NEWSLETTER

I.S.C.C.

INTER-SOCIETY
COLOR COUNCIL
NEWSLETTER

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1961 ANNUAL MEETING
SHERATON HOTEL
ROCHESTER, N. Y.

Color in Photography and Television is the theme for the 30th Annual Meeting of the Inter-Society Color Council to be held at The Sheraton Hotel, Rochester, N. Y., on Monday, Tuesday and Wednesday, April 10, 11, 12, 1961.

Five well qualified speakers will lead a symposium on this theme at the Tuesday afternoon and Wednesday morning sessions. Two other events will add to the meeting: By special arrangement the George Eastman House with its outstanding Historical Color Exhibit, will be open from 4:30 to 6:30 p.m. on Monday to those attending the meeting. Bus transportation will be provided from the hotel to George Eastman House and return. The Banquet will be on Tuesday evening at The Sheraton Hotel and the Banquet Speaker will be Mr. C. S. McCamy, National Bureau of Standards, who will present "A Demonstration of Color Perception with Abridged Color-Projection Systems." The program is arranged as follows:

Sunday, April 9

9:00 a.m. - 5:00 p.m.	Board of Directors' Meeting

Monday, April 10

9:00 a.m. - 4:30 p.m.	Problems Subcommittee Meetings (open to all members and friends of the Council)
4:30 p.m. - 6:30 p.m.	Historical Color Exhibit and Refreshments, George Eastman House
8:00 p.m.	Discussion of subjects for future annual meetings

Tuesday, April 11

9:00 a.m.	Business Session
2:00 p.m.	Symposium: "Color in Photography and Television"
	(1) "How Color Photography Works" Dr. R. O. Edgerton, Eastman Kodak Company
	(2) Movie, "Blue Angels"
	(3) "No Charge for the Picture" Mr. W. A. Reedy, Eastman Kodak Company
6:00 p.m.	Reception
7:00 p.m.	Banquet - after which Mr. C. S. McCamy, National Bureau of Standards, will present "A Demonstration of Color Perception with Abridged Color-Projection Systems."

Wednesday, April 12

9:00 a.m.	Symposium: "Color in Photography and Television"
	(1) "Principles of Color Television" Mr. W. T. Wintringham, Bell Telephone Laboratories
	(2) "Magnetic Tape Recording for Television" Mr. John W. Wentworth, Radio Corporation of America
	(3) "Differences in Stage Preparation Between Black-and-White and Color TV Live Shows" Mr. R. Reid Davis, National Broadcasting Company
12:00 Noon	Meeting adjourned

REVISION OF THE BY-LAWS OF INTER-SOCIETY COLOR COUNCIL INC.

The Board of Directors has approved a revision of the September 1, 1953 By-Laws of the Inter-Society Color Council Inc. The revised By-Laws have been sent to all voting delegates for solicitation of proxies. The personal and proxy vote will be held at the next annual meeting.

Operation of the Council under the present By-Laws has been very satisfactory, yet the very growth in membership and activities has indicated the need to remove ambiguities from the By-Laws and to prepare for an orderly growth in the

future. A By-Laws Revision Committee was organized during the June 1959 Board Meeting, consisting of W. J. Kiernan, Ralph Evans, and Norman Macbeth. The committee relying heavily on the advice of the present and past officers of the Council prepared the proposed revision. Some of the more important changes in the By-Laws are:

1. The distinction between Associate and Affiliate Individual Members has been removed. The rights and privileges of all individual members are the same. The classification was primarily for the convenience of the Secretary and need not be defined in the By-Laws.

2. Fixed membership dues have been deleted. Such dues as are necessary for the maintenance and growth of the Council will be specified and approved by the Board of Directors. It should be emphasized that the healthy financial status of the Council arises from the contribution of free time and effort of its members.

3. Following the practice of most scientific and technical societies, the Vice-President will be a President-Elect and will succeed automatically to the office of President.

4. The officers of the Council will assume their duties at the end of the annual meeting following their election, rather than on January 1st. This permits the incumbent Board to conduct the annual meeting for which it has made plans during the preceding year.

5. The structure of the committee organization has been clarified by the formation of five Permanent Standing Committees. These committees, for which the duties are defined, are: Finance, Problems, President's Advisory, Publications and Membership. Additional Standing Committees, Task groups and special committees are provided for in the new By-Laws.

6. Ambiguities in the necessary quorum and vote to conduct properly the business of the Council and Board of Directors have been eliminated.

7. Numerous small changes were made in order to meet the legal corporation requirements of the State of New York, in which the Council is incorporated.

With the changes in the By-Laws, the Board of Directors feels that the stage has been set for a bright, successful, orderly expansion of the Council.

W. J. Kiernan

NEW MEMBERS The following applications for individual membership were accepted at the last Board of Directors' Meeting held in Cleveland, Ohio, on November 20 and 21, 1960.

Associate Individual Members	Particular Interests:
Mrs. LaVonne B. Gable 4560 North Park Avenue Indianapolis 5, Indiana	All phases related to paint color forecasts, and color psychology.

