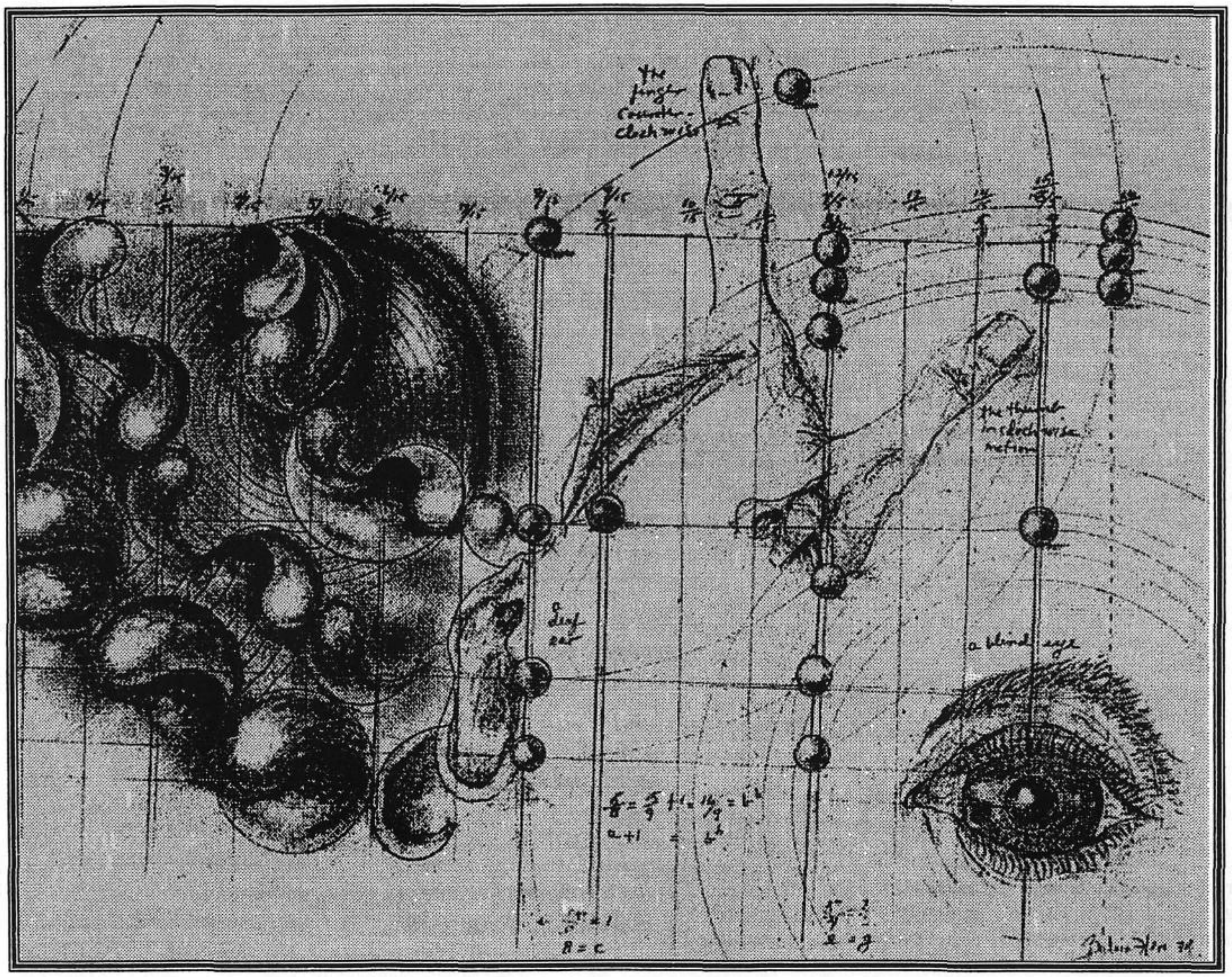

EYES + EARS = IDEAS

By:
Barbara Hero

"Fact or Fancy? Probable or Improbable? Possible or Impossible? This entertaining, potential look at the forces of the universe, their relationship to each other and mankind is required reading/viewing for all thinking beings. Applying the "What if..." test of development the author has provided an artistic rendering of mathematical relationships between form and substance, sound and light as only an artist/musician turned mathematician can explore and explain it." (Editor)

THIS BOOK IS DEDICATED:

To all those souls who are searching for truths off the beaten paths.

