INTER-SOCIETY COLOR COUNCIL

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TWELFTH ANNUAL COUNCIL MEETING

The twelfth annual meeting of the Council will be held at the Hotel Pennsylvania in New York City concurrently with the meeting of the Optical Society of America on March 4-6, 1943. There will be a Discussion Session of the Council on Thursday morning and a Business Session on Thursday afternoon. Chairmen of all delegations are urged to have their annual reports of the color work done by committees of their society, by individuals in their society, and reports of color articles published in their journal during the past year ready for the Business Session. There will be no Popular Session of the Council this year, but all members are invited to a lecture on Friday evening which will be given by Ralph M. Evans, chairman of ISCC delegates from the Society of Motion Picture Engineers. Mr. Evans will discuss the consequences for color photography of brilliance constancy, simultaneous contrast, and adaptation level phenomena; he will demonstrate how these phenomena enter into color processes and what has to be done about them. On Saturday morning there will be a Symposium on Color Blindness and Color Blindness Tests arranged for the Optical Society meeting by the Inter-Society Color Council. A copy of the O.S.A. program announcement is being sent you with this News Letter.

NEW INDIVIDUAL MEMBERS

We are glad to welcome to the Inter-Society Color Council the following new individual members: Mr. Keith F. Stultz, Alexandria, Virginia, who is doing spectrophotometric work at Ft. Belvoir, Virginia; Lt. Robert Colman in the Camouflage Branch, Engineer Board, Ft. Belvoir, Virginia, who is interested in the use of color psychologically for the theatre, color spectrophotometry of paint and dyes, and color mixture data and color designation; and Dr. John C. McCulloch, an ophthalmologist, of Toronto, Canada, of the Royal Canadian Air Force who is interested in color as applied to Aviation Medicine.

ISCC SUB-COMMITTEE MEETS

On Saturday, December 19, the ISCC subcommittee studying Problem No. 11 (red-green discrimination test) met in Washington, D. C. to present data on the ISCC test and decide what should be done about its further development. Members were present from the Army, the Navy, and the Civil Aeronautic Administration. All agreed that the committee had made a big step in the right direction and felt that the work should proceed. Just how funds can be obtained to develop further materials necessary was not, however, decided. It was suggested that the committee should not limit itself to consideration of the ISCC red-green discrimination test, but should procure comparison data for as many tests as possible.

ART EDUCATION SYMPOSIUM READY

The papers given at the last annual meeting on art education will be mailed to members in the very near future. Four of the technical papers appeared in the Journal of the Optical Society in December. They have been reprinted, and to this group have been added the outlines of school courses presented by representatives of the Rhode Island School of Design, Pratt Institute, The Cooper Union, and The Colorado State College of Education. Extra copies of these will be available for distribution to persons working in fields connected with art education.

NEWS FROM OVERSEAS

ISCC members will be glad to hear that their vice-chairman now holds the rank of a full Colonel, having recently been promoted from Lt. Colonel. Colonel Scott is overseas in the Chemical Warfare Branch of the Service.

WASHINGTON COLORISTS MEET

On Monday, February 1, the Washington and Baltimore Colorists will meet at the Arts Club for dinner. The discussion session will be on the general subject of Color Blindness. Dr. Judd will present the principal facts and types of color blindness, Dr. Newhall will report a recent investigation of total color blindness, and Miss Nickerson will demonstrate some of the new color blind tests. Anyone who has access to an unusual or new color test is asked to bring it to the meeting, and anyone who knows of interesting or odd cases of color blindness is asked to come prepared to present the information.

BRITISH COLOR GROUP

With Dr. Wright in the chair, about 42 members and visitors were present at the Ninth Science Meeting of the Physical Society Colour Group held at the Imperial College of Science and Technology at 2:30 p.m. on Friday, September 11, 1942. Mr. E. G. Savage, education officer of the London County Council read a paper on the "Teaching of Colour in Schools." Discussion followed by a number of members. The meeting adjourned at 4:30 for tea, following which Mr. E. G. Knipe read a paper prepared by himself and Mr. J. B. Reid on "A Photoelectric Tricolorimeter." Discussion followed.

