INTER-SOCIETY COLOR COUNCIL

NEWS LETTER NO. 26

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I. H. Godlove, Editor-in-Chief
Charles Bittinger, Editor for Art
C. E. Foss, Editor for Industry
D. B. Judd, Editor for Science

S. M. P. E. NEW MEMBER BODY

It is our pleasure to announce the very recent election of the Society of Motion Picture Engineers as the eleventh member body of the Inter-Society Color Council. We hope -- and expect -- that for each added member body the Council can serve to fulfill the aims and purposes of its organization in a manner that will progress in geometric ratio to the number of its member bodies. As soon as delegates are appointed by the S.M.P.E., you will be informed.

OFFICERS FOR 1940-41

Election of officers for a two-year term, to begin January 1940, has been completed by letter ballot of the voting delegates. The new chairman will be Deane B. Judd, National Bureau of Standards, O.S.A. delegate; Vice-Chairman, Carl E. Foss, Interchemical Corporation, A.S.T.M. delegate; Secretary, Dorothy Nickerson, Agricultural Marketing Service, Individual Member delegate; Treasurer, Norman Macbeth, Macbeth Daylighting Corporation, I.E.S. delegate. Three Counsellors were elected as follows: Henry P. Gage, Corning Glass Works, delegate from I.E.S. and O.S.A.; Le Grand H. Hardy, practising opthalmologist, Individual Member delegate; Sidney M. Newhall, Johns Hopkins University, A.P.A. delegate.

NEW MEMBERS AND DELEGATES

Carl E. Foss has been recently appointed by the American Society for Testing Materials as an additional delegate to represent them in activities of the Inter-Society Color Council.

Since the last annual meeting the following persons have been elected by the Executive Committee as individual members of the Council. We are glad to welcome them:

Feb. 22: Doane Eaton, Box 101 General P.O., New York City.
Julian E. Garnsey, Color Consultant NY World's Fair, 71 W. 45 Street, NYC.
Apr. 5: Robert H. Park, Calco Chemical Company, Inc., Bound Brook, N. J.
Blanche R. Bellamy(Mrs.),Mgr.Munsell Color Co.,10 E.Franklin St.,Balto.,Md.
Apr. 10: Alexander Strobl, Stroblite Company, 35 W. 52nd St., New York City.
L. Wallace Coffer, (Climax Molybdenum Company of Michigan), 14410 Woodrow Wilson Blvd., Detroit, Michigan.
Apr. 29: R. K. Flege, Slatersville Finishing Company, Slatersville, R. I.
Raymond G.Twyeffort (Ch.Fashion Com.Merchant Tailors Assn),620-5th Ave.NYC.
Sept. 16: Edwin W. Cheney, The Mason Box Company, Attleboro Falls, Mass.
Dec. 2: Harry H. Scheid, (Color Engineer), 923 Fifth Avenue, New York City.
Benjamin J. King, Macbeth Daylighting Corp. 227 W. 17th St., NYC.
Foster Kienholz, Pres. Mills Acad., 89 E. Kellogg Blvd., St. Paul, Minn.
Isobel Moore, College Station, Durham, N. C.
John G. Strange, Secretary, The Institute of Paper Chemistry, Appleton,Wisc.

NEW COUNCIL TREASURER

Even we neutrals must suffer when there is a war in Europe. Because of the war our dynamic and able Treasurer of past seasons, Mrs. Margaret Hayden Rorke, has been forced to resign as Treasurer of the Council in order to devote her entire time to duties as Managing Director of the Textile Color Card Association of the United States, Inc. Mrs. Rorke has been active in Council affairs since its organization, and has been an excellent treasurer and chairman of our Finance Committee. She remains, of course, as a delegate of her association to the Council, and we hope that before too long she may again be able to devote a share of her time and abilities to Council affairs.

Meanwhile we are fortunate in being able to welcome as her successor, Mr. Norman Macbeth, appointed by Dr. Dimmick to serve in the interim until he takes office on January 1st as the newly elected Treasurer.