ALSO BY BARBARA HERO

"Lambdoma Unveiled (*The Theory of Relationships*)"
"The Glass Bead and Knot Theory of Relationships"
"Lambdoma Harmonic Intervals"

ACKNOWLEDGMENT

The author and publisher of this manuscript would like to extend their thanks to the International Empirical Research Institute and their staff for the editing and electronic processing of the contents. The original art work was scanned using Photoshop on a LaCie image scanner. Formatting and typesetting were completed in PageMaker and the entire process was assembled, as camera ready copy, using a Macintosh computer.

To Barbara, in recognition of your work.
F. Wayne Grimm
(Pakenham, Ontario,Canada)

Renewing Ancient Ways

By F. W Grimm - 1993

You penetrate the rules of sound
to give the pause of silence;
a measure of singing worlds;

Wise pearls for beads of truth
a single thread from quark
to grand galactic wheels
and far beyond matter's
final gates-

Endless wild wonder,
Worlds upon worlds within
worlds.

You bend to the needs
of broken lives
To bring this tread for their mending.

ABOUT THE AUTHOR

Barbara Hero author of "Lambdoma Unveiled (*The Theory of Relationships*)," and "Glass Bead and Knot Theory of Relationships" is a creative musician, mathematician and artist. She possesses the unique ability to unify these three disciplines into an interrelated functional theory of existence, known as the Lambdoma. She has written and lectured extensively on the wisdom encoded within this ancient matrix of whole number ratio's attributed to Pythagoras.

Born in Washington D. C, daughter of the late artist, Lucile Evans Ferrell, Barbara's life's works in music lead her to focus on the relationship of mankind to the universe and the development of methods to assist individuals in attuning to their own fundamental vibrations. Exploring the intricacies of architecture and its relationship to sound she found interesting relationships between the spaces we live in, the sounds we encounter and the lives that we lead.

Further research led Barbara to the works of Pythagoras, which included a diagram outlining the mathematics of harmony. Acquiring a degree in mathematics she confirmed that there was a relationship between color and music (sight and sound). Researching mathematical frequencies of light and sound, she developed a unique understanding of their interrelationship to individuals and their quality of life.

While working with Boston Massachusetts drug rehabilitation programs she had the opportunity to put her accumulated knowledge to use. She taught addicts to draw what they were feeling. Her investigation of the healing properties of Lambdoma sound inspired her to introduce this music to the art-therapy classes. She noted that her students responded remarkably. Many, inspired by the music, produced symbolic abstract drawings.

Working with her "Creative Application Engineer," Robert M. Foulkrod, she has developed unrivaled methods, using computer processing and laser projection, to document and present musical frequencies.

Computer-generated tones, based on the ancient diagram, have produce unequaled mathematically perfect meditation tapes. The logical "right brain" becomes entranced with the perfect sound intervals. The creative "left brain," now free from interference, produces an unrestricted flow of stimulation leading to the potential production of art, poetry, music and feelings. Many different doorways to ourselves unlock and open wide.

Her methods enable individuals to find their own personal "Key Note" or "Resonant Frequency," to recognize their various "Chakras." Personal voice patterns in the form of "Keynotes" combined with the Lambdoma musical scale enable participants to observe indications of balances or imbalances.

" An emotional healing on an emotional and spiritual level," is her description of the combined experience of the individual.

She has processed much of this knowledge into music, books and produced a series of audio cassettes directed toward bringing the individual into harmony with the universal energies.

