

Inter-Society Color Council *News*



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CALL FOR MACBETH AWARD NOMINATIONS

Every two years your Inter-Society Color Council is honored to be able to present the Macbeth Award. This award was established by Mr. Norman Macbeth, Jr. in honor of the memory of his father, Norman Macbeth.

Nominations for the Macbeth Award are now being considered by the Macbeth Award Committee, Charles Sherman, Chairman. Individuals or groups of individuals interested in having a specific nominee considered by the committee should submit such nominations as soon as possible to Charles Sherman: Sherwin-Williams Co., 601 Canal Road, Cleveland, OH 4113 (phone 216-566-2963).

Rules governing the nominations for the Macbeth Award are given in the By-Laws Booklet of ISCC. Please note that the confidentiality of the nomination is of utmost importance. The Person or group must insure that the nomination is not discussed with the proposed nominee. Should any of the information required in the By-Laws be difficult to obtain without the risk of such disclosure, the information should be omitted from the nominating letter.

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The other members of the Nominating Committee are: Hilton Brown, Fred Billmeyer, Jr., Roland Connelly, Sr. and Danny Rich.

Chuck Sherman, Chairman Macbeth Award Committee

GLOBAL IN SCOPE, GATF INTERNATIONAL CONGRESS KICKS OFF 65TH ANNIVERSARY YEAR

This congress is the focal point of GATF's 65th anniversary year and the major graphic communications industries meeting of 1989.

May 14-17 an unprecedented number of the industry's best minds in areas of business and economics, technology, market research and development, and training and education will conduct sessions to examine universal issues facing graphic communications worldwide. From the keynote address and economic forecasts to breakout sessions and banquet speakers, the congress will review the lithographic process from an international perspective, the impact of electronics on the process, and the growing markets served by printers and publishers throughout the world.

Congress Highlights include presentations of GATF's prestigious InterTech Technology Awards and Education Council of the Graphic Arts Industry, Inc./GATF Awards of Excellence.

The InterTech Technology Awards are presented to manufacturers to honor excellence in innovative technology predicted to have major impact on the graphic communications industries in the next five years.

Education Council/GATF Awards of Excellence single out individuals, clubs, and associations for their dedicated support of industry education and training.

GATF industry manufacturer and supplier member companies will also provide technical tabletop displays describing their products and services during session breaks.

REPORT FROM THE GRAPHIC ARTS TECHNICAL FOUNDATION DELEGATES

During 1988, the Graphic Arts Technical Foundation (GATF) was very active in color research and education for the graphic arts industry. Contributions to color research and related educational activities were made by the GATF Research Department's Chemistry Division, Color Center, Test Images Division, the Techno-Economic Forecasting Division, along with the Education and Special Programs Department.

First, let's review the ongoing color research work performed by the Research Department. The Research Department has continued to make major contributions in color research for the lithographic and gravure industries as evidenced by its continued involvement in cooperative studies with the SNAP Committee on Specifications for Non-Heat Advertising Printing and color measurement studies and testing for the SWOP Committee on Specifications for Web Offset Publications. In addition, the Research Department has recently been involved in cooperative color measurement studies which were conducted with the Gravure Association of America for Groups I and VI color proofing specifications.

In relationship to the above activities, GATF's Chemistry Division continues to be involved in color measurement work by participating with the National Association of Printing Ink Manufacturers SWOP ink verification program, and by analyzing more than 120 four-color ink sets in 1988. With growing emphasis upon standardization in our industry, GATF has participated in two Gravure Association of America Task Forces—Color Specification of Printing Inks, and off press-proofing. Color research continues as the various specifications evolve for gravure and offset. Verification activities are expanding into SNAP color specification. Non-heatset inks will be compared to the Adlitho colors as wet ink standards in a program that will be modeled after the NAPIM/SWOP activities.

The above services and activities are well received by our industry, and GATF is becoming the information source for ink on paper colorimetry and spectrophotometry. Publication of the results of this research is planned during 1989.

The Test Images Division is involved in the development of new quality control devices for utilization in offset lithographic color reproductions. These quality control devices provide the users with process information, consistency and performance. Some of the new quality control devices that have been developed in 1988 include the GATF Sheetfed Color Printing Test Kit, the Six Color Control Bar and the Mini-Control Bar for Web. The Color Printing Test Kit enables sheetfed offset lithographic printers to evaluate their overall printing conditions and determine the color reproduction requirements of their presses. The Kit is designed to work on 38 and 40 inch, four-, five- or six-color presses and it also plays a significant part in the evolving GATF Color Control System. The Six Color Control VBar is a test image that resulted from the development of the Test Kit. However, the Six Color Control Bar is also a stand-alone test image and provides the sheetfed printer with a test image to monitor and control the process during the press run. In addition to these two test images, a color bar was developed for web offset heatset printers who have web presses with short cut-offs.

Color work continues in the Test Images Division and it is anticipated that the several new quality control devices will be released in 1989. These include a Halfsize Sheetfed Test Form Kit for four-, five-, or six-color sheetfed presses with cylinder widths up to 25 inches. The elements and functions of the Halfsize Test Form Kit will be similar to the previously described kit for 40 inch sheetfed presses. Other test images

will include a Mechanical Ghosting Test Form and a family of Color Control Bars that will cover a range of screen rulings from 85 to 200 lines/inch.

During late 1988 and early 1989, the GATF Color Center will be going through a major equipment update. This update will include the areas of offpress color proofing, electronic scanning, and electronic pagination and retouching. The manufacturers who plan to update their equipment are Hell, Crosfield, 3M, DuPont, and DS America.

Hell Graphic Systems will be introducing their state-of-the-art color workstation and interfacing it with the DC 350 electronic color scanner. Crosfield intends to update their existing equipment with a 646 electronic color scanner, along with a Scanview previewing color monitor, an 875 pagination system and a Dicomed electronic design station.

DS America will be installing a new 607-II electronic color scanner. 3M and DuPont will be updating their offpress color proofing equipment and materials with the latest state-of-the-art technology.

The Color Center will also be publishing the results of its studies on gray component replacement (GCR), undercolor removal (UCR) and unsharp masking (USM) during 1988 and 1989.

Additional color research and educational contributions include a Techno-Economic Forecast, No. 31, entitled "Color Press Systems Management: Market and Technological Influences, 1987-1992", and a new color reproduction reference book entitled "Color and Its Reproduction" by Gary G. Field. The Foundation also continues to offer educational workshops and seminars relating to color reproduction. The staff at GATF is looking forward to another year of graphic arts research and education in color and color reproduction. This objective will be accomplished under the leadership of GATF's new Executive Director, Ralph E. Kennickell, Jr., who has made a commitment to GATF and its membership for ... "a resurgence of research at GATF for now and the future."

