Inter-Society Color Council Newsletter

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COVER DESIGN — DONALD M. GENARO AND VALERIE PETTIS OF HENRY DREYFUSS ASSOCIATES, NEW YORK CITY
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BOARD OF DIRECTORS MEETING

The ISCC Board of Directors again met all day Sunday, April 25, 1976, at the Statler Hilton Hotel, New York City, just prior to the Annual Meeting of the Council.

Many of the deliberations of the Board do not fall in the "News" category, but five items seemed worthwhile to report to the membership.

1. Three long-time members and diligent workers in the Council were elected to be Honorary Members – they are George B. Gardner, Walter C. Granville, and William J. Kiernan. (A detailed report on this item will be published separately.)

2. The appointment of Henry Hemmendinger as a member of the Board of Directors was approved. Dr. Hemmindinger replaces Leroy Noyes who was just elected to the Board, but who found it necessary to resign.

3. The Godlove Award Committee was appointed. It consists of Ruth Johnston-Feller, Chairman, Norman Macbeth, Waldron Faulkner, Karl Fink, and Carl Foss.

4. Dates of future Williamsburg Conferences were announced:

February 5-8, 1978. Theme: Color Reproduction in Printing, Photography, and Television. Calvin McCamy, General Chairman.

February 11-14, 1979. Color Scaling.

5. The Board agreed to study the feasibility of establishing a lower rate of dues for students.

Harry K. Hammond III

APPLICATIONS APPROVED FOR INDIVIDUAL MEMBERSHIP

Miss Margarete Baum
1617 Shadford Road
Ann Arbor, Mich. 48104

Painting – print making – design and education. Teaching courses in color at the University of Michigan.

Mr. Robert E. Burridge
Westinghouse Electric Corp.
Westinghouse Building
Gateway Center
Pittsburgh, Pa. 15222

IDSA, Human Factors Council. Engineering materials and their effective use by human operators; product colors.

Mr. James C. Doherty
710 Avondale Ave.
Haddonfield, N.J. 08033

FSCT, NPCA. Measurement, control, computer application and related instrumentation.

Dr. Bradley A. Eagerman
P.O. Box 1088
Lake Alfred, Fla. 33850

IFT. Finding methods to use color measurement as a quality control indicator in the food industry; Master's and Ph.D. theses were on color measurement (1970 and 1974), currently working on three projects involving citrus color measurement and will start teaching in the fall the color section of a course in "Psychophysical Aspects of Foods."

Prof. Richard Filipowski
Associate Professor of Visual Design
Room E21-205, M.I.T.
Cambridge, Mass. 02139

Color and Proportion; Color and Natural Form; Color Depth; Color & Transition; Color and Function; Color & Space etc.

Mr. Donald R. Hall
Applied Color Systems
P.O. Box 5800
Princeton, N.J. 08540

Instrument Society of America. Instrumentation and Computers for measuring and controlling industrial color manufacturing problems. President of Applied Color Systems, Inc. a manufacturer of Color Computing Systems.

Miss Nancy Ann McKay
5833 Newtown Avenue
Philadelphia, Pa. 19120

To further my color education, to continue to use color as an important factor in future human development, i.e.: space colonies. Tylen School of Art, Temple Univ. B.F.A. 8/75, painting and ceramics. Working as a Designer and Color Consultant with the firm of Daniel J. Albert Interiors, now working on color problems for City Underground Concourse Retail Area.

Mr. Malcolm John McKenzie
c/o Bond's-Wear Pty Limited
100 Mallett St.
Camperdown, NSW 2050
AUSTRALIA

Society of Dyers and Colourists of Australia and New Zealand, The Textile Institute. The Measurements of Textile Samples, Instrumental Colourant Formulation – particularly on blended substrates.

Mr. James A. Pendergast
Waters Associates, Inc.
34 Maple St.
Milford, Mass. 01757

AChS, ASTM, IFT. Analysis of dyes and isolation of components therein.

Mr. George A. Robinson
4007 Tara Drive
Tallahassee, Fl. 32303

United States Institute of Theatre Technology. History of pigments and development of selective transmission filters. Teaching color theory, past six years, design and installed discotheque systems 1974 to the present.

Mrs. Thelma Roesch
Davidson Colleagues
Box 157, Tatamy, Pa. 18085

Writing programs for color control.

Mr. Jay G. Schreckendgust
1777 East Henrietta
Rochester, N.Y. 14623

IES. Visual enhancement of surgical tasks by optimizing lighting.

Mr. Alan R. Tilson
8 Moira Court
Wangaratta, Victoria 3677
AUSTRALIA

AATCC, Society of Dyers & Colourists (U.K.) Australia & New Zealand, Royal Australian Chemical Institute. Colour matching, Instrumental colour matching, colour tolerances, colour vision defects, performance of and influences on colour matchers.

Mr. W. V. Walukewicz Deering Milliken Res. P.O. Box 1927 Spartanburg, S.C. 29304	AATCC. Color matching, control and grading.
Ms. Jacqueline K. Welker c/o PPG Industries P.O. Box 28 Oak Creek, Wisconsin 53154	FSCT. Industrial pigmentation, pigment optics and physical properties, industrial effects on the artist, and educational developments for the artists.
Mr. Graham H. Wilstead 63 Fairview Drive Moncton, N.B. E1E 3C9 CANADA	Canadian Society for Color. Working environments (factories) the articulation of architectural space.
Mr. David L. Wing 77 Braddock St. Rochester, N.Y. 14612	Analytical measurement and instrumentation methods. A personal interest in developing a uniform color space. Involved in investigating and analyzing photographic dyes, resin pigments, filter characteristics, fluorescence, etc. at Eastman Kodak Co.
Ms. Theresa F. Zook, F.G.A., A.G.A. Associated Gem Consulting Laboratory 2104 Wakefield St. Alexandria, Va. 22304	Gemmological Association of Great Britain, Accredited Gemologists Assoc. International Turquoise Traders Association, American Association of University Women. The development of color standards to be used in grading colored gemstones.
Mr. Robert J. Zwiller 18414 Santa Fe Ave. Compton, Ca. 90221	Color Control – matching – etc. with ACS computer system (production).

