

Inter-Society Color Council *News*



Number 361

May/June

1996

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THE PAST AND THE FUTURE

As the annual meeting time rolls around this May, it marks the change of administration within the Inter-Society Color Council that happens biannually. I am honored to be allowed to step into the position of president following a long line of people dedicated to the field of color. Founded in 1931, the same year as the CIE Standard Observer was born, the ISCC was first led by the chairman, E. N. Gathercoal, followed by A. E. O. Munsell. It was not until 1952, that the ISCC had its first president, E. I. Stearns. Now in the sixty-fifth year of the ISCC, we continue to evolve and change to meet the interests and needs of our members. At this point we are looking at our own rich heritage and preparing for the future, as well as our officers changing and the annual refreshment to the board of directors, we have new increased communication channels.

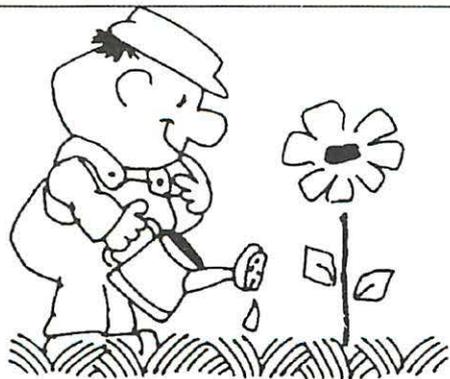
To appreciate and preserve our past, we have formed a historical committee. Joy Turner Luke and Harry K. Hammond have agreed to co-chair this new activity. In order to preserve our past, they are looking into color collections at museums, and saving or reconstructing information about past activities. To serve the needs and trends of the future (office is open), we are adding fax capabilities, a web page, and an e-mail contact point. In future newsletters you will be hearing more about all these activities.

I want to congratulate the officers completing their terms: Paula Alessi, Roland Connelly, and Dan Walton. The office of the treasurer is a quiet and thankless task, but very essential as everyone knows. However, I doubt that many who have not served in this capacity realize how much is involved. We thank Dan for his good service in carrying on the duties of the office of Treasurer.

Paula has completed the six year commitment of the cycle as president-elect, president, and past-president. She has served in all these capacities very ably, and I must admit she has taught me all that I know about these jobs so far. She continues to serve the color community as a member of the AIC Executive Committee, but as you will see later, a past-president does not stop there, and I hope she will continue her dedicated support of the ISCC.

Roland has been active in the color community for many years, and he has held a special vision for the ISCC. I'm not sure exactly when it began, but I know he developed the working plan during his term as president-elect, and that the

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vision has become a reality as he completes his presidential term. That vision was to have a permanent place for the ISCC, an office employing a manager so that the ISCC would have an address that did not change with every change in administration, a phone that anyone could call to get a question answered about the ISCC or its activities, a common location to send and receive materials. He has worked dilligently on that vision, and, now after many stages, it has become a reality. I will give you more about the ISCC office below, but first I want to say that we have not heard the last of Roland, because he moves on to the less visible but still very active office of Past-President where he will continue his dream of what the ISCC should become.

Michael Brill is no newcomer to color, as witnessed by the ISCC presenting to him the Macbeth Award at this annual meeting (read more about this in future newsletters). However, also this May he takes another step by beginning that six year commitment of service to the ISCC through the presidential cycle. Within the ISCC he has co-chaired the first Pan-Chromatic Conference in 1995, served on the board of directors, and co-chaired Interest Group I. To all these activities he has brought the insight and dedication necessary to make the events successful. I am very pleased that he is now President-Elect.

As I wrote earlier past-presidents don't just fade away. Hugh Fairman is an example of this. As everyone knows, he was a recent past-president. Now he has been elected to the position of Treasurer. I am sure that he goes into this job fully aware of the formidable task which he undertakes, since he was vice-chair of the Finance Committee for several years. I am equally confident that he will serve well in this position.

We cannot leave the officers without mentioning the fine work of Danny Rich. He needs no introduction as he begins his fourth two-year term as Secretary. He is the person who keeps the communications going, keeps track of the activities during the board

meetings, fills literature request, and countless other correspondence. If you want to know what is happening, ask Danny. Now he undertakes an addltional duty. It is also under his office, though from a distance, that the new ISCC office will operate.

Let me close this column by introducing one more new person, Cynthia Sturke. Cynthia is the new ISCC Office manager. She is the real person that you will speak to if you call 703/318-0263, the ISCC Office. Cynthia has broad office experience, most recently at Hunter Associates Laboratory. For about half of 1995, Jay Powell was the Office secretary, however she had the special challenge of taking care of the office remotely, from home. We hope the system now in place will prove more efficient and reliable for responding to your queries. The posted office hours are 9AM - 12 noon, Monday through Thursday, although Cynthia might be there other times also, and when she is not there... the dreaded answering machine is. At the writing of this column the FAX machine is not there, it will be shortly, perhaps by the time you read this. The ISCC FAX number is 703/318-0514. We sincerely hope that the long waits for returned calls will be a thing of the past. Call and say "Hi" to Cynthia.

Ellen C. Carter
President
ISCC

THE INTER-SOCIETY COLOR COUNCIL

THE HISTORY

Did you ever wonder how the ISCC started? I did!

Going through the old ISCC news I came across the following article. This brief history about ISCC is intended for the old members as well as the new ones, for those of you who wants to know its historical background, its aims

and purposes, and its accomplishments. This was originally prepared by W. J. Kiernan of Bell Labs, Murray Hill, NJ and appeared first in ISCC Newsletter No:173, Sept-Dec. 1964. It was revised by Fred Billmeyer, then the secretary of ISCC, and appeared in the Newsletter in August 1970. Fred in 1970 was a distinguished professor at Rensselaer Polytechnic Institute.

The Inter-Society Color Council was incorporated in 1931 in the State of New York and is subject to the laws of the State of New York.

AIMS AND PURPOSE

The aims and purpose of ISCC are:

A. To stimulate and coordinate the work being carried out by the various members leading to the uniformity of description and specification of color by these members.

B. To promote the practical application of this work to color problems arising on science, art, and industry, for the benefit of the public at large.

C. To promote communication between technically oriented specialists in color and creative workers in art, design, and education, so as to facilitate more effective use of color by the public through dissemination of information about color in both scientific and artistic applications.

D. To promote educational activities and the interchange of ideas on the subjects of color and appearance among its members and the public generally.

E. To cooperate with other organizations, both public and private, to accomplish these objectives for the direct and indirect enjoyment and benefit of the public at large.

MEMBERSHIP

Membership in the Council shall be of six classes, namely:

A. Member-Bodies

- B. Individual Members
- C. Sustaining Members
- D. Honorary Members
- E. Student Members
- F. Retired Members

A. **MEMBER-BODIES:** Any non-profit society, association or organization of national scope, interested in color and desirous of participating in the activities of the Council for the furtherance of its aims and purposes as set forth in Article II of the Constitution, shall be eligible for membership as a Member-Body. Each Member-Body shall appoint at least three (3) but not more than ten (10) delegates who shall represent that Member-Body in the Council. Three of these delegates shall be designated by the Member-Body as voting delegates. In no case, however, shall the same person be designated, at a given time, a voting delegate of more than one Member-Body.

A specific duty of the delegates is to bring to the attention of the Council any problems in the field of color that are of particular interest to their Member-Body. At this time there are 22 Member-Bodies, their names are listed on the last page of the ISCC NEWS.

B. **INDIVIDUAL MEMBER GROUP:** The Council also provides for membership of individuals who desire to support the work of the Council on color. Individual, Honorary, Student, and Retired members of the Council shall collectively form one Member-Body, designated the Individual Member Group (IMG). This group shall have all the rights, privileges, and duties of Member-Bodies, but shall not pay Member-Body dues to the Council.

C. **SUSTAINING MEMBERS :** The By-Laws of the Council provide that any person or corporation, or society, association, organization, interested in color and desirous of participating in the activities of the Council for furtherance of its aims and purposes as set forth in Article II of the Constitution, shall be eligible for membership as a

sustaining member. The names of the Sustaining Members are listed on the last page of the ISCC NEWS.

D. **HONORARY MEMBERS:** Any person who, as a council member, has rendered signal service to the Council or to those fields served by the individual Member-Bodies of the Council, in such manner as to aid in accomplishing the objectives of the Council, shall be eligible for Honorary membership. There are 47 Honorary Members of the Council; their names are listed in the membership directory.

E. **STUDENT MEMBERS:** Any person who is a junior, senior, or graduate student registered in a college or university of recognized standing and is interested in color and desirous of participating in the activities of the Council for the furtherance of its aims and purposes as set forth in Article II of the Constitution shall be eligible for student membership. This eligibility shall cease when the student leaves the college or university, at which time the student member will be encouraged to apply for individual membership in the Council.

F. **RETIRED MEMBERS:** Any individual member of the council who retires from active employment related to color may, upon application to the Secretary, request change in membership status to that of retired member.

MILESTONES IN COUNCIL HISTORY

The ISCC had its beginnings in a "color conference" held in Washington D.C., May 14, 1930. This color conference was called by Prof. E. N. Gathercoal of the University of Illinois College of Pharmacy in connection with the decennial meeting of the National Formulary 1929 Revision Committee of the U.S. Pharmacopoeia. This committee needed help in the selection of color names for describing drugs and drug products in the U.S. Pharmacopoeia. This "color conference" aroused so much interest

that the Executive Committee of the Optical Society of America adopted a resolution on October 30, 1930 that "the need for better organization of those interested in the description or specification of color which found expression at the color conference... can be met by the formation of a joint council consisting of officially designated representatives of the several national societies and associations interested in the description and specification of color." On February 26, 1931 at the Museum Science and Industry in New York City, forty-seven persons — thirty-one of them representing fourteen national associations and sixteen of them interested individuals — met in a preliminary conference to discuss this resolution. Chairman of the first reorganization committee was Royal Bailey Farnum. Lloyd A. Jones chaired the next sessions until the election of the first Inter-Society Color Council Chairman, Prof. E. N. Gathercoal. The decision was made to form the Inter-Society Color Council at the first meeting held at the Museum of Science Industry in New York City, September 21, 1931.

The preliminary conference of organization of an inter-society committee on color specification, held on February 26, 1931, preceding the first meeting of the Inter-Society Color Council, passed as its first resolution the principle of membership:

Resolved: It is the sense of the meeting that an Inter-Society Color Council be formed composed of delegates from national societies and associations interested in the standardization, description and specification of color.

The first meeting, held on September 21, 1931, recommended expansion of the membership provisions to include individuals vitally interested in the activities of the Council who may not be designated as delegates by the affiliated societies or associations. It should be noted that the principles of membership adopted in 1931 still hold today. At the fourth annual meeting on

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February 21, 1935, articles of organization and procedures were adopted. At that time there were nine member-bodies with 30 official delegates.

Another milestone in Council history was passed on October 14, 1953, when the Inter-Society Color Council was incorporated. The incorporation and the adoption of By-Laws did not change the primary objectives of the Council. Equipped with sound principles of organization, an imposing list of unsolved color problems, committees taking aggressive action on problems of terminology, specification, and measurement, and an established Newsletter publication, the Council could be considered to have come of age.

In 1961 the By-Laws were revised in keeping with the requirements of a growing national organization. It should be noted that the By-Laws are in essence supplemented by a statement from a 1944 Report of an Executive Committee covering the Inter-Society Color Council organization and functions as revised in 1954. The purpose of this statement was to review the procedures which had been developed during the operation of the Council since its inception in 1931. This was done in the hope that the statement would prove helpful in guiding future Inter-Society Color Council activities and responsibilities.

GROUND PLAN FOR THE COUNCIL

To understand and interpret today's activities let us return to the beginning of the Council. Prof. E. N. Gathercoal, at the completion of the first full year of the activities of the ISCC, gave a plan for the future:

1. The Council should very definitely enlist the hearty cooperation and support of those industries of the United States which are definitely interested in color.

2. The Council should definitely interest the two great groups of teachers of color; i.e., the Eastern Arts Association and the Western Arts Association, as well as other national organizations of art, teachers and artists.

3. The Council should definitely undertake to assign for study every problem relating to color that is presented to the Council. This does not mean that the Council should finance and actually carry out research and study in connection with all of these problems, but it should undertake to bring together the problem and the person, committee, or organization that is best qualified to study the problem and present a solution of it. This means that the Council should develop a very wide acquaintanceship among persons and organizations interested in color science so that these problems can be assigned to the very best advantage.

4. The Council should make its purposes and objects known and should initiate and request suitable publicity to this.

5. The Council should definitely endeavor to enlarge its membership in order that its influence may be more widely felt and that its activities may be more highly developed.

6. The Council should endeavor to place as its executive head on its executive committee the strongest executive that can be drawn from the ranks of those deeply interested in the study of color.

The recommendations of Prof. Gathercoal apply today as they did in the beginning.

AWARDS

The Inter-Society Color Council has established a number of awards to honor outstanding scientists and colorists.