Richard D. Warner, Chairman

COLOR MARKETING GROUP (CMG) 1988 ANNUAL REPORT

CMG has gone through 2 very exciting growth years, and a period of positive change under the leadership of Doris M. Cray as President. In 1986 CMG canceled its ISCC Member-Body status although it had been formed as a direct outgrowth of an ISCC Project Committee. In 1988 this decision was reversed by the CMG Board of Directors and an active delegation appointed to ISCC.

Within its purpose to "provide a forum for all phases of color marketing", CMG has been expanding its activities beyond its traditional annual CONSUMER and CONTRACT color palette forecast. Some important developments include:

TRACKING the success of the forecast by obtaining data, after the forecast year, from CMG members on the usefulness of the CMG forecast palette. This effort has given credence and direction to future CMG forecasts.

DESIGN & STYLING influences of color directions. With the growth of the individual membership to nearly 1,000, CMG designers and stylists are now also forecasting the major design influences for the future on a regular basis. A series of slides and descriptive information has been made available to the membership and has proved a valuable forecast tool.

COLOR EDUCATION has been directed to better educate the CMG membership in all aspects of color. A number of Saturday one-day educational seminars have been developed and are offered the day before each of the 2 national meetings each year. These seminars have proven extremely popular with over 150 members attending each session. An experimental **FASHION FORECAST** was done in August with "The Fashion Group" at the Fashion Institute of Technology in New York. The normal CMG group consensus approach was used with experienced CMG members serving as workshop captains. The final selections were notated visually using SCOT/MUNSELL samples and an immediate feedback and color forecast palette chart sent to the participants. The results were impressive and the process will most likely be repeated on an annual basis.

INTERNATIONAL expansion is being considered with the first step a closer affiliation with the U.K. which has modeled its activities on CMG.

In December 1988 CMG moved to new quarters from its traditional offices in downtown Washington, D.C. Their new address is:

Color Marketing Group
4001 North Ninth Street
Suite 101
Arlington, VA 22203

In early 1988 Everitt Call, who had been founding director of CMG, left the position. A search for a successor had begun several months before. The new Executive Director is Nancy A. Burns, CAE. She comes to the position with a great deal of professional experience in similar positions with other organizations. The change has gone smoothly and the continued growth of CMG confirms the vitality of the organization during this time of change.

In November the Board of Directors elected as their new President, for 2 years, Merritt Whitman Seyour, Director, Industrial Design, USG Interiors, Inc. The 1989 national meetings will be held in Atlanta, Georgia May 6-10 and in Scottsdale, Arizona September 23-27. Information on these meetings and other CMG activities is available from CMG national headquarters. *J. DeGross*

FABER BIRREN 1900-1988

Faber Birren, an ISCC member for many years and one of the nation's foremost consultants on color and its role in the human experience, died December 30, 1988, after suffering a stroke a week earlier. (The date given in the last ISCC News was in error, the fault of this writer.) He had been in robust health until about the time of his 88th birthday, September 21 last, when he had an aneurysm in his leg. He recovered well from the surgery required, but close friends say he became aware of a weakening heart.

Faber (as he was known to all) was born in Chicago, son of Joseph (a landscape painter born in Luxembourg) and Crescentia (a musician). His early training in art began at the School of the Art Institute of Chicago. A class on color taken at the University of Chicago sparked his interest in the subject. Conceding that he fell short on artistic talent, he became an industrial color consultant, though he continued to paint throughout his life; the paintings this writer has seen, four of which were published in the first of some 10 articles he wrote for *Color Research and Application*, featured geometric designs and emphasized color effects.

Faber set up shop in Chicago in 1929, starting an almost 60 year career in color. He moved to New York in 1936, and relocated to Stamford, Connecticut in 1949. He resided there until his death. His career was concentrated on three different aspects of color:

In color marketing research, Faber kept sales records of color trends in paints, wallpapers, textiles, plastics, home furnishings, and other building materials and consumer items. On the basis of these cumulative sales records and of market studies and retail sales tests, he made color usage predictions for industry. His contributions to the House & Garden Magazine in this area were well known and extended over many years.

Faber was also well known in the fields of environmental color and human response to color. Studying the visual, physiological, and psychological effects of color, he developed manuals of standard color practice for buildings and equipment for the U. S. Army, Navy, and Coast Guard, and for such businesses as DuPont, Monsanto, General Motors, and the Walt Disney Studios. He wrote color specifications for industrial plants, offices, schools, hospitals, and neuropsychiatric facilities here and abroad.

Faber was a prolific writer. He produced some 26 books on color, the latest, *The Symbolism of Color*, being published just months before his death. In addition, he wrote more than 260 articles, and edited and annotated the works on color of ten early colorists, some famous and some obscure, including Chevreul, Ostwald, Munsell, and Rood. ISCC News No. 317 contains a list of 12 of his books that are currently in print. His favorites among his books were *Color - A Survey in Words and Pictures* (1963) and *The History of Color in Painting* (1965, 1981).

Faber left two lasting legacies in addition to his writings. In 1981 he established the Faber Birren Collection of rare books on color at Yale University, where an entire room is devoted to the collection. It is considered the largest and most authoritative color library in America, and is probably the second largest in the world. Also in 1981, Faber endowed an award for original and creative expression with color, presented annually by the Stamford Art Association. The national competition for the Faber Birren Award is considered the only artistic event devoted exclusively to the use of color in the nation.

Many "hard" color scientists considered some of Faber's writing controversial, especially as it dealt with more subjective matters such as symbolism, mysticism, and physiological

response to color. They probably did not appreciate his writings on art, either. No matter. Each to his own tastes. The fact is that Faber was a dynamic, colorful character, who contributed a vast amount to the field of color. Undoubtedly, he did more to bring color to the attention of the public than any other person.

All who knew Faber well will sorely miss him. He told this writer last spring that he expected to live to be 100. Alas, he did not make it, but his spirit will surely still be around when he would have reached that age, and beyond.

Faber is survived by his wife Wanda, two daughters, and four grandchildren. A memorial service was held in Stamford on January 7. This writer and at least three other present or former ISCC members (Nadine Bertin, Raymond Spilman, and Margaret Walch) were in the large group attending.

Fred W. Billmeyer, Jr.

REMEMBERING FABER BIRREN

I met Faber Birren in the 1930s when we both worked in Chicago. Already he was using color in a functional yet decorative manner, both in offices and factory areas. I remember that R. R. Donnelley was one of his clients and that they thought well of his color plans for them. If anyone can be considered dean of color consultants in this century, it is he.

