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LIGHT AND THE ARTIST

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Twenty years hence—perhaps much sooner—people will find it hard to believe that, in our atomic generation, many still shook their heads at the thought of an eighth art coming into the world to take its place among the accepted seven; a major fine art at that, in which the artist's sole medium of expression is light.

“Nonsense!” And our children will accord us the same overbearing smile we now bestow on our ancestors who greeted telephone, automobile, radio and airplane with the same devastating word.

As far back as we care to look, each generation has firmly believed itself at the pinnacle of human achievement—and been as firmly convinced that the young folks were going to the dogs. The reasoning is simple enough. “Why, if such a thing were possible, someone would have thought of it long ago!”

Well, in the case of Lumia, the Art of Light, someone did—twenty-five centuries ago! The recorded history of the art of light began one starry night on the island of Samos when Pythagoras stood contemplating the firmament. The majestic rhythm of heavenly bodies moving in their orbits appeared to him as cosmic harmony, a vast rhythmic sequence of visual beauty—the music of the spheres.

Here we have the first clear conception of a potential aesthetic language of form, color and motion in their purest manifestation—apart from earthly phenomena and the human body—and precisely the foundation upon which lumia rests.

But, some two hundred years later, Aristotle unwittingly launched the unfortunate changeling “Color Music” with the following passage in *De Sensu*: “Colors may mutually relate like musical concords for their pleasantest arrangement; like those concords mutually proportionate.”

This is merely an analogy to illustrate a point, but the advocates of “Color Music” have construed it to mean that Aristotle believed a definite physical relation existed between the vibrations of light and sound; that each note in the musical scale had a definite color. Science has long since disproved this theory, but “Color Music” still pops out at least once a year as a brand-new idea.

Now we must jump a good many centuries to the year 1719 and the garden of His Chinese Majesty, Emperor K'ang Hsi. It is the fifteenth night of the first month, The Feast of Lanterns, and K'ang Hsi is entertaining guests from far-away Europe. In the darkness of the garden one can just make out the gorgeous

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ceremonial robes; then the Emperor raises his fan and the performance of light begins. Here is an eye-witness account by a French missionary.

"It began by half a dozen of large cylinders, which were suspended from long stakes driven into the earth. These cylinders threw up flames in the air, which rose to the height of twelve feet, and afterward fell down in the form of Golden Rain.

"This spectacle was followed by a large box, filled with different works, and suspended from two posts, or pillars, which threw up a shower of fire, with several lanterns, and sentences written in large characters, and afterwards six-branched candlesticks, that formed pillars with different stories of light, ranged in white and silver-coloured circles, which made the most beautiful appearance, and in a moment converted the night into day. A great number of lanterns and chandeliers were lighted up in an instant.

"The Chinese are acquainted with our Magick Lantern, which they used in this Festival. Perhaps we have borrowed it from them."

A book-filled room in Paris a few years later. Father Louis Bertrand Castel, Jesuit philosopher and mathematician, is poring over page 136 in Isaac Newton's *Opticks*, greatly intrigued by Query fourteen.

"May not the harmony and discord of Colours arise from the proportions of the vibrations propagated through the fibres of the optick Nerves into the Brain, as the harmony and discord of sounds arises from the proportions of the vibrations of the Air? For some Colours are agreeable, as those of Gold and Indico, and others disagree."

Practically what Aristotle wrote in *De Sensu*, reflects Père Castel with a glance at his Harpsichord. Color with sound, music for the eye while the ear listens — color music!

Père Castel rebuilt his harpsichord. The job took several years, but on St. Thomas' Day, December 21st, 1734, the *Clavecin Oculaire*, the world's first color organ, was played in Castel's study in Paris.

Only meager description of this instrument has survived, but it had a musical keyboard of five octaves. When a key was depressed, a colored strip of paper or silk would appear above a black horizontal screen to the rear. The first octave represented the pure hues, the next the same hues "one degree lighter," and the fifth octave the highest values.

Newton had once suggested that C, being the lowest note in the octave, should be red, the lowest vibration in the spectrum.

