Inter-Society Color Council *News*

IN THIS ISSUE

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1991 WILLIAMSBURG CONFERENCE: COLORFASTNESS TO LIGHT

The Inter-Society Color Council and the American Association of Textile Chemists and Colorists will co-sponsor a conference on the colorfastness of materials exposed to natural or to manufactured sources of light. The objectives of the conference are to stimulate research and to exchange knowledge on the complex interaction of photoinitiated reactions within a material that affect its color stability of materials exposed to interior illumination. The two and one half day program will include invited and contributed papers. Contributed papers should consist of thirty minute presentations. A conference proceedings consisting of summaries of the papers will be available at the conference.

Papers on all aspects of the effects of light on the colorfastness of materials will be presented. By colorfastness we refer to the photdegradative effect generated by prolonged exposure to a source of radiant energy that alters the apparent original color of the exposed object. Subjects to be discussed may consider spectral responsivity, effects of light intensification, action and activation spectra, exposure methods and methods of evaluation, relating the attribute of color to causative effects of exposure, colorant/material compatibility, or the transfer of fundamental knowledge to applied research.

From the conservator of fine art to the manufacturer of business machines to the packager of grocery products, colorfastness to interior lighting can be a problem. Artists' pigments, graphic arts, photographic color prints, and inks may be exposed to prolonged intervals of radiation from manufactured sources. Particular attention will be given to papers reporting advances in the study of color fastness to interior lighting.

For more information contact: Jacqui Welker, 6109 Franklin Blvd., Cleveland, Ohio 44102.

COLOR DOPPLER

The University of California at Los Angeles is holding the Second Annual COLOR DOPPLER, October 25-27, 1990. The latest clinical information on uses of Color Doppler Ultrasound will be presented. An optional evening of color physics is also included. The faculty includes Drs. Edward Grant, Franklin Tessler, Rita Perrella, Nagesh Ragavendra, Carolyn Kimme-Smith, William Middleton, and Donald Mitchell.
For more information contact: Kathy Oss, Program Coordinator, at (206) 937- 0355.

THE HUNTERS CELEBRATE—ONE GOLD AND ONE SILVER

About 100 friends participated in the joyful celebration of the 50th Wedding Anniversary of Elizabeth and Richard Hunter and the 25th Wedding Anniversary of Diana and Phil Hunter on June 8, 1990, at The Barns of Wolf Trap. It was a lovely affair with food, dancing, and entertainment including a professional dance team and an amateur singer. Would you believe that Phil can sing? And that Richard at 80 enjoys dancing?

Why report this in ISCC News? For those who don't know, Richard has been quite active in ISCC for many (45 or more) years. He served as President, 1972-74. He attended the Annual Meeting in Cleveland this year. Phil has been ISCC Treasurer since 1988.

One of the highlights of the evening was the reading of a poem, "Fifty Years of Togetherness" by Anna Bunting, the author. It is reproduced here for those who enjoy having history recorded in verse. For another of Anna's poems, see "Richard Hunter Turns Eighty" published in the ISCC News No. 324, March/April 1990.

Harry K. Hammond, III

FIFTY YEARS OF TOGETHERNESS

Sometime in the afternoon
On the twenty second day of June,
Fifty joyful years ago,
A man and woman we all know
United a love that continued to grow.

For Elizabeth Landman changed her name:
Mrs. Richard Hunter she became.
And even though it rained that day,
The wedding reception was truly gay.

One lady there—I don't know her name—
Was heard to say "Ain't it a shame
That they can't always look so pretty?"—
A comment much more wise than witty.

Then they went off on their honeymoon,
Which was organized by the new bridegroom.
So his wallet wouldn't take a beating,
He took her along to a business meeting

Because his way was already paid.
My word! he thought he had it made.
(It took a while for him to know
That marriage causes debts to grow).

Times were hard in World War II,
But vegetables and fruit they grew;
And they raised chickens for eggs and meat,
So they always had something to eat.

Though all of this may sound bucolic,
Richard was a workaholic.
By day he researched optics and light;
And he was an air-raid warden by night.

Two years passed before the thrill
Of giving birth to little Phil.
When Phil was barely three feet tall
Along came his new brother Paul.

Then in nineteen fifty-two
The Hunter's gave birth to something new.
It all began in their abode –
A house that stands on Briar Ridge Road.

That was the year the Lab began,
And Richard said; "I know I can
Solve many problems of appearance
With vision, skill and perseverance."

Elizabeth cautioned: "Richard, honey—
Just you make sure we make some money."
Through the years they worked away
But they took off some time to play
They travelled the world from Fiji to France,
And, most of all, they liked to dance.

They were known to enter a contest or two,
Which was something Elizabeth loved to do;
But Richard soon said, "Elizabeth, hon,
If I have to work at it, its just no fun."

Yet many other interests they share,
And we have to admit they are quite a pair!
Because anyone married for fifty years
Deserves our well wishes and cheers!

So let's all shout Hip! Hip! Hooray!
On this, your Golden Wedding Day!

Anna Bunting, June 1990

1990 ANNUAL MEETING POSTER PAPERS—— A BIG HIT!!

The Poster Papers session held at the 1990 ISCC Annual Meeting was a smashing success! It had somewhat of a rocky start when the four papers were put on display in a room that was far removed from the two main meeting rooms. When it became obvious that meeting attendees were unlikely to make a special trip to find the Poster Papers room, we decided to move the posters to a location alongside the registration desk between the two main meeting room doors. This location change provided the posters and their authors with high visibility, which was the key to success. The posters were easily accessible for all to see between sessions throughout the two days of meeting activities.

