Inter-Society Color Council *News*

Number 336 **March/April 1992**

IN THIS ISSUE

NEW STANDARDS ON SAFETY SIGNS AND COLORS - ANSI Z535

The American National Standards Institute recently approved a series of four new standards containing information needed to specify colors, formats, and symbols for safety signs and labels for use in environmental, industrial facility, and product applications. A fifth standard is expected to be approved shortly.

The standard of most interest to ISCC members is ANSI Z535.1, American National Standard Safety Color Code, which sets forth the technical definitions, color standards, and color tolerances for Safety Colors, and describes the applications of these safety colors to specific purposes in connection with accident prevention. The standard establishes a safety color code that will alert and inform persons to take precautionary action or other appropriate action in the presence of hazards.

The new standards constitute a revision and expansion of ANSI Z53.1 (1979), Safety Color Code for Marking Physical Hazards. The "ordinary surface color" Safety Colors in Z535.1 are changed only trivially from the colors in Z53.1. They are: red, orange, yellow, green, blue, purple, white, gray, black, and brown. They are defined in terms of the 1931 CIE system for standard illuminant C, and in terms of the Munsell system. For each, the Munsell notation and CIE coordinates of the standard color and six tolerance samples, plus and minus hue, plus and minus value, and plus and minus chroma, are specified. Both visual and instrumental test methods for establishing conformance to the standard are described in detail. The last two sections were extensively revised and brought up to date as of the end of 1989.

In addition, an entirely new section of the standard, Color Specifications and Instrumental Test Methods for Fluorescent Materials, was established. Two sets of specifications are provided. A set designated "restricted" consists of specifications for red, orange, yellow and green colors that are identical to those specified by the CIE for fluorescent colors for visual signaling in Publication CIE No. 39.2, 1983. They are meant to be used when the primary consideration is the differentiation among the three fluorescent colors red, orange, and yellow, used together in a single system. The set designated "unrestricted" consists of specifications for red-orange, yellow, and green. They are meant to be used when the primary consideration is the differentiation between only yellow and red-orange fluorescent colors, but it is required that these colors remain distinguishable for long periods of time. There is only one specification for green.

Most of the technical revisions leading to ANSI Z535.1 were carried out by Fred W. Billmeyer, Jr., who drafted the fluorescent color section, and W. Nick Hale, Jr.

The remaining new standards in the Z535 group are: ANSI Z535.2, American National Standard for Environmental and Facility Safety Signs; ANSI Z535.3, Criteria for Safety Symbols; and ANSI Z535.4, American National Standard for Product Safety Signs and Labels. A fifth standard, ANSI Z535.5, Accident Prevention Tags, is expected to be approved in the very near future. Where color is concerned, each of these standards refers back to Z535.1 for its specification.

These American National Standards are the result of some 12 years of development work by ANSI Accredited Standards Committee Z535 on Safety Signs and Colors. On this committee, Fred W. Billmeyer, Jr., serves as representative of the ISCC, with Norbert L. Johnson as alternate. The Chairperson of the Committee is Dr. Belinda L. Collins, also an ISCC member.

Fred W. Billmeyer, Jr.

ASTM COMMITTEE E-12 ON APPEARANCE

ASTM The committee held three days of meetings, January 19-22, 1992, at the Crown Sterling Suites Hotel, Fort Lauderdale, FL.

Each of its 11 subcommittees was scheduled to meet, namely (1) Editorial and Terminology, (2) Spectrophotometry and Colorimetery, (3) Geometry, (4) Plannings, (5) Publications, (6) Appearance of Displays, (7) Color Order Systems, (8) High Visibility Materials, for Individual Safety, (9) Scattering, (10) Retroreflection, and (11) Visual Methods. There has been insufficient time to obtain the minutes from the notes of each subcommittee chairman or secretary to get a meaningful report in the issue; hopefully they will be available the next issue. Meanwhile ISCC members should contact ASTM and procure a copy of the Third Edition of ASTM Standards on Color and Appearance, ASTM $55.00. The price will be slightly higher if you choose to phone or fax ASTM and request that the book be sent on a "mail and bill" basis. Phone: (215) 299-5585, or fax (215) 977 9679. There were 1,500 copies printed and 500 have already been sold; so order now before this edition is out of print!

Harry K. Hammond III

1992 GIA BOOKSTORE CATALOG AVAILABLE

GIA The 1992 edition of the GIA Bookstore's catalog of books and videos on gemology, jewelry manufacturing arts and jewelry business includes many new titles.

Among them are *Proceedings of the International Gemological Symposium, 1991* ($49.95 cloth, $34.95 paper), *Australian Precious Opal, A Guide Book For Professionals* ($20.00), *Contemporary American Jewelry Design* ($39.95), The first English translation of *The Larousse Encyclopedia of Precious Gems* ($60.00) and *Gemology* ($58.00), the revised and updated second edition of the classic resource text.

The GIA Bookstore carries the largest stock of jewelry-related titles in the world, in addition to gift items, course supplements, videos, and 35mm color slides.

To order or request the free catalog of all titles in stock, write the GIA Bookstore, Dept. PR04, P.O. Box 2052, Santa Monica, California 90406-2052, Or call toll-free in the U.S. (800) 421-7250 ext. 703. Outside the U.S., call (310) 829-2991 ext. 703.

RETEC '90 BEST PAPER AWARD

Richard Harold of Hunter Associates Laboratory, Inc., was presented with the Best Paper Award on October 23, 1991, by Charley Bradshaw, Chairman of the Color and Appearance Division of SPE, an ISCC Member Body.

Mr. Harold's paper, "Appearance Measurement and CMC Color Tolerance," was given at the CAD RETEC in Charlotte, NC in October 1990.

Following the lead of the American Association of Chemists and Colorists (AATCC), a wave of interest in building in the plastics industry on the use of CMC Color Differences for such diverse application as automotive interior trim, vinyl house siding and a variety of consumer products. Mr. Harold currently serves as Chairman of the AATCC Subcommittee on Color Measurement using the CMC Test Method.

December 1991 Color and Appearance Division Newsletter of the Society of Plastics Engineers

BOOK REVIEW

Effective Color Displays - Theory and Practice, By David Travis

Published by Academic Press, 1991, 301 pages - Price $49.95

In spite of the transatlantic spelling, David Travis is a U.K. member of the Colour Group. His book starts with a chapter on the technology of the CRT display, and continues with a lengthy chapter on colour vision (if I see the author at a meeting, with one eye closed and looking 18 degrees away from me, I shall know he is trying to 'behead' me). He then gets down to business with chapters on specifying colour, and on Coding, Formatting and Design. The final chapter covers calibration and evaluation of displays, of which a large part is devoted to general ergonomic features of working with displays. The remaining third of the book consists of appendices, covering matrix transformations within colour spaces, tabulated CIE data for a full range of Munsell Colours, and a checklist for environmental ergonomics of the work station environment.

This is a well presented practical guide to display design; the key chapter on coding, formatting and design covers many valuable approaches, appropriate for different colour display needs, including some guidance on the aesthetics and graphic design aspects. Many Colour Group members will find something of value in this chapter. The book is "meant for people with no knowledge of colour science, psychology or physiology", and members might find the remainder of the book unduly extended. It is clearly and entertainingly written, each chapter being preceded by an 'overview' and followed by a summary of key points, and extensive references.

Review by P.M. Forsyth

Reprinted from the November 1991 Newsletter of The Colour Group (Great Britain).

INTER-SOCIETY COLOR COUNCIL

FINAL CALL FOR PAPERS

1992 Annual Meeting,
June 21-24
Interest Group II, Appearance, Vision, & Modeling
Paper & Discussion Session,
June 22, 1992
Recent Advances In Color Appearance Specification

The major unsolved problem in the field of color science is the accurate numerical specification of the color appearance of stimuli under various viewing conditions. This type of specification must go beyond established colorimetry and account for physical factors such as illumination color, luminance level, stimulus background, surround, and media and perceptual factors such as chromatic adaptation, induction, color constancy, and discounting the illuminant. CIE Division I currently has several committees that are actively addressing these problems in search of color appearance specifications for many applications. These applications include, but are not limited to, color rendering properties of light sources, color reproduction, colorant formulation, and quality control.

The Inter-Society Color Council would like to take advantage of the fact that there is a CIE Division I meeting in Princeton on June 18 & 19, immediately preceding the ISCC annual meeting, by providing a forum in which recent advances in color appearance specification can be presented and discussed. Many of the leading international researchers in this field will be present making this a unique opportunity for the dissemination of data, results, and techniques.

The Interest Group II session will consist of invited and contributed papers on the topic of color appearance specification. These papers may include experimental data on chromatic adaptation or color appearance, discussion of empirical or theoretical models for predicting color appearance, tests of color appearance models, and descriptions of applications in which appearance models have been successfully applied or are required but not yet applied. Following the presentations, there will be an open panel discussion in which questions and comments can be explored in detail.

Submit a title and abstract IMMEDIATELY to:

Dr. Mark D. Fairchild
RIT Munsell Color Science Laboratory
P.O. Box 9887
Rochester, New York 14623-0887
Phone: 716-475-2784
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COMPUTATION OF HUE DIFFERENCE, ΔH*

At the meeting of ASTM Subcommittee E12.02 on Spectrophotometry and Colorimetry, this item was included on the agenda. Robert Säve recently published an article on this topic. He proposed a more straightforward means of calculating ΔH and keeping track of its sign, positive or negative. ASTM E12.02 desires to call Säve's proposal to the attention of individuals who compute ΔH and to obtain their views on the preferred equation for its computation.