Castel decided C should be blue because it sounded blue. For the same reason he made F yellow-orange, where Newton had green, and the one choice is fully as justified as the other.

Goethe has stated the case as clearly as anyone. In *Zur Farbenlehre*, 1810, he writes: "Color and Sound do not admit of being compared together in any way. They are like two rivers which spring from the same mountain, but from there on run their courses under totally different conditions, in two totally different regions, so that along the entire course of both no two points can be compared."

Goethe concludes with the statement that color and sound act "in wholly different provinces, in different modes, on different elements, for different senses."

Goethe went unheeded. In the century which followed, color and sound were not only compared together but chained together, and in practically every case the exponent seemed to believe he was the first to conceive of "Color Music."

Among the "rarities" in the P.T. Barnum Museum, at Broadway and Ann Street in New York City, stood a color organ, invented by the American painter, Bainbridge Bishop. It was a more advanced edition of Castel's *Clavecin Oculaire*, but here music and color could be played both together and separately.

The evening of June sixth, 1895, in St. James's Hall, London. A large and select audience has gathered to see the first demonstration of "Colour Music," to be performed on the colour organ invented by Alexander Wallace Rimington, Professor of Fine Arts at Queen's College. There are the Duke of Norfolk, Princess Hohenlohe, Cardinal Vaughan, the painter Alma Tadema, and many other prominent people.

On the stage a large white curtain of heavy silk has been carefully draped in deep folds, and down in the center aisle towers a huge cabinet with an attached organ-keyboard—the colour organ, with its elaborate mechanism and its fourteen arc-lights within.

The distinguished looking young professor delivers a lecture; then the hall is darkened and the strange performance begins.

Wagner's "Rienzi Overture" is played by a small orchestral and accompanied by the colour organ. The draped screen pulsates with changing color; there is no form, only a restless flicker, hue after hue, one for each musical note sounded. As the tempo of the music increases, the accompanying colors succeed one another too rapidly to be caught by the eye, while the ear readily accepts and enjoys the most rapid passage in the music.

The eye seeks an anchorage, a scrap of form to focus on, but none appears. Questions are whispered, heads shaken. Is there really a color for each note? There must be—Rimington is Professor of Art at Queen's. But it hurts my eyes!

The London critics were not kind to Rimington; in other English cities they were even less kind. All commented on the "restless flicker" on the screen, while the music fell smoothly and with clear meaning on the ear. Rimington who, strangely enough, was a painter, realized too late that form is an indispensable factor in a visual art.

On March 20th, 1915, Alexander Scriabine's symphonic poem, *Prometheus*, was performed in New York City. The composition was scored for full orchestra and *Tastiera per Luce*. Modest Altschuler conducted the Russian Symphony Orchestra and the color organ was supplied by one of the large electric companies. Scriabine had never been specific about the visual part of his work. He had suggested that the entire hall be flooded with changing colored light, but the equipment used in Carnegie Hall on this occasion consisted of a small screen on the stage and a number of colored lamps actuated from a musical keyboard. Scriabine's color scale was the strangest of them all. E and B were *Pearly blue, with shimmer of moonshine*, and E flat and B flat *Steely, with the glint of metal*. The performance was not a success.

Isadora Duncan was in the audience. As the last note sounded and the last flicker died on the screen, she turned to her escort. "Well—do you still believe in color music?" and he answered, "Give it time! This is only the wail of a newborn."

The man was Van Dearing Perrine, painter, teacher and member of the National Academy, who had already then made a far more important contribution to the art of light than all the others put together. Perrine had from the beginning rejected all musical analogy theories and experimented with light as an independent aesthetic medium. He built several instruments based on the silent use of form, color and motion, and was one of the first important pioneers in lumia.

During the period 1900 to 1920 there must have been many honest attempts to lay a foundation for an independent art of light, but the obstacles were many. The repeated failures of "color music" demonstrations kept obscuring the issue and prejudicing public and press.

