IV-3c, Note

INTER-SOCIETY COLOR COUNCIL

NEWS LETTER NO. 59

MAY, 1945

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NEW INDIVIDUAL MEMBER

We are glad to welcome to individual membership in the Council Mr. James S. Dyson of Winsor & Newton, Inc., 31 Union Square West, New York City. Mr. Dyson's interest in color is of a technical nature and deals principally with color theories. In the past he has been connected with scientific color work with Winsor & Newton, Ltd. in England, in research on the Ostwald color theory.

A RUSSIAN MEMBER

It will interest Council members to know that the European war is reaching an end in more than one way. A recent communication from the Chase National Bank in New York took the form of a check covering dues in the Inter-Society Color Council for 1944 and 1945 for Professor Dr. N. T. Fedorov, whom a number of us have known through correspondence prior to the time when war cut off such correspondence. The order is to the account of the Academy of Sciences of the USSR. Dr. Federov before the war was a professor in the Mendeleev Chemico-Technological Institute and was a member of the faculty of the Moscow Textile Institute. Just prior to the time when correspondence was broken off there were received in this country copies of a book by Dr. Federov based on a 64-hour course which he gave as a general color course.

THE COLORISTS OF WASHINGTON AND BALTIMORE

We have received announcement of the fifth meeting of the twelfth season of the Colorists, which is to be a dinner meeting at 6:30 P.M. on May 28 at the Y.W.C.A. Cafeteria, 614 E Street, N.W., Washington, D.C. Arrangements are in charge of Kenneth L. Kelly, 2215 Constitution Ave., N.W., Washington 7, D.C. The Program Committee consists of Wm. H. Beck, Keith F. Stultz, W. R. Kauffman and K. L. Kelly, Chairman.

The speaker of the evening will be Mr. Norman F. Barnes of the General Engineering Laboratory (which is responsible for the production of the G. E. Spectrophotometer) of the General Electric Company, covering optics, precision photography and color. He will give a demonstration and talk on "Color Facts and Fantasies." The presentation will cover the scientific and popular aspects of color and will be instructive and entertaining not only to the regular members but also to their wives and friends. The first part will cover briefly the definitions of color, color theories, factors

affecting the color of objects, methods of classification and measurement, and measurement in the ultraviolet and infrared regions. The second and more popular part will include phosphorescent and fluorescent colors with numerous examples such as fluorescent maps for aircraft and marine use, interference colors produced by soap-bubble films and lastly the growth of crystals under polarized light.

MAILING ADDRESSES

The new address of Mr. Carl E. Foss, Associate Editor and member or former member of many ISCC committees, is now 1 Ober Road, Princeton, N. J. Mail sent to the following persons has been returned. If any Council member knows of an address where either may be reached, will he please let the secretary know?

Mrs. Marie S. Carrington, mail returned from 21 East 37th Street, N. Y. 16, N. Y.

Miss Marjorie Sewell, mail returned from P. O. Box 375, New Hope, Pa.

LOVIBOND SET OF GLASSES AVAILABLE

Kenneth A. Dawson, distributor of scientific instruments, Cambridge, Mass., has written the secretary that a Lovibond Tintometer Set has been placed in his hands for sale. The set contains 442 glasses (141 red glasses, .01 to 21.0; 146 yellow glasses, .01 to 21.0; 155 blue glasses, .01 to 20.0), some auxiliary viewing equipment and book "Measurement of Light and Color Sensations" by J. W. Lovibond. Mr. Dawson states that the latest catalog price of the set is around $1150, and the asking price is $500.00. Because this may interest some member of the Council we publish this item. Correspondence should be direct with Mr. Dawson, at 30A Plympton Street, Cambridge 38, Mass. The offer is subject, of course, to prior sale.

A SIMPLE ANOMALOSCOPE

Not only in this country are simple forms of anomaloscopes being developed. We have recently received a reprint of one described by J. H. Shaxby, or Cardiff, Wales, in the Journal of Scientific Instruments, 22, 1 (January 1945). In this simplified instrument the scattering of light by a turbid medium is used to obtain the mixture of two colors required to match a given color. Light is passed through juxtaposed colored filters to fall on a slab of Diffusalyte glass, the scattered light emerging from the edge of the slab. A second slab is similarly illuminated by light of the color to be matched, and the two adjacent fields varied by suitable slides, the first in color, the second in brightness, until they match. Two forms are described, a laboratory type and a "pocket" type.

CORRECTION OF ERROR

The article on Color Harmony and Color Space in News Letter No. 58, by typographical error was signed "I.H.S." It should have been signed I. H. G., the initials of the Editor-in-chief.

