

Inter-Society Color Council *News*

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VIVIANNE C. SMITH AND JOEL POKORNY TO RECEIVE ISCC GODLOVE AWARD



At the Awards Luncheon during the ISCC Annual Meeting in Greensboro, North Carolina (April 24, 1995), Dr. Vivianne C. Smith and Dr. Joel Pokorny will jointly be honored with the presentation of the Godlove Award. The Godlove Award, named for Dr. I. H. Godlove, is the highest honor bestowed by the ISCC, and is given in recognition of a career of distinguished service to the color community.

Drs. Smith and Pokorny have worked together for the last quarter century to advance our scientific knowledge about normal and defective color vision. The cone spectral sensitivities they produced are now accepted as a standard. They have made significant contributions to the fields of visual psychophysics, noninvasive visual diagnosis, and the genetic basis of color-vision deficiencies and retinopathies.

Although their research has spanned many areas of visual perception (as reported in over 90 refereed publications), color research has always figured prominently. Drs. Smith and Pokorny have also contributed to education in color science, especially through several of their graduate students who achieved success in vision research. In addition, their editorship of books and journals have also helped the color-science community.

Drs. Smith and Pokorny are professors in the University of Chicago Department of Ophthalmology and Visual Science, and have been full professors since 1979.

They both received Ph.D. degrees from Columbia University in 1967, and published their first paper together in 1968. Since attaining their Ph.D. degrees, they have held positions at the University of Chicago, in such diverse departments as Surgery and Behavioral Sciences as well as in the Department of Ophthalmology and Visual Sciences.

ANNOUNCEMENT: FIRST ISCC PAN- CHROMATIC CONFERENCE

WILLIAMSBURG, VIRGINIA
12-15 FEBRUARY 1995



The Inter-Society Color Council (ISCC) is sponsoring the First Pan-Chromatic Conference, to provide a forum for people in all

areas of color science to come together, to exchange news and ideas about color measurement and use, and to form a Color Community that transcends the traditional boundaries of each area.

Presentations will cover all areas of color science, with four areas specially featured. For each of the featured areas, there will be a tutorial overview talk to introduce the issues of that area to researchers and practitioners in other branches of color science, as well as selected technical presentations in the area. There will be an interdisciplinary session, and also a panel session to allow focused discussion of the issues.

In addition, the James Bartleson Award will be presented, in conjunction with an on-site banquet February 14, to a young color scientist selected by the Colour Group of Great Britain.

Attending this conference will greatly help color researchers who want to be on the leading edge of the emerging interdisciplinary cooperation that will characterize the economic climate of the '90s. This first Pan-Chromatic Conference will begin a series of such conferences that, in the future, will highlight other areas of color science and technology.

The conference organizers are Michael H. Brill (David Sarnoff

Research Center) and Steven A. Shafer (Carnegie Mellon University). The sessions featured this year will be:

Color Vision: Joel Pokorny (U. Chicago), Organizer

Tutorial: Peter Lennie (U. Rochester), "Mechanisms of Color Vision"

Papers: R. Munger, A. Robertson, G. Fielder (National Res. Council, Canada), "Hue- Dependence of Hue Discrimination in CIELAB Space"; H. Fairman (Metacolor Assocs.), "Calculating Rod Participation in Object-Color Matching"; A. Shapiro, J. Pokorny, V. Smith (U. Chicago), "Defining Rod-Photoreceptor Space"; K. Mullen, M. Losada (McGill Univ., Canada), "Band Pass Spatial Processing for Color Vision Revealed by Noise Masking"; J. Barbur, A. Harlow, G. Plant (UK), "Insights into the Different Exploits of Color in the Visual Cortex."

Colorimetry: Michael Brill (David Sarnoff Research Center), Organizer

Tutorial: Danny Rich (Datacolor Int'l), "Color and Light: More than Meets the Eye"

Papers: H. Hemmendinger (Hemmendinger Color Lab), "Advances in the Industrial Applications of Colorimetry: Is the Computer the Enemy?"; M. Veve (HunterLab), "The Effect of Measurement Errors on Color Formulation Accuracy"; R. Alfvén, M. Fairchild (Munsell Color Science Lab), "Observer Metamerism: Precision of Color Matches and Accuracy of Color Matching Functions"; R. Henry (Univ. S. Cal.), "Colorimetry in the Natural Atmosphere."

Color Machine Vision: Steven Shafer (Carnegie Mellon Univ.), Organizer

Tutorial: Steven Shafer (Carnegie Mellon Univ.), "Color in Machine Perception".

Papers: B. Funt, G. Finlayson (Simon-Fraser Univ., Canada), "Computational Uses for Color"; A. Petrov (Kurchatov Institute, Russia), "Resolving the Color Image Irradiance Equation"; M. Swain, V. Zanko (U. Chicago), "Finding Color Textures in Image Databases"; G. Healey, L. Wang (U. Cal. Irvine), "Illumination-Invariant Recognition of Color Textures"; C. Wong (NASA), "A Real-Time View Invariant Color Recognition Technique".

Color Computer Graphics: Gary Meyer (Univ. of Oregon), Organizer

Tutorial: Gary Meyer (Univ. of Oregon), "Color Synthesis in Computer Graphics".

Papers: M. Stone (Xerox PARC), "Color Applications of Magic Lenses"; J. Jiang, E. Murphy, W. Truszkowski (CTA, Inc.), "A New Tool for Rule-Based Evaluation of Color in Graphical User Interfaces"; R. Geist, S. Junkins (Clemson Univ.), "Color Representation in Virtual Environments"; M. Peercy, D. Baum, B. Zhu (Silicon Graphics, Inc.), "Linear Color Representations for Efficient Image Synthesis".

Interdisciplinary Session: Michael Brill (David Sarnoff Research Center), Organizer

Papers: S Tominaga (Electro-Tech. Univ., Osaka, Japan), "Surface Reflection Estimation by the Dichromatic Model"; G. Finlayson, B. Funt (Simon Fraser Univ, Canada), "Optimal Spectral Sharpening"; A. Gove, A. Waxman (MIT Lincoln Lab.), "Color Vision and Multi-Spectral IR"; N. Liu and H. Yan (U. Sydney, Australia), "Segmentation of Color Drawing and Map Images"; J. Richardson, I. Davies (U. Surrey, UK), "Perceptual Learning of Categorical Color Constancy".

Williamsburg, the traditional site for February ISCC conferences, is the

location of Colonial Williamsburg, a reconstructed town from the Colonial era. The conference will be held at the Williamsburg Lodge, with special conference rates for rooms (\$70-80 a night).

To obtain the special conference room rate, make reservations directly with the hotel at 1-800-447-8679 ext. 5200 before January 13, 1995. The conference registration fee is \$275 if received before this date at the following address:

Inter-Society Color Council
Phone/Fax: 703-318-0514
11491 Sunset Hills Rd.
Suite 301
Reston, VA 22090

Information and registration materials can also be obtained from the conference organizers:

Dr. Michael H. Brill (tel. 609-734-3037; internet: michael_brill@maca.sarnoff.com)

Dr. Steven A. Shafer (tel. 412-268-2527; internet: sas@cs.cmu.edu)

GOVERNMENT MICROCIRCUIT APPLICATIONS CONFERENCE (GOMAC)

The organizers of GOMAC '94, the 1994 edition of the Government Microcircuit Applications Conference, mailed 17,000 copies of the conference's advance program this week. The conference, to be held November 7-10 at the Town and Country Hotel, San Diego, California, will focus on technologies that can be used for both commercial and government applications.

These dual-use technologies are a hot topic in an era of Government budget-cutting. "The dual-use philosophy requires striking technological and economic reorientation from all parties, and opens exciting new opportunities for commercial firms," says Harry Weaver of Sandia National Laboratories, the Conference Chair.

Dr. Arati Prabhakar, Director of the National Institute for Standards and Technology (NIST) will give the keynote address, "Civilian Technology for Economic Growth: A New Role for Federal R & D." This will be followed by the Jack S. Kilby Lecture Series, which includes talks on the Department of Defense's Global Positioning System (GPS), and extremely successful dual-use project, and dual-use medical application on the electronic battlefield. Technical sessions include Partnerships and Dual-Use Technologies, ASIC Design Applications, Optoelectronics, Micromechanics and Microsensors, MMIC Applications, and Electronics in Medicine.

There will be two half-day tutorials, a poster session, one classified session, and an exhibition. Exhibitors include Allied-Signal Aerospace, Harris Semiconductor, Hughes Aircraft, Honeywell, Quickturn Design Systems, the National Security Agency, Raytheon, Texas Instruments, and Martin Marietta Laboratories.

