

ODORS AND COLOURS

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Abstract

Through the approximation of methods, of various researchers of colors, such as Kandinsky, Itten, and other Greeks such as Dimitrelis, Alexios etc., a correlation of properties and particularities among colors and odors is attempted so that odors incorporating elements of the noting system of colors to be enable, in correlation, to be lead to the creation of a corresponding noting and registration system, so that those can be the subject of Urban design.

The odorant landscape, despite its great importance in the overall construction of the identity of a place, is totally absent from all forms of design while it is rarely, treated in the form of its nuisance by it. This is due to the inability of man to talk about the odors and the lack of a common post language noting and registration system of the odorant landscape. A set namely, of organically connected points or symbols to be used to achieve the communication. The analysis of colors and the identification of common characteristics with odors can lead the latter to a similar treatment.

Keywords: *color, odors, odorant landscape, color analysis noting system*

1. Introduction

The text that follows is partly the distillate of a research conducted at the Laboratory of Urban Design of the School of Architects- Engineers of NTUA, with Joseph Stefanou being the supervisor professor. The survey intends to note and record the odors in order for the odorant landscape to become a tool and subject of Urban Planning.

In order for the odorant landscape to acquire a noting and registration system, an attempt to approach other systems that have already progressed in this area is made. Since color has been analyzed, studied, measured and implemented by great scientists and artists and is part of the daily practice, one could borrow elements of how to approach it so as to respectively study the odors.

The odors present high particularities as far as their analysis and imprinting is concerned. However the chromatology and ways of facing colors may provide common ground for investigation of the odors as well.

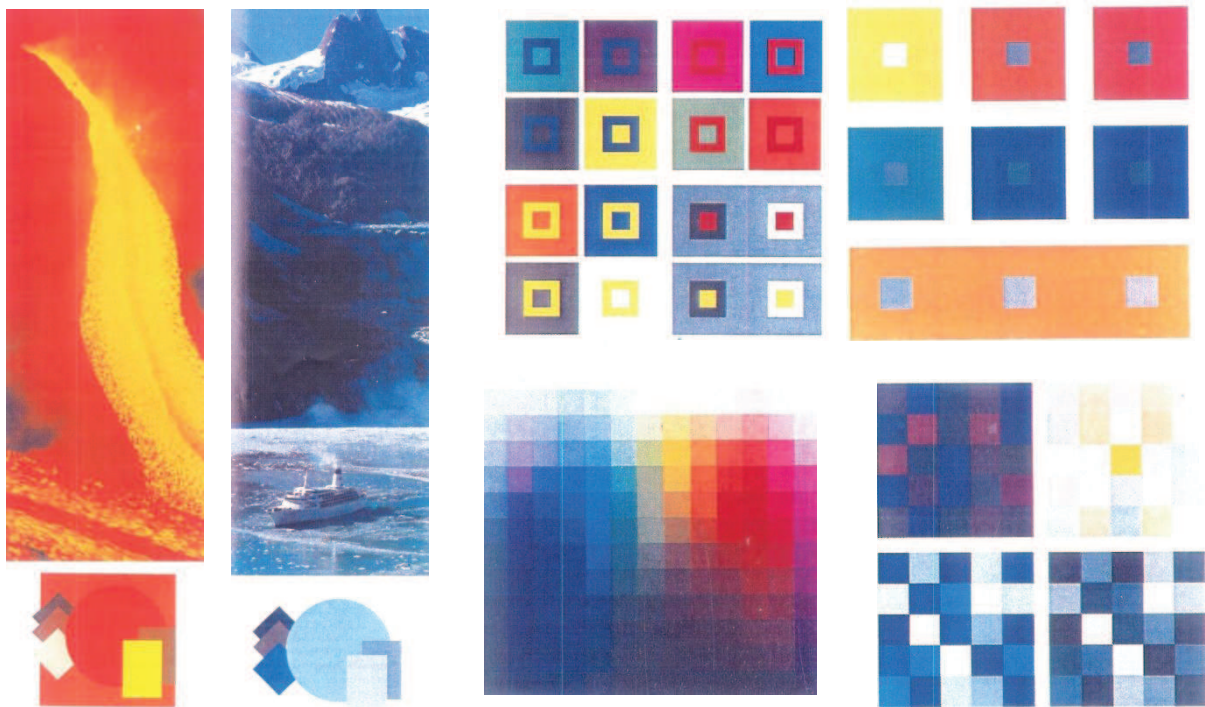
2. Color as a tool

The rich expressiveness of colors as well as their intense psychological dimension is elements found during the investigation of odors. The inwardness of colors, the richness of their inner content but also their associative stimuli, is elements of the odors as well. The colors as well

as the smell are means of exercising direct influences over the soul. Kandinsky¹ says that color is the piano key, the eye is the hammer and **the soul** is a piano with many strings. The same correlation can be made with the odor, but having as a means of stimulating the nose. It would not be therefore unreasonable for someone to attempt **the colored imprinting of odors**. In order to achieve something like that you need to study the importance and value of each color in the way that only great researchers as Kandinsky or Itten have done.

Color as well as odor possesses **emotional and symbolic values**. They have been used as a means of communication, while stimulating all the senses. They have energy, power, and temperature, creating psychological impact, atmosphere, and environment. And while color becomes visible because there is light, the smell due to the presence of air can be sniffed. Like odor color creates the feeling of satisfaction and joy as well. However it creates natural feelings of short duration, according to Kandinsky, which do not leave a lasting impression. This feeling can become a way of life that may disappear after the end of stimulation and return back once memory has recorded it as an element. The psychological effect of the same color causes mental vibration, which is achieved by association.