This Poster Papers session was small, with only four entries. However, the information presented in these four papers was, in my opinion, of the highest quality that has ever been presented at an ISCC Annual Meeting. The balance of content was very refreshing with two highly technical papers and two design-oriented papers. Such a balance was welcome to our color-interested ISCC members, who come from the scientific as well as the art and design communities.

The two technical papers were based on work done at the Munsell Color Science Laboratory under the direction of Dr. Roy Berns at Rochester Institute of Technology. Yan Liu, in his paper entitled, "Systematic Color Vision Model", presented a model based on the physiological hypothesis of our visual system's negative feedback control mechanism an previous color vision theories. This paper featured an illustrative figure of the three stages comprising the human color vision network: the trichromatic photoreceptor stage with red, green and blue sensitive cones, the electronic visual signal processing stage, and the color sensation stage. Absolute and relative negative feedback control loops were clearly illustrated. The systematic negative feedback control mechanism that occurs in the visual system was well characterized into four types:

1. Ca^{2+} feedback in the cone photoreceptors, which primarily contributes to our visual adaptation by controlling both the absolute and relative photoreceptor sensitivities.
2. Negative feedback from the horizontal cells to the cone photoreceptors.
3. Negative feedback from the brain to the cone photoreceptors.
4. Negative feedback from the brain to the pupil.

It was shown how this negative feedback control mechanism resulted in each type of cone photoreceptor possessing it own sensitivity and forming its own image, just as was described in Land's Retinex theory. The final illustration showed how negative feedback control concepts developed in this systematic color vision model could be used to develop a physiological quantitative model of the visual system.

Po-Chieh Hung of the Munsell Color Science Laboratory presented a poster paper entitled, "Comparison of the Hue Non-Linearities for CIELAB and CIELUV hue angles produced on a video display and on a photographic paper". The video display color gamut is very different from that of a photographic paper, which makes softcopy/hardcopy matching applications difficult to achieve. One common method for mapping out-of-gamut colors from one system to another is to bring the high chroma colors into gamut along lines of constant hue. This paper was an excel-

1990 LVMH SCIENCE FOR ART PRIZE: APPLICATION OF MATTER ON A SURFACE SCIENTIFIC PRIZE:

The Scientific prize is awarded to Dr. Hans Kuhn for his wide-ranging theoretical studies, from the properties of monomolecular layers to the energy interactions in complex molecules, interactions which may constitute the transition from inert to living matter. His work has led to important advances in the technology of organic film depos-its and has led to a profound understanding of the complex physico-chemical interaction linking color to molecular structure.

Dr. Hans Kuhn was born in Bern, Switzerland in 1919. He studied chemistry in Switzerland at the Ecole Polytechnique of Zurich and at the University of Basel and in Denmark with Linus Pauling and Werner Kuhn. Until recently, he has been Professor at the University of Marburg and Director of the Department of Biophysical Chemistry at the Max-Planck Institute in Gottingen, West Germany.

Innovation Prize

The Innovation prize is awarded to Werner Ostertag for the development and manufacture of a new type of interference pigment consisting of aluminium particles covered with a thin layer of iron oxide. These stable and non-toxic pigments have remarkable aesthetic and optical properties, making them of the greatest interest to industries related to the decorative arts.

Dr. Werner Ostertag was born in 1935. His early studies in Germany at the University of Tubingen and in the United States with Corning Glass Company were concerned with the composition of the intercalated layers of rare earths. Since his return to BASF in Ludwigshafen in 1970, he has been working on mineral pigments.

A special Artistic Mention is given to the Dutch artist Peter Struycken for his work entitled "Colour, Space and Change". His analysis of pattern distribution of color and light in space and time and his control of the color- space dimension has led to the creation of artistic designs and application for graphic art, film and architecture.

Release from Louis Vuitton Moet Henessey, 1990

lent demonstration of the fact that this type of gamut mapping can result in constant hue angle relationships according to the CIELUV or CIELAB equations, but the perceptual hue relationships are not necessarily constant. The L*,C* planes at various constant hue angles looked more non-linear in the CIELAB color space than in CIELUV, especially for the blur and red hue angles chosen. Po-Chieh's conclusions emphasized that CIELUV, or a slight modification of CIELUV to improve the less extreme hue non-linearities, might be a more uniform color space than CIELAB to use for hybrid imaging color reproduction applications.

Our first design-oriented paper was a very clever display put together by artist Anna Campbell Bliss, entitled "Windows". A VHS tape presentation was shown to describe the computer-based 8 ft. by 30 ft. mural that will be installed in the Data Processing Center at the Utah State Capitol. Her poster display showed portions of a visual collage consisting of the following six different computer-generated windows:

1. Palette - a computer artist's palette consisting not only of available colors but also of available textures and grids.
2. Outer Space - images suggesting nebulae, the Milky Way and other galaxies.
3. Human Scale - a collage of archaeological sites from pre-Colombian Peru, medieval time in Paris, London and Rome, and human habitats in Salt Lake City, Utah today.
4. Communications - an interesting display of bland computer printing contrasted with beautiful flowing strokes of Chinese hand calligraphy.
5. Micro World - an artist's rendition of the computer memory structure.
6. Fractalscape - transcends traditional science with a fractal featuring complex land and sea contours.

