

# Inter-Society Color Council *News*

## ANNUAL REPORT ISSUE

### REPORT OF THE PRESIDENT, JOYCE S. DAVENPORT

How quickly the year has passed since I was first handed the gavel of office and became your President. Perhaps the reason for the time passing so quickly is due to the strong and enthusiastic support from the President-Elect, Dr. Allan Rodrigues, the Secretary and Treasurer and this excellent Board of Directors and the many other active members. Challenging and difficult tasks can be lightened when there is team work, and that is what we have here. I promised you we would function as a team for the best interests of the Council, by working, planning and communicating with each other and the membership. And this we are doing.

Sometimes we lose valuable members of the team, so at this point I would ask you stand and observe a moment of silence for two of those who have departed. S. Leonard Davidson, Treasurer of the ISCC for many years and a familiar face at all our meetings and for Robert Hoban, Project Committee Chairman, coordinator and participant in so many Council activities. They will both be deeply missed.

Your Council is in excellent financial condition as the Treasurers' report will indicate. Despite escalating prices and high inflation rates we have managed to keep the annual dues at \$20 for individual member, \$7 for retired members and \$100 for the Member-Body groups.

We are striving to serve your needs but we can only do this if we hear from you, so please take a moment to drop us a letter and express your opinions. One way to let us know some of the questions we are interested to have answered, is to fill in and return the membership opinion survey Ralph Besnoy has so kindly taken the time to draw up and have printed.

We are interested to know how you like the change in locations and movement away from New York City for our annual meetings. This annual meeting in Pittsburgh has brought many favorable comments, which leads us to believe we are doing the right thing. I would like to thank Joy Turner Luke our Program Chairman for the excellent program and arrangements and also to Jacqui Welker who is the Program Chairman of the SCAI Conference which immediately follows the ISCC. Both chairmen have worked hard to bring you this outstanding meeting.

Next year we will be changing the ISCC meeting to June, where it will be held with the Canadian Society for Color in Toronto Canada, followed by the AIC meeting and a "Hands-On" color and instrumentation symposium at Rochester Institute of Technology.

At this time I would like to acknowledge and for you to meet, Dr. Peter Kaiser, President of the Canadian Society for

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Color (and currently serving on the board of directors of the ISCC), Shelaugh Stewart President-Elect of CSC and a Canadian delegation representing our sister society. We are honored to have them with us and hope that you will all try to get acquainted. We are looking forward to joining them next year in Canada.

The 1987 ISCC meeting is to be held in Philadelphia and the 1988 in Chicago. Further details will be announced at a later date.

Bonnie Swenholt has been our Arrangements Chairman for the last few years and has done a wonderful job, she has handled the annual meeting so capably and with the help of Dr. Tom Webber has taken care of the Williamsburg Conferences, all of which are very time consuming. Last year Bonnie retired from Eastman Kodak and would also like to begin handing over the responsibility of the meetings, she has made an excellent choice in Dr. Norman Burningham who has agreed to assume the work. You may have noticed that he has already jumped into the water and got his feet wet, for the last two days he has been bustling around the registration desk.

There are three Directors retiring from the Board this year, they are as follows:

Dr. Fred W. Billmeyer Jr.

Mr. Richard Ingalls

Mr. Rolf Kuehni

We owe them a debt of gratitude for all their hard work and devotion to the Council.

This will be Fred's last Board meeting after serving many, many years as the Secretary of ISCC, and later but not for the first time as a member of the Board. It goes without saying that it will seem very strange not to see him across the table. Please don't get the impression he will not be attending the Annual meetings. Fred will be here to keep us informed of his many other activities including that of Editor of the journal "Color Research and Application."

Dick Ingalls has contributed significantly to the ISCC. His important project on the color education of school children and his plans to utilize printing space in printing runs, is an ambitious and fascinating goal which is already materializing and showing fruits of his and the committees hard work. Dick was also the program chairman for the very successful 1984 Williamsburg Conference.

Rolf Kuehni has been active in the ISCC for many years in many various activities. He has been active in committee work as both a chairman and a coordinator. Rolf has been the pro-

gram chairman of two Williamsburg Conferences the last one which like the first was an instant success and attracted a large attendance. Rolf is a frequent contributor of papers to "Color Research and Application" journal, and author of several books.

The new Board of Directors for 1985-1988 are:

Mr. Jack Hsai

Mr. Justin Rennilson

Dr. Wolfgang Walter

The 1985 Williamsburg Conference "Color Then and Now" was a great success and again we wish to thank Program Chairmen Mr. Mark Gottsegen and Mr. Rolf Kuehni.

ISCC member Martin C. Bradley has kindly sent his sculpture "Perspectives" to this meeting, it is being displayed in the "Paddle" room of the hotel. I suggest you make arrangements to see it as it will be removed before tomorrow afternoon.

I am looking forward to the coming year and the many challenges that this office may face. The Board of Directors are always available to you, so please direct any comments, questions or suggestions to us.

The next meeting for many of us will be at the AIC in Monte Carlo. There will be a large delegation attending and representing the ISCC and the United States.

## REPORT OF THE PRESIDENT-ELECT AND PROBLEMS COMMITTEE CHAIRMAN ALAN B. J. RODRIGUES

The Problems Committee of the ISCC has had a very successful year:

- Twelve active Project Committees held session during the 1985 Annual Meeting. One of these also had a very fruitful planning meeting mid-year.

- A new committee of "Special Education" has been added. Chaired by Dick Ingalls, it is preparing material explaining the basics of color. This will be distributed to schools to fill the void in color education.

- Committee #38, "Philatelic Color Designations" is currently on standby status, pending its final report.

- Two committees have technical reports near completion for Directors' approval to publish.

- All committees have updated their Scopes and Objectives as needed to better reflect the goals of their membership.

The Problems Committee's greatest accomplishment has been improved communication between Committee Chairmen and the Board of Directors. Six chairmen have attended Board Meetings, updating the Board on their activities and communicating their needs. Board members and committee chairmen have found this useful and believe it will lead to a stronger, more productive Problems Committee. We expect the remaining chairmen to participate in Board meetings over the next year.

We are committed to a path of continued improvement in the Problems Committee. This has been made possible by the hard work of the Project Committee Chairmen, the Coordinators who have been responsible for the improved communication and the Board members who have been so responsive to

the needs of the Project Committees.

## REPORT OF THE SECRETARY THERESE R. COMMERFORD

This past year has been a sad one for the Inter-Society Color Council. Four of its active and long-term members died during this period; Dorothy Nickerson, Robert Hoban, S. Leonard Davidson and Gunter Wyszecski. Their obituaries have appeared in various issues of the Newsletter over the past several months. Both Miss Nickerson and Mr. Davidson received the ISCC Service Award in April, Mr. Davidson posthumously. They will be missed by all of us in color, not only for their many contributions to color science but for the enthusiasm and guidance they so unselfishly gave to ISCC.