Let us reverse the situation for a moment. If each note has a definite color, then each color must have a definite note. We build a "sound organ" by hooking a photo-electric cell to an amplifier with attached loudspeaker and we "tune" the contraption according to the supposed analogy, so that each color scanned by the cell will produce a note of a certain pitch from the loudspeaker. Even if we succeed in getting deep, basso-profundo rumblings from a Rembrandt and high, plaintive howls from a Picasso, we shall have proved nothing, except that we might have used our time and energy to better advantage.

My own experiments began in May in 1905 in Copenhagen with a cigar box, a small incandescent lamp and some pieces of colored glass. During my studies in Paris the instrument grew to several wooden boxes, a few lenses and a real screen—one of my bedsheets tacked up on the wall. One day I invited my teacher of painting to a demonstration. He scowled, "This is an utter waste of time. With this on your mind you will never learn to paint." Well—I didn't. Eventually I became a singer of folk songs and player of the lute, but only in order to support my experiments with light; I would sing till I had money, experiment till I was broke, then sing some more. In 1914 I was honored with a Royal Command to sing at the English Court. After this the engagements multiplied, but three months later World War One cut career and experiments short; within a week I was in uniform and on my way to camp. Mustered out in 1916, I continued my concert work and experiments in the United States. But no one can serve two masters. In 1919 I gave up my career as a singer to devote all my time to the building of an instrument with which I could materialize something of my fourteen-year-old dream: a silent and independent art of light. Late in 1921 my first real instrument stood ready and I named it Clavilux. The visual compositions came readily enough, they had long been before my inner eye, but I had to learn to play them, develop a technique, and the instrument was not nearly flexible enough.

Finally, on January 10th, 1922, I played my first public performance at the Neighborhood Playhouse in New York City; a tense and wonderful evening.

But it was with fear and trembling I went out to buy the morning papers the

next day. Years on the concert platform had taught me to take nothing for granted. It was quite possible I would have to spend many more years as a wandering troubadour with a crazy idea.

The reviews were far better than I had dared to hope. In general the critics accepted lumia as a new art and made allowances for its youth and my inexperience at the keyboard. Kenneth MacGowan wrote in *The World*: "This is an art for itself, an art of pure color; it holds its audience in the rarest moments of silence that I have known in a playhouse."

Requests for recitals in other cities came pouring in and I found myself riding the crest of an unexpected wave, with only a most inadequate surfboard to hold me up. Much against my wish, the Clavilux was christened "Color-Organ" by public and press, and it became a novelty, a fad, a thing it was smart to see and discuss that season. It also seemed that everybody wanted it for something. A novelty is worth money and much money was dangled before my eyes at a time when it would have come in very handy—I was newly married and our first-born had just arrived. Advertising firms offered me tempting contracts for display and signboard use—Stockings, Chewing Gum, Laxatives, Cigarettes. To this day I shudder when I contemplate the harm I might have inflicted on lumia if I had yielded and sold it into slavery.

For a number of years I played lumia recitals during the winters and improved the equipment during the summers. In 1925 I included Europe, and lumia was well received everywhere.

Upon my return to New York I took stock of the situation. This sudden success, all these glowing comments, was enough to turn anybody's head—but the time had come for a stern and sober evaluation.

It was no longer healthy for lumia to be so closely identified with only one person. Many creative minds should be expressing a variety of ideas through it, many inventive minds should supply better instruments.

Thus began the Art Institute of Light, organized in 1930 as a non-profit center for research in lumia. My patents and research data became the property of the Institute, a supporting membership was built up, and in 1933 a lumia theatre with surrounding studios and laboratories was opened in Grand Central Palace in New York. A program of lectures and recitals was inaugurated and at every opportunity I would invite artists to investigate the new medium and make use of our facilities.

We had quite an influx, but very few artists turned up. To our great disappointment we had to classify most of our applicants into two familiar categories: the Curious, who only wanted to find out how the instruments were constructed, and the Talkers, who only wanted us to listen. Perhaps I should include those who could play the piano and were firmly convinced that, after a few hours of instruction, they would be able to play the Clavilux at least as well as any of us. They lost heart when they found out that lumia is no easier to learn than music. It looked so easy!