In CIE Publication 15.2, Colorimetry, 2nd edition, 1986, the defining equation for hue difference is given. Using CIELAB and omitting the subscripts ab, the equation is:

$$\Delta H^* = [(\Delta E^*)2 - (\Delta L^*)2 - (\Delta C^*)2]1/2 \qquad (1)$$

One might ask if there is a way to compute ΔH directly rather than as a component difference of ΔE*? The answer is Yes, the CIE also gives the equation

$$\Delta H^* = C^* \Delta h \, (\Pi/180) \qquad (2)$$

where h is the hue angle. This equation is to be used for small color differences away from the achromatic axis.

In his recent Note in Color Res. Appl. Vol 156 (3), 217-218 (June, 1991), Säve derives and proposes the use of the precursor to eq. (2), which the CIE did not publish:

$$\Delta H^* = 2(C1^*C2^*) \sin(\Delta h/2) \qquad (3)$$

Equation (3) reduces to eq. (2) for C1 approximately equal to C2 and Δh small.

Note that eqs. (2) and (3) automatically preserve the correct sign of ΔH whereas it is lost when eq. (1) is used; it must be restored by following Note 4 in CIE 15.2. Säve gives two numerical examples of the use of eq. (3).

Billmeyer computed the results with all three equations. He found that the differences in the results are negligible - no more than 1 in the fourth decimal place.

Do any ISCC readers compute ΔH? ASTM Committee E12.02 on Appearance would like to know whether you use eq. (1) or (2), and whether you would find eq. (3) useful. Please send your comments to the ISCC editor. His address is on the back page of the News.

If there is strong support for eq. (3) ASTM will ask USNC/CIE to request that it be added to Publication 15.2. ASTM is a Member Body of ISCC and a Constituent Society of USNC and so it would be quite appropriate to make such a request.

Fred W. Billmeyer, Jr.
Harry K. Hammond III

COLOR RESEARCH AND APPLICATION

In This Issue, February 1992

Rolf Kuehni leads off this issue by talking about the progress in vision research. In the "Talking about color..." column he describes the implications of some of the recent discoveries concerning how we see color. This leads into the first article in which Indow and his coauthors study the experimental methods we use to determine matching colors.

From the time of MacAdam's experiments, the way to define the area of indistinguishable color was to have an observer adjust the color of the one half of a split-field until a target light displayed on that half of the field matched the test color on the other half of the field. The area around the split-field could be completely dark giving the impression of aperture colors, or by increasing the brightness of the surrounding area, the colors in the test field could be made to appear like surface colors. However, "surface" color produced in this way is different than a pair of painted colored samples because it does not have texture and may cause a different impression. The use of real painted samples presents a different problem. It is not possible to have a continuously variable test stimuli. One must make a finite number of physical samples and use the method of constant stimuli. In this method the observer is asked to judge whether two colors appear "the same" or "different." Then an algorithm defines the ellipsoid of colors that are indistinguishable. In "Discrimination Ellipsoids of Aperture and Simulated Surface Colors by Matching and Paired Comparison," Tarow Indow, Alan Robertson, Michael von Grunau, and Graham Fielder compare the ellipsoids of indistinguishable color obtained by the two methods.

In "Psychophysical Verification of the Accuracy of Color and Color Difference simulations of Surface Samples on a CRT Display" Danny C. Rich, David L. Alston, and Larry H. Allen also tackle the problem of how similar are observations using colored lights that are simulating paint samples and actual painted surfaces. In the Indow article the methods of matching and of constant stimuli were compared. In this article judgements of actual painted samples are compared to judgements of simulated related color-difference pairs on a CRT display in a magnitude-estimation experiment using a gray-scale anchor.

In the lighting industry it is convenient to use a single number to characterize an illuminant. Use of this number, the correlated color temperature (CCT), is reasonable because of two facts. First, the color of a glowing object (blackbody radiator) changes in a predictable and now well-defined way as the temperature of the object varies. Second, the color of most illuminants or sources are close to the color of a blackbody radiator. Thus the correlated color temperature of an illuminant is defined as the temperature of the blackbody radiator whose perceived color most closely resembles that of the illuminant. The accepted method of determining the CCT is based on the obsolete CIE 1964 u,v chromaticity diagram. In "Determination of Correlated Color Temperature Based on a Color Appearance Model" Wolfgang Walter proposes a new method of determining CCT based on Hunt's color appearance model for unrelated colors.

It would be nice to have one person designated as the standard observer, to whom we could take all color decisions. However, no person exists who can be called the "standard observer." The standard observer was constructed mathematically by averaging the data from approximately 70 observers, but the individual variation was very large. The existence of individual variation can cause problems when conducting experiments or seeking agreement on color for product acceptance. Therefore, it would be useful to know in advance how a certain individual will respond to color. To make this procedure possible one needs to know the cause for the individual variation and to find some index to specify an observer's color-matching behavior. Although this has been attempted before, in this issue Mitsuo Ikeda, Jun Ikeda, and Miyoshi Ayama take a new approach in which no prior visual model is specified. In "Specification of Individual Variation in Luminous Efficience for Brightness" the method of principal component analysis is applied to the data of luminous efficiency curves of observers and analyzed statistically. Individuals may then be characterized by the amounts of these principal components they exhibit.

This month's Color Forum is contributed by Ralph W. Pridmore. In "Music and Color: Relations in the Psychophysical Perspective" he describes the theory behind three electronic sound-to-light transducers that he built to give a visual impression of music to students and deaf people.

In This Issue, April 1992

In the forty years since the Stiles-Burch color-matching work, technical advances have made it possible to measure directly and accurately the absolute spectral power distribution of any light. This makes it possible to relate observers' judgements directly to the absolute spectral power distribution of the lights he views. Building on this basic premise William A. Thornton has spent the last four years measuring and analyzing the color matches made by six observers. In the three-part series "Towards a More Accurate and Extensible Colorimetry" he describes in detail this research and its surprising results. In this issue is "Part I. Introduction. The Visual Colorimeter-spectroradiometer. Experimental Results." He uses both the Maxwell method of matching white light composed of three-spectral colors against broadband light and the maximum-saturation method of matching doublets of spectral lights. The data obtained on these experiments allows comparison to the 1964 CIE chromaticity diagram, comparisons to the Stiles Cawford work of 1933, comparisons to MacAdam's findings of 1950, and visual tests of Grassmann's additivity assumption. While Part I describes the instrumentation and basic experi-

ments, Part II (to appear in the next issue) gives many of the results including as it applies to colorimetry problems and Part II will focus on avenues of possible improvement.

When the CIE first defined the 1931 Standard Observer (2-degree), one of the constraints they imposed was that the color matching function $y(\lambda)$ is identical to the luminous efficiency function $y(\lambda)$. Therefore, CIE tristimulus value Y can be used as the luminance or luminance factor In 1964 the CIE defined a Supplementary Standard Observer to be used when the viewing angle is greater than 4 degrees. In practice the supplementary of 10-degree observer data is used more widely than the original 2-degree observer data. However, the color matching function $y10(\lambda)$ is not identical to the spectral luminousefficiency $V(\lambda)$ and is therefore unable to evaluate the luminance or luminance factor. In "Estimation of Luminance Factors from CIE Supplementary Standard Colorimetric Observers," Noboru Ohta examines the possible errors which may occur when the $y10(\lambda)$ is used instead of the $y(\lambda)$ for evaluating the luminance factor.

The Holmholtz-Kohlrausch effect, whereby equiluminance colors of different chromaticities appear different in brightness, has received quite a bit of attention in this journal since 1991. Two different approaches to the quantification of this effect have been taken. In "Lightness Perception of Chromatic Object Colors," [Vol. 16, 16-25] Nayatani and his co-workers tested the hypothesis that if two chromatic object colors with different hues have the same values for each of three attributes (whiteness, blackness, and chromaticness), the two colors have the same perceived lightness, including a chromatic-component contribution. In another article, "Predicting the Lightness of Chromatic Object Colors Using CIELAB" [Vol. 16, 385-393], Fairchild and Pirrotta suggested a metric of perceived lightness of object colors based on the CIELAB system. Now in "Perceived Lightness of Chromatic Object Colors Including Highly Saturated Colors," Yoshinobu Nayatani, Yutaka Gomi, Masaaki Kamei, Hiroaki Sobagaki, and Kenjiro Hashimoto extend the Nayatani model to make it possible to estimate the Helmholtz-Kohlrausch effect on chromatic object colors with any Munsell Value.

In the last issue, Walter wrote an article "Determination of Correlated Color Temperature Based on a Color Appearance Model" [the Hunt Model]. In this issue Calvin S. McCamy provides a simple equation to compute correlated color temperature from the CIE 1931 chromaticity coordinates, x and y in the article, "Correlated Color Temperature As An Explicit Function of Chromaticity Coordinates." This equation removes the need for an iterative calculation or the use of graphical procedures. In addition, he discusses the use and misuse of correlated color temperature.

Klaus Witt has sent two letters to the Editor which are published in this issue. The first describes the work of CIE Technical Committee 1-28 Parameters affecting colour-difference evaluation, which he chairs. It gives the working program, the progress and problems, and ends with an invitation for researchers to contact the chairman. The second letter, partly in response to Fred W. Billmeyer's talking about color [Vol. 16, 144-145], is a discussion of the shortcomings of the city block model for color difference metrics.

