by orders and correspondences, through the principle of resonance. The entities which people the Cosmos are all connected to a single unrevealed Source; but by degrees, or by orders, in a perfect hierarchical arrangement. A signal of beauty which vibrates in the heart of a man and transforms him from the inside arrives through the filter of a series of hierarchical correspondences, cooperating from above to below, like a radio relay system. It is a progression

which must be respected, both for the descent of the signal and for the contrary, ascending or, if you like, invoking movement. These concepts lead one to realize that energy is transmitted according to two simultaneous methods: by waves and by quanta. The study of Harmony and of its bases also passes through this dualism, which must be resolved in a synthesis. Every point is in contact with every point in the Infinite – which means continuity. And at the same time, Space is coordinated in a hierarchical way, which presupposes degrees, that is leaps, that is a discontinuity.

To accept only one or the other of these two aspects not only limits the field of knowledge but damages the truth of what one knows, as it mars its representation. It remains only to “pass” between the two, that is to synthesize them in a higher comprehension and, as such, inexpressible in words.

The tonal coordinates, which Hans Kaiser will present later in his work, are at this point already mature and recognizable. Two fundamental properties of Space have in fact emerged: continuity and discontinuity. By the first, consciousness communicates with the Infinite. By the second, it proceeds from degree to degree. The diagrams created with the tonal coordinates show that the consciousness contained in a form of Space reacts by resonance to an external “command”, and that it grows correspondingly by stages, phases and cycles.

To vibrate with the rhythm of the Cosmos means to realize all the majesty of the Infinite. ... That is why Our harmonies are so potent. The fire of the centres is harmony; the fire of the spirit is harmony; the fire of the heart is harmony.

10 – THE HIGHER AND LOWER HARMONIC SERIES

At the basis of the whole science of harmonics is a natural, physical law, which has been well known to scientists for centuries but whose value is little understood: any sound, produced in any way, spontaneously generates other sounds, according to a constant order of succession. All these sounds together (which can be physically registered) constitute what is called the series of higher harmonics, whose first values are:

C . C' . G' . C'' . E'' . G'' . xB'' . C'''

It is of great importance to observe that the place occupied by each sound can be numbered, in this way:

C . C' . G' . C'' . E'' . G'' . xB'' . C'''
 1 2 3 4 5 6 7 8 ∞

according to the indefinite series of whole, rational, positive numbers: one and one alone of the infinite whole numbers corresponds to each one of the infinite sounds generated by the basic one.

Sound and number remain thus combined, by an incontrovertible natural law: it is enough to indicate a number to identify a sound, and to emit a note to indicate a number. This truth corroborates the already noted correspondence between sound as number and sound as value.

But of even greater importance is the following observation: the numbers which successively define the “place” of the various sounds in the series of the higher harmonics indicate also the frequency of that sound in relation to the frequency of the basic sound, taken as a unit of measurement. For example, the 5th sound, E'', has a frequency 5 times greater than the base sound C; the 3rd, G', has a frequency 3 times greater than the same, and so on.

This happy, perfect correspondence between sound, position and frequency is certainly one of the most amazing physical laws, both for its simplicity and for its real meaning: it is the experimental confirmation of the indissoluble and natural union between that which is measurable and tangible (number, frequency) and that which is psychic, intangible; between the world of science and that of the psyche; between the sphere of the builder and that of the artist.

What has been said up to now is valid as far as concerns frequencies.

But if the first terms of the series of the superior harmonics are rewritten and are made to correspond to the length of the string which produces them, or to the wavelength of their oscillation in relation to that of the fundamental note, one obtains:

$$\begin{array}{ccccccc}
 C & . & C' & . & G' & . & C'' & . & E'' & . & G'' & . & \dots \\
 \frac{1}{1} & & \frac{1}{2} & & \frac{1}{3} & & \frac{1}{4} & & \frac{1}{5} & & \frac{1}{6} & & \frac{1}{\infty}
 \end{array}$$

where the numerical part repeats, in reverse, the order of the preceding part, relative to the temporal aspect, that is frequencies.

Thus there are two possibilities of combining sound with number: according to the frequency (time) and according to the length (space). A law connects them, as has already been seen, through which one passes from one arrangement to the other using this formula:

$$\gamma = 1 / \lambda$$

according to which frequency and wavelength are reciprocal one to another.

The harmonic series rise rapidly in frequency, as has been seen, and so they soon pass out of the field of oscillations which are audible to the human ear. It is easy, on vibrating a string, to hear the formation of the first and second harmonic, but the successive ones are rarely perceived. It is a fact that, in reality, they exist physically, and this leads one to affirm that it is really impossible to listen to a pure sound, even if one wished to do so: since there is no sound without harmonics, which vibrate together with it and are inevitably merged with it, composing an extremely complex group of chords: the part of this chord which the ear perceives is that which is accepted as the original sound, but the chord, which in reality remains inaudible, is really quite different.

Moreover, it must be reasonably assumed, on the basis of this physical law, that each of the higher harmonics which have been generated so spontaneously produces, in its turn, innumerable sounds, in observance to the same law, which it must also obey; and so on.

A single sound (as long as it vibrates) starts off an infinite complex of secondary sounds, which certainly condition it and which are its specific progeny. This creation is, however, strictly ordered and the place of each creature rigidly fixed, as well as its form (number) and its psychic quality (value) with respect to the base sound and all the other harmonics.

These and numerous other considerations, legitimate yet extraordinary, which can be deduced seem to illustrate the truth of that very famous page, at the beginning of the Gospel of St. John, where the equivalence between God and Word, between Spirit and Sound, its creative agent, is affirmed.

And other Writings, held to be sacred by various ancient and modern peoples, concur in presenting to man the image of the Logos (sound) as the creating Demiurge of forms, according to an ordered, precise and predisposed plan.

It was stated in ancient times (Upanishad) that Sound is Fire. In the world of Fire (or of the Spirit) – where everything is one – the law is only one, and its physical repercussion can only be the law of the higher harmonics.

This is why this is to be considered the authentic, legitimate and incontrovertible basis of all harmonical speculations. In the beginning a Sound echoes and the worlds arise in an orderly way and the creatures are born in order. And as long as that Sound lasts, the creation is developed and is manifested; in case it should cease, immediately all forms would vanish in absolute quiet. And such a creation is knowable because it is orderly and successive, and a universal order must reign which is also knowable, on the basis of its numerical and quantitative expressions: the material basis (number) reveals the psychical content (the value) and the former produces the latter, without error.

Certainly this conception, irreproachable as it is, calls for a far more attentive examination and more serious verification. But it is the immediate conclusion which one reaches if one contemplates without prejudice the impeccable precision of the correspondence between that which is internal and contained (value, sound) and that which is formal and external (number, quantity).

After the preceding affirmations about the higher series of harmonics, it is legitimate to ask oneself: “do lower harmonics also exist?” In other words: if the higher octave is first generated spontaneously from the original sound and then the fifth and so on, should not the lower octave, the lower fifth and so on, also be produced in the same order? The answer is simple: no-one has ever heard them as yet, no instrument has ever recorded them.

It is as if sound produced only other rising sounds, always higher; as if only these were its real progeny. In this the accuracy of the old proposition proves true, according to which the nature of sound is fiery: like the flame it tends to rise by itself, in order to return to its heavenly dwelling.

However, this does not alter the fact that the lower harmonics are still always a logical possibility, which it is right to take into account. But in the study of harmonics their intrinsic nature is to be understood as illusory, which matches perfectly the physical reality of the higher ones. As a legitimate and orderly whole, they constitute a world without true reality, so to speak; or better still, they obtain their appearance only from the reality of the higher ones, of which they are the reflection.

This said, the “other world” of the lower harmonics is arranged in exactly the opposite way to that of the higher ones, both for values and for numbers. The lower series thus assumes these aspects:

a) (frequencies)

C	C,	F,,	C,,	As,,,	F,,, ...
1	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{6}$... $\frac{1}{\infty}$

b) (lengths)

C	C,	F,,	C,,	As,,,	F,,, ...
1	2	3	4	5	6 ... ∞

To summarize, the world of the lower harmonics is thus exactly symmetrical to that of the higher ones, but it is without real existence, just as the sun reflected in the water is not the sun which shines in the sky, although it also emanates light and warmth. It is perfectly knowable on the basis of the higher one, whose laws and arrangement it repeats. But it should not be forgotten that it lacks reality, which allows one to presume that even that which is illusory in the Universe is nevertheless orderly so that, by studying it, one can go back to knowing those truths which it reflects.

From the examination of the two series of harmonics: the higher, real ones and the lower semblances, emerges an aspect of extreme importance: hierarchical order. The original sound, in fact, produces, in a regular and orderly succession, the intervals arranged in order of importance:

A) Higher Harmonics (frequencies)

C	C'	G'	C''	E''	G'' ...
$\frac{1}{1}$	2	3	4	5	6 ...
_____	_____	_____	_____	_____	_____
OCTAVE	FIFTH	FOURTH	M. THIRD	MIN. THIRD	

B) Lower Harmonics (frequencies)

C	C,	F,,	C,,	As,,,	F,,, ...
$\frac{1}{1}$	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{6}$
_____	_____	_____	_____	_____	_____
OCTAVE	FIFTH	FOURTH	M. THIRD	MIN. THIRD	

First of all is that interval to which we give the name of Unison; then the Octave appears, then the Fifth, followed by the Fourth, the Thirds, and so on.

Thus in the world of vibrations created by the original Sound not only do exact concordance and correspondence exist between every single sound entity and its numerical expression, but in addition everything is arranged according to a strict hierarchy of values. This is a phenomenon of immense importance, which will be dealt with in future. But for now it is well to note and learn that all that is sound can be likened to the good and the beautiful, is subject to a numerical expression and is moreover arranged in a hierarchical order. It follows, as a first consequence, that where no hierarchy (of values, not of quantity) exists neither goodness nor beauty exist.

Where is the end, and where the beginning? Let us end with this formula: in the infinite chain of harmony.

379 – In truth, We appreciate above all constructions founded on the higher principles of harmony.

... The creative power of beauty depends on this principle, and the strength of harmony is affirmed by it. Great structures are erected only in unity.