THE GODLOVE AWARD

Any historical survey of the ISCC would be incomplete without mention of the great contributions to the Council of Dr. I. H. Godlove, chairman of its first committee on measurement and specification and for many years editor of the Council's Newsletter. His Newsletter was an authoritative information resource in all fields of color. It became the source for the voluminous ISCC bibliography on color. While he was alive he spoke of establishing a fund with the ISCC to make possible a modest medal or award to members doing outstanding work in color over a designated period. After his death, the Board of Directors at their April 5, 1956 meeting voted to accept with gratitude the generous proposal for the establishment of the I. H. Godlove award made by Mrs. Margaret Godlove. The award is usually, but not necessarily, biennially in odd-numbered years.

The Godlove Award is the most prestigious award bestowed by the ISCC, and honors long term contributions in the field of color. Candidates are judged by their contribution to any fields of interest related to color.

THE MACBETH AWARD

In 1970 the Board of Directors of the Council accepted with gratitude the offer of Norman Macbeth, Jr., to establish a Macbeth Award in memory of his father, Norman Macbeth (1873-1936). The award is usually, but not necessarily, presented in even-numbered years.

The Macbeth Award is given for outstanding contributions in the field of color. It is to be presented to a member, or former member, of the Council. The contributions shall have advanced the field of color, as in the objectives of the Council as defined in Article II of the Constitution. The merit of a candidate shall be judged by his or her contributions to any of the fields of interest related to color. The contribution to color may be direct, it

may be in the active practical stimulation of the application of color, or it may be outstanding dissemination of knowledge of color by writing or lecturing.

NICKERSON AWARD

The Nickerson Service Award was established by the Board of Directors at a meeting held on February 3, 1980. This award is presented as the occasion arises but no more frequently than once a year. The Nickerson Award honors Dorothy Nickerson and is presented for outstanding, long-term contributions towards the advancement of the Council and its aims and purposes. The contribution may be in the form of organizational, clerical, technical or other services that benefit the Council and its members. The candidates must be members of the Council and must have been active in the affairs of the council.

ACTIVITIES OF THE COUNCIL

STANDING COMMITTEES

Problems Committee:

This committee is responsible for investigating color related problems which are brought to the attention of the Council. Such problems should preferably in the fields of activity lying properly within the domain of more than a single member-body. It is intended that project committees shall address limited objectives so that significant progress can be made in a reasonable time. At the annual meetings of the Council, project committees shall either hold open meetings or shall report to the Council membership on their progress by oral or poster presentations.

If a new problem is appropriate to the activities of the problems committee, a new project committee may be proposed. Each project committee acts autonomously and they are encouraged to issue written reports at the ends of important phases of their work and are required to submit a written report at the end of their project. These reports are submitted to the Board

of Directors with a recommendation as to possible publication.

No discussion of the ISCC Standing Committee on Problems is complete without mention of some of the accomplishments which have been made. These include the ISCC-NBS Method for Designating Colors, A Comparative List of Color Terms, A Survey of Color Specifications, the Color Aptitude Tests used internationally, the Standardization of Color Blindness Tests, a very thorough study of the illuminant in Textile Color Matching, widely used as reference material and as the basis for establishing standards for color matching lamps, a Study of the Colorimetry of Near-White Surfaces, the Report of Project Committee #20 entitled "Color — A Guide to Basic Facts and Concepts," (published by Wiley, 1963), Project Committee 25D has published three reports: "A General Procedure for the Determination of Relative Dye Strength by Spectrophotometric Transmittance Measurement," "A general Procedure for the Determination of Relative Dye Strength by Spectrophotometric Measurement of Reflectance Factor," "Reproducibility of Dye Strength Evaluation by Spectrophotometric Transmittance Measurement", all three reports have been published in Textile Chem. Colorist.

To date subcommittees have worked on 51 officially designated committees. First 48 of the committees have completed their work, last three committees, 49, 50 and 51 are still active. The names of the project committees, their project title, and if completed where the results are published, these are all listed in the membership directory.

Interest Groups Committee

There are several interest groups within the Council, composed of individuals having similar interests in color. The main functions of an interest group are to plan and present at the annual meetings of the Council programs of particular interest to their fields. An interest group may also

recommend to the Problem Committee subjects for new project committees that may come to its attention.

At present, there are three interest groups: Interest Group I; Fundamental and Applied Color Research, Interest Group II; Industrial Application of Color and Interest Group III; Art Design and Psychology.

Education Committee

The following are specific duties of this committee:

(1) Organize some event with emphasis on education for presentation at each annual meeting of the Council.

(2) Be responsible for the organization of, and oversee the operation of, ISCC Student Chapters formalizing the relationships between the Council and the colleges and universities with color and color-related programs.

At present there are two student chapters: Rochester Institute of Technology (RIT) student Chapter and The University of Chicago Student Chapter.

ANNUAL MEETING

An outstanding activity of the Council is its Annual Meeting at which time colorists have an opportunity to meet and discuss their mutual problems as part of the continuing effort to sponsor color education. At many of its meetings, or with a meeting of member-body, the Council has supported symposia on some particular aspect of color, of interest to its members. These symposia have been held quite regularly since 1938. The whole gamut of color usage, color science, color in education, and color in art have been treated in these symposia. Project Subcommittees traditionally hold open meetings at the Annual Meeting to review their work and to hear comments and suggestions from members of the Council.

SYMPOSIA

In addition to holding symposia at annual meetings and participating in

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symposia at meetings of member-bodies, the Council has sponsored a series of Technical Conferences which have become known, because of their location, as the Williamsburg Symposia. They have been limited-attendance meetings at which a single subject is discussed in detail by invited speakers and through audience participation. Topics have included instrumental colorant formulation, visual perception, and optimum reproduction of color. These symposia are not scheduled on a regular basis, but planned according to the timeliness of the subject matter.

NEWSLETTER

A major activity of the Inter-Society Color Council is the publication of the ISCC News, under an editor who is also chairman of the Publications Committee. The first Newsletter was published in 1931; this issue is Number 361. The Newsletter tries to call attention to important literature on color, to report on the activities of ISCC, and to report on activities of member-bodies, individuals relating to color, and activities of other color societies. Delegates and individual members are expected to make contributions to the Newsletter. The ISCC News is published every other month and sent to member-bodies and members all over the world.

EPILOGUE

This brief survey of the Inter-Society Color Council could fittingly close with verses Dr. I.H. Godlove wrote expressly for the Council:

It's not the brains or genius
Nor money that we pay;
It's the close cooperation
That's bound to win the day.
It's not the Individual
Nor Council as a whole,
But the everlastin' team work
Of every bloomin' soul.

* * * *

The present editor in order to

prepare this article about the Inter-Society Color Council, liberally used the item that was prepared by W. J. Kjiernan, appeared in ISCC News #173 and a revision by Fred Billmeyer that was published in ISCC News #207.

Gultekin Celikiz

COLOR EXPERT'S GOOD FORTUNE CONTRIBUTED TO 1931 CIE STANDARD COLORIMETRIC OBSERVER

A legendary figure in color science, Dr. W. David Wright insists that a series of quite favorable, even lucky circumstances led to his involvement in research that eventually established the CIE Standard Colorimetric Observer in 1931.

"I was quite lucky in being around at the right time to do the things that needed to be done," said the 81-year old English-man during a break at AATCC's 1987 International Conference & Exhibition in Charlotte, NC. And what he did accomplish once given the opportunity was impressive - in fact, the CIE system that Wright helped establish 57 years ago still remains the basis of modern colorimetry.

The CIE Standard Observer

According to Wright, the fortuitous events leading to the 1931 standard began five years earlier with an outstanding lecture on color by John Guild of the National Physics Laboratory at an Optical Convention held at Imperial College, London University. The chair for that session was Sir John Parsons, a leading ophthalmologist who also was the chairman of the vision committee of

the Medical Research Council (MRC). After a discussion with Professor L. C. Martin of Imperial College, Parsons agreed to provide MRC funds for color research to be conducted at the school, if Martin could find someone to pursue it.

Wright won the job almost by default. "Optical engineering was a very unpopular subject in those days," explained Wright, who had received an Associateship in optical engineering and a BS in physics at Imperial College. "The industry was in really bad shape because of the dumping of government surplus products on the market."

Because of the bleak industry conditions, Wright was one of only two students taking optical engineering courses at the school. "The other person wasn't very interested (in the project), so I was asked to do it," he said. And although Wright admits that he wasn't that interested in color, he accepted the position. "That really set the scene," he said. "It determined my whole career."

Wright's first project was to build a colorimeter. After that he began his now famous work on the measurement of 2° spectral coefficient curves, and by 1929 he had measured curves for 10 observers, which earned him a PhD from London University. At the same time, Guild, who had given the lecture on color at Imperial College, was conducting similar experiments at the National Physics Laboratory. Despite using two different measuring apparatuses, Wright and Guild produced results that were quite similar.

"The first thing that pleased me most was that my results and Guild's results were so close," Wright recalled, "He was very complimentary." With the CIE meeting coming along a year later, Guild began pushing the mean data as an international standard. And as somewhat of a surprise to Wright, the CIE quickly adopted Wright and Guild's results in order to define what is now known as the CIE 1931 Observer. "It's a bit of a fluke that some raw research student in about three years had produced something which led to an international standard," Wright said,

with a laugh. "It was lucky."

Yet only the high standard of the pair's research, and not luck, can explain why the results have stood relatively unchallenged for so many years, so long in fact that it surprises Wright. "Truly it's just amazing that the system is still going on," he said, "and there have never really been any queries about the correctness of our results at all."

Professor Wright

As a researcher, Wright has continued to make significant scientific contributions since 1931, but Professor Wright, the educator, has made equally impressive achievements. In 1951 Wright was named professor and head of the technical optics section at Imperial College, and for the next 22 years he instructed a number of research students who have become experts in their own right. Well-known names in vision and color science such as J. J. Clarke, R. W. Hunt, J. D. Moreland, A. R. Robertson, F. H. Pitt and K. H. Ruddock are just a few members of the succession of distinguished students who benefitted from Wright's guidance at the school.

Success by his students provides a special sense of satisfaction for Wright. "It pleases me to see the number of students that go on and make their mark in the field," said Wright, who also has been a visiting professor at the University of Waterloo in Canada and the Rochester Institute of Technology since his retirement from Imperial College in 1973.

A Career of Accomplishments

Dr. Wright, who resides in England with his wife Dorothy, has received numerous honors as expected for a man who continues to push for the advancement of color science. He was the founder of The Colour Group in Great Britain, vice-president of the Physical Society from 1948 to 1950, secretary of the International Commission for Optics from 1953 to 1966, chairman of the Physical Society

Optical Group from 1956 to 1959, and the first president of the International Colour Association (AIC) from 1967 to 1969. Among the awards he has been presented include the first Colour Group Newton Medal in 1963, the AIC Deane B. Judd Award in 1973, and the Macbeth Award of the Inter-Society Color Council in 1980. In 1989 Inter-Society Color Council awarded the Godlove Award. Dr. Wright is an honorary member of the Inter-Society Color Council. He is the author of five books, including *THE MEASUREMENT OF COLOUR* and *THE RAYS ARE NOT COLOURED*. He also has made important contributions to art conservation by designing two spectrophotometers for measuring the spectral reflectance curves of paintings. The instruments are installed at the National Gallery in England and the Courtauld Institute of Art in London.

Still in a career highlighted by many accomplishments, his research leading to the CIE 1931 Observer possibly remains the most noteworthy. Indeed, the fact that the standard is as entrenched as it was nearly six decades ago is remarkable. But how long will it continue? "It could be quite a long time, but I don't know," Wright conceded. "Just the fact that this thing is still going on is extraordinary to me."

THE 1931 AND 1964 CIE SYSTEMS OF COLORIMETRY: THEIR SIGNIFICANCE TO COLORIMETRISTS TODAY

By W. D. Wright

Abstract:

A surface color can be specified on the CIE System by its chromaticity co-ordinates x, y and by its luminous reflectance Y . But it is necessary to refer

to the color matching experiments leading to the 1931 and 1964 systems to really understand what the specification means. In discussing how the systems began, particular attention is given to the choice of a two degree field for the 1931 standard; selection of a 10 degree annular field in the 1964 system; use of X, Y, Z to define the CIE system rather than real physical stimuli; problems with specifying color differences; why the CIE chromaticity chart is not a color appearance chart; and the rationale of including spectral reflectance curves as part of a surface's color specification.

Key terms

Chromaticity

CIE

Color Matching

1931 Standard Observer

1964 CIE System

Spectral Radiation

The specification of a colored surface in terms of its chromaticity x, y and its luminous reflectance Y is usually calculated from the CIE color matching functions, the spectral power distribution of the illuminant and the spectral reflectance curve of the surface. But having made the calculation, what do x, y and Y really mean? The short answer is that Y is the photometric measure of the amount of light being reflected by the surface, while x and y give the proportions of the CIE primaries X, Y , and Z required to match the colored surface.