FOR INFORMATION ONLY: NEW DELEGATE

Mr. William C. Capehart Tenneco Chem. P.O. Box 365 Piscataway, N.J. 08854	Delegate from the NPCA. CMG, FSCT. Dispersed colorants for paint, chemical coatings, textiles, non woven fabrics, polyesters, wallpaper, color systems for paints etc.

OBITUARY

We regret that Dr. R. D. Somoza of Buenos Aires, Argentina recently died of heart failure.

REPORTS OF MEETINGS

COLOR VISION AT ARVO 76

The Spring meeting of the Association for Research in Vision and Ophthalmology (ARVO) was held in Sarasota, Florida on April 26-30, 1976. ARVO is composed of 10 committees: Anatomy and Pathology, Biochemistry, Cornea, Electrophysiology, Oculomotor Physiology and Disorders, Glaucoma, Immunology and Microbiology, Physiology and Pharmacology, Retina, Visual Psychophysics and Physiological Optics. Papers concerned with color are almost always reported in the Electrophysiology and the Visual Psychophysics and Physiological Optical Committees. During this five day meeting there were 9 sessions dealing with electrophysiology and 9 sessions dealing with visual psychophysics and physiological optics. Each session lasts 3 hours and usually contains 12 papers. Space does not permit detailed discussion of each color vision paper. However I will attempt to provide the major point each paper made. The titles and authors of each paper is provided at the end of this report.

The McCollough effect continues to draw interest. We learned that achromatic inspection stimuli (2) and spatial frequencies (3) influence the phenomenon. When the experiment is done correctly interocular transfer of the McCollough effect can be achieved (4).

Some interesting lower animals were used as subjects. Marc and Sperling studied the distribution of cones in the baboon retina (5); the pikeperch retina was used to study cone input to chromatic and luminosity horizontal cells (6) and the turtle retina was employed to study color processing with the aid of multi-input theory utilizing the Weiner analysis techniques.

The macaque monkey's visual system is almost identical to that of man. Consequently, it continues as a favourite animal for electrophysiological research. de Monasterio studied the linear and nonlinear properties of the ganglion cells in the monkey retina (8); Michael, working at the cortical level, reported that there are hypercomplex cells which have specific spectral sensitivities, (9) while Gouras and Kruger reported cortical cells which are sensitive to luminance gradients, others to chromaticity gradients, and others to a combination of both (10).

Research on the opponent processing nature of color vision continues. Magnitude estimates of colors were compared with the cancellation valence (11) and the influence of chromatic contrast on opponent equilibria (14). Two papers reported on the Bezold-Brücke effect. Wooten and Ollove demonstrated that (contrary to a report several years ago at ARVO) the unique hues do not show a wavelength shift as luminance is increased over a very wide range (12), and Wright reported hue shifts in a behavioral study with pigeons (13).

The saturation of lights was the subject of three papers: Tsou and Ingling reported on the hue shift and brightness enhancement which occurs when mixing white light with specific chromatic lights (15); the effect of chromatic adaptation on saturation discrimination was reported by Berger and Loomis (16), and Kaiser and Comerford reported that saturation discrimination of lights lying near the spectrum locus did not yield flat functions as reported by earlier investigators (18). We learned that color discrimination can be improved if there is a small gap between two fields (19), that the resistence to the fading of a chromatic border directly related to the distinctness of that border (20), and that there is a correspondence between the appearance of colors and the failure of luminance additivity (21). Ingling

et al. has shown that the congruence between flicker photometry and minimally distinct border matches is luminance dependent and that small deviations between the two methods are reliable and fit within the theoretical context used by Ingling and his collaborators (22). Tansley studied protanopes and deuteranopes to further demonstrate that the blue cones do not seem to contribute to the generation of chromatic borders (23).

Color defective observers are still important to color vision. Alpern and Moeller found that for the deuteranomalous observer they studied, the color matching function in the red-green range is a linear transformation of the action spectrum of long wavelength cones of the deuteranope they studied. They also reported that heterochromatic brightness matching and hue discrimination of the deuteranomalous is predictable from these action spectra (24). Other studies involving abnormal color vision showed that thresholds to greenish and orange light vary as a function of retinal eccentricity in the same way for normal and color defective observers (25). The suggestion was made that the color matches made by dichromats are mediated by rods acting with cones as an independent chromatic mechanism (26). Speros reported on a case study of a patient that had only central trichromatic vision. He found that in the dark adapted conditions the rod activity was normal but seemed to saturate at very low luminances (27). Use of the Rayleigh match for protonopic and protanomalous observers led Bastian to conclude that eye media absorbants variations alone cannot account for individual deviations which were observed (28). Peeples, working with human infants, concluded that hereditary protan or deutan efficiencies are present at two months of age and probably at birth (29). Data were presented as support for a suggestion made by Jameson and Hurvich that protanomaly and deuteranomaly reflect shifts in photopigment absorption spectra compared to normal pigments and a reduction in the strength of the r-g opponent system (30).

Bowen and Porkony use the concepts derived from electrophysiology regarding phasic and tonic units to explain the fact that typical u-shaped masking functions were obtained when luminance increments were used but no masking occurred when chromatic substitution was used in a metacontrast experiment (31). The temporal nature of Stiles' π mechanisms were investigated and the results suggest that the stimulus interval between test and background may be an important parameter in isolating Stiles' π_4 and π_1 mechanism (32). Bretton investigated the latency of several different wavelengths equated for luminance found support for the conclusion that chromatic latency differences are mediated by opponent channel activity (33).

Several color vision studies were investigated by means of the visual evoked cortical response. Regan found evidence for the idea that fine pattern information is processed in parallel red and green channels (34). Ary et al. reported several findings using evoked cortical potentials and concluded that their results had implications for normal cortical localization and for VER experiments inferring abnormal brain pathways in hemianopes and albinos (35). Siegfried investigated spectral sensitivity by means of the VECP using the increment threshold technique and narrow band spectral adaptation.

1. Ionic mechanism of a wavelength dependent off response. A. L. F. Gorman and Carter Cornwall. Boston U. School of Medicine.

2. Influence of achromatic inspection on McCollough effects. Keith D. White and Adrienne L. Graves. Brown U. Hunter Psych. Lab.

3. The range of spatial frequency contingency color aftereffects. James D. May, Gregory Agamy and Halsey H. Matteson. U. of New Orleans.

