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INTER-SOCIETY COLOR COUNCIL

NEWS LETTER

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A STORY ABOUT THE INTER-SOCIETY COLOR COUNCIL

This brief story about the Inter-Society Color Council is intended for the new member who wants to know its historical background, its aims and purposes, and its accomplishments. For the new and old member, it is also a reminder of their privileges and duties.

Aims and Purposes

The aims and purposes of the Inter-Society Color Council, founded in 1931 and now an organization of international repute, are to stimulate and coordinate the work being done by various societies, organizations and associations leading to the standardization, description and specification of color, and to promote the practical application of these results to the color problems arising in science, art and industry.

Membership

The By-Laws of the Council (incorporated in the state of New York) state, "Subject to the laws of the state of New York, the ultimate general authority and responsibility for the policies and affairs of the Council shall be vested in the member-bodies acting through their voting delegates and the Board of Directors." A member-body may be any non-profit society, association, or organization of national scope interested in color and desirous of participating in the activities of the Council for the furtherance of its aims and purposes. Each is represented by ten delegates. The chairman and two additional delegates are entitled to vote. It is the duty of the chairman to report to the member-body all proceedings of the Council which are of interest to the member-body and to transmit any reports of the Council which should appear in the publications of the member-body. All delegates should bring to the Council any problems in the field of color of particular interest to his member-body. At least one meeting a year should be held by each delegation probably at a meeting of its member-body. Reports of such meetings should be filed with the ISCC Secretary, who will publish them with the minutes of the Annual Meeting. The Council also provides for membership of individuals who desire to support the work of the Council on color. These individuals, unless they also represent one of the member-bodies may not vote or hold office. Their association in the Council's work has been found to be very rewarding.

By the end of 1964, twenty-nine member-bodies were represented in the Inter-Society Color Council. These member-body societies are as follows:

American Artists' Professional League
American Association of Textile Chemists and Colorists
American Ceramic Society, Incorporated
The American Institute of Architects
American Institute of Interior Designers
American Oil Chemists' Society
American Psychological Association
American Society for Testing and Materials
American Society of Industrial Designers
The Color Association of the United States, Incorporated
Dry Color Manufacturers' Association
Federation of Societies for Paint Technology
Folding Paper Box Association of America
Gravure Technical Association
Illuminating Engineering Society
Industrial Designers Institute
National Association of Printing Ink Makers, Incorporated
National Paint, Varnish, and Lacquer Association, Incorporated
National Society of Interior Designers, Incorporated
Optical Society of America
Package Designers' Council
Packaging Institute
Research and Engineering Council of the Graphic Arts Industry, Incorporated
Society of Motion Picture and Television Engineers
Society of Plastics Engineers, Incorporated
Tanners' Council of America, Incorporated
Technical Association of the Graphic Arts
Technical Association of the Pulp and Paper Industry

Milestones in Council History

The Inter-Society Color Council had its beginnings in a "color conference" held in Washington, May 14, 1930. This color conference was called by Prof. E. N. Gathercoal of the University of Illinois College of Pharmacy in connection with the decennial meeting of the National Formulary 1929 Revision Committee of the U. S. Pharmacopoeia. This committee needed help in the selection of color names for describing drugs and drug products in the U. S. Pharmacopoeia. This "color conference" aroused so much interest that the Executive Committee of the Optical Society of America adopted a resolution on October 30, 1930 that "the need for better organization of those interested in the description or specification of color which found expression at the color conference...can be met by the formation of a joint council consisting of officially designated representatives of the several national societies and associations interested in the description and specification of color." On February 26, 1931 at the Museum of Science and Industry in New York City, forty-seven persons -- thirty-one of them representing fourteen national associations and sixteen of them interested individuals -- met in a preliminary conference to discuss this resolution. Chairman of this first preorganization committee was Royal Bailey Farnum. Lloyd A. Jones chaired the next sessions

until the election of the first Inter-Society Color Council Chairman, Prof. E. N. Gathercoal. The decision was made to form the Inter-Society Color Council at the first meeting held at the Museum of Science and Industry in New York City September 21, 1931.

The preliminary conference on organization of an Inter-Society committee on color specification held on February 26, 1931 preceding the first meeting of the Inter-Society Color Council passed as its first resolution the principle of membership:

> Resolved: It is the sense of the meeting that an Inter-Society Color Council be formed composed of delegates from national societies and associations interested in the standardization, description and specification of color.

The first meeting held on September 21, 1931 recommended expansion of the membership provisions to include the individuals vitally interested in the activities of the Council who may not be designated as delegates by the affiliated societies or associations. It should be noted that the principles of membership adopted in 1931 still hold today. At the fourth annual meeting on February 21, 1935 articles of organization and procedures were adopted. At that time there were nine member-bodies with 30 official delegates.

Another milestone in Council history was accomplished on October 14, 1953 when the Inter-Society Color Council was incorporated. The incorporation and the adoption of By-Laws did not change the primary objectives of the Council. Equipped with sound principles of organization; an imposing list of unsolved color problems; committees taking aggressive action on problems of terminology, specification, and measurement; and an established Newsletter publication; the Council could be considered to have come of age.

In 1961 the By-Laws were revised in keeping with the requirements of a growing national organization. It should be noted that the By-Laws are in essence supplemented by a statement from a 1944 Report of an Executive Committee covering the Inter-Society Color Council organization and functions as revised in 1954. The purpose of this statement was to review the procedures which had been developed during the operation of the Council since its inception in 1931. This was done in the hope that the statement would prove helpful in guiding future Inter-Society Color activities and responsibilities. It is recommended that the By-Laws of the Inter-Society Color Council and its attached Policy Statement be read for detailed description of its organization and functions.

Ground Plan for the Council

To understand and interpret today's activities, let us return to the beginning of the Council. Professor E. N. Gathercoal at the completion of the first full year of the activities of the Inter-Society Color Council brilliantly gave a plan for the future.

1. It should very definitely enlist the hearty cooperation and support of those industries of the United States which are definitely interested in color.

2. It should definitely interest the two great groups of teachers of color; i.e., the Eastern Arts Association and the Western Arts Association, as well as other national organizations of art, teachers and artists.

3. It should definitely undertake to assign for study every problem relating to color that is presented to the Council. This does not mean that the Council should finance and actually carry out research and study in connection with all of these problems, but it should undertake to bring together the problem and the person, committee, or organization that is best qualified to study the problem and present a solution of it. This means that the Council should develop a very wide acquaintanceship among persons and organizations interested in color science so that these problems can be assigned to the very best advantage.

4. The Council should make its purposes and objects known and should initiate and request suitable publicity to do this.

5. The Council should definitely endeavor to enlarge its membership in order that its influence may be more widely felt and that its activities may be more highly developed.

6. The Council should endeavor to place as its executive head on its executive committee the strongest executive that can be drawn from the ranks of those deeply interested in the study of color.

The recommendations of Prof. Gathercoal apply today as they did in the beginning.

The Godlove Award

Any historical survey of the Inter-Society Color Council would be incomplete without mention of the great contributions of Dr. I. H. Godlove to the Council, Chairman of its first committee on measurement and specification and for many years editor of the Council's Newsletter. His Newsletter was an authoritative information resource in all fields of color. It became the source for the voluminous ISCC bibliography on color. While he was alive he spoke of establishing a fund with the Inter-Society Color Council to make possible a modest medal or award to members doing outstanding work in color over a designated period. After his death, the Board of Directors at their April 5, 1956 meeting voted to accept with gratitude the generous proposal for the establishment of an I. H. Godlove award made by Mrs. Margaret Godlove. This award is now presented biennially to worthy persons for their contributions to the knowledge of color.

Activities of the Council

There are now three outstanding activities in the Inter-Society Color Council: One is the work of its Standing Committee on Problems. This committee is responsible for investigating color problems which are brought to the attention of the Council. Such problems should preferably be in fields of activity lying

properly within the domain of more than a single member-body. To date subcommittees have worked on 23 officially designated problems. Each member of member-body delegations should remain continuously alert to color problems which arise in his member-body. These problems should be brought to the attention of the Board of Directors of the Inter-Society Color Council. Once a problem has been accepted by the Board, delegates and individual members are expected to contribute to its solution. The Inter-Society Color Council will only thrive if it has continuously before it those new problems on which the Council members should be working. Otherwise a need for its existence largely disappears. The opportunity for people across many lines of activity to work together in solving color problems furnishes a common link to colorists, both intellectually and socially.

Solutions to the problems studied by the Inter-Society Color Council are published preferably in the member-body publications which originally sponsored the unsolved problem. However, the report which may contain a solution in the whole or perhaps contain only a progress report may be published in other journals in order to obtain the widest dissemination of the findings. No discussion of the ISCC Standing Committee on Problems is complete without mention of some of the accomplishments which have been made. These include the ISCC-NBS Method for Designating Colors, a Comparative List of Color Terms, A Survey of Color Specifications, the Color Aptitude Tests used internationally, the standardization of Color Blindness Tests, a very thorough study of the illuminant in Textile Color Matching, widely used as reference material and as the basis for establishing standards for color matching lamps, a Study of the Colorimetry of Near-White Surfaces, the Report of Problem Committee No. 20 entitled "Color - A Guide to Basic Facts and Concepts," and many other reports too numerous to mention at this time. At the end of 1963 subcommittees were active on thirteen problems.

