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COLOUR IS A FORM OF TRANSPORTATION[1]
Notes on the Reality and Unreality of Colour

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1. This title is a theme, not a thesis.

Do not believe that you have the concept of colour within you because you look at a coloured object-however you look. (Any more than you possess the concept of a negative number by having debts.)
"If humans were not in general agreed about the colours of things, if undetermined cases were not exceptional, then our concept of colour could not exist." No:- our concept *would* not exist.[2]

2. L. WITTGENSTEIN, *Zettel*, ed. G.E.M. ANSCOMBE and G.H. von WRIGHT, Berkeley: University of California Press, 1967, pp. 61e (332), 64e (351).

The world in colour is not the same as the world in black and white. There is no objective correlation between the facts of the physical world and the effect of colour on our perception of these facts. In an achromatic(tonal) world, physical facts would be reciprocally related to our perception of them. Colour complicates the issue. Architecture has developed in the twentieth century with minimal regard to colour. I suspect this is because of the high resistance that colour has to mathematics, and mathematics has an ascendant role in much new architecture. Le Corbusier has had a great effect on architecture, and his book "The Modulor"[3] speaks of some simple mathematics and the "human scale" at length but generally seems to ignore colour. This is notable because he did not ignore colour in his buildings. There probably cannot be a "Modulor" for colour, but this does not mean that it is not of significance to architecture or the human scale. Much has been written on "personal space" recently and again the colour factor seems to be treated like weather is treated in architecture. Our relationships with landscape, buildings and people are bound up with colour and all its properties.

3. Le CORBUSIER, *The Modulor*, London: Faber Editions, (1951).

Everything is coloured.
Most of us dream, most of the time, in black and white.

Colour seems to be an unconscious rather than subconscious aspect of our perception. Colour perception has been the subject of spontaneous debate and much speculation throughout history. What we call"Colour Theory" today is a confused, conglomerate, inchoate, and internally self-contradictory body of data which suffers from being a delta of many disciplines. This is not to say that progress is not being made in many areas, but rather that this progress is disparate and does not contribute to field growth. The problem has been aggravated in recent years by the impact of technology on the

use of colour in film and television, reprographics, communications, consumerism, building materials and paints, and all the products and media that constitute environment. The subject is an expanding one trying to keep pace with the living phenomenon.

Colour is an incidental aspect of environment, each phenomenon having a generic and specific colour recognition pattern. New or peculiar forms are quickly assimilated. Bright green sun-sets or lavender horses are variations on existing configurations which would take a surprisingly short time to be generally accepted ...to become normal. Since the beginning of the last sentence when the concepts of green sun-set and a lavender horse were introduced, these images have begun to be processed and I suggest that to a certain extent (depending upon the individual, you!) are now more acceptable than just a few seconds previous.
One colour amazement threshold is minimal.

Colour is a variform contextural space/light phenomenon. It can be characterized in one aspect as similar to solid/space, sound/silence relationships in that it is a part of a unified process. This process has distinct features which catch our attention, but we must remember that distinction is not separation. Colour exists in a moving life pattern, every aspect is interrelated and interdependent. In the Gestalt theory of perception this is known as the figure/ground relationship, i.e. no figure is ever perceived except in relation to a background (background meaning the entire fabric of existence).

Seeing and Believing

The right Hemisphere of the brain is the one that deals with non-verbal and spatial ideas, performing with a synthetic spatio-perceptual and mechanical kind of information processing that cannot yet be simulated by computers. "Within the brain we pass conceptually in a single continuum from subnuclear particles, to molecules, to cells, to cerebral processes with consciousness."[4] This inductive process and function of the brain is active perception, the transformation of sense data into consicous awareness. Visual sense data is harvested by the eye, the fundamental contributor to our perception. This profound apparatus has a lens system through which light is admitted to the retina where receptors, shaped like rods, and cones receive the images. The cones are sensitive to colour while the rods, although more light sensitive than cones, cannot convey colour sensation. How these rods and cones actually perform their functions is essentially unknown. Interesting research is being done with colour-blind subjects and there is progress being made, but coloured vision remains a mystery. Colour is a sensation caused in the eye by light, another mystery, the nature of which has been conjectured throughout the history of science. Two main ideas persist to describe the composition of light : one is that it is composed of waves; and the other that it is composed of tiny particles or corpuscles.[5] The current view is that under certain conditions light behaves as if it were a series of waves, while under other conditions it acts as if it were a stream of corpuscles.