RECENT TCCA ACTIVITIES

Too late for inclusion in the November News Letter we received advance notice of issuance of the 1943 Spring Hosiery Colors by the Textile Color Card Association of the United States, Inc. Three new colors, featured under the high-spirited caption of Cheeri-Tones are presented; and Mrs. Margaret Hayden Rorke, managing director of the Association, pointed out that hosiery colors, though now limited in number, need not be drab. The animated title, Cheeri-Tones, she added, reflected the cheerful character of the spring colors, appropriately called Sky-Glo, Star-Joy and Sun-Gay. Each color has been keyed to the Colors for Shoe Leathers, as specified in the War Production Board Conservation Order M-217, which restricts the shoe tones to six colors. Because of the limited number, special care was taken to select colors which most effectively harmonized or contrasted with a wide range of smart costume and shoe colors for spring and summer. They are especially keyed to the collection of Harmonies, Solos, Melodies, and Trios highlighted in the Association's 1943 Spring Woolen and Rayon Cards. Sky-Glo is described as an "animated burnished beige," Star-Joy as a "flattering medium beige," and Sun-Gay as a "radiant sunburnt beige." News reports released during the Christmas season detailed various fashion coordination notes for each of these three colors; and it is clear from these that no difficulty will be encountered in making the colors coordinate harmoniously with a wide range of colors of general, street or evening wear.

Early this month we received also notice of three new colors promulgated by the Association for Men's Felt Hat Body Colors for Fall, 1943. These colors are: Mocha Brown, a "lively light coffee tone"; Club Grey, in the slate range; and Autumn Blue, a "deeper greyed blue." Here too, it was stated by Mrs. Rorke, the number of colors was reduced to assist our Government in its wartime conservation effort. All three colors were selected not only for their fashion value but also because they were especially adapted to dyeing on dark fur felt stock. They are likewise adaptable for wool felt stock. In choosing these colors, the Association was assisted by its committee representing leading firms in the men's hat industry.

COLOR BLINDNESS AND CAMOUFLAGE DETECTION

Just too late also for inclusion in the November issue was notice of the interesting talk by our Chairman, Dr. Deane B. Judd, on Color Blindness and its relation to the Detection of Camouflage. According to a Science Service report of the talk, observers with weak color vision have an advantage in detecting faulty camouflage. While Dr. Judd made this statement before the November meeting of the Washington Academy of Sciences, he also said that this need not be a signal for colorblind men to rush to enlist in the Air Forces. Men who are completely colorblind or even partially colorblind have this advantage; but since, out of every 20 men, about one man has weak color vision and another is colorblind, the Army probably already has a good share of men capable of spotting the enemy's blunders in camouflage. To hide a military position from a red-green blind man, whose vision is normal for blue and yellow, it would be necessary to see that it was no lighter and no darker than the surrounding country. And it must be no bluer and no yellower. But the partially colorblind person would not notice if the position happened to be a little redder or a little greener than objects around it.

The partially colorblind person, Dr. Judd said, therefore usually has no advantage over the man with normal color vision in detecting camouflage. If a roof or a gun-shield is painted so that the normal eye cannot tell it from the ground or foliage, the partially colorblind person cannot distinguish it either. Since nature provides the best camouflage, the Army usually prefers to use actual vegetation or dirt whenever possible to hide positions. But cut branches change color when they dry out and the leaves wilt. Dirt used in this way may dry out more rapidly after a rainstorm than the dirt on the ground. This produces slight differences in color and results in imperfect camouflage. Another fault in camouflage is in paint intended to match the surroundings. Such paint, even when it is a close match, is likely to differ in reflectance in some portions of the spectrum. It is such imperfections, not noticeable to the normal eye, which are picked up by the man who has weak color vision.

There are a few situations in which the red-green colorblind man has an advantage in detecting camouflage, Dr. Judd pointed out. In a variegated pattern made up of patches of reddish brown earth and yellowish green foliage, the red-green colorblind will often see the surrounding terrain more nearly uniform than the normal observer, and can therefore more easily pick out a position slightly off-color in a light-dark or yellow-blue sense. This is the most likely basis for detection of camouflage by colorblinds.

COLOR: A PROSE-POEM

That the production of lamps, and optics for the Armed Services, and keeping the accounts of the Council, do not blind our Treasurer, Norman Macbeth, Jr., to the beauties of color and poetry, is evident from his passing on to us recently a prose poem entitled "Color -- the Master's Touch."

He found it in the September, 1942, issue of the McGill News, published by McGill Manufacturing Company, Valparaiso, Ind. It was originally written by Charles R. Sherman. "I am modern as the minute," he wrote of Color, "yet I am old as life itself. It is my nature to beautify and render attractive. Wherever there is Light, you will find me. I appeal to your vision, I attract your attention. I cause you to pause and admire my work. You will find me on the stately trees, on the highest mountain, and I am found in the flowers and shrubs of the quiet valley. I give Life to the rainbow. I translate for the artist his own interpretations. I soothe and pacify or I can incite to wrath and anger. I do not affect all alike, depending on whether I emit, reflect or transmit light. I give to Life gaiety. I stimulate emotions. I beautify the printed page and rob it of its drabness. I give to the Sunrise its beauty. I give to the Sunset its grandeur. From birth until death I play a major part in your daily life. I am Color .... the Master's touch."

