

Inter-Society Color Council *Newsletter*

NUMBER 202
September - October 1969

R. W. BURNHAM TO EDIT NEWS LETTER

The ISCC is, indeed, fortunate in having gained the services of R. W. Burnham as chairman of the Committee on Publications and editor of the N.L., beginning with the January-February 1970 issue. Dr. Burnham has only recently returned to the Council after several years of absence, but he is well-known to many members because of his long and successful career in color research. The N.L. will profit greatly from his experience and scholarship in the field of color.

As retiring editor, I urge all ISCC members to cooperate with the new editor in supplying news items and other material. In particular, if the chairmen of the various delegations were to provide finished or semi-finished copy frequently and regularly, the editor could devote his time primarily to editing.

Copy for the January-February 1970 and subsequent issues should be sent to:

Dr. R. W. Burnham
Research Laboratories
Bldg. 81
Eastman Kodak Company
Rochester, New York 14650

ELECTION OF OFFICERS AND DIRECTORS

Early in 1970, voting delegates will elect officers and directors to serve for two years. Three of the delegates from each of the Member-Bodies are eligible to vote. Ballots will be mailed from the secretary's office to the voting delegates.

Following are the nominees as presented by the Nominating Committee to the Board of Directors:

Vice-President and President-Elect: Richard S. Hunter, OSA, TAPPI
Secretary: Fred W. Billmeyer, Jr., SPE
Treasurer: Warren B. Reese, SMPTE
Directors: S. Leonard Davidson, FSPT
Robert L. Feller, AAPL

George B. Gardner, SPSE
Raymond Spilman, IDSA

The current Vice-President, Randall M. Hanes, APA, succeeds to the office of President, and the retiring President, Fred W. Billmeyer, Jr., becomes a Director.

Readers will note the absence from this list of two familiar names: Ralph M. Evans, who has served as Secretary since 1952, and Norman Macbeth, who has served as Treasurer since 1940. The Council owes much to these two retiring officers. A reception at the forthcoming Annual Meeting is planned as a token of appreciation for their exceptional service.

NEW MEMBERS

The following applications for individual membership were accepted at the meeting of the Board of Directors held in New York City on September 30, 1969.

Individual Members and their Particular Interests

Mr. William S. Armstrong
E. I. du Pont de Nemours & Co.
3500 Grays Ferry Avenue
Philadelphia, Pa. 19146
Color measurement; instrumental-mathematical methods of color matching and shading for paint; correlation of instrumental and visual appraisal of color and color differences.

Mr. Robert P. Bartholomew
711 S. Main St., Apt. 119B
Sycamore, Illinois 60178
Teaching, optical color effects, color trends, color as related to perception on products, fabrics, etc.
Appropriateness of color to form. Member CMG.

Dr. Neil Burditt
Geigy Chemical Corporation
Ardsley, N.Y. 10502
The science of color and its relation to colored products.

Mr. Thomas J. Castorina
704 S. Jefferson St.
Allentown, Pa. 18103
(1) Educate myself fully in the field (2) Application of color theory in general and instrumental color match-

ing specifically to establish a satisfactory means of obtaining commercial matches of our product.

Mr. Edward L. Cairns
104 Jackson Hall Rd.
Newark, Delaware 19711
Characterizing pigments from instrumental measurements for mathematical computation of color prediction.

Mr. G. Dapiran
23 Ballard St.
Yarraville, Victoria 3013
Australia
Color control and tolerances; computer recipe formulation of dyeing recipes.

Mr. William R. Dawes
P.O. Box 73496
Baton Rouge, La. 70807
Application of digital computers to color formulation and control; color measurement and specification.

Mr. Moler A. Duff, Jr.
408 E. Wall St.
Morrison, Illinois 61270
Color matching.

Mr. Zenon Elyjiw
374 Dorchester Rd.
Rochester, N.Y. 14610
Reproduction of color in printing. Member TAGA.

Mr. Janon F. Embury, Jr.
Swedesboro Rd.
Franklinville, N.J. 08322
Color measurement.

Mr. H. D. Farrar
Montgomery Ward
619 W. Chicago Avenue
Chicago, Illinois 60607
To minimize consumer frustration and mysteries with regard to the color subject. This goal is at mass market level through our corporate Home Furnishings program effectively reaching consumers through our home furnishings products and through our consumer education program, The Art of Interior Decorating. We presently have enrolled over 12,000 consumers.
Member CMG.

Mr. William A. Hamill
300 Pelham Road
New Rochelle, N.Y. 10805
Instrumental color matching. Relationship of pigment physical properties to color control. Member FSPT.