Anna used the computer and the "C" programming language as artists' materials to develop mathematically-based textures and patterns that were sent to a Calcomp plotter and transferred photographically to serigraph screens. Anna pioneered many serigraphic processes to produce the final images, some of which were painted, others scanned, and other processed using highly sophisticated equipment to simulate the computer before transfer to the screens. This poster paper featured a refreshing, unique and imaginative use of computer art providing visual excitement to all observers.

Finally, Magenta Yglesias presented a photographic reproduction of the silk screened graphic panels that she designed for "Eddie's Room". Eddie is a severely disabled, wheelchair bound, visually impaired, five and one half year old boy with cerebral palsy. Magenta designed his room in a very clever way using light, color, sound and texture to stimulate his inquisitive mind while at the same time satisfying his his special physical needs. These panels were on display at the National Symphony Orchestra's Decorators' Show House in Washington D.C. in the fall of 1989. We were fortunate to be able to view this reproduction of Magenta's work because it provided us with an insight into the innovative design concepts she used to create an enjoyable, useful and comfortable interior for Eddie.

In summary, I am proud to say that this 1990 ISCC Post Papers session, although small, set a high quality standard that we should strive to achieve or surpass at future ISCC Annual Meetings. *Paula Alessi*

A ONE DAY CONFERENCE ORGANIZED JOINTLY BY THE FOLKLORE SOCIETY AND THE COLOUR GROUP (GB).

This event will be held on Saturday April 13th, 1991 at the Institute of Classical Studies (Institute of Archaeology), Gordon Square, London WC1, from 10 a.m. to 6 p.m.

The response to this conference has been so enthusiastic that it will be in the form of a round table discussions consisting of a number of papers lasting 20 minutes each.

Papers have been volunteered on a very wide range of fascinating subjects and we hope to include contributions on the use of colour in formal tradition, in the English language and in Welsh legend, colour in marriage and in death, colour in traditional decoration and in costume, green, the Green Man, and colour in popular religion. There will also be an update on the Folklore Society/Colour Group (GB) survey on this subject.

For further details, when available, please contact: John Hutchings, 6 Queen's Road, Colmworth, Bedford MK44 2LA, England. *John Hutchings*

NPL SPECTROPHOTOMETRY AND COLORIMETRY CLUB

The National Physical Laboratory is organizing a spectrophotometry and colorimetry club to ensure that NPL is aware of future industrial requirements and that measurement standards and techniques are in place to meet these needs.

They also want to make information on existing measurement standards and techniques more readily available, identify common problems, provide a coordinated response, and finally to provide information on international developments and on the impact of proposed specification standards.

The club plans to hold one or two meetings each year. The first meeting was held June 21, 1990 at NPL. For more information on membership, its benefits and activities, contact: Dr. G. H. C. Freeman, NPL Spectrophotometry & Colorimetry Club, National Physical Laboratory, Teddington, Middlesex TW11 0LW Tel. 0(8) 1-977 3222 ext. 6821, Fax. 0(8) 1-943 2155.

INTEREST GROUP I

Measurement and Colorimetry

Interest Group I, Measurement and Colorimetry, presented a program of contributed papers relating to measurement techniques. The session goal was to provide information on methods used by colorists to reduce sample presentation errors in particular and measurement uncertainty in general. The session was very well attended.

The first speaker, Joseph Deak from Applied Color Systems Incorporated, described sample presentation devices for color measurement. He stressed that procedures should be repeatable, reproducible, and known to all personnel operating the particular measurement device. Mr. Deak described various devices such as transmission cells, yarn windows, ring holders and so forth to improve sample presentation. Unfortunately, information was not provided concerning the trade offs between the increase in preparation time versus improved precision or how a repeatable technique might decrease correlation to visual analyses due to a change in appearance attributes.

William L. Weber, with the Macbeth Division of Kollmorgen Corporation, described in general terms how they developed a spectrophotometer to transfer the scale of reflectance factor for hemispherical and circumferential bidirectional geometries. The device was capable of transferring reflectance factor to within NIST stated uncertainties. (Although not stated by Mr. Weber, it is worth noting that the goal is to minimize the uncertainty that is added to the the already large NIST uncertainties. Reproducing scales within NIST uncertainties still adds error.) Ceramic BCRA tiles are used to insure instrument to instrument agreement. Mr. Weber stated that a proprietary technique was developed to enable the use of line sources for wavelength calibration. Normally, this practice produces errors for 10nm bandwidth instruments due to inherent asymmetric instrument functions.

Gorow Baba from Murakami Color Research Laboratory, presented the partial results of a study to relate bidirectional and hemispherical measurements of paint samples. Using 8o/d, 8o/t, and goniospectrophotometric measurements, Mr. Baba explored whether one could relate particular goniospectrophotometric measurements to either hemispherical geometry. He analyzed a series of solid coat, paint samples with identical pigmentation but of differing amounts of flattening agent. Although the study is still in progress, he found correlation between 8o/d and directional analyses of 30° to 45° from specular. Correlation analyses were performed on tristimulus values.