5+1

INSECTS AND COLOR

The following bibliography on the reactions to colors was gathered by Dr. Judd, who states that it was based largely on the paper by E. Hardy, the last below. Dr. Judd relied on Hardy for the brief summaries of most of the articles cited.

E. Hardy, Lancet 240, 435 (1941); Entomologist's Magazine, London (1941). Musca domestica (housefly) and Fannia canicularis avoid a pale yellow whenever they have a choice. White is preferred.

V. B. Wigglesworth, Principles of Insect Physiology, London, 114-20 (1939). Color vision exists in Fannia (genus containing the lesser housefly) and other insects. Reflex responses of Drosophila (fruit fly) to a striped pattern moved in front of it was due to luminosity, not color.

P. R. Awati, Indian J. Med. Research 7, (3), 548 (1920). Yellow has the greatest attraction for house flies, red and violet the least. Both colored lights at night and colored tanglefoot papers by day were used.

O. C. Lodge, Bull. Ent. Research 9, (2), 141 (1918). House flies show no color preference either in the case of foods, colored lights, or colored fabrics. The sense of smell governs responses more than the sense of sight.

S. B. Freeborn & L. J. Berry, J. Econ. Ent. 28, 913 (1935). Pale colors, including white, are distinctly more repellant to the house fly than the intermediate ones, which included aluminum, the darkest one being obviously the most attractive.

D. J. Lee, J. Coun. Sci. Industr. Res. Aust. 10, 275 (1937). Yellow, blue, pink and green appear to be attractive to Lucilia cuprina Wied. in Australia, a fly also widely distributed in Asia and Africa and related to the common British and U.S. green-bottle or sheep maggot fly, Lucilia sericata, Mg.

R. Newstead, Preliminary report on the habits, life-cycle and breeding places of the common house fly Musca domestica Linn. as observed in Liverpool, second interim report, 1909. The green-bottle fly objects to blue, pale violet, dark brown and lemon yellow distinctly, and also to a lesser degree to clear green. Azure color was much frequented, and it also exhibited a liking for rose, red, clear green (?) and clear yellow. It also preferred light colors to dark colors.

E. Hardy, Horse 9, (35), 169 (1938). In Holland, stables and cow stalls are sometimes treated with a washing blue inside to avoid fly-trouble and a few years ago those German government stables all dark blue inside were without the usual fly trouble.

G. H. F. Nuttall & A. E. Shipley, J. Hygiene 2, 58 (1902); also E. H. F. Nuttall, Brit. Med. J. (2), 668 (1901). The common European malaria-bearing mosquito Anopheles maculipennis Mg. alighted on the fabric-colors in the following order of favor: navy blue, 108; dark red, 90; brown, 81; scarlet, 50; black, 49; slate gray, 31; olive green, 24; violet, 18; leaf green, 17; blue, 14; pearl gray, 9; pale green, 4; light blue, 3; ochre, 2; white, 2; orange, 1; and yellow, 0. (The U. S. Army subsequently to this report withdrew its regulation navy blue shirts and issued light ones for use in malarial districts.)

Shariff, The Times 20; iv. (1932). During five years in South Africa it was found that pink or yellow mosquito curtains never harbored mosquitos in their folds, and with boxes lined with navy blue, pink, gray and yellow flannel, the interiors of the blue and gray boxes were thickly covered with mosquitos, while but two or three were found in the pink or yellow.

Hoodless, London Observer 26, ix (1933); New Caledonia mosquitos prefer blue and white, avoid yellow.

L. M. Bertholf, Z. vergl. Physiol. 18, 32 (1932); F. E. Lutz, Ann. New York Acad. Sci. 29, 181 (1924); F. E. Lutz & E. N. Grisewood, Amer. Mus. Novit., no. 706, 1 (1934). Drosophila will respond to light of wavelength 257 mu. Most insects are sensitive to ultraviolet, but not to deep red. Maximal attraction for Drosophila for a given radiant emittance is at wavelength 487; for Calliphora, the blue-bottle blow fly this attraction is at wavelength 504 mu. Insects attracted to light seem to perceive ultraviolet better than other parts of the spectrum, but the luminosity of various parts appears to be different with different insects.

Z. Zakarian, Color vision in the house fly (Musca Domestica), J. Opt. Soc. Amer. 23, 195 (1933). Flies prefer white and lightest tints of all hues, white and cream being equally preferred. There is no evidence of color vision, the preference being according to luminosity alone.

Pilkington Bros. Ltd., Nature, p. 529, April 5, 1930; Buchanan Smith, Nature, p. 780, May 24, 1930; Beckett, Nature, p. 730, May 24, 1930; Nature, p. 277, August 15, 1931. Colored glasses are deterrent to the house fly, yellow and red being the best deterrents, and blue and green not nearly so effective.