4. Interocular transfer of McCollough effects. Howard D. Baker, Deborah R. Nash and Jack G. May, III. Florida St. U.

5. Chromatic organization of the baboon color mosaic. R. E. Marc and H. G. Sperling. U. of Texas, Sensory Sciences Center.

6. Core input to chromatic and luminosity horizontal cells. Guido Hassin and Dwight A. Burkhardt. U. of Minnesota, Dept. of Psych.

7. Color processing in the turtle retina: An application of multi-input Weiner analysis technique. Thomas G. Wheeler. Calif. Inst. of Tech.

8. Properties of linear and nonlinear ganglion cells in monkey retina. R. M. de Monasterio. Nat. Eye Inst. NIH Lab. of Vision.

9. Color sensitive hypercomplex cells in primate striate cortex. Charles R. Michael. Yale Medical School.

10. Color, Colour everywhere. P. Gouras and J. Kruger. Nat. Eye Inst. NIH, Bethesda.

11. A study relating the Jameson and Hurvich red/green cancellation magnitude estimation of greenness. James R. Moeller. U. of Michigan.

12. Spectral hue determined over a large luminance range. B. R. Wooten and Maxine Ollove. U. of Pennsylvania.

13. Bezold-Brücke hue shift for the pigeon. Anthony A. Wright. U. of Texas, Graduate School of Biomedical Sciences at Houston.

14. The effect of chromatic contrast on red/green opponent color equilibria. James Larimer, Lida Britton Rank. Temple U.

15. The effect of a desaturant on brightness enhancement and hue shifts for short wavelength lights. Brian H. T. Tsou and Carl R. Ingling, Jr. Ohio State U.

16. The effect of chromatic adaptation on saturation discrimination. Teri Bolger and Jack N. Loomis. U. of California, Santa Barbara.

17. Interocular light adaptation effect on the Lie specific threshold. A. M. Prestrude, Linda Rothblum and Jeff Watkins. Virginia Poly. Inst.

18. Saturation discrimination of colors which lie near the spectrum locus. Peter K. Kaiser and James P. Comerford. York U., Downsview, Ont.

19. Gaps can improve color discrimination. Robert N. Boynton and Mary N. Hayhoe. U. of California, San Diego.

20. Initial distinctness and subsequent fading of chromatic borders. Steven L. Buck, Francine Frome and Robert N. Boynton. U. of Calif., S.D.

21. Color appearance and luminance additivity. Howard R. Lodge, James Larimer and Lynne Rank. Ursinus College.

22. Psychophysical estimate of cone response function. Carl R. Ingling, Jr., Thomas Gast, Steven Burns and Brian

Tsou. Ohio State U.

23. Perception of visual contours in the protanope and deuteranope depends upon the activity of one cone type. D. W. Tansley, U. of Calif., S.D.

24. Is erythrolade a deuteranomalous chlorolade? Matthew Alpern and James Moller. U. of Michigan (Ann Arbor).

25. Retinal sensitivities and cone populations in normal and abnormal color vision. E. Jameson, M. Ollove and L. M. Hurvich, U. of Penn.

26. Dichromats see red. Vivianne C. Smith and Joel Pokorny. Eye Res. Lab., U. of Chicago.

27. Congenital absence of peripheral cone function with central trichromatic vision. Perry Speros. Wilmer Eye Inst. Johns Hopkins.

28. Individual differences in cone photopigments underlying protanopic and protanomalous color vision. Bruce L. Bastian. U. of Michigan (Ann Arbor).

29. Hereditary color deficiencies: are they congenital? David R. Peeples. U. of Washington, Dept. of Psych.

30. Chromatic opponent-response functions of anomalous trichromats. Martha Romskie. Brown U. Dept. of Psych.

31. Metacontrast masking with hue substitution. Richard W. Bowen and Gerald Porkony. Loyola U. Dept. of Psych.

32. Action spectra of threshold elevation by flashed backgrounds. Tenji Wake and Yutaka Shimizu. Industrial Products Res. Inst. (Tokyo)

33. Chromatic latency effects under conditions of hue substitution. Michael E. Breton. Columbia U.

34. Spectral sensitivities of parallel color channels in fine patterned vision. D. Martin Regan. Dalhousie U. Canada.

35. Difference between colored and white flashes in human VER source localization. J. P. Ary, W. R. Biersdorf and C. C. Whistler. Ohio State U.

36. VEC implicit time and narrow band spectral adaptation. B. Siegfried. Penn. College of Optometry, Phila.

Peter K. Kaiser

TEXTILE PRINTING SYMPOSIUM

Colorant Consultant James May participated in a two-day symposium on textile printing which was held at the Intercontinental Hotel in Frankfurt, Germany concurrent with the opening of the International "Frankfurt Home Furnishings Fair" in January. The first day was under the sponsorship of the Peter Zimmer Maschienenfabrik, 6330 Kufsteim, Austria and the second day by M. Mitter & Company, D4815 Schloss Holte, Germany. Technical papers, with illustrations, photographs, charts and diagrams may be obtained by interested parties, upon request, directly from the two machine builders. Zimmer and Mitter printing equipment, both flat-bed and rotary, is used extensively by the American and Canadian Textile Industry. The symposium was attended by over 100 textile executives from all over the world.

COLOR, SPACE & LIGHT
AIA STATE CONFERENCE
MINNEAPOLIS, MINNESOTA

Presentation was in two sections, one dealing with the use of color and light in defining space within architectural interiors was covered by Norman DeHaan, AIA, ASID in a slide presentation of recent projects. Mr. DeHaan believes the key to sanity in the interior design field is a sense of humor, for unlike exterior architecture, an interior can be changed overnight with paint, surface coverings and a change of light bulbs. It is important to remember one is dealing in impermanence and to stress this issue with clients. Unless a client understands the raison d'etre of a design solution, the concept and solution can be unwillingly and unwittingly destroyed through an unintelligent maintenance program alone.

Bill Lane, in the second half of the program, developed his ideas on lighting, illustrating the various principles of lighting scales used in different countries and how effective they are, how they may be applied and the relativity and appropriateness of light sources, levels and patterns. This was followed by a general discussion of our over-dependence on direct source-foot candle measurements and a rather technical review of light and energy consumption levels.