(Cont'd)

Associate Individual Members	Particular Interests:
Mr. William O. Kroeschell Michigan Carton Company Battle Creek, Michigan	Measurement and control in manufacture of paperboard and in gravure, letterpress and lithographic printing.
Mr. William D. Schaeffer National Printing Ink Research Institute Lehigh University Bethlehem, Pennsylvania	The influence of pigment physical properties on the optical properties of thin films; color measurement, control, and specification.
Affiliate Individual Members	
Mr. Harold E. Baker 2478 Oakview Drive Rochester 17, New York	Theory, specification, measurement, and formulation.
Miss Eloise Barnhurst 301 W. 57th Street New York 19, New York	Experimentation in response of the blind to light and color - I believe we may find a system of teaching the blind to "see". The "aura" of people, material objects, and its vibratory measurement.
Mr. Rinehart Baron Research & Development Center Armstrong Cork Company Lancaster, Pennsylvania	Tristimulus color instruments, their theoretical basis and improvements in their design; analysis and use of tristimulus data in quality control; visual determination of color standards and tolerances; illumination problems in color matching.
Mr. Luther A. Clement Rohm and Haas Company Plastics Division 222 West Washington Square Philadelphia, Pennsylvania	Technical sales development in connection with colored plastics, color in art and in photography.
Mrs. Mary Burnham Fisher 412 Kreag Road Pittsford, New York	Color vision.
Mr. Thomas L. Jenkins Standard Ultramarine & Color Co. P. O. Box 2166 Huntington, W. Virginia	New product development work with pigments and dyestuffs.

(Cont'd.)

Affiliate Individual Members	Particular Interests:
Mr. Philip Schuss 835 S. Broadleigh Road Columbus 9, Ohio	Industry color preferences - automotive, wall coverings, home furnishings, architectural, luggage, appliances, radio, T.V., airconditioning. Color Names, Color Matching - plastics to textiles, leather, wood, etc. Color Standards, Transparent color printing.
Mr. Cy Weitzman c/o Zolatone Process, Inc. 3411 East 15th Street Los Angeles 23, California	Color trend and general color information.

THE COLOUR COUNCIL OF CANADA

The Newsletter received a communication from our Canadian Neighbors, and we are pleased to learn that many of our old friends are still in the Council, and apparently enthusiastically active. G. W. Butt is the President, C. R. Conquergood is the Honorary President, and Günter Wyszecki is Honorary Member. W. A. Howard is Past President. ISCC members, Professor W. E. Carswell and R. C. Allison are on the board of directors and on some of the committees.

Topics for the meetings this year have been: Hunter Safety Colo(u)rs and Hunter Safety Training; Frank Williamson, A. R. Monteith Company Ltd.; and S. C. Simons, Conservation Officer, Department of Lands and Forests, Province of Ontario. The Two-Colo(u)r Theory; Professor W. E. Carswell, University of Toronto, and John Gilchrist, Gilchrist and Wright. Use and Control of Colo(u)rs, Mr. Alan F. Telfer, Canadian Standards Association.

FOURTH JOURNÉES INTERNATIONALES DE LA COULEUR (CONTINUED)

(The first part of this series of reviews was published in the ISCC Newsletter No. 149-150, September-December 1960, pp 3-8. The summaries were translated by Deane Judd from summaries published in Revue Officielle du Centre d'Information de la Couleur, No. 36, 3rd Quarter of 1960.)

Dr. Catala (New Caledonia), "Fluorescent Corals and Their Cultivation Presented in Black Light"

Jean Cruset (Paris), "Aerial Color Photography and Its Development at l'Institut Geographique National"

C. Ropartz and P. Y. Rousseau (Rouen), "Problems Posed by the Determination of Eye Color and Its Genetic Interest"

A special character of man is pigmentation whose variations, easy to establish but not to measure, have always been used as a criterion of racial classification.

Pigmentation is a complex phenomenon conditioned by multiple factors (genes). The formation of pigment, its distribution, its saturation, characters whose determinism is multiple bringing to man a variation which appears continuous. As a matter of fact, we have to deal here with a discontinuous variation all of whose variants are hereditary.

The role of the geneticist is to unscramble the action of each causative factor, determining in this way the genetic laws presiding over the determinism of the pigmentation.

Many techniques were employed successively to study the coloration of the iris (the descriptive experimental study bearing on more than 15,000 subjects): examination of a photograph of the iris, use of macrophotography in colors of the iris, genetic research carried on by the Centre de Genetique Humaine de Paris. The essential problem remains that of the impersonal reading of documents.

M. Veronese and M. Ibarra, "Presentation of Artistic or Pedagogical Diapositives"

M. Escher-Desrivieres and H. Lenoan (Saint Gobain), "A Market Study of the Effectiveness of Transparent Colorless Screens Opaque to the Ultraviolet Used in Store Windows to Reduce Color Fading and Other Light Damage to Merchandise"

In order to make more precise our knowledge on the fading of colors by light, we have carried out a study of the effectivenss of transparent, colorless screens opaque to the ultra-violet rays, varnishes applicable to windows, or interior show-cases, which have been used in France since about three years ago in a rather large number of store displays in Paris or in the south of France.

We give the first results of this study carried out by specialists in market studies according to methods which we will summarize.

It resulted from this study that in about two-thirds of the cases the complete suppression of ultraviolet rays accompanying the visible light which illuminates merchandise shown behind glass, retards very appreciably the degradation of the exposed merchandise and especially the fading of their colors.

The use of these anti-sunlight devices thus presents an undeniable interest.

P. Dubois (Centre d'Etude des Matiéres Plastiques), "Color and Plastics"

Generalities

One of the causes of the considerable success of plastics is their use as a support for color, the latter being essential esthetic needs of humanity.

- Role of color in surroundings

- Colors of the plastics themselves and of their additives (thermo-hardening, thermo plastic)

- Various categories of plastics as supports for color (transparent plastics or organic glasses "thermoplastics," "thermo-hardeners," "utilization as transparencies," - opaque plastics, "plastics with high-clarity colors," "plastics with more sombre tints")

- Physico-chemical character of the bond between plastic and colorant (Physical state soluble colorants, pigments, solidity, thermal stability, resistance to aging, migration, toxicity, covering power of white pigments, remark on wettability, thermal influence of colors)

- Diverse domaine of application of plastics whether colored or not (transparent plastics uncolored or colored, opaque colored plastics, constructions, canalization, sols, roofs, mobiles, engines of transport, highway signalling, clothing)

Conclusion

This study recalls that humanity is more and more attracted to color; in particular by high-clarity colors and according to the case by the uniformity or contrast of hue. These color needs are increasingly satisfied thanks to plastics which are one of the most important media.