The Board of Directors appointed Dr. Thomas G. Webber as chairman of the By-Laws Committee, succeeding Mr. Rolf Kuehni. Dr. Webber had served as chairman, previous to Mr. Kuehni's appointment. Dr. Webber has asked Mrs. Bonnie K. Swenholt and Mr. F. Joseph Von Tury to serve on this committee with him. The Board also approved Mr. Daan Zwick as chairman of the Planning Committee. Dr. Peter K. Kaiser was the former chairman. Miss Joyce S. Davenport has been appointed representative to AIC, replacing Dr. Fred W. Billmeyer, Jr.

The following table lists the number of ISCC members in each of several categories, as of July 31, 1985. The actual numbers change from month to month as new members are added and old members deleted because of resignations or unknown address changes.

<i>Membership Category</i>	<i>Number of Members</i>
IMG: United States	586
Canada	15
Other Countries	72
IMGR (Retired)	19
IMGS (students)	5
Honorary Members	12
Delegates	198
A/C Representatives	18
Member-Body Liaison	35
Library Subscribers	22
Total Membership	945

Many delegates and AIC representatives are also IMG's; hence the total membership is not the sum of the above categories.

## 1985 GODLOVE AWARD FRANC GRUM

The Godlove Award is in honor of I. O. Godlove and is bestowed biannually to an individual in recognition of their contributions to the field of color. For a more detailed description of the Award one should look in the By-Laws and Standing Rules of the Council which is done by most members far too infrequently.

In accumulating information about an individual for this

type of purpose it's always interesting the information you find out. For example Franc I too have a May 21st birthdate.

Franc's achievements in the field of color are predominantly in the areas of color measurement standards and instrumentation and the proper procedure for the use of that instrumentation. His activities in these areas represents more than 30 years of effort. He was one of the leaders in developing appropriate methods for the measurement of fluorescent materials. He has authored numerous technical papers and is the principal editor of a five volume series on Optical Radiation Measurement.

Franc's formal education began in his native Yugoslavia in the languages and continued along more scientific lines after his emigration to this country and his employment with the Eastman Kodak Co. in the early 50's. Although his major contributions to color have been in the scientific areas, his early education has served him well for his bilingual capabilities are one of his strongest assets to the international color community.

While at Kodak he advanced to the position of Director of the Photometry section of the Research laboratory. Measurements made in that laboratory under his direction and guidance were considered as reliable as any that could be obtained. An effort he continues to pursue through his activities at RIT.

I can recall a four hour conversation with Franc while driving from Rochester to Troy to attend color 77 when we discussed the possibility of establishing a color center at RIT. A few years later with Dick Hunter's interest in establishing an endowed chair in the field of color and the Munsell Foundation's desire to dissolve itself while still maintaining the foundation's objectives that the circumstances began to form that would make such a color center a reality.

He is at present the Richard S. Hunter Professor of Color Science Appearance and Technology in the College of Graphic Arts and Photography at the Rochester Institute of Technology. And serves as the director of the Munsell Color Science Laboratory which was established a year last February at that Institute.

Among his many contributions to the Council he has been a problem committee chairman, served on the board of directors and is one of the past presidents. In addition he has been active for many years in the CIE, presently serving as the Division 2 director, has been past president of the U.S. National Committee of the CIE and is active in the affairs of CORM (Council for Optical Radiation Measurement).

It is an honor and a pleasure to present an award to a colleague in recognition of his efforts and accomplishments and the pleasure deepens when you have the privilege to honor a friend in such a way.

Franc it is a personal pleasure to me and with the respect and admiration of the Council for your accomplishments in the field of color science that you should receive the 1985 Godlove Award.

Milton Pearson

## SERVICE AWARDS

The ISCC Service Award is given for long term contributions to the aims and purposes of the Council. This year there were two outstanding recipients.

DOROTHY NICKERSON was one of the founders of ISCC in 1931. Thereafter she attended the next 52 annual meetings. She served as secretary to the Council from 1938 to 1950, was president 1954 to 1956, and edited the Newsletter for a time.

After attending Boston University and Johns Hopkins, Dorothy studied many topics as her interests expanded. She joined the Munsell Color Co. in 1921 and later served as president of the Munsell Color Foundation and wrote a history of the enterprise. In 1927 she joined the US Department of Agriculture where she introduced instrumental methods of judging colors as well as standard sources for visual judgments. She set up standards for textiles, agricultural products, and educational materials. When the CIE System was adopted she collaborated in converting the notations of the Munsell chips to smooth instrumental values, reported in classic papers as the Munsell Renotation. Other studies led to the Adams-Nickerson color difference formula, the precursor of the 1976 CIE  $L^*a^*b$  transformation. She was also instrumental in providing assistance on lighting problems to the IES and the CIE, particularly in the field of color rendering.

In 1961 Miss Nickerson received the ISCC Godlove Award and in 1975 the first Deane B. Judd-AIC Award from the Association Internationale de la Couleur.

Dorothy Nickerson's interest in ISCC never flagged. She was willing to listen to the problems of others and to offer friendly counsel. Her influence has been widespread. The ISCC Service Award underlines these unstinting contributions. Dorothy personified the ISCC.

S. LEONARD DAVIDSON, who died late in 1984, had been director of the ISCC and had served for 16 years as its treasurer. During his 40 year career with NL Industries he established a fine reputation in the coatings field, for which he received several awards. He found time to be active in the Federation of Societies for Coatings Technology, of which he was past president and an honorary member, the American Chemical Society, the Color and Appearance Division of the Society of Plastics Engineers, the Oil and Colour Chemists' Association of Great Britain, and the Munsell Color Foundation. He was a delegate to ISCC from several of these. He was on the editorial board of *COLOR research and application* from 1975 to 1984.

One of Len's outstanding contributions to the Council was the establishment of the Constitution, By-Laws, and Standing Rules format under which we operate. One remembers him at the registration table at annual meetings handing out badges while peering over the top of his glasses.

## REPORT OF THE 1985 ANNUAL BUSINESS MEETING

The 1985 annual business meeting of the Inter-Society Color Council was called to order by President Joyce S. Davenport at about 1:15 P.M., April 15, 1985, at the end of the annual meeting luncheon. President Davenport welcomed all to the



luncheon and annual meeting of the ISCC. She then presented the annual report of the president, reproduced elsewhere in this issue.