Lisa Reniff of the RIT Munsell Color Science Laboratory, developed colorimetric methods to evaluating systematic spectrophotometric errors. She described how these errors can be approximated by a set of linear equations. As an example, wavelength errors are proportional to the first derivative of reflectance factor with respect to wavelength. This methodology is used by the Munsell Color Science Laboratory to transfer the scale of reflectance factor from NIST. Photometric zero, 100% line, and wavelength errors were simulated for several of the BCRA ceramic tiles. CIE L* a* and b* values were calculated and plotted on various CIELAB projections. These errors plotted linearly in the three space. Accordingly, Ms. Reniff calculated a 3 x 3 matrix relating L*, a*, b* to errors in photometric zero, 100% and wavelength. The matrix was a reasonable approximation to the actual values. This simple technique can be used as an efficient method of diagnosing spectrophotometric accuracy.

Fred W. Billmeyer, Jr. described new ASTM standards on color measurement. During the last 5 years, ASTM has been particularly active in updating existing standards and writing new standards for color measurement. In addition to the familiar E 179 on definitions and terms and E-308-85 on methods of calculating tristimulus values from spectral data, four test methods have just been adopted to improve measurement performance. E 1331-90 and E 1348-90 are test methods for reflectance factor and color and transmittance and color, respectively, for hemispherical geometries. E 1349-90 is a similar method to E1331-90 except for bidirectional geometry. E 1347-90 is a test method for color and color difference measurements of object colors using tristimulus, filter colorimeters. Dr. Billmeyer stressed that ASTM is a participatory organization and that individuals who believe a need exists for a new or revised standard test method or guide should join ASTM and contribute.

Edward G. Pariser with R. R. Donnelley & Sons Company described a sample presentation device for color measurement. In graphic arts, there is often a need to make many measurements on a single substrate. Accordingly, a spectroradiometer was affixed to a computer-controlled x-y positioning device. The Photo Research radiometer incorporates a 256 element diode array detector with a concave holographic polychromator. Fluorescent sources approximating D50 were operated at 10 KHz and illuminated the substrate at 45o from the normal. The high frequency was necessary to reduce flicker. Mr. Pariser described his analyses of sources of uncertainty including positioning error, luminance level, photometric calibration to yield reflectance factor measurements, system stability in terms of how often one must recalibrate, and measurement aperture size.

The last speaker, Mr. James T. DeGroff from Colortec Associates, Incorporated described the X-Rite colorimeter and spectrophotometer. He described design considerations such as focal length and its effect on presentation errors. The talk unfortunately did not relate to the topical theme of the interest group, that of measurement techniques. *Roy S. Berns, Interest Group I Co-chairman*

PROJECT COMMITTEE #32

Image Technology

As of the 1988 annual meeting, the purpose, scope and objective statements for this committee were as follows.

PURPOSE: There is a need for an interdisciplinary study of the problems common to photography, printing, video display, and television relating to the rendition, measurement, and specification of color.

SCOPE: 1. To compile a color reproduction bibliography.
2. To maintain a current list of users' needs and accomplishments with respect to calibration of video display phosphors, and display viewing conditions.
3. To design and execute some experiments to define the mapping function which would allow us to go from video display color space to hardcopy.

OBJECTIVE: To compile the color reproduction bibliography within the coming year (1988-1989).

It became obvious after the 1989 annual meeting that the current members of the committee did not have sufficient time to meet the stated objective. It was therefore decided and approved by the ISCC board of directors to add Mr. Mark Gorzynski of the Munsell Color Science Laboratory as co-chair to Paula to provide the extra help needed. The purpose, scope, and objective of the committee remain the same. The date for completion of the first objective was updated to the end of the calendar year, 1990.

The primary activities of the committee during the past year was three fold. First, the details of the outline for the bibliography were finalized. Second, computer database software was chosen for use in compiling the bibliography. Third, an information package was assembled describing how the active membership could request reference submissions for the bibliography.

Mark arranged for the ISCC to use an Apple Macintosh computer system and Pro-Cite bibliography software owned by the Munsell Color Science Laboratory. Paula and Mark then assembled a 20 page document explaining how to make submissions of references which could be read by this software. This document will be mailed to the committee membership by June 1, 1990. If a sufficient number of references are submitted by the end of the summer, the bibliography will be compiled by fall.

It is possible that the members will not wish to submit references in computer readable form. In this case, arrangements will have to be made for someone to type the entries into the database. We should have a good idea by July as to whether or not the request for references was well received.

Co-chairs, ISCC project committee 32, Paula J. Alessi, Eastman Kodak Company; Mark Gorzynski, Munsell Color Science Laboratory

PROJECT COMMITTEE #48

Slide Collection for Color Education

Project Committee #48 met in Cleveland on Monday, 23 April 1990 during the ISCC Annual Meeting. Some time was spent explaining; how the educational materials produced by the Committee will parallel and support the modular curriculum for color education being developed by Interest Group IV. Nancy Howard shared the results of the survey conducted during the last year concerning the topics of the twenty slides that would make up each of the collections (perception, light, light/object interaction, colorimetry/spectrophotometry, and color order systems). These were discussed, amended, and accepted by the Committee.

The remaining time during the working session was used to "brainstorm" in small groups on (1) the content, and (2) the commentary that will accompany each of the slides in the collection. The results of these "brainstorming" sessions will be utilized during the upcoming year to develop a twenty slide mock-up collection for each of the five topics. This will be circulated to the Committee before the actual prototypes are produced in time for the 1991 ISCC Annual Meeting.