NEW MEMBERS

We are pleased to list the latest members to the ISCC. Their names will appear in the 1992 Membership Directory. Welcome!

Mr. David Berends
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ATTENTION ISCC MEMBERS:
Information Request for Membership Directory

If, since the last Directory was published, you have changed or added to your name, address, telephone or fax number, please ***mail*** your changes immediately (no telephone calls please) to:

Membership Secretary: Ms Ann Laidlaw, c/o SheLyn, Inc., 1108 Grecade Street, Greensboro, NC 27408-8725

MEMBER BODY

The American Society for Photogrammetry and Remote Sensing

ASPRS The American Society for Photogrammetry and Remote Sensing (ASPRS), founded in 1934, has given increasing service to the scientific community and to the nation through development of photogrammetry, remote sensing and geographic information systems. The ASPRS defines photogrammetry and remote sensing as "the art, science, and technology of obtaining reliable information about physical objects and the environment, through the process of recording, measuring, and interpreting imagery and digital representations of energy patterns derived from non-contact sensor systems." Within this definition, photogrammetry includes the acquisition of imagery from conventional photographic systems, as well as from sensors using other portions of the electromagnetic spectrum. Both the quantitative (metric) and qualitative (interpretive) aspects of image analysis are included. Thus, modern photogrammetry is considered to embrace all the elements of image acquisition, mensuration, and interpretation. A new development is the great increase of interest in geographic information systems (GIS), for which a new division was established in November 1988.

The aims of the ASPRS are (1) to advance scientific knowledge in the various disciplines of photogrammetry and remote sensing (including but not limited to aerial surveying and mapping, photointerpretation, and spatial information management); (2) to provide a means for disseminating information on photogrammetry and its related sciences; (3) to encourage the exchange of ideas; (4) to stimulate student interest; (5) to improve standards; and (6) to uphold ethical principles. Publications of the Society include the journal, Photogrammetric Engineering & Remote Sensing (published monthly and containing the Society Newsletter), and the basic manuals of the science— the Manual of Photogrammetry, the Manual of Remote Sensing, and The Multilingual Dictionary of Remote Sensing and Photogrammetry. In addition, the Society publishes Technical Paper Volumes from technical meetings, Proceedings from workshops and symposia, a complete index to the Journal, and indexes to the Technical Paper Volumes. The Society also disseminates information through its local and national meetings, including the Annual and Fall Conventions. The organization of ASPRS now includes five technical divisions: Remote Sensing Applications, Primary Data Acquisition, Professional Practice, Photogrammetric Applications, and Geographic Information Systems.

Much of remote sensing interacts with color technology. For example, multispectral cameras and scanners acquire

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UNIVERSITY CORNER

(Editors Note: We welcome items of interest from ALL educational institutions, for this column!)

INTERR•I•TESTING

An Industry Encounter - A Graduate Student's Perspective

As a graduate student in color science, I have become increasingly familiar with the terms color reproduction, color appearance and color modeling through lecture and lab experiences. Due to my chemistry and physics background, however, I was unacquainted with actual color reproduction instruments such as scanners and film recorders. I had often found myself asking what is an industrial scanner?, why are there so many pre-press proofing systems? Although I have been working with the concepts in theoretical situations, I still did not have a keen grasp on the real world applications.

Fortunately I have now had a taste of one color reproduction industry, printing, thanks to R. R. Donnelley. This Chicago based printing company is supporting my thesis research in chromatic adaptation. In December they invited me and fellow student Tim Kohler for a plant tour of their research printing facilities. Our experiences there have expanded our views of how color is used in industry and has added to our practical knowledge.

Our first destination was the Technical Center in Lisle, IL, about 30 miles from downtown Chicago. Located in Chicago's industrial research corridor with other big names such as Fermilab, AT&T labs and Kodak, the Technical Center focuses on sales training and research & development. We concentrated mainly on 2 major projects in R&D, desktop publishing and a new electronic catalog system.

First I learned that "desktop publishing" was no longer simply printing documents from your PC as a inexpensive service. Now the term means what layout and graphic designers do to prepare advertisements (such as Sunday newspaper inserts), catalogs and magazines for large-scale printing. To further assist the process, Donnelley has designed a pre-press proofing system for color yellow page ads. The use of color ink in yellow page ads is a new technology being that is being realized by advertisers. Many customers are interested in viewing their ad before it goes to print to know, most importantly, what the color will look like. As an example, we had our picture taken with a still video camera (no film, but recorded to diskette) which was then transferred to the computer system, and in five minutes a printed ad for "our" used car dealership, with smiling faces and all, was in our

hands. The color of the printed page was a close simulation of what the color would actually look like in the yellow pages, and can serve as a contract proof. In order to do this, color modeling techniques were necessary.

Another project that was quite interesting, although less color science oriented, was a CD-ROM catalog system. This system is an interactive, in-store catalog and information resource for customers to use freely. All the available products are either stored as pictorial images or written descriptions, or both, and are accessed through menus. For instance, a person might walk into a store looking for the right cable to connect her VCR and TV. By selecting various choices on the menu, the prospective customer would find the right cable for her exact VCR and TV and even the instructions on how to use the cable to correctly complete the task. This information can be printed out and taken home by the customer. In the future, color concerns may be incorporate into this system, if color is one of the selling characteristics of the products being displayed.

On the following day we were in Warsaw, IN, touring one of the few gravure printing plants in the US. Of course Tim was thoroughly impressed by this facility since he has spent a great deal of time involved with printing. The plant was very large and was divided into various work areas, some having to do with color and others just printing. I will focus on the areas using color, although other sections, such as the bindery, were fascinating.

The pre-press work area was naturally the beginning of our tour, since this is where the product is first processed. The photographs, text, layout instructions, actual fabric samples and other pertinent data are received here and incorporated into copy ready for press. Images are scanned in (I saw those industrial scanners!) at incredible speeds, color corrected for the system, and sent to the appropriate work station. Layout designers then size and enhance these images as the customer has requested, fitting the photos into the predetermined areas on the page. At various stages in the process the designer will view an actual fabric sample in a light booth, determine its color match in printing ink amounts (known through experience) and return to the screen image to correct the color. Although the whole layout process is done on the screen, the CRT is not considered to be color accurate. It is the numerical ink data that is understood to be the "press" color. The customer representative is involved in many of the color decisions, often choosing color preferences (high chroma) over actual color matches. It is a very interactive method and requires a great number of iterations before a final pre-press proof is approved.

The finalized, approved page is sent to the cylinder engraving area where both digital and analog data is used to engrave each of the four cylinders (cyan, magenta, yellow and black). Once complete, the cylinders are mounted on a proof press and an actual printed proof is made. The customer will then view, approve or make necessary changes to the proof. At this stage only minute changes are possible since the engraving procedure is very expensive. Alterations are made directly on the cylinders, using acid or carbon scouring to achieve the desired color effect.

After this point, very little new color science is at work. The cylinders are coated and sent to the real press room, where the paper is run through the presses at 35 miles an hour. The pressman is in charge of registration and color and will manually adjust the press until the printed page color looks like that of the approved pre-press proof. It was impressive to see the pressmen compare the copies in the plant light booths and then intuitively adjust the color. I could imagine how many years of experience were behind those decisions, decisions I couldn't make without at least a hint from a color matching system. Right off the press, the pages are cut and trimmed, folded, bound, stacked and sent to the mail room. Some of the larger catalogs are actually stacked right into the trucks, full every half hour.

During the ride back to Chicago, we discussed various aspects of my thesis work that pertained to what I had so recently learned. Understanding some application concerns from industry has added another dimension to the design and analysis of my research. I was glad to realize that such research could contribute to both theoretical aspects of color science and actual production methods without sacrificing intent.

Elizabeth Pirrotta

OBITUARY: DONALD A. CAMPBELL

Donald Andrews Campbell, 63, dye laboratory manager and senior technical associate for C. H. Masland & Sons of Carlisle, PA before retiring in 1990, died December 31, 1991.

Born in Lisbon Falls, Maine, he had been a resident of South Kingstown before moving to Pennsylvania in 1962.

Mr. Campbell had been a chemist at the University of Rhode Island Marine Laboratory during the 1950's. He was graduated from Bates College in 1949 and received his master's degree in chemistry from URI in 1957, with further graduate work at Renssalaer Polytechnic Institute and Clemson University. He authored and co-authored several papers on textile chemistry, limnology and oceanography.

Mr. Campbell was a member of the Inter-Society Color Council, International Color Association, Detroit Colour Council, American Association of Textile Chemists and Colorists, American Association of Limnology, and Oceanography and Sigma Xi, the National Honor Society of Science.

OBITUARY - KENNETH L. KELLY

Just as this issue of the News is going to press, the Editor has been informed that another of our honorary members, Kenneth L. Kelly, died of a heart attack on December 30, 1991.

Expressions of sympathy can be sent to his wife, Helen, at 592 Central Drive, Saint Joseph Villa A-6, Southern Pines, North Carolina 28387. Telephone 919-692-4526.