Perhaps we may borrow and paraphrase Europe's old welcoming acclaim: "The treasurer is passing; long live the Treasurer." Mr. Macbeth is literally a big man, but we do not disparage him when we say it will be difficult to measure up to the standards set by Mrs. Rorke for the efficient, smooth and prompt handling of the Council's financial affairs. Those of us who have been fortunate enough to serve with her will long remember her excellent work and her wise counsels at Executive Committee and other meetings. Our consolation consists in the knowledge that it is a wise policy to bring a certain proportion of new blood into the active work of the Council; and though we would have liked to make an exception in the case of our popular treasurer, we have the further consolation of our good fortune in her successor.

LOCAL COLOR GROUPS

BOSTON: The committee appointed by Prof. Frank L. Allen, chairman, was scheduled to present plans for the 1939-40 season to the group at their first meeting, November 28. After dinner at Madame Burguet's, the group planned to adjourn to the Boston Museum of Fine Arts to hear Miss Margaret George speak on "Period Color".

CHICAGO: The Association for Color Research held their first meeting of the 1939-40 season on September 27 at their new meeting place in the Fine Arts Building. V. A. Schoenberg, C.A., talked to the group on Additive and Subtractive Color. On October 25, R. V. Brost presented to the group giant-size three-dimensional pictures in full natural color. Notices of several other related activities have come to your editor's attention. Color and the Graphic Arts are surely alive and active in Chicago.

WASHINGTON: The Colorists opened their sixth season with a dinner meeting at the Arts Club on November 13. Dr. E. C. McAlister spoke about his work at the Smithsonian Institute on plant growth under different illuminations, intermittent and steady. Dr. Deane B. Judd discussed the new Eastman Color Temperature meter, described by E. M. Lowry and K. S. Weaver in the Journal of the S.M.P.E., March 1939.

NEW YORK: Individual members of the Council who live in and around New York met for dinner at the Piccadilly Hotel on September 15. About twenty persons were present. They decided to hold three or four meetings through the year, and appointed Carl E. Foss, chairman; Julian E. Garnsey, Dean Farnsworth, and Norman Macbeth, as a Planning Committee. They met for the second time on Tuesday, November 28. Following the dinner hour, Dr. Le Grand H. Hardy spoke on Color Vision, and two films on color were exhibited.

REVISION OF 1922 O.S.A. COLORIMETRY COMMITTEE REPORT

The Optical Society of America Colorimetry Committee is approaching the final stage in its revision of the classic 1922 report on colorimetry by the late Dr. Troland. The present chairman, Dr. L. A. Jones, after many long sessions of the committee, has worked out a comprehensive outline for the revised report and has assembled much of the material, but has been delayed in his final writing of it because of disagreement within the committee on the general point of view which should be taken in treating various aspects of the color problem. Recently, three proposed possible approaches have been submitted to Dr. Jones by Dr. Judd, together with comparative material exploring their consequences. It seems almost certain that one of these suggestions will provide a workable basis for writing the report since they all reflect the considerable progress which has been made by the years-long effort of Dr. L. A. Jones' committee to bring Troland's report up to date. It is perhaps not too much to hope that at least a first draft of the revised report will be completed in a few months.

NATIONAL SCHOOL BUS CHROME

Results of a conference of 48 State Education Departments on Uniform State Standards for Construction of School Buses, held April 1939 in New York City, are published in School Bus Standards, obtainable from the International Text Book Company, Scranton, Pennsylvania, at 50 cents each. The cover of the booklet approximates the color designated as National School Bus Chrome.

Specifications for the color limits selected by the conference were made at the National Bureau of Standards. Briefly, they include the following: the color to be that of an opaque glossy sample, which (under specified ICI conditions, "C" Illuminant) shall have a luminous apparant reflectance not less than 0.39, dominant wavelength not greater than 586.5 mμ nor less than 581.6 mμ, the z coordinate not greater than 0.030. The maximum value of z thus specified restricts the color to samples having high gloss (the printed cover of the booklet is not glossy enough to meet the specifications). To assist in securing the proper color, the Bureau of Standards prepared and submitted to Prof. Cyr, chairman of the committee, 150 painted samples which came within the specifications.

National School Bus Chrome in terms of the newly adopted I.S.C.C. system of designations is strong orange (red limit and medium) to strong yellowish orange (green limit).

