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NEWS LETTER NO. 17.

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D. B. Judd, Editor for Science; I. H. Godlove, Chief Editor.

Note: The News Letter is issued from time to time by the Inter-Society Color Council to all members for the purpose of bringing to their attention the current activities of the Council and to serve in a clearing house capacity in keeping members informed concerning recent publications on color in the arts, sciences, industries and education.

The material for the News Letter is obtained from several sources, particularly from the representatives of member-bodies. It is hoped that each member-body representative will keep the News Letter in mind and furnish material that may be of interest. The basic color problems of all groups are alike and one industry can learn much from the others.

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All members are urged to send items of interest (similar to those in this News Letter) to I. H. Godlove, Editor, c/o E. I. du Pont de Nemours & Company, Inc., P. O. Box 386, Wilmington, Del.

CHICAGO COLOR

While the "Colorists" carry on informally but enthusiastically in Washington, the "Association for Color Research" organizes formally but with equal élan in Chicago. It may prove interesting for color-minded folk elsewhere to watch the further development of two bodies of persons having similar goals in view, but pointing there with organizations whose formality, or lack of it, contrast as red with blue-green.

In addition to minutes of an October, 1936, meeting of the Chicago group, a January "Bulletin #5" (implying other bulletins), a number 1 of volume I of the "ACR News" (January 7), we have received from Mr. Walter C. Granville, Secretary, a copy of the Articles of Organization and Procedure, adopted November 18, 1936, as well as notes of the meeting of that date. The News contained over four pages of bibliography of recent treatises on color and a new item on the Color Council system of naming colors, which was described in our own News Letter No. 16.

As an example of the ambitious program which our western friends have laid out, we note that they name in the chief document 13 initial standing committees. The italics are ours. Perhaps we err in speaking of "western friends," and using above the title "Chicago Color," for we note that eligibility for membership is limited only to "All men and women interested in the use of color in industry or in the professions"

Because of the exigencies of space, we have taken the liberty of abbreviating Mr. Granville's notes on the November meeting, which came in a letter announcing a meeting in January.

"The meeting on November 18 marked the formal acceptance of the Articles of Organization and Procedure and the Completion of the Association's quota of officers. About 45 people met for dinner and a dozen came in later. Following routine matters, the following chairmen of standing committees gave reports: Mr. Palmer (Color in Architecture), Mr. Voet (Paint, Pigment and Dye), Mr. McKiernan (Ink), and Mr. Sackett (Color Organization and Harmony). In addition to his report, Mr. J. C. Copeland, chairman of the committee on Color in Psychology and Physiology, and specialist in physiological optics for the Riggs Optical Company, gave a most vivid and stimulating talk on "The Effect of Color On Physical Perception," illustrated by slides and motion pictures and accompanied by demonstrations of ophthalmological instruments.

"Two guests of honor were Mr. Rea Paul, who expressed pleasure at the progress of the group, and Professor E. N. Gathercoal, who became a member, and told how he came to be one of the founders (and first Chairman) of the I.S.C.C., and encouraged the group to proceed along the lines already laid out.

"The Articles of Organization and Procedure were adopted by unanimous vote, and the following were elected: Mr. Glenn Price, Vice President; and Messrs. J. C. Copeland, Ward H. Jackson, K. G. McKiernan and G. L. Palmer, directors."

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THE COLORQUERY AND VISIONNAIRE

Question 4. Why do fishes' and cats' eyes shine in the dark?

Question 5. Are the colors of cherry blossoms and beets chemical cousins?

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COLOR IN PAINTING THROUGH THE AGES

If one recognizes the theory of relativity, and is asked: "What time is it," to give an accurate answer one must first inquire: "Where are you on Mars or the Milky Way?" As complicated a situation as this confronts one if asked the dual questions "What is color," and "What is painting?" To frame understandable replies to these, one must first ask: "Are you an artist or a layman, a physical scientist or a psychologist?" A different language must be used to converse with the artist and the physicist, the psychologist and the business man. Replying to the query concerning painting, one must ask: "To what School do you belong?" or, if replying to one of the departed shades in Hades, condemned to the everlasting torture of being forced to look at Futurist pictures -- we were tempted to say Surrealist art, but it is still too early to expect even shades to have the proper perspective in this direction; -- then we must ask: "In what century were you on Earth?"