11 – WHOLE NUMBERS

As seems clear from the preceding considerations, the numerical and arithmetical aspect of the series of higher and lower harmonics consists of the series of **whole numbers** and their **reciprocal numbers**. This fact is natural and simple only in appearance. If one limits oneself to accepting it as such, one loses the opportunity of being amazed by one of the most wonderful continuities of the physical world. Whole numbers have been given much attention by the best mathematicians and philosophers for a long time and all agree in considering that the concept of whole number is anything but simple. In this regard, one can introduce this reasoning, of a typically Pythagorean nature: let any group of objects be considered. It is inevitable that they have a number. That is, that group will necessarily be composed of 3, 15 or 200 objects. Could that group exist without this number? Certainly not. No number, no group, no objects. So the whole number is an essential constituent of anything. Nothing appears, nothing is perceived without the participation of a whole number. This way of thinking, which is perfectly rational, illustrates quite well the profound nature of the concept of number, which normally escapes superficial and conventional observation. Number is a power, a quality, an indispensable element of manifestation. Any inner energy must express itself with the participation of number.

If one now places beside this superior conception of number the idea of sound as a creative element, one understands much better the amazing, orderly concurrence of both in the series of higher harmonics, generated spontaneously by the fundamental sound.

It is in the sense set out in these pages that the concept of number must be understood, in the harmonical and Pythagorean sense. Number is not only quantity. Its roots lie in the very necessity of creation. It is true that groups or collections of things can be imagined also without knowing their number: for example, who knows how many grains of sand there are on a beach? But the not-knowing of the number does not imply that it does not exist as an indispensable contributor to the perceptible appearance of the object. The number is not everything. Here it is affirmed, however, that it is an essential part of the process of creation. With this one comes quite close to understanding the statement of the Pythagoreans, according to whom “everything has a number, and a number is in everything”.

The number, which is a recognized expression of the quantitative and therefore inferior aspect of manifestation, performs, in the light of the preceding considerations, a role of mysterious, divine efficacy.

It is evident that any group of objects in which, for example, the quality of the number 5 operates is in contact, or in resonance, with all the other infinite manifestations of the same number. This opens up the way to a really sublime mathematics, which for the present remains completely unknown. One can add again, in this regard, that only the Infinite is able to liberate that which the number confines. Number and Infinite are thus placed as opposite, yet assisting, principles: the number extracts the treasures from the Infinite and presents them; the Infinite liberates the condensed energies from the number and puts them back in their primeval state, without limits or form.

373 – A cosmic concordance is established only where the Fire of Space enters into resonance with the subtle harmonies.

12 – THE QUANTA

One of the aspects of the law of the higher harmonics is its peculiar progress: the original sound, in vibrating, generates other innumerable sounds “ad infinitum”, but in an intermittent, discontinuous way. The whole of the sounds thus produced is not continuous, but arranged by degrees; it is a granulation rather than a current.

Between one and the other of the successive sounds, gaps open up, as it were, spaces (intervals) which are never eliminated, however far one goes ahead in the development. This way of describing the phenomenon is improper, but certainly illustrates this characteristic quality. The original phenomenon, which is an oscillation, is of a continuous nature, yet it produces a discontinuity. Only if one supposes that the primary sound vibrates infinitely can one think that the whole generated by it, composed of the infinite wholes produced by each of the innumerable harmonics, saturates the whole of space, or rather produces the infinite and continuous whole of all the possible sounds. This property recalls the great debate, never resolved by the various philosophical schools, about the real consistency of the primordial substance: is it a “continuum” or a “discretum”? In short, is that thing which is the basis of everything something granular or is it without fissures?

Many phenomena incline one to believe in one of the solutions, and just as many in the other. Suffice it to cite the paradoxical case of light, which in certain phenomena behaves as if it has an undulatory (continuous) nature and in others as if it were granular (discontinuous), so that it confounds physicists and philosophers and arouses irremediable controversies.

Max Planck, at the beginning of the century, while studying the absorption of energy of a black body, was the first to notice its strange behaviour: it absorbed luminous energy in a continuous way and returned it at intervals, in the form of heat. Such discontinuous emissions of energy, constant in themselves, were called “quanta”, and since then physics has been enriched by a new field of knowledge and experience. Between the opposing factions, favouring the “continuum” or the “discretum”, an armistice was imposed, very similar to a peace, but still disturbed by this basic perplexity: how can one and the same thing simultaneously demonstrate exactly contrary qualities?

The law of the higher harmonics is a clear example of this extraordinary procedure of nature, which seems superior and transcendent, and shows that ultimate reality must be sought in a

world without dualism. Sound, understood as value, is continuous, as it is a phenomenon of oscillation and has an undulatory nature. As number, on the other hand, it is a “discretum”. Its nature is, therefore, also in this way ambivalent; and the higher harmonics confirm this.

The foregoing suggests a question: given that both the opposites have a real basis, does a recognized principle exist which is common to both and reconciles them in itself?

Certainly there is, and this principle is Truth itself. But it remains elusive and unknowable to the intellect, which is by nature analytical and dualistic. One cannot hope to know such a truth by using a means (reasoning) which is by nature unsuitable to perceiving it.

Certainly that principle exists, and it is the Cause of both manifestations. Reason leads us, honestly, to its limits and shows them to us. It cannot cross them. Another Guide is needed to explore what is beyond those gates. But this is the subject of another science.

As an answer – imperfect – to the question thus posed one can perhaps point out that one property is common both to the “continuum” and to the “discretum”: rhythmic order. For a careful observer, both one and the other obey the law of rhythm, which regulates both the continuous and the granular. An oscillation arranges in a regular form both water and grains of sand; and the great law of the higher harmonics itself governs the appearance of the successive granules of sound with marvellous, orderly precision.

The person who seeks to harmonize his own qualities cooperates with the Cosmos. In creating one's own spiritual image each person perfects universal harmony. The currents of space are intensified through the principle of fusion, a law which governs all universal forces.

13 – THE INTERVALS

Among the many highly valuable concepts of Harmonics – think of Space, Rhythm, etc. – the supreme one is that of the Interval. In music the difference in height (or in frequency) between two sounds is called an interval, and it is expressed in acoustics as the relationship between their frequencies or between their wavelengths. Thus Interval means, in the widest sense, Connection or Relationship.

However, careful attention should be given to the following: the Interval is not only the sum, so to speak, of two sounds, but is their synthesis: it is a new sound, which it is impossible to reproduce without the help of two distinct notes, whether instrumental or vocal. It is an entity apart, endowed with its own psychic qualities, produced by the resounding (simultaneous or successive) of the two components. The relationship, the connection are thus clearly recognized in Harmonics as entities which appear to the hearing and to the psyche with their own, distinct characteristics.

The Interval is the intermediary between two sounds, and Harmonics studies this aspect of it, which is numerical, knowable, exact. But one can certainly also speak of an interval between colours, in which case the numerical part is no longer immediately recognizable, but its psychic value is perceptible: a red and a blue, placed side by side, produce a certain interval, which the psyche records and whose qualities it distinguishes.

But the idea of an Interval drawn from music can and must be taken to its furthest consequences, and thus it can be applied in all fields of what is knowable and perceptible to men. All that is relationship is traceable to a certain interval, even logical opposites, complementary principles and energetic transformations.

Interval means consciousness. In infinite and living Space all the elementary charges of Fire (the Points) are in a reciprocal relationship with all the others, and this infinite field of connection is universal consciousness, different from Point to Point but never completely absent. Space is thus established as the whole of the infinite intervals.

It follows that listening to the interval is a real activity of consciousness and the more one exercises it the more one refines and educates it.

In Harmonics it is not so much the sound that dominates as the interval. By its very nature of intermediary, it functions as a bridge and links the shores of two different worlds: the physical

and the spiritual. It is the child of the continually changing relationship between spirit and substance.

This statement opens the door to considerations relevant to religion and philosophy, which, to the careful observer, are nothing but fields of application of Harmonics.

It is precisely here, in the very centre of the concept of the interval, that that Path separates and is clarified which, if traversed, leads man far beyond his normal experience; and Harmonics, as a science, shows here its major efficacy, its transcendent utility, since it is the Guide which knows the ways of all relationships, being nothing but the Science of Relationships, or intervals.

245 – Any harmonic form shines with a marvellous flame of attraction. Thus, when the Magnet extends its forces, the Fire of Space vibrates in resonance.

The Interval has no “thickness”. It is neither long nor wide: it is without dimensions, but it is not without a goal. It is thus a transcendent way, which passes between the opposites and is finer than a cobweb. It is a real ray. The Interval is the basis of that world which, having no dimensions, is called subtle; and, having no quantities, is purely qualitative. This world, being by nature the seat of consciousness and of relationships, is also recognizable as intermediate between substance and essence. If these definitions, which have a strictly logical basis, are accepted, many concepts which cloud the mind are clarified; not only that, one learns that it is possible to move in a world which is usually barred, yet irresistibly attractive because it is superior. It is possible, by penetrating the idea of an Interval, to rise from the world of quantitative exchanges to the sphere of relationships of quality and to learn and know the laws there and perceive the presences which, on account of their universality, it is right to call divine.

Through the intervals, therefore, relationships, qualities and consciousness can be known. That which appears separate, isolated and distinct in the physical world reveals its correlations, often unexpected, with other entities in the sphere of the intervals, so that it demonstrates its belonging to a group. And the idea of a group is typical of the world of qualities and relationships, where it is the authentic basis, or the centre, of all exchanges. In that sphere the group replaces the individual, upon which, on the contrary, the physical world hinges. Thus the concept of an Interval is a typical group concept, since each of them is the whole, or the group, of all the infinite equivalent intervals: for example, these two sounds: C and C', respectively of frequency 256 and

512, are in a mutual relationship of an octave, since $256/512 = 1/2$; but to this same group all the relationships of that same value belong, whatever their component sounds are.

A great simplification marks the passage from the single sound to the interval: in saying “octave”, for example, the qualities of all the innumerable relationships of that value are identified, even though the individual sounds among them are very different. “Octave” is a group concept and is clear, unmistakeable, exact.

It goes without saying that between groups, or between intervals, innumerable relationships are of necessity established which, by being such, are still always intervals; and this is true both within the same group or outside, that is between groups of a different nature. For example, this interval CC', which is of an octave, is in a relationship of a fifth with this other interval: GG', which by itself is an octave; and that same CC' is in a relationship always of a fifth with the interval GC', which by itself is a fourth.

$$\frac{C - C'}{G - C'} = \frac{\text{octave}}{\text{fourth}} = \frac{1}{2} \times \frac{4}{3} = \frac{2}{3}$$

(wavelengths)

The first of these examples illustrates a relationship inside a group; the other one outside a group.