Color hides tremendous power, which can affect the entire human organism. The bright lemon yellow causes pain in the eye after a period of time, such as the trumpet to the ear. The cinnabar-red attracts and stimulates and is stared to longingly such as the flame and causes mental vibration similar to that of the fire. Red may reach up to a painful torture via its resemblance with the flowing blood. The pale yellow causes acid impression from its connotation with lemon. Such influences and reactions in the human organism aren't also caused by odors?



Speaking of dis-colorization dilution, homogeneity, tone or intensity of a color, one finds that the system of performance of odors has borrowed the terminology of the physical characteristics of the colors or other already known and researched systems such as that of the

¹ Kandinsky Wassily, «For the spiritual in art», ed. Nefeli, Art library, 1981.

sound. Terms like rhythm, harmony, continuity or discontinuity are terms that frequently acquire odorous dimension. The word dis-colorization can easily give a similar meaning for odors with the word deodorization. Besides, according to some researchers¹ colors are categorized based on olfaction since some are fragrant and some not. **The categorization** of colors can be made based on the temperature speaking this way, for cold and warm colors, based on hearing speaking for quiet, sonorous, harmonious and non-colors, based on touch speaking of smooth, soft, tender or hard, based on taste speaking for sour or sweet colors or even based on the emotion that they cause.

So we can talk about balanced, alive, dead, cheerful, oppressive, etc., colors. Studying the views of Kandinsky for colors and art that he has served, one can discern principles that can perfectly serve and interpret the stimuli that the sensory organ of smell receives and decodes. Moreover the energy of both the color and smell Cause transitory irritation of the soul and spirit. He goes on saying that, the result and the energy of every color (or any line) reaches the maximum when "bullets of vision, hearing, touch, etc. are mixed". *It is no coincidence that in each color, Kandinsky finds sound, texture and even taste.* Yellow for example a color he finds annoying, he claims it has the sound of the trumpet, as an element he equates it with the caustic acid and with the centrifugal energy that makes it even more aggressive and penetrating. Contextually he was able to explain their taste, since yellow due to its association with lemon has a sour taste. As for the touch, he spoke about colors that hit strongly in the eye such as green of cobalt and the green-blue oxide. He spoke about colors noticeably as smooth, velvety texture that cause the caress, such as dark ultramarine blue, green of the oxide of chromium, etc. Depending on the pleasant or unpleasant expression he spoke about fragrant colors. As for the hearing, and the association of the color with the sounds, Kandinsky, stated that they would never match yellow with the bass keys of a piano. Saccharin Ounkovski² invented a special precise method "for the copy of music from the colors of nature for the painting of the sounds of nature, for the color visual of sounds and the musical hearing of colors". Scriabin³ empirically, drafted a parallel panel of musical and color sounds.

Moreover, -everybody can see the obvious similarity of odors and their expressive efficiencies - many are **the perceptual factors** such as the environment, personal experiences, or various subconscious factors and many other subjective and non-data-creating sympathies or dislikes for color, as is the case with the odor. Not to mention the chromo therapy used and operated as aromatherapy. The environment is of great importance and plays a significant role both in the perception of odor, and colors. The appropriate background to a color, can make it brighter, to highlight its entire radiation to make it come forward as an anaglyph while it actually is not. In analogy the environment and the conditions in which a perfume is developed, are responsible for the way it becomes perceived. The perfume itself when worn by two different types of people will differently affect as indeed the advertisers of the perfumery industry claim.

The psychological effects of color are obvious in all forms of expression as it also happens with odors as well. Warm colors⁴, such as yellow and orange, stimulate the psyche while cold such as blue and purple help and lead to internal processes. The hot-dark, such as brown and ocher, consolidate irritation and cause commitment, while cold and dark, such as dark blue and gray, remove stimulation and create oppression. Static colors like green, olive green, red, possess the ability to stop the irritation or to complete them and generally act reassuringly. Psychologists have

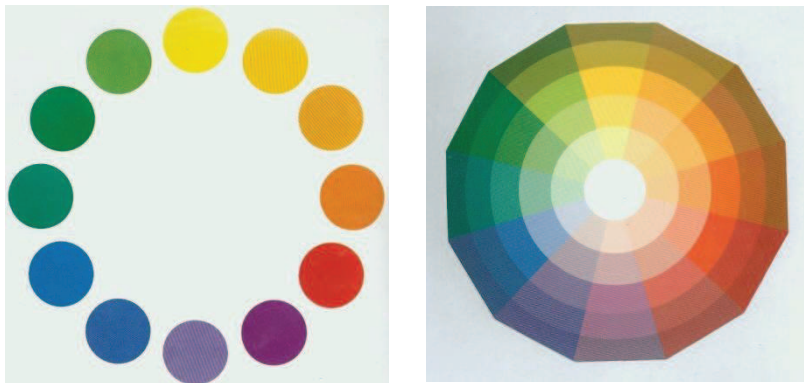
¹ Dimitrelis Dakis-Leonidas, "Color and secrets", ed. Dimitrelis, Thes / niki 1987.

² Saccharin-Ounkovski, wk. Review of "Music", Moscow 1911, No.9

³ Kandinsky Wassily, «For the spiritual in art", ed. Nefeli, Art library, 1981.