Norman DeHaan

LETTERS TO THE EDITOR

Dear Editor:

I would like to contact somebody who is teaching color to children and to learn what materials they usually use to teach the concept of color in the US. In Japan, we have compulsory education from 6 to 15 years old. Teaching how to use color has been included in the curriculum for painting and handicraft. Some materials are used generally in these courses. What are you doing about color education in the US? Please let us know the actual conditions of color education in the primary schools and some examples of teaching materials used for them. We can show you some that have been used generally in Japan.

Sincerely yours,
Genro Kawakami
Japan Color Research Institute

Editor's note: I hope that some of you will be able to furnish information to Dr. Kawakami. His address is: Japan Color Research Institute, 1-19, Nishiazabu 3 Chome, Minato-Ku, Tokyo 106, Japan.

MEETINGS

Society of Photographic Scientists and Engineers (SPSE)

PETER GOLDMARK AND WORLD's COLOR REPRODUCTION EXPERTS WILL ADDRESS MAY 24-28 SPSE CONFERENCE IN NEW YORK

Peter C. Goldmark, president of Goldmark Communications Corporation and former head of the CBS Laboratories, will describe and demonstrate his recently patented Rapid Transmission and Storage (RTS) System at the 29th Annual Conference and Seminar on Color Reproduction of the Society of Photographic Scientists and Engineers in New York City, in May.

Dr. Goldmark's invention, which is basically an educational tool, makes possible extreme high-speed transmission of color pictures and sound by over-the-air broadcast as well as by satellite or cable TV – for storage and playback through ordinary TV sets in homes or learning centers, according to the General Chairman of the Conference, Peter Krause, president of Ilford, Inc.

The SPSE meeting will be held from Monday, May 24th, through Friday, May 28th, at the Barbizon Plaza Hotel, 106 Central Park South in Manhattan.

Among the other scientists and engineers from the world's color reproduction and communications community who will present papers at the Seminar are:

W. D. (David) Wright, Professor Emeritus of the Imperial College of Science & Technology, London: "Visual Aspects of Color Reproduction."

Armin Meyer of Ciba-Geigy Photochemie, Ltd. Fribourg, Switzerland, who was instrumental in the development of the Cibachrome process: "Rapid Access Processing of Silver Dye-Bleach Materials" and "Rapid Access System for Direct Positive Color Portrait Photography."

Seiiti Kubodera and Takeshi Hirose of the Fuji Photo Film Company, Japan, on "Photomicrographic Observation of Dye Development by Single-8 Cinematography."

Julius Weber of the American Museum of Natural History: "Color Photography of Crystals."

K. Knop and M. T. Gale, RCA Ltd. Zurich, Switzerland: "Color Image Encoding and Reproduction of Embossable Relief Structures."

L. D. Maillous and J. E. Bollman of Xerox Corporation: on the design of a Slide Adapter for the Xerox 6500 Color Copier – optical design and color balance considerations.

Ernest P. Taubes, reprographic consultant in Washington, D.C.: on the use of high resolving color microfilm for facsimile map reproduction.

Noncolor themes as well as graphic arts will also be covered by technical papers at the SPSE conference. The following authorities will participate:

Kodak (Rochester, NY) research scientist George C. Higgins: "Image Quality Criteria" and a team of his Kodak colleagues – P. B. Gilman, F. J. Evans and T. D. Koszelak – will report on their study of primary latent image formation.

Tadaaki Tani of Fuji Photo Film Company, Japan, will describe: "Chemical Sensitization by Hydroxytetraazaindenes."

Len Gruber and Thomas Lumenello of the Polaroid Corporation (Cambridge Mass.) will cover: "The Simulation of Judd's Phases of Daylight, as well as Tungsten Illumination, In Xenon Sensitometers."

Robert Chung and Milton Person of the RIT (Rochester, NY) Graphic Arts Research Center will report on the gathering of "Quantitative tonal information by the use of a reflection densitometer interfaced with a computer."

Calvin S. McCamy of the Macbeth Division, Kollmorgen Corporation will give a paper on "Narrow Band Densitometry."

Registration for the full conference period costs $75 for SPSE members and $95 for nonmenbers ($40 and $45 per day for daily registration). Applications should be made to: Robert H. Wood, Executive Director, SPSE, 1330 Mass. Ave., N.W., Washington, D.C. 20005 – checks payable to "SPSE".

DR. HANSON TO DESCRIBE INSTANT FILM, CHEMISTRY TO SPSE

Kodak's new instant color print film and the chemistry behind it will be described by Dr. Wesley T. Hanson, Jr., when the annual convention of the Society of Photographic Scientists and Engineers (SPSE) meets here May 23-27. Dr. Hanson is director of the Kodak Research Laboratories and a Kodak vice president.

The new film, along with two new instant cameras to expose it, was announced today. It is described by Kodak as the result of fundamental breakthroughs in imaging chemistry.

Using drawings, diagrams and photographs, Dr. Hanson will discuss in detail the dye release color chemistry that makes the process possible. In the new film, immobile dye releasers undergo hydrolysis. This yields mobile dyes that migrate to the image receiving layers of the film to form color images. How this chemistry works will be covered in detail.

Dr. Hanson will also describe the new emulsions that make reversal processing possible in the picture unit. He will show how the various layers of the film work to provide the user with a faithful reproduction of the photographed scene. The sensitometric and densitometric properties of the film will also be described.

Dr. Hanson's talk will conclude the Color Photography Symposium on the morning of May 27 at the Barbizon Plaza Hotel.

Society of Plastics Engineers – Color and Appearance Division

RETEC '76 PLANS DEVELOPING RAPIDLY

"Coloring of Plastics X" will be held in Cherry Hill, NJ, on September 20 & 21, 1976. An outstanding program that should be of broad interest is being developed along the "How to –" theme. Currently the program stands as follows:

Monday Afternoon, 9/20/76 (T.B. Reeve, Du Pont, Moderator) – "How to Select Colorants for Acrylics," A.

J. Pentz, Rohm & Haas. "How to Interpret Photometric Curves Using the Maxwell Color Triangle," D. A. Popielski, Monsanto. "How to Determine Colorant Strength and Money Value," D. A. Popielski, Monsanto. "How to Use the 1976 CIE Color Difference Formulae," A. R. Robertson, Nat'l. Research Council of Canada. "How to Recognize Variables in Measurement of Color Samples," A. Keay, Allied Chemical.