Birren was a pioneer in the development of paint color systems. In the late 1940s he designed one for the Bennett Companies in Salt Lake City. This appeared about the same time as the Nu-Hue Custom Color System by Martin Senour with Carl Foss.

Faber carefully studied color atlases and was one of the proponents of the Ostwald triangle as a simple organization of color space. His paper at the Symposium on the Ostwald System, published in the July, 1944 JOSA explains why. His main interest was in the human response to color, rather than measurement. Some persons think he didn't appreciate the merits of the Munsell System. This is nonsense; he simply thought Ostwald was better for some uses.

Birren was continually on the lookout for new attitudes towards color, sponsoring, promoting and writing about the work of artists and others who had a fresh approach. A few months before his death we were corresponding because of his recent article in *Color Research and Application*. His last letter to me was written a day or two before he became ill. It accompanied a copy of a book he had distributed to friends and colleagues some years ago and he was sending me his last copy.

The book is a compilation of paintings and explanations of the painter's feelings, by people who went wrong (*i.e.*, spent time in the cooler). I found it fascinating. The title of the book is *Right Brain People in a Left Brain World as expressed to Evelyn Virshup through art as therapy*, 1970. This illustrates Birren's continuing interest in and search for color truths.

I write this because I want to say something about a colleague I admired and to wonder how he managed to write some 26 books and 260 articles. Yet he believed that "color is like music, it requires no rational explanation". His place in the history of color is secure. *Walter C. Granville*

FROM THE PRESIDENT

I have been using this space to acquaint you with the individuals who keep the ISCC functioning smoothly. An organization the size of the Inter-Society Color Council that does not have any paid staff must rely on the time and expertise of a number of dedicated people. I believe from my own experience that the effort is more than repaid through working with interesting people and by the knowledge gained through those contacts.

One of the most time consuming and vital positions within the Council is Chairman of the Arrangements Committee. He or she is responsible to make all the arrangements necessary for the Annual Meetings, the Williamsburg Conferences, any special meetings the ISCC plans and the Board of Director's meetings. This means recommending sites and hotels; making all the necessary arrangements for rooms, for audio-visual equipment and for official meals; receiving and tabulating registrations; preparing name tags and material to be given out at the registration table; and seeing that the registration table is manned. The Arrangements Chairman also assists in preparing the budget for meetings.

The last Arrangements Chairman was Mr. Norman Burningham. He held the job four years, overseeing a number of very successful meetings. He always had the assistance of his gracious wife, Barbara, the two of them greeting us with a smile at the registration table. He gave sensible recommendations to the Board of Directors and submitted excellent records following each meeting. He has agreed to manage one more meeting, the Williamsburg Conference being held in Williamsburg on November 28 - December 1 of this year.

The new Arrangements Chairman is Mr. James Grady, who began working with Norm at the Baltimore meeting. Jim has already proved to be exceptionally capable and reliable. I count as one of my blessings this year that he agreed to become Arrangements Chairman and all of us can be confident that future meetings will run smoothly. Jim volunteers cheerfully and follows up efficiently. Since the work of the Arrangements Committee is growing each year Mr. James Cave, who has been an Annual Meeting chairman in the past, has agreed to assist and is assuming responsibility for major aspects of the meetings.

One of the major commitments of the Council is to oversee the selection and presentation of two major awards for accomplishments in color and one for outstanding service to the Council. The Godlove Award is awarded to recognize original contributions to color throughout a career. It was established in 1956 by Margaret N. Godlove in memory of her husband, Dr. I.H. Godlove.

The Godlove Award Committee has the responsibility to announce the award and to solicit nominations. Then it must evaluate the contributions of the candidates, seeking out additional information if necessary to assure that all the candidate's accomplishments are considered. This must be done in the strictest confidence. The chairwoman of the Godlove Committee in 1988 was Mrs. Linda Taylor with Dr. Jack Hsia, Mr. Charles Reilly, Mr. Ed Connor and Dr. Thomas Webber serving on the committee. The recipient of the 1989

award to be presented at the Chicago Annual Meeting is Dr. W. David Wright.

The Macbeth Award was established by Mr. Norman Macbeth, Jr. in the memory of his father, Mr. Norman Macbeth. It is awarded for a specific accomplishment in color. The Macbeth Award Committee is chaired by Mr. Charles Sherman and includes Dr. Fred W. Billmeyer, Jr., Professor Hilton Brown, Mr. Roland Connelly, Sr., and Dr. Danny Rich. They are soliciting nominations for the award now. It is important that names of outstanding individuals from different fields who are members, or former members, of the Council are placed before the committee. Forms will be included in a future issue of the *ISCC News* and can be obtained from members of the committee.

In 1980 the Nickerson Service Award was established to honor those who have given exceptional service to the ISCC and through the Council to the color community at large. The award is named in honor of Mrs. Dorothy Nickerson who worked for the Council from its beginning in the 1930's until her death in 1986. The Chairman of the Nickerson Service Award Committee in 1988 has been Dr. Paul Hoffenberg with Mr. Harry Hammond III, Mr. Edward Cairns, Mrs. Bonnie Bender and Dr. Nancy Jo Howard serving on the committee. The recipient of the 1989 Award is Mr. Walter Granville, who has contributed to the success of the Council since its earliest days and continues to be a guide to all of us. Mr. Harry Hammond has just been appointed chairman of this committee and suggestions for future candidates should be given to him.

The individual award committees described above come under the Awards Committee that is chaired by Dr. Stephen Bergen. Steve is in charge of the awards, seeing each year that they are suitably engraved and brought to the meeting for presentation. He also keeps an eye on the operations of the three committees responsible for selecting the award recipients and assists if necessary. *Joy Turner Luke*

A REMINDER TO VOTING DELEGATES

By now, a ballot for voting on the revised ISCC Constitution and By-Laws will have been sent to the Voting Delegates, for return to the Secretary not later than April 3. A return of two-thirds of the ballots is required for the vote to be official. This is a reminder to any Voting Delegates who have not yet responded that your vote is urgently needed. Please vote and return your ballot. The Board of Directors and the By-Laws Committee thank you for your cooperation.

Fred W. Billmeyer, Jr.

WORLD PRINT CONGRESS MAY 6-10, 1989 RIO DE JANEIRO-BRAZIL

THE 4TH WORLD PRINT CONGRESS (W.P.C.) is sponsored by the Brazilian Association of Printing Industries (Abigraf) and is organized by an International Committee. It will count on one thousand participants.

According to Mr. Peri Bomeisel, president of the National Committee, the Congress' focus is the opportunity given to the sector's practitioners to know other markets which will possibly supply future assistance in establishing their position.