Miss Jane E. Hough
420 E. 72nd Street
New York, N.Y. 10021
As related to design of buildings, interiors -- human behavior and environment. Member AIA.

Mr. Brad Johnson
813 Stewart St.
Madison, Wisconsin 53713
To learn more about color to guide my marketing decisions.

Dr. Melvin R. Johnston
Dept. Food Technology
University of Tennessee
P.O. Box 1071
Knoxville, Tenn. 37901
Color in food. Member IFT.

Rev. Alfred A. Juliano
645 Drexel Avenue
Drexel Hill, Pa. 19026
The physical and psychophysical aspects of color; visual relationships and technology for dealing with same; development of visual systems for education; structures and patterns for aesthetic expression; photographic and other methods of color reproduction.

Mr. Alfred C. Lawson
Castle Company
1777 E. Henrietta Rd.
Rochester, N.Y. 14623
Spectral response and color integrity of surgical lights as applied to operating rooms and patient care.
Member IES.

Mr. Ernest H. Lehmann
544 Cooper Road
Rochester, N.Y. 14617
Color measurement, color difference, sensitometry.
Member SPSE.

Mr. Barry J. Meyers
3F Fletcher Road
Monsey, N.Y. 10952
All aspects with special emphasis on problems associated with pigmentation and dyeing of any and all substrates.

Mr. Sachie Minato
3-39-14 Sasazuka Shibuya-ku
Tokyo, Japan 151
Application of color, color measurement.

Mr. Robert R. St. John
Geigy Chemical Corporation
Ardsley, New York 10502
Instrumental analysis and color formulation.

Mr. Sidney Stecher
Brandeis University
Dept. of Psychology
Waltham, Mass. 02154
Psychophysical and physiological assessment of visual mechanisms subserving wavelength and luminance discrimination; simultaneous and successive contrast; Bezold-Brucke effect and spatial and temporal visual interaction effects. An additional interest is in color

instrumentation. Member APA, OSA.

Mr. Robert Tansendfreund
Sandoz Inc.
Route 10
Hanover, New Jersey 07936
Instrumental color control and computer color matching. Member AATCC.

Dr. Peter A. Taylor
14 Glenwood Rd., Apt. 208
Greenville, S.C. 29607
Color matching polymeric fibers. Developing new lines in synthetic fibers involving pigments.

Mr. Salvatore J. Teta
Neotec Instruments Inc.
640 Lofstrand Lane
Rockville, Md. 20850
Developing a full appreciation of color control and instigating equipment to insure color consistency.

Miss Sarah L. Wallace
8075 Jones Mill Road
Washington, D.C. 20015
Graphic arts and printing.

Mr. Robert C. Weiszmann
8311 27th Avenue
Kenosha, Wisconsin 53140
Matching, control, etc.

Mr. Hanson A. Williams, Jr.
518 Pier Avenue
Hermosa Beach, California 90254
Type R and Type C printing. Use of color films for high speed action -- sports -- Dye Transfer. Lighting and using color for industry.

Mr. Sanford Wurmfeld
18 Warren St.
New York, N.Y. 10007
Variations and control of human perceptual responses to color as the basis for the arts.

ANNUAL MEETING THEME: PSYCHOLOGY OF COLOR

The 1970 Annual Meeting of the ISCC will be held at the Statler Hilton in New York City on April 13 and 14. The general subject of the meeting will be the role of psychology in the field of color. Featured will be presentations by Dr. Harry Helson and Dr. John Ott, a symposium dealing with the role of science in art and design, and an illustrated lecture by Dr. R. W. Burnham.

The tentative schedule of events is as follows:

Monday, April 13

Registration -- Ivy Suite Hallway -- 8:00 a.m.

Problems Subcommittees -- Pennsylvania, Cornell, Dartmouth, Washington, Hartford Rooms -- 9:00-12:00 a.m.

Problems Subcommittees -- rooms as above -- 1:00-3:00 p.m.

Presentation by Dr. John Ott -- Georgian Room -- 3:00-5:00 p.m.

Reception for retiring Secretary and Treasurer -- Ivy Suite -- 5:30-7:30 p.m.

Tuesday, April 14

Registration -- Skytop Foyer -- 8:00 a.m.

Business Meeting -- Skytop Foyer -- 9:00-11:00 a.m.

Research report by Dr. Harry Helson -- Skytop Foyer -- 11:00-12:00 a.m.

Symposium -- Skytop Foyer -- 2:00-5:00 p.m.

Pre-Banquet Reception -- Ivy Suite -- 6:00-7:00 p.m.