DELEGATE SCOFIELD

A note, dated May 1, 1945, received by the ISCC Secretary from Francis Scofield, said: "One of the nice things about this world is that almost anything can happen in it." It was Elbert Hubbard who said that even the scars may count in our favor; but we like Mr. Scofield's epigram better.

Mr. Scofield's remark was occasioned by a full-page advertisement of Helena Rubinstein's "new, exciting Color-Spectrograph." "Color-Spectrograph ..... sounds scientific! It is!" So admits the advertisement. "Helena Rubinstein's most recent contribution to the science of beauty. It proves Fact - not fancy - determines the colors that best become you." In the center of the page is the

picture of a pretty lady surrounded by four pairs of conventionalized cupid's-bow lips. Above are 7 gray squares labeled "self-harmony colors." Below are 7 more labeled "complementary colors." At the left are "contrasting colors (subtle)" and at the right, "contrasting colors (dramatic)." Between these are represented four squares marked "transitory hue," as well as lipstick-shaped areas marked "red velvet," "plush red," "red coral" and "apple red." Apparently the "new" feature is that the spectrum is confined to reds; the "exciting" feature is that the color-spectrograph can be obtained "at no charge." However, the lady is very pretty.

COLOR DYNAMICS — A note in the April, 1945, issue of Hospital Management News-letter, sent to us by Mr. Alexander Strobl, states that "Color Dynamics," which we discussed in ISCC News Letter No. 53 (May 1944), is important to hospitals. It says that the Pittsburgh Plate Glass Company is conducting an unusually well prepared advertising campaign in Hospital Management and other hospital magazines on this theme. The scientific use of color as an aid to color therapy, the company says, speeds convalescence and increases efficiency of medical staffs. A book explaining the philosophy and practice of color dynamics is offered to hospitals.

"SPRING'S AWAKENING" — This is the title of a Radio City Music Hall whimsical dance fantasy, produced by Leonidoff, which features luminous color effects by The Stroblite Company, 35 West 52nd Street, New York 19, N. Y. This feature began on March 22, 1945. The head of this company, Mr. Alexander Strobl, is an ISCC member long and favorably known to the News Letter editors. We are sure his spectacular color and lighting effects would interest any of our readers.

V-E DAY COLORS — V-E Day Colors, including Infantry Blue, Artillery Scarlet, Air Corps Blue, Tank Force Orange, Marines' Blue and Navy Grey, are featured in a striking booklet, created by Margaret Hayden Rorke, managing director of The Textile Color Card Association, in honor of the gallant men of our victorious armed services. This commemorative brochure, carried out in the patriotic red, white and blue theme, was issued by the Association to its members on V-E Day.

A novel method is used for presenting the above service colors. Each color is mounted to suggest a waving flag, with the symbol V appearing at the top of each pole. Above the six flags appears the inscription,

COLORS OF OUR VALIANT FIGHTING FORCES
WHO HELPED TO MAKE POSSIBLE THIS EPIC DAY

Mrs. Rorke explained that the colors of the Artillery, Infantry, Air Corps and Tank Forces are reproduced from the official colors of the Arms and Services of the United States Army. They appear in the U. S. Army Card, showing the colors standardized for the different Arms and Services, issued by the Association in cooperation with the Quartermaster General. The Navy Grey and Marines' Blue are likewise replicas of the official colors of the United States Navy and Marine Corps. The former appears in the card portraying the official standard color for U. S. Navy Grey, issued by the Association and approved by the U. S. Navy. Marines' Blue is reproduced from the color, Marine Corps, in the Ninth Edition Standard Card.

SELLING WITH COLOR — This is the title of the most recent book by Faber Birren, received just too late for review in this issue of the News Letter. It is published by the McGraw-Hill Book Co., Inc., New York; pp. viii + 244 pp.

(March 1944). We shall hope to review this book in our next issue, contenting ourselves now with the remark that, among Faber Birren's several books, he is here discussing the field in which he is most at home.

LETTER FROM THE OSA PRESIDENT

"At this late date (April 17, 1945) I am writing to express to you my sincere appreciation of the delightful poem which you dedicated to me..... I shall include this poem with my archives so that when at this advanced age I feel that I am slipping, I can renew my faith in myself.

(Signed) A. H. Pfund

The poem, or song, was read on the occasion of a dinner in Dr. Pfund's honor given by the Lehigh Valley Physics Clubs recently at Lehigh University. It was written by the Editor at the New York World's Fair, whose colors were orange and blue, but whose buildings were all blue - no two alike - and dedicated to Dr. Pfund, who makes bright blues out of blue-grays in his multiple-reflection colorimeter, and bright, most colorful, tales out of his blithsome spirit. The song is sung to the tune of "On the Road to Mandalay."