Tuesday Morning, 9/21/76 (J. G. Davidson, MacBeth, Moderator) "How to Choose a Color Measurement System," Panel Discussion – W. V. Longley, Ford Motor Co.; C. G. Leete, MCCA; S. L. Davidson, NL Industries; W. S. Laycock, Color Technology Corp.; R. A. Charvat, Harshaw Chemical (moderator). "How to Analyze Textile Colors: A New System," Eugene Stutz, IBM. "How to Predict Colorant Effect on Physical and Weathering Properties of Plastics," S. Parikh, Wilson Products.

Tuesday Afternoon, 9/21/76 (C. D. Storms, Red Spot Paint, Moderator) – "How to Apply Decorative Finishes by Silver Reduction," E. Nixon, Red Spot Paint & Varnish. "How to Decorate Plastics by Vacuum Metallizing," J. A. West, Stokes Div., Pennwalt. "How to Decorate Plastics in Conformance with Federal Clean Air Standards," J. J. Ott, Eyelet Specialty. "How to Improve In-Plant Coloring with a Motionless Mixer," S. J. Chen, Kenics. "How to Control the Color of Pigmented Melt Spun Polypropylene Fibers," S. Commanday, Phillips Fibers.

Industrial Designers of America (IDSA)

The IDSA Annual Meeting for 1977 will be held November 2-5 at Lake Barclay, Kentucky.

Optical Society of America

1976 ANNUAL MEETING
TUCSON COMMUNITY CENTER
TUCSON, ARIZONA
OCTOBER 18-22, 1976

Abstract deadline – July 9, 1976.

Abstracts and summaries should be submitted, *as far as possible in advance of the announced deadline date,* to Jarus W. Quinn, Executive Director, Optical Society of America, Suite 620, 2000 L Street, N.W., Washington, D.C. 20036.

Federation of Societies for Coatings Technology (FSCT)

The FSCT will hold its 54th Annual Meeting at the Sheraton Park Hotel in Washington, D.C. on October 27-29, 1976. There will be a special session on color, more information on which will appear in a later issue of the *Newsletter.*

American Society of Interior Designers (ASID)

The ASID national convention will meet in Atlanta, Georgia July 30 - August 2. For more information write to ASID, 730 Fifth Avenue, New York, NY 10019.

Conference on Color and Materials – Technology and Production

The Deutschen Farbzentrums (German Center for Color) will hold a Conference with the theme "Color and Materials – Technology and Production" at the Bundesanstalt für Materialprüfung in West Berlin on November 1-3, 1976. Within this theme, the meeting will be organized into sessions on architecture, illumination, coatings technology, chemistry of dyes and pigments, design of capital and consumer goods, color measurement, art (both papers and display), and techniques of reproduction by printing, photography, and television. For further information in the areas of art, architecture and design, contact: Prof. Klaus Palm, Deutsches Farbzentrums E. V., D-1 Berlin 62, Bozenerstrasse 11-12, WEST GERMANY.

In the areas related to color technology, contact: Dr. Klaus Richter, BAM, 1 Berlin 45, Unter den Eichen 87, WEST BERLIN.

American Academy of Optometry

CALL FOR PAPERS
GENERAL PROGRAM

The purpose of this letter is to provide you information about the American Academy of Optometry. Its purposes and goals, the annual meeting, and the publication that are supported by the Academy. In April, you will receive an invitation to submit a paper for presentation during the next meeting of the Academy. The details for submission of papers will be given at that time. This letter is only intended to acquaint you with the American Academy of Optometry in the hope that you will desire to participate.

The American Academy of Optometry is composed of optometrists, ophthalmologists, biologists, psychologists, engineers, educators and other scientists who have an interest in visual science. One of the goals of the Academy is to encourage basic knowledge. The interests of the Academy vary from the routine clinical problem to more sophisticated problems of optics, anatomy, neurophysiology, neurochemistry and metabolism of the retina and the visual pathways. If research involves the visual system, it is of interest to the Academy. Non-members are welcome to present papers because the non-member provides an opportunity for a greater interdisciplinary exchange of ideas.

Actually, during the first part of December, the Academy meets for 4 to 5 days to provide a forum for visual science and clinical science researchers. The meetings are held in major cities across the U.S. The structure of these meetings generally follows a certain pattern. The Academy is composed of seven sections: Section on Binocular Vision and Perception; Section on Public Health and Occupational Vision; Section on Contact Lenses; Section on Optometric Education; Section on Pathology; Section on Refraction with Subsections on Aniseikonia and Low

Vision and a Section on Visual Science. In addition, there is a General Program which is divided into Clinical and Visual Science Sessions. Each morning of the Academy meeting is devoted to the Section Meetings. The Sections meet concurrently and the papers deal with the particular area of interest of each section. Each afternoon is devoted to the General Program for the presentation of Clinical Science Session and Visual Science Session research papers. Basic and Clinical research papers are usually scheduled simultaneously in these two sessions.

It has been the policy of the Academy to encourage contact and communication between clinical scientists and basic research scientists. To assist in achieving this goal, symposia and/or seminars are usually scheduled so that both the clinical scientist and basic scientist may attend. Seminars may be formed by inviting participants to discuss a selected topic or by grouping contributed papers into a common topic on a *post hoc* basis. In addition, the Academy invites recognized vision researchers to present the Prentice Lecture and the Glenn A. Fry Lecture in combined sessions. Most evenings are kept free to encourage discussions between participants on areas of mutual scientific interest.

The official journal of the Academy is the American Journal of Optometry and Physiological Optics. The Journal is governed by an Editorial Board and each paper submitted for publication is referred by three members of the panel prior to publication. The Journal has a 17,000 reader population. In spite of rising costs in publication, the Executive Council of the Academy has decided to keep the publication of the journal free of page costs. They feel that page costs would be detrimental to a free exchange of ideas that are so vital to scientific inquiry. The annual Academy meeting serves to provide many of the papers published in the Journal. Scientists are invited to submit papers for publication at any time during the year.

The Academy will meet in Portland, Oregon, at the Portland Hilton, December, 1976. You will receive a call for papers during April, 1976. The call for papers will outline the procedures for the submission of your paper, provide hotel and transportation details, and give deadline dates for submission.

I look forward to having you on the 1976 program.