Artists and scholars have written on the aesthetic and expressive aspects of colour. Emil Nolde was a painter with a deep involvement in colour. "Colours, the mathematics of the painter; colours in their own lives, weeping and laughing, dream and

4. R.W. SPERRY, Left Brain, Right Brain, *Saturday Review*, August 9, 1975, pp.30-33.

5. Light is a form of radiant energy (travelling at a velocity of 186,000 miles per second) which makes it possible to see color.

bliss, hot and sacred, like love songs and the erotic, like songs and glorious chorals! Colours in vibration, pealing like silver bells, and clanging like bronze bells, proclaiming happiness, passion and love, soul, blood and death."[6]

6. PROTTER, *Painters on Painting*, New York: Grosset and Dunlap, 1963, p. 179.

A very personal interpretation of colour perception mediated through art. This personalization or abstraction of colour develops naturally out of the painter's intimacy and familiarity with his means of expression. Indeed everyone who *loves abstraction is happy in the land of hues, chromatic* gradations, tints and shades, harmonies, contrasts, intensities, complements and clashes. Twentieth century art has reached a point where colour can be the material, form, and content of painting. Colour is the subject matter (the expression of itself in its own terms) and the aesthetic motive of much new art. In the same spirit as Nolde, Max Ernst, the old man of modern art, wrote early in his career:

> Blue recedes toward the total death of space, black of the cold moon, the dead moon. On the earth the sea of a vanishing blue and the desert yellow with labor are dividing. Blue and yellow are the first apparitions in colour of the coloured totalities of darkness and light, the measureless sphere of the firmament and the finite sphere of the earth, the first formation of the primary colours, blue and yellow. Then the blue and yellow wedding became possible: green, plant, growth multiplied. The sea and sky continued to be the symbol of the mind, finality the symbol of man. The first prayer of the plants *as marriage.* [7]

7. M. ERNST, "Von Werden der Farbe", *Der Sturm*, vol. VIII, no. 5, August 1917, pp. 66-68.

These writings, and the many like them, are an attempt to relate a deeply felt significance found in colour. Poets and writers have a tradition of exploiting the infinite reserves of colour associations. Not everyone has been as recondite and astute as Ernst in employing colour symbolically, but the point is that this metaphorical property of colour is widely recognized.

Colour is a Shaggy-dog Story

In Plato's "Theatetus" the question is asked, "Are you quite certain that the several colours appear to a dog or to any animal whatever as they appear to you?...or that anything appears the same to you as to another man?" This is an expression of what philosophers call "the problem of other minds." It is significant to the subject of colour that it is here used to set the problem: colour in its inconclusive subjective form.

Ludwig Wittgenstein also liked to utilize the evanescent nature of colour, he made numerous references to it throughout his writings. Here is an informative example wherein he uses an aspecet of colour in a proof of one of his philosophical remarks:

Just as the only necessity that exists is "logical necessity", so too the only impossibility that exists is "logical impossibility."

For example, the simultaneous presence of two colours at the same place in the visual field is impossible, in fact logically impossible, since it is ruled out by the logical structure of colour.

Let us think how this contradiction appears in physics: more or less as follows- a particle cannot have two velocities at the same time; that is to say, particles

that are in different places at the same time cannot be identical. (It is clear that the logical product of two elementary propositions can neither be a tautology nor a contradiction. The statement that a point in the visual field has two different colours at the same time is a contradiction.)[8]

8. L. WITTGENSTEIN, *Tractatus Logico-Philosophicus*, tr. by D.F. PEARS and B.F. GUINNESS, London: Routledge and Kegan Paul, p. 145 (6.375, 6.3751).

Interesting to note, Wittgenstein also wrote at length on the above mentioned problem of "other minds".