ABOUT THIS BOOK.

This book was conceived in the early nineteen seventies, after a decade of trying to find a link between visual art and music. The connection was finally found by joining color to the musical notes attributed to Pythagoras, and by using an ancient description of mathematical ratios in a two-dimensional matrix (known as "the Lambdoma") which unites the harmonics of musical intervals.

An artist is free to step over boundaries in ways that mathematicians, scientists or other disciplinarians cannot. Viewing from the outside provides an entirely different perspective often revealing overlooked or unexplored avenues.

This work thus became a foundation upon which to construct visual representations of relationships. In turn this leads to other areas to potentially explore possibility and probability. Much ended in fantasy, much in fact.

To separate the two is not the purpose of this work. To open the doors of the mind to imagination and exploration is a greater challenge. After all much of what we take for granted today was revolutionary or heretical thought at one time. {i.e. Jules Verne's "Vingt Mille Lieues sous les mers" (1870: Twenty Thousand Leagues Under the Sea) and "De la Terre a la Lune" (1865: From the Earth to the Moon) foretold of the submarine and man on the moon}.

One reviewer of this book commented:

"These are the illustrations for a new text in physics which has not yet been written".

After the drawings had been completed, narrative was prepared in an attempt to describe the imaginative thought processes of the artist while drawing. They read somewhat like a stream of consciousness, sometimes unearthly, dream like, a translation from sound to sight by way of a sort of metaphysical mathematics.

Of the four sections in this book the drawings from "Start, Stop, and Think" were displayed in a solo art exhibition at Max Protetch's Gallery in Washington, D.C. At that exhibition a flutist played the drawings, translating sight to sound.

Consequently scores were subsequently written for "Start, Stop, and Think" and "The Other Side of Art". These scores were recoded on a moog and mini-moog at Robert Ceely's "BEEP Studio", in the Boston, Massachusetts area. Cassettes of these two productions are part of the audio catalog of Strawberry Hill Farm Studios and may be purchased separately.

Alas, the section called "Theories and Queries" was not scored because of the tedious nature of setting each note to its specific frequency on a sine wave generator in order to record the more perfect harmonic pitch of each note, most of which were not related to our familiar western scale.

Contents

FORWARD

The reason for writing a book of this sort was determined by the realization that the things in life which are bypassed as of little consequence, have, on the contrary an immense importance to our development as human beings.

This work is a reducing of complexities to a symbol. The symbol is being able to determine our responses to emotion, thought, and psychic awareness. How little we know of the irritations or pleasures which influence our mental states. If we should know such things as sequences, we could predict events. If we should know such things as accelerations and decelerations, we could better understand time. If we could find a way to utilize the energies within us, to direct and focus them, we could be productive individuals.

The ideas here presented could be used as a springboard for an entirely different approach to life. That they should be given a wider and broader audience is based on the realization of the response of many individuals so far to these ideas, and it has compelled me to make them available to others.

They seem to have a unifying effect on those exposed to them, as if the facets of each life have loose dangling strings, and it is possible to pull these together taut. So often our lives are compartmentalized, as is our society. Yet we all long to feel a whole. And if even one of us can make a whole of some of the parts, others are able to do likewise.

Therefore this work is proposing that universal harmonies exist, that we perhaps have long lost sight of.

These harmonies are most manifest in music and proportion in the arts. If we can take the principals behind these harmonies and analyze them, we not only discover guidelines for the arts, but for living harmoniously as well.

If we can define these harmonies without even using sounds, we can begin to understand some of the principals lying underneath the surface. Once these mysteries of harmonic analysis are uncovered, a whole process of growth, healing forces and aging processes are revealed. Each person following his initial overtone structure, could develop his full potentiality intuitively, intellectually, emotionally. One could expand consciousness through effort of understanding at all levels.