The science of the Intervals – that is, the science of that which is “Between” two things or beings – reveals itself as the science of groups and the idea of a group has in this sense nothing indefinite or vague but possesses a real, mathematical clarity. There is no possible uncertainty in defining a group: and its components are clearly identified. Every one of its members (that is, every single interval) can however belong by right and by intrinsic nature to other groups: going back to the example set out above, the interval GG' is by right a member of the Octave group but simultaneously, by its inner essence, it also always belongs to the sphere of the Fifths, and so on.

In brief, the groups are interwoven and merge together without being confused and leaving completely free the relationships of the individual components: a world which is orderly and organized, hierarchical and free.

Before evaluating any physical phenomenon, whether a natural process, an event or a human undertaking, one should examine the values of the intervals which appear in it, which would certainly reveal the degree of cohesion, beauty and solidity. Any creative project or programme

should be imagined beforehand on the basis of the certain laws of the subtle world. Better proportioned works and activities would result, but also more stable and lasting ones, better results for the benefit of many people.

But these are not suitable times for such applications. Today it is possible only to put down the first seeds of an overturning which will shake the world from the inside, building a more advanced future without demolishing anything worthy and noble that was achieved in the past.

The world of the intervals, as has been said, is the world of consciousness, intermediate between substance and spirit. It is a dual environment, since every interval, though being a unitary and collective value has always originated of necessity from two terms, of which it is in every way the relationship. In short, in the idea of an interval, a component of bipolarity is present, in so far as the two creating elements can be represented as energetic entities of an opposite kind, which form between them a magnetic or force field. In this field, lines of flux can be distinguished, just like those studied by physics, along which the material particles which make up the structure, or the connective tissues of form, are arranged. By this is meant that the “subtlety” of the interval generates a field of force, orderly, different and characteristic for each one of them, which in its turn is the origin of the arrangement of material forms – whether they are natural forms, or historical events, or human behaviour. This explains the inextricable presence of qualities in all the quantitative compositions of the physical world; not only that, but it places such qualities at the right level, superior and conditioning rather than in a subject and passive state, as is usually done. It is even useless to make it known that the combination of the intervals among themselves can be very complex and that it is regulated by the laws of affinity, by which like attracts like and repels what is different.

These are the first laws, the first discoveries, the first treasures of the world of the intervals. But the best still remains hidden. Their power is still only recognizable in theory. One day, men and the other creatures will feed on intervals and, with the strength generated by them, mechanisms will be moved and great structures will be built, amazing in their boldness, durability and lightness, yet in perfect harmony with nature and the environment.

Where does the middle world of the intervals lead?

If it is the seat of every connection and the substance is on one side, it must be possible – as has already been written – to touch the other bank, that is the spirit, that world that many human documents call the world of Fire. It is not appropriate to deal with it here, not even in brief. Let a few hints suffice, to direct the mind to that goal. As the birth of a relationship between two entities

(between two sounds) reveals a superior sphere, whose main points we have described in these pages, so at the most secret centre of the interval is a nucleus of Fire, a charge of vital energy. This energy, supreme and creative, is unitary, real, everlasting, unlimited and inextinguishable. Every interval expresses and accentuates certain of its qualities, but it dwells there in its entirety. The world of Fire is unitary and transcends time and distance. The great interval of a fifth reveals, for example, its innovative and stimulating qualities and the octave the receptive and constructive ones. But the Fire is one alone and is the origin of everything and every process.

In setting out these remarks we have passed from the physical laws to the psychic ones and now we are casting a glance at the spiritual realities. But really the path is the opposite: from a stimulus of Fire two entities are produced, which completely describe it with their reciprocal relationship (interval): from this then precipitates, in time and space, the external form which the senses perceive. This is the only direction in which any creation proceeds – while the movement in the opposite direction is developed which leads from the form to the meaning and thence to the Value, by means of the senses and intelligent understanding. It is a question, after all, of that double and simultaneous act of “writing” and “reading”, which has been discussed previously.

The person who is concerned with Harmonics is thus invited to recognize that the Interval hinges on a central, unitary Fire, of which it is the first, partial message and which is then manifested, limited by numbers and forms, in the kingdom of quantities and appearances.

The world of the intervals is clear and simple: three of them dominate and are supreme: another four, of lesser power, assist them; all the others are lost little by little in indistinctness, as far as the human perceptive faculty is concerned, without however losing their individual gifts.

The first three have all been always recognized by all the peoples of history. As far as they are concerned, no doubts or uncertainties exist. They are exact, incontrovertible, primordial, universal. They express completely the Trinity of Being, the three great Persons of the unitary divinity. They are the Unison, the Octave and the Fifth, in the very unsuitable terms of contemporary musicology.

The other four lesser intervals are the Fourth, the Third (major and minor), the Sixth (major and minor) and the Tone (major and minor).

We are now preparing to illustrate the principal qualities of each one of these.

8 – This universal unifying force establishes the power of cosmic Reason. ...Its creative force intensifies a multitude of beginnings. ...We call it the “ray of the Cosmos”. Every wave of the spirit thus amplifies the vibrations in space.

1) UNISON

Unison is sound repeating itself, which vibrates with itself. In reality, it is not an interval, as it has no duality; yet it is the real generator of all the other intervals. It is the One. Its qualities are affirmation, command, power. It is the manifested Origin. It is the first cause. Its energy is creative and destructive. It creates the other intervals and destroys crystallized forms. It is the first impulse, yet it restrains and stops all that opposes it. It is the basis of every movement and it is that which blocks movement. It is the sign of correct orientation, of the path which runs between the opposites. It is the ray of perforating light. It is a sword which divides, cuts off and restores simplicity to life. It is a stimulus, a call, a warning.

It is the Father: it is the Just one, it is the Heaven. It is the centre.

Its action is impetuous and it liberates what is caught among the branches and the nets of manifested order.

It is Will: therefore it aims at a goal with implacable decision. Its purpose is progressive and total order, the Hierarchy of the best, of the beautiful and the good.

It is the First Ray. Its form is the Point.

The hypothesis is put forward that its colour is ruby red.

As it is simple, it is severe, unadorned and bare. But its light shines all the more, because nothing veils it.

151 – Only cosmic tension induces the spirit to change, and only if it comes to know the power of attraction does it generate harmony. ...the sensitive spirit then resounds with the currents of the Cosmos. ...the centre of the Cup resounds. The creativity of the spirit depends on that of Fire.

2) OCTAVE

In this interval the sound also repeats itself, but at the critical level in which, rising or falling, it is about to penetrate into a different sphere. The two sounds of which it consists are like the two columns of Hercules, placed to mark a universal boundary, which is not insuperable but clearly evident. On this there is a certain world, on that side another, governed by the same laws but different because it is higher or lower. In the Harmonics of H. Kaiser, the various octaves

follow each other without important variations in their content: the octave between C and C' is exactly and in every way identical, in its laws and effects, to any other, for example C''- C''' or C, - C,,.

Here, on the other hand, it is presumed that the passage from one to the other marks a profound difference in substance, if not in essence. In short, the octaves understood in this way would not be, a series of equal circles placed one above another but successive volutes of a rising or descending spiral; and this is an unequivocal symbol of a different degree of liberty, of more or less light, even if relative and so valid only inside the spiral or the system itself.

The octave, then, is in this sense an interval-boundary, and thus a suitable symbol to define an ambit, a sphere, a world, a system. The idea "all the octaves" thus expresses, in the best possible way, the concept of universal Space, cosmic container of every flame, every level, every substance, all forms.

The Octave, as the container and the loom of all the innumerable intervals, is thus the first appearance of a bipolarity, of a transcendent dualism: it places two limits to define its system, two poles which condition and determine it.

The Octave is the two and is the goal. It is the receptive and it is the Mother. It is the Earth. It is the infinite and transcendent Space. It is the Womb in which the forms grow, which it feeds and protects. It is perfect passivity and therefore includes and contains. It does not intervene except to exalt or lower, but without judging and without innovating.

The Octave is the foundation of creation and embraces it in every part and justifies all the parts. It is the "field" of evolution, of order. It is the diffused light on everything and everywhere. It holds in itself infinite complexities, yet it simplifies them in secret. It is Love and Wisdom.

Its qualities are obedience and comprehension. Its energy is all-pervading and nutritive. It is the correspondence and it enfolds, encircles, includes, surrounds. It is the horizon. It is a Magnet which coordinates, disposes, arranges, supports.

Its symbolic force is the circle or the sphere. It is the Second Ray.

The hypothesis is presented that its colour is blue, from azure to the dark blue of the deep night.

As it is the mother of all forms, in reality it has no form (like the Father, unison: circle and point, in fact, are not real forms and in reality coincide and stand for each other).

16 – The creative activity is guided by a definite rhythm... The ardent spirit is aware of the vibration of the ray...

3) FIFTH

This third interval has within it the characteristics of the first two, while being different. It repeats the creative activity of Unison and the generating and comprehensive fertility of the Octave. It is intelligent activity and active intelligence.

The Fifth is the innovator par excellence. Where it appears and acts it never leaves things as they were: its passage is always marked by its works.

The Fifth is an unexpected marvel: it is a new sound. From the original and fundamental vibration, as has been said, first the Octave is born, which marks the limits of the field, but without introducing anything new into it – everything is still primordial. But the Fifth is the first fruit, the first “form” (in a transcendental sense), the first child. It is amazing to see this shoot, unimagined, heralding great processes, presenting itself as a different reality in a prepared field (the octave), which now reveals itself as its true field of action and creation. The octave is the prearranged scene: the fifth is the lord, author and actor of the drama. The rational mind is unable to comprehend this surprising appearance, but it must accept it as an indisputable reality and learn to understand its processes, function and goal.

The Fifth is the three: and all that is three is perfect in its completeness. It is the builder of all the other intervals, to which it gives quality and form, if not life, which they obtain only from Unison (the Father) and from the Octave (the Mother). It is the one which revolutionizes and orders, which undoes and recomposes, which incessantly proposes new themes, without ever repeating itself. It is the one which glorifies the Father and exalts the Mother. It is the Demiurge, it is the great Architect of the universe.