E. Hardy, Reactions of Certain Flies to Colors, Medical Record 155, 87 (Feb. 4, 1942). A summary for houseflies, fruit flies, green-bottle flies, and mosquitoes, with a bibliography of 18 titles.

To the above references contributed by Dr. Judd, the Editor may add reference to a paper by the late Prof. F. K. Richtmyer, J. Opt. Soc. Amer. 7, 151-68 (1923), entitled "The Reflection of Ultraviolet by Flowers." After asking the question what part, if any, is played by ultraviolet light in attracting insects to flowers, the author gives one or two observations of his and Dr. F. E. Lutz' and in a footnote (p. 152) writes: "A very large number of papers -- one authority states 5000 -- has been written on the vision of insects and its relation to flowers." In this footnote he gives a half dozen references.

MODERN CAMOUFLAGE

Under the title Modern Camouflage, Major Robert P. Breckenridge, Corps of Engineers, U. S. A., an authority on the subject, has written a book, recently published by Farrar & Rinehart, Inc., $3.50. The book consists of 278 pages, generously illustrated with photographs.

In a Foreword, Gen. U. S. Grant, 3rd, chief of the Protection Branch of the Office of Civilian Defense, states that from this book the reader will obtain "valuable, trustworthy information as to the only means by which our industries and homes can be protected against destruction in this land, too vast to be given direct protection by military force throughout its whole extent; and in addition the owners can learn how to conceal their plants and homes, and how to avoid false and ineffective methods."

The author devotes little space to color for, as has been said many times before, color as such is far less important in this aerial war than many other concealing factors. However, to standardize planning and specification, and facilitate the manufacture of suitable paints, nine colors have been selected for camouflage: light green, dark green, sand, field drab, earth brown, earth yellow, loam, earth red, and olive drab. These, with black and white, are intended to provide for most concealment purposes.

There is little use in reviewing this book at length for it is one that anyone interested in the subject should obtain for his own bookshelf. Much specific information is given regarding paints, texture materials, and plant materials grouped into major classifications for concealment purposes. There is a good chapter on blackouts, and in it the familiar question of red vs. blue light for low visibility from the air is raised, to be conclusively decided in favor of red. In the chapter on the construction of models, detailed layouts are suggested for a model shop, with a list of the necessary hand tools for a small shop.

The author says in one place that too much writing and discourse about camouflage are in terms so general and abstract that they are of little value. Major Breckenridge's book reaches his objective in that it provides a handbook in which suggestions and recommendations are as specific as possible.

COLOR VISION TESTS

In the development of a test for dichotomous color vision, one of our members, Dean Farnsworth of New York University, first worked with the Munsell 100-hue series. Through the cooperation of Mr. Farnsworth and Mrs. Bellamy, several members of Dr. LeGrand Hardy's committee who are developing a red-green discrimination test based on the Aptitude Test material, have been supplied sets of this test for collection and study of comparative data on color vision test results. The committee has already reported to its members results of comparative tests using the ISCC test, the AO test, Ishihara, Rabkin, and the Farnsworth test. On one series of observers there are available, though not yet reported, a series of comparative results on the test devised by Dr. Hecht and his associates at Columbia. Each of these tests, and the ones also under development by Dr. David L. MacAdam at Kodak, and Mr. F. W. Jobe at Bausch & Lomb, will be described at the symposium on Color Blindness and Color Blindness Tests which has been arranged by the Council for the session of the Optical Society of American on March 6.

ACHROMATOPSIA

An experimental study of one typical and two atypical cases of achromatopsia, or so-called total color-blindness, has been published recently by L. L. Sloan and S. M. Newhall (Comparison of Cases of Atypical

and Typical Achromatopsia, Amer. Jour. Ophthal., 1942, 25, 945-961). Typical achromatopsia is characterized by: (1) complete absence of, or markedly defective, chromatic vision for the blue and yellow as well as the red and green; (2) reduced acuity in the foveal region; (3) a spectrum luminosity curve at high luminances which resembles the normal scotopic luminosity curve; (4) photophobic symptoms and nystagmoid eye-movements; (5) inheritance of the defect as a simple recessive characteristic.

The typical case evinced complete absence of chromatic vision in all tests, while the atypical cases both showed significantly greater defects than those characteristic of simple red-green color blindness. One of the latter cases appeared to be atypical only to the extent that the loss of chromatic vision was incomplete, whereas the other seemed atypical with respect to all the criterial characteristics except possible the form of inheritance. The last case showed such slow dark adaptation and such high terminal thresholds that a rod defect also was indicated.