Since X, Y , and Z are nonphysical primaries, some further explanation is called for, and this means referring to the definition of the CIE Standard Observer. It must be emphasized that the standard was not based on some color vision theory, but rather on experimental color matching data. In the case of the 1931 Standard Observer, the standard color mixture curves were expressed in terms of three spectral wavelengths: a red of wavelength 700 nm, a green of wavelength 546.1 nm and a blue of wavelength 435.8 nm. Yet the color matching experiments

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were not carried out with these spectral primaries but with the instrument primaries incorporated in the trichromatic colorimeters used in the experiments.

Guild (1) provided half the data for the 1931 observer using trichromatic colorimeter in which the instrument primaries consisted of red, green and blue glass filters. I provided the rest of the data, but my colorimeter employed spectral primaries of wavelengths 650 nm, 530 nm and 460 nm (2). In this instrument the amounts of the three primaries were controlled with photometer wedges operated by the observer through three knobs. When a color match was made the chromaticities of the color being matched would be given by the co-ordinates r , g , my instrument would give the proportions of the three primaries 650 nm, 530 nm and 460 nm required in the match.

In my opinion, there is no difficulty in understanding what such a color specification means, and the CIE specification in terms of the x , y co-ordinates gives essentially the same information except that the match is expressed on a different co-ordinates system. The x , y co-ordinates could always be converted back to the real r , g co-ordinates if that would help in understanding the meaning of the specification.

I would want to emphasize that the Standard Observer was defined directly from laboratory color matching experiments using optical color mixing apparatus and not on any color vision theory.

The Two Degree Field

Why was a two degree field of view used in the color matching experiments on which the 1931 system was based?

Although CIE colorimetry is not based on any particular color vision theory, we do have to take note of the distribution in the retina of the color receptors responsible for the phenomena of three-color mixture and matching. In fact, there are two main types of receptor in the retina, the rods and cones. The rods operate at low

light levels, give us colorless vision and are absent from the central, foveal area of the retina. The cones operate at high light levels, are responsible for our color vision and occupy the central area of the retina with diminishing representation towards the peripheral zones of the retina.

It therefore made sense in 1931 to determine the standard color matching functions for the central rod-free area of the retina. Two other factors affected this decision. First, the CIE had defined the standard photometric observer in 1924 for the area. It was thought highly desirable in 1931 that the color functions should be combined with the 1924 V_λ curve so that the standard photometric and colorimetric observers would be one and the same person.

A second factor limiting the field size to two degrees was the existence in the central few degrees of the retina of a so-called yellow macular pigment which varies in density from one observer to another. For observers with a dense macular pigment this can produce a nonuniform patch of color, sometimes referred to as Maxwell's spot. However, with a two degree field, color matches are made completely within the pigmented area.

A number of advantages accrue from restricting color matching to the central two degree foveal area of the retina. Observations are made purely with cone vision, unadulterated with rod desaturation and additivity of color matches holds. Color matching is relatively stable, unaffected significantly by adaptation conditions. The foveal area of the retina is the area of maximum visual acuity and maximum color discrimination sensitivity. This means that the colors of a complex scene are determined largely by the response of the foveal receptors as the visual axis makes its saccadic scans and fixation pauses across the scene.

However, the structure of the retina and the structure and shape of the cone receptors are far uniform, even across the foveal area. To that extent, the restriction of the color matching field to exactly two degrees was an arbitrary condition which could be justified only

on technological grounds as providing data that proved for many applications in the color industries.

The 10 Degree Annular Field

Why was a 10 degree annular field, with the central four degree area ignored, used in the experiments for the 1964 system?

Some industries, including the textile trade, require a set of color matching functions that will predict color matches when large areas of color are being compared. It was known that color matches made outside the foveal area were likely to differ from matches made within the foveal area, primarily because of the yellow macular pigment that covered the foveal area. Therefore the need arose for a set of color matching functions for a 10 degree field of view.

The need was met by a major new investigation undertaken by Stiles at the National Physical Laboratory in England (3), in which he built a new trichromator incorporating a 10 degree field of view. The observations, however, ran into difficulties that had been anticipated before 1931, namely the nonuniform patch that appeared in the central three or four degrees of the field because of the yellow macular pigment, an example of Maxwell's spot. Stiles met this problem by instructing his observers to ignore the central three or four degrees and to make color matches for the annular area of the field surrounding Maxwell's spot. In a comparable study carried out by Speranskaya in Russia (4), the problem was handled by actually blocking out the central four degrees in her large-field color matching instrument.

The new 1964 color matching functions were therefore not recorded for a normal 10 degree field of view, but for an annular field. The exclusion of the central area meant that the important foveal cone receptors did not contribute to large-field functions. Rod participation also proved a problem and Stiles had to adapt his measurements to minimize the influence of the rods. Failure of additivity also proved more of a problem

than with the two degree functions.

The 10 degree field conditions were subsequently even more arbitrary than the two degree conditions, but the validity of the 1964 color matching functions were justified because field tests showed they met the industrial requirements of large-field color matching. Again, the functions were established directly from laboratory color matching experiments and not at all from any color vision theory.

By the time Stiles carried out his investigation in the 1950's, radiometric devices and techniques had made major advances compared to the 1920's, enabling Stiles to record the amounts of the spectral primaries required in his color matches directly in terms of radiometric units. The fundamental significance of this recording ability will be discussed in the next section.

X,Y,Z Co-ordinates

Why were hypothetical primaries X,Y,Z used to define the CIE system in preference to real physical stimuli, such as spectral radiations from the red, green and blue regions of the spectrum?

While color matching functions make no claim to represent the spectral sensitivity curves of the three-color receptor processes responsible for the phenomenon of three-color matching, the functions are nevertheless related to these sensitivity curves. The curves are, in fact, broad overlapping curves, so that none of the three processes can be stimulated by a red, green or blue wavelength alone in the spectrum. This is particularly true in the green part of the spectrum where a wavelength such as 530 nm will generate a significant response in the red receptor process, perhaps compared to 70% response in the green receptor process.

Since trichromatic colorimeters have to use real physical primaries, additive mixtures of the primaries will produce colors that are to some extent desaturated compared to the colors of monochromatic spectral radiations. To produce an exact color match the spectral radiations have to be

desaturated to some degree; i.e., a blue-green color of wavelength 500 nm has to be desaturated by the addition of a certain amount of the red instrument primary before it can be matched by a red-green-blue mixture. This means that color mixture curves expressed in terms of real instrument primaries must have negative lobes, which can be inconvenient in some color calculations.

These negative lobes can be avoided if the data are transformed to a different co-ordinate system such as the hypothetical X,Y,Z primaries. This transformation was adopted in 1931 mainly as a result of pressure from American colorimetrists. Admittedly, the XYZ system has a somewhat artificial appearance to it, but the hypothetical primaries they represent may be visualized as supersaturated red, green and blue colors.

In 1924 the CIE had defined the standard photometric observer by adopting a standard weighting curve - the V_λ curve - for converting a spectral radiation from radiometric units to photometric units. As shown, it was regarded as essential in 1931 that the 1924 V_λ curve be incorporated into the color matching functions, and because of encouragement from Deane Judd, the Guild-Wright color matching data were combined with the Y color matching function was the same curve as the V_λ curve.

This was a clever device and has served a useful purpose, but the advantage of combining photometry and colorimetry is being seriously challenged. This is both a subtle and profound question and is linked in part with new thinking about the variables of color appearance which are regarded as most meaningful, especially the variable "lightness."

For example, an alternative set of variables that excludes lightness is that used in the Swedish Natural Color System (5), which is based on the Hering subjective primaries red, yellow, green, blue, black and white. It would be interesting to have the textile chemist's reaction to this system. As stated previously, the photometric correlate

of lightness - namely reflectance or luminance factor - is not an essential ingredient of a color specification, since Stiles' 1964 color matching functions were expressed in radiometric and not photometric or colorimetric units.

Color Differences and CIE

Why are color differences so difficult to specify on the CIE system?

Whether a difference in color can be detected between two stimuli depends first on the difference in response generated in the three retinal color receptor processes by the two stimuli. This response difference will be determined by the spectral compositions of the two stimuli and by the spectral sensitivity curve of the three receptor processes.

Since the CIE color matching functions are related to these spectral sensitivity curves, it would seem reasonable to suppose that color difference formulas could be derived from these functions, but after more than 50 years the CIE has still failed to produce a formulation that still satisfies all the viewing conditions under which discrimination judgments are made. Why should this be so? As I understand it, the explanation must be that color discrimination involves more than the spectral sensitivity curves of the retinal receptors. It must be affected by the coding of the signals from the receptors as they travel across the neural network of the retina and are transmitted along the visual pathway to the visual cortex via the lateral geniculate nucleus. The discrimination will also be affected by adaptation processes along the visual pathway, and most important of all, by the subjective quality of the color sensations that are generated in the visual cortex; i.e., by the quality of redness or greenness that we perceive.

These are subtle considerations that lie outside the strict boundaries of CIE colorimetry so that it should not be a surprise that color difference formulation has proved so difficult. The CIELUV and CIELAB formulas are the nearest to have been produced.

(Continued→)

Chromaticity Not Appearance

Why is the CIE chromaticity chart not a color appearance chart?

The chromaticity chart only expresses color mixture and color matching data, unless supplementary appearance experiments are carried out on colors of specified chromaticity under controlled observation conditions. An example was the investigation carried out by Holmes (6) on the recognition loci of colored lights signals. The observer was presented with a succession of small colored lights of known chromaticity and was asked to identify their color from a possible choice of six names - red, yellow, green, blue, white or purple. Holmes could then plot in the chromaticity chart the contour loci for possibly 50% or 90% correct recognition of these colors. Only in this type of controlled experiment can the chromaticity chart be used as a color appearance chart.

The color of a white surface, for example, cannot be identified with a fixed point in the chromaticity chart. Its location in the chart will depend on the illuminant, shifting in the blue-to-yellow direction when the illuminant is changed from daylight to tungsten light. Yet because of the phenomenon of color constancy, the surface will have essentially the same appearance of whiteness under either illuminant.

We owe this color stability of the world around us to the adaptation processes of the visual system and the fact that colors in a complex scene are perceived in relation to one another. In fact, this is, very important function of the visual process, and colorimetrists just have to accept the inconvenience that a CIE specification does not measure color appearance. This realization sometimes leads to criticism of CIE colorimetry, but quite wrongly because color appearance measurement is something the system could never be designed to do.

Spectral Reflectance Curves

Why should the spectral reflectance curve of a surface be included, if

possible, as part of its color specification?

Because the three groups of retinal color receptors responsible for color perception have broad overlapping spectral sensitivity curves, the retina is capable of making only a crude spectral analysis of the light incident on the retina. Yet the spectral reflectance curve of a surface is a very important item of color information; for example, the reflectance curve of a customer's sample may have to be matched closely to avoid metamerism. This is one reason why both the chromaticity co-ordinates and the spectral reflectance curve should be included in a color specification.

There are other examples, too. When a color is specified by its chromaticity co-ordinates alone, that point on the chromaticity chart could be represented by many different spectral reflectance curves. Suppose we were concerned with a color design consisting of a sequence of colors forming some particular aesthetic pattern. We would want the series to retain their color relationships under different illuminants, but this will only occur if the reflectance curves of the series of colors form a family of curves which differ in a systematic manner. This could not be guaranteed by the chromaticity co-ordinates on their own. The reflectance curves of a chroma series in the Munsell Atlas provide a good example of what is needed.

An obvious question is why do we need both the chromaticity co-ordinates and the spectral reflectance curves. If the reflectance curves are so important, why not specify these curves alone? One answer is that the curves themselves do not indicate what the color is since that depends on the combined response of the individual spectral components incident on the retina. For that, chromaticity co-ordinates are necessary. The other reason is that if a required color sample is specified by its spectral reflectance curve alone, it may be very difficult to precisely reproduce that curve with the dye mixtures available. It will normally suffice if the reflectance curve is

matched to the sample within reasonable limits, provided the dye recipe produces the correct chromaticity specification.

It is, therefore, very good practice whenever feasible for a color standard to be specified both by its spectral reflectance curve and by its chromaticity co-ordinates.

Additional Sources

The following text books offer more detailed information about the color perception process and about colorimetry:

Human Color Visions by R. M. Boynton (7); *Color Science* by G. Wyszecki and W. S Stiles (8);

The Measurement of Colour by W. D. Wright (9).

References

(1) Guild, J., *Transactions of the Optical Society*, Vol. 27, London, 1925, p106.

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(7) Boynton, R. M., *Human Color Vision*, Holt, Rinehart and Winston, 1979.

(8) Wyszecki, G. And W. S. Stiles, *Color Science*, 2nd Ed., Wiley, 1982.

(9) Wright, W. D., *The Measurement of Colour*, 4th Ed., Hilger, 1979.