Donald G. Pitts, O.D., Ph.D.
Chairman, General Program
University of Houston
College of Optometry
Houston, Texas 77004

DCMA RENEWS SUPPORT OF THE RENSSELAER COLOR MEASUREMENT LABORATORY

The Dry Color Manufacturers Association and The Rensselaer Color Measurement Laboratory are pleased to announce that the DCMA has renewed its grant of $1,000 to Rensselaer's color science and technology program for 1976. The grant is in memory of Eric Blackstead, former president and for many years an enthusiastic supporter of the DCMA.

The DCMA was founded in 1925 to promote the common welfare of companies engaged in the manufacture of pigment colors in the U.S. and Canada. A working organization of 36 members, the DCMA is known for its active Ecology Committee and its program of grants, awards and prizes in support of research and communication on pigments and pigmentation. The DCMA is a member-body of the Inter-Society Color Council.

The Rensselaer Color Measurement Laboratory, founded in 1964, is one of the world's leading graduate centers for research, instruction, and industrial liaison in color science and technology. It has awarded eight Ph.D. degrees in color science in addition to M.Sc. degrees, and has produced over 75 technical papers.

For further information on the DCMA contact Dr. John W. Ackerman, Secretary, Dry Color Manufacturers' Association, 561 Franklin Avenue, Nutley, New Jersey 07110; for further information on The Rensselaer Color Measurement Laboratory contact Dr. Fred W. Billmeyer, Jr., Director, Department of Chemistry, Rensselaer Polytechnic Institute, Troy, New York 12181.

HALON NOTES

An information sheet on the optical properties of Halon, as determined in NBS investigations, is being prepared in response to a number of requests. A copy may be obtained from: Dr. William H. Venable, Jr., Room A317, Metrology Bldg., National Bureau of Standards, Washington, D.C. 20234.

Because of its reflectance stability, ease of application, and high reflectance over a wide wavelength range, experimentation with this material as a reflectance coating for integrating spheres has been encouraged (O.R.N. #11 and #13). In recent work, some fluorescence has been observed in Halon coatings. It has not been determined yet whether this is intrinsic with Halon or is the result of contamination, but those using Halon coated integrating spheres in applications which are sensitive to fluorescence in the sphere should be cautious.

Those planning to use Halon or similar materials commercially, as reflectance coatings, should be aware of U.S. Patent 3,764,364 dated October 9, 1973 by Jerome A. Seiner and assigned to P.P.G. Industries. This patent covers the use of fluorinated aliphatic long chain addition polymers as stable reflective coatings and as reflectance standards. Mr. Seiner and officials of P.P.G. have made it clear to us that they in no way wish to discourage experimentation with these materials by individuals and have said that license for commercial use will be generally available from P.P.G. under this patent. Those wishing to discuss such licensing should contact: Mr. Carl T. Severini, P.P.G. Industries, 1 Gateway Center, Pittsburgh, PA 15222. Phone (412) 434-2938.

Some interest has arisen relative to the recent history of the development of Halon as a possible reflectance standard. Halon was first shown to be a good reflective coating by the joint work of Mr. Max Salzman, (Allied Chemical Corporation, retired), who suggested its potential, and Ms. Ruth Johnston-Feller, a coworker with Mr. Seiner.

Johnston-Feller has also investigated the lot-to-lot uniformity, and stability, of Halon as a reflective coating, and experimented with application techniques. Mr. Franc Grum (Eastman Kodak) has reported on his investigations of Halon tablets as reflective standards at the 1975 C.I.E. meeting in London and Eastman Kodak is now exploring the possiblity of marketing mounted Halon tablets as reflectance standards.

Salzman, Johnston-Feller, and Grum suggested that NBS also investigate Halon, and made available to NBS the valuable results of their investigations. Although Halon is normally marketed only in very large lots, it has recently become available to individuals in convenient amounts through the cooperation of Allied Chemical Corporation, which made it available to NBS in single-drum lots, and of the Manufacturers Council on Color and Appearance, who agreed to handle the small-lot distribution.

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BOOK REVIEW

Pigment Section-Raw Materials Index. Ellen E. Marsich, Ed. National Paint and Coatings Association, Washington, D.C. 1976, $40.00.

The "Pigment Index" has been reissued in handsome 8½ by 11 in. format. Seventy-two suppliers have contributed data for over 200 dry pigment types plus aqueous and non-aqueous dispersions. A total of 95 chrome yellows are listed, 150 phthalo blues.

The data given for each pigment include particle size by sieve, sedimentation, and Hegman gage, specific gravity, parts per million of lead, pH of 10% aqueous slurry, applicable federal, military, and ASTM specifications, Colour Index name and number. Notes give further descriptions and suggest uses.

Tables of aqueous dispersions list specific gravity, total solids, and type of surfactant. Non-aqueous dispersons are described as to amount of pigment, amount and type of resin and solvent, and intended use.

The compilation is kept up to date by supplements issued twice a year at no additional cost. Although written primarily for paint formulators, the "Pigment Index" is recommended to the plastics industry for its wealth of information on the thousands of colorants available.

T. G. Webber

Reprinted, with permission from the *SPE CAD Newsletter*, Spring 1976.

PUBLICATIONS NOTED

Interior Design. Arnold Friedman, John F. Pile, and Forrest Wilson. Elsevier, New York, 1976. 432 pp., $17.50.

INTERIOR DESIGN is concerned with the basic facets of interior design and its relationship to the environment in general. It is a text containing meaningful information, a definite point of view on design, and the stimulation to read further in the field of design so as to build a better understanding of man-made environment.

In this second edition, over 40% longer than the first edition, the entire text has been completely revised and updated. Much new information has been added including sections on architectural psychology, environmental behavior, design presentation, supergraphics, personal space, and the office landscape. In addition, the illustrations have been updated and many new ones added, including sixteen plates in full color.

Contents – Part I – What is the Purpose of Design. The Human Environment. The Nature of Good Design. Part II – The Vocabulary of Design. Form. Scale. Texture. Color & Light. Style. Historic Furniture. Part III – Architecture. Function & Planning. Historic Development of Architecture. Pioneer Modern Architects. Current Architecture. The City and Its Surroundings. Environmental Behavior. Part IV – Interior Design in Current Practice. Work Spaces. Living Spaces. Public Spaces. Special Purpose Interiors. Office Landscape. Part V – The Elements of Interior Design. Furniture. Interior Materials. Lighting. Accessories. Painting & Sculpture. Systems Design. Part VI – An Introduction to Interior Construction & Mechanical Systems. The Three Forms of Structure. Building Materials. Architectural Drawing – The Language of Building. Interior Environment – The Mechanical System Building. Part VII – Professional Practice. Individual Designers & Small Offices. The Large Design Office. Interior Design Departments in Architectural Offices. Space Planning Office. Design Presentation. Education for Interior Design.