Nancy Howard, chairman

INTERNATIONAL COLOR ASSOCIATION (AIC)

The program for the AIC Interim Symposium 1990 is going to be completed and the city of Berlin has done the best in taking all its walls down to welcome you. Those of you who were at COLOR 81 wouldn't recognize the city. Taking this in mind and also the fact that we have free admittance to any part of the city and the country side we have arranged for a boat tour, on Tuesday afternoon Sept 4th, along the river Havel to Potsdam. We shall disembark there and visit the famous castle of Friedrich the Great "Sanssouci" in Potsdam and have dinner at the castle Cecilienhof, where the Potsdam conference took place in 1945.

The symposium is preceded by CIE Division 6 meetings on August 29th and 30th, CIE Division 1 meetings on August 31st and September 1st. Those will be partly in BAM-Fabeckstrase, like the Executive Committee meeting on Sunday September 2nd. After the AIC-Symposium there will be CIE Division 2 meetings on September 6th and 7th.

The most convenient hotel to the BAM and the city is Steglitz International. It has Bus and Underground connections from the front of the hotel. I have reserved single rooms for DM120, and double rooms for DM160, per night inclusive of breakfast and free usage of the sauna for the nights from September 1st to 7th. If you wish to stay only from September 2nd to 5th we have another contingent in the hotel Excelsior for DM122 (single) and DM179 (double). The Excelsior is downtown near Kurfurstendamm but also with good Bus and Underground connections to the BAM.

AIC-INTERIM SYMPOSIUM—"INSTRUMENTATION FOR COLOUR MEASUREMENT"

Sunday, Sept. 2	18.00	Registration and Reception
Monday, Sept. 3	9.00	Opening of the Symposium
	9.30	Invited Paper: D. Gundlach, BAM Berlin "Colorimetry for standard Conditions"
	10.15	Coffee break
	10.30	Contributed Papers
	13.00	Lunch Break
	14.00	Demonstration of Instruments
	19.00	Reception by the Senate of Berlin
Tuesday, Sept. 4	9.00	Invited Paper: A. Rodrigues, DuPont, Detroit "Colorimetry of Metallic and Pearlescent Colours"
	10.15	Coffee Break
	10.30	Contributed Papers
	13.00	Lunch Break
	14.00	Departure for Boat Cruise on the River Havel
	18.00	Departure for LMT-Reception in the Museum for Technique
Wednesday, Sept. 5	9.00	Invited Paper: N. Johnson, 3M, Minnesota "Colorimetry of Retroreflective Materials"
	10.15	Coffee Break
	10.30	Contributed Papers
	13.00	Lunch
	14.00	Demonstration of Instruments
	19.00	Farewell Party

NOTE: Since the opening of the wall, the hotel situation is very critical. Advance reservations are necessary. To register for the symposium supply the following information and a cheque payable to AIC Interim Symposium. If you want Dr. Terstiege to make your hotel reservation, include payment for one night's stay. You may otherwise make your hotel reservation through the "Verkehrsverein" (Tourist bureau)

Mr/Ms/Title _____ Surname _____ First Name _____

Institute _____

Mailing Address _____

City _____ State _____ Zip _____ Country _____

Arrival Date for Hotel Reservation\Accompanying Person(s) _____

Registration for participants including lunches, coffee and receptions: 380 DM
Registration for accompanying persons including receptions: 100 DM

- ☐ Welcome reception (Sunday, Sept. 2)
- ☐ Reception by the Senate of Berlin (Monday, Sept. 3)
- ☐ Boat cruise on the River Havel (Tuesday, Sept. 4)
- ☐ Farewell Banquet (Wednesday, Sept. 5) _____ X 40 DM = _____ DM

Total Amount _____ DM

Hotel Deposit _____ DM

Mail the above information and cheques to:

AIC-Interim Symposium, Prof. Dr. H. Terstiege, DfwG c/o BAM, Unter den Eichen 87, D-1000 Berlin 45, Germany, Fed. Rep. Tel. (030),8104 5400 Telefax: (030) 8112029.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

In order to better serve its European members, ASTM opened an office in Hertfordshire, England, on May 1, 1990.

The new office will serve to improve communication between ASTM's European members and ASTM Headquarters in Philadelphia. The office will answer questions about ASTM, coordinate symposia and Standards Technology Training course held in Europe, and provide rooms for standards development meetings.

Bill Keshan will serve as office manager. Inquiries can be addressed to him at the ASTM European Office, 27-29 Knowl Piece, Wilbury Way, Hitchin, Herts SG4 OSX, England, Telephone: or62 437933, FAX: 0462 433678, Telex: 825684 ATPG.

Organized in 1898, ASTM is one of the largest voluntary standards development systems in the world.

Five New Standards On Color Measurement Published

ASTM announces the publication of five new test methods what will assist users of instrumentation for color measurement of object-color specimens, particularly those in the paint, plastics, paper, and textile industries, in performing color measurements.

The test methods, developed by Subcommittee E12.02 of ASTM standards- writing Committee E-12 on Appearance of Materials, are: (1) E-1331, Test Method for Reflectance Factor and Color by Spectrophotometry Using Hemispherical Geometry; (2) E-1345, Practice for Reducing the Effect of Variability of Color Measurement by Use of Multiple Measurements; (3) E-1347, Test Method for Color and Color-Difference Measurement of Object-Color Specimens by Tristimulus (Filter) Colorimetry; (4) E-1348, Test Method for Transmittance and Color Using Hemispherical Geometry; and (5) E-1349, Test Method for Reflectance Factor and Color Using Bidirectional Geometry.