In the case of color, the difficulties are chiefly those of language; but also those centering about the alternative definitions of color, which has been used in such a way as to denote a purely visual or "psychological" concept, as well as the (physical) reflecting and transmitting properties of objects which determine the appearance. We shall not elaborate on our choice of these, or other, alternatives. We shall use color as the word was used by Plato and Aristotle in the 4th century B. C., at the time of the height of Greek painting; as it was used by that great genius, Leonardo da Vinci, in the late 15th century A. D., and as it has been used quite generally in these columns and as it will be used in an authoritative report soon to be published by a member-society of this Council. Suffice it to say that all of these

usages, widely differing in point of time, agree in making color a matter of sensation, or rather perception, not, for example, as equivalent to dyestuff or pigment (as in the term "dry color"). A concise, if rather pedantic, statement of such usage may be found in Webster's "New International Dictionary," under Number 2. Under Number 1 is given a restricted, but perceptual, definition closely related to one very commonly implied in the writings of painters. This is one into which we, not being unduly exercised over the necessity of scientific accuracy, will no doubt occasionally slip. In the discussion of painting, it often becomes convenient to distinguish, as we distinguish "tonalists" from "colorists," the lightness or darkness of colors from the other attributes of colors. Leonardo, when he put his mind to it, was a good colorist, in the sense in which we shall later define the term (though his technique was not good enough to preserve his colors as the colors of other early Italians have been preserved); but he was pre-occupied with many other things, among them his "chiaroscuro," or "modelling" and "light and shade," as painters often put it.

Leonardo, though he examined all things experimentally and scientifically, pictured nature esthetically. He had deep feeling for color; but his interest in contours, the rhythm of lines, the contrasting and the blending of light and shadow, the study of perspective and "atmosphere," not to mention his interest in mechanics, science, and architecture, perhaps prevented him from becoming a very great painter, though he was undoubtedly a great artist, certainly one of the greatest all-around men of all time. In saying that we do not rank him as the greatest of painters, it is because, anticipating here, we wish to show that great painting makes paint do all things which color can do; and da Vinci, by concentrating on some of its functions, somewhat neglected others. As to his understanding of these functions, even to his writing about them, as we have implied, he was far ahead of his own time as well as the great majority of present day painters.

We have said that the difficulties in describing what is color center about language and definition. In the case of painting, the difficulty is the kaleidoscopic changes in the conception of its function. We do not pretend to a comprehensive knowledge of theories of art or esthetics; but, to anticipate still further, we shall indicate our own arbitrary predilections. Whatever else painting is, it is certainly an art using paint. Paint is a mixture of coloring matters, or pigments, and a medium, as mixed oils. Pigments, or paints, are materials for altering the color of surfaces. Hence it is inescapable that painting is inextricably bound up with color. Insofar as art regards color as a necessary evil to aid drawing, as the Neo-Classical School of Louis David regarded it, or wholly ignores color, as the early Cubists did, it is therefore not painting. On the other hand, when it makes color do nearly everything that color can do, as it did in the hands of Giorgione (in the 15th century), and Cezanne and Renoir in the last century, it contains at least the elements of great painting.

We must, of course, add the proviso that painters may from time to time, even from canvas to canvas, or from canvas to wall on which a mural is to be painted, feel the need for greatly varying messages to be expressed in paint. Thus, in a mural, it would not do to create the illusion of a "hole in the wall." Therefore, the method of Cezanne, which

stresses the adequate representation of depth, or the third dimension, would be ill adapted there. Obviously, the use of color must vary with the technique or medium, as oil, tempera, water-color, etc. The historian, Plutarch, by the way, remarked that the sight of certain women leaves a pale and feeble image on the heart, like tempera; and that of other women a burning and durable impression like encaustic (hot wax) painting. Oil painting, not yet developed, was scorned by Michelangelo, who called it an art "fit only for women." There is a legend that Castagno, who shared with Domenico Veneziano the knowledge of oil painting in Italy, murdered the latter to be the sole owner of the secret.

We shall begin to tell what we think painting is, by telling what it is generally agreed painting is not. Then we shall trace conceptions of its use through the ages, laying stress on ancient painting (before the Christian era), because it was there that many modern tendencies first appeared, to be forgotten and later revived. We shall use the past to examine critically the present, and without temerity, to predict what uses of color will remain in the future. In the time of Zeuxis, early Greek painter, in the 5th century B. C., the function of painting and its use of color was definite and simple. Zeuxis was complimented because the birds came and pecked at a bunch of grapes he had painted. But he was not pleased. "If I had painted properly the boy holding the grapes, he would have scared off the birds," he said. Clearly in his time painting consisted in creating an accurate illusion of nature. Contrast that ideal with Duchamp's "Nude Descending a Staircase," the sensation of the 1913 Armory Show which ushered Cubism into this Country; it looks to the casual observer like a photograph of a heap of scrap iron.