NEWS FROM MEMBER BODIES

SOCIETY FOR IMAGING SCIENCE AND TECHNOLOGY (IS&T)

IS&T will hold it's eighth International Congress on Advances in Non-Impact Printing Technologies on October 25 -30, 1992 at the Hilton Hotel, Williamsburg, Virginia. This meeting has become the premier technical conference for non-impact printing technologies with strong international participation. It provides knowledgeable speakers with a timely forum for presenting their state-of-the-art work and progress made toward solving many of the industry's outstanding problems. Those attending will receive both a broad overview of the key technology areas as well as a glimpse into the leading-edge developments that result in tomorrow's breakthrough products. Whether you are interested in learning about the latest advances in non-impact printing, hearing discussions on critical issues or meeting the leading experts in the field this is the event to attend.

Two parallel sessions will address a wide variety of technologies, applications, and system issues, with particular attention to the latest developments in color. There will also be a session on novel technologies that might lead to the next big innovation in hardcopy. A complete day of tutorials in areas of major interest, a Poster Session and an Exhibition are also planned. Proposed program topics include electrophotography, development process, developer materials, photoreceptor, and liquid toners; ink jet printing; thermal printing; magnetography and lonography; image processing; psychophysics of printing/display; color: reproduction, science, standards; print/image quality and measurement; input-output scabbers; media for non-impact printers; advanced printing systems; new and novel printing technologies.

Original contributions related to state-of-the-art and future technologies are invited. The Program Committee will be pleased to consider presentations on these topics as well as other related to the field of non-impact printing. The time allocated for a presentation should be 15 minutes plus 5 minutes for discussion.

Those wishing to present a paper are requested to send an abstract of approximately 150-250 words and a biographical sketch by April 1, 1992 to:

Dr. Eric Hanson
Hewlett-Packard labs
P. O. Box 10490, (M.S. 2U-16)
Palo Alto, CA 94303-0969
(415) 857-3467 FAX (415) 857-4320

FEDERATION OF SOCIETIES FOR COATINGS TECHNOLOGY

FSCT

BYK-Gardner, Inc.; B&P Environmental Resources, Inc.; Hunterlab; Milton Can Co., inc.; Mobay Corp.; Philips Container Co.; Pfizer Minerals; Shell Chemical Co.; and Sherwin-Williams Co. were recipients of the C. Homer Flynn Paint Show Awards at the 1991 Paint Industries' Show, Toronto Convention Centre, November 4-6, 1991. These awards are presented for outstanding exhibits in the Show on the basis of technical excellence, educational value, attractiveness, and novelty.

Other awards presented at the Annual Meeting include the following: A. Clarke Boyce, of Oakville, Ontario Cancad, received the George Baugh Heckel Award as the individual whose contributions to the general advancement of the Federation's interest and prestige have been outstanding; Mitchell A. Winnik and Yongcal Wang of the University of Toronto and Frank Haley of ICI Canada received the first prize in the Roon competition for the best paper presented at the meeting; Timothy Thorstenson, of North Dakota State University received the Alfred L. Hendry award for the best undergraduate student paper submitted for competition; and Valerie E. Gunn of the Detroit Society received first prize for the best society paper.

Election Results

William F. Holmes of Dallas Society was elected 70th President of the Federation at its Annual Meeting in Toronto, Ontario Canada. Colin D. Penny of Hampton Paint MFG Co, Hampton, Virginia was named President-Elect and John A. Lanning, Product Quality Manager, Porter Paints, a Division of Courtauds Coatings Inc.,

Louisville, Kentucky was elected Secretary-Treasurer.

President Holmes appointed 1991-92 committee chairmen including two ISCC members, Ralph Stanziola - ISCC committee, and Robert T. Marcus - Armin J. Bruning Award committee.

COLOR ASS'N OF THE UNITED STATES (CAUS)

Special Pre-Forcast Report.

Notes from the CAUS Women's Meeting for Spring Summer 1993 indicate color and texture are driving sales. Career outfits are being replaced by softer "dressier" styles and a new emphasis on the casual. The success of catalogue marketing and a renaissance of American sportswear is having an impact on color. Anticipating the 500th anniversary of Columbus' discovery, the look is all American.

Notes from the CAUS Men's Meeting for Spring Summer 1993 note in men's wear, as in women's wear, softer brights together with blends and other complex colorations are the dominating trends. Also, watch for the rise of blues.

ATTENTION

If you don't see your organization's logo in the newsletter, please send one to the editor so we can use it with the next applicable article.

DETROIT COLOUR COUNCIL (DCC)

The DDC initiated 1992 programming with a March 3rd presentation by Kimball Shellnut of Chrysler who described an audit program to establish automotive supplier excellence. The objective of this interior parts program is to improve color matching and color-related properties.

Highlight of 1991 was a September symposium on automotive color matching which resulted in a sold-out auditorium in an automotive recession year. A panel of three automotive design and engineering people joined representatives of plastics, paint and textile suppliers to discuss the coordination and limitations surrounding color matching of the many interior and exterior parts. Printed transcripts of the symposium are available. Call Bill Longley at (313) 337-5234.

Winding up the 1991 program year was an address on automotive design by Fritz Mayhew, Chief Design Executive in charge of all design of Ford cars and trucks for North America. Mayhew challenged designers and engineers of parts producers to stretch for a higher level of innovation and described areas where improvement is needed.

DCC supported another year of color technology instruction at Eastern Michigan University. The course was again filled to capacity and was strengthened by a new process in which each group of three students worked on a separate lab exercise related to matching, process control and measurement, then reported findings to the full class.

Three spectrophotometers are now functional and lab assistants Bob Santine of Hunterlab and Ken Maes of Standard Products coordinated the projects.

DCC officers for 1992 are: Brian Stott, PMS Consolidated, President; James Hall, General Motors BOC, Vice-President; Patricia Oldenkamp, Eagle Ottawa Leather, Secretary; Laura Schaefer-Galea, Morton International, Treasurer. *W. V. Longley*

AMERICAN SOCIETY FOR PHOTOGRAMMETRY AND REMOTE SENSING

ASPRS

The preferred reading list of Remote Sensing professionals has the following items available:

Resource Technology '90. (1991) 830 pp. $70 (softcover), Stock # 425.

Protecting Natural Resources with Remote Sensing.(1990) 504 pp. $55. Stock #4523.

Earth Observation Systems: Legal Considerations for the '90s. Co-published with the American Bar Association, (1990) 264 pp. $75. Stock # 4515.

Space Imagery and News Gathering for the 1990s: So What? Robert A. McDonald, ed. (1991) 121 pp. including 4 color plates. $70 (softcover), Stock #4521.

Commercial Observation Satellites and International Security, M. Krepon, P. D. Zimmerman, L. S. Spector, and M. Umberger, eds. St. Martins Press, (1990), 230 pp. $55; Stock #4524.

Advances in Spatial Information Extraction and Analysis for Remote Sensing (1990) 128 pp. $60 Stock #4522.

Proceedings of the International Conference and Workshop on Global Natural Resource Monitoring and Assessments: Preparing for the 21st Century (1990) 1500 pp. $90 Stock#4516. To order contact ASPRS, P. O. Box 1269, Evans City, PA 16033; Tel. (412) 722-0070; FAX (412) 772-5281.

AMERICAN SOCIETY FOR TESTING AND MATERIALS ASTM

Papers are invited for a Symposium on Quality and Statistics: Total Quality Management sponsored by ASTM standards-writing Committee E-11 on Quality and Statistics.

The symposium will be held May 4-5, 1993 Atlanta, Georgia in conjunction with the May 3-5, 1993 standards development meetings of Committee E-11. The symposium will focus on the change in today's world in quality thinking and improvement in relation to the development and use of U.S. and international standards, specifications, and test methods.

Papers are requested in areas of design; manufacturing; testing and verification activities and techniques; standardization; employee involvement and training; international competition; and customer satisfaction.

Prospective authors are requested to submit a title, a 250-300 word abstract, and an ASTM Paper Submittal Form by May 4, 1992. ASTM Paper Submittal Forms are available from Dorothy Savini, Symposia Operations, ASTM 1916 Race Street, Philadelphia, PA 19103-1187, (215) 299-5413. A special technical publication based on the symposium proceedings is anticipated by ASTM.

COLOR MARKETING GROUP (CMG)

The CMG held their fifth fashion workshop to forecast the palette for Spring/Summer 1993. Seventy-five color decision makers in the world of fashion came together to explore color trends and forecast a color palette.

Participation in five workshops included colorists involved in Women's Sportswear, Children/Junior/Active, Menswear, Accessories/Shoes/Hosiery, and Cosmetic/Intimate Apparel.

Out of these workshops came 11 Ascending and 11 Forecast colors.

The Ascending (continuing) colors are 1) African Violet, a lighter violet; 2) Jade, a clear bluish-green; 3) Geranium, a vivid or strong clear coral; 4) Sunflower, a strong yellow with a hint of red; 5) Jungle Green, a sun-lit green with yellow influence; 6) Blackened Iris, a rich purpled-navy; 7) Tropical Red, a small amount of blue added to this red brings it into the hot pink family; 8) Char Black, a grey alternative to black; 9) Stone, a medium grey neutral; 10) Mocha, a light reddish-brown used as a neutral; and 11) Muslin, a flaxen, very light blond.

The Forecast (new) Colors are: 1) Amish Blue, a washed grayish blue; 2) Moss, a natural, washed grey-green; 3) Evening Shadow, a greyed-purple that combines well with neutrals; 4) Sunbaked, a very reddened, weathered brown; 5) Honey mustard, a lightened, weathered copper color; 6) Poolside, a whitened, clear blue-turquoise; 7) Periwinkle, a cool frosted blue with a hint of purple cast; 8) Absinthe, a clean whitened green; 9) Lilac, a lightened reddish purple; 10) Tea Rose, a medium rose color; and 11) Peach Parfait, whitened "candy-like" peach with a slight red cast.