The Fifth is thus the Builder of creation, which populates with innumerable values, different and related to each other. It is the Lord of infinite peace, which continually disturbs every standstill or stagnation. It is perennial youth, it is the great investigator, and it continually seeks and finds, finds and seeks. Always engaged in discovering new horizons and knowing other truths, it is the very impulse of formal evolution and spiritual progress. It produces what is complex but its aim is regaining and understanding simplicity. It is the question, it is the great Interrogator, it is the Weaver (transcendent).

All these phrases intend to describe to some extent the prodigious action of this third interval, or third fire, which constructs without burning, not to veil the forms of ultimate reality, but to express all its aspects infinitely.

As the Octave is a closed interval (since it encloses, though without limiting), so the Fifth is the open interval par excellence, as it unlocks all mysteries and passes through all gates. It is thus the great agent of liberation, gained with active, strenuous, combative and bold commitment.

Its symbolic force is the cross. It is the Third Ray. The hypothesis is put forward that its colour is yellow, which radiates, tends towards white and dazzles.

373 – A cosmic concordance is established only where the Fire of Space enters into resonance with the subtle harmonies.

OPERATIONS OF THE FIFTH

The elevation or the lowering of a sound by one or more intervals of a fifth are called operations of the fifth. For example:

$$\begin{array}{cccc}
 1\ C \rightarrow 3\ G' \rightarrow 9\ D'' \rightarrow 27\ A''' \dots & & & \\
 3^0 & 3^1 & 3^2 & 3^3 \\
 1\ C \rightarrow 1/3\ F' \rightarrow 1/9\ B,, \rightarrow 1/27\ E,,, \dots & & & \\
 3^0 & 3^{-1} & 3^{-2} & 3^{-3}
 \end{array}$$

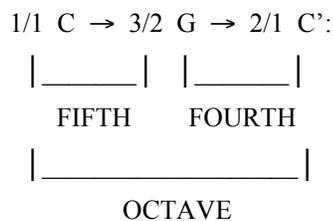
...

This activity of the Fifth is distinctly different from that of the Octave in that the values that are obtained are always sounds that are never repeated. For this reason it was stated previously that the Fifth is the constructing interval of all the others, the one which continually innovates, invents and produces. Like the octave, it also acts on the sounds and raises or lowers their level, but it modifies them in their essence and the result is a new interval and not the simple transposition of the same sound to another sphere. In this lies the great difference between these two primary intervals.

32 – The cosmic creative power chooses and brings together the harmonic energies.

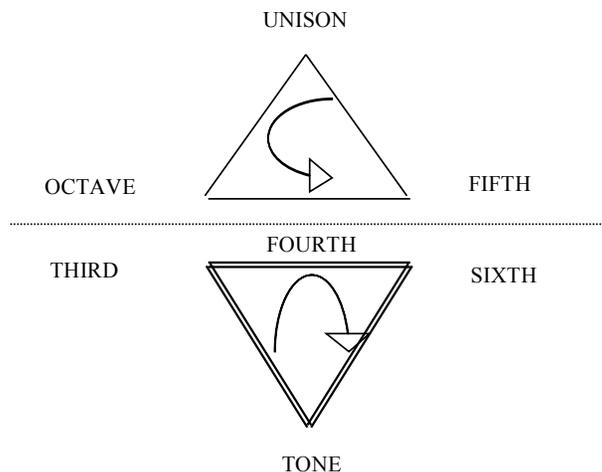
4) FOURTH

The unexpected appearance of the Fifth in the ambit of the octave coincides with another innovation: the interval of the Fourth, which is the completion in the Fifth:



This new interval is thus the first product of the constructive action of the fifth. It is thus the first of the minor, or secondary, intervals. This origin places it in a peculiar condition among the group of intervals and clearly illustrates its qualities and functions.

The Fourth is the central element of the group of seven fundamental intervals, which can be drawn in diagrammatic form in this way:



It thus has the great and twofold function of coordinating the lower and balancing and harmonizing the whole. It is the great reflecting level, where the lights of the higher triangle, or of reality, are reflected, upside down, in the lower one, illusory, dual, precarious and unstable. This task, if properly understood, makes clear its immense importance and reveals one of its unusual and elusive characteristics: precisely on account of its position of hinge of the entire system this interval is often hidden, neglected and unnoticed. It is the real “Magister Musicae”, it is the Fourth Ray, and it has the task of harmonizing through conflict. It is the magic mirror, but it is not inactive: it works without assuming prominence: it fights and corrects, but evades, is elusive; it knows reality and models lower things on it and, when its work is completed, it disappears in the glory of the higher three. Just as the Fifth interrogates and investigates, the Fourth replies and concludes, resolves, equalizes and composes in an ordered system. It is the level of the intuition, the real world of the ideas, still unitary, but about to precipitate in duality and multiplicity. All that works for positive and dynamic equilibrium (not for that degenerate form of equilibrium which is a monotonous and passive standstill) is connected with this interval which, like a great conductor, can pass unobserved, although being the real centre of the musical execution.

The interval of the Fourth operates as a crucible of compensation, with the effect of evoking in the lower a state of resonance with the higher. As a result, broadly speaking, it has the quality of

a producer of beauty and it reflects in itself (as the first of the minor intervals) something of the creative power of the first, unison. It is a reflected, or second, creativity and so it is characteristic of the artist in general. The beauty obtained with the work of art, that is the painful work of reducing disorder to a sufficiently regular state that it can reflect to some degree the heavenly order, this is the authentic action of the fourth interval. Harmony, beauty and art are the result of its interval. It is a question, if one looks closely, of a real capacity for transmutation. The fourth Ray does nothing but seek continually to realize the model, the original and very pure Idea, and to this end it makes use of any operational technique: it acts in the whole of nature, but especially through man.

In fact, man (fourth kingdom of nature), on account of his position in creation (animal + god) incarnates the interval of the Fourth and his first task is just that of helping actively and with loving intelligence in the execution of the divine enterprise. The divine models (the Ideas) can be known by him and little by little he learns to arrange things in such a way as to express them completely. He “reads” the virtues and the aims of things above and he “writes” them in the manifested world, with every kind of sign.

The Fourth is therefore an interval of activity, of dynamic equilibrium, it is a gorge through which the energies that bathe the low regions, and those that evaporate and rise from these regions to return to the unitary Source, are forced to pass. It ensures that everything is finally arranged according to number and correspondence, that from the whole of the parts a synthesis is composed, that the primordial Sound is translated into a Concert. These great functions that it has (by its intrinsic nature) are carried out not through isolated activities, but in collaboration with all the other intervals, that is, with the other qualities of the primary Energy. The Fourth interval, though it is central, loses itself in the others and this illustrates the reason that it is so elusive. It is the Lord of the Ideas and translates the one into the manifold, and from the manifold extracts the original unity.

The hypothesis is offered that its colour is indigo: this light, in fact, which is one of the seven of the rainbow, is hard to perceive in the glory of the rainbow: painters, in fact, normally do not take it into account and do not know if it is the result of the combination of blue and red, or of the combination of the latter with purple. This corresponds well with the nature of this interval, on which we have tried to throw light.

In Harmonics “operations” of the fourth are unknown. Those of the octave, the fifth and the third are used, but not those of the fourth. This also describes its secret yet indispensable action. It should be added at this point that in its numerical expression – 4, 3/4 or 4/3 – an operation of an

octave ($2 \times 2 = 4$) is implicit: which reveals the profound relationship flowing between the Fourth and the Great Mother, Love, Space, comprehension, the magnetic, universal bipolarity.

208 – Any energy in a state of tension manifests other corresponding energies.

5 – THIRD (MAJOR AND MINOR)

The fifth interval is called a Third in today's technical language and demonstrates two qualities which do not appear in the other, superior, intervals or are unexpressed and latent. Each has an immense importance, both conceptual and practical, and must be clearly understood.

A) *For the first time we see a “bifurcation”: the Third is differentiated, or splits, into major and minor.*

$\frac{4}{5} E$:	$\frac{5}{6} Es$	(frequencies)
Major THIRD		Minor THIRD	

Both these sounds are in fact the “third note” starting from the tonic C. In the first case, three tones are counted, C, D, E; in the second, two tones and a semitone: C, D, Es.

This split has innumerable repercussions and is sufficient by itself to explain the causes of infinite phenomena of the manifested world and of the psyche. And it must be stated immediately that, starting with the Third, all the other intervals have this same characteristic, which it is however reasonable to see as derived from it, as the great dualistic principle.

In fact, it is a question of a real manifested dualism, and not a latent one, as noted before with the octave, the fifth and the fourth. Here two distinct ways of expression of Being appear: the intrinsic poles of the octave here come out, so to speak, into the sphere of the explicit. From now on, in the development of sound, everything will be twofold, and many times twofold, with the birth of inevitable double relationships and, in short, of complexities. But here, at the level of the Third, the situation, even though complicated, is still clear; and it is possible to read in it attentively the causes of the following general doubleness, as well as the ways to transcend it.

Bifurcation, branching, splitting, differentiation and dualism are terms with which an attempt is made to describe the appearance of this element. The Third operates dialectically, contrasts, analyses, discriminates, weighs up, discerns, divides and holds a dialogue. One can see in it, distorted, the cause or the mother of all the intervals, not in their essence (which is unitary and synthesizing) but in their appearance, which is of two sounds or, in general, involves a basic dualism. Better still, one can say that the Third is the mother of form, as it introduces that dualism which is indispensable to its appearance and continuance.

Consider the imposing accumulation of consequences: all that has a form can be traced in some way to this peculiar, twofold interval; even a thought, in so far as it is specific and so formal, has an appearance and falls within its empire, or its law. Thought has in fact a twofold nature: it can be abstract or concrete, that is universal and unitary, or dualistic. This last aspect is the product of the intellect, the reason, and reasoning and it is the mental activity which is by far the most common for modern man. Its characteristic is precisely distinguishing between true and false, between right and wrong and between every kind of opposite: it analyses and contrasts, judges, weighs up, confutes and supports; and continually puts forward problems without ever solving one of them. It is incapable of synthesis; it is partisan or agnostic; it is the forge of doubt, hesitation and perplexity. It is the father of concrete science, the glory of modern humanity, but also the cause of his moral poverty.

All intellectual work is dominated by the action of this interval; the mind itself, with its two great categories (abstract and dualistic) sets itself, as fifth principle, under the governance of the Third.