We have said that painting and color are intimately related. This has not always been admitted. Aristotle though he had some interesting theories of color, believed that drawing did not need color to obtain a likeness. In the 17th Century A.D., conferences held in the French Academy discussed the relative importance of drawing and color. Those arguing for drawing cited Raphael and Poussin; those standing out for color, Titian and Rubens. The head of the Academy stated that drawing imitates all real things, but color represents only that which is accidental. Painters like Caravaggio, Millet and Courbet have nearly ignored color (in spite of some good color, for example, by the first named, who tended toward dark shadow masses); and the same was true of the early Cubists. Poussin wrote from Venice: "It is time for me to come away; I fear that I shall become a colorist." It was he who stated "Painting is nothing more than drawing; while Ingres said "Form is everything."

Again anticipating, we feel the need to elaborate slightly on our statement that Courbet nearly ignored color, in spite of some good color characteristics. His palette was meager, not sufficiently varied: Black, gray, white, cool greens and blues, with some dull reds or umbers, in all prone to "muddiness;" that is, his color was weak in variety and decorative prettiness. But Courbet, though chiefly important to art because of his extension of subject matter (though often ugly), was good in realistic space-composition, in the placing of objects, masses and lights; and in keeping with this what little chromatic color he used was dramatic, powerful and great in its integration with the rest of the design.

A contemporary, Daumier, though popularly known because of his great drawing and picturing of the comic, and important because he was able to achieve simultaneity of contour line with volume or depth, used color which, though usually subdued and somber, was varied, harmonious, sometimes rich, and always strong in depicting volume. His chiaroscuro (modelling of light and shading) was subtle and effective in aiding the other aspects of color. Thus, to use the painter's terms, he was successful in integrating not only drawing (i.e. contour lines) and volume (depth or third dimension), but also chiaroscuro ("value" relations) and color. His use of broad colored lines, not sharp, incisive ones, helped to this end; and his whole method to an effect of dramatic movement.

Delacroix, a painter born slightly before these two above-mentioned fellow Frenchmen, vitalized color and made it dramatic. His purpose was to harmonize or integrate subject, drawing (line), volume (depth depiction), light and color. Actually, his color is more two-dimensional (flat decoration) than deep painting; though he achieves volume through good use of line, fine balance of light and dark, use of hot lights and cold shadows. He made his color more brilliant than his predecessors', in part by the juxtaposition of complementaries, in part by the use of small spots of color (forecasting the "divisionism" of the Impressionists). He adapted colors to characters and to subjects. He was good, but not equal to the best (as Cezanne and Rubens, respectively) in what we shall soon define as the "structural" and "organic" uses of color. He thought, felt and expressed himself in color. After him, color could no longer be an afterthought, a delicacy, an accessory to drawing. He was the experimenter. With Constable and Turner he entered in the third cycle of painting, as we outline it in our history.

In the last few paragraphs, we have digressed or anticipated in order to forecast the light in which we shall view the use of color in painting. Enough has been said to show that color does not add merely sensuous value, prettiness or harmony; it enters into and integrates with other elements of design. For example, Louis David's work suffers little by photographic reproduction; for form is developed by drawing. Daumier's work, though not giving the impression of much color, does suffer. Rembrandt's work, developed chiefly by subtle chiaroscuro, likewise suffers; but the work of Titian, Rubens, Delacroix, Renoir, Cezanne and Matisse suffers enormously when reduced to black, white and gray. We shall see that painters are not merely "tonalists" and good or bad "colorists." We may call them relatively poor colorists, because of several factors: lack of diversity or variety; lack of harmonious selection and arrangement; weakness structurally or organically; failure in integrating color with other elements of design (including chiaroscuro or light, more accurately an attribute of color itself). Using "color" to have both subjective and objective meanings, it may be "warm and juicy," as in Rubens, "cool and dry," as in Piero della Francesca, "staccato," or jewel-like. We may have "decorators," who are weak only insofar as they are two-dimensional or non-structural. There may be over-emphasis of chiaroscuro, as by Correggio, of the dramatic possibilities of color, as by Delacroix; of detail, as by Dürer; of flamboyancy, as by Rubens; of sentimentality or over-sweetness, as by Greuze and the Pre-Raphaelites; of lightness, as in Watteau or LaTour. But this list of exemplars includes some great names; for painters