The sixth CMG Fashion Color Forecast Workshop will be held on Friday, February 7, 1992, in New York City, forecasting the Fashion colors for the 1993 Fall/Winter season. For more information, please call CMG Headquarters at (703) 528-7666 or write Color Marketing Group, 4001 N. Ninth Street, Suite 102, Arlington, VA 22203.

AMERICAN INSTITUTE OF ARCHITECTS

AIA

The Interfaith Forum on Religion, Art and Architecture (IFRAA) calls for entries for the 1992 IFRAA International Architectural Design Awards Program for built religious structures. The IFRAA is seeking to encourage design excellence by bringing together architects from around the world, through annual design competitions. For entry forms and requirements, write to: IFRAA National Headquarters, Doris Justis, Executive Secretary, 1777 Church Street, N.W., Washington, D.C. 20036 or call (202) 387-8333. Entry forms due by July 1, 1992; submissions due by August 3, 1992.

The IFRAA also announces the 1991 International Designs Awards for Excellence in the Construction of Religious Structures. the HONOR Awards include:

FOR INTERIORS - Cathedral Church of St. Paul, Boston, MA - Architect: Crissman & Soloman Architects Inc., Watertown, MA

FOR RENOVATIONS/ ADDITIONS - Chapel of St. Andrew, Pembroke, Malta - Architect: Richard England, St. Julians, Malta.

FOR NEW CONSTRUCTION - Christ Church Lake Forest, Lake Forest, IL - Architect: Hammel Green and Abrahamson, Ins., Minneapolis, MN.

FOR NEW CONSTRUCTION - Jewish Religious Center, Williams College, Williamstown, MA - Architect: Herbert S. Newman and Partners, PC, New Haven, CT.

FOR RESTORATION - St. Clement's Church, Chicago, IL - Architect: Holabird & Root, Chicago, IL.

FOR RENOVATION - St. Mary's Chapel, St. Paul Seminary, St. Paul, MN - Architect: Rafferty Rafferty Tollefson Architects, Brother Frank Kacmarcik, O.S.B. Liturgical

Consultant, St. Paul, MN.

FOR NEW CONSTRUCTION - T.E.K. Mosque, T.E. K. Campus, Ankara, Turkey - Architect: Cumhur Keskinok, Ankara, Turkey.

The CITATION AWARDS included:

FOR NEW CONSTRUCTION - Catholic Church, Paks, Hungary - Architect: Makona, Budapest, Hungary.

FOR RENOVATIONS/ADDITIONS - Christ Church Cathedral, Houston, TX - Architects: Ray Baiuley Architects, Inc., Houston, TX.

FOR RENOVATIONS/ ADDITIONS - Christ Lutheran Church - Bell Tower, Baltimore, MD - Architect: Beard Warwick Cornell Associates Inc., Washington, DC.

FOR RESTORATION - Church of the Covenant, Boston, MA - Architect: Ann Beha Associates, Boston, MA.

FOR NEW CONSTRUCTION - Marilyn Moyer Meditation Chapel, Portland, OR - Architect: Thompson Vaivoda & Associates, Portland, OR.

FOR EXCELLENCE - Restoration of the Baptistry, Reggio Emilia, Italy - Architect: Gianfranco Varini, Reggio Emilia, Italy.

FOR NEW CONSTRUCTION - St. Magnus Church, Lillestrom, Norway - Architect: Lund & Slaatto Arkitekter As, Oslo, Norway.

GEMOLOGICAL INSTITUTE OF AMERICA

GIA The GIA has announced publication the *The Proceedings of the 1991 International Gemological Symposium*. The 'Proceedings' volume is the single most important record of the exciting events encompassed by the International Gemological Symposium held last June in Los Angeles. The book's 200+ pages include eight pages of full-color illustrations in a montage format highlighting the many events, presentations, and some of the key figures at the Symposium. Comprehensive abstracts of each of the 72 feature presentations, most with illustrations, provide the most important facts and figures covered. The ten panel discussions are described, with key insights recounted. The 80+ poster presentations are also represented by extended abstracts, many illustrated by charts, graphs, or tables.

The book may be obtained for $34.95 (softbound) or $49.95 (hardbound), plus shipping. For further information call (800) 421-7230 ext. 201, or (310) 829-2991 ext. 201 Fax: (310) 453-4478 or write Gems & Gemology, GIA, P. O. Box 2110, Santa Monica, California 90407-2110.

The Research Department of the GIA has acquired a Hitachi U-4001 spectrophotometer to help in the detection of treated gems. The instrument is currently being used in astudy of the differences between natural and treated colored diamonds. The spectrophotometer measures the absorption of light by a gemstone over the spectrum range from 240 to 2600 nm. Researchers can observe absorption bands from the ultraviolet through the near-infrared spectral regions, detecting very subtle changes in light absorption that are often useful in gem identification.

GIA announces a tour of the major gem centers of Germany and Italy to be offered in the fall of 1992. The tour will embark from Los Angeles, California on September 5, for fifteen days of technical visits, seminars, and sightseeing, returning on September 20. For complete details, including rates and daily itinerary, call GIA at (800) 421-7250 ext.265; outside the U.S. call (310) 829-2991 ext. 265 or write to Travel Facilities inc., 1800 Avenue of the Stars, Los Angeles, California 90067.

REGIONAL TECHNICAL CONFERENCE (RETEC) SET FOR SEPTEMBER 1992

The 1992 color and Appearance Division C&A Div. of the Society of Plastic Engineers (SPE), along with the Philadelphia Section, is sponsoring a Regional Technical Conference (RETEC), September 15-16, 1992, at the Hyatt in Cherry Hill, NJ. The Theme is "Measuring Up to Today's Standards."

The conference will focus on the color instrumentation and measurement aspects of coloring plastics. Half of the conference will be devoted to technical papers, the other half to training seminars conducted by color instrumen-tation suppliers. All major suppliers of color instrumentation have been invited to be present. The concluding highlight of the conference will be a panel discussion of data obtained on colored plastic specimens measured on instruments at the conference. Those attending are urged to bring identified specimens with them. For more information contact Gary Beebe, 215 785 8285.

OTHER NEWS

COUNCIL FOR OPTICAL RADIATION MEASUREMENTS (CORM)

CORM 92

CORM solicits contributed papers on the general topics of array radiometry, spectrophotometry and colorimetry for its 1992 meeting. The conference will include sessions on geometric and other measurement conditions that affect colorimetric agreement and on calibrations of 2-dimensional arrays for photometric measurements.

The conference will be held at the Sheraton Greenbelt 8599 Annapolis Road, New Carrollton, Maryland on May 19 - 20, 1992. In addition to the annual business meeting and traditional banquet, this year's meeting will feature tours of NASA Goddard Space Flight Facility.

For more information contact:

Dianna G. Jones, SciOptics Corp., 7226 W. Colonial Dr., Suite 309, Orlando, FL 32818, (407) 292-3168.

David Porter, Rohm and Haas, Plastics and Technology Center, P. O. Box 219, Bristol, PA 19007, (215) 785-8396.

CORM Committees

CORM Subcommittee CR-1 "Sources for Radiometry and Photometry" chaired by Bob Low is actively gathering information about the needs for improved radiometric and photometric standards for industrial and research applications. Individual users and potential users of spectral and photometric source standards who have not already completed the questionnaire are encouraged to contact

Tec Cannon at (303) 231-7000 ext. 7247.

CORM Subcommittee CR-2 "Array Radiometry" chaired by Dianna Jones announces that it will sponsor a workshop on array radiometry at the SPIE Meeting in Orlando, Florida on April 20-24, 1992. The format for this workshop will consist of panel discussion related to how the array device, the spectroradiometer system and input optics affect radiometric measurements made using array devices.

A new CORM Subcommittee CR-3 "Photometry" is currently being established within the CORM Radiometry committee. CR-3 will address issues related to photometry, colorimetry of display devices, sources, detectors and V-Lambda correction. anyone wishing to join this committee should contact the CORM Radiometry Chairman, Philip Wychorski at (716) 588- 6344.

CR-3 will hold its first subcommittee meeting at the CORM 92 Conference (May 1920, 1992).

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

At the beginning of this year, NIST went through a reorganization. Now there are eight laboratories representing major disciplines of science and technology and under the laboratory offices are divisions. This new structure promotes streamlined communications between the divisions, laboratories and administration.

The Radiometric Physics division is under the Physics Laboratory. Dr. Katherine Gebbie is director of the Physics Laboratory. In March Dr. Klaus Mielenz, Chief of the Radiometric Physics Division, retired. Subsequently, Dr. Albert Parr was appointed Division Chief. Beginning October 1, the radiometric Physics Division will have 4 operational groups: 1)Infrared Radiometry lead by Dr. Raju Daita, 2) Thermal Radiometry lead by Mr. Robert Saunders, 3) Spectrophotometry lead by Dr. Jack Hsia, 4) Detector Metrology lead by Dr. Chris Cromer.

FOUR NEW HONORARY MEMBERS ELECTED

The Inter-Society Color Council (ISCC) is pleased to announce the election of four Honorary Members. They are Blanche R. Bellamy, Edward T. Connor, Joyce S. Davenport, and Harry K. Hammond, III. The ISSC awards outstanding individuals with an Honorary Membership when nominated and elected by the Board of Directors. Any person is eligible who, as a Council member, has rendered significant service to the council or to those fields served by the individual Member-Bodies of the Council, in such manner as to aid in accomplishing the objectives of the Council.