The arts have traditionally been considered an expanding of the mind to the consciousness of the human race. Now, at a crucial point in the development of the arts, where the forces of materialism and an intellectualization of a negative sort are threatening to choke off the life source of creativity, a positive approach, not competing with science but reinforcing this important branch of human endeavor is desperately needed.

The iconoclasts of our age have finally reached a point where everything has metamorphically been smashed, and it is up to all of us to begin putting the pieces back together again.

One thing I wish to emphasis is that GLIMPSES is not merely a collection of diagrams from different disciplines. A few are borrowed from other works, with credit given, but these have either the music grid framework I developed superimposed on them, or are diagrams juxtaposed to show similarities in shape, or concept alone. Most of the diagrams were devised on my own, sometimes picking up an idea from a verbal description, but for the most part the diagrams developed out of their own system.

There are certain aspects of this work I would like to explain. First, many of the sources were second, third or fourth hand. The reason for this was that having found a framework, so to speak, I was intent as an artist, to see if some discoveries from other fields would fit into this system. The intention was never scholarly, in the sense that I always felt that I was basically an artist, not a writer nor scholar. At the same time, I felt that I wanted to communicate not so much to the expert in the fields I chose, but in a broader sense to a wider public, artists, who tend not to know the semantics of musicology, and the general public.

Therefore, in using terms such as octave, musicologist might have said "diapason" or wholeness. In this case octave meant, seven, sixteen, or even 53 notes within a whole, depending on just what scale we were dealing with. The universal ladder of sounds would be a "diapason", as would the grid of either eight or sixteen points. For the tones I used Do, Re, Mi, Fa, Sol, La, Ti, in place of C, D, E, F, G, A, B, C, or even more precise TONIC or fundamental, Unison (C), MINOR SECOND (C# (D♭)), MAJOR SECOND (D), MINOR THIRD (D# (E♭)), MAJOR THIRD (E), FOURTH (F), AUGMENTED FOURTH (F#), FIFTH (G), MINOR SIXTH (G# (A♭)), MAJOR SIXTH (A), MINOR SEVENTH (A# (B♭), MAJOR SEVENTH (B) and

OCTAVE (C).

The sharps and flats I used wherever they fell on the grid. Since, in most cases the grid only went up to 16 points I only considered the flatted notes, which are equivalent to sharped adjacent notes, i. e. , Mi^{b}, or D$^{\#}$, La^{b}, or G$^{\#}$, TI^{b}, or A$^{\#}$. Also, different from musicologists, I have used distance to determine the note exclusively, whereas, I could have used the relationship of tone to tone determined by ear only, but that would have no bearing on the visual determination of pattern and distance, from the stand point of this work. Also I simplified considerably the whole idea of proportion based on fractions. Since single fraction can be visually determined by using the relationship of the denominator to the numerator i. e. 2/3 numerator/denominator, this was the basis for the work. The "partial", or the part left over from dividing a string, was only used in one case, Illustration P-13. I did not deal with any groups of notes as a harmonic cluster, but the notes would be seen more as a simple melodic line. I did not go into any theory dealing with harmony or counterpoint, nor did I feel the need for using music scores to illustrate certain points. However, I have often thought of the feasibility of stretching strings over a drawing, for example, tuned to the notes involved. Sixteen strings, for example tuned from C2, E2, G2, B2, D1, F1, A1 as the base notes and C, E, G, B, D, F, A, as the treble, where one could trace the outline of the forms, in a direction progressing from left to right and would directly join sound with vision. Also, since the notes I was dealing with could be approximated by the process of halving a string, successively, this also was a simplification to most systems.

I could have used technical terms for the rays of multiples fanning out from the grid, known as the Lambdoma", or identity rays for each note, named by the Neo-Platonism Iamblichus.