⁴ Dimitrelis Dakis-Leonidas, "Color and secrets", ed. Dimitrelis, Thes / niki 1987.

observed that intensely annoying noises are more tolerable in an environment with a green olive or dark brown color. The connection of colors with psychosomatic conditions is so powerful like the one we only encounter in perfumes. Color has the power that affects humans in various ways. Besides he feels and perceives color with all his senses. *Examples of blind people who understand by touching the colors are well known.* According to Kandinsky, everything has a psychological impact when its energy causes pulse of the spirit. The fragrance has sensual type energy that however is of short terms. Colors obey in a plurality of mental and emotional interactions, causing proportionate **impressions**. These impressions may not always be scientifically proven, but are real and true. The impression, for example, to see from nearby the bright colors and from distance the dark apart from natural laws has to do with various mental, cognitive, emotional processes that occur as the sensory organ of vision under specific environmental conditions, etc., perceives the color. Similar is the process of perception that is created by odors.



However, the discovery of the **color circle** provides to the study of colors a very important advantage since its use in a variety of ways may even lead to color compositions based on the principles of balance and harmony. The Circle of Kandinsky moreover provides *pairs of opposites and complementary* while sets off cycle black and white since they lead to infinity, towards different directions. The use of specific perfume creates a particular atmosphere for different areas e.g. a house. Accordingly the selection and use of specific colors, adjacent to the color circle, may establish a relaxing atmosphere while with the addition of a small amount opposing colors, to achieve balance. Instead the use of contrasting colors with different intensity, tone and extent may create a stimulating and buoyant atmosphere.

Similar impressions are created by the warm light colors that come together and make the room smaller and the cold and dark colors make a room look bigger. This process of 'appearances' that many times can be different from that of "being", is widely used in perfumes and especially in perfumery and in the impressions caused by its products. After *all perfumers and experts have created an informal aromatic cycle* where they know which key notes (scents) create the secondary, which, as in the colors are complementary, which neutralize the others, which as neighboring match and in which their composition creates balanced and in harmony results with the existence of symmetric forces and order. The difference between the two cycles is that in the one case it is imprinted, in that helps its visual reading, while in the case of odors it has not been documented and is based mainly on the experience and olfactory ability of experts.

Cooperation between touch and vision is evident in the following table¹ of decorators where could very well be added to a column with corresponding odorous options.

¹ Platon B. Alexiou "The practice of color", ed. IVOS, 1984

STYLE	COLOR CHARACTER	COMPOSITION OF MATERIAL-DRAWINGS
Formality	Blurs , cold neutral	Vertical lines, soft materials
Modernism	tonal contrasts	Straight lines, textural variety
Quiet	neighboring tones, cold colors,	horizontal lines, a few motifs
Vivid	Warm, clear colors	Direct light, rough or glossy texture
Femininity	Pastel, light purple	curves, small motifs
Masculinity	Intense powerful shadows, brown	Vertical lines, rough surfaces

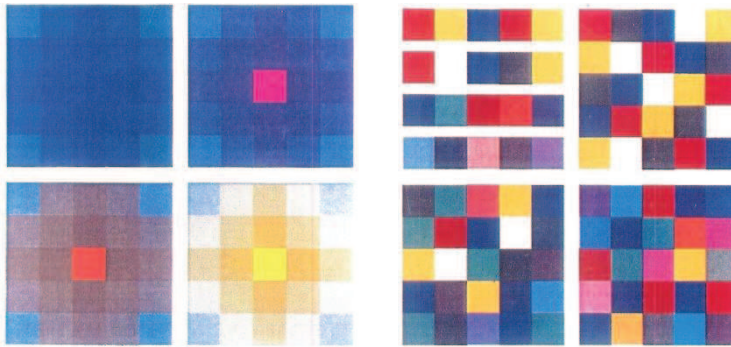
As in odors, so in colors too we have different shades, a term borrowed, concerning the gradual color change from darker to lighter while in the aroma its allay about thickening and dilution. A color can have 3 orientations, the one is shade resulting from its involvement with black, the one of the mix that results in another color and that of the complexion resulting from its mixture with white and so it may result in it. Correspondingly in an odor we can easily realize the direction of mixture with another odor, so that in the end what you smell is another odor.

However, what about **white** and **black**? How are those translated and transformed into odorous realities? According to some researchers white and black are not even colors, according to others there are the most basic on which all others emerge. For Kandinsky white and black colors are self-evident. Especially white is the symbol of the world that is above us. It is a silence that is not dead, but has potential. It is immaculate and expressing joy. A hole that is bottomless. Is the ZERO (0) preceding a new beginning. Black is a silence without future, without hope, the finale of a musical composition. Like a wall that extends to infinity. Exploring the principles and properties of black and white someone could argue that **white is complete ODORLESS**, which is marginal and difficult to even really exist. The presence of air (means of transport of odors) makes it lose its essence. The wind (as light for colors) makes obvious the presence of other odors as well. Like absolute white so does odorless are situations hard to be tolerable by humans. However it operates as a canvas on which odorous compositions harmonious and balanced or not can be embroidered. In the sounds cape, *odorless* can find its correlation with *silence*. In the space of the absolute white, namely the absolute odorless or absolute silence, the minimum unit of light, sound or smell, is planning the first element of the corresponding audio or odor landscape. This 0 to odors is the reference point, the starting point for any odorous reality. The odorless is the result of a smell after successive dilutions until its complete disappearance. Instead, the existence of many scents and in a such great tension where it becomes intolerable and nothing cannot be smelled, not due to the fact that it does not exist but because ultimately the nose hurts, and which in everyday terminology we call **stench, may be the corresponding black**. The mixture of two or several smells that each one separately by itself is pleasant; however their composition is quite malodorous effect, results in the black. One could correspondingly talk about a direction of a shadow line for a perfume whose mixing with black namely with malodorous, causes the outcome of that same into black that is unbearable stench.