The distinction which is produced at this level and which then has repercussions on all the other following manifestations has, however, another great effect: the separation of creation into two separate and complementary spheres, which can be called, in musical terms, the major world (masculine, positive, active and creative) and the minor world (feminine, negative, receptive and nutritive). The Third, in fact, is the interval which is the first to split into major and minor: a bisexuality thus arises which did not exist before, with the reciprocal game of attraction and repulsion.

We cannot, in a few pages, extend or go deeply into the examination of this reality and its effects, which condition all the kingdoms of nature (even the mineral kingdom where, in the atom, the game of the opposites is found between the nucleus and the electron) and thus all that is manifest and perceptible. Let it suffice to consider that everything is traceable to an action of the Third, and that, though inevitable in the development of sound and so of creation, it is only the tangible expression of the inner unity, which continues unmanifested, but present and real. The Third, with its vibration, veils Reality, clothing it with form. Thus the Ideas, once they are thought of materially, take on a mental aspect and become perceptible to the masses, but their light is dimmed. From the world of absolute values they come down into the sphere of meaning and this, in so far as it is dualistic, is relative. On looking closely, the Third, the interval which is par excellence manifesting, formal and dualistic, is destined by nature to remain unknown or hidden. In fact, this fifth Principle never manifests itself: its appearances take up a place in the concrete world, they are

either positive or negative, either major or minor, but the Third, their source, is unknown. It is not, in fact, either the minor or the major Third but the hidden cause of both. We will be compelled to speak of one or the other of its aspects, but remembering that in reality it is neither one nor the other, but the synthesis of both.

B) For the first time, it is noted that this interval, in its two aspects, is not acoustically “exact”. The ear, whether it is particularly sensitive or not, declares as a Third not a precise vibration but a group of vibrations; in fact, the little bridge, on the monochord, can be moved by several millimetres to the right and to the left of the exact point of 4/5 and of 5/6 without a clear impurity or dissonance being registered. All those divisions of the string “are alright” as a Third. It is as if, around the right tonal relationship, a “sphere of action”, equally valid as a Third, whether major or minor, were manifested.

This phenomenon takes on great importance: until now the other intervals (unison, the octave, the fifth and in consequence also the fourth, which is complementary to it) had expressed a remarkable exactitude, if not an absolute precision. Even conceptually, in fact, one cannot think of an approximate octave or a unison which is less than perfect. The Third on the other hand allows, and perhaps imposes, a different situation: imprecision is the accepted rule. In the kingdom of the three minor intervals (these remarks, in fact, concern also the sixth and the tone) precision and mathematical exactitude are no longer respected, but a state of ambiguity slips in.

This explains many things but above all it reveals a different requirement: the need and the function of tolerance. Harmonics is an exact science, to the point that it identifies where exactitude is strict and where compromise is right and proper. The three greater intervals (and the fourth with them) do not permit ambiguity: everything is clear, sharp and unequivocal in the kingdom of the three primary principles. Here tolerance and compromise would be useless or unbearable vices and errors. But in the sphere of the three minor intervals tolerance is not only admitted but is an unavoidable requirement. This does not mean the renunciation of the search for the perfection of the relationship, but the use of compromise as an element of balance and adaptation.

All the world of these three intervals is made ambiguous by this reality: but such a condition can and must be overcome with the appropriate means: not by having recourse to exactness, which here, if not impossible, is rare – but to patient tolerance, to the capacity to adapt oneself, to illuminated compromise. These are virtues in the dualistic world of form, but they would be vices in the higher sphere of being. This clarifies a serious problem that disturbs many consciences, which recognize the necessity of compromise yet recognize the defect in it: Harmonics, alone among the

sciences, determines with precision where and when it is right and resolving and where and when it is ignoble and corrupting.

48 – A majestic Unity reigns in the Universe as a most powerful law. Only the person who respects it can really cooperate with the Cosmos.

With the foregoing we have thrown light, if only partially, on the two great distinctive characteristics of the Third: dualism and ambiguity, which is a kind of corollary to it.

To return now to the examination of the primary qualities of this interval, we shall say that it is the fifth principle, the mind, the Fifth Ray. It is the Lord of concrete Science, of reasoning, of logic. It is the first form (revealed). It is the five. It is the one who bifurcates and chooses, who branches and divides. It is the Author of the world of the forms, innumerable and opposed to one another. It is the Lord of Thought, the first energy gifted with form, the creator of all the others, more dense and material.

The Third hides the light, but to reveal it, not to extinguish it. It presides over all researches, experiments and laboratories.

It is the mystery of dual action, of the nuptial, of the meeting of what is divided. It is the Logos, the Sound from which is born what is perceptible to the reason, the sentiments and the senses. And as every interval is by nature dual, the Third is the Lord of all the manifested intervals, it is the Immanent.

These last statements may confuse, at the beginning, since a short time ago it was learnt that Unison is the real creator. But Unison is and remains unmanifested, and with its three major aspects (unison, octave and fifth) it is the Transcendent. The Third is on the other hand the origin of all that, having a form, has an appearance and encloses and expresses a limited reality. Here lies a fundamental distinction, which yet links the five to the one.

It is suggested that the colour of the Third is orange, as the fusion of the two primary colours: red and yellow. But it is not clear what colour to propose for the major or the minor third separately. The former is not red and the latter is not yellow. But orange could be the light of the Third in itself, that unknown interval which expresses itself in two different ways.

203 – The consciousness which responds to cosmic attraction creates forms of psychic life. The commitment put into achieving the state of right resonance is a sign of responsibility of the spirit.

MAJOR AND MINOR SIXTH

Just as the fifth has the fourth as a complement, so the major and minor third have the minor and major sixth, respectively, as complements.

Here a number of consequences appear which have a paradoxical element. It must be observed, first of all that, while the fourth (complementary to the fifth) is one of the higher harmonics generated spontaneously from the fundamental tonic and has its proper place next to the fifth, the same cannot be said for the sixths. The sixth interval or the sixth harmonic appears in the value

$$1/6 \text{ g'' (lengths)}$$

which composes, together with the preceding $1/5 \text{ e''}$ an interval of a minor third, and not of a major sixth.

The question is delicate and seems to confirm the truth of that affirmation according to which "the sixth principle does not exist", but has an illusory appearance.

One could also consider them in the same way as the two thirds, as if they also were thirds, given the close link of double reciprocity which connects them. But listening to them contradicts this assumption, because the psychic value of the sixths is autonomous and performs a function of its own.

Here then is a condition of uncertainty and ambiguity, which perhaps is due to the intrinsic nature of the minor intervals and which one cannot do without – just as mists are frequent in the plains and are, after all, due to the nature of the places and their atmosphere.

With the sixths one has the impression of penetrating into a world which is more fantastic than real, yet convincing and present; it is like an enchantment which tests the capacity for reasoning, whose laws it distorts.

This sixth level, in fact, has inversion as a typical effect: this is revealed by the inverse correspondence between the minor third and the major sixth, and it is a characteristic which contains the seeds of disorientation. It is a question, also in this case, of a doubleness, but different from that encountered for the first time in the fifth principle, which we called bifurcation and which already separated in an illusory way what in reality is and remains unitary; here this same doubleness is, so to speak, aggravated by the reversal of the couples of opposites and it is easy to lose the way and remain trapped.

One must therefore be very cautious in crossing this singular domain, which puts the faculties of discrimination to a severe test; reality is here so veiled and distorted that one can be drawn to pursuing only its fleeting shadow, laboriously and with bitter disillusionment. What is

positive here reveals itself as negative, the feminine has a masculine aspect and right takes on the appearance of wrong, and so on. Here is the dominion of illusion: instead of with Ideas, it is populated with idealisms, which draw one far away from the sunny fields of truth, disorient and hold one prisoner. Here fanaticism can be born; this is the land of partisans, sects and heresies; of sweet deceptions, desires and delusions.

There is only one way to escape from this swamp, which allures and disperses: to keep to the middle way, where there are no inversions at all and the field of the opposed forces is in balance. Only on this narrow path does one avoid the enchantment of the sixths, the real sirens, Scylla and Charybdis.

The whole of this situation at the sixth level, between doubleness, inversions, deceptions and disorientation, is such that it is the continual theatre of furious battles: the deluded fight through desired hopes and the disappointed fight to find the way out. Fray and confusion are added to the mists.

Yet the sixth principle has a function in reality. Its very nature is preliminary to higher conquests. Desire and sentiment (perhaps clearly expressed by both the sixths) are authentic vibrations, once the field is lightened and the mist dispersed. They are the natural complement to the intellect, the right moisture that tempers the dryness of reason. They are prodigious energies which stretch out towards the Ideas of the fourth level, the authentic complement, that is, real and orderly. These "desires" are the reawakening of the will on the way back. A very luminous desire is implicit in the very act of divine creation: this is undeniable and perhaps explains the real nature of the sixth principle; but it is necessary to purify it from the contradictions, the restlessness, the agitation and the false lights which immature minds perceive in it, disoriented by the inversion and dualism. It is a question, in brief, of false perspectives: but they are formed, like mirages, only because and when the real nature of the sixth principle is not known.

At this point, what was said of the Thirds can be repeated regarding the Sixths: the real interval of a Sixth is unknown. This adds value to the preceding affirmations: the seat of illusions is not illusory.

The Sixth is search for the Ideas, it is the Sixth Ray, it is pure Idealism. It is the Combatant, the Knight without stain and without fear. It is the Battle itself and it is the Banner. Its colour presumably is green, fruit of the combination of yellow (Fifth) and of blue (Octave), and complementary to red (Unison). It would be useful to reflect on these symbolologies.

426 - ...attraction and harmony confer perennial solemnity. ... spiritual attraction perfects the concordances.

7) SEVENTH (TONE)

We have reached consideration of the seventh interval: it is called so, but in reality it originates previously. When the marvel is completed and the fifth is born, two other intervals, the fourth, of which we have spoken already, and the TONE, are also formed, one might say at the same time (but really time does not exist where distances do not exist).

Thus the seventh interval does not depend on the 7 as a numerical expression, but only in so far as it is the seventh among its brothers. This observation opens up new perspectives on the way of understanding the quality and functions of the number seven.