The hexagon or Mi^{b} could have been called a "senarius", or sixth on the scale, which is our Mi^{b}, where the major scale ends. Of vibrating waves I only used the "transverse" or up and down, rather than the longitudinal, back and fourth, whereas combining them would have yielded another dimension. I was puzzled over many aspects of seeming contradictions such as the inversions of the fractions I encountered while studying these facets. Helmholtz, for instance, claimed that the fractions with the denominator large were the ascending notes, whereas, Levarie and Levy claim the opposite.

Also the correspondences worked out by applying the reasoning of logic to the I. Ching do not correspond with the numbers given for the notes on page 89 of Danielou's "Traite Musicologie Comparee" where Do is five, Re is nine and four, MI$^{\#}$ is eight and three, Fa is not included, as being a tritone, Sol is even and two, and La$^{\#}$ is six and one, and Ti is not included.

Both Levarie and Levy, and also Ouspensky hinted at analogies of the octave to the periodic table of elements, but not in any structural way which I could determine.

I would have liked to go into the major-minor modes, and the Greek Modes to compare the scales developed under this system, with others, but as much has been written already on comparative studies of this kind it would have been repetitive and not one of depth, so the best I can do is to cite the sequences discovered under this system,

So in essence, taking a very tiny part of music theory, was enough to weave many thoughts, around certain visual problems, and come up with an enormous amount of visual ideas, which could then be translated into words, and perhaps in the future be retranslated into music.

"There are three kinds of music, the music of the worlds, the music of humanity and the music of instrument. Of the music of the worlds, one is of the elements, another of planets, another of time. Of that which is of the elements, one is of number, another of weights, another of measure. Of that which is of the planets, one is of place, another of motion, another of nature. Of that which is of time, one is of the ways and the vicissitudes of light and darkness; another of the months and the waxing and waning of the moon; another of the years and the changing of spring, summer, autumn, and winter. Of the music of humanity, one is of the body, another of the soul, another in the connection that is between them. " Hugh of St. Victor (1097-1141) "Didascalicon de Studio Legendi"[1]

How, what, when, where, why? Questions that we ask about everything. When we focus on one fact, often discoveries are made which bear little relation to what we are absorbed in at the time. This was the case when compiling a lexicon of images, relating abstract concepts of music and art. Suddenly all sorts of ideas seemed to fit into place. A whole was being built up which dealt with phenomena far beyond music or art. Or, perhaps these phenomena always existed in the arts but were veiled to most of us. I call these discoveries GLIMPSES. Perhaps they are only subjective, but I believe they are universal fragments of truth.

I have decided to focus on the HOW and the WHAT. HOW these forms were constructed, so that others may experiment with them, and WHAT is the significance of these images of thought.

INTRODUCTION

This book, EYES + EARS = IDEAS, is an expansion of the original GLIMPSES and was conceived in the nineteen seventies after having come across Pythagoras' ideas of coding musical notes with corresponding colors. I had been a visual artist since the nineteen fifties, and had been re-studying music for eight years at the New England Conservatory of Music, trying to find a link between art and music. I had come across a book on "Tone a Study of Musical Acoustics" in the early seventies which featured an ancient diagram as a two dimensional matrix which mathematically linked ratio to harmonic intervals in music. By combining the color coding of ratios of notes by Pythagoras and the Lambdoma matrix, I was able to translate from color to musical interval in a new art way for me. I am convinced that Pythagoras knew of the Lambdoma matrix as it was predominately used in ancient Greece.

After going back to each image, which were drawn on a treated canvas called "primac", I began to express in words what I had been thinking visually.

The comments are based on the same insights I had while making connections between the intervals, notes and ratios while drawing. This work of pleasure shows the beginning of a long journey toward the fuller understanding of what is called the Lambdoma.

Later in the seventies I wanted to create a music score for each drawing. For the section called "Start Stop and Think" a flutist played the painting/drawings at a solo exhibit at Max Protecht's Gallery in Washington, DC.

I then took a seminar at Robert Ceely's BEEP recording studio and wrote and recorded the scores from each drawing of the section called "The Other Side of Art" on a moog and mini-moog synthesizer.