lose merit only insofar as their use of color, drawing and composition fails to keep pace with their special forte. There were painters, like Dürer, Holbein and Rousseau who stressed photographic literalness; others who practiced exaggeration of certain characteristics, as Michelangelo the human muscles; others passed through elimination of detail to stages of conservative distortion (Giotto, El Greco) to the great distortion of likeness practiced by many moderns. Rembrandt, Velasquez and Leonardo were realistic without being literal, accomplishing various effects by simplification, idealization and concentration upon essentials with great economy of means.

As we discuss these characteristics, following the historical development, we shall, of course, emphasize color (as our title implies) dealing with the other elements of design and art only so far as necessary to understand the use of color. Such indeed is our only excusable course, for we do not wish to pose as authority or critic of painting. We speak only as a student of color and its use. Digressing further, we may call the attention of the readers to the inclusion of an artist on the editorial staff. But he will be asked to function only by deleting from our tentative draft the most glaring errors from the pen of the writer (I.H.G.) who is somewhat untutored in the theory and practice of painting. But the latter almost from birth had his thoughts turned to painting by a father who was a keen student and critic of painting and had intimate contact with painters and writers on art. The present writer has accumulated thousands of pages of notes on color in painting, which formed the basis of lectures on the subject. He had also the benefit of notes taken by friends in the galleries of Europe. He has had the advantages accruing from a wider experience of color and broader point of view than is possible to a practicing painter trained in the traditional channels of the art. And finally, he had these notes in a nearly finished form which intrigued the interest of a number of persons; and he cannot feel free to call on another member of the editorial staff to undertake the drudgery of arranging them for publication. In consequence, therefore, the reader may hold responsible, for opinions here expressed, only the writer.

Continuing this digression only a little longer, we may say, in keeping with our Apologia (or is it?), expressed in our Hueful Talk to You, that we plan to decorate our exposition of the use of color in painting with some local color taken from the lives and remarks of painters. We hope the embellishment will not be taken amiss by our scientifically-minded friends.

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COMMON COLOR NAMES

Correlation of Common names, Maerz and Paul, Munsell, and tentative Color Council names.

As reported at the February meeting of the Council, the descriptive system being worked out by its Committee on Color Problems, Dr. D. B. Judd, Chairman, is not in its final stage, hence some of the names will need to be revised later. Observations for conversion from Maerz and Paul to Munsell samples were made by I. H. Godlove, G. Becker, and B. R. Bellamy, in many cases using samples cut from two or three different copies of the Maerz and Paul Dictionary.

<u>M and P</u>	<u>Common Name</u>	<u>Munsell</u>	<u>Color Council Tentative Name</u>
36 I 3	Academy Blue	2.8B 4.5/6.0	Moderate Greenish Blue ✓
15 E 7	Acorn	8.5YR 4.0/1.8	Weak Brown ✓ Weak
10 A 2	Alabaster	5.0YR 8.0/1.5	Pinkish Gray to Pale Orange- ✓ Pink ✓
14 B 8	Algerian (Tanbark)	7.0YR 4.8/3.5	Light Brown ✓
12 A 6	Alesan (French Nude, Cafe-au-lait)	4.8YR 6.1/3.5	Weak Red Orange Light Brown ✓
35 G 5	Alice Blue	10 B 5.5/2.7	Blue to Purple Blue, Pale ✓ to Weak
13 B 6	Almond (Almond Brown, Biscuit)	9.2YR 5.7/2.7	Pale Brown ✓
30 E 6	Almond Green	4.5G 4.6/2.5	Weak Green ✓
44 L 8	Amaranth	10 P 3.0/9.0	Dark to Deep Reddish Purple ✓
49 D 8	Amaranth Pink	1 RP 5.8/11.0	Brilliant Reddish Purple ✓
53 L 3	Amaranth Purple	9.5RP 3.2/11.0	Deep Purplish Red ✓
11 L 5	Amber (Lime Yellow)	3.5Y 7.2/7.0	Moderate Yellow ✓
13 K 12	Amber Brown	5.0YR 4.8/8.0	Dark Orange ✓
11 C 1	Amber White	9.5 Y 8.0/2.5	Pale Yellow-Green ✓
10 J 3	Amber Yellow (Venetian Yellow)	5.0Y 7.9/6.5	Moderate Yellow ✓
6 F 6	American Beauty	10 RP 3.2/9.5	Deep Purplish Red ✓
22 A 7	American Green	1.0G 4.7/2.7	Dusky Yellow-Green Weak Green ✓
45 J 8	Amethyst (Amethyst Violet)	7.5P 3.4/5.0	Purple to Reddish-Purple, ✓ Dusky to Dark ✓
43 F 3	Anemone	3.0RP 5.8/4.4	Pale Red-Purple ✓
10 J 86	Antimony Yellow, (Daffodil Yellow)	9.2YR 7.3/7.8	Moderate yellowish ✓ Yellow-Orange
36 L 8	Antwerp Blue (Mineral Blue)	9.5B 3.2/8.0	Dark Deep Blue ✓
4 I 3	Appleblossom (Apple- blossom Pink)	10 RP 4.9/5.5	Moderate Purplish Red ✓
19 J 6	Apple Green	5.5GY 6.7/5.5	Moderate Yellow-Green ✓
10 F 7	Apricot	6.8YR 7.2/7.0	Orange, Weak to Moderate ✓