The above article by Dr. D. W. Wright was first published in *Textile Chemist & Colorist*, February 1988. It is printed here with permission from the American Association of Textile Chemists and Colorists. AATCC, one of the original member-body, is located at One Davis Drive, P.O.Box 12215,

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COLOR RESEARCH AND APPLICATION

IN THIS ISSUE, JUNE 1996
[Vol. 21, #3, 1996]

We begin this issue with an article examining the development of color theory in art by Barbara Whitney Keyser. The approach to teaching color in art changed in the first half of the nineteenth century. Was this a result of the increased understanding of color in science? While most scholars find only weak correlation between painting and optics at this time, Dr. Keyser uncovers a stronger link by following a pathway connecting chemistry to Victorian decorative illustrations and designs.

In "Science and Sensibility: Chemistry and Aesthetics of Color in the Early Nineteenth Century," Dr. Keyser describes the influences of four men: two chemists, George Field and Michel Eugene Chevreul, who were also aestheticians, and two design theorists, Owen Jones and Richard Redgrave, who, influenced by Field and Chevreul, attempted to put artistic color theory on an objective basis. In this article she contends that the abstract, arbitrary approach to color passes to Victorian fine art by way of decorative painting, pattern design, and book illustration.

The next two articles describe foundation and development of the Natural Color System (NCS) in Sweden. Both articles are written by Anders Hård, Lars Sivik, and Gunnar Tonnquist. Work on the development of the Natural Color System (NCS) and Atlas was directed during the 1960s by Anders Hård with the collaboration of Gunnar Tonnquist and Lars Sivik, who contributed principally in the areas of colorimetry and psychometrics, respectively. The research was characterized by the

phenomenological analysis of the experience of color, i.e., "appearance" in the spirit of Hering, both in research on color parameters and later in developing and testing theories concerning the experience of color combinations, especially in relation to the concept of color difference. In "NCS, Natural Color System From Concept to Research and Applications - Part I," the development of a system for color notation, compilation of a color atlas, and establishment of the NCS as a Swedish Standard for descriptive color notations is described.

The later research, particularly concerning the experience of color combinations, is recapitulated in "NCS, Natural Color System From Concept to Research and Applications Part II," which is directed at certain attributes and applications of the NCS. These can be divided into two groups: the first group contains the related concepts of NCS lightness, distinctness of border and legibility; and the second is NCS Color Categories, which lead to dual attributes such as greyness. Lightness is the quantity of intensity determining how distinctly colors contrast to one another. This concept gives rise to how distinct various forms appear, i.e., legibility. Legibility of a color element against a colored surround proved to be related to the distinctness of the border. Distinctness of border provides a method to develop composite color differences.

The last full-sized article of this issue deals with the application of a color appearance model to optimal selection of colors for map-making. Maps have many more uses than merely portraying the geophysical features of the land. They also can show population distributions, vegetation, land use, and many other items. Color is an essential component conveying information in maps. Cartographers may use color on maps not only to differentiate areas, but also to show relationships or interactions among several of the mapped phenomena. The choice of colors is not a trivial exercise. Well-selected colors are easy

to tell apart, and not confused, even when their appearance is affected by the simultaneous contrast of adjoining areas. In "Prediction of Simultaneous Contrast between Map Colors with Hunt's Model of Color Appearance," Cynthia Brewer describes the development of a quantitative model of simultaneous contrast to aid selection of sets of easily identified CRT map colors.

The first illuminants defined by the International Commission on Illumination (CIE) also had defined sources. A color matcher could go to a light booth, turn on Source A, and evaluate the materials for match, metamerism, etc. However, when the CIE defined standard daylight illuminants as averaged values of the measured daylight spectra, no actual sources meeting these definitions were available. Thus, it became necessary to use simulated-daylight sources in light booths for visual judgments. In 1981, the CIE published a method for assessing the quality of daylight simulators for colorimetry using virtual metamers at D55, D65, and D75. It is important to note that, for the fields of photography and color printing, D50 is often specified as the daylight of choice.¹ However, at that time the CIE method was written, no metamers for assessing D50 sources were designed. In a note in this issue, Calvin S. McCamy presents a set of data for virtual "Metamers for Assessing the Quality of CIE D50 Simulators" in part based on a Japanese standard and in part based on new data.

The Communications and Comments section this month includes "A Theorem on Prima-Color Wavelengths" by Michael H. Brill. Some properties of color-matching functions have been understood for quite sometime, others are relatively newly recognized. Prime-color wavelengths were first described by William Thornton, who noted that for the CIE 1931 color-matching functions, it is possible to choose primary wavelengths that have the property of being at maximum power as well as unitary. Dr. Brill says, "I have often

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wondered whether the human visual system is special in having prime-color wavelengths, or if any conceivable set of color-matching functions (coming from, e.g., the bee or fish, or from the design of some robotic sensor) also has a set of prime-color wavelengths by Thornton's definition." In this communication, Dr. Brill answers his own query by proving that prime-color wavelengths always exist for any set of color-matching functions that are differentiable over all wavelengths in the visible domain and approach zero at the boundary points of this domain.

*Ellen C. Carter
Editor*

Color Research and Application

particular interest: Industrial applications, developing industrial and scientific software

Mr. Douglas Jacobs
Olan Mills
P. O. Box 23456
6104 Preservation Drive
Chattanooga, TN 37422

particular interests: Color transformation between different color space, definitions and systems

particular interest: Utilizing new uses of color

Dr. Barbara Martinson
University of Minnesota
Design, Housing and Apparel
240 McNeal Hall
1985 Baford Ave.
St. Paul, MN 55113

particular interest: Color perception

Ms Mithra K. Moosavi
Rochester Institute of Technology
Center for Imaging Science
54 Lomb Memorial Drive
Rochester, NY 14623

particular interest: All areas of color

NEW MEMBERS

The following is list of new members as approved by the Board of Directors.

Mr. Seth Ansell
Hewlett PackardCo.
Vancouver Division
P. O. Box 8906
Vancouver, WA 98668-8906
particular interests: Vision, metrology
color modeling

Mr. Harvey Bailey
Olan Mills Inc.
Box 23456
Chattanooga, TN 37422
particular interests: Color reproduction & measurement in the graphic arts, color space transforms in applied software

Mr. Edward Coronado
Security Plastics West Inc.
3900 West Military Hwy.
McAllen, TX 78503
particular interest: Gloss level;
color shades

Mr. Daniel P. Hughes
CVI Laser Corporation
111 Highland Drive
Putnam, CT 06260

CONGRATULATIONS

Our sincere congratulations go to Wade Thompson for exhibiting his paintings in Perkinson Gallery, Kirkland Fine Arts Center, MILLIKIN UNIVERSITY, Decatur IL.

Ms Amy Keiser
Student @ Michigan State U
340 Division street
East Lansing, MI 48824
particular interest: Effect of color on people , color trends

Mr. Gerald M. Kraai
Litman, McMahon & Brown, L.L.C.
1200 Main St., Suite 1600
Kansas City, MO 64105
particular interest: Industrial application of color, trademarks and litigation

Ms Michelle McVicker
Student
231 Maple St.
Indiana, PA 15701

Mr. Jerry Rudquist
Macalester College
Art Dept.

1600 Grand Avenue
St. Paul, MN 55105

particular interest: how and why we see color, how it works in the structure of paintings, new materials that give new sensations of color, history of the use of color in different cultures.

Dr. Stephen S. Solomon
203 Main St.
Owego, NY 13527
particular interest : visibility and safety

Mr. Luk Stroobants
DuPont
Antoon Spinostraat 6
2800 Mechelen, Belgium
particular interest: color physics

HISTORICAL COMMITTEE SOLICITS THE DONATION OF COLOR MATERIALS.

Some years ago a group of materials relating to color, including significant articles, color systems and color samples, was donated by ISCC members to the Cooper-Hewitt Museum and National Design Library in New York city. This material has not been shown or available to the public for years. The ISCC Historical Committee is in touch with the Cooper-Hewitt to see if arrangements can be made to make this material available to the public.

Meanwhile there several collections of materials on color that have been lost, including much of the material that the old U.S. Bureau of Standards (now the National Institute for Standards and Technology) had collected during the years that NBS took a leading role in color science and technology. Kenneth Kelly and following his death Nick Hale and Fred Billmeyer did what they could to save the materials, but there was no place with room for the collection at the time.

Appropriate placement of objects and papers relating to color can pose a problem for ISCC members. After an individual's death the family frequently does not know what to do with color materials he or she had collected. Sometimes when people retire they no longer need their color materials or have a place to store them. Some of this material may be of interest to a museum, while other items, such as color systems, may be useful to students at universities. The ISCC is interested in facilitating the placement of these materials.

The Historical Committee is compiling two lists of color materials, one for items people are ready to donate now and a separate list of materials that people would like to earmark for later donation. In this second case, the

decision to donate the material must also be put in an individual's will or communicated to relatives. Of course, the ISCC cannot guarantee that a suitable institution will accept the items, but the committee has begun contacting museums and libraries and will coordinate an effort to see that the history of color is preserved, that color materials are made available for research or to be studied and used by students.

In addition to the Cooper-Hewitt, the Hagley Museum and Library in Wilmington, Delaware has expressed an interest in material on color. The Hagley preserves the history of American business, while the Cooper-Hewitt specializes in design. The Fashion Institute of Technology (FIT) does not have space in their museum to store a quantity of material; however, they are definitely interested in items that can be used by students. FIT outlines their particular color interests as:

- A Macbeth light booth.
- Any kind of color forecast material, especially early 20th century, including industries not related to fashion.
- An unabridged copy of Albers "Interaction of Color," including the silk screened color prints.
- Books on color, color theory, color systems and color usage in various industries.
- Three dimensional games or material for students to learn hue, value and intensity. There was one with little colored discs that progressed from one hue to another in 20 steps.
- Various ephemera – historical or archival pigment color lists or advertisements.

The Historical Committee cannot assist with items you might have for sale. It can serve as a conduit for passing important color materials from ISCC members or Member-bodies to reputable museums, libraries and museums for the benefit of the public. If you have items that you would like to donate, either now or in the future, please contact:

*Joy Turner Luke, 93 Bronson Lane,
Sperryville, VA 22740.
540-987-8386. Fax 540-987-3353.*

NEWS FROM MEMBER BODIES

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS NAMES A NEW EXECUTIVE DIRECTOR



Research Triangle Park, NC - John Y. (Jack) Daniels has been named Executive Director of AATCC.

He succeeds William R. Martin Jr. who is retiring May 31 after 33 years of service to the Association. Our best wishes goes to Bill Martin.

Jack is a native of London, KY and raised in Decatur GA., he holds BS and MS degrees in textile chemistry from North Carolina State University in Raleigh and an MBA from Winthrop University in Rock Hill, SC.

Jack began his textile career with Deering Milliken Research Corp. as research chemist/management trainee

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and later transferred to Deering Millikan-Hillside Plant and supervised flatbed carpet printing. He then joined AATCC as laboratory manager and was responsible for managing the laboratory activities, inventory and marketing of quality control aids, and development of textile educational symposia. In 1979, he joined Springs Industries where he held several positions including research chemist, research group leader, research manager, director of research, director of product development, business unit manager of Springs Window Fashions division, and most recently director of automotive fabrics for Clark-Schewebel, a subsidiary of Springs Industries.

Jack Daniels has been involved in several career-related activities such as the ASTM Committee D-13.20 Inflatable Restraints and the Automotive Occupant Safety Restraints Council and has been active in numerous AATCC technical and administrative committees. He was chairman of AATCC's Executive Committee on Research 1990-1992 and was chairman of the Technical Committee on Research 1987-1990. He has number of patents relating to textile wet processing.

He and his wife, the former Marsha Robbs of Gaffney, SC have two daughters, Jill and Bonnie.

AATCC is the world's largest technical and scientific society devoted to the advancement of textile chemistry. The association has some 7400 individual and 291 corporate members in the US and 66 other countries.

Officers of ISCC wish John Y. Daniels good luck and success in his new position as Executive Director of AATCC.



NEWS FROM AMERICAN ASSOCIATION OF TEXTILE CHEMISTS & COLORISTS

The following symposia are announced by AATCC:

Printing Technology Research Committee (RA80) is sponsoring a symposium on June 6-7, 1996 at the Sheraton Anaheim Hotel, Anaheim, CA. The theme for this program will be *Printing for the Global Market*. The symposium is chaired by Amy G. Hammonds, will focus on an industry update, color and design, innovative technology in the color and chemical fields, new machinery and systems, and environmental concerns. A post ITMA review will be given by Richard Malachowski with Cranston Printing Works Co.

Guest speakers will discuss the following topics:

- **The Magic of Color and Design**, Nancy W. Webster, Fieldcrest Cannon Inc.
- **Printing from a Retailer's Perspective**, William C. Nichols, Jr., JC Penney Co., Inc.
- **AMTEX Project**, Speaker from AMTEX Partnership.
- **Environmental Concerns for Printers**, Roger Holt, Ervin, Cohen & Jessup, Beverly Hills, CA.
- **ITMA Review: What's New in Machinery**, Richard Malachowski, Cranston Print Works Co., Cranston, RI.
- **Marketing Trends and Quality Control**, Speaker TBA.
- **Color Instrumentation for Textile Printing Applications**, John Severens, Datacolor International, Irvine, CA.
- **The Economic and Ecological Aspects of 2 Phase Reactive Printing**, Fletcher S. Stone, Jr., DyStar L.P., Charlotte, NC.
- **Binders for Textile Printing**,

Venkataraman Krishnan, Reichhold Chemicals Inc., Research Triangle Park, NC.