Martin Marietta's Harley Stein identified four of the major issues his company believes will be explored at GOMAC '94: (1) maintenance of military strength in the face of declining defense budgets, (2) use of the rapidly evolving information infrastructure by aerospace industrial organizations, (3) preserving the aerospace industrial base despite reductions in the number of large production programs for military equipment, and (4) an increased focus on dual-use technologies.

FIRST CALL FOR PAPERS

1995 Annual
Meeting,
April 22-25,
1995

INTEREST
GROUP II,
INDUSTRIAL
APPLICATION
OF COLOR



PAPER &
DISCUSSION SESSION

PROBLEMS, SOLUTIONS,
AND OPPORTUNITIES IN THE
TEXTILE INDUSTRY FOR
COLOR MEASUREMENT

The textile industry is in many respects unlike any other, relative to color measurement and formulation. Particularly in the areas of sample preparation, presentation, and instrumental measurement technique, careful attention to detail can mean the difference between success and failure of any color system.

The application of color measurement in the textile industry goes far beyond a mere starting formulation, batch correction, and final QC check. Sorting, tapering, and dyebath solution measurement all require different approaches to color measurement unlike those in other industries.

With the 1995 ISCC meeting being co-sponsored by AATCC, this year's session will center around the unique problems and solutions in the textile industry. The session will consist of both contributed and invited papers. The papers should be approximately 25 minutes in length.

Interested parties should submit a title and abstract by February 1, 1995 to:

Richard W. Riffel, Chair IGII
ColorTec Associates
74 Main Street
Lebanon, NJ 08833
(908) 236-2311 (voice)
(908) 236-7865 (fax)

INTEREST GROUP II, INDUSTRIAL APPLICATION OF COLOR IS LOOKING FOR HELP.

IGII is looking for a vice-chairman. If you would be interested in serving your ISCC in this capacity, please contact the chairman, Mr. Richard W. Riffel, ColorTec Associates, 74 Main Street, Lebanon, NJ 08833. Telephone (908) 236-2311, Fax (908) 236-7865

INTEREST GROUP III, ART, DESIGN AND PSYCHOLOGY REPORT

1994 Annual Meeting and
Additional News

Cranbrook Tour:

Members of the Art, Design and Psychology Interest Group III were the guests of Cranbrook Academy of Art, Bloomfield Hills, Michigan where they were presented a slide/lecture presentation and tour of the architectural sights of the campus. Mr. Bob Yares, Assistant to the President at Cranbrook, presented a lecture concerning the history of the Academy and its professional and aesthetic philosophy. Also included in the program was a campus tour which provided the Interest Group attendees an insightful overview of the renowned architectural structures of the campus. Additionally, the ISCC members were able to view an exhibition of current M.F.A. thesis students and works from the permanent collection which were all on view in the campus Museum of Art.

The Cranbrook Academy founders, George and Ellen Scripps Booth, envisioned the school as a community of artists and students dedicated to "produce objects to embellish and improve the American environment." Eliel Saarinen, the first president of the

Academy, was also the master architect who established the Cranbrook campus internationally through his magnificently eclectic campus architectural structures. The Academy of Art was given the power to grant degrees in 1942 and currently offers the Master of Fine Arts and the Master of Architecture degrees.

Since Saarinen had the unusual opportunity to design and develop the campus over a period of time, years of refinement brought his architectural structures closer to the realm of fine art. This was what the ISCC Interest Group III was able to experience during the thoughtful tour given by Mr. Yares; the assumed separations of art and design (in this case architecture) are not always a given.

When a serious and talented architect such as Saarinen is afforded the time and opportunity, wondrous and unexpected visual statements take form and transcend common notions of the traditional categories of art and design. Indeed, Mr. Yares made it clear to the ISCC members in attendance that the educational program at Cranbrook does not confine students into stringent disciplinary categories. Students are encouraged to explore their ideas and expressive directions within a cross disciplinary environment.

As the ISCC group absorbed the visual richness of the Cranbrook campus, Saarinen's use of color became progressively more evident.

The colors of brick which the architect used from building to building and surface to surface change subtly and provide a rich, yet unobtrusive

visual feast of patterns, circles and visual motifs.

Even the colors of slate which form the textural patterns of the building rooftops engage the viewer and provide visual tensions to complement the thoughtful architecture. Surface color is manipulated through constant shifts and surprises of natural light through ceiling domes and leaded glass windows. The carved patterns which adorn the doors are not repeated door to door but constantly change and continue to provide the viewer an ongoing visual tour of the best in visual design and fine craftsmanship. The richness of color of the architectural structures is counterbalanced by the rolling and wooded landscape which envelopes the campus.

The thesis exhibition of student works within the Museum of Art at Cranbrook verified the academy's dedication to educational diversity and the development of individuality within each graduating student.

The Interest Group III participants were able to view a wide variety of visual and expressive statements within traditional and non-traditional media. Fine craftsmanship combined with thoughtful visual statements upheld the tradition of Cranbrook excellence. On behalf of the attending Interest Group III members, Magenta Yglesias and Wade Thompson would like to extend a very sincere "thank you" to Mr. Bob Yares at Cranbrook for providing our group an excellent program and to Jim Keiser for arranging the transportation to and from the Cranbrook campus.

In addition to the tour of the Cranbrook campus, Margaret Walch of the Color Association of the United States (successor to the Textile Color Card Association of America, founded in 1915) presented her lecture "Three Historic Palettes (Art Deco Bright Colors, American Southwest Earth Tones and Cubist Monochromatic) and Their Contemporary Applications: A Case Study for the Automotive Industry" to the Interest Group III meeting. Ms. Walch is the author of the Color Source Book, Charles Scribner and Sons, 1979 and co-author (with

August Hope) of the Color Sources Book, Chronicle Books, 1994. Ms. Walch presented three historic palettes and discussed their applications to exterior and interior automotive design. Among the issues she considered were specific applications of three historic palettes to growing international automotive markets in light of regional and local taste, why, where and how to choose an appropriate historic palette and reinterpretations of historic palettes for contemporary sensibilities.

INTERNATIONAL CONFERENCE ON COLOR EDUCATION, HELSINKI:

The ISCC was represented in August by a contingent of Interest Group III members attending and participating in the International Conference on Color Education held at the University of Art and Design in Helsinki, Finland August 16-19. Wade Thompson, Vice-Chair, Interest Group III and Professor of Art and Design at Southwest Missouri State University, presented a paper: "Color, Light and Temperature: A General Studies Component for Preparing Students for Fine Arts Painting" and Shashi Caan, Brooklyn, New York, presented "Color is an Equal Partner: Teaching Architects Color." Magenta Yglesias, Interest Group III Co-chair, also attended many of the sessions which included keynote address speaker Ellen Marx.

The aim of the Conference was to review the current state of colour teaching and its role in art and design education, to examine critically the position of established theories of color in the visual arts and to provide an international forum for the exchange of ideas on teaching color. The Conference was intended primarily for teachers, students and researchers of color in degree-level art, design and architecture schools, as well as for designers, artists and professionals with an interest in the multifaceted world of color.

"CHROMATIC EXPERIENCE" INVESTIGATION, Professor Billy Wooten, Walter S. Hunter Laboratory of Psychology, Brown University, Providence, Rhode Island:

Professor Billy Wooten of the Walter S. Hunter Laboratory of Psychology at Brown University, Providence, Rhode Island recently communicated the current status of their project in color psychology entitled "Chromatic Experience." Professor Wooten first discussed some of his initial ideas concerning this project with Magenta Yglesias and Wade Thompson during the ISCC conference in Newport in 1993. Professor Wooten states: "There are widespread beliefs that red, orange and yellow are warm colors while blue, green and purple are cool. In addition, some colors, like yellow, are said to be lighter than others, such as blue. The present study investigated how the psychological dimensions of hue, saturation and lightness contribute to these distinctions, and attempted to relate ratings of these attributes to the Opponent Process Theory. Subjects rated colored chips from the Natural Color System atlas for their warmth/coolness or lightness/darkness. Increases in the percentage of saturation in a color produced warmer ratings with the specific amount of increase depending on the hue. Changes in lightness did not significantly affect warmth/coolness ratings. Increases in saturation and in blackness both produced darker ratings, but the size of the increase in ratings depended on the hue. In addition, hues associated with longer wavelengths were rated as warmer than those associated with shorter wavelengths, while hue had no significant effects on ratings of lightness/darkness. Furthermore, higher ratings of warmth were found to correspond with opponent channel activation in one direction, while lower ratings corresponded with activation in the opposite direction. This suggests that warmth ratings may be associated with the low-level physiological processes

involved in color perception, rather than with the psychological dimension of hue, and that the attribution of thermal properties to colors may be more than simply a cognitive process."