President-Elect Allan B.J. Rodrigues gave a brief report on the status of the Problems Committees. Dr. Rodrigues' report is included in this issue, as well.

Secretary Therese R. Commerford gave a short report of new individual members of ISCC this year. It was mentioned that the Council is desirous of increasing the number of individual members in the coming year. Mr. Edward T. Connor briefly summarized the reports of the Treasurer and the Finance Committee. All three reports are included in the annual report issue of the Newsletter.

President Davenport announced that the new directors for 1985-1988 are Mr. Jack Hsia, Mr. Justin Rennilson and Dr. Wolfgang Walter. She presented Certificates of Appreciation to retiring Directors Fred W. Billmeyer, Jr., Richard D. Ingalls and Rolf G. Kuehni. President Davenport thanked the outgoing directors for their help to ISCC over the past three years, with a special vote of thanks to Dr. Billmeyer for his many years of service on the Board. President Davenport warned Dr. Billmeyer that, even though this meeting represents his last formal attendance at a Board meeting, ISCC will still require his assistance and guidance.

The business meeting was purposely kept brief because of the full meeting schedule that day. The meeting adjourned at 1:30 P.M.

Respectfully submitted,  
Therese R. Commerford, Secretary

#### **REPORT OF THE BY-LAWS COMMITTEE ROLF G. KUEHNI, CHAIRMAN**

Nothing to report.

#### **REPORT OF THE PUBLICITY COMMITTEE THOMAS G. WEBBER, CHAIRMAN**

The present chairman succeeded Dr. Fred W. Billmeyer, Jr. in July 1984.

Arrangements were made with a firm in Marietta, Ohio to do both printing and mailing. Folders for Williamsburg '85 were designed, printed, and mailed. Circulation included 150 college art departments and 2000 members of ASID. For the Annual Meeting in April publicity went to 325 publications, brochures to ISCC members, and to the paint Federation. Notices went out in February regarding the three newly elected Directors and in April about the Godlove Award to Franc Grum and the Service Awards to Dorothy Nickerson and Len Davidson. Early information about Williamsburg '86 has been released.

#### **REPORT OF PROJECT COMMITTEE 6 SURVEY OF COLOR TERMS, C. JAMES BARTLESON, CHAIRMAN**

Committee on standby status. No report.

#### **REPORT OF PROJECT COMMITTEE 18 COLORIMETRY OF FLUORESCENT MATERIAL**

No report has been received.

#### **REPORT OF PROJECT COMMITTEE 25D JOHN RICHARDSON, CHAIRMAN**

Central to the discussions at this year's meeting of the committee was an attempt to determine a suitable problem to be undertaken as a project. Letters have been sent to past and current members of 25D inviting suggestions. Let us hear from you!

#### **REPORT OF PROJECT COMMITTEE 25F GEORGE SONN, CHAIRMAN**

A summary of the 1984-85 measurements from the round robin is attached. The pigment used for this round robin was PR144.

The 1984-85 round robin was the first year that all participants used a standardized formulation for the preparation of the tinted plaques. This standard formulation was derived by averaging several test methods that were submitted by various participants in this sub-committee. Emphasis was also placed on the fact that the average pigment loading in PP fiber is approximately 0.5%. This formula will be used again for the 1985-86 round robin. Correlation among participants was good again on this year's samples. Strengths of the 90% reduction samples ranged from 91.21% to 93.99%. The one fiber preparation submitted by Amoco Fabrics was 90.87%.

Two significant changes will be made for the 1985-86 round robin. They are:

1) All participants will be given a standard white concentrate (50% Du Pont R-101) to use for tinting supplied by Ampacet. George Sonn will arrange for samples to be sent to participants.

2) In the past, we have used one concentrate sample to make a 100% standard, then used that same concentrate to make an intentional 90% sample by reducing the loading 10%. This year, we are introducing color differences into our measurements as well as strength differences. This is being done by preparing two different lot #'s of concentrate, each being made from separate lot #'s of pigment. Mobay will be supplying the pigment for conversion to concentrate by Indol. George Sonn will arrange for distribution of the samples. The pigment for this year's testing will be PG 7. These changes are an attempt to introduce some "real world" concept into our sub-committee. We have, by opinions from participants at the meeting, reached a level of confidence that plaque to fiber correlation has been successful when derived from the intentional 90% reductions. The introduction of the two lot #'s should possibly reopen the scope of our meeting.

Another short summary will follow later in the year describing formulas and procedures to be used when the samples for preparation become available.

## ISCC Sub-Committee 25-F 1984-1985 PR 144

<i>Company Reporting</i>	<i>Sample</i>	<i>Units</i>	<i>DE</i>	<i>% Strength</i>	<i>Adjusted DE</i>
Amoco	Plaque	FMC II	3.79	93.63	0.30
Fabrics	Fiber	FMC II	4.42	90.87	1.06
Ampacet Corp.	Plaque	FMC II	3.44	93.99	0.20
Phillips					
Fibers	Plaque	FMC II	4.80	91.21	0.40
PMS	Plaque	FMC II	4.13	92.95	0.32
		CIELAB	1.11	92.95	0.14
Indol	Plaque	CIELAB	1.40	—	—

## REPORT OF PROJECT COMMITTEE 25P STRENGTH OF COLORANTS – PIGMENTS JACQUI WELKER, CHAIRPERSON

A brief summary of the activities of subcommittee 25P during the past year follows. This year the round robin testing dealt with reds. The reds were selected so as to give straightforward results because of the smooth spectral curves, and provide a challenge because of the possibility that more than one point of absorption may be present.

Of the eight laboratories participating six have reported their results, and in some instances their exhibits. One laboratory discarded the samples of pigment and vehicles required because the person who was responsible for the round robin testing left that company. Their testing materials have been replenished and hopefully we will have their results soon.

Work is currently underway to "fill in" some missing data from those already received such as at which wavelength was tint strength calculated, what are the tint strengths at which broad band tristimulus regions or both, and why one laboratory has not responded at all.

## REPORT OF PROJECT COMMITTEE 27 INDICES OF METAMERISM HUGH FAIRMAN, CHAIRMAN

The committee's endeavors have proceeded in three areas during the past year. The first area, which was carried out by students at Rochester Institute of Technology, under the direction of Dr. Roy Berns, was the study of the gamut of producible metamers from real colorants. Dr. Berns and his students gathered colorant files from coatings, plastic, and fibre manufacturers and users. These files contained absorption and scattering coefficient data which characterized the colorants. By combining all possible combinations of colorants capable of matching a given standard, it was possible to study the gamut of metameric mismatch likely to arise under actual conditions. Dr. Berns presented the results of this study at the recent AIC meeting in Monte Carlo.