- **Synthetic Thickeners - Critical Marketing and Technical Factors for the Printer**

Charles D. Quirk and Michael J. Vaickus, Morton Int. Inc., Greenville, SC.

- **Printing Auxiliaries**, Daniel S. Thompson, Catawba-Charlab Inc., Charlotte, NC.

- **Transfer Printing**, Jack Whisenant, Blackman Uhler, Spartanburg, SC.

- **Troubleshooting**, Peter G. Schoenfuss, DyStar L.P., Rock Hill, SC.

- **Print Paste Preparation for the Small Volume Printer**, Glenn Townley, Hydrolabs Inc., Albemarle, NC.

- **One Phase Printing**, Barry Shay, ZENECA Colours, Charlotte, NC.

- **Pigment Discharge Printing**, Art Allen, BASF Corp., Charlotte, NC.

- **Specialty Printing on Textile Fabrics**, James R. Sisson, Advanced Color & Chemical Corp., Baldwin Park, CA.

- **CAD/CAM Technology for Printing**, Glenn Rinderman, Sophis USA, Charlotte, NC.

- **Theory of Color**, Selby Brannon, Plasticolors, Inc., Ashtabula, OH.

- **T-shirt Printing**, Speaker TBA.

In addition to the formal presentations, the symposium will feature printed fabric displays. The program will conclude with a troubleshooting panel discussion.

For more information, contact Peggy J. Pickett, AATCC P.O. Box 12215, Research Triangle Park, NC 27709-2215, TEL: 919/549-8141, FAX: 919/5549-8933.

NIR SYMPOSIUM

Near Infrared Technology Research Committee (RA103) will sponsor a symposium on June 27-28, 1996 in Asheville, NC. The program, chaired by James E. Rodgers, Monsanto Chemical Co. Will focus on the applications of Near Infrared (NIR) technology to the textile industry.

The presentations will cover a wide

variety of textile applications including:

- An overview of Textile Applications of NIR: Theory, Quantitative and Qualitative application

- On-Line NIR Measurement of Total and Fixed Durable Press Resin on Cotton

- Uses and Common Concerns of NIR in Textile Plants

- Identification of Post-Consumer Carpet by NIR.

- At-Line Measurement of Carpet Yarn Heat -set Temperature by NIR.

- Application of NIR in Warp Sizing

- Monitoring Cotton Conditioning and Correction of Strength Measurements in High Volume Instrument (HVI) Testing Using NIR

- NIR HVI Research to Measure Cotton Maturity and Fineness

- What is Chemometric? or What is that Funny Math Used by NIR to Obtain Quantitative and Qualitative Results?

AATCC Symposium on Environmental Successes: American Textile Industry '96

Safety, Health and Environmental Technology Research Committee (RA100) will sponsor a symposium on August 8-9, 1996 at the Sea Trail Resort in Sunset Beach, NC. The program is chaired by Sue Wagner, of CIBA, will focus on mill case studies.

The case studies include activated sludge treatment in above ground tanks, dye recovery and color removal, recycling size mixes, waste minimization and pollution prevention. Additional presentations will address legal issues that impact textile operations, federal and state water and air quality regulations, aquatic toxicity, effluent metals and environmental concerns of application processes.

Topics and Speakers will include:

- Changing the Textile Industry's Environmental Paradigm

- Activated Sludge Treatment in Above Ground Tanks

- Simplified Dye Waste Re-Use

- Waste Minimization.

- Pollution Prevention

- A Case Study Regarding Dye Recovery and Color Removal in a Textile Plant.

- An Overview of Federal and State Water Quality Regulations

- Waste Reduction in a Pigment Printing Operations

- An Environmental Regulator's View of Zero Discharge Slasher System.

- Air Quality Compliance in the Textile Industry: Federal and State Program Update.

- A Case Study Involving Waste Minimization.

- Optimizing Application Processes to Reduce Environmental Impact.

- Effluent Metals.

- Factors Affecting the Aquatic Toxicity of Textile Dyeing and Finishing Effluents.

Overnight accommodations are available at the Sea Trail Resort, 211 Clubhouse Rd., Sunset Beach, NC, 28468, TEL: 800/624-6601. Reservations should be made directly with the hotel and attendance at the AATCC symposium should be specified to receive the group rate.

AATCC Workshop "Introduction to Textile Testing-June 11-12, 1996

California State University, Long Beach, CA.

California will be site for a training program on the fundamentals of textile testing. The program will consist of demonstrations and discussions of approximately 30 AATCC procedures for evaluating colorfastness and physical properties. The colorfastness tests which will be discussed include crocking, light, washing and perspiration. Tests for evaluating physical properties included dimensional change, skewness, barré, soil release, water repellency and resistance, appearance retention and wrinkle recovery. Emphasis will be placed on how to properly conduct and interpret the tests. Registrants will be involved in hands-on participation. Sessions will also be conducted on basic color theory and fiber identification. Participants will

be shown how to use and interpret the AATCC Gray Scales for Staining and Color Change, the AATCC Chromatic Transference Scale and the Xenon Reference Fabric.

This workshop is an overview of the majority of tests needed to operate a textile laboratory.

It is designed for those responsible for product evaluation, specifications, and quality control of fibers, yarns, fabrics, garments, and carpets.

The registration fee for this workshop is \$505 (\$450 for individual and corporate AATCC members) and includes luncheons, breaks, and a copy of the 1996 AATCC Technical Manual.

Overnight accommodations are available at the Ramada Inn, 5325 East Pacific Coast Hwy., Long Beach, CA 90804, TEL: 310/597-1341. Reservations should be made directly with the hotel and attendance at the AATCC workshop should be specified to receive the group rate.

To register to any of the above symposia or workshop or for further information, please contact Peggy J. Pickett, P. O. Box 12215, Research Triangle Park, NC 27709-2215, TEL: 919/549-8141, FAX: 919/549-8933.

COLOR MEASUREMENT COMMITTEE (RA36) OF AATCC

RA36 met February 14, 1996 in Charlotte, NC. Meeting was convened by Ann Laidlaw, chairman. Old business included discussion of development of precision and bias statements for all the test methods. The second edition of Color Technology in the Textile Industry is underway, with all papers already submitted to the editor. Electronic Media subcommittee of publications committee provided a draft script for the instructional videotape on Visual Color Evaluation Procedure. Interested

members of RA36 volunteered to review the draft for content. Fred Simon presented information regarding color naming for color difference applications. Laidlaw reviewed replacement of some CWF bulbs with low energy, tri-phosphor products, and to obtain quantitative data describing same. Charles Bino described plans for a lighting symposium at the International Conference and Exhibition (ICE) in September, in Nashville. Several speakers have been invited to discuss the effect of lighting changes for the textile industry. This promises to be an important technical session, and everyone affected by lighting conditions should plan to attend.

The next meeting of RA36 is in May 9, 1996 at 8:45 a.m. at the Baltimore Marriott Inner Harbor Hotel. Contact AATCC at 919/549-8141 for more information. Or better still join RA36 Color Measurement Committee.

Ann Laid Laidlaw
Chairman
RA36

AIC INTERIM MEETING '96 COLOUR AND PSYCHOLOGY JUNE 15 - 18, 1996 GÖTEBORG, SWEDEN

AIC Many psychological questions are asked about colours. Colours carry symbolic meaning, but do all cultures share this meaning? Are colour preferences completely individual? Are colours related to certain moods, personality traits, etc? How do we talk about colours, do we name them in the

same way? Are we effected by colours in the environment? How is colour used in literature?

During this international conference the focus will be on what empirical research has to offer as answers to questions of this kind. The psychological question of colour appearance will also be taken up, including transparency, appearance changes due to distance, lighting and other conditions.

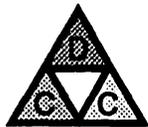
Göteborg (Gothenburg), situated on the west-coast, is Sweden's second largest city and considered to be very charming, it has a good selection of hotels ranging from budget to luxury.

Registration fees for delegates is expected to be about SEK 2700 (appr. 370 USD) including the proceedings, reception at the evening of arrival, lunches, morning and afternoon coffees, as well as a get-together party.

For further details write: Colour and Psychology
Prof. Lars Sivik
Inst. Of Visual Env. Res..
Kullaviks Skogsvag 4
S-429 35 Kullavik - Sweden
TEL: +46(0)31 933347
FAX: +46(0)31 431012
E-MAIL: sivik@psy.gu.se

Paula Alessi
Eastman Kodak Company

DETROIT COLOUR COUNCIL



Detroit Colour Council met in March, speaker, Peter Lazanik of Promatx Universal Corp. made a presentation on color harmony, demonstrating the effect of harmony on product value. Dividing any color palette into two basic groups, he emphasized the need for balance between the two groups in order to appeal to all buyers. Promatx provides the mechanism for establishing the two

groups. It is important that multi-color components, whether fashion, home furnishings or vehicle accenting, be drawn from the same group, avoiding the unattractive mix of a product's colors from Group 1 and Group 2.

W. Longley

The Council also announces the following meeting dates:

May 16, 1996, "Color in China", Hyatt Regency, Dearborn, MI.

Sept. 19, 1996, "The 10 Year Car - Performance of Colored Materials" MSU Management Education Center, Troy, MI.

For both meetings, contact: Jim Keiser, TEL: 810/583-8345

SID '96

THE FUTURE OF ELECTRONIC CINEMA TO BE REVEALED AT SID '96

SID The solution to one of the movie industry's major problems will be demonstrated at the 1996 edition of The Society for Information Displays' International Symposium, Seminar and Exhibition (SID '96) — to be held this year from May 12 through May 17 at the new convention center in San Diego, CA. The problem is that making copies of movies on film for theatrical distribution is a major expense. If someone made a very sharp, very bright, easy-to-maintain video projector, scratchless digital copies of movies could be transmitted over high-speed phone lines or satellite links and shown electronically. Movie quality would be better and distribution would be far less expensive. The British company Rank Brimar will hold the first showing of just such a projector on Tuesday, May 14, according to the Society's Press Relations Office.

Electronic cinema will not be the only display technology featured at SID '96 - the 27th edition of North America's

only conference and trade show devoted exclusively to display technology, components, products, systems, applications, and manufacturing. In the short courses, seminars, 60-odd technical sessions, and over 300 exhibit booths, attendees will see and learn about:

- Liquid-crystal-display (LCD) computer monitors as they begin their assault on the desktop;

- Reflective LCDs that hold an image without any power;

- The coming generation of color facsimile machines;

- Large hang-on-the-wall color plasma displays;

- Low-cost manufacturing of flat-panel displays;

- The first generation of high-definition digital television sets — and how far away we are from enjoying them;

Short courses on display fundamentals will be held on Sunday, May 12; seminars on many topics will be held Monday, May 13 and Friday, May 17; exhibits and technical sessions will be held from Tuesday, May 14 through Thursday, May 16; and there will be a variety of receptions and special events, including the traditional Wednesday Luncheon. For the first time, the luncheon will include the formal presentation of *Information Display Magazine's* Display of the Year Awards — which go this year to Texas Instruments, Casio, Fujitsu, and Sharp.

For SID '96 registration and hotel information, call Mark Goldfarb, Palisades Institute for Research Services, 1745 Jefferson Davis Highway, Suite 500, Arlington, VA 22202.

TEL: 703/413-3891; FAX: 703/413-1315.

SID Press Relations Office

ISO/IEC COLOR EXPERTS MEETING HOSTED BY CIE IN VIENNA, AUSTRIA (25-27 MARCH 1996)

SUMMARY REPORT BACKGROUND

Joint Technical Advisory Group, JTAG2, - Imagery, of ISO/IEC, is the group responsible for providing coordination among the various international standards groups involved in imagery. In response to concerns about the development of standards defining the color characteristics of images within various technology areas, JTAG2 initiated a "Meeting of Color Experts" in 1993.

This first meeting was hosted by JTC1/SC18 and held in Colorado Springs, CO, USA. The meeting provided considerable crossover between groups in ISO, IEC, ITU, as well as individual company activities. It was so successful that the attendees recommended that such meetings be held at periodic intervals.

As a follow up to that first meeting, JTAG2 invited the Commission Internationale de l'Eclairage (CIE) to host a second meeting in 1995-1996. In initiating the second meeting, JTAG2 noted that:

"Currently there is considerable effort within the imaging industry and the imaging standards community to move forward in the area of color image definition and exchange. This has, in part, been enabled by the recent rapid increases in both computer power and data storage technologies. Whilst the basic fundamentals of color technology are well laid out by the work of the CIE there has been little coordination of the options selected by the various activities for use in formal or defacto standards."