Marc Havel (Couleurs Bourgeois Ainé), "Influence of the Vehicle on the Stability of Artists' Oil Paintings"

Luigi Longo (Rome), "Use of Photography in Color for the Detection of Writing Under Stains"

Detections of writing hidden under spots of colored ink may be obtained by placing in front of the camera objective a screen of the same color as the spot. To obtain the total elimination of the spot and the complete revelation of the writing it is necessary to have a screen whose color has the same wavelength as that of the spot. To arrive at this result the following procedure has been adopted: A color photograph of the spot hiding the writing is made and the resulting diapositive is used to construct by a special process the screen to use for the black and white photograph.

Sub-section: Safety, Surroundings, and Hygiene of Work

J. P. Levy (Institut National de Sécurité), "Researches on Criteria of the Effectiveness of Safety Signs"

M. Assemat (Rouen), "A Practical Case of Transformation of the Ambiance of an Atelier by Color, Study, Criticism, and Discussion"

Dott. Albertazzi (Italy), "Color in the Technical Schools of Milan"

M. Gaymard, "Light and Colors in the USA"

S. Baudoin and J. Vacher (Tours), "Color in Agriculture"

E. Barthes (Compagnie des Lampes Mazda), "Remarks on Colored Constructions"

The development of the use of color in offices, factories, schools, reception rooms, or theaters, renews continuously the causes of discussion between lighting engineers or technicians in colored building materials on the one hand, and architects and colorists on the other.

In the domain of color, the technician cannot predict with certainty colors of the surroundings which will be obtained at a given location; he has to interpret the plans of the architect without being certain in advance of giving satisfaction to the latter. Very often, it will be convenient in order to respond better to the image which the decorator makes for himself of the future construction, to make certain modifications in the choice of the light or the furnishings.

- Research to elaborate the method of prediction on the part of the technician

- Summary of the works tending to determine the luminance (in the photometric sense) that ought to be given to a colored plaque in order that it may appear balanced with a neighboring white plaque

- Calculation of the role of inter-reflections in modifying the color of the light reaching the working plane by the colored surroundings of a location

- Explanation of a study having for its purpose to determine the role of color on the apparent relative position in space of two plaques, one white, the other colored and eventually on their respective, apparent dimensions (description of an experimental set-up, examination of the results of trials)

Conclusion

The effect of colors is variable within wide limits from one observer to another. However, it has been established for example that a red plaque will be placed by most observers back of the white plaque; thus the red provokes an apparent displacement to the front of the actual plane; the green plaque being placed very regularly in front, the green provoking a slight apparent displacement to the rear of the actual plane.

As far as blue is concerned, the judgment of the observers becomes difficult: This color can be considered as provoking an indeterminateness of position; certain tricks such as the effect of perspective and the surface ratios will probably permit this indeterminateness to be inclined in the one sense or the other.

These trials still do not constitute the final study of a very complex problem. The average effects found remain small: The role of color must therefore be completed by other elements such as the dimension ratios and in a general way the effects of ratios of solid angles and luminances.

Sub-Section: Graphic Industries

E. Paszkiewicz (Institut Professionnel de Recherches et d'Etudes des Industries Graphiques, IPREIG), "Some Considerations in the Study of Primary Inks"

The behavior of primary inks, from the point of view of reproducing colors, ought first of all to be studied under their pure colorimetric aspect in order to obtain a determination of the basic colorimetric properties of each ink and binary combination (spectrophotometric curve, chromaticity coordinates, and luminance factor).

It is not necessary, however, to lose sight of other factors that influence the final result of a reproduction.

These variations are due in large part to the relative importance of the effect of transmission and reflection attached to each ink taken individually and which combine themselves differently according to the thickness of each layer and the order of the superposition.

Another delicate aspect of colored reproductions by superposition of inks is that of the admissible tolerances, a function, furthermore, of the needs of client and of the connection between the over-all tolerances and the tolerances proper to each elementary color printing.

Loic Cahierre (Institut Géographique National), "The Colors in the Topographique Charts of the National Geographic Institute"

Since the use of lithography has given us the possibility to print maps in colors, we started by establishing maps carrying a large number of colors. This number was subsequently reduced to make the work easier and to lower the price, all based on some very simple principles of esthetic or graphic order.

We have tried to uniformize the colors used in the different topographic maps of the IGN. We are thus on the track of a standardization that is not yet complete. The use of certain colors on these maps is in conformity to an international project of standardization.

R. Delattre (Compagnie Francaise des Matiéres Colorantes), "Some Aspects of the Behavior of New Pigments for Brilliant Inks"

The study of new pigments with treated surface specially intended for the production of brilliant inks has brought to view the only slightly arbitrary character of choice of the method of preparing colored specimens intended for determination of tinting strength.

Also it is sometimes opportune to control the tinting strength of a pigment by the maintenance or disequilibrium which it brings in a formula normally leading to a gray.