ON THE ROAD FROM BLUES TO BLUES

By the Perisphere and Trylon
Look'd at roundly, there you see
All the colors of the rainbow,
And no matter what they be;
Rioting 'midst blue nuances
On the buildings o'er the lea.
Get you back, you blue-struck colors!
Find some uniformity!
Find some uniformity!

On the road from blue to blue,
With an orange stripe or two,
Can't you hear the blues a-clashin'
Rarely red or tranquil hue?
On the road from blue to blue,
And the orange colors few
There the clan of blues come struggling
Sapphire, Sky, and Navy too.

Virgin white the Sphere and Trylon
'Midst the blues in deep array
Royal Blue and cousin Alice
Drive old Aqua far away;
And you hear him rally Neptune
To the fight 'gainst bluish kin
And the blues that come to being
When you swiggle too much gin!
When you swiggle too much gin!

On the road from blue to blue
With an orange stripe or two,
Saturation, lightness vary,
As the hues they likewise do.

Though as bluish kinsman he,
Ultramarine fights his king --
Royal Blue -- he sinks the Navy,
Baby Blue is saved by Ch'ing.

By the Perisphere and Trylon,
Where the blues are light and dark,
Where there ain't no ten that's standard --
Like a rainbow on a lark,
For the building blues are raging,
And you see them strong and weak,
By the complementary orange
Uniformity we seek!
Constancy we vainly seek!

Come you back, you bluish clan,
Million hues that are your span,
Can't you find a single standard?
Cease your clashing, every man!
On the road from blue to blue,
With an orange stripe or two,
There the blues roll down like thunder,
From the walls all over you!

Get you in a color meter;
Doctor Pfund will take your pulse,
Standardize your millimicrons,
Deviations he'll repulse.
Off-color shades annihilate,
He'll reflections multiply,
Off-color tales will compensate.
Flee the blues; but fill the eye!
Gone the blues; but pleas'd the eye!

Kill the blues that make you glum;
Doctor Pfund is frolicsome,
While his reflections multiply,
Tales so vivid then become.
Thus his color meter too
Makes things bright though gray or blue,
Blues are gone and problems vanish;
He's so colorful and true!

FALL WOOL, RAYON, GLOVE & MILLINERY

The 1945 Fall Rayon Collection, recently issued by The Textile Color Card Association, features the Chinese Dynasty Colors. According to Margaret Hayden Rorke, managing director, inspiration for these colors was found in the Metropolitan Art Museum exhibition of costumes from the Manchu court of China. The colors of this group include Temple Jade, Forbidden Gold, Imperial Coral, Blue of Heaven, Chinese Pink, Ch'ing Turquoise, Manchu Fuchsin, Pagoda Violet, Mandarin Red and Green Dragon. Other colors are grouped in twelve groups of light and medium "tone-on-tones." Warm colors, violets and roses include: Hot Mustard and China Gold; Pepper Spice and the harmonizing Primitive Orange; Sunset Copper and Flame Zinnia; Romantic Violet and Blush Mauve; Pink Cloud and Cinnamon Rose; and Festive Pink and Vineyard

Rose. More neutral colors are Cocoa Glace' and String Blond, Pilot Gray and Greydove; while cool colors include Clover Green, Dulcet Green, Mexican Olive, Sunlime Seabreeze Blue, Aquafrost; Dauntless Blue and the lighter Tropic Sky.

The Association's advance collection of 1945 Fall Woolen Colors feature Overtones, which play up a dramatic contrast theme in fall and winter fashions which may be used in all woolens, worsteds and mixtures of wool with rayon or cotton. The colors are interesting not only in themselves, but as harmonizing combinations. They are arranged in pairs of overlapping colors. The medium and darker top colors are smart not only for coats worn over dresses in the brighter undertone, but are also effective for darker dresses having a jacket or contrasting accent of the more brilliant color. The contrasts are also useful for sportswear, suits, millinery or accessories. The "Overtones" include Black Raspberry with Electron Blue, Chinese Cherry with Valiant Green, Pheasant Blue with Yankee Gold, Allied Navy with Potent Pink, Bitter Chocolate with Grotto Turquoise, Mexican Tile with Planters Lime, Glider Grey with Hero Red and Pacific Pine with Fiesta Orange. A lighter group, called Magnetic Pastels, include: Dynamic White, Exotic Chartreuse, Glamour Aqua, Beauty Coral, Magic Pink, Ardent Violet, Dramatic Gold and Rapture Blue. Other colors in the collection are: Winter Plum, Mauve Dahlia, Jungle Pink, Blush Orchid, Lacquer Green, Limemint, Yukon Green, Cloudgreen, Autumn Mist, Smoke Taupe, Cream Coffee, Stratobeige, Clover Red, Burgundy Rose, Watermelon Pink, Strawberry Ice, Defender Blue, Sunshine Blue, Spruce Blue, Snow Aqua, Burnt Honey, Butter Cream, Rio Copper, and California Melon.