It seems interesting that this atypical case agrees with the second form of defect postulated by E. Q. Adams in his bi-polar cell theory of color vision, while the typical case agrees with his first form.

BOOK ON ANCIENT POTTERY

Intrigued by the title, "Pottery of the Ancients," by Helen E. Stiles, we purchased this book and awaited its delivery with breathless expectancy. Alas, in spite of its excellent illustrations and the fine paper on which they are printed, we must say at once that we felt very much let down when we read the book. The fault may have been in large part our own. For the last two decades had revealed to us so much of the story of the painted-pottery cultures going back from one to two thousand years before the start of Egyptian history and still more before the beginning of anything which might be called civilization in China. Out of 114 pages, Miss Stiles devotes 20 to Egyptian pottery and 34 to Chinese porcelain. We cannot demand of every author that he conform to our conception of the word "ancient."

To be sure, two illustrations show Egyptian Predynastic pottery. But 7 of the 8 wares pictured are undistinguished by any explanatory legend; and there is nothing to show whether these are Tasian, Badarian, Merimbdian, Faiyumian, Amratian, Gerzian, or Semainian. Nor are any of these styles or their colors described. Turning to the Chinese section, one hunts in vain for any mention of the Yang Shao painted ware. Equally vainly does one look for any description or mention of the beautiful painted pottery of the Halafian culture (as found, for example, at Arpachiyah) or of Susa or other Highland-culture centers. Two pages are devoted to India; but there is no mention of the pottery of the Indus culture, of Amri, Chanhudaro, Mohenjo-Daro or Harappa. To Crete, with its great variety of pottery styles, 20 lines are devoted. None of the Neolithic Cretan, Minoan or Mycenaean (Greek and Cretan) styles are described or even mentioned. The nearest approach is: "They made ..... smaller vessels which were almost like the egg-shell porcelain of China" (Middle Minoan I light-on-dark ware was of an egg-shell thinness). It is not correct to say that "they (Cretan wares) have a decoration which is different from that of any other ancient country" unless we refer to minutiae of motives in ornamentation. Incidentally, even the writer of the Introduction, Professor C. M. Harder, was guilty of exaggeration when he wrote: "There have been potters in every land and in every age." There is no evidence for the production of pottery in roughly the first 99% of man's life on this earth.

A typical paragraph illustrates the style of the book. "'Water, water', has always been the cry of the people of Egypt. When the Nile rose and covered the land the people were blessed. Long ago they learned to control these floods, to build canals, and store up water for use during the dry seasons. Special vessels were made, not only to hold and pour the water, but to raise it from the river. These vessels, or pitchers, were attached to large wheels, which were turned and turned, for many weary hours, to raise the water which would quench the thirst of the land. Today at Qena thousands of pitchers are made which look exactly like those found in the rombs, and which were made thousands of years ago." We would be better informed by a description of the pitchers or by a picture of them labeled to distinguish them from others.

On page 31 we find: "A painted and polished red ware was made in Egypt, but was never as fine as the polished red-ware of the Romans." But there is no mention of the great Red-ware province centering in Anatolia (the pots actually were red, gray or black) which gave its name to an important civilization of the Near East whose wares mingled with the Painted-pottery fabrics to form important mixed cultures before the beginning of Egypt's history.

Within each section, the illustrations are well selected. But on page 26, for example, we find depicted 15 Egyptian vases of different periods; and there is no legend or explanatory matter to tell which is which. On page 23 is shown a bronze statue of the god Osiris. Since the book is devoted to pottery, the space would be better utilized for a clay product. Eighteen pages are devoted to the painted vases of the Greeks. Here the black-on-red and red-on-black styles are described. While some pictured vases are labeled "Athenian," and one "Corinthian," there are no descriptions of Proto-geometric, Geometric, Dipylon, Proto-Corinthian, Corinthian, Ionian (including Rhodian, etc.), or other wares by which we can distinguish them. On page 66, we find: "Painted pottery has been found in Greece which archaeologists feel sure was made before the 8th century B.C." We are not told that the Early Helladic III culture, dated reasonably surely at about 2400 B.C., had both light-on-dark and dark-on-light painted wares, that the Mycenaeans had a brown-on-buff painted ware, nor that Grecian Proto-Geometric ware may go back to the 12th century B.C.

If as a rule the book displays no familiarity with the work of the last decade or two, the single exception (which appeared in much popular literature) is an illustration and brief description of the vase from Tepe Gawra which bears the earliest known example of landscape painting. For this we thank the author, as for the fine illustrations. For the fine paper and printing we thank the publisher, E. P. Dutton & Co. (1938).