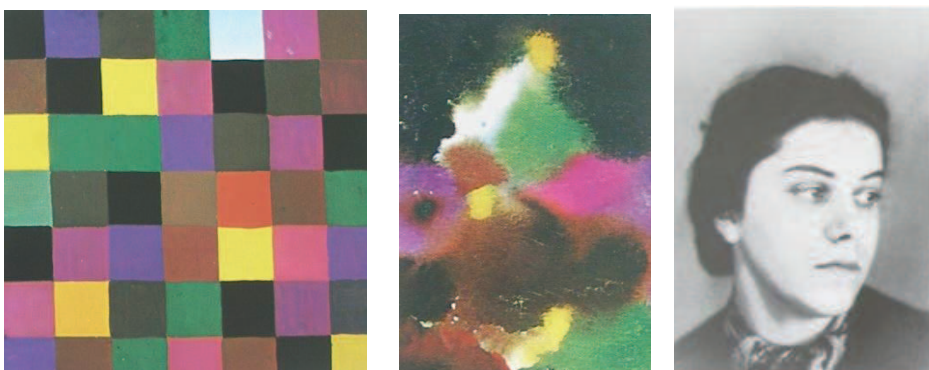
Like **odors**, so **colors are not static in terms of their perception**. For odors it is easy to understand this due to their nature. For the colors it is more difficult since while many of us are witnesses of their frequently unexplained behaviors, few of us delve deeper into the study of these phenomena. The metikeisma ("Merge" that creates a continuous stream of impressions) of the eyes caused by the presence of two complementary colors is the result of an unexplained process that may obey in a law of self-preservation and balancing through the tendency of each color to generate its opposite, where even though it does not really exist, the familiar eye sees it. The eye

asks for a supplementary integration of a given color. A color that we place, for example in a small amount, defend itself and appears brighter than if it was presented in a harmonious quantity. Colors do also provably *interfere with their adjacent ones*. The juxtaposition for example, of two hot colors, makes them get mutually cooler. The opposite happens with the juxtaposition of two cool colors that mutually become warm. The complementary colors cancel each other since their radiations simultaneously irritate the nerves of the optical system. Nonetheless they create harmonious and pleasant contradictions. The placement of gray next to a color makes it brighter. Besides that, gray for Kandinsky expresses inconsolable immobility. It is a sultry color that has neither sound nor movement. The other capacity, for example, of the colors where warm colors give the impression that they are moving forward, while the cold ones recede in depth, although they occupy the same extend area in the same paper, are those elements that enhance the view over mobility, vitality, activation and interdependence of colors, elements and characteristics namely, assigned to odors as well.

The idea therefore of colors as well as of odors is many times a matter of impressions rather than the reality.



Itten's experiments¹ showed that there is an agreement between the color expression of faces according to their radiation and colors of their face that is their **physiognomy**. Through that expression of color, sometimes the physical appearance is displayed, sometimes, the spiritual or intellectual aspect of people. Each person has his own *subjective colors* through which he may express himself, his personality and inclinations or even his profession may be perceived.



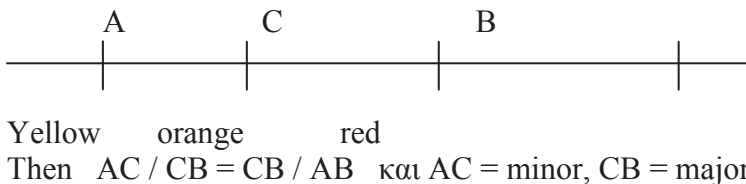
These subjective chromatic harmonies and preferences provide information for the inner side of human. The way he thinks, feels, acts, can be read in detail through these chords. The inner

¹ Johannes Itten, "The Art of color"

temperament and internal structures are mirrored in the colors. According to Itten, colors are born out of refractions and filtrations of the white light of life and through the electromagnetic vibrations of human psychophysical sphere. Kandinsky again said that the harmony of colors should only be based in the axiom of the beneficial approach to the human soul. The personal perfume of everybody corresponds to this analysis.

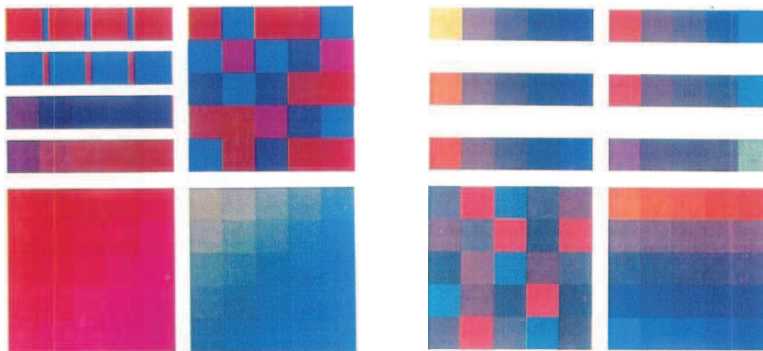
Each human sees feels and judges colors, like perfumes in a very personal manner. The judgment 'pleasant or unpleasant' regarding colors as in perfumes cannot form a valid unit of measurement for a true and accurate assessment of all these. As pointed out by Itten we acquire useful metric rule only if in every judgment we examine each color - or as we would say odor - its position and its relation with the adjacent and its entirety. While the experience is subjective, it leads to objective knowledge. For Itten *while the impression of color is visual and aesthetics, its expression is psychological while its structure is mentally-symbolic*. So as in perfumes, there are colors that touch the soul, or that serve different purposes or that obey in various laws and rules.