Mr. Roy Takaham Ariga, president of the International Division and representative of the Japanese Federation of Printing Industry, believes that this event will stimulate the exchange among the advanced countries and the countries still in progress. For him, the Congress will be the generator of technological tendencies in the graphic arts field and in the development of human resources in this segment "because the graphic arts, in spite of the increasing automatization is still a lagging sector of manual work". Mr. Ariga believes that the panel about administration allied to the teamwork developed will be the event's culminating point.

The National Abigraf's president, Mr. Max Schrappe, alerted about the present situation of reforestation in Brazil: "The country is today a world-wide source of paper, pulp and paste-board". He cited Australia, where the period between the planting and the cutting of the eucalypt is eight years, but in Brazil, this process is realized in only four years, as a result of the country's climate.

Finally, Mr. Richard Uribe, W.P.C.'s general secretary, added that the event mainly aims to headline Latin America worldwide, besides presenting a balance of each country's needs. For the first time, the W.P.C. will congregate the presidents of all its 40 printing industry organizations which are spread all over the world. *A. Lorena*

1988 ANNUAL REPORT FROM THE HUNTER PROFESSOR AND THE MUNSELL LABORATORY

The 1988 Annual Report of the Rochester Institute of Technology (RIT) Richard S. Hunter Professor and the Munsell Color Science Laboratory was recently published. Some of its contents will be of interest to many ISCC readers, particularly the long term objectives in optical radiation measurements and appearance measurements.

The report was submitted by Roy Berns, the Hunter Professor and director of the Munsell Laboratory. In his overview, Berns noted that the Professorship and the Laboratory were both established just five years ago, thus a restatement of the goals and objectives of both endowed programs was in order. He stated that his primary objective continues to be the development of a strong educational program in color, including industrial education as well as academics. The theory of color measurement, colorant formulation, colorimetry applied to statistical process control, and oral and written communication skills are stressed.

NICKERSON-ISCC SERVICE AWARD TO WALTER GRANVILLE

It should come as no surprise that Walter Granville has been selected as the next recipient of the Nickerson Service Award. Walter has served the council for many years—wearing many different hats. He has been both an individual member and a delegate from the Optical Society and in 1946 he was the vice-chairman of the ASTM delegation. He served as a counselor from 1949-1950, as a director from 1954-1956. In 1956 he became the vice-president serving from 56-58. 1958-60 was his term as president and he continued to serve on the board from 1960 through 1962.

In addition to these administrative contributions, Walter has presented papers at annual meetings, among them, a paper on Dynamic Metamerism at the 31st annual meeting and in 1986 a paper on Color Harmony. As long ago as 1947, he worked as chairman of the re-constituted problem 7 subcommittee. This group completed its work, the results of which were published in 1956 by the National Paint, Varnish and Lacquer Association under the title "A survey of color specifications". With Mary Buckley, Walter was co-chair of Project #33 from 1982-84 and was chairman from 1986 till consolidation of this committee with committee #45 in 1987. Over the years, he has been a regular contributor to the ISCC News, including this issue, and has been a willing advisor to many of our members.

We have made no mention of his contributions to the field of color knowledge in general since this award is specifically for service to the council. It should be noted that Walter is an honorary member of the Council and it is most appropriate that his loyalty and service be recognized officially with the presentation of this award.

COLOR DIFFERENCE TOLERANCES

Difficult to Specify in Nonuniform Color Space

CIE x,y,z chromaticity space of 1931 was recognized from the beginning as being grossly nonuniform. Colorimetrists soon generated a variety of color equations that provided color spaces with improved uniformity, about 20 of them over a period of several decades. This profusion added to the difficulty of exchanging information on color difference because various material groups preferred different spaces. In 1976 the CIE recommended that the color community standardize on two spaces. One is generally used for surface colors, the other for light sources. The surface-color space is usually referred to as CIELAB and it has been adopted by ASTM and other groups almost universally. Its greatest shortcoming, however, is that it is still not perfectly uniform and this complicates the problem of specifying tolerances because the same tolerance cannot be

used throughout color space. Color experts, particularly in the textile field in the United Kingdom, have investigated possible solutions. They decided that instead of having to use different tolerances in different regions of color space, it would be much more convenient to have equations that could be used to modify the space so that the same tolerances would apply. This has now been accomplished to a satisfactory degree. The space has been designated CMC(1:c), an abbreviation of *Color Measurement Committee (lightness:chroma)*. The British Standards Institute (BSI), has published BS 6923, Method for Calculation of Small Color Differences, September 1988, based on this space. The concept permits use of the same size tolerances throughout color space. However, the user must specify the magnitude of the difference he is willing to accept. The magnitude of an acceptable tolerance depends in large measure on the application. For example, when two pieces of cloth are to be sewn together to make a garment the acceptable color difference is very small compared to two garments of the same color displayed on a rack. It should be pointed out that the equations on which BS6923 is based were developed from data on textiles. The assumption is made that the same equations should be applicable to other materials, but the validity of such an assumption must await field testing with specific materials such as paint, plastics, and paper. Copies of BS6923 can be obtained from Global Engineering, Suite 460, 1990 M Street N.W., Washington, D.C. 20036. Telephone (202) 429-2860.
Harry K. Hammond, III

NEWS FROM MEMBER BODIES

Gemological Institute of America (GIA)

On January 15, 1989 a luncheon was held to honor the GIA's historian Eunice Miles. The occasion of the luncheon was the establishment of the Eunice R. Miles Scholarship Fund at GIA. Mrs. Miles was the first woman gemologist in the GIA Gem Trade Laboratory thirty years ago. As one member said, "Without Eunice, we wouldn't be in gemology. She paved the way for all the women in this industry." Mrs. Miles, also a member of the ISCC, gave an interesting presentation at our Annual Meeting in New York. We would like to join with the GIA in recognizing her fine contributions.

The Eunice Miles Scholarship will be awarded on the basis of merit or prior achievement in gemology. Its purpose is to allow gemologists to engage in continuing research and to help defray expenses related to travel to international gem centers for study.

The GIA also wants to recognize chief gemologist John I. Koivulathe whose photographs are on display in EPCOT Center and in the 14th annual International Small World competition currently touring the country. Koivulathe, a specialist in micro-gemology and photomicrography, has developed several illumination techniques applicable to gemological microscopy. He is currently engaged in basic and applied research in GIA's Technical Development Department and has numerous publications in this field.

Society For Information Display (SID)

Eastern Display Workshop (EDW) sponsored by the Delaware Valley (Philadelphia Region) chapter of SID.

This EDW was held on January 11, 1989 at the Four Seasons Hotel in Philadelphia as a one day forum to review the state of the art in display technology and human factors engineering. The full day program featured eight invited speakers, each of whom spoke in their areas of expertise.