The seven, in fact, is the quantified part of the first "ekmelic" value, that is outside the system. If one vibrates a string, subdivided so as to be $1/7$, $2/7$ or $3/7$ of the total, one hears it as clearly "out of tune" with this latter and with all the tonal values of the divisions of the senarius (that is, expressed by the numbers from 1 to 6 inclusive and their multiples and sub-multiples).

The seven, in this regard, is rightly considered as an outsider; not an enemy, but a citizen of another order, a member of another system which, though supported by identical laws, remains separate and does not mix with the others. It is thus a symbol and a reminder of the fact that, given a world that is orderly and perfect in itself, other worlds always exist which are just as legitimate and regular, which must be taken into account and with which it will be necessary to be attuned in a superior and more inclusive harmony.

The presence of the seven is a severe warning: there is no limit to the process of harmonization, there is no rest from searching, perfection is not the standstill of lethargy; all this is implicit in the symbolism of the seven. The seven is, and keeps alive restlessness and anxiety for perfection. Therefore it is considered as baleful and beneficent at the same time by various religions; it is like the inspector who does not check the peace that has been reached but the capacity to go beyond it in view of new beginnings.

It is therefore necessary to distinguish between this disconcerting but inevitable presence and the qualities and functions of the TONE which, as we have seen, has only certain characteristics of order, but not of number, of the seven. The seventh interval is in fact a "measure" of the system gravitating round the senarius and regulated and populated by it. The TONE is the degree which subdivides the scale and all the musical scales (that is, every harmonic "system").

It is therefore a regulator, a master of ceremonies, a master of rites; and in this lies its essence as seven. Nevertheless it belongs to the system and is not at all outside it.

It seems, therefore, that one must distinguish clearly between the seven as an ekmelic value, and the seven of the intervals, which is a “basis” of co-measurement of the senarius. If anything, one can say that the TONE is the guarantor of harmony between the intervals, major and minor, quite a different thing from being an outsider. It is the necessary tester and in this it assumes, in the lower sphere, analogous functions to those of unison, the supreme creator. And since its action is exercised among all the intervals, it must be twofold, that is it must possess also the characteristics of the minor intervals. In fact the TONE is divided into major (8/9) and minor (9/10), and in this the essence and the necessity for dualism are repropounded – since one would not be able to co-measure what is dual while remaining unitary, and thus purely subjective. The seventh lord is, in short, a Magician, who manifests a dualism on purpose and controls it, without remaining its prisoner.

But it also carries out another function, of extreme importance, which connects it to what was said just now regarding the seven; since it is the extreme point, so to speak, of the senarius, the TONE is both a gate and a Guardian, watching over the regularity of the order and excluding from it the outsiders and the unworthy; it is ready to admit those who have the right to enter, being right and perfect, and to keep away, inexorably, those who do not have their papers in order. Lastly, this inflexible regulator of the rhythms is like a voice which calls and invites those who are qualified to participate in the harmony; it is the Town-crier of the Order, or its Messenger.

Its functions are precise and clear, as all ceremonies and any rite must be – these actions have, in fact, the aim of excluding irregularities. It is a builder of states of dynamic equilibrium and must therefore continually be in equilibrium between major and minor, between positive and negative, between light and dark, between full and empty. Thus it ends up by being the Celebrant of the eternal marriage between value and number, spirit and substance.

If the fifth principle (the mind, the third) is the origin of dualism and thus the creator of form, and the elusive sixth is the one responsible for inversion, the seventh is the one which fixes, materializes, arranges and distributes. From its hands, so to speak, issues a piece of tissue or a net, which, however intricate, is nevertheless regular and cleverly composed. It knots together what the five has split up and the six has reversed. The great Work started by the supreme Lord of unison is here completed in its final form: the canvas is finished and the drawing appears. What the

transcendent weaver (the fifth) thought and willed finds, through the work of the seventh Lord, its manifested completion.

But this conclusive act is only the beginning of a new journey, as the life imprisoned in this canvas must in the end be liberated and go back to the primary source. And from the TONE, in fact, the first impulses of this ascension depart – and so the work of the first interval is repeated and begins again in reverse, as the seventh interval is its reflection.

The TONE is thus the seventh Ray (which is the nearest to the first), the Master of Ceremonies, the Messenger, the Guard, the Magician, the Master of Rites, the Standard; its presumed colour is purple, which closes the rainbow and links it to ultraviolet, to the zones which are not yet illuminated and are unexplored by divine consciousness.

204 – When the Magnet stimulates parts which are identical, it attracts them by a harmonic fusion. When we unite arches of consciousness, we complete the circle. A cosmic action gathers together all the identical energies and an attraction between the arches of consciousness begins.

...Remember the great cosmic Law.

MAJOR AND MINOR INTERVALS

To conclude this treatment of the various intervals – which we have even imagined, with good reason, as living Entities – it remains to examine briefly, as a whole, the complex relationship between the two groups in which they are undeniably subdivided, that is major and minor. These terms must not generate confusion with the same ones used regarding tonalities; here also, in fact, we speak of major and minor, but the sense is completely different and remains in the field of dualism, of expression.

UNISON, the OCTAVE and the FIFTH are called major intervals (or Rays of aspect). They are exact and do not tolerate imprecision. They are the great principles and they possess the same ternary qualities of the divine. They are the reality, they are unitary and they are really the three in one and the one in three. Together they make up the “armonia perfecta maxima” and they are the three primary lights shining eternally. If understood in their superior meaning, they are transcendent yet creative, they are the formless, unmanifested causes of every visible process.

The intervals which are called minor (or Rays of attribute) are the THIRD, the SIXTH and the TONE. Each one of them – as we have seen – is twofold, that is, it is manifested in two distinct

ways. This illustrates their profound nature and shows them as formal, reflected and so illusory and unreal. It should be borne in mind that in these analyses it is intended to speak of the intervals, not of the sounds. Here we are dealing with the value of that psychic entity which is the synthesis of the two values which make up the interval. Or rather, if one wishes to understand this point of view clearly, it must be made clear that this synthesis is in reality something which is pre-existent to the production of the physical interval, is its cause and is manifested, precisely, through the vibration of the two sounds. In the world of physical appearances, which is the reverse of the spiritual order, two sounds are needed to produce an interval and so this appears like their effect. But really the interval is an eternal, ideal, formless value and, when it resounds physically, "it appears", as if evoked, in the world of phenomena.

It will be understood now why, though being minor, or unreal, the three secondary intervals are not without reality: what distinguishes them from the others is the fact that they appear in a twofold aspect and this is their illusory nature. However, we have already said that the THIRD, the SIXTH and the TONE are never manifested in themselves, but only in one or the other of their dualistic forms. Paradoxically, their essence seems, in this way, still more profound than that of the three primary intervals which, though being transcendent, are knowable through their unitary expression. But one should realize that the latter, inasmuch as it is revealed, is itself also illusory, so that the essence of the primary intervals also remains unfathomable to the intellect.

In summary, though divided into major and minor, the intervals all have a real nature and all reveal the glory of the One.

This said, let us return to the comparison between the two groups.

The lower group of three is not as harmonical as the higher group. In it are present strong causes of contrast and conflict. The TONE and SIXTHS are not always in accordance and in any case are not free from ambiguity, imprecision and uncertainty. This has already been seen.

But affinities exist which link this triangle to the higher one. Here are some of them:

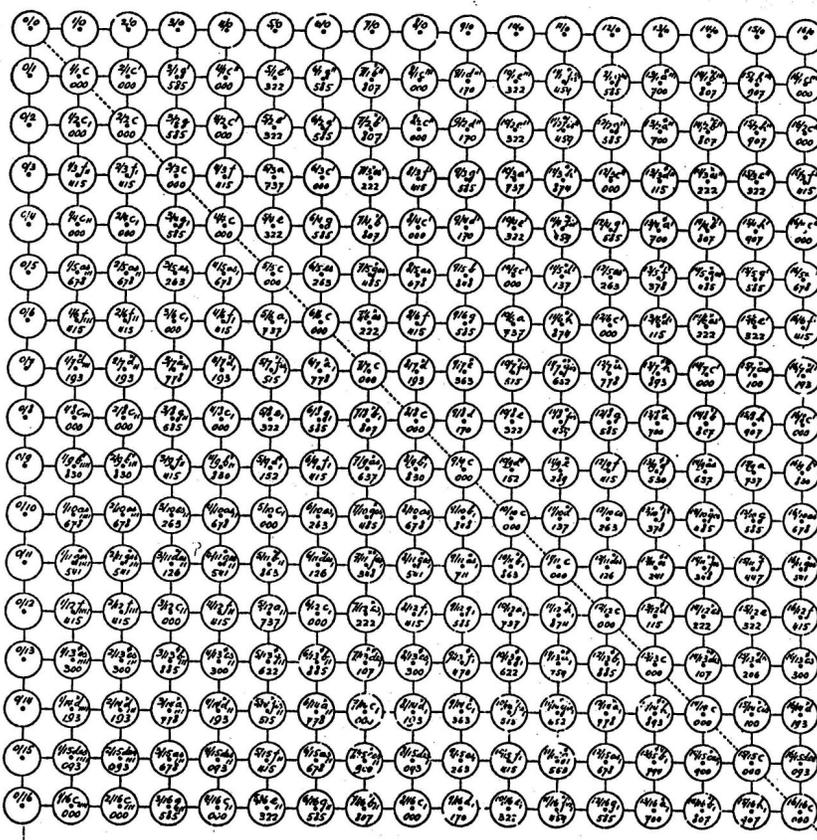
- a) The TONE is connected to the first ray by its functions, already described. Moreover, it is the one which combines the THIRDS and the SIXTHS.
- b) The THIRD is allied to the FIFTH, of which it is the manifesting creativity. But it is also allied to the OCTAVE, mother and container of all the forms and of every essence.
- c) The SIXTH is also linked to the OCTAVE and to the FIFTH, by affinity of nature and function.