Itten was able to **make mathematics** out of the relation of colors with each other, namely to quantify the qualitative data. Dividing the length of a line segment in accordance with the golden section certain proportions and sections of specific properties are arising.



Analyzing great works of art, he proved that the combination and the choice of colors can give the expressive power of the whole project. The chord that is formed by placing colors in a canvas has the same effects as those of a musical composition or a fragrance composition by a perfumer. *The force of contrast, the position, and the directions of colors are elements of the whole composition*. The chromatic chords that are nothing more than the juxtaposition of colors, according to the laws of the relations with each other, which can be used as a basis for color compositions, may be two or more colors that in the color circle meet a common place (e.g. the peaks of square, triangle or other shapes).

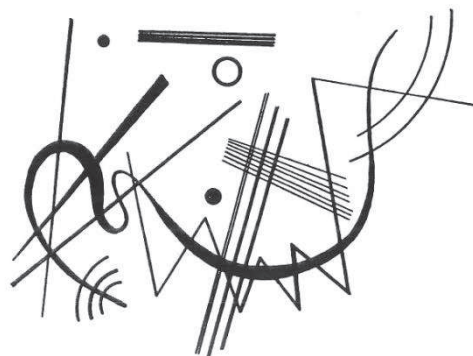
Another way of composition is **the use of mixture proportions quantities through luminous values** firstly recorded by Goethe. So when we want to put in a composition red and blue, this will be done in the ratio 1/2: 1/2 since the brightness value for both colors is 6. Yellow and violet having the values of 9 and 3 respectively will get a ratio 9: 3⇒3: 1⇒3 / 4: 1/4 in order to achieve *a harmonious* result.



The other way of composition is the use of **contrasts**. Same color, light-dark, cold-warm, complementary, qualitative, quantitative relationship of colors, are compositions that can lead to harmonious results. Something that is subjectively judged since disharmony is not strictly defined. It also depends on many factors such as space, material, shape etc. In the corresponding composition of odors, only the perfumery industry can demonstrate similar methods that however are mainly based on experience. The quantification of qualitative data is a desired target that the odorous reality has failed to resolve.

However, the use of colors and of perfumes is not only made for the satisfaction of the **aesthetic necessary**. Its utilitarian purpose at both cases is obvious and the result not only of psycho-spiritual associations that those primarily cause, but also their actual properties. Each scent is recommended by the experts for each space so it brings out its features. In the same manner a particular color is proposed for a butcher for example, green-blue light that makes the meat fresh in appearance while for a pastry shop orange, pink, white and a little black that with psychosomatic effects bring the appetite for dessert are suggested. Orange and red create a warm atmosphere, yellow and black help for concentration green creates a sense of security, while black and white lead. It also has been observed that a deep sound is acoustically balanced in a yellowish space.

All the colors have an innate tendency to move, which may be introverted or extroverted, approaching or moving away from the viewer, depending on their temperature. The color for Kandinsky is so powerful that it can even alter the **shape**, which however has an absolute need to exist, in contrast to the shape that can exist by itself. However when they coexist then they interact each other. According to the visual code that he developed, a yellow triangle is much more different from a green triangle. Besides dark match the curvilinear while the lighter the angular shapes.



W. Kandinsky

The fundamental *principle of the internal necessity* expressed by him dictates the classification of colors in a new visual code where the warmth of colors leads them towards yellow and coldness towards blue. This principle is based on three factors the individual, time and the eternal artistic that provides the value at art and is based on the beneficial approach of the human soul. Furthermore for Kandinsky, a work is a **PROJECT OF ART**, when its creation obeys in the laws of " internal necessity ", is a living being 'encouraged by a spiritual breath.' 'The artwork lives, acts and is able to cause spiritual changes. Art is not a creation without purpose, but a force that serves the development and awareness of the human soul. In this definition matches the judgment of a perfume as artwork, in the way that perfumers but also advertisers for perfumes have highlighted. Besides that, Kandinsky envisaged *merging of the arts*. In abstract art believed in by Kandinsky, instead of having the imprinting of the image of nature, we see a picture of our own relationship with nature. *Subject of knowledge is not really nature, rather than nature that suffered*

the questions of human. The abstract element is identical with a new type of dialogue between man and nature, with a tendency towards abstraction. As he says, " ... *the art work is an autonomous subject, with spiritual breath. It is a being that lives with spiritual fulfillment. The soul and art are in a relationship of mutual influence and perfection. Beauty is measured by the extent of the internal necessity and derives from this. Beauty is what is internally ... beautiful.* " The combination between color and shape, creates a new harmony (in an abstract notion).

This image even though it excludes the object and the third dimension it does not exclude **the space**. Space for Kandinsky can be expressed both with color (which may deepen and proceed) and with shape so that it can be converted to "*a being waving in air*". When Kandinsky analyzes the principles of abstraction in art and the way of its visualization, the capability of expression of odors and odor landscape in general becomes obvious in the same way. In his book " Point, Line, Surface, " he analyzes the way in which linguistic units (color, line, etc.) isolated from traditional expressions, could be able to contribute much in a communication. In the absence of form all these elements of artistic language, acquire the value of clean sounds, without being signified. He considers a duty to find new signified for every linguistic element (perhaps the only way, in my opinion, in which the problem of odor recording can be solved). Kandinsky is not interested in **language** as a product or as a project, but as an activity, as a capability of voice. The artwork is placed between the " sound " and " Silence ". It is an act through which speech is de-crystallized According to Kandinsky¹ "... As an internal vibration raises every spoken word (tree, sky, man), the same thing exactly happens with every virtually represented object. For anybody to be deprived of this possibility, the challenge of a vibration would mean the reduction of his arsenal of means for expression..." The same we would add goes with some elements - items that the word -name and only, it contains an internal odorous vibration that until today with the lack of recording system functions as an expressive means therefore a means of communication. (Garlic, lemon, rose, violet, etc., possess by themselves an odorous identification, even just as words).