R. W. Pickford (Glasgow), "Minor Variations in Color Vision"

The anomaloscope, when used for red/green, green/blue and yellow/blue equations, reveals minor color-vision variations better than any other test. The results are of considerable practical and theoretical interest. They take the forms of variations in matching range and deviation. They are affected by the differences of apparatus, techniques of testing, sizes of test spot, and physical properties of the lights used. Heterozygous manifestations and differences due to age of subject are important. (Complete text of paper is given. DBJ)

Frantz Braun (Louvain), "Contribution to the Study of Esthetics in the Application and Use of Color"

Contrast in an association of colors is the basis of all esthetic realization. The study of contrast in the three domains of physics, physiology, and psychology permits the elaboration of a series of propositions, rules, which may guide the inspiration of the esthetician within rational limits. (Complete text of paper is given. DBJ)

Albertazzi Bossi (Italy), "The Teaching of Color in the Technical Schools of Milan"

In the physics courses of all the technical schools one chapter on optics deals with color: In general it is neglected by the professors as being a subject of little importance and unfamiliar to themselves. The textbooks of physics, even those exemplary everywhere else, give only brief treatments, usually incomprehensible even though competent, which indicates that they are resumés instead of being original.

In the qualification courses for professional specialties there is nothing that could be called modern teaching of color. It is true that they teach how to use color, how to observe the resulting harmonies or disharmonies, how to reproduce a color by means of mixtures, but they do not have a unified terminology, and no didactic means are used. The teaching remains limited to the domain of the specialty.

One school at least presents an example of a rational criterion in the use of color for its interiors. The previous principal criterion for selecting colors was to hide or duplicate the colors of dirt. The new criterion was to realize a chromatic composition having the delicacy or reposing qualities furnished by nature in all its nuances and graduations. The colors chosen include grass green, forest green, sky blue, and light gray.

One institute in its course on photography teaches chemical technology treating chromatic sensitizers of photographic emulsions, photographic synthesis of colors (additive and subtractive), and systems of chromogenic development (Kodacolor, Agfacolor, Ferraniacolor). In optics the teaching of color is limited to the following questions: colors and their combinations, laws of additive combination of colors, Maxwell triangle, subtractive combination of colors, Young-Helmholtz theory, anomalies in color preception, and simultaneous contrast and its laws.

A very serious study of colors in teaching and apprenticeship has been undertaken by Mario Pantaleo of the National Didactic Center of Technical and Professional Instruction by means of a detailed and specific questionnaire addressed to the directors of Italian schools. The review, "Homo Faber" has devoted a special double issue[1] to this problem. (Complete text of the paper is given. DBJ)

FSPT EVALUATES METHOD FOR THE ASSESSMENT OF LIGHT FASTNESS

The Federation of Societies for Paint Technology distributed a reprint, "Recommended Method for the Assessment of Light Fastness," to its member Societies, asking for an opinion and an evaluation of the method suggested. The following is an excerpt from the article which was printed in the Journal of the Oil and Colour Chemists' Association, August 1960:

"At a meeting of Council on 1 October, 1958, the Report of the Light Fastness Committee was accepted, and it was agreed that steps be taken to encourage the adoption of the procedure of British Standard 1006: 1955 for the assessment of light fastness in the Paint, Printing Ink and Allied Industries. The object of this paper is to describe modifications which are advantageous in the use of B. S. 1006 in the pigment using industries.

The Light Fastness Committee was set up because it was considered that the so-called "Madder Scale" used in the assessment of pigmentations was out of date, and the Committee was asked to consider the possibility of preparing a series of standards using pigments printed on paper. Very early in these investigations, however, it became apparent that such procedure was fraught with difficulties, which have been described in detail in previous reports in this journal, (J.O.C.C.A., 1951, 34, 185--First Report of the Light Fastness Committee, J.O.C.C.A., 1957, 40, 544--The Use of the B. S. 1006 Standards in the Paint Industry) and offered no advantage over B. S. 1006 already well established in the Textile Industries for this purpose.

It was recognised that the idea of comparing pigmented panels, prints, etc., with textile dyeings might not be immediately acceptable, but confidence was gathered from the fact that when the newer industries, e.g., plastics and anodised aluminium were faced with this problem, they immediately adopted the procedure of B. S. 1006 without undue difficulty, and to their great advantage.

A good deal of discussion on the subject has taken place throughout local sections of the Association, and a co-operative investigation was carried out by members of the Association on the use of the B. S. standards in which it was shown that no serious difficulty is involved.

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1 "Homo Faber," Special double fascicule, No. 100-101, Bossi. Flli Palombi, Editors, Via dei Gracchi, 181, Rome, Italy.

It is felt that the Paint, Printing Ink and Allied Industries have not so far made the full use of the light fastness standards of B. S. 1006 which would have been expected and are not getting the benefits which it offers. It is clear that a vast improvement over the so-called "Madder Scale" is long overdue if our industries are to remain in the forefront of technical progress.

It was decided to issue this paper in the first place giving detailed guidance on the use of B. S. 1006 with pigmented surfaces and pigmented systems in general, with the strong recommendation that the method described should be used widely for the assessment of light fastness. Already international agreement is being discussed and preliminary views are being sought to ensure that there is no fundamental divergence of thought on this important question. With this document available and the method in daily use, it will be much more practicable to exchange opinions and experiences with other bodies, both national and international."

DEANE B. JUDD BECOMES NEW EDITOR OF JOURNAL OF THE OPTICAL SOCIETY OF AMERICA

With the January 1961 number of the Journal of the Optical Society of America, Deane B. Judd becomes its new editor. As Wallace R. Brode and Mary E. Corning, outgoing editor and assistant editor, said in the opening editorial of the December journal, Dr. Judd needs no introduction to most O. S. A. members, for he is a past president of the society, and has, in the years since 1924, contributed nearly 100 papers to the journal. Dr. Brode points out that the society is indeed fortunate to obtain so distinguished a scientist as Dr. Judd to serve as Editor, and also to continue the hospitality which the National Bureau of Standards has shown, not only to the past editor, but also to the earlier editorship of Dr. Paule D. Foote from 1920 to 1933, the Secretary's office under Dr. L. B. Tuckerman from 1930 to 1940, and under Dr. K. S. Gibson from 1957 to 1959.