The second outstanding activity of the Inter-Society Color Council is the publication of the ISCC Newsletter, under an editor who at present is also chairman of the Publications Committee. The first Newsletter was published in 1931; this issue is Number 173. The Newsletter tries to call attention to important literature on color, to report on the activities of ISCC and to report on activities of member-bodies, individuals relating to color, and activities of other color societies. The Newsletter also includes a selected bibliography. Delegates and individual members are expected to make contributions to the Newsletter.

The third outstanding activity is the holding of its Annual Meeting at which time colorists have an opportunity to meet each other and discuss their mutual problems as part of the continuing effort to sponsor color education. At many of its annual meetings, or with a meeting of a member-body, the Council has supported symposia on some particular aspect of color, of interest to its members. These symposia have been held quite regularly since 1938. The whole gamut of color usage, color science, color in education, and color in art have been treated in these symposia. In recent years Problems Subcommittees have held open meetings to review their work and to hear comments and suggestions from members of the Council.

Epilogue

This brief survey of the Inter-Society Color Council could fittingly close with verses Dr. I. H. Godlove wrote expressly for the Council:

It's not the brains or genius
Nor money that we pay;
It's the close cooperation
That's bound to win the day.

It's not the individual
Nor Council as a whole,
But the everlastin' teamwork
Of every bloomin' soul.

W. J. Kiernan

NEW MEMBERS The following applications for individual membership were accepted at the last meeting of the Board of Directors held in Washington on October 19, 1964.

Individual Members	Particular Interests
Mr. Herbert Aach 780 Lincoln Street Hazleton, Pennsylvania 18201	Physical, physiological and psychological.
Mr. Dennis C. DeBest 1313 41st Street Parkersburg, West Virginia	Color matching and metamerism, color matching using a digital computer, evaluation of pigments and pigment systems, better control of color throughout production operations, pigment dispersing, pigment manufacture.
Mr. Nathaniel N. Dummer General Electric Company 40 Federal Street West Lynn, Massachusetts 01905	Application of instrumentation.
Miss Annette Green 101 Park Avenue New York, New York 10017	Advertising and packaging. Desire to bring greater understanding and integration of color techniques to my clients.
Miss Margot W. Gunther 679 Madison Avenue New York, New York 10021	As interior designer and color coordinator.
Miss Dorothy Harper Central Research Laboratory Dominion Tar & Chemical Company Senneville, Quebec, Canada	Ceramic, arborite, clays and optical brighteners.

Individual Members	Particular Interests
Mr. Theodore Hommel 28 Twin Hills Road Poughkeepsie, New York 12601	As it relates to printing and photography.
Mr. Edwin E. Kasha Highway 69 South Mt. Vernon, Indiana	Color measurement and control.
Mr. M. Michael Marciniak 540 West Wellington Chicago 14, Illinois	Quality control of color as used in manufacture of textiles, also instrumental and visual evaluation, specification of color appearance.
Mr. Joseph A. McSweeney Progressive Color Corporation 12500 Ardennes Avenue Rockville, Maryland	Scientific control techniques for processing color separations for the lithographic trade.
Miss Elizabeth A. Meehan Sylvania Lighting Products 60 Boston Street Salem, Massachusetts 01971	As related to lighting.
Mr. Bobby L. Neal P. O. Box 24 McCormick, South Carolina	Color development, color control by instrumentation, color in general as applied to textile fibers.
Mr. Alvin O. Ramsley 15 Farm Road Sherborn, Massachusetts	Color control, measurement, specification and research related to camouflage signal panels and dress uniforms.
Mrs. Mary Shrady Dan River Mills 111 West 40th Street New York 18, New York	Fashion trends as related to textiles and ready-to-wear.
Miss Claudia F. Vosbeck National Bureau of Standards Connecticut Ave. & Van Ness St. 2108 Industrial Building Washington, D. C. 20234	Small color differences of textiles and daylight and fluorescent light sources.
Mr. F. J. B. Wall Minnesota 3-M Research Ltd. Pinnacles Harlow, Essex, England	Color perception and the influence of viewing conditions.

Individual Members	Particular Interests
Mr. Stanley H. Walsh 545 Davisville Avenue Toronto 7, Ontario, Canada	Instrumental color measurement, plant color matching and production color control.
Mr. Dwight L. Wardell 908 East 35th Street Brooklyn, New York 11210	Use of color in advertising, marketing, printing. Psychological aspects of color. Color in textiles, paper, leather.
Miss Kathryn Wharton National Bureau of Standards Connecticut Ave. & Van Ness St. 2115 Industrial Building Washington, D. C. 20234	Measurement of color.

ISCC COLOR APTITUDE TEST

The Problems Subcommittee 10, ISCC Color Aptitude Test, has been working for the past several months to produce a repaint of the test. The Color Aptitude Test has been unavailable for some time, and a committee under Forrest Dimmick has been busy trying to produce new Tests to meet the back orders. The job of producing a new Test to match the old one is a difficult one indeed. Although the committee is filling a few of the back orders, it is not yet known when they will be in a position to accept new orders.

An interesting application of the Aptitude Test was brought to the attention of the Newsletter. The following is taken from "Change Notice 5 to Government Paper Specification Standards No. 3 Effective 11/1/64."

Color by visual comparison: Visual comparison of color shall be made in accordance with ASTM Tentative Recommended Practice for Visual Evaluation of Color Differences of Opaque Materials, D 1729-60T, using the conditions for the general evaluation category. Place a sheet of the test sample and the standard sample side by side on the specified neutral gray background, with the felt sides up and the grain directions parallel. Use sheets not less than 5 by 8 inches. When either sample has low opacity, use enough layers of paper that the addition of one more layer causes no change in the results. Make comparisons under the daylight source, with a correlated color temperature of 7400°K., and also under the incandescent source with a color temperature of 2854°K. The comparison area is shielded from extraneous light by a booth, also of a specified neutral gray color inside. A test specimen is deemed to match the standard sample when a qualified observer finds a good commercial match under both light sources. A qualified observer is a person with considerable experience in paper color matching, who is able to obtain a score of at least 75 in the ISCC Color Aptitude Test (obtainable through the Federation of Societies for Paint Technology, 121 South Broad Street, Philadelphia, Pa. 19103).

COLOUR GROUP OF GREAT BRITAIN

The Colour Group presented a new face to its members and friends with the publication of Journal of the Colour Group, Number 1, September 1964. It is an 8-page typeset slick paper publication with reproductions of photographs. Its Editor, J. M. Adams (Printing and Allied Trades Research Association), presents reports of Science Meetings, Regular Meetings, and Summer Visits in an interesting and informative style. In Chairman Michael Wilson's launching message he says, "The Colour Group presents its new Journal to friends at home and abroad. The Group in its present independent form is three years old, following twenty-one years as part of the Physical Society. Both the membership and the activities are growing steadily, which shows that the Group has a real job to do. The systematic study of colour goes far beyond the traditional domain of the physicist, and there are many indications that both he and the chemist will find that they have to be familiar, not only with the work of the physiologist and the lighting engineer, but with that of the psychologist, educator and artist as well. It is remarkable how often communication between the physicist and the painter is seriously hampered by the fact that they still speak quite different languages.

"Thanks to the Colour Group's many friends who have constantly put their services and their premises at our disposal, we are able to launch this Journal without any increase in members' subscriptions. Its purpose is to keep members in touch with each other and with other workers in the field, and to carry the informal spirit of the Group to those out of reach of London, where most of our meetings have hitherto been held. If it thrives as a healthy child should do, it may well require a different financial basis in the future. But for the present we only ask members to take their share of responsibility in helping our Editor, John Adams, to make it a lively medium for the exchange of information.

"More and more people are asking for a working knowledge of the use and the effect of colour as well as for reliable methods of measurement and specification, and I can only hope that the Colour Group and its Journal may play a real part in helping to meet these needs."

Adam's interest in information and detail can be seen in the following:

"Mr. Macwhirter began by saying that he had hoped to talk to the Group with a firm knowledge of the systems that would be used in European colour television in the coming years. Unfortunately, the recent conference on the subject had not reached agreement and had deferred final decisions until the Vienna meeting in 1965.

"The existence of twelve million monochrome sets made the problem of colour multiplexing very difficult, since it must include something similar to a luminance signal. Mr. Macwhirter described the difficulties in detail and the influence of the likely coding systems, phosphors, signal bandwidths, receiver luminance levels and noise interference.