The JTAG2 goals for the meeting were:

a) to share information on the technical content and status of projects involving the characterization or definition of the color of images,

b) to identify areas where existing/proposed directions are divergent and to initiate discussion toward resolution,

c) to identify areas requiring new technology, or knowledge, and to recommend activities of CIE and industry and standards groups to provide the necessary solutions.

The CIE organizing committee, under the leadership of Dr. János Schanda and Dr. Alan Robinson, arranged the 2nd Meeting of Color Experts for 25-27 March 1996 at the CIE Headquarters in Vienna, Austria.

Overview of the Meeting

The meeting was attended by 67 participants from 16 countries. Technical Committees of ISO, IEC, ITU and CIE were well represented. The attendees brought a diverse background to the meeting. Some were there as CIE experts, and were very familiar with the CIE and theoretical aspects of color science. Others were from a more applied or engineering background, and color science to them was another tool to use to accomplish an imaging task. This diversity added to the quality of the discussions, providing challenges to both groups. Of the 28 attendees who responded to the evaluation questionnaire, 100% indicated that additional meetings of this type should be held on a periodic basis. The respondents were about equally divided between a 1 year and a 2 year time interval between meetings.

The meeting program was approximately equally divided between presentations by representatives of various sections of CIE or standards committees and open round table discussions of the topics presented.

A key focus of the CIE presentations, and the interest of the attendees, was on color appearance models. Strong sentiment was expressed that the CIE

(Continued→)

should recommend a model for general use, but to date studies of various models have shown that none of them is satisfactory over all conditions. There were strong sentiments expressed that an interim model, that works well enough for typical imaging applications, is needed quickly. The reports of the evaluation of color appearance modeling typically included, some or all of, the following models: XYZ, CIELAB, CIELUV, Hunt, Nayatani, RLAB, LLAB and von Kries. (The presence of Drs. Hunt, Luo, and Berns, who have been key architects of some of the appearance models currently being evaluated, added to the quality of the discussions.)

A universal reaction of the participants, from the applied community, was "I thought that there was a much better understanding of the vision and color appearance models than what is being reported here by the experts". A universal reaction of the participants from the color science expert community was "We are in the middle of development of color-appearance models, much as color difference models were prior to 1976. Therefore, it is a little premature to pick the best color appearance model".

Other topics, that generated extra discussion, include the desire for CIE to endorse weighting factors for color-matching functions at wavelength intervals greater than 1 nm, studies of the effects of viewing conditions, daylight simulators, a default RGB/CRT colorimetric definition, and the work of the International Color Consortium (ICC).

The latter group is an industry group that is developing specifications for the exchange of color profile data to allow interoperability between color management systems from different vendors. They arranged their schedule such that a meeting of the ICC could be held in conjunction with this Meeting of Color Experts. This added to the attendance and provided additional synergy between the groups involved.

Throughout the discussions, a common theme was the need for agreed upon models, procedures, etc. To allow

the technical community to implement solutions. There was clearly a sense that "good enough for now" and "consistency" was better than a perfect model sometime in the future. This was coupled with encouragements to the scientific community to continue studying and refining so that as the current technology matures it can be upgraded to higher quality levels.

Clearly the colorimetric measurement geometry of ISO 13655 (D50, 2 degree observer, 0/45 and black backing for reflection and 0/diffuse for transmission) was widely accepted. For CRTs (and a default RGB) the chromaticity values and transfer functions of ITU Recommendations 709 were generally accepted. There was discussion of the benefit of a D50 white point vs the increased brightness associated with a D65 white point. (It was emphasized that white point color temperature and brightness go hand in hand and counter to the needs of the color community.) Strong suggestions were made that the CIE should consider accepting/endorsing the work of the ASTM in the area of computational weighting functions to provide specific implementation recommendations in that area.

Summary

Advanced written material was provided to all attendees to facilitate preparation and discussion. Proceedings of the symposium will also be published by CIE and made available through a variety of channels.

A preliminary list of Action Items resulting from this meeting (from my notes) is:

a) CIE to try to provide an interim color appearance model by 1997 CIE Quadrennial Meeting.

b) to review possible real sources to match D50 and D65.

c) There is a need for a Color Rendering Index type function for displays. This should be referred back to JTAG2.

d) There is a need for a viewing geometry specification for colorimetric

measurements that better simulates a real viewing situation.

e) CIE to create or recommend weighting factors for color matching functions at wavelength intervals greater than 1 nm.

f) A formal liaison was recommended between CIE and the ICC.

g) A strong CIE involvement in JTAG2 was recommended.

The CIE is to be commended for their arrangement of a highly successful meeting and thanked for their extraordinary efforts.

*David Q. McDowell
Eastman Kodak Company*

CALL FOR PAPERS BY IS&T AND SID THE FOURTH COLOR IMAGING CONFERENCE: NOVEMBER 19 - 22, 1996

THE RADISON RESORT
SCOTTSDALE, ARIZONA



1996 marks the fourth year of this topical, annual conference with a significant growth in overall participation as well as an increase in the professional disciplines represented. The Color Imaging Conference has become the premier technical conference for scientists, technologists and engineers working in the areas of color science and systems and their application to

color imaging. The conference is international in nature. In 1995 one third of the participants came from outside the United States and Canada.

As the Color Imaging Conference has grown and matured, the focal areas have expanded dramatically. Professional disciplines represented range from psychophysics, optical physics, image processing, color science, graphic arts, systems engineering as well as hardware and software development. The focus is color - color as a critical element of the research and application efforts of this segment of the professional community.

While color science continues to be a fundamental component, an increasing number of presentations have focused on the application of color in a variety of emerging areas including printing, display, graphics, and imaging science. This application focus led to the coining of a new term "Color Engineering" which has become the general descriptor for the work of many of the conference participants. Beyond representing all areas of color imaging, this year's conference will expand into the areas of the graphic arts in particular and computer science in general.

The conference program is designed to promote interaction between the participants. The format includes invited addresses by leading specialists in various color fields as well as submitted papers presented in oral and poster format. Despite rapid growth in the conference we will continue the single-session format in this year's conference to allow participants to attend all presentations.

With this call for paper we are urging you, the members of the color imaging profession, to submit a paper to the technical program committee. All submitted papers will be refereed by the technical committee in order to ensure that the conference continues to provide significant and timely information on color imaging to its participants.

Tentative Program

Tutorials

As in the past, this year's conference will feature a comprehensive series of tutorials on both basic and advanced topics in color science, measurement, imaging, technology, image processing. Tutorials are planned on the following topics:

- Fundamentals of Colorimetry
- Color Measurement and Instrumentation
- Color Image Compression
- Color Scanning and Printing
- Color Management Systems
- Digital Halftoning
- Effective Color Use
- Color in Graphic Arts
- Color Standards

Papers Program

- Color Science and Colorimetry
- Color Standards
- Human Color Vision
- Color Display Physics and Psychophysics
- Color Management
- Color in the Graphic Arts
- Color Appearance
- Color Image Processing Algorithms
- Image Capture and Communication
- Color Calibration and Measurement
- Color Scanning and Printing
- Device Independent Color Rendering
- Color Communication System

Special Features of the Program

The program will include a panel discussion on a topic of major significance related to color imaging. Last year's topic was digital versus traditional photography. In addition, the International Color Committee (ICC) is planning a working group meeting in conjunction with the conference.

An Invitation to Authors & Participants

We solicit presentations on technical issues of color imaging. The program committee will be pleased to consider original work on the topics suggested in the Tentative Program as well as others related to color imaging. Please submit a 35-50 word abstract, a 2-4 page descriptive summary of the technical approach and the results, and a short biography ASAP:

Michael Stokes, Hewlett Packard
1501 Page Mill Road, Palo Alto, CA
96304

Voice: 415/ 857-3908; FAX: 415/
857-4320

E-Mail: stokes@hpl.hp.com
or

Lindsay MacDonald, MacColour
Limited

6 Hatherley Road, Cheltenham
Gloucs. GL51 6DZ, UK
+ 4 4 - 0 1 2 4 2 - 2 2 8 - 2 3 6 ;
lm@MacColour.nildram.co.uk

Please indicate your preference for either oral or poster presentation. Final decisions on presentation format for all papers are at the discretion of the technical committee. Upon acceptance of your abstract, you will be sent an author's kit with instructions for the preparation of the paper to be published in the conference proceedings. If you plan to present a poster paper, indicate whether you plan to use a computer. Papers are due by September 6, 1996 and are preferred in electronic form; camera-ready copy also be accepted.

Cooperating Societies

Inter-Society Color Council
Society of Electrophotography of
Japan

The Society of Motion Picture and
Television Engineers

Society of Photographic Science &
Technology of Japan

FEDERATIONS OF SOCIETIES FOR COATINGS TECHNOLOGY



The Federation has announced the theme and course offerings for the International Coatings Technology, to be held October 22-24, in Chi-

cago. As part of the FSCT's newly-formatted convention programming, the Conference will be in conjunction with the Federation's Annual Meeting and International Coatings EXPO (ICE), scheduled for October 23-25.

The Conference, a series of one and two day technical seminars with these "Insights and Innovations," will feature programs conducted by well-known experts in the industry on a variety of topics and will be held at two sites, the Chicago Hilton and Towers, FSCT convention headquarters hotel, and at the McCormick Place convention complex, site of ICE.

The conference seminars take an in-depth look at subjects critical to achieving success in today's competitive and have been developed as educational "tracks" for various levels of industry professionals. Featuring one-day seminars on Tuesday, October 22, and two-day sessions on Wednesday and Thursday, October 23-24, the conference schedule includes the following:

Tuesday, October 22 (held at the Chicago Hilton and Towers)

Surfactant Chemistry - Designed for R & D personnel, synthesizers, formulators and applicators. This course will provide registrants with a better understanding of surfactants and polymers; information on new uses and technologies in this area; and a working knowledge of surfactant synergy in waterborne technology.

Winning Technical Presentations - Targeted at all levels of lab and R&D personnel, in addition to marketing and sales staff and anyone else responsible for technical presentations. Program attendees will learn how to effectively develop visuals; proper speaking techniques and data organization; how to handle question and answer sessions; tips to transfer written information to speaking terms; and how to effectively communicate to all audience. *Attendance limited to 25 attendees.*

Effective Technical and Scientific Writing Workshop - Aimed at all levels of lab personnel, applicators, R&D staff and anyone responsible for communicating technical information. Participants will acquire skills and techniques for improved technical communication; learn proper methods of data collection and tabulation to maximize data impact; and how to make technical issues understandable, to improve effectiveness in communicating technology. *Attendance limited to 25 attendees.*

Design of Experiments - Targeted for Lab. personnel, R&D staff, project managers and technicians. Attendees will receive information to improve project management, including better planning, time saving methods; tips on how to receive greater certainty of results; ability to predict coatings properties; and truer selection criteria/evaluation methods.

Spray Applications (to be held at Binks Manufacturing, Franklin Park, IL) - This course is designed for applicators, field service staff, specifiers, and formulators. Participants will gain a greater understanding of spray equipment (adjust, tip, size, fanning, technique); receive training on how to select the right equipment for the proper application and coating; and learn problem solving techniques. *Attendance limited to 40 attendees.*

Technology Assessment (an Executive Forum, includes dinner on Monday evening) - Primarily directed at marketing or sales directors and managers, small business owners, and senior R&D staff, such as group leaders, technical directors and sr. chemists. Individuals will receive information on how to determine the feasibility of new technology, including concept/idea assessment and the financial issues related to the topic. *Attendance limited to 30 attendees.*

Wednesday and Thursday, October 23-24 (held at McCormick Place)

Substrates and Coatings - Developed for formulators, lab chemists, technical service personnel, in addition to sales personnel and R&D chemists. This course will provide an understanding of the physical nature of substrates, including definitions of various substrate types and surfaces (wood, plastic, metal, etc.); effect on substrate of coatings application and performance; tips on how to overcome or compensate for substrate problems by proper formulation; and how to formulate a coating for right substrate.

Coatings Characterization - Designed for lab directors, QC managers, analytical staff and coatings specifiers. The program will review the basics of coatings characterization, while providing an update of recent developments related to criteria and new equipment. Attendees will be made aware of what is available, such as practical equipment and services, in order to better study problems.

Polymer Chemistry - Aimed at coatings formulators, R&D chemists, and sales and marketing personnel with strong technical background and interests. Participants will gain a better understanding of the important basic concepts of polymer science; learn the fundamental principles behind chain-growth and step-growth polymerization; discover the most important classes of polymers used in

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coatings, the properties which can be expected from each type, and how polymer chemistry can be used to modify the properties, learn basic principles of emulsion polymerization and how it differs from solution polymerization and how polymers are characterized using modern analytical techniques.

Back to Basics in

Coatings Chemistry - This course is primarily for new chemists or those with minimal experience, technicians, and sales, marketing and field support. The program will provide attendees with an overview of coatings types; a review of the four basic coatings components (what they are, why, functions and purpose); cost savings ideas for formulation; gain a better understanding of the physical properties associated with coatings and tips on troubleshooting.