In 1949, when Dean George R. Harrison, after serving ten years as journal editor, turned over the office to Dr. Brode, he noted that in his decade of Editorship there had been a marked growth from 1,400 to 3,700 subscribers. Dr. Brode points out that in the succeeding decade the journal distribution has grown to 5,500 copies, not including 2,500 copies that are photo offset by the USSR for their internal use. About one-third of the J. O. S. A. subscription list is outside the United States, and if one adds the USSR reprint, about one-half is foreign. It is truly international, yet very specifically it is the Journal of the Optical Society of America, and its prime audience is the American optical community. This is also true of the Society's meetings, local sections, special publications, and activities authorized by its legal charter.

As Dr. Judd takes on the demanding responsibilities of this editorship, we wish him well in this difficult task. We feel most confident that under his leadership the high quality of the journal will continue to be maintained and improved, and that the prestige of the journal will continue to provide the Society with a high degree of pride and satisfaction. We are only sorry that this added task makes it necessary for us to lose Dr. Judd as a member of our ISCC Newsletter Committee.

COLOR SYSTEMS DISCUSSED IN LENINGRAD

During a visit to Leningrad, July 6, 1959, Mr. A. E. O. Munsell requested and obtained an interview with Prof. G. N. Rautian and Dr. E. N. Justova of the Mendeleev All-Union Institute of Metrology. Prof. Rautian has recently been appointed Expert on CIE Committee E-1.3.1, Colorimetry, to replace the late Prof. N. T. Federov. Dr. Justova has carried out important researches in color blindness and theory of color vision. Mr. Munsell sought clarification of a Soviet evaluation of the Munsell color system (N. T. Federov, General Color Knowledge, Moscow, 1939, p. 181) which states: "Unfortunately, in this (Munsell) system it is not possible to make use of the concept of optimal pigment colors, without which the construction of a rational color solid is impossible." Mr. Munsell was graciously received and obtained both an oral and a written reply to the following effect: "The statement is too brief to be easily understood. We understand it in the sense that only by utilizing the concept of optimal pigment colors is it possible to construct a completely defined color solid as is done by Luther and Nyuberg. Every color atlas, depending on the quality of the pigments made use of in it, covers a certain portion of this color solid, lies within, and cannot be pushed to, these theoretical limits. The system of the Munsell atlas, like any other colorimetric system, including the CIE system, does not yield the possibility of constructing a color solid. Federov criticism does not refer to the quality of developing the atlas as an empirical system nor to its rationality."

(Note by D. B. Judd: This Russian view is close to that held in this country. Foss, for example, has often spoken of the supplementary merits of two ways of developing a color system, the first way, as in the Munsell system, from the inside of the color solid outwards; the second, as in Richter's DIN system, from the outside inwards. In the Munsell system the notations of the "optimal pigment colors" or, as we speak of them here more often, the "MacAdam limits," may be given (Nickerson and Newhall, JOSA, 33, 419 (1943), but the Munsell system of color notation is not based on these limits. In the DIN system, on the other hand, the optimal pigment colors are those of zero darkness degree, and all other colors are characterized by darkness degree greater than zero. The DIN-system is directly and simply related to the CIE-system and to optimal pigment colors; but the basic idea of the Munsell system is the perceptual uniformity of the scales of hue, value and chroma, the chroma scales being indefinitely extensible.)

Mr. Munsell also asked about a statement in Rabkin's Atlas of Colors (Moscow, 1956, p. 7): "It is well-known that these atlases, among which are also the Ostwald and Munsell atlases, do not permit the expression of determinable colors in the standard 3-color system (CIE-system)." Prof. Rautian and Dr. Justova replied that this statement is contradicted by a later statement by Rabkin that the Munsell Atlas was "recently" expressed in 3-color coordinates (CIE), and furthermore that the word "recently" in this second statement is misleading because this expression took place 13 years before Rabkin's statement was made.

(Further note by D. B. Judd: In so far as there has been a tendency in some Russian papers to minimize American achievements in colorimetry, this interview by Mr. Munsell with the recognized Russian authorities in colorimetry is of particular interest because it reveals a very objective attitude on their part. On the other hand, American publications minimize Russian achievements by generally ignoring them, perhaps chiefly because of the language barrier. It is perhaps not out of place to acknowledge here that the color-blindness tests developed by Rabkin are second to none, and furthermore, that the connection between optimal pigment colors and color systems was very clearly pointed out by N. Nyuberg (Zum Aufbau des Farbenkörpers im Raume aller Lichtempfindungen, Zeitschrift für Physik, 52, 406; 1928) years before the American treatment of the subject by MacAdam.)

KARL FREUND AS "MR. PHOTO RESEARCH"

The International Photographer for October 1960, 32, 212-3, 222, carried a most interesting article on, and by, ISCC member Karl Freund, outstanding cinematographer and founder and head of his own instrument company, Photo Research Corporation of Hollywood. His company is concerned with scientific instruments for measuring the quantity and quality of illumination.