If the viewer/reader maintains an open mind, there are some insights which might be a spring board to others to further explore this fascinating path.

Barbara Hero (December 1993)

[1] Hugo of St. Victor, "Didascalicon de Studio Legendi"

GLIMPSES

MUSIC OF WORLDS, HUMANITIES, INSTRUMENTS. (RE: ILLUSTRATION # P-1).

This illustration shows one way we can interpret thoughts from a written page, and translate these ideas into pictorial symbolic form. Three suggests three objects. Since the world is a sphere, circular forms become the next step. Since elements, number, weight, measure, planets, place, motion and nature and time all fit into one sphere, we can almost conceive of wholes within wholes, the sphere of our visible world. The music of instruments, however, suggest the invisible world of vibrations, solid hitting solid, to give off vibrations in the spaces between the objects. It is here where we find patterns of sound, always following the same sequence of fundamental, fifths, fourths, sixths, thirds, sevenths and seconds, which when rendered pictorially give us much to think about.

The music of humanity in essence is the body, the visible, and the soul, the invisible. The connection between them is the reaching of the visible, or material, for the invisible, or spiritual.

This describes what we are trying to do, specifically in life, no less than in art, uncompleted beings searching for fulfillment.

The lines are the five lines of the music staff at right angles. The right angles assumes importance as we go on, as do the differing degrees of angles, as we shall see.

So do the circles within the circles, and the rims of the circles meeting at the center. If we can imagine the circles all rotating, we know, from mechanical laws that the inner ones must go in the opposite direction from the outer ones.

Light and darkness also can be depicted to show opposites, by making what was light in one, dark in the next, symbolizing the juxtaposition of the known and the unknown. In all three cases the inner circles were different, rims meeting in one case, then turned at right angles in the next, and finally both coming into the whole at the same time, superimposed over one another and giving the impression of a backward forward motion, pulsating.

The smaller to larger spheres in the foreground stand for the notes on a keyboard. (Do) or the tonic, becoming the middle (C), one side of middle (C) representing TIME, the other side representing SPACE. The descending scale represents contraction, as we shall see later. The earliest known music, incidentally, had the scale descending step by step, rather than ascending as we know it today[1] . Could it be that in an expanding contracting universe, ancient civilizations were in a contracting phase, whereas now, with present emphasis on overtones, ascending, time and all we know and experience is expanding?

The ascending scale represents expansion, not only because of the patterns of notes when laid out on a numbered grid, but because of decreasing radii (the overtones can be reproduced by shortening the string length or radii) and the fact that we are dealing with an infinite, in the sense that we have an ever increasing set of numbers, rather than a given length. Thus the descending scale represents the finite, the ascending scale the infinite.

The N. S. E. W. directions were used because we could then determine where the notes were in relation to one another.

The Chinese are apparently the only culture which assigned direction to their musical scale. Since they also assigned color and taste in some instances, that is another reality, we can make visible.[2]

This Illustration does not deal with specific instances of making musical ideas visible as much as showing the relationship of an art to everything around us, material and spiritual. It suggests a receptive frame of mind which the viewer or reader might assume to gain the most benefit from the work.

A work of this sort is not aimed only at those who see or hear, but the physically blind and the deaf should also be able to understand and experience these abstract truths, and benefit with the same esthetic enjoyment of discovery.

ORBIT OF PLUTO. (RE: ILLUSTRATION # P-2). Pluto's orbit is in an ellipse. While all other planets have orbits with the sun as center, the orbit of Pluto has its center off from the sun. We know that we need two points to draw an ellipse, and in space two forces are needed to create an elliptical curve. The sun is at one focus, the other is empty. The idea was intriguing so this was the model used for relating the notes of the scale to the planets. Pluto represents the limit to the circle.

The smaller, more dense rings symbolize the four planets nearest to the Sun, Mercury, Venus, Earth and Mars or (Fa), (Do), (Sol) and (Re). The asteroid zone, or