Banquet -- Georgian Room -- 7:00-10:00 p.m.

At the banquet, Dr. R. W. Burnham will present an illustrated lecture entitled "More to Color Than Meets the Eye," and he will also be chairman for the symposium. Dr. Helson's report will feature studies of color harmony. Dr. Ott's material will include examples of his work in time-lapse photography.

The reception on Monday will honor George Gardner as well as the retiring Secretary and the retiring Treasurer. Ralph Evans and Norman Macbeth have served long and well in official capacities; George Gardner has given equally devoted and effective service, largely in unofficial roles.

As she has so capably before, Midge Wilson will handle the decorations again this year.

S. LEONARD DAVIDSON RECEIVES ARMIN J. BRUNING AWARD

At the 1969 Annual Meeting of the Federation of Societies for Paint Technology, the Armin J. Bruning Award was presented to S. Leonard Davidson, Assistant Technical Director of the Pigment and Chemical Division, National Lead Co. This award -- "for the most outstanding contribution to the science of color in the field of coatings technology" -- was established in 1962 by the Masury Paint Co. in honor of Armin J. Bruning, who created the Bruning Colorimeter.

Mr. Davidson began his career in paint chemistry in the San Francisco laboratory of National Lead Co. in 1943. One year later he became chief chemist of the Pacific Coast branch and served in this capacity until he was transferred in 1951 to Perth Amboy, N.J.

He was President of the Golden Gate Society in 1950 and President of the New York Society in 1965. He received the latter's Kienle and PaVaC Awards in 1960 and 1968, respectively.

In 1954 he was Chairman of the New York Society's Technical Subcommittee on "Color Matching in Production" which prepared the Annual Meeting paper, "A Color Matching Box." Later, he initiated the evening color courses sponsored by the New York Society and served as instructor for several years.

Mr. Davidson has served as Chairman of the Federation's Mattiello Lecture, Host, and Inter-Society Color Council Committees, the latter for six years. He was Treasurer of the Federation in 1968-69 and is the President-Elect for 1969-70.

ISCC WILLIAMSBURG CONFERENCE ON THE OPTIMUM REPRODUCTION OF COLOR

Call for papers

How should the colors in a color reproduction be related to those in the original, bearing in mind the inherent limitations of the reproduction processes? About five invited papers on this subject will be presented at the 1971 ISCC Williamsburg Conference, to be held in Williamsburg, Va., Jan. 31 to Feb. 3. Contributed papers on the subject will be preprinted and distributed to registrants before the conference, and an opportunity will be given to discuss them at the conference. We hope to publish the papers afterwards in a single volume. If you wish to contribute to this important but neglected subject, let us know the probable title and provide an abstract, as soon as possible. Papers should be ready for publication by January, 1971.

Address correspondence to either of the co-chairmen:

W. L. Rhodes, Principal Scientist
Xerox Research Laboratories
Xerox Square
Rochester, New York 14603

or

J. A. C. Yule, Research Associate
Graphic Arts Research Center
Rochester Institute of Technology
1 Lomb Memorial Drive
Rochester, New York 14623

Scope and Purpose of the Conference

Millions of dollars have been spent on the improvement of color reproduction processes, to make them more accurate or more pleasing, but relatively little effort has gone into finding out what we are aiming at -- what relationship between original and reproduction produces the best reproduction, taking into account the inherent limitations in color gamut, changes in size, viewing conditions, sharpness, etc., of the reproduction processes. Considering these limitations, we do not know what the optimum relationship is, even though this is the basic question in designing color reproduction processes. In designing a color scanner or a color TV system, for example, the electronic engineers could probably give us almost anything we ask for in the way of color reproduction, but we don't know what to ask for.

Perhaps one reason why this work has been neglected is that the financial return from it is indirect. But the cost of not knowing the answers, in terms of past and future misdirected effort, must be enormous.

The object of the 1971 ISCC Conference on ORC (Optimum Reproduction of Color) is to share our knowledge on this basic question, and to encourage further work on it. Papers at this conference will be limited to the relationship between the original and the reproduction: factors such as size, sharpness, and viewing conditions, and how these affect reproduction quality. They include all types of color reproduction -- color photographs of live scenes (still or motion pictures), printed reproductions of color photographs or paintings, color television, and so on.

COLOR FORUM AT NPVLA MEETING

At the Annual Meeting of the National Paint, Varnish, and Lacquer Association on Oct. 28 in Chicago, Ill., a Forum on "Color -- Fact or Fiction?" was presented by the Trade Sales Marketing Committee. Harold W. Miles, Chairman of the Committee, served as moderator. Carl J. Allen, Color Specialist, General Electric, Inc., spoke on the subject: "New Light Sources and Their Effect on Color." Professor I. A. Balinkin, University of Cincinnati, discussed "Color Phenomena."