COLOR FOR AMERICA

Recently, "Color for America," published by The Glidden Company, Cleveland, Ohio, came to our attention. This beautifully executed 122-page loose-leaf-bound 14 by 16 1/2 inch book is a mint of useful information and suggestions for color arrangement accomplished with paint and other decorative materials. It is divided into six sections: Home exteriors (28 pages), home interiors (56 pages), farm buildings and equipment (6 pages), decorative studio service (10 pages), color harmony (and explanation of the three attributes of colors, 10 pages), color "prescriptions" (11 pages).

We shall turn to the fifth section first, as probably of most direct interest to our readers, though no more valuable than the other sections. Here the first page explains the conception of a hue cycle from the prismatic spectrum. The second

outlines the specification of the color of a chair in terms of "three dimensions." The following pages, all well illustrated in full color, explain hue, value and chroma (incidentally, acknowledging indebtedness to the Munsell Color Company). Complementary, neighboring, cool and warm hues and simultaneous contrast are illustrated in color and the "values" in a kitchen are explained. Section four gives many practical detailed suggestions for adequate use of color and paint in schools, hospitals, churches, apartments, hotels, restaurants, factories, offices, stores, theatres, dairies, laundries, bakeries and miscellaneous establishments, the whole being exemplified by 48 illustrations in full color. Each type is discussed under divisions; for example, under churches, the paragraphs are headed: exteriors, auditorium, chapels, classrooms, study, and recreation rooms.

The earlier sections give a great variety of illustrations arranged as already indicated. Frequently the exterior or interior is illustrated in five different color combinations. For example, page 6 illustrates a common type of shingle house with verandah in white with green roof and green and yellow accents. On page 7 is shown the same house in four other color combinations. On pages 38 to 41 are color-ensemble suggestions for combinations keyed to the floor coverings. One page and six illustrations are devoted to each of the ranges in the rose, blue, brown, and green ranges. The range, in terms of "popular names," is shown in a merging strip of color at the top; for example, the blue range shows Jewel Blue, French Blue, Pale Blue, Antique Blue, True Blue, Dusty Blue, Marine Blue and Royal Blue, all merging into one another. The color schemes are neatly simplified so as to stress essentials.

A portion of the second section deals with the "plus rooms." These are nursery, play room, utility room, farm work-room, music room, library-den, sewing room, recreation room, sun room, sun porch, apart-a-room (one-room apartment) and powder room. There are also suggestions for organized areas in the basement for work and play. Section six gives half a dozen alternate "prescriptions" for each type of house and room illustrated in the earlier sections; and at the end formulas for mixing ready-made paints to obtain other colors than those named on the cans.

The book has definitely a workmanlike atmosphere about it, and while attractively done, is not obviously embellished by "high-art" features. To four persons, including the Editor, who made judgments of the relative attractiveness of the various interiors and exteriors, the color schemes did not appear uniformly good. For example, on pages 42 and 43 are shown five decorative schemes for a living room with circular bay and niche seat. All four of us (three with considerable experience in this sort of judgment) rated the room in the upper right of page 43 quite good; but three of us gave low ratings to the same room decorated as shown on page 42. In the latter, the floor covering was about Munsell 9 R 5.7/4, and one chair was nearly the same color. The large window seat was in "bittersweet," 6.5 R 5/9. The ceiling was white, the walls 7 Y 8/4 (pistachio green); a chair was an olive green, 7.5 Y 4-5/4; the drapes were striped red and white, and accents 6.5 R 5/9. Perhaps our low rating was due to a feeling of a lack of unity, too much variety in color, a bordering on a three-ring circus type of competing attractions. Perhaps this effect was heightened by the unsuccessful attempt to reconcile the curved lines of the bay with the straight lines of the room, for example in the fireplace and drapes. There is no "echoing" of any given color around the room to tie the various elements together.

The same room, done in different colors on the upper right of page 43, we thought quite good. Here the carpet was about 7.5 R 4/5, the drapes and wall, containing a window through which a green landscape showed, were 7.5 R 6.3/4 ("dusty rose"); this

same color was seen on another wall with inset book shelves. The ceiling was off-white, the chairs 2.5 GY 6/3. The same room in a nearly complementary color scheme on the lower left of page 43 was given a fairly good rating.

Of the color-renderings of a common type of shingled house with veranda shown on pages 6 and 7, we unanimously gave that on the upper left corner of page 7 the highest rating. Here the main color was 7.5 YR 8/2 in sunlight and 7.5 YR 6.5/1.5 in shadow; the roof was 10 YR 5/3. The shades were 2.5 Y 7.5/5, the window trim dark green and dark brown. Here too a complementary scheme did not rate so well, perhaps because the very dark roof, 7.5 PB 2.5/2, gave the house a false top-heaviness which the actual house so painted would not have.