Interest Group III looks forward to more information concerning the "Chromatic Experience" investigation held at Brown University's Walter S. Hunter Laboratory of Psychology including the possibility of Professor Wooten presenting the final paper at the Greensboro conference next spring.

Wade S. Thompson
Vice-Chair
Interest Group III
Art, Design and Psychology

NEWS FROM MEMBER BODIES

ASTM STANDARDS ON COLOR AND APPEARANCE

The fourth (1994) edition of the compilation of ASTM Standards on Color and Appearance was reviewed in the previous edition of ISCC NEWS (No. 351, page 12). In addition to the 74 standards in the compilation, there are ten additional standards that may be of interest. They are listed below with ASTM Designation Number, Title, (Responsible Committee), Number of Pages, and Scope of Standard.

D 542-90, Test Method for Index of Refraction of Transparent Organic Plastics (D20.40), three pages. A refractometer method is used to cover the range of refractive indexes found in transparent organic plastics. Specimens must be optically homogeneous and of uniform refractive index.

(Continued→)

D 1494-92, Test Method for Diffuse Light Transmission Factor of Reinforced Plastic Panels (D20.40), three pages. This test method covers the determination of the diffuse light transmission factor of translucent reinforced plastics building panels.

D 1746-92, Test Method for Transparency of Plastic Sheeting (D20.40), three pages. This test method covers the measurement of the transparency of plastic sheeting in terms of regular transmittance. Although generally applicable to any translucent or transparent material, it is principally intended for use with nominally clear and colorless thin sheeting.

D 5531-94, Guide for the Preparation, Maintenance and Distribution of Physical Product Standards for Color and Geometric Appearance of Coatings (D01.26), three pages. This guide describes three levels of physical product standards for color commonly used in the coatings industry, provides terminology to describe each level, and includes techniques for generating standards.

E 1477-92, Test Method for Luminous Reflectance Factor of Acoustical Material by Use of Integrating Sphere Reflectometers (E12.02), two pages. This test method covers the measurement of the luminous reflectance factor of acoustical materials for use in predicting the levels of room illumination.

E 1478-92, Practice for Visual Color Evaluation of Transparent Sheet Material

(E12.11), three pages. This practice was developed to help its users critically judge the transmitted color appearance of transparent sheet materials. Its primary application is for colored flat glass and plastic materials.

E 1499-94, Guide to the Selection, Evaluation and Training of Observers (E12.11), four pages. This guide describes criteria and tests for selecting,

evaluating, and training human visual-sensory observers for tasks involving the perception and scaling of properties and phenomena relating to appearance. Examples of tests requiring use of trained observers are described in the following ASTM standards: on color, Test Method D 1535 and Practice E 1360; on color difference, Practice D 1729 and Test Method D 2616; on gloss, Test Method D 4449; on metamerism, Practice D 4086; on setting tolerances, Practice D 3134.

E 1541-93, Practice for Specifying and Matching Color Using the Colorcurve System (E12.07), 34 pages. This practice provides a means for specifying the colors of objects in terms of the Colorcurve system. Both computational and visual methods are included. This practice is applicable to inked, painted, dyed, or mass-colored surfaces viewed by an observer with normal color vision. Included is a method for producing a color specimen to match a Colorcurve sample. Specimen preparation is not included; when needed a mutually agreed upon procedure is to be established.

E 1651-94, Test Method for Total Luminous Reflectance Factor by Use of 30/t Integrating Sphere Geometry (E12.02), four pages. This method covers measurement of total luminous reflectance factor of opaque, nonfluorescent specimens by use of an integrating-sphere reflectometer with illumination at an angle of 30 deg from the surface normal and diffuse viewing with specular component included. The method is intended to be used for evaluation of total luminous reflectance factor of reflector lighting sheet material. It may be used for evaluation of other material when its specific geometry has been found to be applicable.

F 1048-87 (Reapproved 1992), Test Method for Measuring the Effective Surface Roughness of Optical Components by Total Integrated Scattering (E12.09), four pages. This test method covers the measurement of

the effective surface roughness of an opaque reflecting surface as determined by total integrated light scattering. It is particularly applicable to flat metal mirrors or smooth dielectrics covered with an opaque reflecting surface. The sampling area is approximately 1 mm in diameter. The test method determines the integrated scattering from an angle approximately 2.5 deg from the surface normal to an angle of approximately 70 deg.

Standards listed above are available separately from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187. Price depends on number of pages and whether order is placed by an ASTM member. To place an order phone 215-299-5585 or fax 215-977-9679. ASTM accepts three major credit cards and pays shipping cost on prepaid orders. All standards under the jurisdiction of ASTM Committee E-12 on Appearance are published in Volume 06.01 of the Annual Book of ASTM Standards. It also contains paint tests for chemical, physical and optical properties, 1268 pages, 251 standards. The 1994 edition of this volume can be purchased for \$114, but one volume of the 70 volume Annual Book of ASTM Standards is supplied free to each ASTM member. The annual membership fee is still only \$50; so you can save \$64 by applying for ASTM membership!

Harry K. Hammond III

FACTITIOUS COLOR BY GERHARD LANG

Vernacularism



"Everyone was showing and talking power colors..."

That opening line ba a fashion media person reflects the brilliancy of fashion hyperbole. Really?

Not! Simply part of the factitious color vernacularisms (FICOVE) pandemic in sham fashion media reportage. Call it "colorese".

Other colorwise jarring jargon includes: "Bogus Color" - suggesting one could suspect there are fallacious, apochryphal, quasi, and make-believe colors prevalent in the rag trade. "You know that color stuff" - possibly meaning there are anti-matter, haecceity, paraphernalia, and impedimenta colors awash in the Sea of Chroma. "Oh, wow, I like that gizmo coor" - next, one can expect the media hype to introduce - dingus, gimcrack, eppes or what's-that-kind-of-color-lingo. "But, the color..." (NYT quote). If that is not bogus stuff then one can anticipate qualification.

Impetuousness, bavardage, and schizo-like ideograms have become dernier cri linguistics to explain unendurableness of color usage affectations. Apparently, fashionese replaces rational usage of language in the market/mediaplace. There is an aggressive attitude to create an insider's cuteness. Thus, buzziness and bobinationness is what the fashionistic whizz writers use to show off their alleged fashion ingenuity. They abet wannabe renaissance designers, me-tooism styles, words and colors, rather than using overt personal creativity statements.

Today color becomes an anticlimax factor. Once hears and reads of environmental, contextural, quantum and spirit healing colors. And more amazing: 150 gigaflops per second computer colorization modes. Should one be awed or impressed with variable color verbiage? No way, Jose! Can one ask, is red real red, or is fake red real red? The growing, glowing color enigma of the third millennium is a real threat.

What one forgets - the rainbow-in-the-sky has been in fashion for billions of years. No earthling has since invented, designed or created a color not basic to the sky prism. Variations on hues are what colorist contributed to color usage. There are endless reds and yellows - all reverberating the wave lengths of the rainbow's red or yellow.

Other color spectaculars can be found in the aurora australis and aurora borealis, or in there are snowbow aurora of a winter's night. Add the geocolors of flora and fauna.

Can one suspect the Maker of the rainbow pleaded with the then colorist, "try some artificial coloring to give it impact." Or the Maker could have yelled, "like use collision, impetus, shock or some kind of momentum colors."

Here in Barrio Barelitas one hears of "el sindrome padecimiento del color" to the non-Spanish personal, that translates to "the color suffering syndrome" - meaning burro elegante (smart ass) colorese materia (stuff). Get real! Next one can expect to look forward to doing eco-lunches wearing an ironic or oxymoronic colored outfit.

The final questions: (1) is there major evidence of an epidemic chroma dyslexia abuse practice (ECDYSAP) upon the blue Planet? (2) Is there a therapeutic procedure to correct colorese disorientation or chromaphobia? (3) Can one get back to the basics that color is color and never needs media overkill to prove color is something new? (4) Are there too many pseudo-color practitioners screwing up the natural color system?

GET COLORSMART!

VANILLA

"Vanilla is no longer plain vanilla," ran a lead piece in the Times' Business Section of June 10. Familiar, comforting and calming, vanilla is turning up in everything from coffee beans to yogurt. What is newsworthy is that the vanilla scent is one of the first to come out of the kitchen into fragrance. Additionally, we learn that this August, Haagen Daaz was slated to introduce Brownies a la mode, a vanilla flavor mixed with chunks of brownies.