The second area of endeavor for the committee was a review of the impact of the recently published, so-called Cohen-

Kappauf decomposition on our understanding of metamerically related phenomenon. One of the applications of the decomposition yields a mathematical technique for decomposing color difference into its simple color difference component and its metameric component. This has far reaching consequences for our current understanding of metamerism.

The third area of endeavor for the committee this year has been the preparation of a note to be submitted for publication, wherein the committee urges the adoption and use of the term "paramerism." This term applies to color difference pairs whose color difference arises both from a metameric component and from a simple color difference component.

## REPORT OF PROJECT COMMITTEE 30 COLOR IN THE BUILDING INDUSTRY

Committee on standby status. No report.

## REPORT OF PROJECT COMMITTEE NO. 32 IMAGE TECHNOLOGY PAULA ALESSI, CHAIRPERSON

This committee has been very active over the past year. In fact there has been so much interest generated that it was necessary to have two sessions at this year's annual meeting.

The first order of business for our last meeting on Sunday April 14th in Pittsburgh was a review of the scope and objectives of this committee. The chairperson, Paula Alessi, stated the scope in the following manner:

This project committee addresses problems common to photography, printing, video display, and television involving rendition, measurement, and specification of color. Solutions require the interaction of members from diverse fields sharing a common interest in the color problems associated with their imaging systems.

The objectives were then stated.

Since the scope is so broad, the main emphasis of this committee is placed on the area that needs the most work. All efforts address the two-way relationship between a video display and a hardcopy (i.e. a graphic arts or photographic material). There are three objectives based on this main emphasis.

1. An ongoing activity is the compilation of a general video display bibliography.

2. We hope to investigate what has been done and perhaps what needs to be done in the areas of calibration of video display phosphors and recommendation of optimum video display viewing conditions. This work will be carried out in conjunction with the ASTM.

3. We will design and execute some experiments to define the mapping function that will allow us to go from video display color space to hardcopy color space. A subset of this work involves studying the practical gamut of colors achievable in video display and hardcopy media.

The remainder of the meeting was spent discussing the status of each of these objectives.

Efforts towards meeting the first objective have just begun. Thanks to Danny Rich we have many pages from a bibliography on video displays and graphics that he found at a recent meet-

ing. Paula divided the stack up into three piles and handed each pile out to three volunteers, who agreed to study the bibliographic material and compile it according to major headings that might be of interest to this committee. The three volunteers were Danny Rich, Joann Taylor, and Paul McManus. There was some discussion as to what form this bibliography should take. It was agreed that it should be restricted to literature references that discussed the color aspects of video displays.

Since the ISCC is not a standardizing body, it became evident that the only way this committee was going to accomplish its second objective was to join forces with some standardizing organization that shared a common interest. Nick Hale suggested that the ASTM would be interested if we could provide someone to chair that effort. Paula Alessi volunteered to chair ASTM subcommittee E12.06 called Appearance of Displays. That subcommittee agreed to pursue writing standards for the spectroradiometric measurement of video displays and for the video display viewing environment. In order to make the joint effort successful, it was necessary for some ISCC members to join the ASTM subcommittee. A sign up sheet was sent around and a few of our ISCC project committee no. 32 members agreed to serve on the ASTM subcommittee. An obvious first step for this joint group is to identify what has already been done in terms of establishing sound measurement techniques and optimum viewing conditions for video displays. Paula mentioned CIE Publication 40 on video display units. It describes some visual requirements of video displays and recommends appropriate viewing conditions. Some of the visual environment recommendations are:

1. Windows should have blinds or curtains with reflectance between 0.5 and 0.7.
2. Average reflectance of ceiling should be greater than 0.7.
3. Reflectance of walls should be between 0.5 and 0.7.
4. Reflectance of floor should be 0.3.
5. Illuminance in horizontal working plane should be between 300 and 1000 lux.

Most of these recommendations are not specific enough for our purposes. Ken Miller presented a copy of a draft soon to be published by ANSI entitled American National Standard for Human Factors Engineering of Visual Display Work Stations. At first glance this document appears to have more detailed specifications for optimum conditions representing acceptable human factors engineering principles and practices in the use of video displays. Paula will study it more closely to assess its recommendations. Paula will also take the necessary steps to get this ASTM-ISCC group started.

Steps toward achieving the third objective began at the October 1984 meeting. A preliminary experiment aimed at trying to define the mapping function between hardcopy and video display color space was discussed in very general terms. The following proposal was drafted to outline more of the specific details for such an experiment:

#### **Proposal for First Experiment to Define Mapping Function Between Hardcopy and Video Display Color Space**

**Objective:** To determine whether the color appearance matches when the colorimetric values for a set of reproduced object colors are the same on a video display screen as on a hardcopy.

**Procedure:** I. Set up the Video display under typical office viewing conditions. Refer to the ANSI draft for recommendations.

II. Produce a well-balanced image of the Macbeth Color Checker at a normal exposure level on a transparency film.

III. Project that image in a room set up with the same illuminant and at the same level as the video display environment. This may require a special screen, filtering of the projector illumination, and other special lighting conditions, but the ultimate goal should be to match the color temperature of video display environment.

IV. Measure the spectral distribution of the 24 colors and compute tristimulus values for the appropriate illuminant.

V. Produce an image on the video display which has the same tristimulus values as the projected transparency. Care must be taken to first achieve the same white point.

VI. Determine whether the video display image matches that of the projected transparency.

VII. If a match does not result, determine what set of tristimulus values leads to a match between the video display image and the projected transparency image. Define the relationship between the two sets of tristimulus values.

**Equipment:** I. Carousel projector, screen, filters, and other special equipment needed to achieve what is outlined in Procedure III. above.

II. Video display device — 60Hz non-interlaced.

III. Instrumentation for performing the necessary measurements.

This proposal provided the basis for discussion at two meetings of ISCC project committee no. 32 in Pittsburgh. There were a few important points raised throughout those discussions. First the issue of whether the hardcopy should be a reflection print or a transparency was raised. A transparency was the preferable choice because it is likely to be easier to achieve a match between it and a luminous video display than between a reflection print and a video display. However the reflection print does offer the advantage that it can be viewed under the same illumination conditions in a side-by-side comparison with the video display. Second it was agreed upon that the viewing room should be illuminated with filtered incandescent lights that meet the requirements stated in the ANSI draft document. Third, it was felt by some that a perceptual match should be achieved first rather than dialing the transparency's tristimulus values into the video display unit. Fourth, observers should take a color aptitude test as a preliminary screening and they should also have their match points determined on the D&H color rule. Fifth, the exact details of the matching exercise were discussed. The observer should match one color at a time and that color should be surrounded by the same background luminance in the hardcopy and the video display. If we decide not to have the observer dial in a perceptual match first, then it may be a good idea to

have the observer do some visual scaling of the tristimulus value match. If the observer is shown a gray scale, he can be asked how far apart the two colors (one on the video display and one on the hardcopy) are which represent a tristimulus value match relative to the steps in the gray scale. Finally it was suggested that if conventional colorimetry fails to predict the matches, then we might try the CIE 1964 10° observer or some other modification such as employing color matching functions derived from Judd's recommended adjustment to the  $V_7$  curve or from Smith and Pokorny's alternate set of red, green and blue fundamental trichromatic primaries.