PAPERS ON COLOR AT 1969 OSA MEETING

At the 1969 Annual Meeting of the Optical Society of America, 21-24 October, the following papers on color were scheduled for presentation:

"Interference Filters for Color Measurement" by K. D. Chickering, Kollmorgen Corp.

"Highly Saturated-Color Stimuli Produced by Combining Subjective Color and Physical Color" by James F. Butterfield, Color-Tel Corp.

"Color-Match Classifications Assessed in Terms of Variable Parameters" by I. Nimeroff, National Bureau of Standards.

"Brightness Contrast: Does It Contribute to Chromatic Border Contrast?" by P. K. Kaiser, York Univ. (Canada).

"Test of a Vector Model for Near-Threshold Luminance Additivity" by Howard R. Lodge, Indiana Univ.

"Similarities Between Congenital Tritan Defects and Dominant Optic-Nerve Atrophy: Coincidence or Identity?" by Alex. E. Krill, Univ. of Chicago, Eye Research Labs.

"Deuteranopic Convergence Point" by I. Nimeroff, National Bureau of Standards.

THE COLOUR GROUP (GREAT BRITAIN)

Science meetings scheduled for 1969-70:

5 November -- Measurement of the Colour Sequences in the Positive Visual After-image -- Dr. C. A. Padgham.

Lop-sided Ellipses of Colour Sensitivity -- Dr. B. H. Crawford.

3 December -- The Ceramic Colour Standards -- Dr. F. J. J. Clarke, G. E. V. Lambert, F. Malkin.

7 January -- Joint meeting with S.D.C. & O.C.C.A. London sections -- Instrumental Shade Passing -- K. McLaren.

Visual and Instrumental Colour Tolerances in Plastics -- R. Best and Miss S. R. Williams.

4 February -- Colour in Situ -- Mrs. P. Brooke, Mrs. P. Pirie, D. Phillips, M. J. Thomas.

4 March -- Two New Colour Measuring Instruments -- speaker to be arranged.

8 April -- Some Other Turbid-medium Theories -- S. Orchard

A paper from British Titan Products Co., Ltd. -- speaker to be arranged.

6 May -- Annual General Meeting

Fourth Newton Lecture -- G. J. Chamberlin

Colour Group Dinner

Scottish Section

Nov./Dec. -- Fluorescent Pigments -- speaker to be arranged.

8 May -- Annual General Meeting and Dinner, Glasgow University.

Northern Section

15 October -- Colour Photography -- E. MacDonald

10 December -- Ceramics -- speaker to be arranged.

11 February -- The Use of Dyes in Food -- Dr. H. E. Nursten

11 March -- Problems in Colour Measurement -- Dr. D. Patterson

Colour Measuring Instruments at Leeds University.

15 April -- Colour in Cosmetics -- Dr. T. J. Elliott

Midlands Section

9 October -- The Technique of Coloration for Stretch Cloths -- J. Keaton

13 November -- Is Your Colorimeter Gathering Dust? -- Miss S. R. Williams

12 February -- Colour Measurement and Visual Assessments of Knitted Fabrics -- S. M. Jaeckel

12 March -- The Use of Ceramic Standards in Colorimetry -- F. Malkin

JOINT MEETING OF THE INTER-SOCIETY COLOR COUNCIL AND THE COLOUR GROUP (GREAT BRITAIN) IMPERIAL COLLEGE, LONDON, 17 JUNE 1969

Reported by Charles A. Padgham, The City University

Applied Optics, 1969, Vol. 8

Since a number of ISCC members were visiting Great Britain on their way home from the AIC Conference in Sweden, the opportunity was taken by the British Colour Group to entertain them on a trip by motor launch on the River Thames in the evening of 16 June and to hold an all-day meeting with them on the following day in London.

The morning session (chaired by R. A. Weale, Inst. Ophthalmology, Chairman of the Colour Group) was divided into two parts, the first dealing with color differences, and the second with instrumentation. Since there were a good number of speakers it was decided to limit each presentation to approximately 5 min and to leave ample time for discussion. This proved an

excellent arrangement, and the discussions were certainly most stimulating. Accounts of recent work was given; some of the subject matter was an extension of that discussed in Stockholm and some was new.