Ethnic Variables in Human Factors Engineering. Alphonse Chapanis, Ed. The Johns Hopkins University Press, Baltimore, Maryland, 1976. 302 pp., $17.50.

Ethnic and national differences in height and weight, in language, and in cognitive and cultural styles present an important challenge to the human factors engineer. In a world where complex technology is becoming increasingly international these variables must be taken into account.

This book describes how human factors engineering emerged as a separate discipline during World War II, when man had to be integrated into the new and complicated machine systems that were the products of the war effort. Since then research has broadened to include the problems of contemporary society – transportation, urban design, health facilities, pollution control, and airports.

Until recently, however, all human factors and ergonomic research was geared to large-boned people who used the English language, and had Western customs, habits, and ways of life. This presented serious problems when Western engineering and industrial technology were introduced into the less developed areas of the world. This book studies the human considerations which enter into the design of systems, products, jobs, and environments on an international level.

Five classes of differences receive attention: anthropometric dimensions, language, physiology, psychology, and customs and practices. The contributors focus on the practical aspects of ethnic variables in such diverse applications as the preparation of instruction books. language de-

sign, telephone design, keyboard arrangement, highway signs, aircraft design, housing, and town planning. Their discussion will be of great interest to industrialists, engineers, designers, psychologists, sociologists, and economists who are concerned with the adaptation of engineering technology on a global scale.

Early Caucasian Rugs. Charles Grant Ellis. Textile Museum, Washington, D.C., 1976. 112 pp., 16 color plates, 41 black and white illustrations, $12.50.

Early Caucasian carpets are exceptional in their use of large bold patterns and vivid colors. Frequently referred to as "Kuba" rugs, they were woven from the 17th through the 19th centiries. The majority of the 37 featured rugs in this publication belong to the Textile Museum whose founder, George Hewitt Myers, assembled the largest Western collection of "Kuba" rugs. Mr. Ellis has carefully selected additional representative examples in order to present as comprehensive a study as possible. Sixteen of the finest rugs are in color. All the catalogue entries have detailed descriptive and technical information. In addition, Mr. Ellis has written a very valuable and lucid essay on the general history of "Kuba" rugs, their Designs and their Construction. A Glossary and Bibliography are also included. This is the first publication devoted to the subject of early Caucasian carpets and has been published in conjunction with a special exhibition of Early Caucasian Rugs celebrating the Fiftieth Anniversary of the founding of The Textile Museum.

1976 GRADUATING SCHOLARS BOOKLET FROM NSTF

Available from the National Scholarship Trust Fund (NSTF) is a booklet entitled "Graduating Scholars 1976," a listing of resumes of the NSTF scholars graduating from colleges and universities throughout the United States from December 1975 through August 1976.

These students have concentrated their study and/or interest in areas related to the graphic arts and are now seeking opportunities to gain employment in the industry.

Some of the nation's top-ranking graphic arts students have received grants for two-year or four-year degree courses. The grants were donated by organizations and individuals associated with the graphic communications industries and were administered by the National Scholarship Trust Fund.

Employers in search of new talent are urged to review this booklet and study qualifications of these young graduates. This is an opportunity to reap the rewards of the two- to four-year investment already made by the industry.

Free copies of the "Graduating Scholars 1976" booklet are available by writing to NSTF, 4615 Forbes Ave., Pittsburgh, Pa. 15213.

FSCT 1976 YEAR BOOK/MEMBERSHIP DIRECTORY NOW AVAILABLE

The Federation of Societies for Coatings Technology has announced publication of its 1976 Year Book/Membership Directory. The 272 page book features the complete membership roster of each of the 25 Constituent Societies of the Federation, including names, company affiliations, addresses, and telephone numbers, as well as an alphabetical cross-reference listing of the entire membership — over 6000 names.

The publication also includes basic information on the Federation (officers, committees, by-laws, awards, publications, etc.) and its Constituent Societies.

The Year Book is available to non-members of the Federation for $5.00, and may be ordered from Membership Services Department, Federation of Societies for Coatings Technology, Suite 830, 1315 Walnut St., Philadelphia, Pa. 19107.

TABLE OF CONTENTS FOR ACTA CHROMATICA VOL. 3, NO. 1, 1976

PRODUCTS AND SERVICES

Clemson University

Clemson University presents new, intensive courses in Color Science. These courses have been developed after many years in teaching Color to serve the needs of those in industry.

Two levels of instruction are offered: the Basic course is for those who are either beginners or who need just a broad understanding of the subject; the Advanced course covers more specific subjects in Color Science continuing from the Basic course in greater depth for both the practitioner and the person who needs a more complete understanding.

BASIC COLOR SCIENCE
June 7-8, 1976

First Day – Unit 1. What is Color, and how do you treat it as a science? Unit 2. Let's measure colored samples and do something with the data. Unit 3. Light is many things, so quantify it by measurement. Unit 4. When a match isn't the same to everyone; the eye and metamerism.

Second Day – Unit 5. Many dyes can be measured in solution – if you know how! Unit 6. Opaque colored fabrics, paints, and plastics can be measured, too. Unit 7. Making order out of groups of colored samples and describing numerical color differences. Unit 8. Elementary color formulation, or is the computer quicker than the eye?

ADVANCED COLOR SCIENCE APPLICATIONS
June 9-10, 1976

First Day – Unit 1. What makes a color formulation computer work? Unit 2. Color formulation with two constants is not as simple as with one. Unit 3. Fluorescent samples are nuisances to most measurements, but there is a way. Unit 4. A colorimeter and a spectrophotometer both make useful measurements: to each his own.

Second Day – Unit 5. Color specification and metamerism, a tour de force in color science. Unit 6. Instrumental color sorting (for happy customers). Unit 7. Batch correction; a need for speed. Unit 8. Color cataloging, or where did I file that formula?

Rensselaer Polytechnic Institute

Principles of Color Technology – June 7-11, 1976.

Color Technology for Management – June 15-16, 1976.