Many issues were raised and so many different points of view were expressed that it was difficult to agree on the exact experimental design. Yet time is of the essence because we would like to have this project carried out as part of a student's Master's thesis working in the Munsell Color Science Laboratory at Rochester Institute of Technology. There is a student ready to start in the fall, but he will need equipment. We are hoping to request an equipment loan from Tektronix, but before we can, we must finalize this experimental proposal. Such finalization will be done by a subcommittee that can keep in closer, more frequent contact. Its members are Paula Alessi, Roy Berns, Franc Grum, Paul McManus and Joann Taylor. This subcommittee will formalize the proposal, keeping in mind all the issues that were raised at the annual meeting. They will report on their progress at a later date.

### **REPORT OF PROJECT COMMITTEE 33 HUMAN RESPONSE TO COLOR MARY BUCKLEY, CHAIRPERSON**

During the ISCC 45th Annual Meeting at Station Square in Pittsburgh on April 15th, the Human Response to Color committee met under the chairmanship of Mary Buckley with about 38 people attending. A slide and lecture presentation on buildings and interiors was given by Mary Delaney of Skidmore, Owens and Merrill. Ms. Delaney discussed the use of colors and light, finishes, materials and furnishings in these interiors.

Several committee members met previously on January 8th in New York City and proposed the following committee goals:

- I. Illustrate to designers through experiential demonstrations the more complex attributes of light and color.
- II. Establish a uniform vocabulary for the exchange of concepts about light and color.
- III. Provide a forum for presentation and publication of color concepts as related to human response.
- IV. Establish a task force charged with bringing to the committee new areas of color and light research related to human response.

These goals were presented and discussed at the meeting.

The existing working committee is dealing with Goals I and II. In the fall Mary hopes to have completed work involving light, shade, pattern and texture. Under Mary's guidance a subcommittee will deal with Goal IV. The subcommittee members are David Johnson, Bonnie Bender and Chris Burton.

### **REPORT OF PROJECT COMMITTEE 34 COLOR DIFFERENCE PROBLEMS**

No report has been received.

### **REPORT OF PROJECT COMMITTEE 35 COLOR MATCHING OF HUMAN TISSUES STEPHEN F. BERGEN, CHAIRMAN**

Subcommittee 35 held its Annual Meeting on Sunday, April 14, 1985 in Pittsburgh, Pennsylvania. This past year Dr. Richard McPhee has taken over the leadership of the Color Matching Committee of the American College of Prosthodontists. The main project for this year was to complete the compiling and approval of the glossary of prosthodontic terms. That committee of the College has been charged with compiling color terms to be included in the glossary. Subcommittee 35 members are part of that review process.

There were several attendees who were not familiar with the role of color in Dentistry and Maxillofacial Prosthetics. I discussed the various problems and implications of each area in Dentistry where color was an issue.

At this Annual Session of the ISCC, the use of a spectrophotometer with fiberoptic capabilities was discussed. The instrument, connected to an I.B.M. P.C. has the capability of reading and analyzing spectral data from a tooth and displaying its appropriate data and curves on a C.R.T. or printer. The table top spectrophotometer is a state of the art instrument and holds much promise for dental as well as many other fields. The instrument is at present available for use in the paint industry. Sample matches were shown and discussed. The instrument has applicability clinically as well as for extensive tooth color research. September 85 is the target date for its debut. If the schedule can be met, and some work completed, results will be presented at next years meeting.

Other areas of application of this spectrophotometer are the automotive and cosmetic industries. A representative of both groups attended our Committee and entered into the discussion. Once a fiberoptic instrument is available, many applications heretofore impossible, or at least impractical, can be reexamined.

The highlight of this meeting was a lecture given by Dr. Roy Berns of R.P.I. He was asked to discuss the Opponent Color System and why there are different primaries and complementary colors in the various systems we use. The CIE LAB, CIE LOVE, ADDITIVE, SUBTRACTIVE systems were discussed.

Another topic for review was whether Metamerism as classically understood was really an issue in Dentistry, or were we dealing primarily with a color difference problem. It seems both concepts are influencing what we see, but that problems other than metamerism play such a strong role in how the color is seen in final product (standardization, materials, formulation, shade guides, etc.), that metamerism plays a secondary or even tertiary role. Color differences can be so great, that metamerism may be minor.

Operatory lighting was examined in view of the fact that several fluorescent tubes have appeared in the market place and have not been reexamined by the dental industry. I, and my

wife, Juliet, also a Prosthodontist, plan to conduct a study of available lights over the summer. The study will be modeled after the one I did at Walter Reed in 1977.

Several other topics were discussed in the 2 hour session. It was a most fruitful and educational meeting.

**REPORT OF PROJECT COMMITTEE 36  
EXAMPLES OF INDUSTRIAL COLOR  
DIFFERENCE ACCEPTABILITY  
ANTHONY J. PENTZ AND W. RICH MATHEW,  
CO-CHAIRMEN**

No report has been received.

**REPORT OF PROJECT COMMITTEE 37,  
ARTISTS' MATERIALS  
MARK GOTTSEGEN, CHAIRMAN**

An editorial task group of the Committee met in late November 1984 to consider the proposed handbook on the paint standards. A tentative outline was formulated, and included the following items: an introduction; a section on health labeling; a section on quality labeling; a section about artists' tests (lightfastness, tinting strength, etc.); and a section of appendices of a more technical nature (pigment identification, studio lighting, etc.).

At the Annual Meeting of the Committee, with many new visitors, there was further discussion about the audience for the handbook. It was generally agreed that the style and contents of the manual must be kept relatively simple for the average artist/reader. It was suggested that a "for further reading" section be added to the back of the handbook for those who want more complete technical information. It was also suggested that perhaps the scope of the handbook could be expanded to accommodate other materials and information, and that maybe a series of separate pamphlets with individual authors be developed. Some graphic material for the handbook might be provided by the ISCC Committee on Color Education and Materials.