K. McLaren, CIE, spoke on the precision of visual color matches and pointed out that instrumental methods are more precise than visual judgments. He also suggested that factors converting color difference units to equal CIE 1964 units would be useful. J. Moir Courtaulds spoke of work in which pairs of samples were made up, each with 10 NBS units difference. Nevertheless they could be ranked visually into grades of color difference. F. T. Simon Climson gave a contribution on industrial color control by means of feeding data to an on-site computer. He pointed out that if one has a perfectly controlled process there is no need for color control, but in a normal situation there is a need. This is augmented by the lack of trained operators and colorists. A great deal of money can be saved by objective control, although the need for adequate sampling was stressed.

R. E. Derby, Jr., Derby Co., spoke on the complexities of assessing textile color differences especially when dealing with large bulk orders for cloth. No satisfactory factor had been found for textiles for combining the chromaticity and lightness differences; he found that it was necessary to consider each term separately. Many members participated in the very lively discussion which followed. It was clear that a large number of different color difference formulae were in use by different people. Some were more valuable than others depending upon the particular problem. G. Wyszeccki NRCC admirably summed up the situation by stating that results from none of the formulae could easily be converted into another. The CIE in 1964 had attempted to produce a formula for color difference which was acceptable to everyone. It was not necessarily a better formula, but it was an attempt to obtain uniformity of practice, which would be a great advantage to all, if universally used.

The second half of the morning session, on instrumentation, was opened by A. E. Cutler, Redifon, with an account of the Redifon color mixture computer -- a match prediction system. This had several desirable features such as no warming-up period, great reliability and consistency, axially symmetrical optics with no orientation problems. It also included cost prediction facilities. G. P. Bentley, Kollmorgen, emphasized that instruments of the future must have great versatility and high speed to be able to deal with different color difference formulas, fluorescence, goniospectrophotometry, polarization, etc. The technology is becoming available to enable the measurements to be made, but not for the manufacturing processes to be adjusted at the required speed.

R. M. Johnston, Kollmorgen, then described the techniques, problems, and instrumentation involved in goniospectrophotometric measurements and

stressed the need for clarification of terminology. Some suggestions were put forward for consideration, although the extreme length of some terms was pointed out. The session was brought to a close with a description by F. W. Billmeyer, Jr., RPI of some interesting measurements on metallized paints which were goniochromatic.

After lunch the program -- mainly concerned with color vision -- was chaired by Professor Billmeyer, President of the ISCC. After he presented greetings from the Color Council and given a short history of it, D. Palmer Inst. Ophthalmology opened with an account of a single system of large-field photometry which is applicable over the photopic, mesopic, and scotopic regions. C. A. Padgham City University recounted measurements of the Helmholtz-Kohlrausch effect by means of direct estimation of brightness. This is the increase of apparent brightness at constant luminance as saturation is increased. Saturated blues showed a large increase of apparent brightness compared with achromatic fields of the same luminance, while saturated reds and greens showed a smaller increase. Some colored slides were shown to demonstrate the effect. C. J. Bartleson, Kollmorgen, next spoke of some haploscopic observations employing a Macbeth illuminometer, which explained the change of exponent occurring when directly scaling brightness when the stimulus is of greater luminance than the surround.

S. Leon Guth, Indiana U., described his work on the failure of the additivity law for luminance, and explained his vector model which could be used in place of the additivity law at threshold levels. The reason for the failure of additivity was suggested as arising from the opponent color mechanisms and the nonopponent luminosity mechanism in the neuron layers in the retina.

R. S. Hunter Hunter Associates talked about the various lightness and chromatic weighting factors in a number of color difference formulae. Finally, J. J. Shepherd, Rand Corp., spoke of the enhancement of biomedical images with pseudo-color techniques and showed some interesting slides to illustrate this valuable technique.

This was in fact the second joint meeting of the two societies in London; the first was during the Maxwell centenary in 1961. It was so eminently successful and enjoyable that one can only hope the next joint meeting will not be too long hence.

BOOK REVIEWS

THE NEW AMERICAN HERITAGE DICTIONARY

THE AMERICAN HERITAGE DICTIONARY of the English Language, edited by William Morris. American Heritage and Houghton Mifflin, 1550 + L pages, illus-

trated, 1969. Price: \$7.95 plain-edged, \$8.95 thumb-indexed, \$12.50 deluxe.

They call it their most important product ever, this new American Heritage Dictionary of the English Language. And indeed it may be. Certainly the comments and reviews in TIME, LIFE, the NEW YORK TIMES, and the SATURDAY REVIEW have been spirited, although all have been so intrigued by the opinions of the Usage Panel that are included as a guide to current American standards of "good English," that most of them fail to make note of another of its important contributions, the definitions and explanation of "the latest findings of science and devices of technology." This includes the unambiguous definition of color names in terms of ISCC-NBS word descriptions, the definition of basic color names and terms, and a reference article on the ISCC-NBS method that is set in the column and margin opposite the column which carries the word color.