When used in conjunction with two recently revised standards providing background information, E-1164, Practice for Obtaining Spectrophotometric Data for Object-Color Evaluation, and E-308, Method for Computing the Colors of Objects by Using the CIE System, these new test methods provide the user with detailed assistance in making precise and unbiased measurements and provide guidance in setting instrument parameters for best correlation between measured and perceived color.

Copies of the new standards are available from ASTM Customer Services, 1916 Race Street, Philadelphia, PA 19103, (215) 299-5585. Committee E-12 welcomes comments and suggestions for revisions to improve these standards or for additional standards needed in the field. For additional information or to offer comments, contact Robert Morgan, ASTM, (215) 299-5505. Upcoming meetings of Committee E-12 are scheduled for Jun 18-24, 1990 in San Francisco California and January 21-23, 1991 in Ft. Lauderdale, Florida. All interested parties are invited to participate. Committee E-12 is one of 134 ASTM technical standards-writing committees.

Participants Needed For Two New ASTM Task Groups To Study Measuring of Road Deliniation

These two new ASTM task groups are charged with studying the practices of measuring the field performance of horizontal and vertical road delineation using hand-held and mobile instrumentation.

The new task groups are organized under the jurisdiction of Subcommittee E12.10 on Retroflectivity of ASTM standards-writing Committee E-12 on Appearance of Materials. They will meet at the committee's upcoming standards development meetings scheduled for June 18-21, 1990 in San Francisco, CA and January 21-24, 1991 in Ft. Lauderdale, FL. All interested parties are invited to participate.

For more information, contact Subcommittee E12.10 Chairman, Robert Dejaiffee, Pennsylvania Transportation Institute, Pennsylvania State University, 6th Ave. and 45th St., Altoona, PA 16602, (814) 949-79454; or Robert Morgan, ASTM, 1916 Race St., Philadelphia, PA 19103, (215) 399-5505.
News Releases from ASTM

DETROIT COLOUR COUNCIL (DCC)

The first DCC program meeting of 1990 featured Richard Harold of Hunterlab, March 8 with a timely presentation of the CMC color difference formula which has found acceptance in the textile industry. Application to paint and plastics was especially useful to DCC members.

A visit to the Cranbrook Museum of Science was held on May 10. Cranbrook has developed a year-long exhibition on color science, featuring hands-on exhibits which illustrate color principles.

A panel conference on toxicity issues affecting automotive finishes and plastics is scheduled for September 13 at the Michigan State University Management Center. Speakers are scheduled from the EPA Office of Toxic Substances and the General Motors Toxic Materials Control Office, as well as producers and users of pigments which are under examination.

The DCC continued support of the Color Marketing class at the Center for Creative Studies in Detroit by furnishing guest instructors. Newly added were two class design projects by Patricia Olden-kamp of Chrysler.

DCC officers for 1990 are Joseph Koreck, Morton International, president; Ella Brennan Cotter, BASF, vice-president; Brian Stott, PMS Consolidated, secretary; and James Hall, General Motors, treasurer.
W.V. Longley

GATF'S THREE-DAY AUGUST CONFERENCE

"Integrating Color Electronic Prepress Systems"—August 12-14, 1990, Chicago, Illinois

This conference will focus on selecting the components for a prepress system and managing those components to ensure maximum profitability and productivity. With ten panels and over forty speakers scheduled during the conference, plenty of time can be devoted to the issues that are uppermost in the minds of those involved in electronic prepress operations:

- How soon will PC- and Mac-based systems have the power necessary to produce high quality plate-ready film?
- What profit opportunities will emerge for trade houses and printers as more of their customers operate layout/design/prepress stations?
- What advancements are taking place in input and output devices and how is the industry's use of this equipment forecast to change?
- How can trade houses and printers develop a reliable method of random-access data storage and movement?
- What changes are taking place in typographic printout devices and what effect will they have on prepress operations?
- How do you effectively and profitably coordinate the use of electronic prepress and conventional prepress methods in the same plant?
- What can be done to minimize the problems caused by receiving digital customer input?
- What learning curve can you expect after installing a desktop color electronic prepress system?

In addition to attending panel discussions that will cover these and other issues, you will hear a number of users forecast the future of color electronic prepress systems, and learn about the product introductions/refinements exhibited at DRUPA.

Another new feature of the conference is the addition of a Sunday-afternoon seminar on the system architecture and concepts associated with electronic color prepress. The seminar is designed for those conference attendees who want to enhance the value of the conference by acquiring a solid understanding of electronic color prepress. Those individuals who are just beginning to restructure conventional production centers to accommodate electronic equipment will also benefit greatly.

So join us August 12-14 at the Marriott O'Hare to gain the necessary insight to assess your company's application of prepress technologies and position your firm properly as we move toward the year 2000. *GATF brochure*

GATF Appoints Smith To Direct Internal Training

GATF has named William H. Smith to direct its internal training. As such, he will develop and implement training programs for FATF's staff. He will formulate overall organizational training policies and goals, assess organizational and individual needs and direction, and suggest and implement programs and courses for training. "Such programs will ensure that the staff maintain the highest skill and expertise levels possible to serve the industry," said Smith. *GATF News Release*

FROM PANTONE'S COLOR NEWS VOL. 5, NO. 1, 1990

Discount Program For Students

Pantone, in its continuing commitment to assist design students, believes that a thorough understanding of how to select, use and specify color will help these young people attain successful design careers. In support of this commitment, we have a 50% discount program for students. Details of this special educational program are available to graphic, fashion and commercial design faculty members at accredited not-for-profit institutions in the U.S.A. and Canada.