Blanche R. Bellamy has been a member of the ISCC for over fifty years, serving as a Director from 1962-1963, and has been active in the Individual Member Group since its formation. She joined the Munsell Color Company in 1924 and retired as Manager when the company was bought by Macbeth Corporation in the 1970s. She was a trustee for and served as Secretary-Treasurer of the Munsell Color Foundation from its formation in 1942 to her retirement; she remained a trustee for the remainder of the existence of the Foundation.

Edward T. Connor joined the General Electric Company after graduation from University of Pittsburgh. In 1959 he became associated with Instrument Development Laboratories working in various capacities including President. In 1971 he joined Gardner Laboratory, also serving in numerous capacities which include president. He remained with Gardner until his retirement in 1989. He served as Treasurer of the ISCC from 1980-1988. Ed and his wife Louise have six children, many

grandchildren, and reside in Kenwood, Maryland.

Joyce S. Davenport served as the President of the ISCC from 1984-86. She was only the second woman to hold that position in the Council's first 55 years. She has extensive background in color science in the plastics and coatings industries and has lectured to business and industry. Her activities include serving on the Color Marketing Group (CMG) Board of Directors as Treasurer and as Chairman of Technical Direction. Also she was Chairman of the CMG delegation to the ISCC. She has been exceptionally active in the ISCC; besides serving as President, she co-chaired Subcommittee 25-P on Strength of Pigments, served on the Board of Directors, and was Member-Body Liaison, and co-chairman of the 50th Anniversary Meeting and the 1989 Annual Meeting. In 1990 she received the Nickerson Service Award.

Harry K. Hammond, III, with an interruption of four years of service in the Army during WWII, worked on the staff of the National Bureau of Standards for 38 years after receiving his BS degree in Engineering Physics from Lehigh University in 1938. At the Bureau he worked in photometry, colorimetry, radiometry, and product evaluation technology.

Since 1967 Hammond has participated in the work of the CIE and its U.S. National Committee, where he served for 15 years as an ASTM delegate. He was a founding member of ASTM Committee E-12 on Appearance and is a past-chairman. In 1977 Harry took an early retirement to join the staff of Gardner Laboratory, (now BYK-Gardner, Inc). He served on the Board of Directors of ISCC from 1974-1976; in 1987 he received the Dorothy Nickerson-ISCC Service Award. Hammond has been a frequent contributor to ISCC News for more than 15 years. He was first listed as a member of the Publications Committee in 1978, served as Interim Editor in 1986, and continues to coordinate the Calender for the Publications committee. Hammond has been a Fellow of the Optical Society of America and ASTM, a member of the Testing Procedures Committee of the Illuminating Engineering Society, and a member of the Optical Methods Committee of the Technical Association of the Pulp and Paper Industry.

OBITUARY: EDWIN STEARNS

Edwin Ira Stearns, 80, Former ISCC President and Godlove Award recipient, died on January 19, 1992 at his home in Clemson, SC. Born in Matawan, NJ on September 3, 1911, he was the son of the late Reverend Edwin Ira and Mary Beatrice Jeter Stearns.

He was graduated summa cum laude from Lafayette College in 1932 with a degree of Bachelor of Chemical Engineering. He obtained a Master of Science degree from Rensselaer Polytechnic Institute and a Doctor of Philosophy degree from Rutgers University. While at Lafayette he was a charter member of the local chapter of the social fraternity Theta Xi. He was a member of the following honorary fraternities: Phi Beta Kappa (scholastic), Sigma Xi (science), Tau Beta Pi (engineering), Phi Lambda Upsilon (chemistry), Alpha Chi Sigma (chemistry) and Phi Psi (textiles).

He was employed by the American Cyanamid Company for 39 years from 1933 to 1972 where he worked with dyes and textile chemicals. He was professor of textiles at Clemson University and head of the department from 1972 to 1977. He was secretary of the Association for the Advancement of Textile Education.

Dr. Stearns was an honorary member of the American Chemical Society because of his 50 years of dues-paying membership. He authored 100 technical papers, 20 patents, and a book on color measurement and color matching, *The Practice of Absorption Spectrophotometry*, John Wiley, New York 1967, pp 350.

He was an honorary member and past president of the American Association of Textile Chemists and Colorists. This association awarded him the Olney Medal in recognition of his contributions to textile wet processing.

He was an honorary member and first president of the Inter Society Color Council which he helped incorporate. The Council awarded him its Godlove Award in recognition, in part, that he was the first person to calculate a color match from numerical data.

His avocation was ornithology. He was a founder and past president of the Urner Ornithological Club. Under its auspices he was the first person to study the migration of hawks from a blimp. For 20 years he held the unofficial record of number of species of birds seen in one day in New Jersey. His name was chosen by the New Jersey Audubon Society for the award given each year for the out-of-state team of birders that see the largest number of species in one day. He was a founder and life member of the American Birding Association.

He is survived by a son Richard Edwin of Schenectady, NY , a son Robert Nichols of Chevy Chase, MD, a daughter Mary-Dinnis Taylor of Williamstown, MA, and six grandchildren.

Those of us who appreciate his accomplishments in the field of color and know of his emphasis on education suggest that memorial contributions be made in his name to the ISCC for deposit in its endowment fund for the advancement of color education. Checks made out to "ISCC" and marked "For Stearns Endowment" may be sent to ISCC Treasurer, Philip Hunter, C/O Hunterlab, 11491 Sunset Hills Road, Reston, VA 22090

CALENDAR

Please send information on Member Body and other organization meetings involving color with dates, places, and information source to:

Harry K. Hammond, III
BYK-Gardner, Inc.
2435 Linden Lane
Silver Spring, MD 20910
(301) 495-7150 FAX (301) 585-4067

1992

ASTM COMMITTEE D-20 ON PLASTICS, Mar. 8-12
Ashville, North Carolina. Information: Katherine Schaff, (215) 299-5529.

TAGA ANNUAL CONFERENCE, Apr. 5-8
Technical Association of the Graphic Arts Annual Technical Conference, Westin Bay Shore Hotel, Vancouver, British Columbia. Information: Karen Lawrence (716) 272-0557.

ISO MEETING, Apr. 6-11
International Standards Organization Meeting, Paris France. Information: Bill Martin, (919) 549-8141.

COLOR MEASUREMENT FOR THE TEXTILE INDUSTRY, Apr. 28-29
Clemson University, Professional Development, Color Measurement for the Textile Industry, Hyatt Regency, Greenville, South Carolina. Information: Kay James, (803) 656-2200.

IS&T IMAGING '92, May 10-15
The Society for Imaging Science & Technology 45th Annual Conference, The Meadowlands Sheraton, East Rutherford, New Jersey. Information: (703) 642-9090.

AATCC SPRING MEETING, May 12-14
American Association of Textile Chemists and Colorists, AATCC Technical Center, Research Triangle Park, North Carolina. Information: Jerry Tew, (919) 549-8141.

SID '92, May 17-22
Society for Information Display International Symposium Seminar and Exhibition, Haynes Convention Center, Boston, Massachusetts. Information: Paul M. Alt, (914) 945-2437.

CORM ANNUAL MEETING, May 19-20
NIST, Gaithersburg, Maryland. Information: Albert Parr, (301)-975-3739.

ASTM COMMITTEE D-1 ON PAINT, Jun. 21-24
Marriott, Minneapolis, Minnesota. Information: Scott Orthey, (215) 299-5507.

ISCC - ANNUAL MEETING, Jun. 21-24
Nassau Inn, Princeton, New Jersey. Information: Dr. Allan B. J. Rodrigues, (313) 583-8245.

AIC INTERIM SYMPOSIUM, Jun. 23-24
Computer Colorant Formulation, Nassau Inn, Princeton, New Jersey. Information: Dr. Allan B. J. Rodrigues, (313) 583-8245.

ASTM COMMITTEE E-12 ON APPEARANCE, Jun. 24-26
Nassau Inn, Princeton, New Jersey. Information: Bode Buckley (215) 299-5599.

ASTM COMMITTEE D-1 ON PAINT, Jun. 28-Jul 1
Minneapolis Marriott Center City, Minneapolis, Minnesota. Information: Scott Orthey, (215) 299-5507

IESNA ANNUAL CONFERENCE, Aug. 2-6
Illuminating Engineering Society of North America, 86th Annual Conference, San Diego, California. Information: Valerie Landers, (212) 705-7269.

XVII ISPRS CONGRESS, Aug. 4-13
17th International Society of Photogrammetry and Remote Sensing Congress in conjunction with 27th International Geographic Congress and 1992 Global Change Conference, Washington Convention Center, Washington, District of Columbia. Information: Judy Peesel (301) 493-0290.

WWDU '92, Sep. 1-4
Third International Scientific Conference - Work With Display Units, International Conference Center, Berlin, Germany. Information: Dr. Ahmet Cakir, ERGONOMIC Institute Ltd., Soldauer Platz 3, D-1000 Berlin 19, German Federal Republic.

SPE RETEC, Sep. 15-16
Society of Plastics Engineers, Color and Appearance Division/ Philadelphia Section Measuring Up To Todays Standards", Hyatt at Cherry Hill, New Jersey. Information: Gary Beebe, (215) 785-8285.