AND SPEAKING OF CARS:

According to Bob Daily, Color Marketing Manager of duPont Automotive Finishes, purple in cars is beginning to receive some interest. "A

deep reddish aubergine mostly is the customer's favorite. The pale shades tend toward a pinkish sweetness that is difficult on a large surface. At the moment 3% in full and midsize cars in purple may seem small, but coming from nowhere it is significant." he noted.

FSCT ANNOUNCES THEME FOR 1995 ANNUAL MEETING

FSCT The Federation of Societies for Coatings

Technology has selected "Creativity + Adaptability = Gateway to Success" as the theme for its 1995 Annual Meeting scheduled for October 9-11, 1995, St. Louis, MO

Louis Holzknect, Chairman of the 1995 Annual Meeting Program committee made the following statement regarding the 1995 theme, "Success starts with a vision. Our vision for the coatings industry must include the creative use of all available technologies. Only by expanding our knowledge of new and parallel technologies can we adapt to the ever-changing requirements of the marketplace." Holzknect concluded by stating, "Education is the key that unlocks the gateway to success".

A call for Papers and Sessions has been issued by the 1995 Annual Meeting Program committee. To obtain a copy which explains the submission procedures, Contact Michael G. Bell, Director of Educational Services, FSCT, 492 Norristown Road, Blue Bell, PA 19422. Phone (610) 940-0777; FAX (610) 940-0292.

Completed abstract should be returned to Louis Holzknect, Devco Coatings Co., 1437 Portland Ave., Louisville, KY 40203. Phone (502) 589-9340; FAX (502) 589-5105. The deadline to submit session proposals is January 15 and the deadline to submit abstracts is February 15, 1995.

(Continued on pg. 16)

NEW MEMBERS

We are pleased to list the latest members to the ISCC. Welcome!

Ms. Rebecca Alston
RAI Design Renovation & Multi-
Artist
Studio 518
503 Broadway
New York NY 10012 USA

Ms. Patricia B. Bell
Zeneca Resins
67 Victoria St.
Lowell MA 01851 USA

Mr. Thomas R. Burlson
Baker & Collinson, Inc.
12000 Mt. Elliott Avenue
Detroit MI 48212 USA

Dr. Jim Davidson
PO Box 136
Cornwall NY 12518 USA

Mr. Robert L. Donofrio
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Mr. Manish S. Kulkarni
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Ms. Sheila J. Lewis
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Greensboro NC 27408 USA

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Lawrence Tech University
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Ms. Holly L. Shetty
Indiana University of Pennsylvania
4 Holly Drive
Palmyra PA 17078 USA

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University of Chicago
939 E. 57th Street
Chicago IL 60637 USA

Mr. Simon Tan
3M Company
Bldg 207-BN-02
St. Paul MN 55144 USA

OTHER NEWS

MEETING SUMMARY 2ND OXFORD CONFERENCE OF THE CORM/ UVSG RINDGE, NH 19-23 JUNE, 1994

The first Oxford Conference on Advances in Standards and Methodology in UV-VIS Spectrophotometry was held at Oxford University, Oxford, England in 1986. That meeting had been an enormous success, resulting in the publication of a book containing the text of the oral presentations and abstracts of the poster papers. This meeting lived up to high level of professionalism set by the first meeting.

This was a very intense and exciting meeting. It is a conference which is narrowly focused on UV-VIS

spectrophotometry and is sponsored jointly by the Council on Optical Radiation Measurements in the US and the Ultra Violet Spectrophotometry Group of the UK. CORM is the industrial consortium with a charter to give direction to the optical metrology division of NIST. UVSG is the industrial consortium with a charter to provide a technical clearing house for activities and advances in applied UV-VIS spectrophotometry. This includes analytical methods used by the pharmaceutical industry as well as colorimetry.

At the first Oxford conference, many of the papers were on instrument performance, stability and accuracy. The pharmaceutical industry is much more concerned about accurate spectrophotometry than is the color industry. At this meeting, there was much more emphasis on meeting ISO requirements than on absolute accuracy. But then, in the last 8 years, the uncertainty in transmission spectrophotometry has dropped from 0.3% to 0.03%. Reports at this meeting indicated that the old analytical chemistry "rule of thumb" that the absorbance reading must be between 0 and 1 AU (100% to 10%

transmittance) is no longer true. The analytical instrument makers were reporting performances of linearity tests down to 6AU (0.0001% transmittance) with a wavelength accuracy of 0.01 nm.

Thus, the pharmaceutical industry has specific, absolute spectrophotometric targets for many products written into the Pharmacopoeia standards. A 10 grain aspirin dissolved in distilled water must have a UV/VIS spectrum with an absorbance peak of so many absorbance units at exactly one specific wavelength.

In the first presentation by Dr. C Burgess, he reviewed the various requirements and approaches to validation of spectrophotometers under these strict regulatory rules. He identified four areas of regulatory conformance. 1) The fitness of the equipment for the measurement in questions. This is basically a test of the geometric and spectral capabilities of the instrument. "Can the instrument read a solution in 1 cm square cuvette?" "Can it measure absorbance at 347 nm?" and so on. 2) Is there demonstrable compliance with the manufacturer's performance criteria. If the manufacturer says the instrument has a wavelength accuracy of 0.1 nm, can the user test and verify this number. The same is true for photometric tests or repeatability and reproducibility. 3) Is there demonstrable compliance with established documentary standards and practices. 4) Is there documented evidence for operability and data integrity. He then went on to describe a general four step model for any analytical process, including instrument design. The steps are Design Qualification — "What do you want the instrument to do?"; Installation Qualification — "Does the instrument work the way the manufacturer says it should?"; Operational Qualification — "Does the instrument work for the customer's specific application?"; Performance Qualification — "Does the instrument continue to work in the manner intended?" DQ involves the setting of the specifications, by

marketing and engineering. IQ involves the verification of the specifications at the time delivery by customer support. OQ involves the customer getting the necessary training on the use of the instrument (how to position the black traps, for example), and PQ involves the regular maintenance and service of the instrument. Both the instrument manufacturer and the user contribute to these goals. A draft version of an ISO document, specifying the manufacturer's duties and the user's duties was handed out.

A second paper of interest was given by D. Porter of ATO Haas, entitled, "Global Harmonization of Spectrophotometric Standards." His premise was that the first and second derivatives fully describe the functional performance of a spectrophotometer. Therefore, all standards should have the two derivatives reported along with the transmittance or reflectance. From those three readings a "unique" cubic spline can be derived which can be used to adjust any laboratory or instrument data to that of the national standards laboratory. The idea was well received by the audience. In the discussion period, it was suggested that major standardizing organizations could use this process to tie themselves together and then define an "International Standard of Adjustments of Measurement Results." This standard would then be applied to secondary standards labs and so on down to the user to create a network of laboratories all linked by spline equations. What makes this possible and reasonable is that the level of accuracy remains much poorer than the level of precision, especially for reflectance measurements. At the meeting, NRC (Canada) admitted that they no longer agree with PTB (Germany) on the realization of the scale of reflectance and NIST was confident that they too, have drifted since the last inter-comparison nearly twenty years ago. NPL still has not committed to try to establish their own scale. At present, they are "traceable" to PTB.

John Verrill gave a paper describing

the activities of the NPL. They are the only standardizing laboratory with an active program in colorimetry. They lead a group known as the "NPL Spectrophotometry and Colorimetry Club" which is modeled after CORM. It currently has about 65 members, of which only three are academic organizations. John described several measurement errors recently quantified by the NPL on integrating sphere spectrophotometers. First, they acknowledged the severity of the problem of translucency of transfer standards. He admitted that they issued transfer standards made from materials with known translucent behavior because they "believed" that if the samples were thick enough then the translucency would not be a problem. They have now changed their thinking and realize that edge loss is a problem for all pressed powders and white glasses (including opal glass). He also commented on errors with glossy materials, including ceramic tiles, due to non-uniformities in the sphere coating and to a fall off in the reflectance at high angles due to internal reflection losses. I believe that we will see the NPL join PTB and recommend that only matte white materials be used as transfer standards and they will both standardize on the new, matte BCRA tiles. PTB currently recommends matte opal glass, at least 20 mm thick. When using a matte standard, John Verrill recommends placing a thin piece of paper between the matte tile and the instrument port to keep the tile from touching the instrument surface. He also recommends checking the stability of the matte surface by verifying it against a more durable glossy standard, periodically.

John also reported on the results of a study on the uniformity of sphere coatings. He found that a BaSO₄ coated sphere changed its uniformity of reflectance from +/- 0.2% freshly painted to +/- 8% to 10% after one year on the shelf. At first, he thought they had made a measurement error in the initial readings. But they obtained similar results on a commercial sphere.