But our doors remained open and we kept our eyes peeled for the Real Thing. From time to time our prayers were answered; serious-minded artists came with ideas and preliminary work was done on many compositions.

Meanwhile more and more people became acquainted with lumia through our

recitals and lectures. Art classes from Teachers College, Pratt Institute, and many art schools, came regularly, and the seed sown during those ten seasons will some day bear fruit.

Came World War Two. The Army took over Grand Central Palace for an Induction Center, our staff was called to the colors and I was requested to do a special job for the government, a full-time job which was to last for several years. We had no choice; the Art Institute of Light closed its doors "for the duration."

So much for history. Now for a closer analysis.

An eighth fine art is beginning its life in our generation, a silent visual art, in which the artist's sole medium of expression is light. The new art form has been named lumia.

Like its seven older sisters, lumia is an aesthetic concept, expressed through a physical basis of methods, materials and tools. In a complete definition the two aspects must be stated separately before a composite can yield a clear picture. The aesthetic definition must clarify the artist's conception and intent, the physical one the means he employs in achieving his object.

a: Aesthetic concept: The use of light as an independent art-medium through the silent visual treatment of form, color and motion in dark space with the object of conveying an aesthetic experience to a spectator.

b: Physical basis: The composition, recording and performance of a silent visual sequence in form, color and motion, projected on a flat white screen by means of a light-generating instrument controlled from a keyboard.

The spectator is a necessary factor in the concept: a *materialized vision, beheld by a beholder*. The spectator may be only the artist himself.

We may now fuse imagination and reality. The aesthetic concept is one of form, color and motion evolving in *dark space*, the physical reality is form, color and motion projected on a flat *white screen*.

The lumia artist conceives his idea as a three-dimensional drama unfolding in infinite space.

In order to share his vision with others he must materialize it. This he may do by executing it as a two-dimensional sequence, projected on a flat white screen by means of a specially constructed projection instrument controlled from a keyboard. Seated before the keyboard he may, by manipulation of sliding keys, release white light, mold the light into form, add color and imbue the result with motion and change.

But the original vision—the three-dimensional drama in space—is constantly before him and he strives to add, by optical means, an illusion of the missing third dimension to his flat screen image, and to perform it so convincingly in a spatial way that the screen creates the illusion of a large window opening on infinity, and the spectator imagines he is witnessing a radiant drama in deep space.

Form, color and motion are the three basic factors in lumia—as in all visual experience—and form and motion are the two most important. A lumia artist may compose and perform in black and white only, never using color. The use

of form and color alone—static composition with projected light—constitutes a less important, but still practical field in lumia.

The only two-factor combination that cannot meet the requirements is motion and color, without form. This is because it violates a basic principle in vision. The human eye must have an anchorage, a point to focus on. If a spectator is facing an absolutely formless and unbroken area of color, his two eyes are unable to perform an orientational triangulation and he will quickly seek a visual anchorage elsewhere, an apex for the distance-measuring triangle that has its base between the pupils of his eyes.

The anchorage may be the frame of the projection screen, the head of another spectator, or his own raised hand, but in the process his attention is diverted from the screen simply because it cannot remain there without discomfort.

FORM, THE INTEGRATED MANIFESTATION OF LIGHT

In lumia form is a general and basic visual concept. Form is present on a screen if any part of its surface can be distinguished from the remainder. It therefore embraces the line and the point.

Form has four sub-factors:

LOCATION—Where is it?

VOLUME—How big?

SHAPE—What is it?

CHARACTER—What is there about it?

COLOR, THE FRACTIONAL MANIFESTATION OF LIGHT

In lumia color is an optical phenomenon, non-existent without light.

Color also has four sub-factors.

HUE—What color is it—red, green, blue?

CHROMA—How much gray has been mixed with the pure hue?

VALUE—How much white in that gray?

INTENSITY—How strong is the light it sheds?

In lumia intensity is a necessary fourth factor. In a given combination of hue, chroma and value these three factors may retain the same relation to each other, while being moved into a higher intensity range by increased illumination.