In an attempt to get some actual writing done, the chairman passed out a few copies of a draft of three sections of the handbook: explanations of the two ASTM Standards and a simple tinting strength test method. The chairman would welcome comments from those who have read the drafts; those who would like a copy are asked to write—they will be sent with apologies for underestimating this year's attendance!

At next year's meeting (Toronto, June 16-18) the chairman hopes to have a draft of the complete handbook, and urges those who wish to contribute sections of particular interest to do so forthwith.

**REPORT OF PROJECT COMMITTEE 39  
COLOR OF GEMS**

Committee on standby status. No report.

**REPORT OF PROJECT COMMITTEE 40  
COLOR EDUCATION RESOURCES AND  
MATERIAL, EVELYN STEPHENS, CHAIRMAN**

No report has been received.

**REPORTS FROM MEMBER-BODY DELEGATIONS**

**REPORT FROM THE AMERICAN ARTISTS'  
PROFESSIONAL LEAGUE  
ANGELO GRADY, CHAIRMAN**

No report has been received.

**REPORT FROM THE AMERICAN ASSOCIATION  
OF TEXTILE CHEMIST AND COLORIST  
DELEGATES  
ROLAND LEE CONNELLY, SR., CHAIRMAN**

No report has been received.

**REPORT FROM THE AMERICAN CERAMIC  
SOCIETY DELEGATES  
F. JOSEPH VON TURY, CHAIRMAN**

No report has been received.

**REPORT FROM THE AMERICAN CHEMICAL  
SOCIETY DELEGATES  
LAWRENCE R. LERNER, CHAIRMAN**

No report has been received.

**REPORT FROM THE AMERICAN COLLEGE OF  
PROSTHODONTISTS  
STEVEN F. BERGEN, CHAIRMAN**

This report is combined with that of Project Committee 35 and may be found under Project Committee reports.

**REPORT FROM THE AMERICAN PHILATELIC  
SOCIETY DELEGATES  
DONALD L. MacPEEK, CHAIRMAN**

This report is combined with that of Project Committee 38 and may be found under Project Committee reports.

**REPORT FROM THE AMERICAN  
PSYCHOLOGICAL ASSOCIATION DELEGATES  
EDWARD H. RINALDUCCI, CHAIRMAN**

No report has been received.

**REPORT FROM THE AMERICAN SOCIETY FOR  
TESTING AND MATERIALS DELEGATES  
HARRY K. HAMMOND III, CHAIRMAN**

Revision of several important standards dealing with color and appearance have been or are being made. E308-85, "Standard Method for Computing the Colors of Objects by Using the CIE System," is now completed and published in Volume 14.02



(Appearance) of the *1985 Annual Book of ASTM Standards*. It is also available as a "separate" item from ASTM, 1916 Race Street, Philadelphia, PA 19103, price \$8.00 less 20% to members. The other half of the revision of E308 will be a standard practice dealing with how to obtain the spectral data from which to compute results according to the standard method of computation past published. At present, this material exists only in outline form.

Another major accomplishment in 1984 was the publication in May of the "Composition of ASTM Standards on Color and Appearance" (see ISCC News No. 290, May-June 1984, Part 217, for a review of this book). The price is \$39.00, again less 20% to members of ASTM; so, those working on color or appearance shouldn't be without a copy.

The Optical Properties Subcommittee of the Paint Committee is in the process of reviewing and revising a number of standards, as is the Plastics Committee. Details of these revisions will be reported in subsequent issues of the ISCC News as they are completed.

**REPORT FROM THE AMERICAN SOCIETY OF  
INTERIOR DESIGNER DELEGATES  
ANNA CAMPBELL BLISS, CHAIRMAN**

No report has been received.

**REPORT FROM THE AMERICAN SOCIETY OF  
PHOTOGRAMMETRY DELEGATES**

No report has been received.

**REPORT FROM THE ARTISTS EQUITY  
ASSOCIATION DELEGATES  
LINDA LEWIS TAYLOR, CHAIRPERSON**

No report has been received.

**REPORT FROM THE COLOR ASSOCIATION OF  
THE UNITED STATES DELEGATES**

No report has been received.

**REPORT FROM THE COLOR MARKETING  
GROUP DELEGATES  
JAMES GRABOWSKY, CHAIRMAN**

No report has been received.

**REPORT FROM THE DETROIT COLOUR  
COUNCIL  
WILLIAM V. LONGLEY, CHAIRMAN**

The DCC held the usual four color presentations in the '84-'85 program year, dealing with color parts analysis, styling, color difference measurement and pigment properties. The highlight was the March symposium on automotive color difference, attended by 300-plus people. This was the seventh in a series of annual DCC panel conferences on automotive color issues.

The latest symposium was an open forum on issues under consideration by the DCC Color Difference Committee. Com-

mittee members summarized findings on issues of color space, standard observer, standard illuminant, instrument geometry, color difference formulas, sample preparation, effect of metamerism, secondary standards and tolerancing. A lively discussion followed the presentations.

The committee has reached agreement on most issues and is expected to issue a test method this summer. The Society of Automotive Engineers will then be asked to endorse the test method and issue an SAE Recommended Practice for consideration by the auto companies. Committee members, in addition to auto company engineers, represent all areas of supply of parts and materials.

**REPORT FROM THE DRY COLOR  
MANUFACTURERS ASSOCIATION DELEGATES  
A. M. KEAY, CHAIRMAN**

No report has been received.

**REPORT FROM THE FEDERATION OF  
SOCIETIES FOR COATINGS TECHNOLOGY  
DELEGATES  
JACQUELINE WELKER, CHAIRMAN**

No report has been received.

**REPORT FROM THE FOUNDATION FOR  
ANALYTICAL RESEARCH IN THE ARTS, LTD.,  
DELEGATES  
ROY H. WHITE, CHAIRMAN**

No report has been received.

**REPORT FROM THE GEMOLOGICAL INSTITUTE  
OF AMERICA DELEGATES  
VINCENT MANSON, CHAIRMAN**

No report has been received.

**REPORT FROM THE GRAPHIC ARTS TECHNICAL  
FOUNDATION DELEGATES  
RICHARD D. WARNER, CHAIRMAN**

No report has been received.

**REPORT FROM THE GRAVURE TECHNICAL  
ASSOCIATION DELEGATES  
FRANK BENHAM, CHAIRMAN**

No report has been received.

**REPORT FROM THE ILLUMINATING  
ENGINEERING SOCIETY OF NORTH AMERICA  
DELEGATES  
WILLIAM A. THORNTON, CHAIRMAN**

A substantial delegation from the U.S. lighting community, led by IES President James Jewell and IES Technical Director John Kaufman, visited the Peoples' Republic of China for several weeks in October.