LARGE PRISM

Information, please! We have a letter from Mr. Faber Birren, well-known member of the Council, asking for information on liquid prisms. He writes: "I have such a development now under consideration, and I am anxious to find out about large prisms. Can anyone tell me what is the largest prism, solid or liquid, ever produced?" The Editor remembers seeing, several years ago, a large liquid prism at Wilmer Institute, Johns Hopkins University; also what was claimed to be the largest spectrograph prism ever produced, which was loaned to him for the Exhibition on Color at the New York Museum of Science and Industry in 1930. As it is probable that more recent developments have produced bigger prisms, in accord with America's policy of the biggest, we shall leave to our readers a final answer to Mr. Birren's questions.

ARTIFICIAL DAY-LIGHTING STUDIES

A paper of this title by our secretary, Miss Dorothy Nickerson, Color Technologist of the Agricultural Marketing Service, Washington, was presented before the Thirty-third Annual Convention of the Illuminating Engineering Society, San Francisco, California, August 21-25. Miss Nickerson discusses lamp-and-filter

combinations, carbon arcs, carbon dioxide tubes and fluorescent tubes. Some of the conclusions of the paper have been discussed previously in the News Letter; but we believe that the reader will profit by reference to Miss Nickerson's paper, which can be found in the December Transactions of the above-named society.

PSYCHOLOGICALLY UNIQUE RED

In a paper entitled "The Spectral Components of Psychologically Unique Red", Amer. J. Psychol. 52, 348-53 (July, 1939), our Chairman, Dr. Forrest L. Dimmick, and Margaret R. Hubbard, of Hobart College, have determined the amount of "unique" blue (476 millimicrons) which must be added to spectral red (635 millimicrons) to obtain the "psychologically unique" red; that is, a red which is neither bluish nor yellowish. The just-not-yellow and just-not-blue limits of red were obtained with 5 observers, and a representative red was calculated as the mean between these two limits, yielding the complement of 493.6 millimicrons as the result. The authors state that the seven points of reference have now been experimentally established for the 4-variable equation: Color equals x (red or green) plus or minus y (yellow or blue) plus or minus z (black or white) plus G (gray). For a discussion of the application of this equation to the description of color, the reader should consult the original paper and an earlier one by the authors in Amer. J. Psychol. 52, 242-54 (1939).

STANDARDIZATION OF SIGNAL GLASSES

A paper of fundamental significance to colorimetry, and an outstanding example of cooperative effort, is one entitled "Standardization of the Luminous-Transmission Scale Used in the Specification of Railroad Signal Glasses", by K. S. Gibson & Geraldine W. Haupt, J. Opt. Soc. Amer. 29, 188-200 (May, 1939), and J. Res. Nat. Bur. Stand. 22, 627-49 (June, 1939). This standardization resulted from the cooperative efforts of the Signal Section of the Association of American Railroads, Corning Glass Works and the National Bureau of Standards. The work reported in this paper carries on a unified series which may be dated back to a paper by Wm. Churchill of Corning Glass Works presented at the 1905 meeting of the Railway Signal Association, in which the "mixture diagram", so essential in specifying the chromatic properties of signal lights, was illustrated in colors and used by Dr. Churchill in his study of the characteristics of signal glassware. In 1908, the Railway Signal Association, with the cooperation of Corning Glass Works, adopted certain glass roundels, for use with the kerosene flame, to represent the most desirable colors (red, yellow, green, blue, purple and lunar white) then available for signal purposes. Each of these roundels was designated arbitrarily as having a "photometric value" of 100, regardless of the absolute luminous transmission. Manufacturing tolerances deviating from these standards in photometric value were stated and chromaticity tolerances implied. This pioneering work was the first known effort to place the colorimetric part of a purchase specification on a fundamental basis. The precision was improved in 1918 specifications; but adequate colorimetric specification of the tolerances had to wait until first the Optical Society of America (1922) and then the International Commission on Illumination (1931) had set up computational procedures and data suitable for such purpose. The present paper is the first of several dealing with the development and description of the signal-glass specifications formulated by the Signal Section in 1935 and 1938 (for references, see the paper). The present paper gives the spectral transmissions of the basic standards on which the AAR scale of luminous transmission is based, and defines that scale in fundamental absolute units. Comparison is made with the scales defined in the 1905 and 1918 signal-glass specifications. We understand this work to be of broader application than to railway signalling, as the probability is high that it will be extended to traffic and marine signalling and other fields.