Larry Tannas (Tannas Electronics) discussed the (Recent Developments in Display Products and Technology in Japan), focussing on new display products and prototypes of emerging display technology featured at the Japan Electronics Show. Larry Weber (University of Illinois) reviewed *Advances in Plasma Display Technology*, particularly AC and DC plasma displays and the recent progress towards achieving grey-scale and color. Improvements in the design and fabrication of *TFT based LCDs and their Design for Video Applications* was detailed by Tom Credelle (General Electric), after which Richard Breslin (President, Drexel University), in his luncheon address, shared his vision of the role of the university in our increasingly technology oriented society, *As We Race Towards the 21st Century: The Importance of the Technological University*.

To kick off the afternoon session (Recent Advances in Electroluminescent Displays), Elliott Schlam (Sigmatron Nova) reviewed the current state of the art with particular attention to advances in multicolor displays. This was followed by a discussion of *The ANSI Standard for Visual Displays* by Harry Snyder (Virginia Polytechnic Institute and State University (VPISU)). Terry Scheffer (Tektronix) reviewed the state of the art in liquid crystal technology focussing on *Advances in Ferroelectric and Supertwist Displays*. To conclude the formal session, *A Review of Current CRT Developments* focussing on the major application fields of TV, computer displays, radar, and photo recording was presented by Peter Seats (Thompson Electron Tubes and Devices).

Following the invited addresses, six poster sessions were held: *Elastomeric Connectors Facilitate Innovative Display Packaging*, Dr. Leonard Buchoff, Elastomeric Technologies, Inc. *Evaluation of Two Pitch Ladder Formats for Recovery from Unusual Attitudes*, LtCdr John E. Deaton, et al., Naval Air Development Center *A Platform for the Human Factors Testing of Military Command and Control Graphics Subsystems*, Art Mansky, Vitro Corporation *Human Factors Display Design Guidelines for the Disabled*, John T. Ward, VPISUA *17 inch Diagonal Full-Color AC Plasma Video Monitor*, Abdul Rahman and Carol Wedding, Photonics Technologies. *Computer Imprint Technology for the Blind Using an Alternative to Braille: Elementary Imprint Assistance*, Elia V. Chepaitis, Ph.D., Fairfield University.

Although no formal set of proceedings was compiled, those interested in additional information, may make inquiries directly to individual presenters or to: Mr. Steven M. Filarsky, SID Delaware Valley Regional Director, Naval Air Development Center, Code 6021, Warminster, PA 18974.

SID continues to support chapter activities of this sort

which bring a variety of the latest developments in display technology to professionals who may not have the opportunity to attend the SID Annual Seminar, Symposium and Exhibition. Joann Taylor, SID

SID-89 To Focus On Display Applications As Well As Technology Advances

Display technology advances coupled with applications form the central focus for SID '89, the 1989 International Symposium, Seminar, and Exhibition for the Society for Information Display to be held May 15-19 at the beautiful Baltimore Inner Harbor Convention Center.

SID '89 will feature 19 technical sessions running concurrently on Tuesday, Wednesday, and Thursday (May 16-18); the largest exhibit of display manufacturers in SID's history (143 booths); and a two-day seminar of tutorials by technology leaders on Monday and Friday of the conference week (May 15 and 19).

Monday's seminar topics are: Display Industry Status Update (Lawrence E. Tannas, Jr., Tannas Electronics); Page-Description Languages for Displays and Printers (Thomas Baffico, Adobe Systems); CRT: Present and Future (Peter Barten, Barten Consultancy); Thin-film Electroluminescent Displays (Runar Tornqvist, Lohja Corp.); Plasma Displays (Larry F. Wever, University of Illinois); The Comparison of Colored Images Reproduced by Different Media (Milton Pearson, RIT Research Corp.); and Color Hard Copy (Ross N. Mills, IBM Corp.)

Friday's topics are: Visual Information Display Based on Biological Image Primitives (John G. Daugman, Harvard University); Display Measurements (Robert J. Beaton, VPI & SU); Active-Matrix Displays (Shinji Morozumi, Seiko Epson Corp.); Overview of Workstation Technology (Paul T. Breen, The MITRE Corp.); and LCDs with High Information Content (Bernhard Scheuble, Merck Japan).

There will be two keynote speakers: John E. Mahoney of GE Medical Systems will explore "Techniques for Medical Imaging" and Ancile Malden of IBM Systems Integration Division will talk about an "Advanced Automation System Common Console Workstation" that the FAA is developing to improve the performance and productivity of air traffic controllers.

At the annual SID luncheon on May 17, NASA Astronaut Maj. Kevin P. Chilton will speak about the space program.

Technical Sessions distributed over Tuesday, Wednesday and Thursday will feature papers on such topics as Printers and Scanners, Human Factors, Display measurement, Cathode-ray tubes, Workstations, Emissive flat panels, Large-screen displays and Nonemissive displays and many more.

Off-the-record informal panel discussions have been scheduled for Tuesday evening (May 16).

Programs, containing advance registration and hotel reservation forms, will be mailed to all *Information Display* subscribers at the beginning of March. The advance registration fee for the Symposium is \$120 for SID members and \$165 for nonmembers and includes a copy of the *Digest of Technical*

Papers. (The nonmember fee includes U.S. or Canadian SID membership through April 30, 1990—overseas membership is an additional \$20.) The fee for the Seminar is \$225 for both days and includes a bound set of *Seminar Lecture Notes*. Special event tickets are \$40 each; tickets to the annual SID luncheon are \$25. May 1 is the advance registration deadline.

Information on registration may be obtained from Palisades Institute for Research Services, Inc., 201 varick Street, New York, NY 10014, (212)620-3388.

SID News Release

Japan Display 89

The Society for Information Display and the Institute of Television Engineers of Japan will hold the 9th International Display Research Conference, *Japan Display 89*, October 16-18, 1989 at the Kyoto Park Hotel, Kyoto, Japan. Original papers are being solicited in, but are not restricted to, the following areas of interest: CRT displays, emissive and nonemissive flat panels, large area displays, image input devices, image storage, printers/hard copy, image processing, human factors, display concepts and fundamentals, as well as related materials and technologies.

Both an abstract and technical summary of 4 pages (maximum) detailing the work must be submitted for the committee's consideration not later than June 9, 1989. To obtain a copy of the Call for Papers which details Abstract and Technical Summary submission requirements, contact: Secretariat of JAPAN DISPLAY 89, c/o Japan Convention Services, Inc., Nippon Press Center Bldg., 2-2-1 Uchisaiwai-cho, Chiyoda-ku, Tokyo 100, Japan.

A limited number of post-deadline papers for oral or poster presentations, which detail important new developments, will also be considered.

Limited financial assistance for travel, which must be requested at the time of abstract/technical summary submission, is available to student authors of accepted papers.