For complete details, contact Pantone's Customer Service Department at (800) 222-1149 [New Jersey (201) 935-5500].

GEMOLOGICAL INSTITUTE OF AMERICA

The Second International Gemological Symposium will be held June 20-24, 1991, at the Century Plaza Hotel in Los Angeles, immediately following the 1991 ICA Congress in Hawaii.

In addition to a wide array of oral presentations and discussion panels planned for Symposium, volunteer contributions are now being solicited for an open poster session. Individuals conducting research applicable to the study of gem materials are encouraged to participate in this poster session. Preliminary abstracts approximately 200 words in length should be received at GIA no later than November 1, 1990.

For further information on the International Gemological Symposium poster session, contact Dr. James E. Shigley, Research Department, Gemological Institute of America, P. O. Box 2110, Santa Monica, California 90404-2110; (213) 829-2991 ext. 305; Fax (213) 829-2269. For information on the 1991 ICA Congress, call (818) 716-0489 or write the International Colored Gemstone Association, 22643 Strathern Street, West Hills, California 91304.

FROM DOWN UNDER: "NEWTON'S INDIGO"

Keith McLaren stopped in Perth on his way to Melbourne and gave a fascinating talk to local members. Why did Newton mention indigo in his historic work on spectral colours? Very few observers today would go beyond red, orange, yellow, green, blue, violet; and yet Newton included it quite specifically between violet and blue. Keith has done quite a comprehensive study of the literature in this field and has contributed extensively to it himself. He listed theories that have been proposed to explain Newton's identification of this colour and then clearly and logically examined them. And in doing so he ranged over a whole range of topics in the field of colour.

Did Newton, or his assistant in the experimental work, have defective colour vision? Was it a matter of colour nomenclature in that wishing to separate red from yellow and blue from violet, he mentioned orange and a colour term in common use then but one that has fallen into disuse now, indigo? What was the type of glass used in the prism?

Keith's conclusion was that Newton was looking for symmetry in nature and trying to relate light to sound. Thus to match the musical scale of five tones and two semi-tones, he used five principal colours - red, yellow, green, blue and violet - and two other colours which had to be between red and yellow on the one hand and blue and violet on the other.

There was a spirited discussion after the lecture on the many issues that Keith had raised.

Ron Price, SPECTRUM, the Newsletter of The Colour Society of Australia, Vol.4, No.4, April 1990

CALLS FOR PAPERS

Comparison Of Color Images Presented In Different Media 1992 Williamsburg

Conference of the Inter-Society Color Council (ISCC) co-sponsored with the Technical Association of Graphic Arts (TAGA) February 23-26, 1992, Colonial Williamsburg, Virginia

ISCC and TAGA will co-sponsor a conference on the difficulties encountered when comparing images presented in different media that are intended to simulate each other or another image. The objectives of the conference will be to identify the problems involved in comparing images displayed in different media. It will address such topics as color space transformations, ambient conditions, viewing geometry, surface properties and adaptation. It will deal with the present status of inter-media image comparison, identify the significant factors involved and explore the technology used in such comparisons. The conference will be technical in nature and will consist of invited and contributed papers emphasizing the exchange of information and discussion. Papers of a commercial nature will not be accepted. Contributed papers will consist of thirty minute presentations. Extended abstracts will be available prior to the conference and a conference proceedings will be published.

Those wishing to contribute should submit a title and abstract by March 1, 1991. The title and abstract should not exceed 750 words. This along with the authors names, their affiliation, principal author's address and day time telephone number should be sent to: Milton Pearson, RIT Research Corporation, 75 Highpower Road, Rochester, NY 14623; phone (716) 475-5290; Fax (716) 475-2361

Authors will be notified of acceptance by June 1, 1991. *Milton Pearson*

INDIVIDUAL MEMBER GROUP (IMG)

At the Annual Meeting in Cleveland, April 22, 1990, a meeting was held for all members of the Individual Member Group. This meeting discussed future plans of the group, with an emphasis on the various avenues available with which to gain member response and participation. It was suggested that at the annual meeting in 1991, the meeting for new-members be held directly before the IMG meeting in order to include those members in the IMG meeting.

It was determined that a questionnaire should be sent to all IMG members in order to compile information on such topics as member interests and future needs. An election was also held to select a new voting delegate. IMG voting delegates serve for terms of three years, with one term expiring each year. The following delegates were selected to represent the group, with Lynn Bement selected as the new voting delegate:

IMG DELEGATION
Lynn Bement (voting)
George C. Brainard
Jean Bourges
Donald Campbell
Ellen Carter
Jeaneatte Chupak
Carol Mitchell Derov (voting)
Duane G. Wahl
Don Woelfel (Chairman and voting)
Magenta Yglesias

All individual members of the ISCC are part of the IMG and are encouraged to become active participants to ensure that the ISCC meets the needs of this large member body. Please feel free to contact any member of the delegation (Don Woelfel would love to hear from you!) concerning any issues that you would like to see addressed by the group or the ISCC Board. Any ideas regarding future meetings would be greatly appreciated. Remember this is your group. We need you to get involved! Your delegation can serve you well only with your input. Accept our Thanks in advance for your response. We look forward to hearing from you.