(Continued→)

He now recommends re-coating spheres every 9 to 12 months, a recommendation well known to users of Hardy type instruments and one which this reviewer has made in the past users who want to hold the highest long term repeatability.

How bad is the sphere problem? NPL conducted a 4-way inter-comparison with four other National Standards laboratories in Europe. He did not mention the countries. NPL has been active in helping several European countries set up and certify standards labs with an interest in color. The results of the inter-comparison yielded an average difference of 0.5 CIELAB units with a maximum of 2.0 CIELAB units on 12 BCRA tiles. The NPL believes that the differences are due primarily to directional sensitivity in the spheres. NPL has also recently released a set of five metameric pairs. The set has the following characteristics.

SERIES OF METAMERIC CERAMIC TILES

CIELAB COLOR DIFFERENCES

Color	D/10deg	A/10deg
Gray	0.30	3.27
Green	0.30	3.68
Yellow	0.50	3.60
Orange	0.55	5.29
Pink	0.54	5.07

The NRC reported on the development of their new reference spectrofluorimeter. This

presentation was very similar to the one given at the Williamsburg Conference on fluorescence. Even so, the instrument will be very impressive when completed. Have a more instrument oriented audience, Dr. Zwinkels was able to focus on more details of the design, construction and calibration of the new instrument.

NIST reported on a round-robin experiment on the reproducibility of pressing of PTFE powder for use as transfer standard for 45/0 radiance factor. This is similar to the

experiment they did a number of years ago for d/0 reflectance factor. It was interesting to note that the random uncertainties for 45/0 measurements were 2 to 3 times larger than for d/0. This is similar to the results observed at the 1992 SPE RETEC in Cherry Hill, NJ. The main difference is that the measurements in the NIST experiment were all performed on the NIST instrument. Chuck Leete's conclusion that sphere instruments have better reproducibility than 45/0 instruments seems to be confirmed by the NIST report, though the source of the problem seems to lie not in design variances but in an intrinsic over-sensitivity on the part of the 45/0 instruments to specimen surface character.

During a panel discussion on the topic, "Are National Standards Labs and Academia filling the Needs of Industry?", the following points were made: 1) National Standards Labs should focus on developing standards and scales based on sound principles, traceable to fundamental laws, consistent between countries, relevant to the real world, robust and reliable, easy to use in a variety of situations, expressed in an unambiguous way and applicable to being transferred to working standards. 2) Academia is not producing adequate students due to a downward drift in standards, a tendency to produce "techno freaks" enamored with technology but not capable of

understanding it, too many specialist degrees and not enough generalists with solid backgrounds in various technologies and the ability to work effectively in a range of applications. In response the NRC pointed to their offerings of training courses offered to industry which are always sold out, high accuracy (?) calibration services on radiometry, photometry, regular transmittances, diffuse reflectance (SCI or SCE) and gloss. They have recently added a marketing group to sell the services and build closer, collaborative relationships with industry, NPL also

holds training courses but limits attendance so that courses are "hands on!" They mentioned that both they

and CERAM Research, a secondary standards lab, are using the Spectraflash 500 as transfer instruments. They are currently carrying out an inter-comparison with 22 UK companies on regular transmittance. NIST cited the SRM (Standard Reference Material) office as their point of contact - where upon several members of the audience commented that the SRM office is a communication sink. NIST strongly refuted that, saying that they received copies of all correspondence from customers to the SRM office. When asked if they knew of the requests from the audience - they said they had not seen such requests - the complaints were thus validated.

There were several presentations during the rest of the conference by analytical instrument manufacturers such as Varian (makers of the Cary line of spectrophotometers), Perkin Elmer (PB) Shimadzu and Hewlett-Packard. It was interesting to note that both PE and HP do all spectrophotometer development in Germany. The top of the line instruments from these companies have stray light levels of less than 0.0001%, wavelength accuracies of better than 0.05 nm, and photometric accuracies of 0.10% regular transmittance.

They have field kits for the user to certify the stray light, wavelength scale and photometric linearity. The stray light is tested with standard solution filters, the wavelength scale with a built-in mercury pen lamp and the line structure in the deuterium lamp and linearity using a double aperture accessory. Varian reported that marketing sets the instrument specifications according to customer requirements (focus group inputs). The written specs are passed to engineering who tightens the specs so that a 4 sigma range is inside the marketing specifications and then build the first prototypes. The prototypes are passed to manufacturing who does the tooling and assembly and test procedures to specifications, generally looser than the marketing specifications. The time frame from written specification from marketing to first production unit is

three years. Each instrument is shipped with a signed certificate of analysis and a diskette with test data and programs for use by service engineers. They also have a re-certification program.

Shimadzu commented that training has become a problem for them. They have recently built a new training center in Columbia, MD but are also developing multimedia training packages so that the attendees can take it back and use it to train others in their company. It was noted by ATI-Unicam that some ISO certified customers in Europe are requiring proof of training of service and application engineers as part of the purchase requirements. ATI-Unicam offers a multimedia "help" tutorial under Windows, including a comprehensive "How to" section.

Jerry Workman from Perkin-Elmer described a relatively new product from their NIR group. They have an NIR diffuse reflectance instrument with a diode array for measurements in the 700 nm to 1100 nm range. They have material reflectance standards built into the instrument. The instrument rotates these reference standards into the optical path between readings and verifies the stability of photometric and wavelength scales. Small changes are compensated and large changes signal a need for recalibration or service. They have also developed an absolute virtual instrument concept. They define the ideal instrument function. They then measure a series of physical standards such as an etalon - digital optical filter, to "finger print" the instrument function of each instrument on the production line. Because the etalon encodes phase information as well as distance information, they can transform via FFT to the frequency domain and derive a multivariate convolution filter which will transform the actual instrument function to the ideal instrument function. The result is a line of spectrophotometers whose reproducibility is limited only by the repeatability of the etalon measurement.

Finally, NIST raised the issue of NVLAP and the certification of secondary standards labs in the US.

This was to be their solution to not having the resources to service the needs of industry. I raised the issue of the cost of establishing and maintaining NVLAP certification. All of the instrument makers and Labsphere echoed my concerns. Only Kodak is pursuing certification and they are certified under NAMAS from the NPL, as is CERAM Research in the UK.

There was a large number of poster papers, just as there had been at the first Oxford conference. Unlike many technical meetings, the quality of the presentation was not reflected in whether the paper was given in one of the lecture sessions or in one of the poster sessions. All of the national standards labs had one or more poster papers. NPL had a paper describing the wide array of new reference instruments which they have recently developed. Of particular interest to those of us involved in spectrophotometry was a report by George Freeman on an instrument with a 200 mm diameter integrating sphere which can be operated in either $t/8$, $d/8$ or $d/0$ geometries. Perhaps we can finally get an answer to the question as to whether $d/8$ and $d/0$ are equivalent geometries. George also reported on a spectrogoniophotometer and hazemeter which are being used to provide transfer standards for bidirectional radiance factor and haze. John Verrill reported on the development of a new spectrofluorimeter at the NPL. When all of these projects are finished, it will make NPL the most well equipped of all of the standards laboratories.

Researchers from NIST reported on several activities in optical metrology. A poster paper by T. R. Gentile, A. Frenkel, A. L. Migdall and Z. M. Zhang described some improved methods for characterizing neutral density filters. Their technique allow direct determination of density down to an optical density of 6 and a heterodyne determination down to a density of 12. Len Hanssen gave a paper on a new instrument for directional/hemispherical reflectance measurements in the infrared (2000 nm to 20,000 nm). A paper, jointly

authored by Datacolor and CERAM described the long stability and temperature compensation of the BCRA series II ceramic tiles. If one measures the ambient temperature and adjusts the colorimetric readings as per the information supplied with the tiles, the long term stability of the tiles improves to the point where instrument performance can be tested at the 0.1 DE* CIELAB unit level. A paper from Oriel analyzed the stray light performance of single disperser, diode array spectrometers. They identified the sources of stray radiant power in a diode array spectrometer and recommended filtersets to reduce the influence on high absorbance readings. Henry Hemmendinger gave a paper on balancing the treatment of the specular and diffuse components of white standards during calibration. This effect is becoming more and more of a problem. According to his paper and the comments of researchers from NPL and PTB, the use of a glossy material for photometric scale transfer and verification is questionable. In response, CERAM has recently introduced a matte version of the Series II Ceramic Colour Standards as well as a white and black tile. Henry showed how to correct an instrument for the effect of the specular component on the calibration function. Fred Simon gave a paper on fluorescent plastic standards, available from him. The standards come in either white or red, orange or yellow chromatic specimens.