OSA - ANNUAL MEETING, Sep. 20-25
Optical Society of America Annual Meeting, Albuquerque, New Mexico. Information: Optical Society, (202) 223-8130.

IMAGING THE FUTURE, Sep. 21-25
The Royal Photographic Society Science Committee Symposium on Imaging the Future, University of Cambridge, England. Information: Dr. M. R. Pointer, Kodak Ltd., Research Div. W- 93, Harrow, Middlesex, HA1 4TY, England, tel. 44-81-427-380 or FAX 44-81-863-4798.

AATCC - CONFERENCE AND EXHIBITION, Oct. 4-7
American Association of Textile Chemists and Colorists, Hyatt Regency, Atlanta, Georgia. Information: AATCC, (919) 549-8141.

USNC/CIE ANNUAL MEETING, Oct. 11-13
The United States National Committee of the CIE Annual Meeting, Embassy Suites Resort, Scottsdale, Arizona. Information: Dr. Ian Lewis (602) 991-9260, FAX (602) 991-0375.

FSCT, Oct. 21-23
Federation of Societies for Coatings Technology, 70th Annual Meeting and 57th Paint Industries Show, McCormick Place, Chicago, Illinois. Information: (215) 545-1507.

GIS/LIS Conference, Nov. 6-12
Geographic Information Systems and Land Information Systems Conference sponsored by the American Society of Photogrammetry and Remote Sensing and several other organizations, San Jose Convention Center, San Jose, California. Information: Denise Cranwell, (301) 493-0200.

continued page 17

INTER-SOCIETY COLOR COUNCIL APPLICATION FOR INDIVIDUAL MEMBERSHIP

Name _____ Date _____

❒ Dr. ❒ Mr. ❒ Ms.

Company/Affiliation _____

Street _____

City, State, Zip _____

Telephone (____) _____ ❒ Home

Fax (____) _____ ❒ Business

_____

Signature

My chief interests in color are:

❒ education ❒ art

❒ industry ❒ science

_____

Name other interests

My work relates to the following products and services:

_____

_____

_____

My present and past business, professional or educational connections with color are: _____

_____

_____

_____

My particular interests in color are: _____

_____

_____

_____

I belong to the following national organizations or associations: _____

_____

_____

_____

I learned about ISCC from: ❒ ISCC Newsletter ❒ Other source: _____

Please tell us the individual or organization that interested you in ISCC

ISCC dues are shown on the reverse side. Applications for membership dated prior to July 1 should be accompanied by full annual dues; those dated July 1 and later should be accompanied by 50% of annual dues. You have the option of subscribing to Color Research & Application at special membership rates. If you wish to do so, please add $70.00 (US) or $100.00 (overseas) to the amount of your check.

This application and remittance should be sent to

Ms. Ann C. Laidlaw, Membership Committee, c/o SheLyn, Inc., 1108 Grecade Street, Greensboro, NC 27408

Telephone: (919) 274-1963

EXCERPT FROM THE BY-LAWS OF THE INTER-SOCIETY COLOR COUNCIL, INC.

Constitution, Article II — Aims and Purposes

The Council shall operate solely and exclusively as a non-profit organization with the aims and purposes:

A. To stimulate and coordinate the work being done by the various members leading to the description and specification of color by these members.
B. To promote the practical application of this work to the color problems arising in science, art, and industry, for the benefit of the public at large.
C. To promote communications between technically oriented specialists in color and creative workers in art, design, and education, so as to facilitate more effective use of color by the public through dissemination of information about color in both scientific and artistic applications.
D. To promote educational activities and the interchange of ideas on the subject of color and appearance among its members and the public generally.
E. To cooperate with other organizations, both public and private, to accomplish these objectives for the direct and indirect enjoyment and benefit of the public at large.

Council Activities

The ISCC is the principal professional society on the field of color in the United States, encompassing the arts, sciences and industry, pursuant to the Aims and Purposes described above. Other national organizations with an interest in color are Member-Bodies of the Council and appoint delegations to participate in the Council's work. Individual members are the largest single group. The Annual Meeting, usually held in April, includes meetings of the Project Committees and sessions of four Interest Group: Measurement & Colorimetry; Vision & Color Appearance: Art, Design & Psychology; and Color Education. There is also a main program devoted to a specific aspect of color plus a Poster Paper session. Joint programs with one of the Council's Member-Bodies are interesting and educational.

In most years there is a separate topical Williamsburg Conference, often in February, where a single color subject is explored in depth with participants from all over the world providing state-of-the art information. Attendance at these conferences is usually smaller than at Annual Meetings, reflecting their topical nature and permitting interaction between speakers and participants.

The ISCC is the U.S. Member of the Association Internationale de la Coulour (AIC), which holds general meetings quadrennially and topical meetings annually. Color Research & Application, published bimonthly in English, is the principal international journal in this field; it is endorsed by ISCC. It reports recent research and opinions of colorists, review books and reports on national and international color meetings. Membership in ISCC permits subscription at more than a 50% discount.
The ISCC News, a bimonthly newsletter, reports the color activities of the Council, its members, Member-Bodies and international color organizations. Members receive the ISCC News at no cost. Member-Bodies and Sustaining Members receive 10 copies of the ISCC News.

Categories of Membership	Annual Dues
Individual Member. Any person interested in color and desirous of participating in the activities of the Council.	$30.00
Student Member. Full time students.	$10.00
Member-Body. Any non-profit national organization interested in color and desirous of participating in the activities of the Council.	$100.00
Sustaining Member. Any organization not eligible as a Member-Body, or any individual, interested in color and wishing to support the work of the Council. Receives 10 copies of ISCC News.	$250.00
Retired. Treasurer must be notified, in writing, of retirement before dues have been billed.	$10.00
Library Subscriptions. Receives all ISCC mailings, including ISCC News.	$40.00
Overseas Member. A surcharge of $20 is added to $30 dues to cover additional mailing costs.	$50.00

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IS&T E/W SYMPOSIUM III, Nov. 8-13
The Society for Imaging Science & Technology, Maui Westin Hotel, Maui, Hawaii. Information: (703) 642-9090.

ASTM COMMITTEE D-20 ON PLASTICS, Nov. 15-19
Miami, Florida. Information: Katherine Schaff, (215) 299-5529.

OPTICON, Nov. 15-20
Optical Society of America OPTICON '92, Boston, Massachusetts.Information: Optical Society, (202) 223-8130.

AATCC FALL MEETING, Nov. 17-19
American Association of Textile Chemists and Colorists, The Doral Inn, Hew York City, New York. Information: Jerry Tew, (919) 549-8141.

LONG RANGE CALENDAR

1993

ASTM COMMITTEE D-1 ON PAINT, Jan. 17-20
Crown Sterling Suites, Ft. Lauderdale South, Florida. Information: Scott Orthey, (215) 299-5507.

ASTM COMMITTEE E-12 ON APPEARANCE, Jan. 17-20
Crown Sterling Suites, Ft. Lauderdale South, Florida. Information: Bode Buckley, (215) 299-5599.

ASTM COMMITTEE D-20 ON PLASTICS, Mar. 1-4
Atlanta, Georgia. Information: Katherine Schaff, (215) 299-5529.

LUX EUROPA 1993, Apr. 4-7
Chartered Institution of Building Services Engineers, Edinburgh, Scotland. Information: CIBSE, Delta House, 222 Balham High Rd., London SW12 9BS.

TAGA ANNUAL CONFERENCE, May 2-5
Technical Association of the Graphic Arts Annual Technical Conference, Minneapolis - St. Paul, Minnesota. Information: Karen Lawrence, (716) 272-0557.

AIC-7TH CONGRESS, Jun. 14-18
International Colour Association - 7th Congress, Technical University of Budapest, Budapest, Hungary. Information: Prof. Antal Nemcsics, Technical University of Budapest, Conference Office, Building Z, Room 101/b, H-1521 Budapest, Muegyetem rkp.3-9, Hungary, Phone and FAX (36-1) 185-218.

ASTM COMMITTEE E-12 ON APPEARANCE, Jun. 23-25
Atlanta, Georgia Information: , Bode Buckley, (215) 299-5599.

ASTM COMMITTEE D-1 ON PAINT, Jun. 27-30
Wyndham Franklin Hotel, Philadelphia, Pennsylvania. Information: Scott Orthey, (215) 299-5507.

IESNA ANNUAL CONFERENCE, Aug. 8-12
Illuminating Engineering Society of North America, 87th Annual Conference, Houston, Texas. Information: Valerie Landers, (212) 705-7269.

AATCC - CONFERENCE AND EXHIBITION, Oct. 3-6
American Association of Textile Chemists and Colorists, Montreal, Quebec, Canada. Information: AATCC, (919) 549-8141.

ASTM COMMITTEE D-20 ON PLASTICS, Nov. 15-18
Fort Worth, Texas. Information: Katherine Schaff, (215) 299-5529.

1994

ASTM COMMITTEE D-1 ON PAINT, Jan. 23-26
Crown Sterling Suites, Fort Lauderdale South, Florida Information: Scott Orthey, (215) 299-5507.

ASTM COMMITTEE E-12 ON APPEARANCE, Jan. 23-26
Crown Sterling Suites, Fort Lauderdale South, Florida Information: Bode Buckley, (215) 299-5599.

TAGA ANNUAL CONFERENCE, May 1-4
Technical Association of the Graphic Arts Annual Technical Conference, Baltimore, Maryland. Information: Karen Lawrence, (716) 272-0557.