High Colour

The use of drugs has always been an impetus for colour expression. Aldous Huxley, a writer who experimented with mescalin, wrote a drug culture classic called, *The Doors of Perception*. In the book he vividly relates his experiences and writes: "Mescalin raises all colours to a higher power and makes the percipient aware of innumerable fine shades of difference, to which, at ordinary times, he is completely blind."[9] In recent years the use of brilliant colours has been identified with the drug culture. Since the Beatles, popular music has had drug experiences and drug society for subject matter. The discotheque started as an ersatz drug experience. The use of bright "day-glo" colours and vibrating lights was an attempt to recreate(or be super conducive to) the intensity of being "high".

9. A. HUXLEY, *The Doors of Perception*, New York: Harper and Row, Perennial Library, 1970, p. 27.
"If the doors of perception were cleansed every thing would appear to man as it is, infinite." William Blake.

Discotheques have become a total environment convention (one of the very few successful ones), a type of night/light architecture that is now found all over the world. It would be interesting to study the effect it has had on the traditional colour and space awarenesses of the last generation.

Stretching much further back than recent years the oriental religions and cults had a tradition of colour symbology which was revived by the drug culture and was in many ways supportive of it. However incompatible drugs and religion, there exists an affinity between them. Both insist upon and try to demonstrate the superficiality of our ordinary perceptions. Both speak of another reality, and in terms of colour perception, a more intense reality.

Aldous Huxley describes bright colours(in a later analysis of his drug experiences) as being properties of the world of mystical experience. He insists throughout his writing that there is a greater significance or dimension to all our perceptions. In the service of this idea his speculations stress the deeper possibilities inherent in our conventional perceptional attitudes. "Bright pure colours are characteristic of the Other World. Consequently works of art painted in bright, pure colours are capable, in suitable circumstances, of transporting the beholders' mind in the direction of its antipodes. Bright pure colours are of the essence, not of beauty in general, but only of a special kind of beauty, the visionary."[10]

10. A. HUXLEY, *Heaven and Hell*, New York: Harper and Row, 1970, p. 27.

Semyon Davidovich Kirlian, a Russian scientist, has developed a type of photography using high frequency electrical fields. "Kirlian"[11] photography of people(and plants) shows a coloured field of energy around the body which could be called an aura. The research being conducted with these photographs is to determine how and if they can be used for diagnosing illnesses. The implication of this is that we are luminous beings that radiate coloured light. This would be in some agreement with most mystical teachings.

11. S. OSTRANDER and L. SCHROEDER, *Psychic Discoveries Behind the Iron Curtain*, London : Bantam Books, 1971, pp. 200-213.

Spaced Space

"Metaphysics raises the doubt, whether space is actually extended and we, together with "Things", are contained in it; whether-just the reverse- the whole spatial world is not rather only a form of intuition in us."[12] Space is a fundamental issue in the discussion of colour. The distance/space, time/space, colour/space relationships are inextricably combined in visual perception. "Form" is a perceived configuration composed of these circumstances ("form" in painting is a construction/ reconstruction of this configuration in plastic terms, i.e. plastic in the painterly sense). The intuitions of the spatial world are the inspired responses felt as a result of creative perception. The quality and intensity of our perception determines our conception of space. "Most people think...that space is 'just nothing' unless it happens to be filled with air. They are therefore puzzled when the artists or architects speak of the types and properties of space, and more so when astronomers and physicists speak of curved space, extending space, finite space, or the influence of space on light or on stars."[13]

12. W. DEMBER, *Visual Perception, the Nineteenth Century*. New York, London: John Wiley, 1964, p. 131.

13. A. WATTS, *The Book*, New York: Pantheon Books, 1966, p. 24.

Our tendency is to dispute our perception and through an act of will(unconscious) transcend ourselves, and the image, into a "picture" that is acceptable and abstract. "The visual field is simply the pictorial mode of visual perception, and it depends in the last analysis not on conditions of stimulation but on conditions of attitude. The visual field is the product of the chronic habit of civilized men of seeing the world as a picture...So far from being the basis, it is a kind of *alternative* to ordinary perception."[14] The attitudes necessary for "ordinary perception" in the "visual world" would be those attitudes which consciously disrupted our picture making tendency.