The study of Kandinsky over color and form is indicative and may be able to serve as a guide for the use of form and color in an effort of visualization of odor qualities. In such a composition, the relation of color and form is inevitable. While color has to be subjectively defined (since for example there are several red colors) and be defined, form can exist autonomously as space or surface area. Form is very much acting over color. Although abstract although resembles geometric, it has its internal sound and functions as a spiritual being. A triangle, for example (without any further characterization, if acid level, equilateral, etc.) is a being with its own specific perfume, as he characteristically says. " *In relation to other forms this perfume varies acquires consonant variations however still remains essentially unchanged, as the perfume of rose that can ever be confused with that of the violet. The same thing exactly happens with the circle, the square and all other possible forms....* "

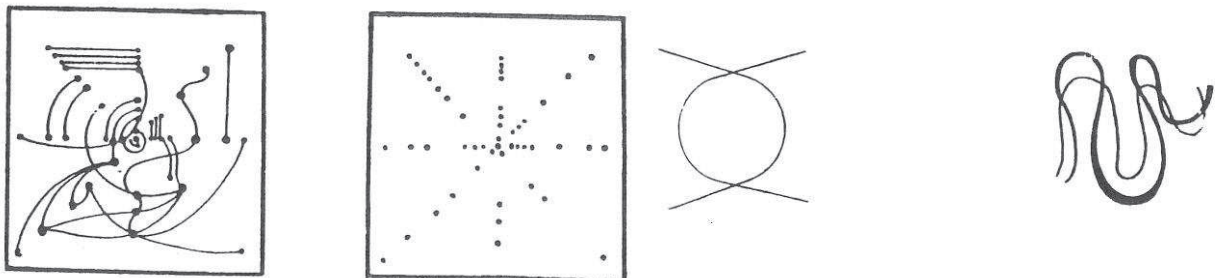
A color can be emphasized or its value may be softened through some kind of form. For example, the penetrating colors sound (-smell, we would add), more strongly in acute form, and that is why yellow fits in a triangle. The colors which tend to deepen enhance this effect with rounded forms. That is why blue fits in the circle. However the combinations that can be made are endless. *In abstract forms* the sole judge, guide and regulator is the sense. In a composition there is nothing absolute. Everything is variable. In the illustration of odorant landscape, the case is that the visual composition of a visual work of art according to the principles of abstract painting. '*... Every form is as sensitive as a bubble of smoke the most imperceptible, minimum displacement of any of its part can substantially alter it ...*' Thus, *the method of abstract painting may be applied to*

¹ Kandinsky Wassily, «For the spiritual in art", ed. Nefeli, Art library, 1981.

the representation of the odorant landscape. Where everything that is irrelevant deducts and the essential still remains, discharged of irrelevant calculations and representations of specific characteristics emerge. The flexibility of the form, the change the direction, the predominance of a form over another, the composition, the juxtaposition the consonance or the resonance, the meeting or prevention, the combination of rhythm and arrhythmic, the combination of abstract or geometric forms, the combination of delimitation, intense or soft, are elements that form purely design 'counterpoint'.

Of the above and the consideration of the basic values of abstract painting, one may come to the conclusion that Kandinsky could perfectly well visualize and in every detail an odorant landscape. However, everyone who would come across that painting, should be connoisseurs of the principles that he set in order to be understood and be led to the same conclusions. But the goal is to develop a methodology, a regulation to be understood by everybody in the same way, free from the concept of art and the expression of the particularity of the artist and will highlight the concept of a scientific approach.

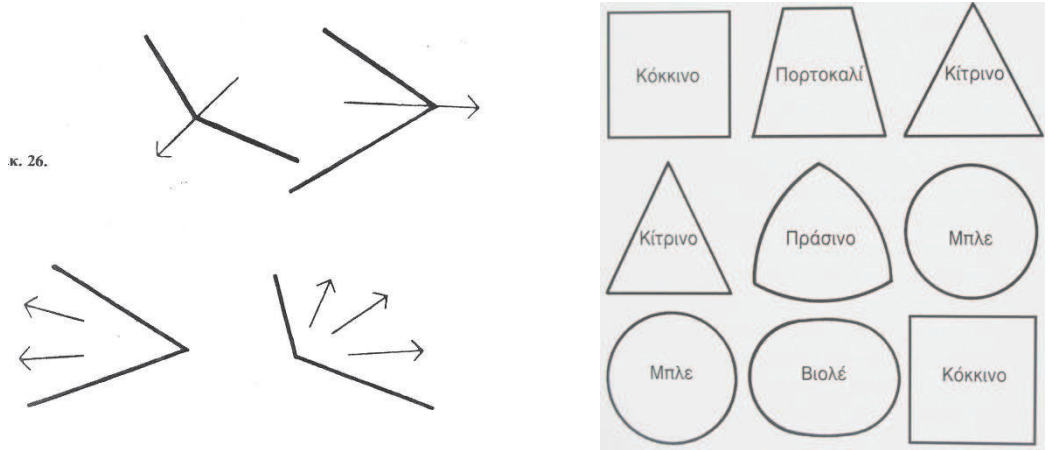
Kandinsky's study over the "point-line - level" is also indicative of a mode of use of the elements and their symbols, in an attempt to construct an odor map. The points and lines acquire another dimension, very useful in order to present qualities that have the need to be visualized like odors do. For Kandinsky, the point is an abstract element, geometrical, intangible and at the same times an autonomous being. A point at the center of a level constitutes the first picture of painting expression, while expressing stagnation. This is zero. It is the latest and unique union of silence and speech. The echo of silence that accompanies the point is so loud that it deafens the other properties. The point begins to live as autonomous being, by internal necessity. It is a small, special and isolated world that stays in its place without any mood for motion, is a well-defined unit. The dimensions and contour of a point is relevant. The first sonority (radiation) of the point varies depending on the dimensions and its shape. Several points may create a composition, which is defined as the necessary internal subjugation of the isolated elements and construction in this particular painting or odorant purpose. The point for Kandinsky is being identified with the sound of percussion instruments. The material is the way in which the elements; points are tied together with the original level which depends on the nature of the background, the nature of the instrument and the nature of the touch.