IES is developing, with illuminating societies in the Pacific Basin (z.b. China, Hong Kong, Australia), a 'Lux Pacifica' modelled after Lux Europa.

IES 1985 Annual Meeting will be July 22 in Detroit, in conjunction with the Annual Conference.

IES Lighting Research and Education Fund has reached \$2 million.

IES Lighting Research Institute's solicitation for proposals brought in 53, of which 8 were funded.

The second Workshop for Teachers in Lighting should come about in July, and may become an annual affair.

"Mission: IESNA's purpose is to be the authoritative source of lighting information to foster quality lighted environments. This shall be accomplished by developing, promulgating, and promoting quality-of-lighting practices."

Volume 14, No. 1, of the Journal of the Illuminating Engineering Society (October 1984) contains all thirty of the technical papers presented at the 1984 IES Annual Conference, August 5-9, in Saint Louis. Reference to color or color-rendering is essentially absent. The drive to generate footcandles for fewer watts is further degrading color-rendering.

The two-volume IES LIGHTING HANDBOOK is an admirable and comprehensive package of lighting concepts, sources, processes, definitions and application. From the point of view of ISCC members, in the Reference Volume, chapter 5 (Color, 31 pages) is good, and chapter 8 (Light Sources, 137 pages) is useful. In the Application Volume, there are discussions of lighting design, the lighting of offices, educational facilities, public buildings, merchandising, industrial, residential, theater, TV, photography, sports, roadways, aviation, transportation, advertising. In the last few months, an update of the Reference Volume was announced.

Pros in entertainment lighting met at SHOWLIGHT '85, an annual international symposium sponsored by the IES Theater, Television, and Film Lighting Committee. Coincident with the ISCC Annual Meeting will occur LIGHTING WORLD III, an advanced illumination conference and exposition, at the New York Hilton.

#### **REPORT FROM THE INDIVIDUAL MEMBER GROUP VOTING DELEGATES**

No report has been received.

#### **REPORT FROM THE INDUSTRIAL DESIGNERS SOCIETY OF AMERICAN DELEGATES RAYMOND SPILMAN, CHAIRMAN**

No report has been received.

#### **REPORT FROM THE MANUFACTURERS COUNCIL ON COLOR AND APPEARANCE DELEGATES JAMES G. DAVIDSON, CHAIRMAN**

No report has been received.

#### **REPORT FROM THE MYCOLOGICAL SOCIETY OF AMERICA DELEGATES KENT H. McKNIGHT, CHAIRMAN**

No report has been received.

#### **REPORT FROM THE NATIONAL ASSOCIATION OF PRINTING INK MANUFACTURERS DELEGATES ALFRED DIBERNARDO, CHAIRMAN**

No report has been received.

#### **REPORT FROM THE NATIONAL PAINT AND COATINGS ASSOCIATION DELEGATES EVERETT R. CALL, CHAIRMAN**

No report has been received.

#### **REPORT FROM THE OPTICAL SOCIETY OF AMERICA DELEGATES C. JAMES BARTLESON, CHAIRMAN**

No report has been received.

#### **REPORT FROM THE PHILATELIC FOUNDATION DELEGATES TIMOTHY A. HOLMES, CHAIRMAN**

The Philatelic Foundation has been continuing its research in methods of color determination of stamps and postal material. The pursuit of this study is in support of the Foundation's Expert Committee, a recognized authentication body.

The subject matter consists of classic stamps, in which identity depends on specific "shade" of color, and postal markings on entire envelopes or covers. Such markings lend significance to items of postal — historic value and are subject to alteration and forgery.

Techniques being used include color reflectance methods and analysis of chemical composition. A limitation on applications to this authentication work is that non-destructive techniques are requisite in the examination of relics of value.

The groundwork was laid in the 1979 Foundation text, *Color in Philately*, edited by R. H. White and including articles by Fred Billmeyer, Jr., Ivor Preiss, and Ruth Johnston-Feller outlining use of spectrophotometry and x-ray fluorescence in analysis of inks and papers.

The Foundation is seeking to enlist the widest possible technical support in method development. Several Federal Bureaus have been among its helpful supporters.

One example of the work being done was written up for the Foundation's 1984 book *Opinions II*, a compendium of authentication problems and their solution. This was "X-ray and Example, India: The 4-Anna Issue of 1854 with a Double Frame."

In 1984 the Foundation established a research program, the Alfred R. Clark Fund, for the furtherance of its studies in technical means of stamp authentication. It welcomes both contributions to and technical participation in the program.

**REPORT FROM THE SOCIETY OF INFORMATION  
DISPLAY DELEGATES  
IFAY F. CHANG, CHAIRMAN**

**1984 SID International Symposium Digest of  
Technical Papers**

**June 1984**

Perceptual Analysis of Color Monitors (R. W. Klopfenstein, C. R. Carlson)

Simulation of Alphaneumeric Characters on Color Monitors (Albert P. Pica)

Matching Video and Hard-Copy Color (Paul McManus, David Mead)

Color and Brightness Contrast Effects in CRT Displays (Alan Spiker, Steven P. Rogers, Joseph Cicinelli)

Automatic Chrominance Compensation for Cockpit Color Displays (Kun H. Kuo, Michael H. Kalmanash)

Color and Gray Scale in Sonar Displays (K. F. Kraiss, K. H. Kuttelwesch)

High Definition Color Television (T. True)

An 8-in.-Diagonal Pulse Discharge Panel with Internal Memory for a Color TV Display (Hiroshi Murakami, Ryuichi Kaneko, Ryuya Toyonaga, Seiji Sega)

An 8-in.-Diagonal High-Efficacy Townsend-Discharge Memory Panel Color TV Display (Shigeo Mikoshiba, Shinichi Shinada)

PLZT Color Displays (Gene Haertling)

Characteristics of Crosstalk in Color Doughnut ac Plasma Display Panels (H. Uchiike, N. Awaji, Y. Fukushima, T. Shinoda)

Multicolor Graphic LCD with Tricolor Layers Formed by Electrodeposition (Hitoshi Kamamori, Mitsuru Suginoya, Yumiko Terada, Koji Iwasa, Toyokazu Nomura, Jun-ichi Yasukawa, Tameyuki Suzuki)

A Flat Color TV Display with Horizontal Addressing and Vertical Deflection (Ei-ichi Miyazaki, Yasutada Sakamoto)

A 7.23-in.-Diagonal Color LCD Addressed by a-Si TFTs (Y. Ugai, Y. Murakami, J. Tamamura, S. Aoki)