Between the two triangles, as the invisible but potent director, is placed the fourth interval, whose qualities we have already tried to illustrate; it is the great mediator; it is "the interval" between the

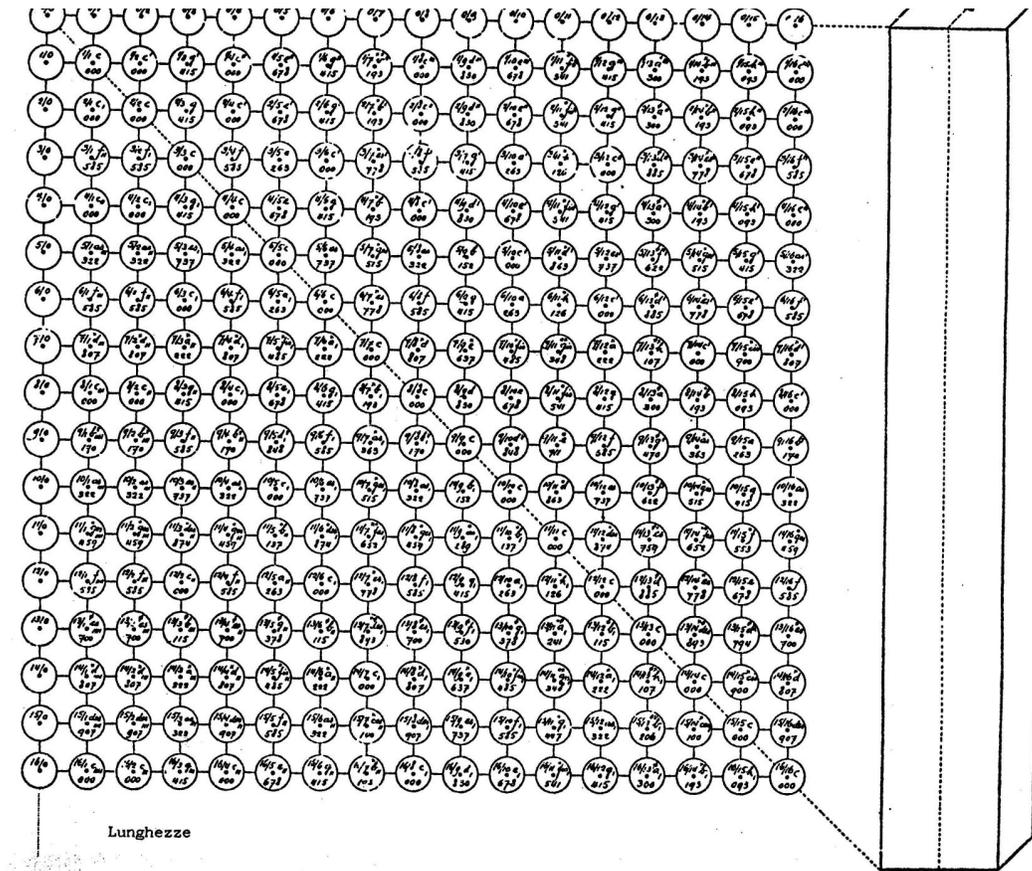
two triangles, higher and lower. Despite this specific function, it belongs to the group of the minor intervals, which is thus a group of four.

This interweaving of two triangles, regulated by a third element, this septenate is the very weft of life. One should see it working in the vital body of any creature; not only that, it must be present and active in any organization. The health, the usefulness, the efficacy and the operational level of any form of life and any human institution depend on its balance, its conditions and the state of its relationships.

20 – Worlds of the infinite; established world; worlds of harmony; limited worlds; worlds of Light and of shadows – humanity creates them and expresses its own field of action. Thus it demonstrates its creative power. All the thoughts launched into space produce a form and fill the worlds with their powerful vibrations.



Frequenze



The study of Harmonics now proceeds to examination of the diagram (K) to extract from it all the precious gems hidden there. Before going ahead in this “universe”, it is warmly recommended to consider the diagram, or the symbols, as the expression of energy and thus in movement, and not as a static form.

The diagonal or generator divides the diagram into two sectors, one greater and one less than 1.

All the horizontal harmonic series (K of frequencies) are divergent, as they tend to ∞ : the vertical ones are convergent as they tend to 0. This expansion and contraction of the horizontal and vertical harmonic series gives the idea of a heart which beats. Each sound (man) can thus tend towards 0 or ∞ , according to whether he travels the materialistic or the spiritual path. It should be noted, moreover, that this convergence or divergence has a different “speed”, whose movement varies in relation to the series. In fact, all the horizontal series (if represented for instance as a, b, c, d etc.) are of arithmetical proportions:

$$a - b = c - d$$

the vertical ones are of harmonic proportions:

$$a : c = (a - b) : (b - c)$$

the ones which are perpendicular to the generator are of geometrical proportions:

$$a : b = c : d$$

This system of coordinates is a group scheme of primary structure, based on the series of the whole numbers and their reciprocal numbers.

It should be noted that the examination of K. has concerned so far only the "number" aspect, but the psychic content which appears when the "tonal values" are introduced is still more remarkable.

All the series of intervals, horizontal and vertical, start from the octave and the other intervals subsequently appear in order:

OCTAVE	1/2
FIFTH	2/3
FOURTH	3/4
MAJOR THIRD	4/5
MAJOR THIRD	5/6
MINOR THIRD	6/7
MAJOR TONE	7/8
MAJOR TONE	8/9
MINOR TONE	9/10
.....	10/11
.....

It is important to impress on the mind, as "listeners", this series of always decreasing intervals and it is also appropriate to compare them with the corresponding ones on the pianoforte.

201 – Any vibration invisibly attracts the Fire of space.

15 – THE EQUITONAL LINES

Introduction of the “null” series:

0/0 1/0 2/0 ∞/0
0/1 1/1C
0/2
.
.
.
.
0/∞

which naturally do not correspond to verifiable or expressible sounds.

We have already observed that in the “K” some sounds are repeated and especially the “C”, then the “g” and then the “f”, and so on, according to their “hierarchical” position. But in this repetition we must distinguish two different types. The first derives from raising or lowering the octave:

1/1 C ; 2/1 C' ; 4/1 C'' ...

and these, which keep their value but vary in height, we call “Sounds of equal character”. The second, on the other hand, concerns those sounds which are repeated unchanged both in height and in character:

2/1 C' ; 4/2 C' ; 8/4 C' ...

We call them “Sounds of equal value” and we will now deal with them.

If we connect all these identical sounds contained in the “K”, we note that not only do they belong to the same straight line, but also that all these straight lines meet in the point 0/0, and not 1/1, of the diagram. These straight lines are called “equitonal”.

Through any point we can trace a straight line which connects it to the 0/0 (point of reference of the band of all the equitonals): the line will pass also through all the other points of equal value.

It of no little importance to demonstrate that in a mathematical sense the equitonals “must” meet in 0/0. But it is amazing to observe this phenomenon, and whoever takes this action and discovers it for himself on the coordinated plane cannot but feel surprised: it is a question, as we

shall see, not only of one of the many phenomena of Harmonics, but of a Theory of extraordinarily vast significance, both in an esoteric and a symbolic sense.

This check carried out on the monochord is the supreme proof of the psycho-physical and inner rightness of the arrangement assumed by the points of the “K”. With it, one penetrates directly from a mathematical-physical field into a psychic arrangement which is equivalent to it: a transmutation of what is material and logical into what is psychic and spiritual, which surpasses every other harmonic operation in its persuasive force and introduces something which, with respect to today’s scientific methods, is absolutely new.

131 – Who is sensitive to the beauty of universal creation? Who knows how to perceive the Highest and to resound to the pure manifestations of the Cosmos? We shall say that it is he who carries within him the greatest fires. I affirm that only the vibrations of the finest energies reveal the higher spheres.

16 – MEANING OF THE HARMONIC PRINCIPLES 0/0, 1/1 AND EQUITONAL LINES

In this paragraph Kaiser introduces the figure and the work of A. Von Thimus (1806-1878). He itemises his qualities as a man and a scholar and narrates the story of his works which are largely unknown but have enormous importance for Harmonics.

He rediscovered Pythagoras while he was studying the symbolism of the ancient peoples. The commentary therefore shifts to the value of the symbol and thus the discussion progresses to our topic. The author goes with caution into this field of enquiry and seeks to be sure of the attention of the reader.

The harmonic theorems are not only facts which are encountered in nature, not only logical abstractions deriving from numbers and figures, which the intellect recognizes as right, but above all forms of the mind, whose value we feel lives deep within us.

Let the person who sees in the diagram only a device suitable for the theoretical study of harmonies – which seems to him more or less interesting in its peculiarities – be content with this level. On the other hand, the person who feels the very structure of the diagram living within him will appreciate also the remarks which follow and will understand their psycho-spiritual implications.

Every value springs from two distinct polar psycho-physical impulses impressed by the principal higher and lower harmonic series, which in their turn come from unity, 1/1, a material and psychic measure. This is to be considered as the creative “Fiat” of the Demiurge... All that in the normal sense we understand as reality, as realized, comes from 1/1. But this unity must not be understood only in a logical-material way, as number or frequency of something, but as an a-priori sound, with which it is inseparably connected. Primeval physical-material greatness has no value in itself, and philosophical-religious unity has no material essence, but in harmony both, being and value, coexist in the Origin and are inseparable. The character of this Origin is evolutionary and concerned with development, emanation and multiplication.

Now let us observe the single values which appear in the diagram, as individualities. We learn that they “reincarnate” here and there, that is they renew their oneness but in different environments, in other “places”. However it is not a reincarnation “ad libitum”, but in a regular relationship with the Origin and also with the material basis. The value $3/2$ g, for example, cannot

reappear in any places, but only in 6/4, 9/6, 12/8, ... it keeps its individuality unchanged, but the "circumstances" change and the process continues to ∞ , when it returns to Unity, to the Generator. We shall see, with regard to the logarithmic arrangement of "K", that also those vectors of the values which are the equitonal lines run parallel to the Generator, with which they cross and are mixed at ∞ , which means that for an Index ∞ the value ends in the unit 1/1.

Examples of the different environment, in which a value "reincarnates" from time to time (for example, g), a value which is increasingly dissonant and hostile, that is in which no resonance is aroused:

- first incarnation of the value g in the ambit of the senarius:

2/1 c'	3/1 g	4/1 c''
2/2 c	3/2 g	4/2 c'
2/3 f,	3/3 c	4/3 f

- in the second incarnation the presence of a dissonance already exists because of the appearance of the 7:

5/3 a	6/3 c'	7/3 xes'
5/4 e	6/4 g	7/4 xb
5/5 c	6/5 es	7/5 xges

- and in this way in the third ...

8/5 as	9/5 b	10/5 c'
8/6 f	9/6 g	10/6 a
8/7 ^x a	9/7 ^x e	10/7 ^x fis

- in the fourth and fifth incarnation the ekmelic values increase and the environment becomes increasingly more dissonant and hostile.