"There had been considerable confusion over the 'white point' for the colour balance of the receivers. Originally Ralph M. Evans had been approached, and had advised 3500° to 4500°K. and that the spread was less critical as the luminance increased. Despite this, in 1951 Source 'C' was chosen as white

point and since then the colour temperature of the white point of the average set has been rising. It was argued that it should be similar to monochrome colour, and that the public consistently demands 'blue' images. Nowadays these may have a correlated colour temperature of 9000 to 11000°K.

"Mr. Macwhirter ended his lecture with an interesting demonstration of the sort of colour television the public can expect at a typical cost of 250 pounds per set. The SECAM coding system was used, and a series of colour films and video tape recordings was shown."

TERMINOLOGY OF COLOR RENDERING
CIE INFORMAL REPORT

When CIE Committee E-1.3.2, Color Rendering (W. Münch, Germany, Chairman) started its work, one of its first tasks was to assemble and define in three languages a list of those terms that seemed peculiarly connected with the understanding and clearly stating the problems of color rendering of light sources.

Several industries require that colors of test samples appear to match those of reference standards. These include:

a. color matching (as in inks, dyes, paints) where it is presumed that the illumination under which the match is made is the same as that under which the materials will be seen or used;

b. color reproduction, as in photography, printing, painting, television, where the degree of approximation is often called color fidelity; and

c. color rendering, the selection of a light source so that the colors of objects will approximate those of the same objects under familiar lighting, such as daylight or incandescent lamp light.

The chief variable in a and b is the spectral reflectance or transmittance of objects, but in c it is the spectral character of the light source. In Germany the term "Farbwiedergabe" is used in all three cases. In the U. S. A. and Great Britain the term "color rendering" usually is used only with case c. In France the term "fidelité de couleur" is used in cases a and b, and "rendu des couleurs" in case c. In no case does the term "color rendering" include any kind of color preference from the point of view of agreeability.

As a result of the E-1.3.2 studies, the CIE has recently published an Informal Report on Terminology of Color Rendering in which the following 14 terms are defined in three languages.

1. Color rendering: general expression for the effect of an illuminant on the color appearance of the objects in conscious or subconscious comparison with their color appearance under a reference illuminant.

2. Color rendering properties: the effect of a light source on the color appearance of objects in comparison with their color appearance under a reference illuminant for specified conditions.

2.1 Color rendering index (of a light source): a measure of the degree to which the perceived colors of objects illuminated by the source conform to those of the same objects illuminated by a standard illuminant for specified conditions.

"Special color rendering index" is restricted to a particular object (or a group of objects of which the particular object is an adequate representative).

"General color rendering index" refers to a group of diverse objects.

3. Reference color perception (in relation to color rendering): the perceived color of an object in the state of reference.

(Italics) The essential characteristic of the state of reference is the state of chromatic adaptation of the observer.

4. Rendered color perception: the perceived color of an object in the state of appraisal.

(Italics) The essential characteristic of the state of appraisal is the state of chromatic adaptation of the observer.

5. Colorimetric shift: the change of chromaticity and luminance factor of an object color due to change of the illuminant.

6. Adaptive color shift: the change in the perceived color of an object caused solely by change of chromatic adaptation (see item 13).

7. Resultant color shift (in relation to color rendering): the difference between the perceived color of an object illuminated by a test source and that of the same object illuminated by the reference source, taking account of the state of chromatic adaptation in each case; i.e., the resultant of colorimetric shift and adaptive color shift.

8. Illuminant: radiant energy with a relative spectral distribution defined over the wavelength range that influences object color perception.

Note 1: Certain kinds of illuminants are designated by symbols, e.g., A, B, C.

Note 2: In English, this term is not restricted to this sense, but is a general term used for any kind of light falling on a body or scene, and is also used to refer to the light source itself.

9. Illuminant chromaticity.

10. Object color: the color of a non-self luminous body defined by chromaticity and luminance factor.

11. Object color perception: the color perceived as belonging to a non-self luminous body defined by its chromaticness (hue and saturation) and lightness. This includes the effect of viewing conditions and chromatic adaptation.

12. State of chromatic adaptation: the condition of the eye in equilibrium with the totality of colors of the visual field.

(Italics) "Chromatic adaptation" is often used for either 12 or 13 when the context indicates which is meant.

13. Change of chromatic adaptation: the act of changing the state of chromatic adaptation.

(Italics) "Chromatic adaptation" is often used for either 12 or 13 when the context indicates which is meant.

14. Object color inspection: the judgment of equality or of the amount and character of difference in color of objects under identical illumination.

Comments Addressed to ISCC Members

The foregoing CIE terms are generally similar to those published in Section I of the IES subcommittee report on Color Rendering of Light Sources published in Illuminating Engineering, July 1962, pp. 473-4. Definitions in the 1962 IES report were prepared jointly by IES and USNC-CIE color rendering committees in 1957 as a U. S. reply to a CIE E-1.3.2 questionnaire on color rendering terminology. Any changes since then have been made only to bring the terms into agreement with those recommended by the CIE experts.

For such differences as remain, reference may be made to the 1962 IES subcommittee report. Over CIE term 8, "illuminant," there has been the greatest discussion and change. For a time it was agreed in the CIE committee that this term should be "light source" rather than "illuminant," but at a later meeting this was reversed. It looks, therefore, as if "illuminant," as defined in the CIE report would continue in use in this country as a synonym for "light source," the parallel term defined in the IES report, in spite of the fact that it had been hoped at one time that use of the term "illuminant" could be discouraged.

It is expected that the chapter on standards and nomenclature in the 1966 edition of the IES Handbook will include the more important of the color rendering terms from the CIE and IEW reports. From the IES report they will include the following that do not appear in the CIE report:

Color comparison (object color inspection, by CIE definition): the judgment of equality, or of the amount and character of difference, in color of the two objects that are under identical illumination.

Color shading (of a colorant formulation): the adjustment of the proportions of the components of a mixture of colorants to improve color conformity to a standard.

Color correction (of a photograph or printed picture): the adjustment of a color reproduction process to improve the color conformity of the reproduction to the original.

Color rendering improvement (of a light source): the adjustment of spectral composition to improve color rendering.

Color matching: the process of adjusting the color of one area so that it is the same color as that of another.

INTERNATIONAL COLOR MEETING

Just as the papers from the 1961 International Color Meeting are being published, plans are being formulated for the next. It will be held June 1-4, 1965 in Lucerne, Switzerland. The sponsors again expect an outstanding participation by the world's leading color experts. Members of the Inter-Society Color Council will play heavily in the program. The theme of the meeting is Scientific and Practical Aspects of Color. The meeting promises to be of interest to all of those in any way concerned with scientific or practical matters bearing on color. Physiologists, ophthomologists, psychologists, educational artists, architects, color coordinators, lighting technicians, dye manufacturers, dye consumers, mathematicians, physicists, and chemists. Lectures are to be grouped under eight main headings: color psychology, colorimetric, color systems, color measurement, reproduction of colors, calculation of dye recipes, color in art, color conditioning and color education. An invitation to the meeting is included with this copy of the Newsletter. Those interested should complete the return card and mail it immediately.

The last International Meeting in 1961 in Düsseldorf, Germany, was overwhelming in its scope and content. The 1965 meeting in Lucerne promises to be equally as comprehensive and useful. Those who plan to attend can look forward to a rich diet of practical and scientific aspects of color as well as a wonderful exposure to beautiful Switzerland.

COLOR STANDARDS FOR THE OLYMPIC MARK

Newsletter No. 169, January-February 1964, carried abstracts in an item by K. L. Kelly of articles from the Japan Color Research Institute's journal, "Studies of Color," 9, 4 (1962). This was followed in Newsletter No. 170 by reviews of Japanese market research in color that appeared in the same journal. We now have copies of Vol. 10, Nos. 1-3, of this journal. The papers are in Japanese, but they carry English titles and abstracts. Nos. 1 and 3 report statistical studies of color in two parts, with tables and many charts and diagrams of the Transition of Color of the Female Costume on Ginza Street. Vol. 10, No. 2, contains two papers, one "A Study of Color Preference and Color Effect in Delinquents"; the other is by Dr. Sanzo Wada, "On the Selection of the Color Standards for the Olympic Mark." The colors selected and tolerances for their reproduction are shown in the following table--the color mark being based upon the JIS (Japan Institute of Standards) notation according to the three attributes of a color (in this country the Munsell color notation):

Color Name	Standard Color	Tolerance for Color Sample		
		Hue Range	Lightness Range	Saturation Range
Blue	1.0PB 4/11	10.0B - 2.0PB	3.5 - 4.5	More than 8.0
Yellow	3.0Y 8/14	2.0Y - 4.0Y	7.5 - 8.5	More than 13.0
Black	N 1		0.5 - 2.0	0.5 and less
Green	3.0G 5.5/9	2.0G - 4.0G	5.0 - 6.0	7.5 and over
Red	6.0R 4/15	5/0R - 7.0R	3.5 - 4.5	More than 13.0

The article includes samples of the five colors in three finishes: glossy, mat, and semi-gloss or provided for dyeing, printing, and painting. At least one of the five colors is said to appear in the flag of each competing country. A sketch of each flag, with color notations of each, is included.