APPLICATION TO DYES OF THE ISCC METHOD OF SPECIFICATION OF FILTERS

The Editor has elaborated an extension of the ISCC method of designation of filters for theatrical lighting, published by Dr. Judd (J. Opt. Soc. Amer. 28, 390-7; 1938), with applications to two different problems. These are: rapid filing and reference to spectral transmission curves of various shapes and identification of unknown dyes. On examining the transmission curves of several hundred dyes, obtained with the Hardy-G.E. automatic spectrophotometer, it was found necessary to add some precision to the ISCC seven-digit approximate specification of the spectral transmission of filters as a function of wave length, by using nine characters (digits or letters, as on an automobile license plate). Also, instead of ten intervals on the transmission scale, 15 were used; in addition to the ten digits, the letters T, J, Q, K and A. The letters can be easily remembered as abbreviations of ten, jack, queen, king, and ace, respectively. These characters define intervals of percentage transmission, the lowest figure of which is easily remembered as half the square of the number (J and Q standing for 11 and 12, and so on). For example, the sixth lowest interval, designated by 6, extends from 18 to 24.5 percent transmission. The wave lengths at which transmissions are read are 400, 420, 460 and then every fortieth millimicron, ending with 700 millimicrons. Experience showed that "kinks" were very frequently found at the violet end, while all curves were of relatively simple shape at the red end of the spectrum. A very essential part of the method is the adjustment of the minimum transmission to ten percent (corrected for reflection by the use of a "blank" water cell in the standard beam) before reading the complete curve. Further, all solutions must be made with very hot, nearly boiling, water, and buffered with an appropriate buffer. With these precautions, no weighing of the dye is necessary; consequently the Editor has found it possible to dissolve the dye, buffer it and adjust its strength for measurement all within one minute.

It is the Editor's intention to build up a library of curves for not only all the several hundred soluble dyes of his Company's line, but eventually also all soluble dyes on the American market. The designations, illustrated below, will be used as filing indices. It has been found possible to read the designations from the curves in 20 to 30 seconds. Having such designations systematically filed, it is possible to locate very quickly a dye having a desired shape of spectral transmission curve. It is also possible to identify unknown dyes very quickly, provided they are relatively pure in the sense of having not more than small amounts of inert (non-coloring) material present. The Editor has tested this application by having an assistant give him for identification a few specks of unknown dyestuffs picked from a long list of dyes whose designations had already been determined. Examples of such designations follow. The hyphen or underlining is used to designate the position of the wave length of minimum transmission (the exact wave length will vary as much as several millimicrons with the amount of inert material present); the dot indicates a clearly marked inflection in the curve. In the case of some yellows, and some browns and oranges, whose maximum absorption is outside the range 400 to 700 millimicrons so that the curve slopes steadily upward from the violet, the strength is adjusted to give ten percent transmission at 430 millimicrons.

Du Pont Thioflavine TCN Concentrated (a yellow)	5-4QAAAAAA
"Pontamine" Fast Yellow BBL	237JKKAAA
"Pontamine" Fast Orange MRL	65-46JKAAA
Du Pont Basic Brown BR	75-46TQKAA
"Pontamine" Brown RMR	444556TKK
Du Pont Purpurine 4B Concentrated (a red)	985-47QKAA
"Pontamine" Fast Red 8BL	78.74-5TKAA

Du Pont Victoria Blue B Concentrated	KK.KQ96-4JK
Du Pont Indigotine Concentrated	KKQQT6-4JK
"Pontacyl" Green NV Concentrated	QQ-K.KKT6-7K
"Pontamine" Fast Black L	87.6.6.5-469Q
"Pontamine" Fast Gray L	77..8765445

The Editor would like to hear criticism and suggestions for making this application more generally useful. For example, in the case of curves passing very near the border line of two divisions of the scale, so that filing at two places is necessary, would a small (lower case) letter be useful to indicate this fact?

ANNUAL REPORTS — Annual reports on the activities of the Color Council during the past year have been made to the Secretary of the Illuminating Engineering Society by Messrs. Gage and Little, and to the American Psychological Association by Dr. Dimmick, copies being on file with the Council secretary. It is requested that chairmen of all other delegations send copies of such reports to your secretary when they are made. We would like also to keep a roster of annual meetings of all member bodies, if the chairman of each delegation will supply the necessary information.