On the other hand, the line has an internal power that pushes the point in one direction, destroying the concentric volume and creating a new being. A line has potential, intensity and direction. The line is a force that is born out of the point. Rushes in the point and pushes it in any direction. This way the concentric point of pressure is being destroyed. The point disappears and its place is being taken by a new being. The power of the line can even create surfaces, with thickening, with or without a common center. *The horizontal* lines are cold, *the vertical* are warm

while the inclined are cold and warm at the same time. White is expressed with the absolute vertical, while black with the absolute horizontal line. *The curves* and *zigzags* are the result of intervention of two powers simultaneously and respectively alternate.

The lines own character, strength and vitality. A zigzag for example contains the echoes of two straight lines, expressing the vivid, youthful and spontaneous, while a curve carries within the existence of the ephemeral surface. The zigzag angles depending upon the angle they form express a corresponding sonority. The right angle is a cold angle, the acute is considered warm. An obtuse angle is tilted toward the tensions; unlike the acute angle has the tendency of sprawl level. The acute angle of 30 degrees corresponds to the energetic warm yellow. As the angle increases loses strength and warmth of color to which it corresponds. When the lines, zigzags and straight lines intersect one another, then the point receives not two but additional thrusts, alternating angles and differentiating the lengths. The angle is considered by Kandinsky's study as new and spontaneous, while the bow expresses the maturity and conscious power.



3. Matches

Many researchers in the past have talked about the relation of various arts and their expressions. In the context of the relationship of the arts that Souriau¹ raised, common ground, properties, qualities may be discovered, each of which can be expressed through the other. However on the comparability of basic odors with the colors, it is necessary to study colors themselves as well as the symbolisms they contain. Visualization via the various quality color concepts, symbolisms, expressions, conditions and metaphors, which even verbally is hard to be described presents a particular interest for the relevant addressing of the odors.

More specifically:

Yellow is considered the eminently bright color. Although it is considered a cheerful color, is better suited to situations of anguish and hatred because it encloses an aggressive mood. It is a bright and clear color. For Itten² it symbolizes the purification of matter, through the power of light. It is untouchable, radiant like pure oscillation. It corresponds in the triangle where acute angles have a militant and aggressive character. It highlights the triangle as a symbol of THOUGHT. Related shapes are a rhombus and trapezium. According to Dimitrelis³ it resembles

¹ Souriau Etienne, " La correspondance des arts' ", ed. Flammarion, Science de l' home, Paris 1969.

² Johannes Itten, "The Art of color"

³ Leonidas -Dakis Dimitrelis, " Color and Secrets ", ed. Dimitrelis, Thes / niki 1987.

with the light that wants to escape from its frames. Yellow causes distraction even from great distance. It is a source of life and joy and helps for the awareness of the approaching danger. It gives the impression of freedom, of the disembodied and of merriment. It encourages the spirit and promotes energy, while in large quantities acts irritant. According to Franz Marc, yellow is conventional, feminine and comforting, while according to Goethe, it expresses the alluring power of the sun. Kandinsky considers yellow as particularly annoying, aggressive and penetrating color. As an element it coincides to the properties of caustic acid. The energy of yellow is centrifugal. The shape that expresses yellow is the energetic triangle and the straight line. As an eminently warm color, it tends to go toward the viewer. Its dimension is physical, while its power is centered. Yellow stimulates and excites people and has great power. Its inclination is toward light tones. Kandinsky identifies yellow with the shrill sound of the trumpet or the high sound of fanfare. It's an earthy color. It does not deepen and is youthful and cheerful. As a statement is a color representing paranoia.

Red although it is considered as a warm color, it stimulates and causes tension so it fits with war and violence. For Itten symbolizes strength. It corresponds in the square which is a symbol of matter, gravity and strict limitation. Related shapes are the cross, the rectangle, the meander. The weight and density of the red fits the heavy shape of a square. It symbolizes MATTER. According to Dimitrelis, the shape of red is the triangle which symbolizes movement and tendency towards up. Red represents strength and rebelliousness. Although heavy it poses vitality and vigor. It symbolizes the grand and formal, while it is the color of love and passion. It's festive and is serious, playful and cheery. It is the color of power and justice. According to Franz Marc, that expresses the brutality that must be combated. For Kandinsky red color is attractive and expresses the flame. It also expresses the power that is aware of the target. As a color, with several degrees, it has many symbolic and psychological consequences. The red cinnabar expresses passion and matches with the sound of the trombone. The bright red expresses the desire and matches with the sound of the violin. The red-orange expresses the sound of the bell. Generally, red is considered a warm color; however it is lively and restless. It is variable, while it expresses feelings of strength, of energy, intense activity, determination, joy and triumph. It is identified with the sound of fanfare. It expresses the mobility in dynamism however is still. Finally for Kandinsky red corresponds to the square.