Conference fees have been discounted for members of FSCT and its Constituent Societies and include all course materials and access to the EXPO and the Annual Meeting technical program sessions. If registering in advance, Conference attendance fees are \$195 members, \$295 non-member for Tuesday's one-day sessions; \$395 members, \$495 non-member for Wednesday-Thursday's two-day courses. Special package fees for all three days are \$495 for members, \$595 for non-members. Discounted attendance fees for multiple company registrations are also available. Add \$50 to all fees for on-site registration.

The attendance fee for Tuesday's one-day Executive Forum On Technology Assessment, which includes a Monday evening dinner, is \$395 for FSCT and NPCA members, \$495 for non-members, in advanced, \$50 additional on site. Attendance at this Executive Forum session is limited to 30 persons.

For registration materials, contact the FSCT, 492 Norristown Rd., Blue Bell, PA 19422; TEL. 610/940-0777; FAX. 610/940-0292

NATIONAL PAINT & COATINGS ASSOCIATION (NPCA) TO HOLD 109TH ANNUAL MEETING IN CHICAGO

Washington, D.C., Jan. 4, 1996— National Paint & Coatings Association will hold its 109th Annual Meeting Oct. 23-25, 1996 at the Palmer House (Hilton) in Chicago. For the first time, the Annual Meeting will run concurrently with the Federation of Societies for Coatings Technology's International Coatings Technology Conference and EXPO, (formerly, the FSCT Annual Meeting and Paint Industries' Show).

NPCA will switch to the Wednesday through Friday pattern, but will continue its new two-day format. The Wednesday program will consist of the opening session, the honors luncheon and forum sessions. Thursday's schedule will include the legislative/regulatory update breakfast forum, the general session, the final business session and luncheon and additional forums. NPCA's Annual Meeting, will officially conclude with the Thursday night Chairman's reception.

NPCA has extended its meeting dates to include Friday, Oct. 25, which will allow its members additional time to attend the FSCT Conference and EXPO. NPCA registrants will be admitted to the FSCT events during each of the three days at no charge as part of attending the NPCA Annual Meeting.

NPCA members will receive registration and hotel information, with additional details, through the April issue of NPCA's *Coatings* newsletter. Updated information will be provided to members in subsequent mailings.

For information on NPCA's Annual Meeting, contact Cheryl Matthews at 202/462-6272. For further information on the FSCT Conference and EXPO, individuals should contact Victoria Graves at 610/940-0777.

The National Paint and Coatings Association, Inc. is an industry trade association representing over 500 paint and coatings manufacturers, raw materials suppliers and distributors. Collectively, the NPCA membership produces approximately 75 % of the total dollar-volume of paints and industrial coatings sold in the U. S.

Katrina Norfleet Brown
202/462-6272

NPCA SUPPORTS NEW EPA AIM DRAFT PROPOSAL AND STUDY

Washington, D.C., Jan. 16, 1996 — In a recent survey of NPCA's Architectural and Industrial Maintenance (AIM) Streeting Committee and Architectural Coatings Committee, members voted overwhelmingly in favor of NPCA's offering its support of the U.S. Environmental Protection Agency's (EPA) proposed AIM rule. In November 1995 EPA released a new draft framework for a proposed national AIM coatings rule, which is substantially based on a model AIM rule suggested by NPCA.

In conjunction with its proposal, EPA asked industry to participate in a post-rule study to determine whether there is any justification or need for further regulatory action beyond 1996. NPCA's Board of Directors has endorsed NPCA's participation in the study contingent on the development of an acceptable study to protocol.

Bob Nelson

COLOUR AND APPEARANCE IN FOLKLORE PUBLICATION

The second booklet reporting results of the Colour Group and Folklore Society supported surveys into Colour in Folklore was published in April 1996. It is entitled "Colour in Folklore with particular reference to Japan, Britain and Rice." The magnificent response received from Japanese nationals dictated the form of the report. This is a comparative study of Japan and Britain contrasted with contributions received from many other countries. Rice was chosen as the food for study because of its worldwide use. Themes include colour in marriage and other rites of passage, colours for good and bad luck; also colour of cultivated and wild rice. There is a discussion of the historic, economic and social driving forces for the use of colour in folklore and oral tradition.

The cost of the booklet, written by John Hutchings, Munehira Akita, Noriko Yoshida and Geraldine Twilley, is six pounds (eleven US dollars), post free. There are a few copies remaining of the first booklet reporting the proceedings of the 1991 Colour and Appearance in Folklore Conference. Both copies may be obtained for a total cost of eleven pounds sterling (twenty US dollars). They can be obtained from the Office of the:

John Hutchings
Folklore Society
University College London
Gower Street
WC1E 6BT
Great Britain



COLOR MARKETING GROUP

BRIGHTER, CLEANER COLORS FORECAST FOR 1998 CONTRACT/ COMMERCIAL MARKETS

COLOR
MARKETING
GROUP



THE
ASSOCIATION
FOR
INTERNATIONAL
COLOR
DIRECTIONS

Alexandria, VA —Color Marketing Group's (CMG) 1998 Contract Color Directions™ Palette bridges the present and the future with a passage to a brighter, cleaner palette. This exciting new palette reflects the influences of yellow and red, the emergence of blues, the "color-full" neutrals, brighter colors and the reappearance of primary hues. Confirming the narrowing of the gap between retail, office, hospitality and health care environments, the 1998 Contract Color Directions Palette, based on color forecasting Workshops held at CMG's November 1995 International Conference in Phoenix, AZ, is usable by all contract markets.

"It's a very optimistic palette," says CMG Contract Color Directions Co-Chairman Susan Sugar, CMG*, of Compendium in Columbus, OH. "It reflects the blending of the existing with the new, and re-introduces the generational 'Youth Colors' of the '60s and '70s, but with new freshness."

Global influences on the 1998 Palette were strongly European, followed closely by the Pacific Rim and Asia. The Mediterranean, on its own, continues to inspire colors defined by the interaction of light and ethnic pigmentation. There was also a strong, growing interest in the Latin American market, which is reflected in some of the colors of the Palette.

"If we were to analyze the driving forces responsible for past previous CMG contract Palettes, we can clearly

see that we are becoming more focused in our search for balance," says CMG Contract Color Directions Co-Chairman Sandra Imre, CMG, of Formats, Inc., in Seattle, WA. "As we accept the emerging digitalized universe and the impact of technology in our daily lives, we are becoming bolder with color and determined to pull our comfort zones from ethnic roots, from nature, from different cultures, and create the bridge a balanced globalized environment."

CMG's 16 Forecast Colors, which will appear in Contract markets in 1998, are:

Apache - A centered rich red — not too yellow, not too blue.

Cortez - A rich brown-based apricot, with a strong European influence.

Desert Sun - A rich golden yellow with a flavor of curry.

Mantis - An Acidic, lime-yellow, from the retro influence of the '50s.

Palo Verde - A yellow-based, ethereal sage green.

Expearment - A clean, versatile mid-tone green.

Zuni - A liquid turquoise, reminiscent of swimming pools.

Phoenician - A rich, Mediterranean blue.

Too Blue - A saturated, red-based blue, clear and vibrant.

Purplexed - A rich, red purple, ethnic and exotic.

Frontier - A soft, red-based brown.

Hi-Ho Silver - Grey with a silver touch, evocative of brushed chrome, both in flat and metallic finishes.

Black Tie - A sueded, elegant black.

Fool's Gold - The essence of blonde-gold, burnished with green, reminiscent of the aged qualities of old world coins, both in flat and metallic finishes.

Ghost Town - A soft, powdered white.

Camelback - A classic, yellow-influenced beige.

These Forecast Colors are part of CMG's 1998 Contract Color Directions Palette, which was developed during

CMG's November 1995 International Conference held in Phoenix, AZ. Over 650 CMG members from around the world attended. In formulating a Color Directions palette, CMG members draw on their own color experience, but at the same time, look at trends they see in consumer behavior and in economic and political climates. At the 2 1/2 day Conference, the topics of discussion regarding the direction of color and design included:

- Color being interpreted as dimensional - the importance of surface textures as color — from soft and slick, to nubby and heavily textured.

- Influences of computer-generated design on color.

- Increasing concern for safe buildings, quality of light and interaction of light and color - all relating to creating healthy environments.

- The importance of remodeling, in relation to long-term investments, and blending the existing with the new.

COLOR MARKETING GROUP ELECTS 1996 COLOR LEADERS

Alexandria, VA - **Laraine Turner**, CMG, of the Jolley/Turner Group, Inc., Long Beach, CA and President of the Color Marketing Group, has announced the results of the election of officers for calendar year 1996. **Sue Ross**, IIDA, Monterey carpets, Inc., Santa Ana, CA elected Executive Vice President, after serving as Vice President in 1995; **Melanie C. Wood**, CMG, Mannington Mills, Inc., Salem, NJ, elected Vice President, Strategic Planning, a newly created position; **Hall S. Dillon, II**, CMG, Dorn Color, Inc., Cleveland, OH, re-elected Treasurer; and **Patrice White**, CMG, Patrice White Studios, Marietta,

GA, re-elected Secretary. **Turner** will serve the second half of her two-year term as President.

COLOR MARKETING GROUP TO FORECAST

COLOR DIRECTIONS™ FOR 1998 CONSUMER/ RESIDENTIAL PRODUCTS

Alexandria, VA - More than 650 Color Designers will focus on the colors you'll be seeing, wearing and driving in 1998 at the Color Marketing Group's (CMG) **Spring International Conference, "Get Jazzed With Color!!!"** in New Orleans, LA, May 5-7, 1996. At the Spring International Conference, members will participate in cooperative Color Workshops where Color Directions™ will be forecast and new Color Palette developed for consumer (Residential) markets.

During the Conference in New Orleans, qualified CMG members will participate in either the **1998 Consumer Color Directions Workshops** or the **1996-97 Consumer Colors Current™ Workshops**. In the Workshops, members forecast future color trends which will influence product design, and determine the colors 'sure to sell' for Consumer markets, remarked Laraine Turner, CMG,* president of CMG and co-owner of The Jolley/Turner Group, Inc. The **1998 Consumer Color Directions Workshops** focus on color and design influences which will become apparent in 1998 while the **1996-97 Consumer Colors Current Workshops** concentrate on color trends either already apparent in Consumer markets or committed to appear in the next 12 to 18 months.

Those members not involved in Consumer markets will attend **1996 Contract Color Combinations Workshops**, where the "hows" and "whys" of combining colors are

discussed and viable, marketable Color Combinations are produced. Additionally, all Conference attendees take part in **Industry Exchange Workshops**, where small, diverse group discussions bring about an exchange of non-competitive color and trend information.

A new and exciting feature of this year's Conference will be **International Trends Roundtable Discussions**, where attendees will be able to share information about what's hot on the international color and design scene.

In addition, color design and marketing experts will address a variety of relevant, contemporary topics, including:

- **"Marketing to Kids! American Youth - The Potential Goldmine"**

Dave Siegel, vice president of product accounts, Sive/Young & Rubicam, and also general manager of Small Talk, a leading kids marketing and advertising division of Y&R.

- **"The Streets and Runways of Europe Now - A Multimedia Color, Fashion and Trend Show"**

June Roche, corporate fashion director, Miliken & Company, renowned for anticipating trends and setting finalized color lines well in advance.

Reports from the major European trade fairs **HEIM TEXTIL**, **DECOSIT** and **PREMIERE VISION** will also be a part of the Conference program.

The findings from the Color Workshops held throughout the Conference will be presented to attendees at an exciting, information-packed General Session on Tuesday, May 7, along with a report on Color Directions from the Fashion Workshops. The highlight of Tuesday's session will be a colorful preview of the just-developed 1998 Consumer Color Directions Palette.

For more information on CMG's Spring International Conference please call: 703/329-8500 or write: Color Marketing Group, 5904 Richmond Highway, Suite 408, Alexandria, VA 22303, USA.

WELCOME!

We welcome Ms Cynthia Sturke as the new ISCC office manager. She will be at the office from 9AM to 12 noon, Monday through Thursday. She can be reached at TEL:703/318-0263 and at FAX: 703/318-0514.

GENTLE REMINDER!

All appropriate information submitted to this NEWS publication is the full and complete responsibility of the sender.

This publication and the ISCC assumes no responsibility for information changes and inaccuracies.