In addition to 104 members of the Usage Panel, the services of a wide group of consultants were obtained: in the Arts and Humanities, Life Sciences, Physical Sciences and Mathematics, Practical and Applied Sciences, Religion, and Social Sciences. This reviewer was consultant for color technology, so naturally is interested in the whole project, as well as in the part restricted to color.

The editors' aim was to phrase definitions in concise, lucid prose. They have quite eliminated the usual "dictionary shorthand," and, except for a few obvious abbreviations, have spelled out all definitions. The book begins with a series of articles contributed by several distinguished linguists that provides a wonderful introduction to a study of the English language. The series starts with a brief history of the language and ends with a description of the application of computers to linguistic analyses and lexicography. The pages of the book are large, with wide margins which contain most of the many inviting illustrations.

From the Saturday Review review I learn that there are 10,000 biographical and geographical entries contained in the 155,000 total of terms, "many of them newcomers of Negro, hippie and Yiddish invention." Their review begins, "If word-watching's your bag". . .this dictionary. . ."affords the most with-it ball of the year."!!

As for color, the original plan -- back in 1964 -- was for an unabridged volume that would be illustrated in color, complete with accurately produced color charts. After working on this basis for more than a year, word came in March, 1966, of two things -- first, that publication of the dictionaries would be in partnership with Houghton Mifflin, and second, that a shorter edition would be published before any large unabridged dictionary. This meant a rather drastic shortening of the list of color names, as well as many changes necessitated by the omission of a color chart to which

the name definitions were to be keyed. In looking over the result of the editing that was done, on the whole I am well pleased. Most adjective combination names are omitted, and many of the less usual terms. Yet in the a's we still have color as the prime definition for alice-blue, amaranth, amber, apple green, auburn, and azure, with second or third place definitions for color of alabaster, American Beauty, amethyst, apricot, aqua, aquamarine. Color definitions are not included for such words as acacia, acajou, aconite, acorn, agate, etc., but their primary definitions make clear what the color association might be. Also, if anyone wishes to find a color definition for these words, he will be referred to NBS Circular 553 in the color article that describes the ISCC-NBS method.

As for color names such as red, yellow, green, blue, purple, white, black (under n.), scarlet, brown, cyan, -- all have primary color definitions, while color is the 3rd, 4th, or 5th meaning for such words as orange, violet, pink, olive. For the most part, definitions are given as submitted, with a reference to "See Color." However, there has been some editing, not always in the direction of clarity, or in parallel with other terms already defined. I note, for example, that while cyan remains a "greenish blue, one of the subtractive color primaries, See color: primary colors" (the original entry of "minus-red" was deleted), the definition of the term magenta (whose primary definition is "1. A coal-tar dye, fuchsin (see)") deleted part of the color definition supplied, thus excluding reference to the fact that magenta is also one of the subtractive color-primaries, minus-green. Nor is reference given to "See primary colors," although under primary colors magenta remains (as it should) one of the three subtractive primaries: magenta, yellow, cyan. There are other examples of this sort, but for the most part the color definitions are clearly given as provided by the consultant. A few non-color definitions given for words used as color names in the ISCC-NBS dictionary are quite revealing, as acajou, which I did not know meant mahogany, or aconite, which is "any plant of the genus Aconitum; the monkshood," that is, "having hooded flowers of various colors." And so we could go on. The only term that I have so far found missing of those submitted which I think truly regrettable, is metamers. Nor is metamerism included. This is such a useful and important concept in color today that I am sorry it was omitted. (Perhaps the computer threw it out of an abridged edition!)

But these are minor criticisms. It is an excellent dictionary. Having worked on this one, and others before it, I can appreciate the differences intended in different dictionaries, and this one I think fulfills its purpose admirably. And its price will astonish you in this day of high prices for books. I have already reserved several copies for the young fry in my own family, and expect the parents to find it as useful and as interesting as the children should.

Reviewed by Dorothy Nickerson

TRILOGY BY BIRREN

Van Nostrand Reinhold Company released on October 15, 1969, three small volumes on color, available separately or as a boxed set, that should prove a welcome addition to the color literature, particularly for the novice, or for someone about to enter the field of art or art application. They should be included also on the bookshelves of any color scientist who has an interest in anything more than the strictest applications of mathematical colorimetry. The publishers call the set a Basic Color Library with books by Munsell, Ostwald, and Birren, the first two edited and with an introduction or foreword by Faber Birren.