The 1989 Japan Electronics Show, will be held just after this meeting on October 19-24, 1989 in Osaka.

Technical Association of the Graphic Arts (TAGA)

The 41st Annual Conference of TAGA will be held a month earlier than usual this year. Normally scheduled for the first week in May, the 1989 conference will be held April 2-5 at the Crowne Plaza Holiday Inn in Orlando, FL. This early April date should attract many "snowbirds" from the rest of the country who have had their fill of snow and cold winter weather to the sunny clime of Florida. Local conference chairman is Bud Pedley, President of Lanman Lithotech, Orlando, FL, and President of the newly formed Hell User Group. Papers Chairman is Donald R. Voas of Jame River Corp., Nenah, WI, and TAGA Technical Papers Vice-President. TAGA President is Frederick T. Dankert of Flint Ink Corp. in Lodi, NJ.

The conference will consist of a welcome reception on Sunday evening April 2; Monday, April 3, two technical papers sessions, an Ink, Paper, and Press Workshop, Student and

Foreign Guest Receptions; Tuesday, April 4, a Color Workshop, two technical papers sessions, award for best student paper, a reception and Honors Banquet; Wednesday, April 5, Electronic Prepress Workshop, and technical papers session. This year's "Call for Papers" exploded with the submission of 55 papers but to avoid concurrent sessions 48 papers have been selected for presentation. Twelve of these are from overseas from authors in England, Finland, France, Holland, Japan, Thailand, and West Germany. The papers have been divided into five categories: Color Measurement, Tone Reproduction, Prepress/Process Control, Process Control and Plate, and Process Control/Press/Materials. In addition, there will be a panel discussion on Issues in Office Systems and Graphic Arts Inter-connectivity. The panel will consist of three members and the session will be moderated by David Q. McDowell, Eastman Kodak and TAGA Executive Vice President.

Prominent authors presenting papers include: John Bobalek, Western Michigan University; Dudley Boden, Macbeth; John DeGrace, PAPRI, Canada; Patrice and Dr. S. Tom Dunn, Dunn Technology; Irving Pobboravsky and Milton Pearson, RIT Research Corp.; Chester Daniels, RIT T & E Center; Zenon Elyjiw, RIT; Dr. Tom Fadner, Shem Chou, Rockwell International; Gary Field, Cal Poly; Dr. Richard Fisch, James R. Huntsman, Alice Mentzer, and John Souter, 3M Company; Ray Prince, Anthony Stanton, David Crouse, GATF; Yigal Gur, Gurlab; Roy Hensel, John MacPhee, Baldwin Technology; Robert Bassemir, Sun Chemical; John P. Sweeney, X-Rite; Anthony Johnson, Crosfield, England; Bryan Sunderland, PIRA, England; Simo Karttunen and Tapio Lehtonen, Technical University, Finland; P. Piette and J. F. Lafaye, Domaine University, Grenoble, France; Flip Wester, Reptest, Holland; Dr. Arthur Rettberg, M.A.N.-Roland and Dr. Gerhard Fischer, DuPont, West Germany; Kazuo Sayanagi, Shaken, Japan; Patchanee Malikhao, Chulalongkorn University, Bangkok, Thailand.

A tentative program and compilation of the abstracts of the papers submitted will be distributed by TAGA in time for prospective attendees to evaluate the program and make arrangements for attending the conference.

TAGA is an international association of graphic arts professionals and technical specialists with corporate members which meets annually in formal papers sessions to report on and discuss new developments and technology that past, present or future impact the graphic arts industry. All the papers presented at the conferences are published in the annual TAGA Proceedings which are recognized world-wide as the most important and comprehensive literature sources on graphic arts technology. For more information on the annual conference, program and fees, membership and Proceedings, contact Karen Lawrence at TAGA, P.O. Box 9887, Rochester, NY 14623; telephone (716) 272-0557; FAX (716) 475-2250.

Detroit Color Council (DCC)

One of the highlights of recent years for the DCC will be the fall, 1989 program featuring Carlton Wagner, Director of the Wagner Institute for Color Research. The Institute specializes in gathering scientific information about human response to color. Wagner is internationally known for his unique, multi-disciplinary expertise in the use of color and its effect on people. Wagner taught psychology and maintained a clinical practitioner before turning his attention to color response. For more information on the September 28, 1989 program call Bill Longley, (313)337-5234.

The Spring DCC symposium will focus on automotive refinish May 10 at the Michigan State University Management Center. A panel of speakers will address the issue of color matching, coating quality and environmental concerns for repairing and refinishing vehicles. Moderator Dick Sproul of DuPont will direct a program featuring Terry Chambers, PPG; Bob Latham, BASF; and Jim Marquart, Sherwin Williams. Symposium chairman is James Keiser, (313)583-8345.
Bill Longley

NEWS FROM OTHER ORGANIZATIONS

National Computer Graphics Association (NCGA) NCGA 89

The NCGA will hold its Tenth Annual Conference and Exposition dedicated to Computer Graphics Applications, April 17-20, 1989 at the Philadelphia Civic Center, Philadelphia, PA.

The conference is aimed at meeting the needs of computer graphics users in a wide range of application areas. The meeting is organized into eighteen tracks, each of which is conducted by leading industry experts. Since color and color applications are so pervasive in most areas of computer graphics, the color community will find a wide range of available topics of interest. In particular, sessions on Aerospace and Military Graphics, The Art of Desktop Graphics for Presentation and Print, Biomedical Applications, CADD/CAM/CAE/CIM, Human Factors and Window Management, Information and Presentation Graphics, and Scientific Visualization and Technical Graphics will each have a variety of presentations, tutorials and panel sessions that are designed for participants ranging from the beginner to the expert.

To obtain a copy of the Preliminary Program and additional information, contact NCGA 89, National Computer Graphics Association, 2722 Merrilee Drive, Suite 200, Fairfax, VA 22031 or call Toll free 1-800-255-NCGA THE COLOUR GROUP.

The 219th meeting of the Colour Group was held jointly with the Optical Group of the Institute of Physics on October 5, 1989 at Imperial College, London. The topic was Developments in Optical Instrumentation. P. Knight of Balzers High Vacuum Ltd. presented a paper entitled "New products and applications in the field of optical thin film technology." Thin film *products* were highlighted, rather than a detailed description of the techniques used in thin film production. The main areas covered were instrumentation, printing, displays and the

lighting industry. A second talk was presented by Kevin Lindsey of the National Physical Laboratory. It was entitled "Trends in the production of optical elements." Kevin Lindsey made it quite apparent that optical component manufacture is changing rapidly. Higher accuracy and cheaper production together with new materials and methods leads optics into a new and exciting future.