Karl, who has received many tributes, among them an Academy Award in 1937 for "The Good Earth," started in the motion picture industry in Berlin in 1905. In 1909 he made a sound picture with Caruso, and the article tells how. It also tells how he was first to mount his camera on a dolly or crane, using a motor to turn the camera. He first used the new technique for photographing "The Last Laugh" with Emil Jennings, a silent picture that was also the first without titles. Later, he went to London, where in 1927 he took part in experiments with magnetic tape. In 1928 he went to Paris, then with early color-process developments, back to London to promote a new corporation, The Movie Color, Ltd. The process used was an additive 3-color process, the one introduced in this country by Eastman as Kodak Color. In London he met Dr. Herbert Kalmus, president of Technicolor, which at that time was using a 2-color subtractive process. Dr. Kalmus became interested in the 3-color process, and developed further ideas, persuading Karl to go with him to Hollywood. This particular development did not succeed, so after about a year the idea was dropped, and Karl's contract was taken over by Universal Film Company, which marked the beginning of his career as a Hollywood motion picture cameraman.

We look forward to the book we understand Karl is writing about his experiences in the motion picture industry. It should be fascinating, for he has met and photographed so many of Hollywood's greats and near-greats, and has taken part in so many firsts in the development and improvement of photographic techniques and instruments. Not long ago he demonstrated on television how his spot photometer could measure at some fabulous distance a tiny spot of suntan. It is that sort of thing he builds instruments to do. He is indeed, as the article says, Mr. Photo Research!

Dorothy Nickerson

EDITOR'S NOTE In the last issue of the Newsletter (No. 149-150, September-December, pp. 14-16) Henderson Wolfe responded to Deane Judd's article on Artist's Pigment Color Systems. Actually, that item should have been labeled Part 1 because Mr. Wolfe's response was in two parts. The second part follows.

MORE ON ARTISTS' PIGMENT-COLOR SYSTEMS - THE ARTIST'S PROBLEM

As a painter of fast protraits from life, in full color, I have a personal interest in the systematic palette. In addition to the local colors of flesh, hair and eyes, which of course are identified by hue, value and chroma, I have an additional problem. This is the source of light. In its simplest form, this means the direction of the light. (For convenience I assume a standard white light.) Suppose, for instance, I want to feature the effect on such a light on blonde hair. To get this effect, I throw the face into shadow. This gives me a substantial area of a subdued tint, which in turn gives the high-lights added luminosity, by the classic principle of contrast. This relationship, so important in painting, is one not shown by any color system I am familiar with .

Arthur Pope, whose "language of Drawing and Painting" (Harvard: 1949) is perhaps. the most detailed study of an artist's pigment-color system in existence, has this to say about the tone of light: "As I have pointed out elsewhere (JOSA, 1944), exact intervals and exact uniformities have not the same significance in vision that they have in sound; otherwise a slight change in the tone of the light falling on a surface would so affect the exact relations that discords would result as would happen in the case of sound, and this is obviously not true. A textile pattern that looks well in a slightly cool light will probably look well in a slightly warmer light; but the intervals may be very different."

The point which Prof. Pope misses here is that the tone of the light corresponds to the key in which a melody is played. A melody played in one key would be extremely discordant if the same notes were used in a different key; but of course they are not. A tone of light falling on a surface automatically gives the key to the color scheme, because it affects each color. On the piano, however, the key is changed by changing the notes played.

This lack in our color-systems seems to justify Mr. Ted Sprague's criticism that "you've left Man out of the picture." (ISCC NEWSLETTER, January 1960.) When an artist paints a picture, he either sees or imagines a light situation, or rather a series of light situations; in each situation the tone of the light modifies the local colors of the objects. Almost always, the modification is in the direction of pleasing harmony. From this we may conclude that no systematic statement regarding a series of colors can be made, unless that statement takes into account the position (i. e., the "light situation") of the observer.

It was once supposed that an observer sees everything within his range of vision simultaneously. Experiments in color perception have shown that this is not true. I quote John C. Hole: "One of the most important factors which determines the actual sensation of a particular color is the state of adaptation of the eye... the rates of adaptation, and of recovery from adaptation, are not the same

for the three receptors. The blue reacts more slowly than the green and yellow. If one looks steadily at a red surface, the red receptors and to a certain extent the green, which are affected by the red light, adapt to the red stimulus and become relatively insensitive while the blue receptors, being unstimulated, may even gain in sensitivity." ("The Art of Color Matching." INTERCHEMICAL REVIEW, Vol. 15, No. 3, p. 69.)

It is because this important factor has been left out of our color systems that these systems are of such doubtful aid to an artist. As Ralph M. Evans writes: "The 'catch,' if it may be so-called, comes in the fact that he has no simple relations to guide him on his way." ("Introduction to Color." N. Y. 1948, p. 275.) Mr. Evans writes understandingly of the artist's problems, including an examination of Prof. Pope's theories." He continues: "In the first place it is apparent that the artist must necessarily compensate for the particular mixture series his particular colorants follow, and this is simply a matter of familiarity. In the second place and more important, it is necessary that he have some definite goal, some preconceived notion of the color he desires to produce. These aims may come from the color circle he imagines or from the object at which he is looking, but <u>ultimately in any event they are psychological in nature</u>." (Op. cit. pp. 275-6.) (The underscoring is mine.)

I think that this quotation shows clearly how important to the present discussion is a careful study of the history of color notation. In the August 1922 issue of the <u>Journal of the Optical Society of America</u>, is a Report of Committee on Colorimetry by its chairman, L. T. Troland. This report states (Page 571) that both the Munsell and Ostwald arrangements are "based upon psychological rather than physical criteria." There is no simple mathematical relation between equi-spaced points in either the color circle or the color solid and the characteristics, such as frequency, of the light reflected by the corresponding color samples. The scientist is not bothered by the complicated relation of his color standards to the physics of the light they reflect. The artist, on the other hand, is continually challenged by the mathematical simplicity of musical notation which is just as psychological as color systems are. He is haunted by the psychological beauty and validity of a color system, but frustrated by its mathematical complexity."