Overall, this was a very intense meeting. There were many excellent presentations and posters, discussion was always lively and lasted long into the evening, thanks in part to sponsorship of the "Pub Nights". There is nothing better than sitting around in a pub, watching the World Cup playoff with a group of international spectroscopists and discussing the problems of standards and standardization. So many people raise the issue of the poor level of uncertainty on diffuse reflectance measurements that the standards laboratories began discussions on a process to harmonize the scale of

(Continued→)

reflectance much as they have the melting point of gold for the temperature scale. This would provide a theoretical, agreed upon scale to which everyone could develop corrections for their own systematic bias. Those corrections would be supplied along with any standard reference material to allow one to be traceable to the national standards laboratory or to the international scale of reflectance. This seemed like a good compromise as it will reduce the total uncertainty by a large amount. Both standards labs and commercial instruments have better repeatability than is reflected in the combined uncertainty of the reproducibility between laboratories. If you have and an interest in spectrophotometry and missed this meeting then you missed a lot. Fortunately, the proceedings and many of the poster paper will be published in a book. The book should be available early in 1995. I can highly recommend it just for its content.

Danny Rich

COLOUR COMMUNICATION

CALL FOR PAPERS



A three day International Conference on Colour Communication is to be held at UMIST, Manchester, United Kingdom from 19 to 21 April 1995. It is jointly organized by the Department of Textiles at UMIST, The National Physical laboratory, and The Colour Measurement Committee of The Society of Dyers and Colourists.

Color is a vital element in the marketing of goods and services, from the esoteric to the ordinary - from toothbrushes to cars, paints to textiles and food to jewelry. The human eye will always be the final arbiter, but color is increasingly communicated by numbers, and electronic means. Both those within the field of color measurement and specification and the end users of color technology are invited to attend the conference.

Oral and poster presentations related to all aspects of color and its communication are invited. Topics will include, but will not be limited to: color order systems, color measurement and specification, perception of color, color appearance, color range management, color in visual displays and hardcopy, color in architecture and design, on-line color control, color difference formulae, and fluorescent colors.

A 200 word abstract should be submitted together with the completed registration form by November 15, 1994. Please mail to Mrs. P. A. Leigh, CE Office, UMIST, P. O. Box 88, Manchester M60 1QD, United Kingdom.

COLOR SCIENCE ASSOCIATION OF JAPAN (CSAJ)

It is with pleasure that the CSAJ announces their new officers for the 1994-1995 year. They are President: Prof. Hiroshi Kansaku of Chukyo University, Vice-president: Prof. Takashi Hasegawa of University of the Sacred Heart, Vice-president: Dr. Motoi Manjo of the Electrotechnical Laboratory, LERC, Head of Kantoh Branch: Mr. Yasuhiro Nagata of Color Planning Center, Head of Tohoku Branch: Prof. Shuntaro Hika of Aichi Institute of Technology and Head of Kansai Branch: Prof. Naoyuki Osaka of Kyoto University.

The address of CSAJ is 12-14, Hamamatsucho 2 chome, Minato-ku, Tokyo 105. The telephone and fax number is 03-3432-0868.

Ellen C. Carter
Color Research and Application

IESNA ANNOUNCES NEW PUBLICATION

IESNA recently announced the publication of a new revision of a standard entitled: "COLORIMETRY OF LIGHT SOURCES". The standard discusses various techniques in determining light source color appearance and its effect on evaluating the color performance of lamps. The revision is 10 pages, and is a value at \$20 (IESNA members really save - \$12 is their cost). The ISBN is 0-87995-093-5. Please contact IESNA for further information and availability.

Danny Rich

COLOR RESEARCH AND APPLICATION

In This Issue, December 1994

This special issue on fluorescence contains selected articles related to presentations at the 1994 Inter-Society Color Council Williamsburg Conference on the Colorimetry of Fluorescent materials. For a brief description of all the presentations at that conference readers should note Michael Brill's review of the meeting published in the August issue of this journal. [See 19:313-317, 1994.] The articles in this issue fall into the general category of colorimetry of fluorescent materials. A second special issue will contain articles relating to applications of fluorescent colors.

We begin with articles relating to

standards, both documentary and materials for instrument standardization. First, an article by Fred W. Billmeyer, Jr. titled "Documentary Standards and Color Specifications for Fluorescent Materials" in which Professor Billmeyer outlines the work of ASTM Committee E-12 on Appearance as it relates to fluorescent materials. Then an article by J. Anthony Bristow, "The Calibration of Instruments for the Measurement of Paper Whiteness" which examines the development of a viable calibration system to permit the adjustment of the UV-content in the illumination in different instruments using matte paper samples as a transfer material.

Next, Dietrich Gundlach and Heinz Tersteige review the radiometric aspects of fluorescent materials and the measurement of their radiometric and colorimetric characteristics. They also discuss the problems of radiation feedback with the sphere geometry in spectrophotometers and a way to solve this problem with a two-monochromator system in their article entitled "Problems in Measurement of Fluorescent Materials."

The proper visual evaluation or instrumental measurement of fluorescent colors requires the satisfactory simulation of the ultraviolet component of daylight because many fluorescent colors absorb ultraviolet radiation and re-emit radiation in the visible region of the spectrum. In "Simulation of Daylight for Viewing and Measuring Color," Mr. C. S. McCamy reviews the characterization of daylight and the development of sources to simulate daylight. He then describes a new filter design method that can lead to better simulations of daylight both in viewing booths and instrument sources.

Instrumental simulation of daylight is part of the next article in which Rolf Griesser tackles the problem of how to obtain constant, comparable results when measuring whiteness, tint and lightness for fluorescent materials using measuring instruments of different designs incorporating different means of simulating standard D65 and other D

illuminants. The "Assessment of Whiteness and Tint of Fluorescent Substrates with Good Inter-Instrument Correlation" includes in detail a method involving both a specific hardware controls and software calculations that results in the measurement of the critical dimensions of whiteness and tint indirectly yet consistently and comparably.

Special instrumental measurements are a keystone to formulation of fluorescent colors. The team of Frederick T. Simon, Robert A. Funk and Ann Campbell Laidlaw describe research from Clemson University in the development of "Match Prediction

of Highly Fluorescent Colors" in textiles using color measuring instruments and computers. Simon, Funk and Laidlaw developed a new technique based on dual monochromator measurements of fluorescent colorants and defining a new spectral quantity, RELEX, which describes the relative excitation of the colorant and is independent of the illuminant. With this combination of instrumentation and technique color formulation of fluorescent materials is feasible.

*Ellen C. Carter
Color Research and Application*

OBITUARY

**Paul H. Hoffenberg
1942 - 1994**

Paul Hoffenberg, 42, died suddenly on September 6, 1994 of a heart attack. Paul was a long time individual member of the Council and had served on several Project Committees and most recently as Chairman of the IMG Memberbody delegation.

Paul had many friends and colleagues within the Council and in the color community at large. He had taken his undergraduate training in Physics at Union College in Schenectady, NY. He worked for a while in the ink lab of BASF under Bob Bassemir before deciding to go back to graduate school. His exposure to graphic arts and printing attracted him to the program at Lehigh University, Bethlehem, PA. There he studied under the direction of Eugene Allen. He received his Ph.D. in Chemistry from Lehigh after defending his dissertation on computer color matching of non-opaque inks.

After graduation Paul moved to Appleton, Wisconsin where he worked for American Can, Inc in the graphic arts Research Department. When American Can decided to get out of the printing and publishing business they closed the Research Department and Paul took a position in the development group in Applied Color Systems, Inc. At ACS he was instrumental in the development of color recipe prediction algorithms for ChromaPac[®], ColorCalc and ChromaCalc[®] products. After the acquisition of ACS by Armstrong World Industries Paul headed up his own department on Color Technology and worked on several technologies related to point of sale formulation systems including gloss compensation and palette search and correction algorithms. After the sale of ACS to the Eichhof Group of Lucerne, Switzerland Paul served as Director of Research & Development and Manager of Advanced Color Technology.

Paul was always most interested in the application of color science and technology to the problems of graphics arts, printing and publishing. He served on several standards committees including ISO TC 130, ANSI-CGATS, GAA-SWOP to name a few. He will be missed most by those of us who knew his wit and his penchant for detail in his work.

Danny Rich

C A L E N D A R

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

1994

GOMAC '94, Nov. 7-10
 Government Microcircuit Applications Conference, Town and Country Hotel, San Diego, California. Information: Mark Goldfarb, Palisades Institute for Research Services, (800) 787-7477, Fax (703) 413-1315.

ASTM COMMITTEE D-20 ON PLASTICS, Nov. 14-17
 Phoenix, Arizona. Information: Katharine Schaaf (215) 299-5529.