The Newton Medal Dinner 1989 was held February 15, 1989 at City University, London, England. W. N. Sproson is the recipient of the Newton Medal for 1989. After the presentation of the medal, Mr. Sproson delivered a lecture entitled Colour Television. In his lecture he described the development of compatible colour television. The quality of colour television is assessed from a colorimetric point of view, and future trends to new systems with appreciably better definition were outlined.

On April 5, 1989 in conjunction with the UV Spectrometry group with the Institute of Physics Optical and Spectroscopy Groups, the Colour Group will present a one day meeting on Reflectance Measurement: Basic concepts, developments and uses at the National Physical Laboratory, Teddington, Middlesex, England.

Corm 1990 Meeting

The 1990 CORM annual meeting will be held in Rochester, New York at the Rochester Institute of Technology's Center for Imaging Science. Plans for the two and a half day conference focus on two main topics: spectrophotometry/colorimetry and radiometry/spectroradiometry. Included in the conference will be a tour of the RIT Munsell Color Science Laboratory's standards facility as well as other activities to be announced later. The co-chairmen of this conference are Roy S. Berns of the Munsell Color Science Laboratory and Philip Wychorski of the Eastman Kodak Company.

COLOR RESEARCH AND APPLICATION IN THIS ISSUE April, 1989

Color as a component of perhaps the most important sense, vision, has been of interest to philosophers for a very long time. The question of what color is and if it is anything other than a brain event touches on the larger question of the relationship of brain and mind. In *Reduction in Visual Science: A Philosopher's View* C.L. Hardin discusses three arguments claimed to show color to be more than a brain event and concludes that they are defective.

Better and more fundamental classification of colors is a requirement for a clearer phenomenological description of color, the need for which is described by Hardin in the previous article. A novel technique to contribute to this subject has been used by Hsu and Wei. In *Classification of Colors through Fuzzy Statistical Experiment* they describe the technique and results obtained with it.

The NCS Color Order system is based on the assumption of an innate ability to phenomenologically describe colors in terms of up to four of six fundamentals. In the past it has been

analyzed in terms of the CIE and the Munsell systems. Nayatani and co-workers have now analyzed it in terms of their nonlinear color-appearance model. As described in the article *Analysis of the NCS Color Order System by using a Nonlinear Color Appearance Model*, they conclude that it is of value for the study of color appearance of object colors.

What do people mean when they use color terms or color-related terms in their conversations or writings? Is there a congruence of meaning when terms are used by technical experts and by more casual users? This question has been investigated for the case of architects in England by using a multiple sorting task method. The investigators O'Connor, Whitfield and Wiltshire, present their findings in *Architect's Colour Terminology: Is There Order?*. Rolf Kuehni, Editor

IN THIS ISSUE June, 1989

The question of the wiring of the human visual system is a complex and perplexing one. Direct evidence by neurophysiological methods is very difficult to obtain. Psychophysical methods are therefore also being used to supply data that can then be analyzed and explained in terms of a particular wiring theory. Such an effort is described by Haruo Hibino and Tadasu Oyama in their article *Chromatic Adaption at the Minimally Distinct Border and Brightness Matching in Colors Normals and Deuteranopes*.

Color matching functions are fingerprints of the workings of our individual color vision systems. Statistical averages in the form of the 2 degree and the 10 degree observer represent the color normal population and are one of the fundamentals of the CIE system of colorimetry. Modern electro-optical technology has produced new possibilities for evaluating color matching functions rapidly and accurately. A suitable apparatus using lasers was built at the Munsell Color Science Laboratory and Mark Fairchild describes its operation and early results in *A Novel Method for Determining Color Matching Functions*.

One of the perennial arguments concerning CIE D illuminants is the absence of an artificial source to represent them accurately. This continues to be a field of considerable research effort. Heinz Terstiege addressed this subject in his Franc Grum Memorial Lecture at the 1988 CORM Conference. In his *Artificial Daylight for Measurement of Optical Properties of Materials* he makes his insights available to a wider audience.

Color-difference evaluation continues to be one of the most important technical applications of color science. While considerable advance has been made in this field since the recommendation in 1976 by the CIELAB and CIELUV formulas much remains to be done. In particular, an extensive, accurate, reliable, uniform set of visual color difference data is missing. Efforts to weight CIELAB dimensions to make the formula more reliable have made use of a large number of visual studies determined under a wide variety of conditions. David Alman and his co-authors, using a methodology not previously used, have begun to assemble such a uniform data set. They report on the methodology and initial results in *Performance Testing of Color-Difference Metrics Using a Color Tolerance Dataset*.

There are a number of color vision models that have been proposed to represent the operation of the human color vision system. For such a model to be taken seriously it has to have the ability to predict the results of any kind of psychophysical experiment. One of these models was proposed in 1971 by MacLeod and Boynton. Glenn Fry discusses this model and some perceived shortcomings in *Color Vision Model of MacLeod and Boynton* and the original authors reply. Rolf G. Kuehni

HELP! HELP! HELP!

In order to make his presentation at the Fall Williamsburg conference most meaningful, Rolf Kuehni needs your input through the return of a completed questionnaire. A questionnaire form is enclosed with this issue. Please complete and return as soon as possible. We all thank you for your assistance.

Bonnie K. Swenholt

CALENDAR

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

Harry K. Hammond, III
Pacific Scientific Instrument Division
2431 Linden Lane
Silver Spring, MD 20901
(301) 495-7046

1989

ISCC ANNUAL MEETING, Apr. 9-12
Ambassador West Hotel, Chicago, Illinois.
Information: Joy Luke, (703) 987-8386.

COLOR MARKETING GROUP SPRING MEETING, May 6-10
Westin Peachtree Plaza, Atlanta, Georgia.
Information: Nancy Burns, (703) 528-7666.

AATCC NAT'L COMMITTEE MEETINGS, May 9-11
AATCC Technical Center, Research Triangle Park, North Carolina.
Information: Jerry Tew, (919) 549-8141.

DCC SYMPOSIUM ON AUTOMOTIVE REFINISH, May 10

Detroit Colour Council, Michigan State University Management Center, Troy, MI.

Information: James Keiser, (313) 583-8345.

ASTM COMMITTEE E-12 ON APPEARANCE, May 15-16

National Institute of Standards and Technology, Gaithersburg, Maryland.

Information: Sharon Kauffman, (215) 299-5599.

SID INTERNATIONAL SYMPOSIUM, May 15-19

Society for Information Display Symposium, Seminar, and Exhibition, Baltimore Convention Center, Baltimore, Maryland.

Information: Jay Morreale, (212) 620-3371.