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checked + reported
CHK - 7/22/39THE COLORQUERY AND VISIONNAIRE

Answer 4. Fish eyes shine in the dark even more than those of cats, lions, dogs, deer and oxen. We may not know this since most of us are less used to seeing fish than cats (but not lions!) in the dark. All of these animals are equipped with wonderful reflectors, rivalling those of our automobile roadway signs. Their reflector is the choroid, the middle one of the three main coats of the eye. The part of the choroid which acts as a reflector is called the "tapetum lucidum." This runs around to the front of the fish's eye, there forming the silver front coat of its iris. While the other animals' eyes shine because of the concave reflector at the back, the fish's eye shines both in this way and by means of light reflected from the front of the iris. The dog's eye, viewed with the instrument called the

ophthalmoscope, shines at the center like beaten gold; around this is a beautiful green area; then a dark zone, the "tapetum nigrum," meaning black carpet. We humans have no such reflector, except that it has been observed in some children. This subject reminds us that we have hardly any right to use the phrase: "The poor fish." The fishes presented us with many fine factors of inheritance: Our backbone; in our eyes, the iris and the pupil, a true crystalline lens (not merely a corneal one), true focusing apparatus (to use in accommodation), extrinsic eye muscles, and almost, but not quite, eyelids, useful in resting the eyes by involuntary winking. The purpose of the reflector, if nature has a purpose, was not to shine and make the animal more visible, but to enable it to see better in the feeble light of sea, jungle, and night by utilizing multiple reflections.

Answer 5. The answer is yes, in the sense that they are both produced by the same class of chemical pigments; that is, by substances very closely related. Both arise from compounds of the group called "anthocyanins." Along with the chlorophylls, responsible for the green color of leaves as well as their "breathing," there are other plant pigments of at least two general classes. One group is dissolved in the cell-sap; the other comprises insoluble pigments which separate as "plastids," small specialized bodies in the protoplasm of the cells. In addition to the green chloroplastids, containing the chlorophylls, there are the yellow to red "chromoplastids," which contain the pigments called carotinoids. The latter in turn include carotenes, which are hydrocarbons, and xanthophylls, which are oxygenated. Carotenes are responsible for the orange color of carrots, pumpkins and sweet potatoes, the red of tomatoes, red pepper and the flesh of watermelons. Xanthophylls give the yellow color to dandelions, sunflowers, buttercups, marigolds, etc. There are also chromoplastids which fail to develop leaf greens and give yellow to golden leaves and orange to red flowers. In the cell-sap, the soluble pigments include the flavones, which give the yellow color of primroses, flowers of Indian cotton, the bark of the apple tree, and several natural dyes; other related ones called xanthoncs, e. g., in "Indian yellow;" and finally, along with some miscellaneous ones, as yellow anthoxanthins, the group of anthocyanins, which give the red, blue and purple colors of flowers. The same pigments may give either one of these extreme spectral (and non-spectral) hues, for when the cell sap is acid they are red; otherwise, blue or violet. One of the group is found in red geraniums and certain dahlias; others in the larkspur and the blue cornflower. The skin of oranges contains both carotinoids and anthocyanins. Changes giving rise to autumn coloring will be discussed in answering later questions. Finally, to answer the present question specifically, the colors of cherry blossoms and beets are derived either from the identical anthocyanin or from extremely similar ones.