A GRAMMAR OF COLOR, 96 pages, illustrated, is "a basic treatise on the color system of Albert H. Munsell," edited and with an introduction by Faber Birren. It is based largely on a volume of the same title issued in 1921 by the Strathmore Paper Company in which the introduction, written in 1918, was by Munsell and the explanatory text, plus a series of delightful diagrams, was by T. M. Cleland. These Mr. Birren has introduced, with a brief sketch of Prof. Munsell's life (including a black and white reproduction of his 1885 prize winning painting, *The Ascension of Elijah*), followed by chapters on the art of harmony as suggested by Munsell, the science of identification, and a brief list of references. Color plates illustrate, in better design than the original book, a number of color combinations suggested by the Munsell discussions of harmony. (Plate II shows a peculiar lapse at 9/2 and 8/6; in my copy these are considerably greener than the more reddish yellow of the remainder of the chart. D.N.)

THE COLOR PRIMER, 96 pages, illustrated, is a complete, liberally translated and edited reprinting of Wilhelm Ostwald's 1916 *DIE FARBENFIBEL* including all of the black-and-white and color illustrations more or less intact. This treatise, not previously published in English (although translated by Mrs. J. E. O. Munsell in the early 1920s, and later by Egbert Jacobson with the expressed intention in the early 1940s of publishing), is preceded by a foreword, a brief history of Ostwald, and an interesting and well illustrated presentation of a history of color systems by Faber Birren, one that includes diagrams of the color solids of Mayer (1758), Lambert (1772), Runge (1810), Chevreul (1839), vonBezold (1876), Rood (1879), Munsell (1900), Höpfler (1897). The Ostwald work is followed by an evaluation by Birren, a brief list of references in English, a group of color plates, each of which is discussed in some detail. (Note: A 68-item bibliography of Ostwald's books, and discussions of them in German and English will be found on pages 360-1 of the July 1944 *Journal of the Optical Society of America*.) The Primer itself discusses, in six chapters, the achromatic colors, the chromatic colors, light clear and dark clear colors, the muted colors, the color solid, and the harmony of colors.

PRINCIPLES OF COLOR, by Faber Birren, 96 pages, illustrated, is "a review of past traditions and modern theories of color harmony." In the introduction the publishers indicate that this is meant to be an elementary book. It begins with a chapter on color circles and how leading colorists of the past have sought to bring order out of chaos, then proceeds to a discussion of traditional principles of color harmony, and how they were accepted in the past, going on to advanced principles that venture in new directions. A brief history of Faber Birren's background tells us that he was born in 1900, his mother a skilled musician and his father a successful painter. He attended the Art Institute of Chicago, and at the University of Chicago attended Walter Sargent's course on color theory in the School of Education. It was here that his interest in color began. In the years since he has written over a score of books, and several hundred articles for general, professional, and scientific publications. His first book, *COLOR IN VISION*, is dated 1928. An informative account of his life is given by a calendar of the books on color that he has written since then.

In the history of color circles he goes back to mention the early Greeks and their concepts, then daVinci, Newton (c. 1666), LeBlon (1756), Moses Harris (1766), Schiffermuller (1772), Goethe (1810), Chevreul (1839), Charles Blanc (1873), Hayter (1826), Rood (1879), vonBezold (1876), Michel Jacobs (1923), Munsell (1898), Hering (1878), Ostwald (1916). All of these circles, Newton to Ostwald, are illustrated. There is discussion of circles based on red-yellow-blue pigment primaries, of circles based on red-green-blue light primaries, and of others such as the Hering, based on a circle of four unitary hues. The author points out that the Munsell circle traces to the primaries of the physicist, while Hering's theories "became more or less the basis of the color system of Wilhelm Ostwald." Birren uses a red, yellow, blue color circle, following a tradition which "with certain modifications -- is still a sound one." But, as he points out: "All color circles for the most part are satisfactory for color harmony purposes, the red-yellow-blue, the Munsell circle, the Ostwald circle, or any other." Chapters that follow cover the harmony of colors and of color forms, the new perception in which the author points to very interesting work in portraying the effects of luster, iridescence, luminosity, transparency, and chromatic light. The last pages consist of several color plates and their descriptions, all very interesting.