But these slight evidences of lack of uniformity in achieving pleasantness in rendering the color schemes should not be thought of as marring an excellent work, for which the Glidden Company and Mr. Carl R. Smedly (who signed the gift copy we saw) are to be heartily congratulated.

BIBLIOGRAPHY AND PATENTS

J. N. Aldington; Trans. Illum. Engin. Soc. (London) 7, 57-73 (1942); fluorescent light sources: characteristics and applications

Anon.; Ciba Rev. 1941, No. 37, 1355-6; dyed textiles: fluorescence in ultraviolet light

Anon.; Amer. Paint J. 27, No. 10, 54-5, 58, 60; better seeing through paint

Anon.; Amer. Paint & Oil Dealer 35, No. 1, 10-1 (Sept. 1942); light comes from paint pails -- profits too (effect of paint on eye strain, fatigue, accident rate, morale and production)

Anon.; Analyst 67, 164 (1942); spectrophotometric terms and symbols (report of a Panel appointed by the Publication Committee)

Anon.; Text. Colorist 64, 481-502 (1942); proposed trade-practice rules relating to the colorfastness of textiles and comments thereon

Anon.; Illum. Engin. 37, No. 4, (April 1942); Nomenclature and Photometric Standards Report

N. C. Beese & J. W. Marden; J. Opt. Soc. Amer. 32, 317-23 (June 1942); fatigue effect in luminescent materials

E. W. Beggs; Rayon Text. Monthly 23, 233-4 (1942); fluorescent lighting installations: maintenance

F. Birren; J. Opt. Soc. Amer. 32, 400-1 (July 1942); notes on the empirical use of color in industry (criticism of remark of P. Moon, same, p. 401

F. Bond; Amer. Photog. (& Photo Technique) 36, No. 12, 12-5 (Dec. 1942); color alone does not make a picture (plea for good color composition)

G. A. Boutry & J. Gillod; Compt. rend. 213, 235-8 (1941); simple recording spectrophotometer

C. S. Bridgman & K. U. Smith; Amer. J. Physiol. 136, 463-6 (1942); absolute threshold of vision in cat and man with observations on its relation to optic cortex

E. E. Broda & C. F. Goodeve; Proc. Roy. Soc. B 130, 217-25 (1941); the behavior of visual purple at low temperature

L. G. Brooker (to Eastman Kodak Co.); U. S. Pat. 2,282,116; dye-sensitized photographic silver-halide emulsion

L. G. S. Brooker, G. H. Keyes & W. W. Williams; J. Amer. Chem. Soc. 64, 199-210 (1942); color and constitution ; V, absorption of unsymmetrical cyanines; resonance as a basis for a classification of dyes

H. Buckley; Phys. Soc. Rept. Progr. Physics 8, 318-37 (1941); photometry (a progress report)

H. M. Burian; Arch. Ophthal. (Chicago) 26, 626-52 (1941); fusional movements in permanent stravismus: a study of the role of the central and peripheral retinal region in the act of binocular vision in squint

E. Burke, V. G. W. Harrison, J. Strachan, J. L. Bowen, J. L. King; Nature 149, 613, 732-3 (1942); reflection from paper (discussion and explanations of an effect, observed when white paper is strongly illuminated from one side, in which its general color is different for the two eyes when one or the other is closed)

B. H. Carroll & J. J. Checkak (to Eastman Kodak Co.); U. S. Pat. 2,294,892-3 (1942); photographic processes

Carroll & Davey (to Kodak Ltd.); Brit. Pat. 515,370 (1939); photographic process

H. C. Caveness, G. H. Satterfield & W. J. Dann; Arch. Ophthal. (NY) 25, 827-32 (1941); correlation biophotometer test results with vitamin-A content of human blood

R. B. Collins; Brit. Pats. 545,529 and 546,631 (1942); anti-halation or color-filter layers in photographic processes

E. Croen; Cotton (US) 106, No. 3, 63-5 (1942); luminous coated fabrics: production and use

C. M. Croft (to Celanese Corp. of America); U. S. Pat. 2,296,379 (1942); production of mottled effects on organic derivatives of cellulose

G. E. Davis & J. W. Woodrow; Rev. Sci. Instr. 13, 223-8 (1942); rapid photographic spectrophotometry

J. M. DeMent; "Fluorescent Chemicals and their Applications"; New York, 1942; pp. 240 + xiii; $4.25; review by J. A. R. in Paint Manuf. 12, 190-1 (Oct. 1942)

S. R. Detrick & C. R. Brandt (to E. I. Du Pont de Nemours & Co.); Brit. Pat. 547,411 (1942); manufacture of water-insoluble coloring matters, as vat dyes and phthalocyanine pigments, by turbulent-flow drowning in water of the acid-pasted material