It is of interest that the committee on the Coloring of the Olympic Mark seems to have been a high-powered one, with the names of many well known Japanese color workers represented. Cooperating also were the Japan Color Research Institute (JCRI), the Textile Research Institute of the Japanese Government, Kaseihin Kogyo Kyokai (Japan Dyestuff Industry), Japanese Printing Ink Makers Association, and Nippon Toryo Kogyokai (Japan Paint Industry Association).

For a journal written in Japanese, we find that through the tables and figures, and use of the Munsell notation as the official JIS notation, we can gain a great deal of information concerning the color interests and current activities of our color friends and co-workers in Japan.

D. N.

INDUSTRIAL DESIGNERS INSTITUTE

The Industrial Designers Institute at its recent Annual Meeting of the National Board of Trustees held in Philadelphia, elected new officers and three new Fellow members. The officers, all of whom were installed on October 15, are: Jon W. Hauser*, President of Jon W. Hauser, Inc., St. Charles, Illinois, as Chairman of the Board; Tucker P. Madawick, who is Manager of Industrial Design for RCA Sales Corporation in Indianapolis, Indiana, is President. Executive Vice President is Theodore G. Clement, FIDI*, Eastman Kodak Company, Rochester, New York. Vice President for International Affairs is Leon Gordon Miller, FIDI*, of Leon Gordon Miller & Associates, Cleveland, Ohio. Secretary is Benjamin E. Werremeyer* of Henry P. Glass Associates, Chicago; and Treasurer is Alan Berni*, President of Alan Berni Associates, New York City. Fellow memberships--the highest honor the Industrial Designers Institute can give a member for his contributions both to the field of Industrial design and to the organization--were conferred on Jon W. Hauser, Tucker P. Madawick, and George A. Jergenson* of Los Angeles, head of the Department of Industrial Design at the Art Center School in that city, and a consultant designer. (*ISCC members)

DOROTHY NICKERSON RECEIVES INSTRUMENT SOCIETY AWARD

The Instrument Society of America recognized the contributions of Dorothy Nickerson to instrumentation in color and appearance at their Honors and Awards Luncheon, October 13, 1964. The award is offered annually to an individual in recognition of an outstanding technical, educational or philosophical contribution to the science and technology of instrumentation. The Newsletter cannot do better than quote from the Instrument Society Citation.

"ISA presents the 1964 Distinguished Achievement Award to Dorothy Nickerson, Leader, Color Research Laboratory, Market Quality Research Division, Agricultural Research Service, United States Department of Agriculture, Washington, D. C., in recognition of her contribution to the advancement of optical and color instrumentation for agricultural applications.

"Miss Dorothy Nickerson has the honor of being the first member of the fair sex to receive this award. In both color and cotton, Miss Nickerson has pioneered in developing instrumentation and standardization. In 1921, she was first introduced to color research at the Munsell Color Company in Boston. Her interests expanded to include cotton in 1927 when she joined the United States Department of Agriculture as a color technologist with the Cotton and Hay Divisions. Two years later, Miss Nickerson (on the suggestion of Carl Keuffel) designed and patented a disk colorimeter which determined color standards for cotton and hay. This instrument was built by Keuffel and Esser. In 1950, Miss Nickerson, in collaboration with R. S. Hunter and M. G. Posell, developed the Nickerson-Hunter Cotton Colorimeter. It is a self-standardizing electronic instrument for measuring the color of raw cotton. Calibration methods and standards were developed to insure that measurements made on different cotton colorimeters would agree and be related precisely to the cotton standards. In 1957, performance specifications were written for a new model cotton colorimeter with more sensitivity, using photo tubes to replace barrier-layer cells as the sensing device. A total of about 100 of these cotton colorimeters are now in use all over the world. For the cotton colorimeter, Miss Nickerson was awarded the Superior Service Medal of the Department of Agriculture in 1951. The team of Nickerson and Hunter developed a cotton lustermeter in 1955. This device measures the luster of raw cotton fiber and yarn samples. Some years earlier Miss Nickerson and C. M. Asbill, also of USDA laboratories, began research on a cotton trashmeter. Originally designed as an optical scanner, it is now an electronic optical-mechanical scanner which measures the trash content of raw cotton.

"One of Miss Nickerson's fondest hopes is that one day the United States will have a national language for color that can be understood and translated for use by art, science, and industry. This would mean it would be possible to go by co-ordinated steps from the simplest form of visual color chart work to the most complicated and technical type of spectrophotometric or spectroradiometric measurements and be able to co-ordinate and convert color results to whatever level of precision may be required for a particular purpose. To this end, she has championed the ISCC-NBS (Inter-Society Color Council--National Bureau of Standards) methods of designating colors. One of her many projects related to the ISCC-NBS names is the Nickerson Color Fan which she developed in 1957. It is a 40-hue color chart of 262 samples. The Munsell notation and ISCC-NBS name designations are printed on each sample. For her contribution, the American Horticulture Council awarded her its Gold Certificate of Recognition in 1957. Another important project was Miss Nickerson's proposal in 1960 to supplement ISCC-NBS's definition of the boundaries of color name designations with color charts to illustrate the centroids of the names. Under the supervision of a committee composed of Miss Nickerson, K. L. Kelly, and D. B. Judd, a set of 214 color samples were developed. Between 1938 and 1952, Miss Nickerson served as the secretary of the Inter-Society Color Council, and from 1954 to 1956 she was president. She received the ISCC Godlove Award for her contributions to the knowledge of color in 1961. The Inter-Society Color Council's Board of Directors also appointed Miss Nickerson as a special trustee of the Munsell Color Foundation which she helped found in 1942."

Congratulations, Dorothy. It is a well-earned and deserved recognition of your work.

MEETINGS OF MEMBERS
INTER-SOCIETY COLOR COUNCIL

Member Societies	Date and City
American Ceramic Society, Inc. Columbus, Ohio	67th Annual Meeting May 1 - 6, 1965 Bellevue Stratford Hotel, Philadelphia
The American Institute of Architects Washington, D. C.	AIA National Convention and Pan American Congress of Architects June 14 - 18, 1965 Sheraton-Park, Washington
The American Oil Chemists' Society Chicago, Illinois	55th Annual Meeting April 25 - 28, 1965 Shamrock-Hilton Hotel, Houston
American Psychological Association Washington, D. C.	73rd Annual Convention September 3 - 7, 1965 Chicago
American Society for Testing and Materials Philadelphia, Pennsylvania	Annual Meeting June 13 - 18, 1965 Purdue University, Lafayette, Ind.
Gravure Technical Association New York, New York	Annual Convention March 15 - 18, 1965 Hotel Drake, Chicago
Illuminating Engineering Society New York, New York	National Technical Conference August 30 - September 3, 1965 Americana Hotel, New York City
National Association of Printing Ink Makers, Inc. New York, New York	May 24 - 26, 1965 Point Clear, Ala.
Optical Society of America Washington, D. C.	50th Annual Meeting October 6 - 8, 1965 Bellevue-Stratford Hotel, Philadelphia

Member Societies	Date and City
Society of Motion Picture and Television Engineers New York, New York	97th Semiannual Technical Conference of SMPTE and Equipment Exhibit March 28 - April 2, 1965 Ambassador Hotel, Los Angeles 98th Semiannual Technical Conference of SMPTE and Equipment Exhibit October 31 - November 5, 1965 Queen Elizabeth Hotel, Montreal
Society of Plastic Engineers, Inc. Stamford, Connecticut	21st Annual Technical Conference March 1 - 5, 1965 Statler-Hilton Hotel, Boston
Society of Photographic Scientists and Engineers Washington, D. C.	Annual Conference May 16 - 20, 1965 Cleveland Sheraton Hotel, Cleveland
Technical Association of the Pulp and Paper Industry New York, New York	Annual Meeting February 22 - 24, 1965 Statler-Hilton, New York City

DICK HUNTER RECEIVES FIRST ARMIN J. BRUNING AWARD

The first Armin J. Bruning Award was presented to Richard Hunter, President of Hunterlab, McLean, Virginia. The award was presented to Mr. Hunter for his pioneer work in the field of color and appearance measurement through instrumental techniques. John W. Masury & Sons, Inc., established the award in 1962 in memory of Armin "Joe" Bruning, who headed the Color Control Departments at Masury and the H. B. Davis Company.

INTERACTION OF COLOR
BY JOSEF ALBERS
YALE UNIVERSITY PRESS, 1963

The big volume, Interaction of Color, by Josef Albers, the well-known painter and former art teacher at the Yale School of Design, contains 80 pages of text and 81 chiefly silk-screen printed folders each 10" x 13". All this is presented in a black linen covered box. It costs $200, a price, when one considers the enormous amount of work that went into the hand printed plates, that is reasonable. No doubt Interaction of Color will one day be a collector's item since the edition is limited to 2000. Visually, the work as a whole is an aesthetic pleasure - a feast to the eye.