Musical notation is very much older than color notation. An effort to organize the factors in musical notation, comparable to similar efforts in the color field today, was undertaken in the eleventh century by Guido d'Arezzo. In his "Story of Notation" (London: 1903) Abdy Williams writes: "By this time a new form of music has arisen, in which the voices sang different melodies, and it became imperatively necessary to find some system which should absolutely indicate both the exact pitch and the exact time value of the sounds to be sung; and the history of notation from the eleventh century to the sixteenth is a story of the efforts made by churchmen who, hampered by theological difficulties, by morbid scruples over the meaning of words, and a contempt for the more practical efforts of worldly musicians, painfully evolved something like a satisfactory system, upon which the latter were able eventually to graft their own results; and so the notation, as we know it, was completed. The history of notation is a story of human effort sustained over many centuries towards the attainment of one object."

In his Introduction to Albert Munsell's "A Color Notation" (Baltimore, 1946) Royal B. Farnum writes: "In a discussion of Mr. Munsell's work some critics have stated that anything of this kind must cramp one's style; 'limit the artist'; and 'hamper free expression.' Perhaps similar remarks were called forth by music critics before music notation was fully developed, yet one ventures to assert that the greatest master of music today feels liberated instead of bound down by his expert knowledge of the attributes of sound and its simple recording on the instrumental or vocal music score....Music is equipped with a system by which it defines each sound in terms of its pitch, intensity, duration, without allusions to the endless varying sounds of nature. So should color be equipped with an appropriate system....Mr. Munsell has pioneered and given us the fundamental approach."

Henderson Wolfe

A NEW LOOK AT THE MEASUREMENT OF LIGHT AND COLOR

An excellent article by Deane B. Judd was published in the February 1958 Illuminating Engineering magazine (pp 61-71). It was taken from a paper presented at the National Technical Conference of the Illuminating Engineering Society, September 9-13, 1957. The following is an abstract which appeared at the beginning of the article:

"Since 1935 the standard definition of light has been based on a luminous-efficiency function first adopted provisionally by the International Commission on Illumination (CIE) in 1924. This function was intended to give the reciprocal of the spectral radiance required to make each part of the spectrum appear equally bright to the average normal eye, and new determinations during the last 30 years indicate that the standard luminous-efficiency function succeeds very well in doing this, except perhaps that it may be too low in the short-wave portion (less than 460 mu). At the 1955 Congress of the CIE in Zürich, Dr. W. S. Stiles presented preliminary results of determinations of the color-mixture functions that suggested an entirely new basis for the definition of light. To make clear this new basis, and the advantages that it may have, the basic principles of the measurement of light and color are examined briefly."

STILL MORE ABOUT SKIN COLOR

In the last issue of the Newsletter (No. 149-150, Page 18) were two articles on skin color. Having read the article, the Tintometer Limited sent the Newsletter information about a device which has been used to measure skin color in England, the Lovibond Portable Hand Tintometer. The device is a hand held visual comparator containing its own light source and using red, blue, and yellow filters in the comparison field.

In their letter, Tintometer states: "This instrument is used mainly in the clinical aspects of skin colo(u)r in relation to radiation, erythema and is not so far very widely used, as only a few specialists are concerned. The instrument has, however, been applied to other work such as measuring the colo(u)r of growing plants (tomatoes, lettuces, etc.), and as a sort of telescope for measuring the colo(u)r of illuminated cinema screens."

The Newsletter received two copies of articles, one describing the Hand Tintometer and one describing experiments using the instrument in the study of erythema. Newsletter readers may borrow the reprints by writing to the editor.

MISCELLANY Diplomats Like True-Blue Hue. New York Times 11/29/60

If you like a room that is true blue, then chances are you have a leaning toward diplomacy. Such is the finding of Betram Weal, manager of the Tuscany Hotel. Diplomats like a light azure shade, he reports.

The hotel, which has an individual color scheme for every room, boasts that it can provide a "room for every color taste." Other preferences, Mr. Weal finds, are beige for honeymooners, yellow for children and coral pink--of all shades -- for leaders of American industry.

Each bathroom has a colored extension telephone, each room a colored television set. There is a thermometer outside each window in a matching colored frame. The hotel can change its decor swiftly with the aid of fast-drying paints. Guests at the Tuscany are accustomed to leaving a blue room only to return to a pink one after a long lunch hour.

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Politics in Color. Newark Evening News 11/1/60

A color-blind man has no place in West German politics where varied hues identify objectives.

Only a person with great color perception could possibly keep up with the "Green," "Black," and "Blue" plans for which government and parliamentary approval are sought.

As America's New Deal gave all the schemes fancy sets of initials so Germans name their pet pork barrel projects after colors. Thus, the parliament is involved in how much tax money should be spent on the "Green Plan" to assist agriculture, the "Golden Plan" to build athletic fields, the "Black Plan" for aid to the coal miners of the Ruhr; and the fishermen term their own bleat for government help with the "Blue Plan."

The color scheme in German politics actually begins with the political parties themselves. Catholic politicians are known as "The Blacks," while Socialists are termed "The Reds," unless the speaker means the Communists, who also are known as "The Reds." Nazis are "The Browns," of course.

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Food Color Additive Banned. Journal of the American Medical Association

A red coloring used in hot dog casings, ice cream, maraschino cherries, and many other foods was banned by the Food and Drug Administration in one of the first major actions taken under the new color additive bill.