The Glove Color Committee of the Association selected ten colors for 1945 fall and winter seasons. Seven of these were selected from the advance woolen collection, namely Mexican Tile, Chinese Cherry, Black Raspberry, Allied Navy, Mauve Dahlia, Stratobeige and Dramatic Gold. Three colors were carried over from recent seasons: Town Brown, Tropic Olive and Wing Grey. In addition to these, black, white and chamois gloves are recommended. Stressing the close connection between glove and millinery colors, six of the glove colors were selected for the 1945 fall Millinery colors. The colors adapted to both fur and wool felt include: Mexican Tile, Pacific Pine, Chinese Cherry, Spruce Blue, Burgundy Rose, Defender Blue, Tropic Olive, and Wing Grey. Colors for fur only are Black Raspberry, Lacquer Green and Cream Coffee; and for wool felt only are Mauve Dahlia, Jolly Red, Light Coffee, Soldier Blue, Trophy Gold and Hockey Green. In addition to the above, black, brown and navy are specified for both fur felt and wool felt. In support of the Government's wartime conservation program, the colors were selected by the Association's Dyestuff Advisory Committee not only for style significance but in accordance with existing dyestuff conservation regulations.

CALIBRATION OF ARC LAMPS FOR TESTING COLORFASTNESS TO LIGHT

Work has been in progress at the National Bureau of Standards for several years on a reference standard lamp for testing colorfastness to light of textiles, paper, and similar materials; and on means for calibrating, in terms of this standard, the lamps used in laboratories throughout the country. The purpose is to provide a reliable method for expressing colorfastness to light in "standard fading hours."

Recently a survey was made of the relative fading abilities of some 46 lamps in 21 different laboratories, in order to arrive at an average value and to demonstrate the need for calibration. The standard lamp and proposed method of calibration are described briefly in the Bureau's Letter Circular LC785, and the results of the survey are given. The survey was made by distributing test strips of paper dyed

blue which were exposed for exactly 20 hours in each unit, and were then measured to determine the change in reflectance. The variation of from 0.405 to 0.092 found, reveals the great need for a standard means of calibrating the lamps.

In the proposed method of calibration, paper dyed blue made in the Bureau's paper mill is used. A strip of the paper is exposed in the lamp for a suitable period of time, say for 20 hours. The strip is then compared visually with a strip of the same calibration paper which has been exposed in the reference standard lamp in steps of 16, 18, 20, and 22 standard fading hours. The time of exposure in the lamp being calibrated, that is equivalent to one of the steps of exposure in the reference standard lamp can be determined in this simple manner within 10 percent or possibly better. Thus, the lamp can be calibrated in terms of the reference standard lamp and therefore in terms of any other similarly calibrated lamp. The calibration can be repeated as often as the particular installation requires. Laboratories desiring to try the paper will be supplied with unexposed test strips and with a book of strips which have been exposed in the reference standard lamp for 16, 18, 20 and 22 hours. They will be asked to comment on their experience with the paper to guide any further work that seems necessary. Requests for the paper, and for LC785, which are furnished without charge, should be addressed to the National Bureau of Standards, Division VII-2, Washington 25, D. C.

GERMANS IN 1941 HAD TROUBLE WITH COLORBLINDNESS TESTING

A recently procured article by Hensius (Arch. Ophthal. 144, 150; 1941) reveals that color-vision examination of volunteers for the German Navy was beset with many of the difficulties experienced here a year or two later. Oberstarzt docent lecturer Dr. Hensius writes in part (p. 154): "A three-minute expenditure of time on each volunteer is not always feasible, so the examining officer mostly on his own authority has recourse to a more or less impromptu simplification of the color-sense test; in most cases, unless the necessary comprehension of the test method exists, the whole examination totters and is useless.... In the year 1938 I established that in recruiting and similar mass examinations about 60 to 70% of the color-sense defects went undiscovered; the most frequent mistakes in these examinations were from then on forbidden, and the following fundamental rules for mass examinations of the color sense with pseudo-isochromatic charts laid down:

1. Each subject tested separately;
2. Allow reading only by good daylight at a distance of from 60 cm to 1 meter;
3. No looking at the charts from the side allowed;
4. Each hesitation and long scrutiny renders the subject suspect of color weakness; in such cases go on, let the chart be read again later, resort in given cases to other test methods;
5. If certain charts are not read, then in each case color weakness is to be assumed;
6. All questionable, doubtful cases should definitely be designated as such by the designation "?", whereby in necessary cases an anomaloscope test will be made by a specialist.