Since the publication of Johann Wolfgang von Goethe's Color Theory one and a half centuries ago, the German mind has been constantly occupied in an almost mystical way by the phenomenon of color. One has only to mention names like Goethe, Runge, Schopenhauer, Hering, Hoelzel, Renner, Katz, Ostwald, Itten, among others. Josef Albers belongs to this long list of authors who have investigated and written about color. The Germans have a tendency to be rather more interested in the magic than in the logic of color, with two great exceptions being David Katz and Wilhelm Ostwald.

The color system devised by Ostwald is so logical and operational that it seems to take all the magic out of color. This is of course not so, but most painters will not even look at the Ostwald structured color solid for fear they will lose some of their innocence or what they call spontaneity of feeling for color. They continue with their feeling level approach and argue that the knowledge of color theory has never made a good painting. The German Walter Hess has written a whole book--The Problem of Color (Prestel Verlag, Munich, 1953)--to prove that painters have done good paintings despite their involvement in theories. There is no doubt that a painter like Seurat, for instance, was certainly influenced and stimulated by Chevreul's color theories and even such an emotional painter as van Gogh would say, "I do not regret at all that I tried to understand the theoretical principles of color."

The polemics and quarrels about the usefulness and value of color theories and systems for painters continue. One of the reasons is that we do not always clearly differentiate between three basic viewpoints to approach the problem of color.

There is the approach of the physicist, who deals with color as measurable energy. Then there is the artist, whose approach to color is one of dealing with paints (pigments) which he has to turn into color and last but not least we have the psychologist, who talks about the effect not the cause of colors.

No wonder that many painters have turned away from literature about color, confused and frustrated, and went on in their belief that color can only be conceived on the 'feeling level.' Albers shares to a certain degree this belief. He does, however, replace the term 'feeling,' with its connotation of a passive response, with a more meaningful term, 'to sense.' His entire color teaching is designed to develop sensitivity by direct perception - by looking and looking again at colors. For this purpose he uses a set of 209 colored papers. He will say to his student: "We prefer to choose color at the beginning of our color studies rather than getting involved in mixing pigments." To judge by the results and the great enthusiasm he has been able to create among his very devoted students, his method seems to make sense. At the base of Albers' philosophy is the maxim: "values (he means aesthetic values) are established by comparison." His aim, as he writes, is to develop "an eye for colors." There is no doubt the serious student of Interaction of Color will gain from the book an awareness of the aesthetic potentialities of color as from no other book at the moment available, not to mention the many books about color with aesthetically unacceptable illustrations or with no colored illustrations at all. This fact alone makes Albers' work a great contribution to education.

That the text to Interaction of Color is sometimes scientifically incorrect and rather confused, as the interpretation of the Weber-Fechner law, for instance, has led to some criticism. This may bother the pure scientist more than the artist. The law simply declares: "in order for the perception of change to occur arithmetically (i.e., 1, 2, 3, 4, 5, etc.) the stimulus must be in a logarithmic progression (1, 2, 3, 5, 8, 13, 21, etc.)."

In other words, a painter who wants to mix a gray that is visually placed in the middle of the gray scale must not try to achieve this gray by mixing one part white with one part black. He rather has to mix one part white with two parts black. The knowledge of the Weber-Fechner law makes a painter aware of the great difference between pigment performance and the psychological, visual effect of colors.

Albers emphasizes that at the beginning of color study one should avoid color systems. One can agree with him that before becoming involved in the study of any color system, it is necessary to develop first a highly sensitized eye for color in general. The fact that Albers presents the Munsell, Ostwald, and Faber Birren systems acknowledges the value of systems per se. Indeed, there are advanced color problems, not mentioned in Albers' book, which can only be solved with the help of an operational tool like the Ostwald system. This system enables one to chart diagrams of color combinations which are beyond the power of direct visualization (of what Albers calls 'painting with the eyes closed'!)-as, for instance, the effect of a colored light source over a series of colors. Faber Birren, in his books, refers to such a visual situation as all-over illumination. Colors in an all-over illumination will change in a very orderly way. The opposite colors (opposite on the Ostwald color wheel) of the illuminant color will lose their identity to a varying degree depending on the strength of the light source. The successful illusion of all-over illumination will harmonize even brutal color combinations. Unfortunately, very few painters have paid attention to the fact that the Ostwald system is like a tuned instrument; it permits the engineering of and control over complex color relationships.

One final point in reference to Albers' book: the colored samples refer only to the function of color on the two-dimensional plane. There is no mention of colors in three-dimensional space, but one can assume that an architect or stage designer who has acquired 'an eye for color' may very well apply his developed sensitivity also to three-dimensional space.

To summarize: Albers' Interaction of Color deals with the basic problem of color. It approaches the problem of teaching color by direct perception, by strictly visual means. We learn about color by eye. The 81 folders show color plates which are almost self explanatory. They are aesthetically of a high level and a great pleasure to look at. To everyone who loves color, Albers has presented with this book an invaluable gift, one that will stimulate many art teachers and students to investigate further the aesthetic possibilities of color.

Hannes Beckmann

(Mr. Hannes Beckmann, Adjunct Instructor in Art, Cooper Union School of Art and Architecture, has studied with Albers, is a professional painter, and is a teacher of design with a highly trained and special interest in color.)

HUMAN NEEDS DEMAND EFFECTIVE COLOR

Advances in technology, aided by the pressures of urban dwellers, alert politicians, ambitious planners and a number of architects, have signaled the end of the Age of Soot. But unfortunately, as the air clears in our crowded metropolitan centers, another problem comes into the light: ours is the Age of Drab. In every city in America, the human need for a clean living environment is bringing about effective air-pollution laws, slum clearance projects, and urban renewal programs. Cities as infamously smoke-bound as Pittsburgh and St. Louis have emerged into a newly-cleaned atmosphere with old buildings scrubbed and new ones erected in record time. But the beautiful dreams of the city planners and the city dwellers are being realized without the most important human element of warmth, friendliness, and graciousness. The cities we are building for the rest of the twentieth century are almost totally devoid of color planning that would make them pleasant, inviting places to live and work. It is sadly apparent that imaginative use of color, so long avoided as an economic risk by architects, builders, mortgage lenders and industrial tenants, is not being employed to make the dramatic reappearance of our cities "a thing of beauty." One type of gloom is being replaced by another, and the people who work and live in the cities will be the ones to suffer from it for years to come.

The basic human need for the psychological benefits of color is obvious and undeniable. The smart clothes we select, the cheerful furnishings of our homes and our response to flowers, trees and sky are just some of the indications that color brightens and refreshes, soothes and stimulates. But architects, builders, and manufacturers of building materials have generally ignored this need, or have attempted to cater to it with surprising lack of knowledge, taste and training for the appropriate application of color. New buildings rising everywhere in urban centers are examples of almost indiscriminate use of colors and materials, without regard for the total effect they give, and with precious little understanding of the impact of the colors used on the people who will be seeing them.

At a time when much lip service is being offered to the improvement of the total community picture, the architect and builder who select colors and materials are peculiarly limited in the results they can achieve. The architecture we see all around us is damning evidence that the manufacturers of building materials have avoided any serious attempt to improve the use of color. The limits that they impose on the economic possibilities of building design and appearance are all too visible in every vista. The total city scene, as viewed by twentieth century sightseers, from the air, or from a high vantage point anywhere, is dull and uninspiring blotched by the colorless masses of raw new structures. Whether due to cautious conservatism, timidity, or flat disinterest, the prevalence of such monotony is the most compelling argument for coordinated color planning as an essential step in creation of the spirited modern city.

Until the camera was made practical, in Lincoln's time, and released a flood of black-and-white pictures of the world's personalities, treasures, distant scenes, and architecture, it was generally understood that color was an inherent quality of all man's buildings. Cultivated persons who had seen great architecture or collected paintings of it, from Canaletto's theatrical scenes

to Aunt Agatha's water views, knew the rich colors that heightened and expressed the meaning of architecture. The following generations studied book illustrations and "educational" prints produced in black or a mournful brown until their discrimination atrophied. In our century, tolerance has been accorded to pallid, aseptic structures that are no more appetizing than unbaked bread.

Americans who succumbed to the annual temptation to revisit Paris shared a delightful surprise. Without disturbing the true patina of the ancient architecture, the accumulated grime (from those smoking chimneys beloved of garret painters) is being gently washed from the monuments. All can now enjoy, for the first time, the full impact by daylight or floodlight of the glorious original tones of gold and other colors on old buildings. Color is also used on many new structures. Architects Lathrop Douglas and Pierre Graber specified a distinctive and attractive cobalt blue for the new Esso Standard S. A. F. office building in the Place de la Defense. Other colorful Paris structures include the new airport buildings in green accented with bright yellow awnings, and the Saint Gobain Glass Company's buildings in metal and glass. The regilded domes of the Sorbonne and the Invalides, and the newly touched-up flèche of the Sainte Chapelle look particularly effective. The Luxor Obelisk in the Place de la Concorde, twin of ours in Central Park, now glows as richly rose-hued as though it had never left the undefiling atmosphere of Egypt. National treasures that have been long loved in ghostly monochrome can now be admired in all their glory by new generations. Color has resumed its rightful role.