11/7 °gis	12/7 °a	13/7 °h	14/9 °as	15/9 a	16/9 b ^v
11/8 °fis	12/8 g	13/8 °a	14/10 °ges	15/10 g	16/10 as
11/9 °e	12/9 f	13/9 °g ^v	14/11 °fes	15/11 °f	16/11 °ges

But when the index grows, something wonderful happens. The environment is getting closer to the character of the place analyzed, and not only with regard to the closest values, but the process affects in a wider and wider way the surrounding regions, as the example shows:

1/1 c 000	←	64/1 000		65/1 022		66/1 044
1/51 328	←	64/51 328	①	65/51 350	①	66/51 372
1/52 300	←	64/52 300	③	65/52 322 e	⑬	66/52 344
1/53 273	←	64/53 272	①	65/53 294	①	66/53 316
65/52	→	5/4 e		65 = 13 x 5		52 = 13 x 4

So that one can say that even the environment around the value, eg. 65/52 e, is "colored" or has the "key" e; and this trend is growing with the increase of the Index.

But the analysis of this phenomenon reveals something else of great importance. The close analysis, in fact, shows that the outward similarity, the "kinship" of the environment, is only apparent. The eight values that surround a certain sound, not only are different in origin, but also differ in the hierarchical order within the system. Sound 65/52 e has already experienced many incarnations: it comes from 5/4 e, and has elaborated a number of consonant rapports.

The value 64/52 (next to it) only goes back to 32/26 e and 16/13øes, and so it is at its third incarnation, and has yet to find (with difficulty) its own resonances in the world of the Diagram "K". The sound 65/51 is just born, and its mission is still fully wrapped in the future, meeting great difficulties, and feeling like a stranger; and so on. In this is the solution of a number of riddles concerning psychic differences, the more or less great faculty of adaptation, etc...

These considerations lead to better understand the meaning of 0/0. All harmonic values, regarding their "reincarnation", are in constant, direct relationship, with 0/0, the harmonic symbol of divinity. This is shown clearly by the equitonal lines. This fact is independent of the position and

the hierarchical degree covered throughout the system; it does not matter when and where one was born, neither if the environment is more or less favorable and congenial: the individuality of any "spark" issued by 0/0 retains its importance without modification.

To spiritually deepen the considerations and phenomena of Harmony, it is befitting not only to fix them well in mind, but to meditate quietly or intensively. The reader is placed in front of the done works and elaborated diagrams, and reflects on the whys and wherefors, taking care of those internal considerations from which a creative certainty arises. Only then, with all his/her heart and mind, he/she will be able to judge the legitimacy for having considered the highest Principles. The "K" is not only a system of coordinates more or less interesting, full of numbers and geometrical figures, ... but a configuration that, emanating from the psycho-physical law of higher harmonics, is "made" in nature, the soul being able to sense its "rightness".

200 – The vibration of the heart draws the spirit to its destiny and moves the levers which guide it to what is due to it. Therefore, when the creative power is on the way to completion, the heart resounds. Any vibratory commitment evokes a reply there, and the ray emits a corresponding vibration: the sensitive heart assimilates the rays received. The concordant vibrations generate harmony.

17 – INDEX AND GENERATOR

We have come to one of the most important phenomena for all researches into harmonic series and groups: limitation...

In Harmonics there is a distinction between the internal and the external limit: the first is called the “generator” and the second the “index”.

The INDEX is the limit of the external development fixed for the series or for the group.

However, it is not a question simply of an external device. In reality, every index has its own “face”, not only because of the numbers contained, but also and especially because of the tonal values.

index 1	index 2		index 3			index 4			
1/1 c 000	1/1 c 000	2/1 c' 000	1/1 c 000	2/1 c' 000	3/1 g' 585	1/1 c 000	2/1 c' 000	3/1 g' 585	4/1 c'' 000
	1/2 c, 000	2/2 c 000	1/2 c, 000	2/2 c 000	3/2 g 585	1/2 c, 000	2/2 c 000	3/2 g 585	4/2 c' 000
			1/3 f,, 415	2/3 f' 415	3/3 c 000	1/3 f,, 415	2/3 f' 415	3/3 c 000	4/3 f 415
						1/4 c,, 000	2/4 c, 000	3/4 g, 585	4/4 c 000

Index1 remains in the peace of Unity; 2 contains it developed in the trinity; 3 sees the great interval of the fifth appear, etc. Thus in the whole of every index something new occurs which did not exist before. Every index has its own characteristic aspect, its own shape, and it is not a simple accumulation which is already foreseeable. It should be noted, inter alia, that only the odd indices produce new values. Nevertheless, the aspect of Index 3 is quite different from that of Index 4, even if only new octaves come in here, and this difference is important for the interior arrangement.

'GENERATOR' is the term chosen to indicate a principle, a directive, an inner law which presides over the construction of form.

For Harmonics, the most important generator is the "Senarius", that is the finite series of numbers from 1 to 6 and their reciprocal numbers. We have already said what is meant by "emmelic" and "ekmelic".* All the emmelic numbers are contained in the Senarius, while the ekmelic numbers are excluded.

The Generator works as the principle of selection from the inside and constructs any configuration in the ambit of a certain Index. The reader is asked to train himself in this sense and he will be convinced of the peculiar tendency of the Generator to define a shape.

Index is therefore to limit outwardly; Generator for building from within. Since no limitless figures exist, the Generators are always limited by a certain index, and at this "edge" they meet. The Index can never be greater than the development of the Generator, and the latter (if the figure must have a sense, and since in theory neither Index nor Generator can be ∞) must have an Index, that is a limit.

EMERGING CONSIDERATIONS

These two concepts, of the Index and Generator, have an immense significance in Harmony, so that to represent all the fields of possible application is not possible in a book, but only to give a very few examples regarding creation in nature. The aspect generator can be described as the principle of universal selection; if we add the concept of index, the main way we can speak of it is as a "limit of the group", which is the Form of all values, from within and without In any case where the construction of a form is considered, we encounter always two basic principles: the process from inside to outside and the limit imposed from outside. These two principles can be isolated only in a theoretical sense, but this is impossible in practice. They are, however, not linked by a rigid relationship, but in a living interchange, and perhaps only in this dialectic is the solution of the riddle of the general construction of form.

It is interesting to note that sciences consider especially the generative aspect, while that of the index is taken as a simple statement of fact.

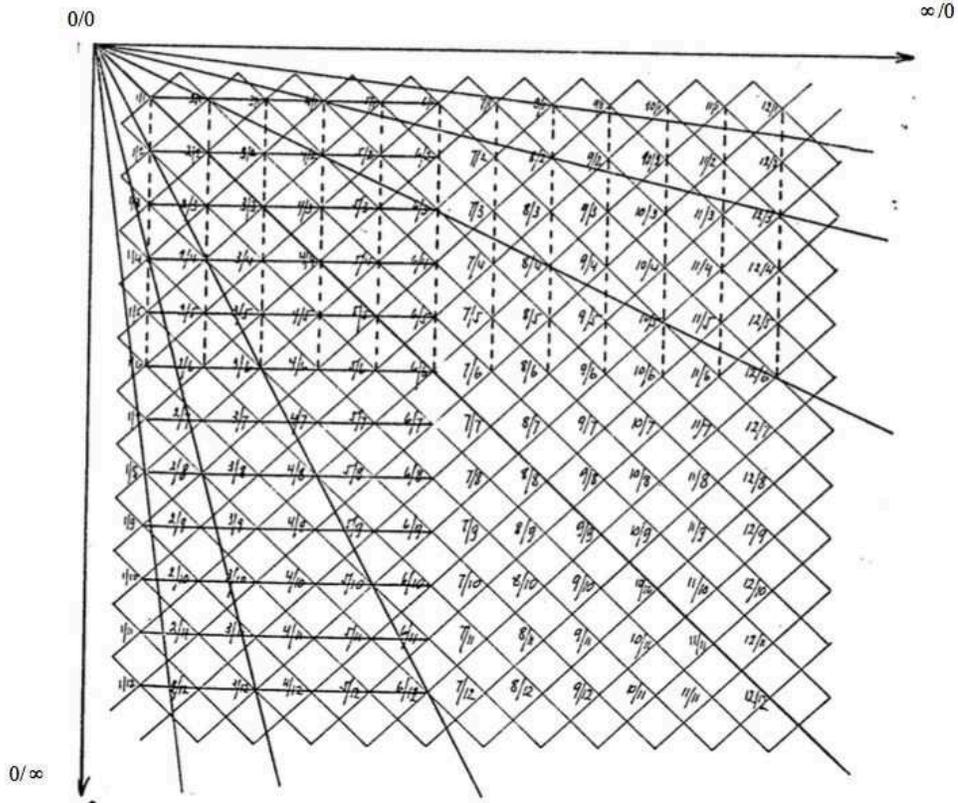
* "Ekmelic" means outside the system, and "emmelic" inside it.

Each atom consists of a generative selection of quantum orbits, and of the "Number" of its nucleus; the dependence of the index from the inner selection should be unquestionable; precisely therein the difference of the various atomic structures lies. Each crystal is formed according to the Generator of its class; it could conceivably grow unlimited, but actually crystals - like trees - do not grow till the sky: they must therefore conform also to an Index.

An artist not only chooses the material for his/her work, but imposes strict limits, which result from an interior choice. So the work of art is limited not only in an external sense, but also inwardly, and these limitations depend on each other. It can be said that the value of this work depends on the balance between the two principles. A monument originates always and only by a choice of materials and projects, and the Index of its architecture must consist of the harmony of its parts, otherwise it would not have lasted.

The Senarius.

If we equate Index and generator, that is, if we limit the Senarius to the finite series 1, 2, 3, 4, 5, 6, we obtain the corresponding crossed harmonic series. On the other hand, if we set the index for example to 16, and connect with vertical and horizontal lines the values contained in the senarius, we get the following figure, where there are also marked, and only, the equitonals with value C. We see that the Senarius comprises a closed world, which nonetheless tends to ∞ in two directions.



Other brief remarks follow on the Senarius, which appears almost everywhere, in crystallography as well as in chemistry, plants, etc. To be remembered are the subdivision of the round angle in 360° , the 12 months, the 24 hours, the zodiac, the examples of Greek architecture, etc. Everything demonstrates the great, creative impulse of the inner senarius.

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