Thanks,
The Editor

C A L E N D A R

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

Harry K. Hammond, III
or
John Peterson
BYK-Gardner, USA
2435 Linden Lane
Silver Spring, MD 20910
Phone: 301-495-7150
Fax: 301-585-4067

1996

ISCC ANNUAL MEETING WITH ASTM

May 5 - 7

Orlando, FL

Information: Danny Rich

Phone: (609) 895-7427

Fax: (609) 895-7461

CMG SPRING CONFERENCE

May 5 - 7

Color Marketing Group Conference

Sheraton New Orleans Hotel & Towers

New Orleans, LA

Information: Katie Register

Phone: (703) 329-8500

Fax: (703) 329-0155

EXPO 96

May 11 - Oct. 4

Color and Light in Communication

Information: Gabor David

3 Tukory u.

Budapest,H-1054

Hungary

SID '96

May 13 - 17

San Diego, CA

Information: Lauren Kinsey,SID

1526 Brookhollow Drive, Suite 82

Santa Ana, CA 92705

Phone: (714) 545-1526

Fax: (714) 545-1547

email: socforinfodisplay@mcimail.com

IS&T 49th ANNUAL CONFERENCE

May 19 - 24

Minneapolis Marriott City Center

Minneapolis, MN

Information: IS&T Conference Manager

7003 Kilworth Lane

Springfield, VA 22151

Phone: (703) 642-9090

Fax: (703) 642-9094

GATF COLOR MEASUREMENT WORKSHOP

May 30 - 31

Graphic Arts Technical Foundation

4615 Forbes Ave

Pittsburgh, PA 15213

Information: Amy Mangis

Phone: (412) 621-6941

Fax: (412) 621-3049

AIC - '96 INTERIM MEETING

June 16 - 18

Color Psychology Beyond Psychophysics

Gothenburg, Sweden

Information: Lars Sivik

Kullaviks Skogsväg 4

S-429 35 Kullavik, Sweden

Phone: (011) 46-31-933347

Fax: (011) 46-31-431012

email: sivik@psy.gu.se

ASTM COMMITTEE D-1 ON PAINT

June 23 - 26
 San Francisco, CA
 Information: Scott Orthey
 Phone: (610) 832-9717
 Fax: (610) 832-9555

IESNA ANNUAL CONFERENCE

Aug. 5 - 7
 Renaissance Cleveland Hotel
 Cleveland, OH
 Information: IESNA Headquarters
 Phone: (212) 248-5010

ANTIQUÉ AND PERIOD JEWELRY & GEMSTONE COURSE

University of Maine
 July 17 - 21
 Orono, Maine
 Information: University of Maine
 Department of Public Affairs
 5761 Public Affairs Building
 Orono, Maine 04469-5761
 Phone: (207) 581-3743
 Fax: (207) 581-3776

- OR -

Joyce Jonas & Associates, Inc.
 215 East 80th Street
 New York, NY 10021-0539
 Phone: (212) 535-2479
 Fax: (212) 988-0721

GATF COLOR MEASUREMENT WORKSHOP

Aug. 8 - 9
 Graphic Arts Technical Foundation
 4615 Forbes Ave
 Pittsburgh, PA 15213
 Information: Amy Mangis
 Phone: (412) 621-6941
 Fax: (412) 621-3049

AATCC CONFERENCE AND EXHIBITION

Sept. 15-18
 American Association of Textile Chemists and Colorists
 Opryland Hotel
 Nashville, TN
 Information: AATCC
 Phone: (919) 549-8141



SPIE / IS&T
 Sept. 24 - 26
 Advanced Imaging Networks
 Berlin, Germany
 Information: IS&T Conference Manager
 7003 Kilworth Lane
 Springfield, VA 22151
 Phone: (703) 642-9090
 Fax: (703) 642-9094
 email: imagesoc@us.net

JERMOV

Oct. 9 - 13
 Joint European Research Meetings in Ophthalmology and Vision
 Montpellier, France
 Information: Chairman Congress
 43, Place Vauban
 BP 9173
 34042 MONTPELLIER
 Cedex 1 (France)
 Phone: +33 67 15 99 00
 Fax: +33 67 15 99 09

IS&T / OSA

Oct. 20 - 25
 Conference on Optics & Imaging in the Information Age
 Rochester Riverside Convention Center
 Rochester, NY
 Information: IS&T Conference Manager
 7003 Kilworth Lane
 Springfield, VA 22151
 Phone: (703) 642-9090
 Fax: (703) 642-9094
 email: imagesoc@us.net

IS&T 12th INTERNATIONAL CONGRESS

Oct. 27 - Nov. 1
 Advances In Non-Impact Printing Technologies
 Hyatt Regency San Antonio
 San Antonio, TX
 Information: IS&T Conference Manager
 7003 Kilworth Lane
 Springfield, VA 22151
 Phone: (703) 642-9090
 Fax: (703) 642-9094
 email: imagesoc@us.net

CMG FALL CONFERENCE

Nov. 3 - 5
 Color Marketing Group Conference
 Sheraton Seattle Hotel & Towers
 Seattle, WA
 Information: Katie Register
 Phone: (703) 329-8500
 Fax: (703) 329-0155

IS&T / SID's FOURTH COLOR IMAGING CONFERENCE

Nov. 19 - 22
 Color Science, Systems & Applications
 Radisson Resort
 Scottsdale, AZ
 Information: IS&T Conference Manager
 7003 Kilworth Lane
 Springfield, VA 22151
 Phone: (703) 642-9090
 Fax: (703) 642-9094

ASTM COMMITTEE D-20 ON PLASTICS

Nov. 18 - 21
 New Orleans, LA
 Information: Mrs. Katherine Morgan
 Phone: (610) 852-9500
 Fax: (610) 832-9555

1997**ASTM COMMITTEE D-1 ON PAINT**

Jan. 26 - 29
 Fort Lauderdale, FL
 Information: Scott Orthey
 Phone: (610) 832-9717
 Fax: (610) 832-9555

ASTM COMMITTEE E-12 ON APPEARANCE

Jan. 26 - 29
 Fort Lauderdale, Florida
 Information: Bode Buckley
 Phone: (610) 832-9740
 Fax: (610) 832-9555

IS&T / SPIE

Feb. 9 - 14
Electronic Imaging: Science and Technology
 San Jose Convention Center
 San Jose, CA
 Information: IS&T Conference Manager
 7003 Kilworth Lane
 Springfield, VA 22151
 Phone: (703) 642-9090
 Fax: (703) 642-9094
 email: imagesoc@us.net

TAGA ANNUAL CONFERENCE

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

SID '97

May 12 - 16
 Boston, MA
 Information: Lauren Kinsey, SID
 1526 Brookhollow Drive, Suite 82
 Santa Ana, CA 92705
 Phone: (714) 545-1526
 Fax: (714) 545-1547
 email: socforinfodisplay@mcimail.com

IS&T 50th ANNUAL CONFERENCE

May 18 - 23
 Hyatt Regency Cambridge Hotel
 Cambridge, MA
 Information: IS&T Conference Manager
 7003 Kilworth Lane
 Springfield, VA 22151
 Phone: (703) 642-9090
 Fax: (703) 642-9094

COLOUR '97

May 26 - 30
 8th AIC Quadrennial Meeting
 Colour '97 Executive Committee Meeting
 May 25
 Kyoto International Conference Hall (KICH)
 Kyoto, Japan

ISCC ANNUAL MEETING

Sep. 14 - 17
 Inter-Society Color Council Annual Meeting with Color and
 Appearance Division of Society of Plastics Engineers
 Newport, RI
 Information: Gary Beebe
 Phone: (215) 785-8497

AATCC CONFERENCE AND EXHIBITION

Sep. 28 - Oct. 1
 American Association of Textile Chemists and Colorists
 Marriot Marquis
 Atlanta, GA
 Information: AATCC
 Phone: (919) 549-8141

OSA ANNUAL MEETING

Oct. 11-19
 Optical Society of America
 Long beach Convention Center, Long Beach, CA
 Information: OSA
 Phone: (202) 223-0920
 Fax: (202) 416-6100
 email: mtg@osa.org

IS&T 13th INTERNATIONAL CONGRESS
 Nov. 2 - 7
Advances In Non-Impact Printing Technologies
 Sheraton Seattle Hotel
 Seattle, WA
 Information: IS&T Conference Manager
 7003 Kilworth Lane
 Springfield, VA 22151
 Phone: (703) 642-9090
 Fax: (703) 642-9094
 email: imagesoc@us.net

IS&T / SID's FIFTH COLOR IMAGING CONFERENCE
 Nov. 16 - 19
Transforms and Transportability of Color
 Radisson Resort
 Scottsdale, AZ
 Information: IS&T Conference Manager
 7003 Kilworth Lane
 Springfield, VA 22151
 Phone: (703) 642-9090
 Fax: (703) 642-9094

1998

TAGA ANNUAL CONFERENCE
 May 3 - 6
Technical Association of the Graphic Arts Annual Technical Conference
 Chicago, IL
 Information: Karen Lawrence
 Phone: (716) 475-7470

SID '98
 May 17 - 22
 Anaheim, CA
 Information: Lauren Kinsey, SID
 1526 Brookhollow Drive, Suite 82
 Santa Ana, CA 92705
 Phone: (714) 545-1526
 Fax: (714) 545-1547
 email: socforinfodisplay@mcimail.com

ASTM COMMITTEE E-12 ON APPEARANCE
 Jun. 16 - 18
 Saint Louis, MO
 Information: Bode Buckley
 Phone: (610) 832-9740
 Fax: (610) 832-9555

AATCC CONFERENCE AND EXHIBITION
 Sept. 22-25
American Association of Textile Chemists and Colorists
 Convention Center
 Philadelphia, PA
 Information: AATCC
 Phone: (919) 549-8141

OSA ANNUAL MEETING
 Oct. 3-9
Baltimore Convention Center
 Baltimore, MD
 Information: OSA
 Phone: (202) 223-0920
 Fax: (202) 416-6100
 email: mtg@osa.org

1999

TAGA ANNUAL CONFERENCE
 May 2 - 5
Technical Association of the Graphic Arts Annual Technical Conference
 Philadelphia, PA
 Information: Karen Lawrence
 Phone: (716) 475-7470

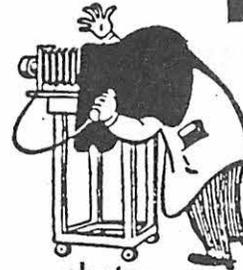
SID '99
 May
 San Jose California
 Information: Lauren Kinsey, SID
 1526 Brookhollow Drive, Suite 82
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 Phone: (714) 545-1526
 Fax: (714) 545-1547
 email: socforinfodisplay@mcimail.com

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

ISCC NEWS EDITOR: Gultekin (Tek) Celikiz



meeting reports



photos



contributions from members

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

Editor, ISCC News • Gultekin Celikiz • 1309 Paper Mill Rd, Erdenheim, PA 19038-7025

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

MS DOS-ASCII, (3.5"- 1.44 Meg); MACINTOSH- (Most formats)
(3.5"-1.44 Meg, 800K or 400K).

E-mail: celikizg@hardy.texsci.edu

If necessary, fax material to (215) 836-0448

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

All submissions must be in English.

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President	Mr. Roland L. Connelly	SheLyn, Inc., 1108 Greccade Street, Greensboro, NC 27408	73041.2772@compuserve.com	(910) 274-1963	(910) 274-1971
Pres. Elect	Dr. Ellen C. Carter	2509 N. Utah Street, Arlington, VA 22207	ecarter@capaccess.org	(703) 527-6003	
Secretary	Dr. Danny C. Rich	Datacolor International, 5 Princess Rd., Lawrenceville, NJ 08648	73700.3514@compuserve.com	(609) 895-7427	(609) 895-7461
Treasurer	Mr. Daniel S. Walton	Color and Appearance Technology P.O. Box 3709, Princeton, NJ 08543		(609) 734-0300	(609) 734-0245
Past-Pres.	Ms. Paula J. Alessi	Eastman Kodak Company, Rochester, NY 14650	pjalessi@kodak.com	(716) 477-7673	(716) 722-1116

LIST OF DIRECTORS

1993-1996

Mr. Gary E. Beebe	Ato Hass North America Inc., P.O. Box 219, Bristol, PA 19007	(215) 785-8497	(215) 785-8931
Mr. Joseph F. Campbell	DuPont Marshall Lab., 3401 Grays Ferry Ave., Philadelphia, PA 19146	(215) 339-6039	(215) 339-6431
Dr. Robert T. Marcus	Pantone Inc., 590 Commerce Blvd., Carlstadt, NJ 07072	rmarcus@pantone.com	(201) 935-5500 (201) 896-0242

1994-1997

Mr. Michael A. Hammel	3782 Bonny Rigg Trail Roswell, GA 30075	mahammel@ix.netcom.com	(770) 587-5120 (770) 587-5128
Mr. Richard W. Riffel	3800 Monroe Ave., Pittsford, NY 14534-1330	73441.512@compuserve.com	(908) 236-2311 (908) 236-7865
Mr. William S. Vogel	204 Four Lakes Drive, Easley, SC 29642		(864) 277-8977

1995-1998

Ms. Cynthia A. Brewer	PSU Dept. of Geography, University Park, PA 16802	cbrewer@essc.psu.edu	(814) 865-5072 (814) 863-7943
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Prof. Wade Thompson	1910 East Cardinal St., Springfield, MO 65804		(417) 882-2553 (417) 883-5830

ISCC MEMBER-BODIES

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

SUSTAINING MEMBERS

Pantone Color Institute
Color and Appearance Technology

BYK-Gardner
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