In other parts of the world, too, color in buildings is an accepted tradition. One of the most outstanding is Juan O'Gorman's library of the university, Mexico City, resplendent with bold, brilliant ceramic murals decorating its exterior walls. Many modern buildings in this old country wear bright colors that blend, in the best of taste, with the traditional Spanish stone and adobe structures. Francis Keally has skillfully transplanted the glorious faience tile colorings of Iran in that country's new embassy in Washington. There is no reason why the principles of good color planning for architectural beauty should not be applied to all American towns and cities.

The impact of color in our total environment enormously influences us for better or worse, emotionally, and even physically. Whether employed for its esthetic values or for its functional uses, color must be correctly chosen and coordinated. It should create interest without distraction; a change of pace without jarring contradictions, unity without recourse to simple uniformity.

Howard Ketcham

(Selected parts reprinted from American Institute of Architects' Journal, April 1964.)

PALETTE ON SWITZERLAND The Newsletter has often made reference to Palette, a publication of Sandoz, Ltd., Basle, Switzerland. It is always beautifully printed and illustrated with color reproductions, and its content is invariably interesting. We were intrigued with the editorial in their Special Number Expo 64.

"The editors have taken the occasion of the 1964 Swiss National Exhibition in Lausanne to for once commission articles not on questions of colour and on dyestuff chemistry, but rather on colourful Switzerland. We do not of course wish to compete with the all-inclusive range of the Exhibition in Lausanne; it has been much more our intention to present our readers--and in view of the international character of this magazine above all our foreign readers--with articles that will make them familiar with some typical aspects of Switzerland: first the geographical factors, the image of a diverse landscape determined by destiny. This is followed by a discussion of the peasant element, now on the wane but still in existence, exemplified in popular art in Appenzell. Then we have an episode from our economic history, with the beginnings of Swiss industry. Finally there is a subject that goes beyond the confines of this country, 'Present-day Swiss Artists.'

The Editors"

This issue lives up to the Palette reputation. It is profusely illustrated with photographs of Switzerland, and illustrations of Swiss art textile design, sculpture and ceramics.

COULEURS JOURNAL OF CIC

The journal, Couleurs, regularly published by the CIC (Centre d'Information de la Couleur) and the ACF (Association Française de Colorimètrie) continues to provide wide coverage of color information for its French-reading public. The index to the last number to reach us, No. 53, 1 er Trimestre 1964, shows that it covers the following subjects:

Editorial	page	3
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Association Française de Colorimètrie		8
Bases physiologiques de la colorimètrie		11
Leçons de colorimètrie		13
A propos de la blancheur et de sa conception		22
Les problèmes de blancheur dans l'industrie papetière		32
Mesure de blancheur dans l'industrie textile		40
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This journal is regularly published by the CIC at 23, Rue Notre-Dame des Victoires, Paris, annual subscription price to those outside France is 33 francs, each number is 4.50 francs.

NATURAL SELECTION AND COLOR BLINDNESS

Many Newsletter readers regularly send reprints of articles to the Newsletter (for which the editor is grateful). Among these is R. W. Pickford, Professor of Psychology in the University of Glasgow. The Newsletter has found Professor Pickford's work fascinating, and we would like to share it all with you. But, we must confine ourselves to some of the more interesting.

One reprint, "Natural Selection and Colour Blindness," the Eugenics Review, July 1963, poses a curious problem for civilization. It can be inferred that mankind, in becoming civilized, may be permitting certain undesirable traits to develop. These traits are those which tend to be eliminated by competition

for food or mate, or by other factors which favor those who do not possess the trait. Among the undesirable characteristics is color blindness. Professor Pickford says, "Good colour vision was evolved among insects, fishes, and reptiles. Frogs and toads are colour blind. Birds have good colour vision, except owls which are totally colour blind. Colour vision was lost in the evolution of mammals, all of which are totally colour blind, except the Primates, for whom it was re-evolved. The problem of the frequency of red-green blindness in Man is of great interest because it appears that in the course of civilization there may be a tendency for colour blindness to be on the increase.

"Studies of the frequencies of red-green blindness in various parts of the world and among various peoples have shown that it is most frequent among Caucasian white populations in Europe, America and elsewhere, and least frequent among such groups as the Australian aborigines and North American Indians. Polyak[1] pointed out the importance of colour vision in the evolution of Man, in food gathering and hunting. Pickford[2,3] suggested that colour blindness might tend to be eliminated by natural selection less in civilized Man, for whom choice of fruit which is neither under- nor over-ripe, and the recognition of enemies by colour become less and less important. This would possibly account for its greater frequency in civilized peoples, because fewer normal than colour blind people, especially children, would die of food poisoning or diarrhoea. Post[4] has developed similar ideas much more fully, suggesting that the numbers of colour blind would tend to increase by mutations if the rigours of natural selection against them were relaxed. He[8] has also suggested that increases in the frequencies of myopia may have been brought about in the same way."

Pickford's review of known color blindness data shows that 6-10% of males in Europe, United States, and Australia are color blind. Among Turks, Armenians, Finns, Jews, and other Eastern Peoples the figure falls to about 4-7%. It is 2-5% among Japanese, Indians and Mexicans. American Indian color blindness in males falls to 1-2%. There seems to be a definite distribution of color blindness within countries. In northeast, central, and northern Scotland the rate is 5%, while in southwest England the rate is 9.2%. In the coastal and plains areas of France color blindness is 12%; while in the mountainous regions it is 8%. Color blindness is also found to be more prevalent in ruling or wealthy classes.

Professor Pickford concludes by saying, "Data about the frequencies of red-green blindness throughout the world suggest that those groups in which it is most frequent, namely European and American whites, may have undergone a relaxation of natural selection against colour blindness owing to the influence of civilization in removing them from dangerous food choices, from direct food gathering and hunting. On the other hand, those groups in which it is least frequent, such as Asutralian aborigines, Negroes and American Indians, are much more closely dependent on choice of foods, hunting and food gathering. It is also found that in Great Britain the areas in which colour blindness is most frequent are the South and East coastal regions which were populated by invaders of more settled agricultural habits, and were more fully civilized by the Roman occupation. In France colour blindness is most frequent in the North and South littoral areas and the Northern plains, which were most fully settled by Megalithic and Chalcolithic invaders, and least frequent in the central and mountainous areas. Colour blindness is possibly more frequent in the superior

than in the inferior Indian castes. At the present day it is an interesting question whether the dangers of road traffic and the dependence of safety on red brake lights, and on red, amber and green signal lights might tend to reverse a relaxation of natural selection against colour blindness resulting from the progress of civilization.

"References

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3. Pickford, R. W. 1959. The Inheritance and Frequency of Colour Blindness, Surgo (Glasgow), 26, 29-32.

4. Post, R. H. 1962. Population Differences in Red and Green Colour Vision Deficiency: Review and a Query on Selection Relaxation. Eugenics Quarterly, 9, 131-146.

5. Kherumian, R. and Pickford, R. W. 1959. Hérédité et Frequence des Dyschromatopsies. Paris, Vigot Frères.

6. Pickford, R. W. 1951. Individual Differences in Colour Vision. London, Routledge and Kegan Paul.

7. Vernon, P. E. and Straker, A. 1943. Distribution of Colour-Blind Men in Great Britain. Nature, 152, 690.

8. Post, R. H. 1962. Population Differences in Vision Acuity: A Review, with Speculative Notes on Selection Relaxation. Eugenics Quarterly, 9, 189-212."

WAS "MAUVE" DISCOVERED BEFORE PERKINS?

An article in American Inkmaker was called to Newsletter attention by G. L. Erikson. In the article, "A Pioneer in Coal Tar Colors," the author claims that F. F. Runge made Perkin's Violet before Perkins was born. He was the discoverer of auline phenol, caffine, atropine, etc.; and was the first to observe that true pigments could be made from coal tar, according to Mr. Laugstroth; and he dyed cotton, wool, silk, linen, etc., with coal tar dyes long before Perkin's discovery in 1856. He refers to the German Poggendorf Annalen later published in The American Railroad Journal and Advocate of Internal Improvements, issue of November 26, 1836, in which Cyanol (blue oil), Pyrrol (red oil), and Leucol (white oil) are described as well as a number of the common tar acids. Details of Runge's experiments are described in the articles. Theodore Laugstroth is employed by Hilton Davis Company.

G. L. E.

INTERNATIONALE BIBLIOGRAPHIE
DER FARBENLEHRE UND IHRER GRENZGEBIETE
VOL. 2. 1950 - 1954

(by Manfred Richter. Musterschmidt-Verlag, Göttingen, Postfach 421, 1963. Pp. xi + 840. Price DM 57-.)