FSCT - FEDERATION SPRING WEEK, May 16-19

Seminar on 16th & 17th, Society Officers' meeting on 18th, and Board of Directors' meeting on 19th.

Airport Marriot Hotel, Los Angeles, California.

Information: (215) 545-1506.

CORM ANNUAL MEETING, May 17-19

National Institute of Standards and Technology, Gaithersburg, Maryland

Information: Norbert Johnson, (612) 733-5939.

GATF INTERNATIONAL CONGRESS, May 17-19

Graphic Arts Technical Foundation, Westin William Penn Hotel, Pittsburgh, Pennsylvania.

Information: William H. Smith, Special Programs Department, GATF, 4615 Forbes Ave., Pittsburgh, Pennsylvania 15213-3796, (412) 621-6941
Telex: 866412, Cable: GAFTWORLD.

COLORIMETRY SHORT COURSE, May 23-26

Munsell Color Science Lab, Rochester Institute of Technology Rochester, New York 14623-0887.

Information & Registration: Barbara Capierso, (716) 475-5842.

OSA TOPICAL MEETING ON IMAGE UNDERSTANDING AND MACHINE VISION, June 12-14

North Falmouth, Cape Cod, Massachusetts.

Information: Optical Society of America, 1816 Jefferson Place, N.W., Washington, D.C. 20036. (202) 223-0920.

ASTM COMMITTEE D-1 ON PAINT, June 25-28

St. Louis, Missouri.

Information: David Bradley, (215) 299-5504.

OSA TOPICAL MEETING ON APPLIED VISION, July 12-14

San Francisco, California.

Information: Optical Society of America, 1816 Jefferson Place, N.W., Washington, D.C. 20036. (202) 223-0920.

WORK WITH DISPLAY UNITS, Sept. 11-14

Second International Scientific Conference

Queen Elizabeth Hotel, Montreal, Canada.

Information: Diane Berthelette, (514) 288-1551.

ROYAL PHOTOGRAPHIC SOCIETY, Sept. 18-22

Symposium on the Quantification of Images,

Clare College, University of Cambridge.

Information: Dr. M. R. Pointer, Kodak Ltd, Harrow Middlesex, HA1 4TY England, Tel. 01 427 4380.

COLOR MARKETING GROUP FALL MEETING, Sep. 23-27

The Phoenician, Scottsdale, Arizona.

Information: Nancy Burns, (703)528-7666.

DCC - HUMAN RESPONSE TO COLOR, Sep. 28

Detroit Colour Council; Carlton Wagner, Director, Wagner Institute for Color Research.

Information: William Longley, (313) 337-5234.

CIE INTERIM MEETING, Oct. 2-3

Information: Dr. J. D. Schanda, Central Bureau, A-1030

Vienna, Kegelgasse 27 Austria, or Dr. Jack Hsia, (301) 975-2342.

SYMPOSIUM ON DAYLIGHT AND SOLAR RADIATION MEASUREMENT, OCT. 9-11

Technische Universitat Berlin (West), Germany.

Information: Herr Prof. Dr. H.Kaase, Institut fur Lichttechnik der Technischen Universitat Berlin, Einsteinufer 19, D-1000 Berlin 10 GERMANY. (030) 314 224 01.

OPTICS 89, Oct. 15-20

Optical Society of America Annual Meeting, Orlando, Florida.

Information: OSA, 1816 Jefferson Place, N.W., Washington, D.C. 20036. (202) 223-0920.

USNC/CIE ANNUAL MEETING, Oct. 29-31

U. S. National Committee of the CIE, Hyatt San Jose, 1740 N. 1st St., San Jose, California.

Information: Jack Hsia, (301) 975-2342.

FSCT, Nov. 8-10

Federation of Societies for Coating Technology 67th Annual Meeting and 54th Paint Industries' Show, The Rivergate, New Orleans, Louisiana. Information: (215) 545-1506.

AATCC NAT'L COMMITTEE MEETING, Nov. 14-16

The Doral Inn, New York, New York

Information: Jerry Tew, (919) 549-8141.

ISCC WILLIAMSBURG CONFERENCE, Nov. 28-Dec. 1

"Color Discrimination Psychophysics", Colonial Williamsburg, Virginia.

Information: Dr. Roy Berns, (716) 475-2784.

ISO/TC 187 COLOR ORDER SYSTEMS, Dec. 4-6

Baltimore, Maryland. Information: Nick Hale, (301) 472-4850.

1990**ASTM E-12 ON APPEARANCE, Jan. 21-24**

Embassy Suites Hotel, Fr. Lauderdale South, Florida.

Information: Sharon Kauffman, (215) 299-5599.

ASTM COMMITTEE D-1 ON PAINT, Jan 21-25

Embassy Suites Hotel, Ft. Lauderdale South, Florida.

Information: David Bradley, (215) 299-5504.

ASTM COMMITTEE D-1 ON PAINT, June 17-20

San Francisco, California.

Information: David Bradley, (215) 299-5504.

OSA ANNUAL MEETING '90, Nov. 4-9

Boston, Massachusetts.

Information: Optical Society of America, 1816 Jefferson Place, N.W., Washington, D.C. 20036. (202) 223-0920.

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American Chemical Society (ACS)
American College of Prosthodontists (ACP)
American Psychological Association (APA)
American Society for Testing and Materials (ASTM)
American Society of Interior Designers (ASID)
American Society for Photogrammetry and Remote Sensing (ASPRS)
The Color Association of the United States, Inc. (CAUS)
Color Marketing Group (CMG)
Detroit Color Council (DCC)
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Graphic Arts Technical Foundation (GATF)
Illuminating Engineering Society (IES)
National Artists Equity Association (NAEA)
National Association of Printing Ink Manufacturers (NAPIM)
National Paint and Coatings Association, Inc.(NPCA)
Optical Society of America (OSA)
Society for Information Display (SID)
Society of Motion Picture and Television Engineers (SMPTE)
Society for Imaging Science and Technology (SIST)
Technical Association of the Graphic Arts (TAGA)
Technical Association of the Pulp and Paper Industry (TAPPI)

1989 COLOR DIFFERENCE QUESTIONNAIRE

1. What is (are) your application(s) of color-difference formulas?

(Mark as many as appropriate)

Quality control

Shade sorting

Computer color matching

Other: _____

2. What formula(s) are you using? (Mark as many as applicable)

CIELAB

CMC

Hunter Lab

Other: _____

FMC2

3. Where are you employed?

Colorant producer

Paint, Plastics

Paper

Textiles

Academia

Food, Cosmetics

Other: _____

Return as soon as possible to:

Rolf G. Kuehni
Mobay Corporation
P.O. Drawer 2855
Rock Hill, SC 29731

YOUR HELP IS APPRECIATED!