Advances in Color Technology – June 21-25, 1976.

For more information, write to: Office of Continuing Studies, Rensselaer Polytechnic Institute, Troy, New York 12181, 518/270-6442.

Japan Color Research Institute (JCRI)

JCRI has announced the availability of a book of glossy color standards. The price is $280 per copy, and worldwide distribution is planned. Additional information can be obtained from Dr. Genro Kawakami, Japan Color Research Institute, 1-19, Nishiazabu 3 Chome, Minato-Ku, Tokyo 106, Japan.

Graphic Arts Research Center (GARC)
Rochester Institute of Technology (RIT)

HEAT TRANSFER (SUBLIMATION) PRINTING FOR THE PRINTING AND FABRICS INDUSTRIES

Heat transfer (sublimation) printing will be the topic at a two-day seminar May 26-27 and September 16-17, 1976 at RIT's Graphic Arts Research Center. The seminar will focus on color specifications, printing, and heat transfer procedures.

In addition to presenting information on the physics and chemistry of sublimation transfer, the program will consider the establishment of color printing specifications including the color reproduction system, color variables on the press, the gamut of printed colors, and color charts for matching colors. A printing demonstration and a transfer demonstration will also be a part of the seminar.

The program is intended for management, technical and administrative staff in the graphic arts and textile industries, and their counterparts in the supply and equipment fields. Program charge for the seminar, including tuition, supplies, samples and reference material is $135.

For more information, contact William Siegfried, Director of Training, Graphic Arts Research Center, Rochester Institute of Technology, One Lomb Memorial Drive, Rochester, NY 14623. Phone: (716) 464-2758.

SEMINAR ON QUALITY CONTROL FOR PHOTOGRAPHIC PROCESSING JUNE 14-18, 1976

COLOR SEMINAR FOR PRESSMEN – JUNE 22-25, 1976

A COLORFUL DRAMA OF COVER-UP

The following table was given in the April 7, 1976 issue of *Footnotes**, the staff newsletter of the National Research Council (NRC).

STANDARD COVER STOCK AND INK COLOR LISTING FOR REPORTS OF NRC

	Cover Stock	*Ink Color*
ABASS	Sulgrave Blue	Black
AMPS	Sulgrave Tan	Photo Brown S-59
AE	Strathmore Stone Gray	Cherry Red S-17
ALS	Sulgrave Yellow	Garden Green
CSS	Strathmore Golden Yellow	Avon Green S-45
CHR	Strathmore Green Gold	Black
CIR	Sulgrave Ivory	Triumph Blue S-38
CNR	Strathmore Tree Green	Corsair Blue S-28
EO	Sulgrave Granite	Nobility Blue S-39

However, the preceding issue (March 27) captured something of the drama inherent in these sober color specifications.

By delayed mail we have been informed by the Print Shop that Assemblies, Commissions and the Executive Office have been assigned standard cover-stock and ink colors for the reports they put out. So has IOM.

It may still be true that one should not judge a book by its cover. But at least, by looking at NRC reports and noting the color of the cover stock and ink, it is now possible to identify the source without reading a line.

For example, if you see a report clothed in Strathmore cover stock Stone Gray, imprinted with Cherry Red S-17 ink, you know without more that it was issued by the Assembly of Engineering. Similarly, if you hold a cover of Sulgrave Ivory stock in your hands, imprinted with Triumph Blue S-38 ink, it is the product of the Commission on International Relations.

It is not clear how each Assembly or Commission ended up with the color combination it got. However, in some cases there is a compelling logic.

For instance, no one could object to letting the Commission on Natural Resources put out its reports in Strathmore cover stock Tree Green, with printing in Corsair Blue S-28.

Perhaps the most appropriate of all is the Executive Office combination: Sulgrave Granite imprinted with Nobility Blue S-39.

Although color coding may be useful in the design of traffic lights, national flags, number plates, and as a means of routing people around the Watergate basement, one wonders what good it will do as applied to NRC reports. As it eliminates the pain of decision making, report by report, is it possible that the anguish of ennui may take its place? Is not variety still the spice of life?

Will the Commission on Sociotechnical Systems become bored with Strathmore Golden Yellow and Avon Green S-45? Will CIR try to steal Strathmore Green Gold away from CHR? Will CIR reconcile herself to a lifetime with Sulgrave Ivory and Triumph Blue S-38?

Such are the questions, the human dilemmas, the bitter agonies that make up *Bladensburg*, seen every day at this time on NRC . . . Let us reach out and, if we may, touch your life, too . . . . . .

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DEUTERIUM LAMP STANDARD OF SPECTRAL IRRADIANCE

A deuterium lamp standard of spectral irradiance between 200 nm and 350 nm is in the final stages of being established at NBS. The first group of these standards is expected to be available to the public in January 1976. Purchase orders for this initial group are now being accepted, The price for a calibrated lamp in this first group will be $700. The lamp output at 50 cm from the medium bipost base is about 0.7 watt/cm^3 at 200 nm and drops off smoothly to 0.3 watt/cm^3 at 250 nm and 0.07 watt/cm^3 at 350 nm. Purchase orders and requests for additional information should be addressed to: A.T. Hattenburg, A223 Physics Bldg., NBS, Washington, D.C. 20234.

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To be continued

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NOTES

1. Any person interested in color and desirous of participating in the activities of the Council for the furtherance of its aims and purposes . . . shall be eligible for individual membership (By-Laws, Article III, Section 2). Application forms for individual membership may be obtained from the Secretary (address given above).

2. The Council re-affirms its community of interest and cooperation with the Munsell Color Foundation, a tax exempt organization set up to acquire and use its funds to further aims and purposes very similar to those of the ISCC: to further the scientific and practical advancement of color knowledge relating to standardization, nomenclature and specification of color, and to promote the practical application of these results to color problems arising in science, art and industry. The Council recommends and encourages contributions for the advancement of these purposes to the Munsell Color Foundation. For information, write S.L. Davidson, NL Industries, P.O. Box 700, Hightstown, N.J. 08520.

3. The Council promotes color education by its association with the Cooper-Hewitt Museum. It recommends that intended gifts of historical significance, past or present, related to the artistic or scientific usage of color be brought to the attention of Christian Rohlfing, Cooper-Hewitt Museum, 9 East 90th Street, New York, New York 10028.