Carol Mitchell Derov

COLOR RESEARCH AND APPLICATION IN THIS ISSUE: AUGUST 1990

In 1978 the Colour Difference Subcommittee of the CIE Technical Committee on Colorimetry published guidelines so that researchers in the field could design their experiments in such a way that a coordinated comprehensive set of data describing the perceptibility of small, moderate, and large color differences under a variety of viewing conditions would be developed. The program was divided into four steps: the study of methodology, a systematic study of the effect of different parameters, a complete mapping of colour- difference perception over the whole of color space for one set of viewing conditions, and finally the derivation of a formula to fit the data. Two of the articles in this issue describe work that falls under these guidelines.

The first article is a systematic study of two parameters that are involved in color difference evaluation of physical samples. In "Parametric effects on surface color-difference evaluation at threshold", Klaus Witt describes the results of experiments at the five designated CIE color centers which examine the effects of the lightness of an achromatic surround and of the separating gap between a pair of painted specimens.

The second is a technical note in which a first step towards composing and checking new color-difference formulas is described. In "Metric Coefficients for Chromatic Discrimination of Surface Colors", Melgosa, Romero, and Hita used the orientations and lengths of the semiaxes of Luo and Rigg's discrimination ellipses to calculate g11, g22, and 2g12. The smoothed isocurves were then computed and plotted. Experimental results at the five CIE color centers are then compared with those predicted by various equations.

Metallic paints offer an even greater challenge for color-difference evaluation. If instrumental measurements using only the diffuse geometry and a grazing angle geometry are the criteria for judgements, the result will be completely erroneous when compared to visual judgements. The advent of variable or multiple geometry instruments has made it feasible to solve this problem. Adding a third measurement geometry, according to H. J. A. Saris, R. J. B. Gottenbos, and H. van Houwelingen, eliminates this error at least qualitatively. "Correlation between visual and instrumental colour differences of metallic paint films" includes measurement techniques and a calculation procedure that yield instrumental judgements which have a high correlation with visual judgements.

The American Society for Testing and Materials (ASTM) Committee on Appearance of Materials is undertaking the writing of a comprehensive documentary standard on color-difference calculation. It is anticipated that this document will take the form of a guide which is a series of options or instructions that does not recommend a specific course of action. Fred W. Billmeyer, Jr. and Harry K. Hammond, III, in "ASTM standards on color- difference measurements" document the history and invite readers to contribute suggestions for material to be included in the proposed Guide.

Since 1983 the CIE Technical Committee on Color Appearance has promoted studies so that predicted color appearance could be applied to practical color perception situations such as assessing color-rendering properties of light sources. In 1986 Yoshinobu Nayatani, Kotaro Takahama, and Hiroaki Sobagaki described color appearance under various adapting conditions. Since then numerous articles have appeared in this journal dealing with this model and its field trials. In "Color-Appearance Model and Chromatic-Adaptation Transform" the authors, also teamed with Kenjiro Hashimoto, extend this model to include light gray background and different adapting illuminance levels.

Remembering colors depends on one's ability to name and thereby categorize them. Therefore, any time the two specimens are not viewed simultaneously, the judgement of color shifts depends on the memory of the color seen initially. The name of a remembered color does not precisely define the color but could refer to any of thousands of perceptibly different samples. However, if a color that appears blue under one illuminant continues to appear blue under another, the color-rendering may be judged to be satisfactory for many practical applications despite a shift in color appearance that would be obvious if looking at the samples simultaneously. The CIE color-rendering index is based on illuminant induced shifts in a uniform color space rather than on the categorical nature of color perception. A specific distance in uniform color space may sometimes represent a series of colors within one category, and at other times the same distance may bridge between different color categories. In "Categorical color rendering of four common light sources" Robert Boynton, Lee Fargo and Belinda Collins use color categorization to evaluate the practical color-rendering quality of various sources.

Ellen Carter, Editor, Color Research and Application

TECHNICAL ASSOCIATION OF THE GRAPHIC ARTS (TAGA) 1991 CONFERENCE

ISCC member Robert Mason of HUNTERLAB continues as a Board member of TAGA. TAGA is comprised mainly of scientists, researchers, technical and production personnel in the graphic industries and its primary goal is to report on any new research an technology in the graphic arts. Their 1991 conference will be held May 5-8 in Rochester, NY. For more information about TAGA, contact the TAGA office: TAGA Office, P.O. Box 9887, Rochester, NY 14623-0887. Phone (716) 272-0557; FAX (716) 475-2250.

MEMBERSHIP IN THE ISCC

IS OPEN TO EVERYONE INTERESTED IN COLOR!!

For further information and membership application, please fill out the items below and mail to the address shown.

Your name _____

Address _____

City _____ State ____ Zip _____

MAIL TO: Ms. Anne Lailaw
Shelyn Incorporated
1108 Grecade Street
Greensboro, NC 27408

OR: Tel: (919) 274-1963
FAX: (919) 274-1971

The ISCC is composed of both individual members and member bodies who have an interest in color. If you are a member of a national organization that might be interested in this affiliation, please indicate its name below and we will get in touch with you about it.

Organization _____

Your Phone No. (daytime) (____)_____

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Mrs. Bonnie K. Swenholt

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