W. H. Dooley; Text. Colorist 64, 325-30 (1942); importance of color (emotional, social, artistic, health, religious, industrial and business, chemical and biological, and salesmanship values)

C. R. Draper; Paint 12, 47 (1942); blackout paints

K. Dunlap & R. D. Loken; Science 95, 554 (1942); vitamin-A for color-blindness

K. Dunlap & R. D. Loken; Science 96, No. 2489, 251-2 (1942); anomalies of color vision

E. I. Du Pont de Nemours & Co.; Brit. Pat. 542,291 (1942); luminescent zinc sulfide pigments (containing copper)

E. I. Du Pont de Nemours & Co. and Imperial Chemical Industries Ltd.; Brit. Pat. 547,442 (1942); production of colored photographic images

Du Pont Film Manuf. Corp. (now Photo Products Dept., E. I. Du Pont de Nemours & Co.); Brit. Pat. 542,904 (1942); production of colored photographic images

A. J. Eikhoff & R. S. Hunter; Paint, Oil & Chem. Rev. 104, No. 13, 9-11, 41 (1942); measurement of the fading rate of paints

B. K. Elliott Co.; Brit. Pat. 539,066 (1941); sensitizing composition for blue-print paper

G. H. Ellis & E. Stanley (to Celanese Corp. of America); U. S. Pat. 2,278,540 (1942); textile materials delustered with titanium dioxide and a vanadium compound

C. Fader; Amer. Paint. J. 26, No. 44, 10 (Aug. 3, 1942); 27, No. 4, 46 (Oct. 26, 1942); 27, No. 6, 58 (Nov. 9, 1942); 27, No. 8, 10 (Nov. 23, 1942); 27, No. 10, 12 (Dec. 7, 1942); "This Colorful World" (series of illustrated news items involving color)

C. E. Ferree & G. Rand; J. Aviation Med. 13, No. 3, 193-200 (Sept. 1942); color and composition of light in relation to the blackout

F. P. Fischer & J. W. Wagenaar; Ophthalmologica 103, 129-42 (1942); binocular-vision tests

T. Förster; Z. physik. Chem. B 47, 245-68 (1940); quantum-mechanical calculations on the theory of organic dyes; I (absorption, etc.)

R. Fürth; Nature 149, 730 (1942); a new type of microphotometer

H. A. Gardner; Natl. Paint. Var. Lacq. Assoc. Circ. No. 634 (1942); protective concealment paints; camouflage; blackout; night guide

W. Garner; J. Soc. Dyers Col. 58, 65-71 (1942); color-matching: factors affecting judgment

T. R. P. Gibb Jr.; "Optical Methods of Chemical Analysis" (including chapters on the spectrophotometer, colorimeter, turbidimeter, etc.); McGraw-Hill Book Co., New York, 1942; 391 + xiv pages; $5.00

H. Goldmann; Ophthalmologica 103, 225-9 (1942); Stiles-Crawford effect

C. F. Goodeve, R. J. Lythgoe & E. E. Schneider; Proc. Roy. Soc. B 130, 380-95 (1942); photosensitivity of visual purple solutions and scotopic sensitivity of eye in ultraviolet

A. Henrici; Z. physik. Chem. B 47, 93-126 (1940) light absorption by unsaturated compounds in the near ultraviolet and visible due to electroncloud oscillations

A. J. Herbolsheimer; J. Aviation Med. 13, No. 3, 201-215 (Sept. 1942); color and color perception

K. F. Herzfeld; J. Chem. Physics 10, 508-20 (1942); absorption spectrum of some polymethine dyes (mathematical theory)

P. L. Hexter & R. Shepheard (to Arco Co.); U. S. Pat. 2,294,875 (1942); production of colors for camouflage of military equipment, comprising blending a combination of pigments of high infra-red reflectance with pigments of high infrared transmittance

C. S. Heys-Hallett; Proc. Phys. Soc. 54, pt. 2, 98 (1942); the apparent whiteness of cinema screens

L. Hogben; Nature 149, 735 (1942); chromatic behavior (of Vertebrata, Crustacea and Hirudinea; lecture)

C. Iddings; Amer. Paint. J. 26, No. 28, 62-5 (1942); luminous and fluorescent paints

Imperial Chemical Industries Ltd. & E. I. Du Pont de Nemours & Co.; Brit. Pat. 546,527 (1942); production of colored photographic images

R. W. Joerger; Amer. Dyestuff Rptr. 31, 183-5, 190 (1942); luminescent pigments: properties and uses

N. C. Jones; Chem. & Indus. 61, 352 (1942); light and colour in the factory