MOTION, THE KINETIC MANIFESTATION OF LIGHT

In lumia the term motion applies to all phenomena in the time dimension. Motion may therefore occur in a static form, with changes in volume, shape, character, hue, chroma, value and intensity.

Like form and color, motion has four sub-factors:

ORBIT—Where is it going?

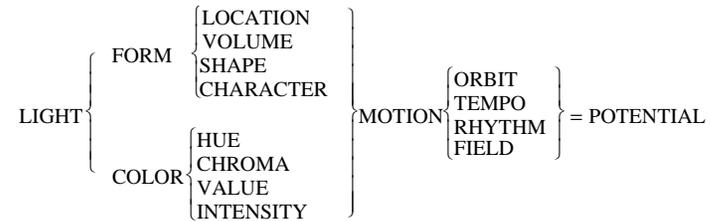
TEMPO—How fast? Speeding up? Slowing down?

RHYTHM—Does it repeat anything?

FIELD—Is it constantly visible, or does any part of its orbit carry it beyond the range of vision?

Lumia's theoretical space-stage is divided into FIRST FIELD: the visible section of space (screen surface), and SECOND FIELD: the remainder of space, not visible to the spectator.

Lumia's twelve sub-factors may be arranged in a graphic equation:



Place this inert potential in a creative artist's hand, supply him with a physical basis—screen, instrument and keyboard—and when his finished composition is performed, the last link in the chain has been forged and you have the eighth fine art, lumia, the art of light, which will open up a new aesthetic realm, as rich in promise as the seven older ones.

In composition and execution the potential range of expression reaches from the purely non-objective to the stark representational; from the diaphanous and amorphous to the solid and sharply outlined; from the very slow to split-second rapidity; from barely perceptible dimness to dazzling brilliance and from the majestic to the grotesque.

In time we shall have lumia virtuosi who can sweep the spectators off their feet with masterly interpretations of a composer's work.

But first the Johann Sebastian Bach of lumia must appear on the scene. Let us hope he is at least a high school student at the moment.

Now for a constructive glance at the future.

What can be done to help and encourage potential pioneer-artists and experimenters in this new medium and thus speed its broader development and acceptance?

First of all: those who have acquired a practical knowledge of lumia must be given opportunities to teach what they know to as many interested students as possible. A comprehensive lumia textbook is now being completed. It is here the progressive art museums, art schools and art organizations may be of real assistance.

Next: an experimental lumia recital hall with adjoining studios and laboratories must be re-established for practical advanced work. For this purpose the Art Institute of Light organization is available with its equipment, research data, library and patents—ready to resume its activities interrupted by the war. At the moment we are planning a new building. It is still just a dream, but so many of our dreams have come true that we work as if an endowment had already been granted us.

Included in the plan is the Hall of Light, a miniature theatre seating about fifty spectators. Open day and night, it will present an uninterrupted per-

formance of selected lumia compositions in utter silence. No admission charge, no questions asked, no philosophy propounded. You may walk in at any hour of day and night and remain as long as you like, to rest your ears and bathe your soul in the slowly evolving sequences of radiant form, pure color and graceful motion.

It is easy to wax poetic on the subject. It is practically impossible to explain lumia convincingly to a person who has never experienced it.

All I can say is that the art of light is here to stay! It has already survived oceans of ridicule and jealousy and it could not have arrived at a time when it was more sorely needed in the world.

Part of the foundation has been laid and seems to rest securely enough. That is about all. The lumia compositions and instruments of today may not even be an indication of what is to come when the first real genius arrives to awaken the Sleeping Beauty.

In a *Primer of Modern Art*, Sheldon Cheney has this to say about lumia: "Here is the beginning, or at least the first serious achievement, of an art as primitive, as complex, as capable of varied emotional beauty as music; and its medium is light—that light which was the earliest god of humankind, which to this day typifies all that is spiritual, joy-bringing and radiant. Perhaps, then, this is the beginning of the greatest, the most spiritual and radiant art of all."

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