Not everyone who reads the pseudo-isochromatic charts is color-normal. Through brightness differences, contrast and form of the colored numbers, and not least through expenditure of intellect, a large fraction of subjects succeed in reading the numbers correctly, though not without taking great care. These errors can only be avoided if the operator makes sure that the charts are uniformly illuminated, so that light effects are ruled out, and that the subject reads without hesitation.

TEXTILE-COLOR SOLID AND DYEING BRIGHTNESS

A paper of considerable interest to the dyestuff industry, as well as colorimetry, is one by T. Vickerstaff (Proc. Phys. Soc. 57, 15-31; 1 Jan. 1945); the brightness of present-day dyes. This paper continues the investigation into the meaning of the dyers' and colorists' concepts, and their practical significance, reported by E. Waters (J. Soc. Dyers) Col. 59, 261-6; 1943) and G. S. J. White, T. Vickerstaff and E. Waters (Proc. Phys. Soc. 55, 1-14; 1943). Other recent papers in this field, listed for the sake of completeness, are: M. O. Pelton (J. Text. Inst. 29, T 227-38; 1938); J. G. Grundy (Proc. Phys. Soc. 54, 1-13; 1942); E. I. Stearns (Amer. Dyestuff Rptr. 33, 1-6, 16-20; Jan. 3, 1944); and I. H. Godlove (J. Opt. Soc. Amer. 33, 351-2; 1943). Grundy dealt with the color changes due to variations in the concentration of dye solutions. Stearns with a variety of dyestuff problems, and Waters, White et al and Godlove with the physical significance of the dyer's method of specifying colors in terms of "shade," "dullness" or "brightness" and "strength." It will be remembered that the Imperial Chemical Industries workers found that trained colorists estimate the strength of dulled samples largely on the basis of purity; non-colorists estimate strength mainly on the basis of lightness. But probably neither psychophysical variable is alone used. When a dullness difference is not present, probably lightness is used, according to the British workers; if a dullness difference is present, untrained observers judge mainly by lightness, but are influenced by purity. When trained, the observer gives more weight to purity. Godlove reported rather similar results. He found that the dyer's "strength" is measured by the color-difference from white, or the light gray of the undyed fiber, as judged by reference to a particular composite of the Munsell specifications; dyer's "brightness" was found to be better represented by the simple product of Munsell "value" (lightness) and "chroma" (saturation) than by any other function of these or similar variables. The significance of this finding will be discussed below. We have frequently heard colorists say that dullness is "mistaken for strength."

Godlove in 1943 and now Vickerstaff have reported on the "brightness" and "efficiency" of present-day dyeings. Efficiency in this case is a concept related to but somewhat different from the maximum "visual efficiency" computed by Mac Adam, this efficiency being the ratio of the actual saturation to the maximum possible saturation at the given lightness and hue. Since Godlove was originally interested in comparing the actual saturations of dyeings with those of the hypothetical corresponding colors due to a V-shaped absorption band, 200 mu wide at the widest point, passing through the visible spectrum, and these colors never had a reflectance less than 33%, he did not introduce the following step which Vickerstaff now reports. Godlove found that a single absorption band never produces true greens (the limits being about Munsell 5.5. GY and 5 BG), and that the efficiency of green dyeings is very low. Vickerstaff goes further, and obtains the corrected result that both greens and purples are of low efficiency, while reds, oranges and yellows are highly efficient and blue-greens and bluish reds less so.

The correction applied by Vickerstaff was to take account of the approximately 2% of the incident light which is reflected by the surfaces of textiles. This may be an appreciable percentage of the total light which is reflected by dark, heavy dyeings. Vickerstaff computed the ideal textile-surface colors of maximum saturation which can be obtained by having all spectral reflectance ordinates 100% or 2% (Mac Adam's were all 100% or zero). In that way a modified Mac Adam color-solid was made the basis of the efficiency computations. Originally this correction was not made, and the efficiencies were not measured in sensation steps. This led to efficiency ratings for given dyes which varied with the concentration. With the satura-

tions being measured in Munsell units and the surface reflection being taken account of, unambiguous ratings were obtained.

Vickerstaff and his colleagues are to be congratulated on a job very well done.

IHG

COLORED SMOKE SIGNALS

Dr. Sidney M. Newhall was so kind as to send us an abstract of an article on this subject which appeared in the March, 1945, Science Digest, pp. 81-2. We may add that another very informative article, by the Technical Command, Chemical Warfare Service, is in Chem. & Engin. News 22, pp. 1990-1 (Nov. 25, 1944). The Editor-in-chief, who has now worked on these smokes himself for at least three years, and being of course careful to keep the nature of the materials secret, was pleased to note that in the latter article even the chemical composition of the colored smokes is given. One does feel relieved somewhat not to be forced to keep a secret too long.