Blue is considered to be a cold color. It is cool while calm and reassuring. According to Itten, it is the color that drifts the mind to the vibrations of the infinite. Its shape is the cycle, while it causes relaxation and a sense of continuous in motion. Related shapes are the elliptical the curved line, the semicircle. It is the symbol of the spirit, moving within its unity, symbolizes THE MOVING SPIRIT. With the circle, as shape of the blue agrees Dimitrelis as well, considers the figure as cumulative, cold, wet, and transparent. Blue has pronounced personality however in order to grab attention it should be bright and in a large surface area. Generally it removes and takes away the thoughts. It urges in daydreaming while is considered dynamic and youthful. It has inner strength, is dark, eerie and deep. Franz Marc also considers it serious and spiritual while Goethe believes that it symbolizes the negative, passive moon. Kandinsky¹ gives as well special symbolism in this color. He considers it a heavenly color that exerts a calming energy. It matches the blue with the sound of the flute, while in the darker matches the cello and double bass in the darker depending. The energy of blue is centripetal. Blue is a cold color. It tends to be removed by the viewer. Its dimension is primarily spiritual, while its power is concentric. It has the ability to soothe, to cause

¹ Kandinsky Wassily, «For the spiritual in art", ed. Nefeli, Art library, 1981.

Vasilara Arhontoula (2010), "Note and record the odor landscape", NTUA, School of Architecture Engineering, Department of Urban Planning.

nostalgia and sadness. Tends towards infinity and is situated above the senses. The innate inclination is towards dark tones. The light blue is identified with the lumen, the dark with a cello, and the darker to the bass. The shape that Kandinsky gives to the blue is the passive circle and the curved line.

Orange causes heat, however it irritates the psychism. It symbolizes the pride and outdoor luxury. According to Itten since the orange results from the union of yellow and red, namely the circle and the triangle, the resulting shape, and thus the color representing orange is the trapezium. According to Dimitrelis the shape of orange is rectangle he considers dry, warm and forced moving. It unites the apparent vitality of red with the transparency of yellow. It draws attention, is warm and cheerful, while symbolizes maturity in nature. For Kandinsky orange exudes a healthy sense. It is also a warm color that approaches. It is identified with the sound of a church's middle bell, while to what yellow prevails, it remind the sound of an old violin.

Purple incorporates the sense of dignity and office. According to Itten it shows devotion and dismal superstition, while its shape is the ellipse, since purple, results from the union of blue and red that is the circle and the square. Dimitrelis agrees to that as official figure and heavy. He also considers it to be a feminine color. Franz Marc considers it the color of sadness. Violet for Kandinsky has the sound of the bassoon. It also has the tendency to move away, while it is also a spiritual color and sad. Fits well with the sound of the English horn and flute depending on the tone and whether it contains more blue or red.

Green color reassures and calms However, it is easy to bring the monotony For Itten it symbolizes knowledge and faith. Its shape is spherical triangle since it results from the union of yellow and blue namely the triangle and the circle. Dimitrelis affix to green, the hexagon, considering its relationship with nature, as great color that dominates it expresses the average contrast of dark and light and the perfect balance between the disembodied yellow and deep blue. It is a light color that soothes the eye. It creates feelings of joy, wellness, hope, confidence and gives a sense of the whole. It is also lighthearted and mild. Kandinsky as a mixture of yellow and blue considers green neutral, passive, pleased with itself, bourgeois. When the blue predominates it becomes thoughtful. Although a dull color, it expresses the balance, tranquility, and absence of motion.

However it is not just colors that can contribute in the matching of odors with them. Aristotle said that simple colors are the characteristic colors of elements that are fire, air, water, land. These were created of an alloy of darkness and fire. Yellow was created from light, blue from dark. In a search effort associations and correlation between elements offering other stimuli, visual, auditory, taste, etc., as well as other sciences, such as mathematics, physics or astronomy, history, became the following training approach of a correlation table. Besides, for example, if a lighter shade of color is associated with a particular **odor**, the color can be the result of an accurate mathematical approach, mixing and calculations can visualize the smell.

Table of Correspondence								COMMENTS
Numbers	1	2	3	4	5	6	7	
Iris	red	orange	yellow	green	blue	blue deep	violet	
Notes	do	Re	mi	fa	sol	la	si	Newton 1676
Waves	long	middle	short	
Elements	fire		earth	water	air			Leonardo da Vinci: white⇒light, black⇒dark
Shape	rectangular	trapezium	triangle	spherical triangle	circle		ellipse	Itten
Prism	cube		pyramid	cone	sphere			
Wave length	0,8-0,65	0,64-0,59	0,58-0,55	0,53-0,49	0,48-0,46	0,45-0,44	0,43-0,39	
vibration frequency (x10 ^{στην 9})	400-470	470-520	520-590	590-650	650-700	700-760	760-800	Itten: the ratio of the vibration from red to violet is 1: 2, Therefore this octave
Radiation	6	8	9	6	4		3	Goethe: The light values: power radiation detectors, brightness
Time		autumn	summer	spring	winter			Dimitrelis: June = bright yellow prevails, hot, December = dark blue, cold
Sound of musical instrument	violin	bell	trumbet		flute	- violonts e	φαγκότο	Kandinsky
angle (in degrees)	90	60			150		120	Kandinsky: the black horizontal line corresponds to 180 degrees.
Emotion	stimulation	pride	hate	hope	calmness	nuisance	sorrow	
Basic odor	petiole	pungent	acrid	floreal	ethereal	resinous	disgusting	Amur Stereochemical theory

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