Richter's bibliography has become a standard tool for color scientists since the appearance of Vol. 1 in 1952. That volume listed nearly all the pertinent publications for the decade 1940-49. Short abstracts (in German) for about one-third of the more important references, which made the first volume a particularly useful guide to the literature, also appear in the new volume, which covers the five-year period 1950-1954.

The subject index of Vol. 2 uses only the Universal Decimal Classification (DK) numbers rather than subject headings (Schlagworten) such as were used in Vol. 1. The only source referred to, of information concerning the Universal Decimal Classification, lacks many of the DK numbers used in the index. A notice on the contents page mentions a separate supplement("Beiheft") containing a German, French, English index of subject headings. Presumably that indicates the meaning of every DK number used in the index. The Beiheft was not supplied with the review copy. Since it is essential for use of the index, purchasers are advised to request a copy of the Beiheft.

Although it covers only half as many years, the new volume has nearly three times as many titles (4559) as has Vol. 1 (1668). Richter estimates that the rate of production of papers and books on color has tripled since 1950. The increased number of titles in the second volume is also attributed to more thorough coverage of the literature, from all nations and languages. Because transliteration from Cyrillic to Roman characters is not unique, the original Cyrillic forms of the authors' names and of the titles are repeated, following the Roman transliteration according to which the entries are alphabetically arranged (by name of senior author).

The following abbreviated list of subjects may give an idea of the breadth of coverage of Vol. 2: color metrics, color physics, color vision of men and animals, anomalous color vision, color systems, color psychology, color aesthetics, color harmony and their applications in the dyestuff industry, textile coloring, color printing, color photography, color television, interior decorating, architecture, fashions, and philately.

The delayed appearance of the second volume, nearly nine years after the close of the period covered, compared to the prompt publication of Vol. 1, which appeared in the third year after the close of its decade, is in part attributed to a change from letterpress to offset printing. That change was made in the interest not only of economy but also coordination with the current reference service (Referatendienst) inaugurated by Die Farbe in 1955. That service consists of abstracts and/or references to current articles and books in the fields covered by Richter's bibliography, printed on translucent paper in standard A6 cardform. The intention is to assemble and print by offset, in book form, all such abstracts and references issued during each five-year period subsequent to 1954. The delayed appearance of this volume is also attributed to belated decisions to broaden its scope to include relevant contributions from the fields of electroretinography, chemistry of vision, and color television.

Search in the added topics covered the preceding decade as well as the period from 1950-54. Nearly one-sixth of the titles in Vol. 2 were published in the period 1940-49 but were missed or omitted from Vol. 1 because of its narrower scope.

Therefore, in breadth of coverage, as well as in period covered, Vol. 2 is a welcome and valuable supplement to the original Richter bibliography. Both volumes are essential tools for any serious work in the science of color. It is to be hoped that Vol. 3, for the period 1955-1959, will appear before the years to be covered by Vol. 4 are completed. In any event, ability to read German has been made a necessity for practical colorimetrists, as well as for color scientists, by Richter, his bibliographies, and Die Farbe.

(Book reviewed by D. R. MacAdam, Eastman Kodak Company. Reprinted with permission of Optical Society of America from Vol. 54, April 1964, JOSA, p. 555.)

MORE ON THE REVIEW

In the March-April 1964 ISCC Newsletter, your attention was called to three excellent review articles on color. They were D. L. Tilleard, "Colour Systems and Atlases," XXXVI, No. 258, 831-941 (1963); D. R. Duncan, "Modern Techniques of Colour Matching," XXXVI, No. 257, 847-855 (1963); P. V. Foote, "Measurement of Colour and Colour Difference," XXXVII, No. 259, 1-11 (1964). The item concluded saying that the Newsletter has no information on the availability of these reviews. Since then the Research Association of the British Paint, Colour, and Varnish Manufacturers sent the Newsletter a sample copy of the Review and permission to reprint. They further suggested adding a fourth title to this list: D. L. Tilleard, "Evaluation of Small Colour Differences and Tolerances in Colour Matching," XXXVII, No. 261, 143-153 (March 1964).

Included also was a pamphlet describing the Review. The pamphlet states, "In 1962 the Review contained 7,200 abstracts of material from over 30 countries selected from more than 1,500 different publications including the patent literature... The Review covers all types of organic coating composition including paints, lacquers, and varnishes with preservatives, anti-corrosives, putties, plastisols, linoleum, printing inks, writing, drawing, and marketing materials generally. It covers relevant raw materials (pigments, drying oils, synthetic resins, etc.) many of which are of interest also in the dyestuff, plastic, and other industries." The cost of the twelve monthly issues and index is $60.00. The cloth-bound volume complete is $48.00. Twelve monthly issues indexed and cloth-bound volume $98.00. A limited number of bound volumes of earlier years are available at $16.00 each. Subscriptions may be submitted to Chorley and Pickersgill Limited, Amberley House, Norfolk Street, Strand, London W. C. 2.

OUTLINES OF A THEORY OF THE LIGHT SENSE

(Ewald Hering; translated by Leo M. Hurvich and Dorothea Jameson.)

Studies in visual phenomena have long been dominated by the physicist rather than the psychophysiologist. This is the first English translation of this work (368 pp., 79 illus., $9.95) on vision written in the early 1900's by Ewald Hering. Mr. Hering is a leading exponent of the biological point of

view, whose radical and unorthodox ideas are only now receiving striking confirmation. This precise translation of the work of a brilliant scientific innovator, with an introduction that relates Hering's work to contemporary issues in vision, will be immensely valuable to all students of visual phenomena. The translators are Leo M. Hurvich, Professor of Psychology, and his wife, Dorothea Jameson, Research Associate at the University of Pennsylvania.

FACT AND FANCY CONCERNING DERIVED REACTIONS TO COLOR

In the preparation of the ISCC report, "Color: A Guide to Basic Facts and Concepts," the authors, C. J. Bartleson, R. W. Burnham, and R. M. Hanes, tried to select those facts about color... "about which there is broad general agreement" to occupy the main body of the report. In Mr. Hanes' recently published paper to the 1961 International Conference in Düsseldorf, he states, "...so little is stated... on the important subject of derived reactions to color. On this potentially most important topic, the report is weak." In reaction he posed the question, "Are the facts about derived reactions to color really as limited as indicated in the report?"

In his paper, Mr. Hanes seems to suggest that much of the reported effects of colors such as warm and cold, receding and advancing, expanding, confining, exciting and soothing, etc., could be verified by systematic experimentation. Apparently, however, few of these derived reactions have been documented by rigorous experimentation. Mr. Hanes then presented the results of an experiment which might be a model for testing these reactions.

The purpose of the experiment was to study the color-distance illusion reaction of observers in a full sized room under full illumination. A three-factor factorially designed experiment was used. The factors were sex, color, and instruction. Sixty-four male and sixty-four female observers each made two observations on each of seven colors. Observers were divided into four groups. Each received one of four sets of instructions. The instructions were varied for two purposes: (1) to determine whether or not results could be influenced by positive statements about the way in which color affected apparent distance; (2) to provide some degree of check on the use of extraneous cues by the observers.

Suggesting the right answers to the observers apparently had no observable effect on their judgments, and there was no distinguishable difference between sexes in their judgments of distances. Yellow was the most advancing color with red and green next. White was followed by light gray, blue, and black.

Interpretation of experimental results is always a difficult and dangerous part of any experiment, and the one important part of the experimental ritual most often neglected. Unless caution is observed it is easy to arrive at the wrong interpretation of otherwise reliable information. Hanes guarded against this pitfall by asking observers after the experiment to state which colors seemed to be the most advancing. The mean of these responses placed red as most advancing. This was followed by black, yellow, blue, green, medium gray, light gray, and white. Correlation coefficient between observers' experimental settings of the apparatus and the colors they remembered as the most advancing was 0.07.

Mr. Hanes says, "Do these results, then, suggest that color cannot be an effective tool in changing the apparent size of a room or other enclosure? Was this experiment conducted in a situation which was realistic enough to permit such a conclusion to be drawn? I believe that we can safely say that it was a step in the right direction and that claims about important size effects in enclosures due to color, per se, must be treated with some skepticism. I am not prepared to relegate such claims to the realms of fancy, but I do believe that a very careful re-examination of derived reactions to color is long overdue.

"...There is essentially no quantitative information available, and the qualitative information is full of contradictions. I believe that the practical application of color has sufficient potential to warrant large-scale systematic research. But even if the claims about the effects of color are sheer fancy, systematic research is still necessary, if only to demonstrate that fact. It is my hope that when another report is written about the facts of color, the section on derived reactions will be the most extensive and important part."

COLOR EMPLOYEE WANTED The Newsletter received the following letter:

"We are very anxious to obtain a young man to work in our Color Laboratory. In this laboratory we create all new colors and systems for our Trade Sales, Maintenance and Industrial color lines. Matching colors is a very important part of our daily routine. In connection to this laboratory we have a Color Studio employing seven decorators.

"The main requisite is good color eye and a genuine interest in color. He should also have some interest in art and decorating. We would prefer he have some chemistry training."