Since we assume that both of these journals are accessible to most of our readers, we shall not discuss them further now, in spite of Dr. Newhall's kindness. If we are wrong, and any reader would like us to do so we shall be glad to print a review or abstract.

Incidentally, speaking of this arm of the Services, we ran into our old classmate at two universities, Colonel Ralph Hufferd, who told us that Colonel Walter Scott, former ISCC and AATCC officer, served under him in the CWS; and Colonel Hufferd added some stories to show how well Dr. Scott was liked by the men in the service.

COLOR AND THE PROFESSIONAL ARTIST

It is expected that the more complete paper of Mr. J. Scott Williams, delivered at the recent meeting of the American Artists Professional League, together with that of Mr. Conrow, will be mimeographed and distributed with the printed articles by Messrs. Hiler and Churchill, supplied by the AAPL. Here we give a few paragraphs condensed from his paper by Mr. Williams at the editors' request.

Color is a language by which an artist expresses his thoughts and this color problem is further complicated by light, atmosphere, design, emotion and application. On interviewing several types of professionals as to the relative merits of hue, value and chroma, the general answer was values as of first importance, especially among the painters and designers. The general opinion of the order of importance was values first, chroma second and hue last. Mature artists refine chroma while young painters often like full chroma effects, that is, lots of color. Hue is last in consideration, and mature artists use almost any hue combination, and being specialists have their individual hue preference.

Fully trained artists are not much concerned about the primary colors, color wheels, the spectrum or the scientific aspect of color. It is sufficient to use it as part of their language of expression. As a class, they are concerned with the effect of color and color combinations on the mind, also as a means of expressing emotions. Artists who are skillful composers are generally equally good as colorists because the essence of their problem is in the adjustment of areas of unequal proportions with plenty of latitude in changes of value and chroma to make hue combinations acceptable.

Other considerations which the artist must understand as applied to color are

harmony and proportions. Harmony may mean related hues or it may include complements or contrasts. Basically it implies a sense of beauty. Proportion usually means unequal distribution of areas where the skillful manipulation of hue and chroma combinations is achieved as design. The term balance is often used in color designing and also may include even and uneven balance. As applied to hues it may denote the duality characteristic of the spectrum. The artist sees the series from red to yellow-green as the warm or advancing type of hues and the blue and violet part of the spectrum as the cool, retiring, or shadow type of hues and will manipulate this characteristic in the mechanics of composing as well as depending on the general mental or psychological aspects of hues. Much other design color work requires a recognition of this characteristic if the solution is to fully satisfy. Some designing of commercial or novelty character ignores this factor and uses only a fraction of the spectral scale for forcing attention. The scientist knows that the artist includes orange and purple in his subtractive mix color scale and places orange instead of yellow opposite the blue and places purple opposite to yellow, a practical design method.

In regard to the effect of color on the mind, most artists are not consciously psychologists, nor do they probe the meaning of color experience or its mental influence on others. Being eye minded, also geometrically minded in some instances, they use the language as nature suggests and stimulates them individually. They are not always interested in good color but just its opposite when it suits their purpose. They gain a sense of color effectiveness and become highly sensitive to it in the same way a musical composer is sensitive to sounds. To a high degree they develop an emotional capacity and use it as such. Artists thus use color both for its psychological aspect and for its aesthetic capacity.

COLOR NAMES — In the November, 1944, Textile Colorist and Converter an article by Dr. Waldemar Schweisheimer is titled "Look What We Missed in Color Names." After speaking of the wide variety of names, what the eye sees, and the fact that there are so many distinguishable colors, the article goes on to say that while the natives of some portions of the earth -- for example those who live in the Tundra -- have no words for such colors as red, green and blue, they do have as many as 31 different words to differentiate browns, the suggestion being made that this is due to the fact that they make their living from their cows which have a great many nuances of brown. The article goes on to say: "To the stranger the tundra seems a lifeless gray green or brown or green brown. It would be difficult or impossible for him to name and distinguish between more than ten colors there. On the other hand the native who lives continually in the tundra has some five to eight hundred words or word combinations to specify these colors." While we do not know the source of Dr. Schweisheimer's information, it sounds very interesting.

Another article by Dr. Schweisheimer, which we have not yet read, but whose title sounds interesting, is: W. Schweisheimer; Textile Colorist & Converter 67, #3, 659 (March 1945); color is a form of superstition.