The three books provide good primers, good introductions particularly for art-oriented students, to the work of Birren, Munsell, and Ostwald. While there are occasional inconsistencies, nevertheless, in this reviewer's opinion, Faber Birren has done a great service to the color field in these past several years by editing, republishing, and commenting on historical color material with which many colorists are quite unfamiliar, particularly with original works. He is

responsible for a private, limited facsimile edition in 1963 of the Moses Harris 1766 NATURAL SYSTEM OF COLOURS, for a limited edition in 1965 of Thomas Sully's 1873 HINTS TO YOUNG PAINTERS, and in 1967 for the magnificent volume of Chevreul, based on the first English edition of 1854 as translated from the first French edition of 1839 of his PRINCIPLES OF HARMONY AND CONTRAST OF COLORS and Their Application to the Arts (see review, News Letter #197, Nov.-Dec. 1968). This is in addition to a long list of his own books which become increasingly useful as the years go by. He is a successful color consultant and undoubtedly the best known author of books on color in this generation, as Luckiesh was in the last! Most of his books are aimed at the art-oriented student and the practitioners of applied arts. (Books on color in the science field have usually been limited to one or two per author, although extensive publication has been made by many in these fields in the periodical literature.) Not the least among Faber Birren's contributions has been his keen sense of historical perspective that has led him to see that useful and interesting volumes of past generations are made newly available to those of the present era. It is from the past that we learn how best to work for the future.

D.N.

1969 BASIC COLOR LIBRARY, 3 VOLUMES

BIRREN, PRINCIPLES OF COLOR, by Faber Birren, 96 pages, illus. (red binding)

MUNSELL, A GRAMMAR OF COLOR, edited and with an introduction by Faber Birren, 96 pages, illus. (green binding)

OSTWALD, THE COLOR PRIMER, edited and with a foreword by Faber Birren, 96 pages, illus. (blue binding)

Available in boxed set uniformly designed, \$18.50, or separately at \$6.95 each, Van Nostrand Reinhold Co., New York, N.Y.

MISCELLANY

"You Just Can't Get C-128 Anymore" by Rudolph R. Spik. (From Martin Levin's "Phoenix Nest," SATURDAY REVIEW; Copyright 1969 Saturday Review, Inc.)

YOU JUST CAN'T GET C-128 ANYMORE

As part of my personal clean-up/paint-up campaign this spring, I headed toward my favorite paint store with visions of transforming my bedroom with two fresh coats of my favorite color, C-128. Rodgers and Hart may have their blue room, but I have my C-128

room where I can smoke my pipe in peace and quiet color harmony.

"We don't handle C-128 anymore," said the clerk, ruining my visions of earning a two-page spread in Paint and Wallpaper Dealers Journal complete with some smashing black and white "before" photographs and some four-color "after" pictures. "They don't make C-128 anymore."

How can a person express his true self without the help of C-128? Now, C-135 is almost me and M-68 is a passable approximation, but it took a great deal of self-knowledge, as they say in the house-beautiful magazines, to settle for C-135.

"We don't carry C-135 anymore, either."

"M-68?"

"No M-68. In fact, we don't carry any paints with numerical designations anymore. Our color consultants tell us that people don't like to buy colors identified by numbers. They prefer descriptive names, names that indicate the true character of the colors."

"Try me," I said, my devotion to C-128 unshaken.

"Well, we've got Marsh Mist, Water Sprite, Falling Water, Ice Crystal, and Sea Bubble in the light greens."

I told him he hadn't come close to the real me, yet.

"French Endive, Woodland Fern, and Grotto Green in the darker greens."

"Still not me."

"Solar Glow, Sun Dance, Lemon Ice, Grapefruit, and Martini in the yellows."

He was getting closer.

"Sandman, Nutmeat, Blanched Almond, Onion Seed, Old Cork, and Champagne in the beiges."

He was getting even closer.

"Stick Candy!"

Colder, colder.

"Raffia, Poplar Green, Honey Amber, and Tart Green in the yellow-greens. Firecracker, Sour Cherry, Red Raspberry in the reds."

He almost got to me with Grape Glacé, but when you've lived with and loved C-128 for years, you don't sell out cheap.

"Cliff Stone? Cactus Sprout? Pickle Chip?" He was groping.

I just couldn't get used to the idea of describing rather than numbering colors. Somehow the names didn't conjure up real colors the way M-45 and even Z-17 do. It just wasn't decent.

"Spanish Brass?"

I turned to leave.

"Uh," he signed in a conspiratorial tone. "Why not give Tender Sprout a gry?" The words came hard: "It's . . . really . . . C-128. But don't tell anyone else, anyone. We don't want the market research boys down on us, do we?"

I'm pausing to write this, three walls of my bedroom freshly coated with Tender Sprout. I've got to get this happiness down on paper. After all, a tender sprout by any other name is still C-128.

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