14. J.J. GIBSON, "The Visual Field and the Visual World", *Psychological Review*, v. 59, 1952, pp. 148-151.

Transportation

The only thing that is definite, is change. The concept of "expanding space" leads one to some interesting inferences. The quality of space around the sharp point of a fish hook contrasted with the space around a baby's bottom leads one to think of space in a dynamic relationship with matter. This dynamic of space(expanding or not) acting as an energy, acts in a similar way on colour. Colour is transmitted through space by light. During transmission, space acts upon colour so that what we perceive is the flux of interaction. Architecture and some sculpture make use of this inter-face of space and solid mediated by light and colour.
Flux is the real dynamic of perception.
From the moist surface of the eye to the surface of the configuration which our attention is focused is a moving energy field which physically involves us. In fact the surface of the eye is an arbitrary point of reference because we and our perceptions are an undifferentiated part of that continuum. In the deliberate(willful) apprehension of colour we make unavoidable readjustments of spatial sense, corrections. Colour has properties that influence these adjustments: a bright red flag appears closer to us than it actually is (especially if seen against a large blue background, like the sky) and each colour configures in its own way, in its own context. In advertising, red has what is called a high reader notation, in fact the highest. This refers to the fact that red will be noticed before any other colour in the same or similar context.G.K. Chesterton had this to say about red:

"Red is the most joyful and dreadful thing in the physical universe; it is the fiercest note, it is the highest light, it is the place where the walls of this world of ours wear the thinnest and something beyond burns through."

Synesthesia

Synesthesia is an unusual perceptional ability of certain people to experience sounds as colours, or tastes. Information from one sensory department crosses to another and combines to form a hybrid sensation. This vividly perceived association is now the the subject of research and scientific investigation. There are many permutations possible among the five senses,but the most common varieties are coloured hearing and coloured taste. Arthur Rimbaud wrote in "Une saison en enfer"...I invented the colours of the vowels! - A black, E white, I red, O blue, U green- I made rules for the form and movement of each consonant, and, with instinctive rhythms, I flattered myself that I had created a poetic language accessible, some day, to all the senses. I reserved translation rights."[15]

15. A. RIMBAUD, *Rimbaud*, tr. O. BERNARD, Harmondsworth: Penguin Books, 1969, (1962), p. 327.

Rimbaud was a synesthete, and it is possible that, "Everyone is capable of synesthesia. In fact, most people may learn not to be synesthetic as they grow up." If music suggests colours, if certain letters or words are immediately associated with colours, or if any sensation evokes a parallel association in any of the other senses, this is synesthesia. There are resemblances here to drug experiences and the fact..."That drugs can induce synesthesia in individuals who never display it normally suggests that most people have the potential to experience synesthetic perception".[16]

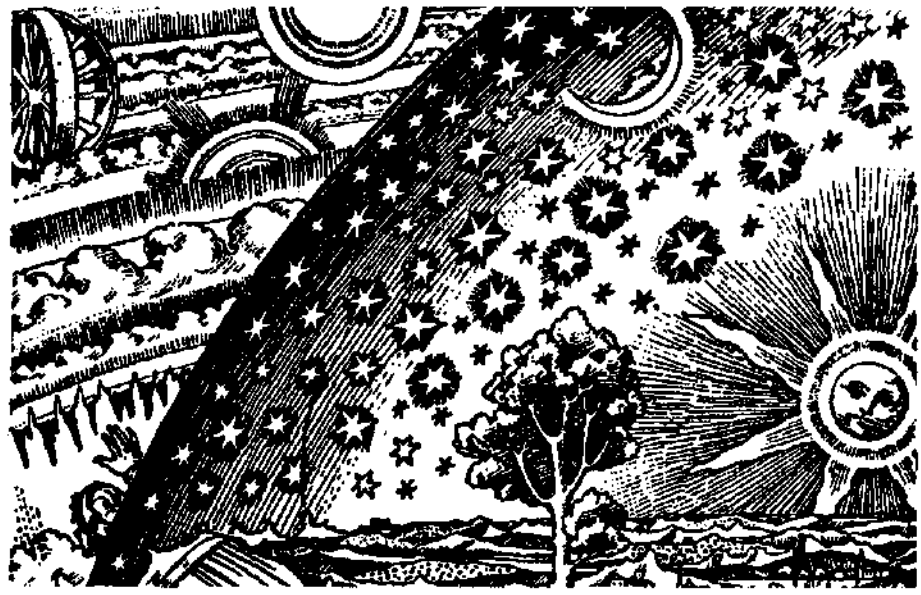
16. L.E. MARKS, "Synesthesia: The Lucky People with Mixed up Senses", *Psychology Today*, v.9, n.1, 1975, pp. 50-55.