FROM S.M.P.E. — The following technical item on color, taken from the March 1945 journal of the S.M.P.E., will be of interest to Council members.

"Technicolor is now making 16-mm prints of current studio feature-length Technicolor pictures for distribution to the armed forces through the War Activities Committee. These prints are made both by the Kodachrome procedure and by the Technicolor imbibition procedure, the latter being a relatively new development for 16-mm which yields prints approaching the high Technicolor 35-mm quality."

HILAIRE HILER — Mr. Hilaire Hiler, artist now living in New Mexico, and a newly appointed delegate from the AAPL, has written several books to which one of your editors recently had occasion to refer. They are of such interest that a list of them is passed on to other Council members.

1929. From Nudity to Raiment; 303 pp. (141 figs., XII plates, 12 colored); E. Weyhe, 794 Lexington Ave., New York City; includes: The Origin of Clothing, p. 1; Prehistoric Dress, p. 15; The Primitives, p. 61; The Bronze Age and the Early Iron Age, p. 185; Costumes in Mexico, Central America and Peru, p. 213.

1934. Notes on the Technique of Painting, with a preface by Sir William Rothenstein; 340 pp. (not illustrated); Faber & Faber Ltd., 24 Russell Square, London; Oxford Univ. Press, New York (1935); includes: Introduction, p. 1; Supports and Grounds, p. 23; Colour and Pigments, p. 72; Vehicles and Media, p. 144; The Ideal Studio, p. 248; Conservation of Paintings, p. 284; Bibliography, p. 297; Glossary, p. 328.

1938. The Painter's Pocket-book of Methods and Materials; edited by Jan Gordon; Harcourt Brace & Co., New York; also published by Faber & Faber, London, 1937; contains condensed and rearranged material from the author's larger work Notes on the Technique of Painting. Includes: Drawing Materials, Water-color Methods, Oil-painting, Supports, Grounds, Varnishes, Wax Painting, Murals, Tools; Pigments, Conclusions, Appendix (The Problems of Color, Perception, Methodical Classification, Contrast, "Temperature," Color Summary), Glossary.

1939. Bibliography of Costume; a dictionary catalog of about 8,000 books and periodicals by Hilaire and Meyer Hiler, edited by Helen Grant Cushing, assisted by Adah V. Morris; The H. W. Wilson Co., New York.

1942. Color Harmony and Pigments; Favor, Ruhl & Co., Chicago and New York; Practical color systematization for artists boxed with Hiler Color Chart.

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LETTER FROM DR. MACADAM — The following quotation from a letter from Dr. David L. Mac Adam, dated February 18, is self-explanatory. "The quotation from Goethe, on page 6 of the January 1945 issue of the ISCC News Letter intrigues me. Can you inform me of its source? For many years I have used the enclosed book-plate, with the quotation taken from Mephistopheles' interview with the student in scene IV of the first part of Goethe's 'Faust.' (The book-plate, under drawings of five regular solids reads: 'Mephistopheles. Grau, teurer Freund, ist alle Theorie, und grün des Lebens goldner Baum') I thought that I understood the meaning of this without ever having attempted to render it in English. Bayard Taylor translated it, 'My worthy friend, gray are all theories, and green alone Life's golden tree.' I suppose that I have been more conscious of the metaphorical meanings of the words than their literal chromatic meanings. At any rate, when occasionally asked to interpret my book-plate, I have read it somewaht as follows:

'Dear Friend, all theory is dull and Life's adventure is refreshing.' At times, according to mood I have been even less literal and have said tiresome or fruitless instead of dull, and 'Life is a lot of fun.' Although these are pretty far from Goethe's expressions I believe that they are fair renderings of his meaning and attitude."

In reply, the Editor said that his notes gave the reference as Goethe, Faust I 4, 515; and wrote further as follows: "Two of the physicists here are lovers of, and experts in, Faust. A chemist, former German plant manager, is another; and all gave me opinions. All of us agreed that Bayard Taylor's translation was not literally incorrect, but that your more liberal translation came nearer the spirit of Goethe. Obviously, the lines cannot be taken too literally, for then the golden tree could not be green. The experts thought your word 'refreshing' might be made even a little more like 'inspiring' or 'exalting'; but that might be too unliteral. They stress the fact that Goethe, unlike some other German poets, was quite worldly and would want to make Mephistopheles talk not merely as a cold, scoffing, relentless fiend, but also as a man of the world. He would tell the student, if he used their modern jargon, 'Books are full of theories, and I guess they're O. K.; but you gotta live if you want to know what life is. Yeah, live life!'"