ERRATUM It has been called to our attention that the report "International Intercomparison of Photometric and Colorimetric Measurements of Fluorescent Lamps," published in Newsletter No. 172, is the substance of a report prepared for the 1963 Proceedings of the Commission Internationale de l'Eclairage by Dr. B. H. Crawford, Department of Scientific and Industrial Research, National Physical Laboratory, Teddington, Middlesex, England. The Inter-Society Color Council is happy to give proper credit to the author of this report now that we have learned his identity.

MISCELLANY

Color on Time.

Time Magazine, known for its spectaculars in color reproduction has successfully pulled off a spectacular to end all spectaculars--the color reproduction coverage of the 1964 presidential election. According to publisher Auer, "...extra edition... started rolling off the presses the morning after the election..." For those of us who are accustomed to waiting two weeks to three months for color plates, such a feat seems incredible.

Life set the pace, as described in the September 6, 1963 Editors' Note,

"Recently we have brought you more and more last-minute news events in color--the Astronaut flights, the eclipse, the death of Pope John, the new Pope, Christine Keeler. Events happen in color. The eye sees them that way. And often, to report them in color rather than black and white adds to the truth of the matter.

"This week two last-minute news events were reported in color--the rescue of the trapped Pennsylvania miners and the freedom march on Washington. The march took place on the same day we go to press. Attempting it in color placed an enormous added burden on our forces. Three presses at R. R. Donnelley & Sons, Chicago, were reserved in its plant and a chartered DC-7 was kept standing by to fly the film to Chicago. While our photographers recorded the pageantry of the march in Washington, messengers kept the exposed film constantly on the move from the demonstration site to the Washington airport, from where it was couriered to New York for processing in our color laboratory. By 1:00 a.m. we had made the final selection.

"In Chicago the electronic scanners skilled craftsmen, mechanical etchers made color plates. There was another day of molding plates, locking them onto press cylinders before the three presses started rolling the story off, 135,000 copies per hour.

"More than four million were bound in Chicago. To meet our countrywide distribution schedule, we shipped by jet plane three million copies of the story --100 tons of paper--to plants in Connecticut and California."

The story is similar for the November 4, 1964 special edition of Time. "The whole edition was written, edited and produced by a New York staff of about 140 people working through election night and into Wednesday morning... The color pages were printed in advance in Chicago and shipped to other plants to be bound with the black-and-white pages at press time." Color photography appeared on the cover and on four inside pages. Such an accomplishment is a tribute to the ingenuity and effort which Time, Inc. are willing to put into a weekly news magazine and to the importance put on having the photographs in color. Many readers saw the Time color photographs before they saw black-and-white photographs of the winners in their newspapers.

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Colored Steel -- Colored steel may be the next major advance in steel-frame building construction, providing maintenance-free exterior and interior finishes. Although a spokesman for U. S. Steel concedes it won't be available commercially for some time, the company has produced it in blue, green, violet, gold, and gray.

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King Olav Ends Squabble Over Village Church's Color.

Arendal, Norway (Reuters)--King Olav V has settled a long-standing battle between the villagers of Todval near here over whether their 142-year-old wooden church should be painted red or white.

The "red" supporters among the 200 villagers said the church should remain the color it was originally. Their opponents said red kept people away.

The controversy headed for a showdown when workers painted the church white some time ago.

The "reds" lost their case in a local court and in a plebiscite, but they then appealed to the King. He rejected their appeal, and the church will remain white.

The Royal Antiquarian Office said the church was originally painted red in 1822, changed to white in line with the fashion at the end of the century and restored to red in 1932.

"But now the majority say it must be white, because most churches are. So we have disregarded historical facts in order to restore peace to the village," an office spokesman said.

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Self-Tinting Glass Seen.

Detroit -- Glass that automatically tints itself blue in sunlight and returns to clearness out of the sun, is a possibility for the near future.

Store windows, glass-walled office buildings, automobile windshields and even space vehicles would use the new type of glass. The secret of the color change lies in molybdenum compounds. For more than a century it has been known that acid molybodate solutions changed color when exposed to light.

Recent research at the Climax Molybdenum Co., Detroit, has shown that the molybdenum compounds in a plastic turn blue if placed in a beam of light. The original color is restored when the light is removed. The research has been with acrylic plastic but is believed applicable to glass. Research is now being done by glass manufacturers with photosensitive molybdenum and tungsten compounds. They are added directly to the glass or are placed in an organic layer between two glass sheets.

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$300,000 Color Test Program Financed by Drug Industry (AMA Journal, May 1964).

A $300,000 two-year public service project to make animal tests on dyes that give drugs their identifying colors has been announced by the prescription drug industry.

Financed by 26 member firms of the Pharmaceutical Manufacturers Association, the program will test seven key colors. Since 1938 the government has certified the safety of every batch of dyes used in food, drugs, and cosmetics, but a 1958 revision of the federal food and drug laws sets up new and very comprehensive safety tests for color additives. It in effect disqualifies all color additives now in use, in spite of the fact that all of these had been tested for safety during previous years.

Protection of the patient is the primary function of color in drugs. By color-coding their capsules, tablets, and liquids, drug makers help doctors, nurses, and pharmacists ensure that each patient receives the intended medicine in the proper dosage form.

Size and complexity of the program are illustrated by the number of test animals involved--1460 rats and 180 dogs. Each animal will be subjected to more than 100 times normal human exposure to the test colors. The dogs will become so valuable that they are being insured for $20,000 each during the two-year feeding experiment.

Colors that pass all tests will probably be safer than common table salt. When testing is complete, petitions will be filed with the government for certification of the reproven dyes. The animal work for each basic color will cost about $60,000, and the filing fee for each petition is $2,600.

Once the colors are certified, the bulk of the work will have been done as a public service by the drug firms, so that other industries or individuals will be able to file petitions to use these colors in their products without having to repeat the animal safety tests.

Planning for the project began over a year ago when it became apparent that, unless the drug makers did the testing, the important color-coding system would be severely hampered.

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Car Colors Seen Link to Crashes (Newark Evening News, October 9, 1962).

Los Angeles (UPI) -- One cause of head-on collisions could be the color of the car. Studies at the University of California in Los Angeles show a driver's judgment of how far away an approaching car may be is influenced by the color. Blue and yellow make an object seem closest. Gray makes the oncoming car appear farthest away.

Tests proved that at 200 feet objects colored blue or yellow seem as much as six feet closer than objects colored gray--a discrepancy great enough to explain fatal errors in judging distance.

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Colors Dominate New Travel Gear (by William Freeman, N. Y. Times, 7/24/62).

The Skyway Luggage Company of Seattle announced six sets of match luggage in more or less edible colors--vanilla, flame, tangerine, stone, black, and taffy, all patterned after jellybeans. Salesmen use jellybeans instead of "swatch books" as color samples.

The jellybean-color luggage retails at $20 to $79.95 with the total for ten matched items coming close to $500.

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"Adventures, Vogues for China and Lacquer Painting (History of Art of Lacquer Painting)," P. Baur, FATIPEC VI, Congress, pp. 3-15 (May 1962).

"Arguments for and Against the Standard Brightness Method," Richard S. Hunter, TAPPI, 46, No. 5, pp. 204A-206A (May 1963).

"A Brief Review of Some Factorial Studies of Colour Vision," R. W. Pickford, Die Farbe, 11, Nr. 1/6, pp. 59-68 (1962).

"Brightness Function: Effects of Adaptation," J. C. Stevens and S. S. Stevens, J. Opt. Soc. Amer., 53, No. 3, pp. 375-385 (March 1963).

"Calibration of the Donaldson Colorimeter," G. Wyszecki and Y. Nayatani, J. Opt. Soc. Amer., 54, No. 5, pp. 705-709 (May 1964).

"Carbon Black as a Pigment," Dr. I. Drogin, Color Engineering, 2, No. 3, pp. 12-18, 20-28, 30-32 (March 1964).

"Chromatic Adaptation. Part II: Nonlinear Hypothesis," David L. MacAdam, J. Opt. Soc. Amer., 53, No. 12, pp. 1441-1445 (December 1963).

"Color and Efficiency of Luminescent Light Sources," Henry F. Ivey, J. Opt. Soc. Amer., 53, No. 10, pp. 1185-1198 (October 1963).

"Color as an Engineering Material," M. Saltzman, SPE Journal, 19, p. 476 (1963).

"Color Can Stimulate Sales," E. Dichter, Coloramic, 7, No. 3, pp. 16, 23 (September 1963).

"Color Discrimination," S. M. Luria and Forrest L. Dimmick, Color Engineering, 2, No. 1, pp. 14-22 (January 1964).

"Color, the Eye, and the Film," John H. Waddell, Research/Development, 15, No. 9, pp. 17-18 (September 1964).

"Color: A Guide to Basic Facts and Concepts," R. W. Burnham, R. M. Hanes, and C. J. Bartleson, John Wiley & Sons, Inc., New York (1963).

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