ASTM COMMITTEE D-1 ON PAINT, Jun. 25-29
Crab Tree Valley Hotel, Raleigh, North Carolina. Information: Scott Orthey, (215) 299-5507.

ASTM COMMITTEE E-12 ON APPEARANCE, Jun. 19-23
Montreal, Canada. Information: Bode Buckley, (215) 299-5599.

IESNA ANNUAL CONFERENCE, Aug. 7-11
Illuminating Engineering Society of North America, 88th Annual Conference, Miami, Florida. Information: Valerie Landers, (212) 705-7269.

AATCC - CONFERENCE AND EXHIBITION, Oct. 11-14
American Association of Textile Chemists and Colorists, Convention Center, Charlotte, North Carolina. Information: AATCC, (919) 549-8141.

1995

ASTM COMMITTEE E-12 ON APPEARANCE, Jan. 22-26
San Antonio, Texas. Information: Bode Buckley, (215) 299-5599.

TAGA ANNUAL CONFERENCE, Apr. 2-5
Technical Association of the Graphic Arts Annual Technical Conference, Orlando, Florida. Information: Karen Lawrence, (716) 272-0557.

CIE, Sept.
New Delhi, India

AATCC - CONFERENCE AND EXHIBITION, Oct. 8-11
American Association of Textile Chemists and Colorists, Hyatt Regency, Atlanta, Georgia. Information: AATCC, (919) 549-8141.

1996

TAGA ANNUAL CONFERENCE, May 5-8
Technical Association of the Graphic Arts Annual Technical Conference, St. Louis, Missouri or Dallas, Texas. Information: Karen Lawrence, (716) 272-0557.

AATCC - CONFERENCE AND EXHIBITION, Oct. 8-11
American Association of Textile Chemists and Colorists, Opryland Hotel, Nashville, Tennessee. Information: AATCC, (919) 549-8141.

1997

TAGA ANNUAL CONFERENCE, May 4-7
Technical Association of the Graphic Arts Annual Technical Conference, Montreal or Quebec City, Canada. Information: Karen Lawrence, (716) 272-0557.

AATCC - CONFERENCE AND EXHIBITION, Sep. 28- Oct. 1
American Association of Textile Chemists and Colorists, Marriott Marquis, Atlanta, Georgia. Information: AATCC, (919) 549-8141.

1998

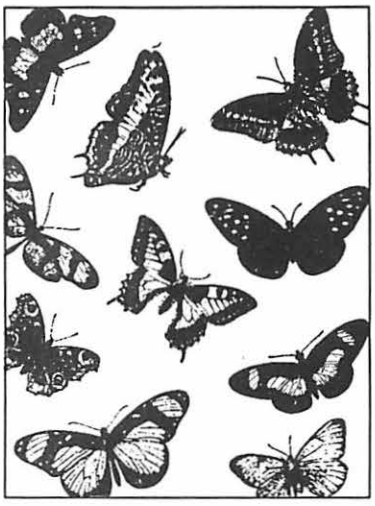
TAGA ANNUAL CONFERENCE, May 3-6
Technical Association of the Graphic Arts Annual Technical Conference, Chicago, Illinois. Information: Karen Lawrence, (716) 272-0557.

AATCC - CONFERENCE AND EXHIBITION, Oct. 4-7
American Association of Textile Chemists and Colorists, Philadelphia, Pennsylvania. Information: AATCC, (919) 549-8141.

1999

TAGA ANNUAL CONFERENCE, May 2-5
Technical Association of the Graphic Arts Annual Technical Conference, Philadelphia, Pennsylvania. Information: Karen Lawrence, (716) 272-0557.

AATCC - CONFERENCE AND EXHIBITION, Oct. 12-15
American Association of Textile Chemists and Colorists, Convention Center, Charlotte, North Carolina. Information: AATCC, (919) 549-8141.

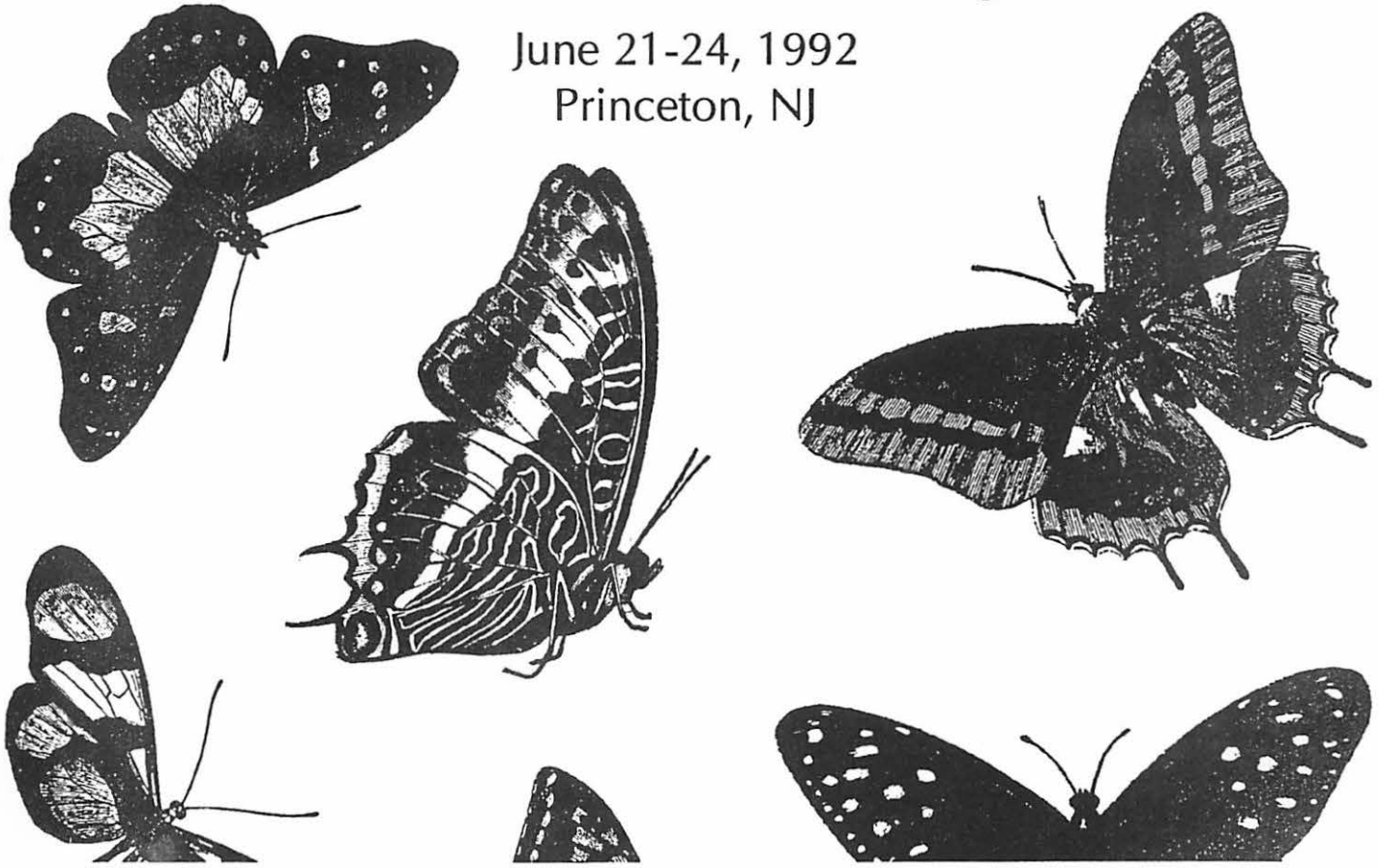


Think Summer.

Think ISCC Annual Meeting.

Theme: Color Matching

June 21-24, 1992
Princeton, NJ



NEWSLETTER EDITOR Michael A. Hammel

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MSDOS–ASCII, Q&A, Word Star, Word Perfect (5.25"–1.2 Meg, or 360K) (3.5"–1.44 Meg, or 730K).

Macintosh–Word, Macwrite, MS Works (3.5"–1.44 Meg, 800K, or 400K)

For hard copy transmission, FAX to (716) 425-2411.

Or send to: Dr. Ellen Carter • 2509 N. Utah St. • Arlington, VA 22207

Please note: the deadline for submission of material is the 1st of even numbered months.

meeting reports

contributions from members

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1991-1994			
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Dr. Ellen Carter	2509 N. Utah St., Arlington, VA 22207	(703) 527-6003	
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ISCC MEMBER-BODIES

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American Chemical Society (ACS)
American College of Prosthodontists (ACP)
American Psychological Association (APA)
American Society for Testing and Materials (ASTM)
American Society of Interior Designers (ASID)
American Society for Photogrammetry and Remote Sensing (ASPRS)
The Color Association of the United States, Inc. (CAUS)
Color Marketing Group (CMG)
Detroit Colour Council (DCC)
Dry Color Manufacturers Association (DCMA)
Federation of Societies for Coatings Technology (FSCT)
Gemological Institute of America (GIA)
Graphic Arts Technical Foundation (GATF)
The Human Factors Society
Illuminating Engineering Society (IES)
National Artists Equity Association (NAEA)
National Association of Printing Ink Manufacturers (NAPIM)
National Paint and Coatings Association, Inc. (NPCA)
Optical Society of America (OSA)
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Society of Motion Picture and Television Engineers (SMPTE)
Society of Plastics Engineers, Color & Appearance Division
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