The FDA said the coloring, a coal tar additive known as red No. 1, will undergo continued tests to determine if it is cancer-producing. Preliminary tests have shown the color "produces liver damage in test animals, and no safe use level has been established," according to the agency.

John L. Harvey, FDA Deputy Administrator, said there appeared to be no need to remove food, drugs, and cosmetics containing the coloring from the market. It is not used in lipstick.

The FDA said the lowest amounts of red No. 1 which have been shown to produce liver damage in test animals were many times greater than the amounts of this color that would be consumed in the human diet.

The new color additive law places on manufacturers the burden of proving that colors are safe before they can be allowed in foods, drugs, and cosmetics.

Previously, there were no limits on the amount of red No. 1 that could be used in foods, although in practice the actual amounts were small, even where red No. 1 was the sole coloring agent used.

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LETTER TO THE EDITOR

Dear Mr. Rhodes: We all enjoyed Wright's paper in the September-December Newsletter.

If the report published on Page 19 of the issue that "the old folk superstition about black (in hearses) is changing with a resulting new status symbol in the funeral business ..... fully half of all hearses now produced are colored ..... threetone tan ..... peacock blue with aqua ..... etc." were quoted without any comment by the New Yorker it would be certain of tragicomical impact.

What next?

Perhaps the old folk superstition about the American flag is changing with a resulting new status symbol in the patriotic business ..... fully half of all flags now produced are parrot green and two-tone crimson ..... etc., etc.

Perhaps the old folk superstition about mourning our dead is changing with a resulting new status symbol in the business ..... fully half of all relations now produced are tinted by money ..... etc., etc.

Norbert J. Kreidl
Bausch & Lomb Incorporated

The Hosiery Manufacturer Hires a Color Man

"O.K., mister—what was the name again?"

"Jones, sir."

"O.K., Jones, here's the bit: we got a nice set of threads this season, and browns are big like always. We got a light brown and a medium brown and a dark brown. Howya gonna play it?"

"Well, let's see. How about this, sir? Three smart classic colors: beige, tan and brown."

"Beige, tan and br—— Listen, Jones. We ain't here to bat the breeze. *Sing* it."

"Oh. H'm-m-m. Oh, you mean like: go naughty, go spicy, go nutmeg, cinnamon, clove!"

"Naaah, that's ——"

"Or like—wait a minute! Sweet-talkin' sugar shades! Butterscotch, French caramel, Swiss chocolate!"

"Naaah, we ——"

"Or listen! Get cockeyed on cocktail colors—Gibson, Manhattan, Irish Whisk—— No, wait. Here it is. Listen: they're wicked, they're witching, they're catch-a-feller colors —— A mad marvelous range of Bardot browns!"

"Naaah, we went the Mansfield-Monroe route two years ago. Look, Jones, whatcha tryna do? Tell the people what the colors *look* like? Now get out there. *Way* out."

"Oh. You mean *real* gone, like sand hog, sump, wet dirt?"

"Wrong filter, friend. I'm still getting the picture."

"Wait. How's this? Dancing colors for dancing feet—samba, hucklebuck, cha-cha!"

"Well—you're moving in, but ——"

"Hold it—I got it! Sonic shades: Blast-off! Whoooosh! Orbit!"

"Hey, man, you're on. Hang your hat and scrape off a desk. Why, nobody'd guess what colors they are, never in a million years!"

OFF-COLOR YARN

The Light That Failed—Tale Of Sale Hangs by a Thread

Dear Editor:

I have a friend who thinks sewing her own clothes beats shopping for them any day. She finds home - sewing both entertaining and therapeutic, so much so that when I arrived to pick up this nervous bride on her wedding day, I found her calmly finishing up the hem on her bridal gown. But despite her delight in creating her own fashions, Eileen tells me that she's almost ready to give up her hobby in despair. "It's just too much trouble trying to assemble the makings," she says. She blames her difficulties on department store fabrics and notions departments, which, she feels, are going out of their way to make things tough for her.

Constant Consumer

She bitterly listed her grievances on the phone the other night, after a particularly frustrating experience. "I've been dreaming about a purple drip-dry dress for ages," she said, "and I finally got around to doing something about it this morning. I spent a good hour in a fabrics department tracking down the right fiber proportion in a drip-dry and then finding the color I had in mind. I finally located just what I wanted, but terribly expensive.

"The department is lighted fluorescently and you know what that does to colors so I asked the salesgirl whether I could see the fabric under natural light. Do you know that in that whole department there wasn't a single window or one miserable daylight bulb?"

Eileen decided to take a chance on the fabric, bought the yardage she needed and asked for thread and binding to match. "That," she said between clenched teeth, "turned out to be in the notions department on the first floor. So off I went, hunted down the thread, unwrapped my fabric and proceeded to match thread color. No problem at all, except that the notions department was fluorescently lit, too, and it wasn't until I read the label on the perfectly matching spool of purple thread that the real horror of it all struck me. The label read 'Bright Red.'"

Eileen flew out into the daylight with her fabrics and sure enough, she was the dismayed owner of 3½ costly yards of tomato - colored Dacron - cotton. "It's not returnable," she moaned, "and I look ghastly in tomato.

"Why," she demanded, "couldn't that elaborate department have one little ray of natural light to show me my mistake before the goods had been cut? Why couldn't they have a little counter of thread and findings so I wouldn't have to lug that heavy stuff around with me to match it? Besides, if they'd had the thread on hand, I would have been able to read the label on the spool in time to catch my error.

"And why in the world, with all the nonsense they have printed on bolts of fabric, can't they include the color? That darned bolt had every fiber in the dictionary on it. But did it have the key word 'red'? It did not; that might help the customer. And that," she asserted poisonously, "is against the rules."

Sincerely,
C. C.