IS&T/SID COLOR CONFERENCE, Nov. 15-18
 2nd Color Imaging Conference: Color Science, Systems, and Applications, Sponsored by Society for Information Display (SID) and Society for Image Science & TEchnology (IS&T), The Radisson Resort, Scottsdale, Arizona. Information: Pam Forness (703) 642-9090, Fax (703) 642-9094.

ADVANCES IN PHOTOMETRY, Dec. 1-3
 CIE Expert Symposium on Advances in Photometry, Lighting Quality and Energy Conservation, CIE Central Bureau, Vienna, Austria. Information: CIE (+43-1) 714-3187, Fax (+43-1) 713-0838.

1995

ASTM COMMITTEE D-1 ON PAINT, Jan. 22-24
 San Antonio, Texas. Information: Scott Orthey (215) 299-5507.

ASTM COMMITTEE E-12 ON APPEARANCE, Jan. 25-27
 Phoenix, Arizona. Information: Bode Buckley (215) 299-5599.

ISCC WILLIAMSBURG CONFERENCE, Feb. 12-15
 Pan-Chromatic Conference, Inter-Society Color Council Williamsburg Conference, Williamsburg, Virginia. Information: Dr. Steven A. Shafer (412) 268-2527.

ASTM COMMITTEE D-20 ON PLASTICS, Mar. 12-16
 Denver, Colorado. Information: Katharine Schaaf (215) 299-5529.

TAGA ANNUAL CONFERENCE, Apr. 2-5
 Technical Association of the Graphic Arts Annual Technical Conference, Orlando, Florida. Information: Karen Lawrence (716) 475-7470.

COLOR COMMUNICATIONS, Apr. 19-21
 International conference to be held at the Renold Conference Center, UMIST, Manchester, UK. Information: Mrs P.A. Leigh, CE Office UMIST, P.O. Box 88 Manchester, M60 10D (01) 61-200-3995, Fax (01) 61-200-3534

ISCC ANNUAL MEETING, Apr. 23-25
 Color And Textiles, Inter-Society Color Council with American Association of Textile Chemists and Colorists, Holiday Inn Four Seasons, Greensboro, North Carolina. Information: Ann Laidlaw (919) 274-1963.

CMG - CONFERENCE, May 14-16
 Color Marketing Group International Color Directions Conference, Fairmont Hotel, Dallas, Texas. Information: Katie Register (703) 329-8500, Fax (703) 329-0155.

CORM 95, ANNUAL MEETING, May 15-17
 Council for Optical Radiation Measurements, Ottawa, Ontario, Canada. Information: Norbert Johnson (612) 733-5939, Fax (612) 733-6211.

ASTM COMMITTEE E-12 ON APPEARANCE, Jun. 21-23
 Denver, Colorado. Information: Bode Buckley (215) 299-5599.

ASTM COMMITTEE D-1 ON PAINT, Jul. 9-13
 Atlanta, Georgia. Information: Scott Orthey (215) 299-5507.

ASTM COMMITTEE D-20 ON PLASTICS, Jul. 9-13
 Lake Como, Wisconsin. Information: Katharine Schaaf (215) 299-5529.

OSA - ANNUAL MEETING, Sep. 10-15
 Optical Society of America Annual Meeting, Portland, Oregon. Information: OSA Meetings Department (202) 416-1980.

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

CIE 23rd QUADRENNIAL MEETING, Nov. 1-3
 Division Meetings, Nov. 6-8
 International Commission on Illumination (CIE), Vigyan
 Bhavan Conference Complex, New Delhi, India. Information:
 Jonathan Hardis, Secretary USNC/CIE (301) 975-2373, Fax
 (301) 840-8551, E-mail "hardis@onyx.nist.gov"

CMG - CONFERENCE, Nov. 5-7
 Color Marketing Group International Color Directions
 Conference, Phoenix, Arizona. Information: Katie Register
 (703) 329-8500, Fax (703) 329-0155.

ASTM COMMITTEE D-20 ON PLASTICS, Nov. 13-16
 Norfolk, Virginia. Information: Katharine Schaaf (215) 299-
 5529.

1996

ASTM COMMITTEE D-1 ON PAINT, Jan. 21-24
 Fort Lauderdale, Florida. Information: Scott Orthey (215) 299-
 5507.

**ASTM COMMITTEE E-12 ON APPEARANCE, Jan. 22-
 24**
 Fort Lauderdale, Florida. Information: Bode Buckley (215)
 299-5599.

USNC/CIE "1995" ANNUAL MEETING, Jan 27-29
 United States National Committee of CIE, Orlando Florida.
 Information: Bode Buckley (215) 299-5599.

ASTM COMMITTEE D-20 ON PLASTICS, Mar. 18-21
 Orlando, Florida. Information: Katharine Schaaf (215) 299-
 5529.

TAGA ANNUAL CONFERENCE, Apr 28-May 1
 Technical Association of the Graphic Arts Annual Technical
 Conference, Dallas, Texas. Information: Karen Lawrence
 (716) 475-7470.

ISCC/ASTM ANNUAL MEETING, May 5-7
 Orlando, Florida. Information: Dr. Dan Rich (609) 895-7427,
 Fax (609) 895-7461

CMG CONFERENCE, May 5-7
 Color Marketing Group Conference, Sheraton New Orleans,
 New Orleans, Louisiana, Information: Katie Register (703)
 329-8500, Fax (703) 329-0155.

ASTM E-12 COMMITTEE ON APPEARANCE, May 8-10
 Orlando, Florida. Information: Bode Buckley (215) 299-5599.

ASTM COMMITTEE D-1 ON PAINT, Jun. 23-26
 San Francisco, California. Information: Scott Orthey (215)
 299-5507.

**ASTM COMMITTEE E-12 ON APPEARANCE, Jun. 24-
 26**
 San Francisco, California. Information: Bode Buckley (215)
 299-5599.

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

CMG FALL CONFERENCE, Nov. 3-5
 Color Marketing Group Conference, Sheraton Seattle,
 Washington. Information: Katie Register (703) 329-8500,
 Fax (703) 329-0155.

ASTM COMMITTEE D-20 ON PLASTICS, Nov. 18-21
 New Orleans, Louisiana. Information: Katharine Schaaf (215)
 299-5529.

1997

ASTM COMMITTEE D-1 ON PAINT, Jan. 26-29
 Ft Lauderdale, Florida. Information: Scott Orthey (215) 299-
 5507

TAGA ANNUAL CONFERENCE, May 4-7
 Technical Association of the Graphic Arts Annual Technical
 Conference, Montreal or Quebec City, Canada. Information:
 Karen Lawrence, (716) 475-7470.

COLOUR '97, May 26-30
 8th AIC Quadrennial Meeting, Colour '97, Executive Com-
 mittee Meeting on May 25, Kyoto International Conference
 Hall (KICH), Kyoto, Japan.

ISCC ANNUAL MEETING, Sep. 14-17
 Inter-Society Color Council Annual Meeting with Color and
 Appearance Division of Society of Plastics Engineers. New-
 port, Rhode Island. Information: Gary Beebe (215) 785-8497.

**AATCC - CONFERENCE AND EXHIBITION, Sep. 28-
 Oct. 1**
 American Association of Textile Chemists and Colorists,
 Marriot 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) 475-7470.

(Continued→)

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) 475-7470

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

News From Member Bodies, continued

1995 DISPLAY MANUFACTURING TECHNOLOGY CONFERENCE



The Society for Information Display (SID), the United States Display Consortium (USDC), and Semiconductor

Equipment and Materials International (SEMI) are developing cooperative programs for the second annual Display Manufacturing Technology Conference (DMTC), to be held at the Santa Clara Convention Center, Santa Clara, California, January 31 - February 2, 1995. DMTC is North America's only trade show and conference devoted exclusively to display manufacturing.

"There is a high probability that USDC, SEMI, and SID will jointly sponsor a reception to build on the extremely successful reception USDC and SEMI sponsored at DMTC '94," said Conference Chair Sal Lalama, at SID's International Display Research Conference, held in Monterey, California. The earlier reception, according to an article in Information Display Magazine, drew more than 300 people. "New relationships were being forged," the magazine reported, "and the participants seemed to realize that these relationships could form the foundation of a newly revitalized flat-panel display manufacturing industry."

"In addition to the reception, it is likely that DMTC '95 will incorporate a manufacturing standards workshop organized by SEMI," said Lalama. "For 1996, SID, USDC, and SEMI are discussing even closer collaboration on DMTC. Because of the common interests of our three organizations, it makes sense for all of us to use DMTC as the industry forum for display manufacturing." U.S. Government organizations, including the Advanced Research Projects Agency (ARPA)

and the Department of Defense, are also supporting the development of a North American display manufacturing infrastructure.