At the end of his letter, Dr. Mac Adam wrote: "One of the most 'colorful' bits of prose which I have read was quoted by Bancroft at the end of his paper on the 'Color of Water' in the Journal of the Franklin Institute, 1919: 187 about page 485."

MUNSELL I.C.I. DATA — A summary of the I.C.I. data for four illuminants on 421 Munsell standard colors spectrophotometrically measured at the National Bureau of Standards and originally published in the Journal of the Optical Society of America by Kelly, Gibson and Nickerson, has appeared in Illuminating Engineering, March 1945 (pp. 159-71). The summary was prepared to inform I.E.S. members of this OSA report and to present them with sufficient working data for the several illuminants studied. In an 8-page table the data are summarized by reporting only Y and x, y values.

A NEW SYSTEM OF COLOR-MATCHING FLUIDS — This is the title of a paper by Kenneth L. Kelly, of the American Pharmaceutical Association Laboratory, in J. Amer. Pharm. Assoc. Sci. Ed. 34, No. 2, 59-63 (Feb. 1945). Following the pioneering work of Arny, Taub, et al. three colorimetric solutions (of cobalt, ferric and cupric salts) were selected as the primary solutions from which standard color-matching fluids were prepared and incorporated into certain tests in the U. S. Pharmacopeoia, Eleventh Revision (1942). Table I of the paper gives the Munsell notations and ISCC-NBS color names of the 20 matching fluids in the U.S.P., when observed in the way previously described by Kelly, and by Judd and Kelly. It was observed that the U.S.P. color-matching fluids were not evenly stepped in "depth of color." Therefore there were prepared and proposed six new series of fluids of uniform stepping covering evenly the range of color (orange to greenish yellow) resulting from carbonization tests. The compositions of these are given in Table II along with Munsell notations and ISCC-NBS color names; and in Table III the proposed color-matching fluids are compared with the U.S.P. fluids, giving Munsell notations and relative depths. In this table it is seen that the judgment of "depth" is not one of lightness (Munsell value) only, but a combination of lightness and saturation or strength (Munsell chroma). In the ISCC-NBS system of color names, "deep" means dark and strong; accordingly depth infers a combination of darkness and saturation. In this connection, see our

discussion of the dyer's concepts of "strength" and "brightness" in this issue of the News Letter, under the title "Textile -color solid and dyeing brightness." It is to be remembered that Godlove, in a paper before the Optical Society (J. Opt. Soc. Amer. 33, 351-2; 1943) pointed out how closely these concepts and the Schutze series of hues of increasing "depth" are related to the chemists' familiarity with solutions of increasing strength and depth.

COLOR VISION

A paper on "Standard response functions for protanopic and and deuteranopic vision" by Dr. Deane B. Judd, News Letter Editor for Science and former ISCC Chairman, has recently appeared in both the N. B. S. Journal of Research (J. Res. Natl. Bur. Stand 33, 407-37; 1944) and the Journal of the Optical Society of America (J. Opt. Soc. Amer. 35, 199-221; 1945). According to the author's abstract, the color matches set up by the normal observer can be predicted satisfactorily by three functions of wave-length defining the ICI standard observer. It has been found possible by a transformation of coordinate system to express these three functions in a form such that two of the three pairs also represent the color matches of the two recognized types of red-green-blind observer, the protanope and the deuteranope, within the rather small uncertainties to which they are known. The remaining pair of functions represents, within the comparatively large uncertainties to which they are known, the color matches of the tritanope, a more rare type of observer who confuses reddish blue with greenish yellow. These three functions, therefore, serve to relate the color matches made by dichromats to those made by normal trichromats, and so make conveniently accessible the color confusions of average dichromatic observers. The use of these three functions in the solution of problems arising in the design of tests for colorblindness is illustrated by solution of three such problems, and their connection to theories of color vision is discussed.

COLOR TEMPERATURE OF TUNGSTEN LAMPS

On many occasions those working in color have need for information regarding the color temperature at rated voltage of many usually available lamps. A recent article under the title "A Color Temperature Scale" by Dr. W. E. Forsythe and Dr. E. Q. Adams of the Lamp Department, General Electric Company, appeared in two parts in the September and October 1944 issues of General Electric Review 47, No. 9, 26-34; No. 10, 59-62. Part I: Lamp or furnace temperature is best determined by measuring specific brightness. These data, from General Electric laboratory tests, therefore, apply to a large number of the industrial arts. Part II: Color temperature and characteristics of various popular lamps.

It is probable that reprints of these two papers can be obtained by writing to Dr. Forsythe or Dr. Adams. In this connection we should also refer to an earlier and excellent report by the same authors, "The tungsten filament incandescent lamp," Denison University Bulletin, Journal of the Scientific Laboratories 32, 70-131, April 1937.

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