Seeing Colour in Colour

The The Navajo and Pueblo Indians of Arizona and New Mexico in north America traditionally assigned colours to compass directions, and also to "up" and "down". This was true for the Cherokee Indians too, who also used colours to presage the future. Red-stop, green-go are among the more exciting colour symbols of the twentieth century. Pink for girls and powder blue for boys is another striking example: our symbology tends towards monochrome and black and white. What we normally see is colouration, not colour.

The cultural pattern which the American Indians related to contrasts sharply with the present urban cultural patterns. The city has reduced contact possibilities with the abstractions of nature, and urban living has produced its own abstractions. These new conditions which are evolving pose new perceptual problems and demand new solutions. Traditionally, the role of the artist or shaman has been to discover and describe new solutions which go through a selection process and become part of the cultural configuration. This role of the artist has been radically changed. The response of each individual in his own context, is recognized as more fundamental than the artist's recorded response. The artist now creates environments as opposed to responses to environment, which in turn create responses, inter-reactions, and all the permutations that creative action and creative response engender.

Colour perception is a personal responsibility. Artists no longer explain it to us in pictures, our own creativity in viewing the environment removes the need of explanations. Colour is a form of transportation.



RENKLERİN GERÇEKLİĞİ VE "GERÇEK-ALTI" OLUŞLARI ÜSTÜNE BAZI NOTLAR

ÖZET

Bu yazıda "Renk Kuramının" birbiri ile tutarsız bazı yaklaşımları gözden geçirilmektedir. İncelenen yaklaşımlarda renk algılamasının insan bilincinin temel bir kesimi olduğu kabul edilmekle birlikte, fazlasıyla "kendiliğinden"ve desteksiz olduğu belirtilmektedir.

Bu yazı renk algılamasının iyi betimlenmemiş ve"kendiliğinden" renk kavramlarımızın da yetersiz oluşlarını dikkati çekmektedir. Sanatçılar, yazarlar, felsefeciler ve bilim adamlarının, kişi veya topluluk olarak renk anlayışları açıklanmakta ve yazar geçmişin veya günümüzün renk karşısındaki tutumlarını incelemektedir. Yazar çağrışımlar yoluyla bu derinlikli algılama yeteneği konusunda okurda yeni bilinçlenme istekleri uyandırmayı ummaktadır.

BIBLIOGRAPHY

GOMBRICH, E.H. *Art and Illusion.* New York: Pantheon Books, 1960.

HAMILTON, W.J. III, *Life's Colour Code.* New York: McGraw-Hill, 1973.

KEPES, G.,ed., *Sign, Image and Symbol.* London: Studio Vista, 1966.

LIPPARD, L.R. ed., *Six Years: The Dematerialisation of the Art Object.* New York:Praeger, 1973.

LORENZ, K. *On Aggression.* New York: Harcourt, Brace and World, Inc., 1967.

MORICK, H., ed., *Wittgenstein and the Problem of Other Minds.* New York: McGraw-Hill, 1967.

NEUMANN, E. *Art and the Creative Unconscious.* New York: Pantheon Books, 1959.

SLOANE, P. *Colour: Basic Principles and the New Directions.* London: Studio Vista, 1967.

TILGHMAN, B.R. ed., *Language and Aesthetics.* Lawrence: The University Press of Kansas, 1973.

WATTS, A. *The Book.* New York: Pantheon Books, 1966(1957).