MUNSELL PAPERS — Psychologists and others using Munsell papers for experimental work who have complained of their expense will be glad to learn of a recent reduction in price.

TRIBUTE TO A COUNCIL MEMBER — The following excerpt was heard over WEAF, red network, a few months ago, when Captain Tim Healy interviewed Mr. A. Maerz, co-author with our vice-chairman of the Dictionary of Color on the subject of color in relation to postage stamps.

Question: But are not some philatelists using color systems, Mr. Maerz?

Answer: Yes; that is true. For example, my friend, Mr. William H. Beck of Baltimore is doing some splendid work in research on color in philately, and I have great respect for his ability and enterprise. It is a thoroughly valuable work, and in it for his particular purpose a strictly scientific color system is decidedly beneficial. But Beck is an exceptional man, and few collectors would give the devotion and labor to it that he does, though plainly it is not labor but joy to him. The general philatelist, however, is not interested in the systematization of colors, but only casually in colors as they appear on his stamps. His stamps are a hobby, a recreation to him. He may give his love to it, and as much of his time as he can, but he would insist on keeping it a recreation. He wants to study his stamps, not color systems.

ANNUAL MEETING — Your Executive Committee met in New York City for all day sessions on June 30, September 16, and December 2. Among other matters, the following program plans for the 1940 annual meeting were developed at those meetings. The technical session, under the chairmanship of Dr. John L. Parsons, will be held jointly with the Technical Association of the Pulp and Paper Industry on February 21, the day previous to the annual meeting, and will be a symposium on the usefulness of spectrophotometry in the paper industry. Discussions of abridged spectrophotometers and their applications, as well as the more complete type, will be held. Planning the technical session as part of the program of the annual meeting of the society co-sponsoring the papers will allow time on the program of the annual meeting of the Council for the presentation and discussion of color problems under the leadership of the Problems Committee on the

morning of February 22. The business session will be held on the afternoon of February 22. Plans for the Popular Session are in charge of a subcommittee consisting of Messrs. Foss, Godlove, and Paul, and it is expected that they will have wide appeal to the general membership. All meetings, except perhaps the evening session, will be held, by courtesy of T.A.P.P.I., at the Roosevelt Hotel, New York City, where they will be in session. Our meeting will be held, as in the past two years, jointly with the Optical Society of America and the American Physical Society. TAPPI meets Monday through Thursday of the week of February 19. The joint session of the OSA, Am. Phys. Soc., and ISCC will be held Thursday through Saturday of the same week.

REPORTS TO MEMBERS

It was due to the efforts of our chairman, Dr. Forrest Lee Dimmick, that you received recently the well prepared report on Color Terms. Collection of the material included was completed by the Problems Committee about a year ago. There seemed no way to make it available to the membership until Dr. Dimmick agreed to have it prepared at his office at Hobart College. The black cover was by courtesy of Dr. John H. Parsons, the spectrum was the contribution of Mr. Carl E. Foss. Cooperation pays!

Reprints of the Council color designation report adopted by letter ballot last spring have been mailed to members. The original report by Judd and Kelly, would have been published by the Council itself had not the National Bureau of Standards, where the work was done, exercised its privilege of publishing the report in their Journal of Research. The paper appeared in the September number of that journal. Additional copies of the report may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. at 10 cents each.

Additional copies of the February Symposium on Color Tolerances may be obtained as long as the limited supply lasts by enclosing 50 cents (stamps of small denominations are satisfactory) and addressing your request to Inter-Society Color Council, Box 155, Benjamin Franklin Station, Washington, D. C. Please be sure to use this address when funds are enclosed.

BIBLIOGRAPHY

Important Notice. A Letter Circular bibliography (LC-398), containing about 360 references, has been published by the Bureau of Standards. It is entitled "Colorimetry and Spectrophotometry: Publications by the Staff of the National Bureau of Standards". It is dated January 1, 1939; but it includes a few references bearing a 1939 date. It is divided into three parts, these being, respectively, publications of primary importance to colorimetry; abstracts, reports, letter circulars, etc., not included in the first part; and miscellaneous publications. A seven-page alphabetized subject index is included at the end.

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