DMTC '95 exhibitors include Accudyne, Display Inspection Systems, Florod, Microphase Laboratories, MRS Technology, Graseby Optronics, OCLI, PlasmaArc, PlasmaTherm, Progressive System Technologies, Semiconductor Systems, Tamarack Scientific, TEAM Systems, VEECO, Viratec Thin Films, and XMR.

Papers submitted to the selection committee for the technical conference accompanying the trade show cover dry-etching technology, a method for investigating shock-drop behavior of LCDs, laser patterning of ITO films, a process for black-matrix TFT arrays, LCD prototype manufacturing, an in-line TAB system for LCD panel assembly, analysis of inspection costs to make the test/not-to-test decision, stylus profiling, high-throughput excimer-laser annealing for low-temperature poly-Si AMLCD manufacturing, and the effects if plant scale in AMLCD manufacturing costs.

For DMTC registration and hotel information, call Mark Goldfarb, Palisades Institute for Research Services, 1745 Jefferson Davis Highway, Suite 500, Arlington, VA 22202. Or call (800) 787-7477, (703) 413-3891, Fax (703) 413-1315.

SID News Release

TOYS: A FASHION INDUSTRY?

Where does the toy industry look for color directions? For girls' products, Kenner Products, a division of Hasbro, Cincinnati, Ohio, looks to forecasting groups such as the Color Marketing Group. Steve Toth, girls toy design director of Kenner says: "The yearly palettes are deeply rooted in fashion, which we realize is important in our many categories. The automotive and sporting goods industries also influence our boys' products."

While Kenner may not adapt forecasted colors directly, they do note the important signals they see in each palette. Recent introductions were turquoise, periwinkle, purple paired with red, orange and green, as well as the increased use of dark blue, violet, and maroon to replace black in many instances.

Colors in the toy industry are not determined by regional influences, but by age groups, gender, and the tone set by a license property (such as Toys R Us.) Some combinations are very traditional and do not vary much with the trends, such as pastel shades of pink, yellow, blue, peach, seafoam greens for infants, or primary combinations of red, yellow, blue, white, and green for preschoolers.

Judging by what we've seen in the bright, fun colors on the fashion runways recently, toys are very much in the fashion forefront.

excerpted from Pantone Institute's Color News

MEMBERSHIP APPLICATION

INTER-SOCIETY COLOR COUNCIL APPLICATION FOR INDIVIDUAL MEMBERSHIP

Name _____ Date _____

Dr. Mr. Ms.

Company/Affiliation _____

Street _____

City, State, Zip _____

Telephone (____) _____

Home

Fax (____) _____

Business

E-mail Address _____

Signature

My chief interests in color are:

- Fundamental and Applied Research
- Industrial Application of Color
- Art, Design and Psychology

My work relates to the following products and services:

Name other interests

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 \$75 (U.S.) or \$105.00 (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 Grecale Street, Greensboro, NC 27408 Telephone: (910) 274-1963

ISCC BY-LAWS

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 three Interest Groups: Fundamental & Applied Color Research; Industrial Application of Color; and Art, Design & Psychology. 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 Couleur (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
<i>Individual Member.</i> Any person interested in color and desirous of participating in the activities of the Council.	\$45.00
<i>Student Member.</i> Full time students.	\$10.00
<i>Member-Body.</i> Any non-profit national organization interested in color and desirous of participating in the activities of the Council.	\$100.00
<i>Sustaining Member.</i> 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.	\$500.00
<i>Retired.</i> Treasurer must be notified, in writing, of retirement before dues have been billed.	\$10.00
<i>Library Subscriptions.</i> Receives all ISCC mailings, including ISCC News.	\$60.00
<i>Overseas Member.</i> A surcharge of \$20 is added to \$45 dues to cover additional mailing costs.	\$65.00



J O B S W A N T E D !

THIS IS A NEW SECTION IN THE ISCC NEWS!

It is intended to help ISCC members that are in need of, and are looking for employment. Here is an opportunity to use the resources at hand.

There is no charge for this service. However the restrictions are as follows:

1. This service is for ISCC members' use only.
2. No more than 50 words may be used to describe yourself
(Not including name address and/or telephone number)
3. If you are using a P.O. Box, you must supply a complete address.
4. No Agency representing member(s) is allowed.
5. Neither the ISCC News nor the editors are responsible for any errors.

We hope this new section will be of value to you, the ISCC member. If you have any suggestions/criticisms, please send them to the editor. Let's make this work!

JOB WANTED

B.S. in Imaging Science (Rochester Institute of Technology) seeks full time position in product development. Strong fundamental background in imaging science. Working knowledge of C, C++, digital image processing, and color measurement instrumentation.
Experience: Research assistant at Munsell Color Science Laboratory conducting psychophysical study on observer metamerism.
Willing to relocate.

Please contact:

Jason E. Gibson
247 Kimball Dr.
Rochester, NY 14623
Telephone: 716/424-8633
E-mail: jeg7324@ulb.rit.edu

JOB WANTED

Macintosh Expert looking for computer support opportunity in multi-Macintosh environment in Washington, D.C. area.

7 yrs. Experience in graphic design company. Responsibilities included computer support & graphic design.

Abilities include system design, installation, troubleshooting, hardware & software support & training, and graphic design.

Please contact:

Jensen Kvarnes
Rt.1, Box 430, Washington, VA 22747
Telephone 703-987-8219

ISCC NEWS EDITOR Michael A. Hammel

Send photo material (black and white if possible) to:

Editor, ISCC News • Michael A. Hammel • 3782 Bonny Rigg Trail, Roswell, GA 30075

Please send all other materials on diskette as follows to the above address:

MS DOS-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).

INTERNET E-mail, send information to: 75664.1567@compuserve.com
OR MCSL@rit.edu

Compuserve: Send information to M.A. Hammel User # 75664,1567

If necessary, fax material to (404) 587-5128

Please note: the deadline for submission of material is the 1st of each even numbered month. Material received after the 1st will not be printed until the following issue.



meeting reports



photos



contributions
from members

OFFICERS 1994-1996

Position	Name	Address	Telephone	FAX
President	Mr. Roland L. Connelly	SheLyn, Inc., 1108 Greccade Street, Greensboro, NC 27408	(910) 274-1963	(910) 274-1971
Pres. Elect	Dr. Ellen C. Carter	2509 N. Utah Street, Arlington, VA 22207	(703) 527-6003	
Secretary	Dr. Danny C. Rich	Datacolor International, 5 Princess Rd., Lawrenceville, NJ 08648	(609) 924-2189	(609) 895-7461
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Past-Pres.	Ms. Paula J. Alessi	Eastman Kodak Company, Rochester, NY 14650	(716) 477-7673	(716) 722-1116

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1993-1996

Mr. Gary E. Beebe	Ato Hass North America Inc., P.O. Box 219, Bristol, PA 19007	(215) 785-8497	(215) 785-4315
Mr. Joseph F. Campbell	DuPont Marshall Laboratory, 3401 Grays Ferry Ave., Philadelphia, PA 19146	(215) 339-6039	(215) 339-6008
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1994-1997

Mr. Michael A. Hammel	3782 Bonny Rigg Trail Roswell, GA 30075	(404) 587-5120	(404) 587-5128
Mr. Richard W. Riffel	ColorTec Associates, Inc., P.O. Box 386 Lebanon, NJ 08833	(908) 236-2311	(908) 236-7865
Mr. William S. Vogel	10013 Sagefield Dr., Baton Rouge, LA 70818	(504) 261-7107	

ISCC MEMBER-BODIES

American Association of Textile Chemists and Colorists (AATCC)	Graphic Arts Technical Foundation (GATF)
American College of Prosthodontists (ACP)	The Human Factors & Ergonomics Society
American Society for Testing and Materials (ASTM)	Illuminating Engineering Society of North America (IESNA)
American Society of Interior Designers (ASID)	National Artists Equity Association (NAEA)
American Society for Photogrammetry and Remote Sensing (ASPRS)	National Association of Printing Ink Manufacturers (NAPIM)
The Color Association of the United States, Inc. (CAUS)	Optical Society of America (OSA)
Color Marketing Group (CMG)	Society for Information Display (SID)
Color Pigments Manufacturers Association (CPMA)	Society of Plastics Engineers, Color & Appearance Division
Detroit Colour Council (DCC)	Society for Imaging Science and Technology (IS&T)
Federation of Societies for Coatings Technology (FSCT)	Technical Association of the Graphic Arts (TAGA)
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Color and Appearance Technology	Labsphere