4.25-in. and 1.51-in. B/W and Full-Color LC Video Displays Addressed by Poly-Si TFTs (Shinji Morozumi, Kouichi Oguchi, Toshiyuki Misawa, Ryosuke Araki, Hiroyuki Ohshima)

High-Resolution Color CRTs Using a Tilt-Array Shadow Mask (T. Banno, S. Hayashi, Y. Yamaguchi)

Optimum Color Reproduction for Thermal Ink-Transfer Printing (Osamu Asada, Shinichi Itoh, Takehito Sekiguchi, Kenzo Tsuji)

**International Conference on Color in Information  
Technology and Visual Displays**

**March 27 - 28, 1985**

**University of Surrey, Guildford, England**

Color in Quantitative and Qualitative Display Formats: Does Color Help? (J. M. Reising, T. J. Emerson)

Color Contrast Calculations for Displays Viewed in Illumi-

nation (Dr. John Laycock)

Uniform Color Space — The Effect of Luminance on the Perception of Constant Hue (Mrs. F. A. Greene, C. Gibson)

Minimum Color Differences Required to Recognize Small Objects on a Color CRT (P. L. Phillips)

Human Color Vision and Natural Images (I. Moorhead)

Derivation of a Uniform Color Space from Discriminative Reaction Times (J. D. Mollon, C. R. Cavonius)

What Does Color Add to a Display that can't be done in Black and White? (P. T. W. Hudson)

A Lighting Design Aid Using Color Television (D. Gilderdale)

Color in Visual Display Units (R. N. Jackson, S. R. Turner)

The Separation of Characters by Color Instead of Spacing (V. David Hopkin, Ruth E. Caswell, N. Zoe Hilton)

The Application of Color Coding to Air Traffic Control Displays (C. S. Narborough-Hall)

The Use of Color in Enhancing Satellite Imagery of the Earth (P. M. Mather)

Applications of Color in the Presentation of NMR Images (D. Gilderdale, Jacqueline Pennock)

Color Displays in Fisheries: Echo Sounding and Sonar (R. B. Mitson)

Color Display for the Kingfisher Computer Navigator (R. Coates)

A Versatile Stereo Viewing System for use with Color-Graphics Screen (M. R. Harris)

Three Dimensional Computer Graphics in Real-Time (R. L. Rhodes, L. Serra)

**SOCIETY FOR INFORMATION DISPLAY  
1985 INTERNATIONAL SYMPOSIUM, SEMINAR  
& EXHIBITION**

**April 29 - May 3, 1985**

The Ergonomics of Enhancing User Performance With Color Displays (Wanda Smith)

Ultra-Large-Screen Color Display (Akio Ohkoshi)

A Color-Based Text Editor (M. Saito, W. Bender)

Desktop Color Document Scanner (F. Nagano, S. Misaka, H. Mori)

A Continuous Very-Large-Area Liquid Crystal Color Display (H. Matsukawa, Y. Wakahata, M. Ito, A. Takada)

A Full-Color Field-Sequential LCD Using Modulated Backlight (H. Hasebe, S. Kobayashi)

The Prospects For Color Flat-Panel Displays (P.R. van Loan, P. Bos, G. Dick, C. King, S. Uemura)

Effects of Shadow Mask Color vs Monochrome CRTs on Detection of Sonar Signals (G. Volkov, Jr.)

High-Resolution Thermal Ink Transfer Color Printer (S. Yoshida, M. Itoh, Y. Kimura, M. Hirota)

A Color Thermal Transfer Printer with Recoating Mechanism (I. Nose, T. Takeda, S. Kuroe, H. Masaki, K. Tanoshima)

High-Resolution Electron Gun Designed for a New Generation of Color Data Display Tubes (H. Y. Chen)

Perceptual Problems in Color Display Imagery (J. Walraven)

Effects of Color on CRT Symbol Legibility (D. L. Post)

Accommodation During Color Contrast (D. T. Donohoo, H. L. Snyder)  
 A Method for Matching Hardcopy Color to Display Color (P. McManus, G. Hoffman)  
 Visual Efficacy Improvement of Displays with Bandpass Filters (H. Xi)  
 Multi-Color Electroluminescence in Alkaline-Earth-Sulfide Thin-Film Devices (S. Tanaka, V. Shanker, M. Shiiki, H. Deguchi, H. Kobayashi)  
 A Single-Lens Three-CRT Crossed Dichroic Color Projector for Data and Video (T. Schmidt)  
 Full-Color TFT-LCD with Phase-Change Guest-Host Mode (T. Sonehara, S. Morozumi, K. Oguchi, R. Araki, S. Aruga)  
 Color Jet Ink: Printability on Paper and Transparency Film (I. Tabayashi, H. Okubo, H. Harada, H. Fukutomi)  
 Full-Color Ink-Jet Printer Using Multilevel Ink (M. Takahashi, T. Ushioda, R. Uematsu, N. Tagawa, H. Fukuchi)  
 Precision Color CRT Monitor for Military Applications (S. Berkoff, A. N. DeLorenzo)  
 A Flicker-Free 2448 x 2048 Dot Color CRT Display (K. Ando, M. Osawa, T. Shimizu, T. Maruyama, M. Fukushima)  
 A Real-Time Digital-Map Color Display System for Cockpit Applications (J. F. Dawson)  
 Color-Graphic Front Luminous VFD (K. Morimoto, E. Imaizumi, T. L. Pykosz)  
 Computing Color Gamuts of Ink-Jet Printing Systems (P. G. Engeldrum)

## **REPORT FROM THE SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS DELEGATES**

### **ROLAND J. ZAVADA, CHAIRMAN**

"Focusing on the Future of Image Technology" was the theme of the Society's 126th Technical Conference at the New York Hilton and Sheraton Centre Hotels, October 28 - November 2, 1984. More than 111 papers were presented and color was the subject of many:

A Portable Wireless Camera Utilizing Analog Component Video Techniques  
 Recovery of CD-2 from Process ECP-2A Color Developer and Stop Bath  
 Technology and Technique: How New Equipment and Technology Help the Cameraman  
 Evaluating Lens and Camera Image Quality: An On-the-Spot, Filmmaker-Oriented Approach  
 Graininess in Motion Pictures  
 Improved Fujicolor High-Speed Negative and Positive Films  
 XT Crystal Technology for Speed Increase with Preservation of Overall Image Quality in Color Negative Film  
 Agfa XT 125 and Agfa XT 320 — Two New Color Negative Films with Outstanding Pictorial Characteristics  
 In-Camera Pre-Flash on Eastman Color High Speed Negative Film  
 High-Speed Beam-Splitting Prism for Small-Format Color Cameras  
 The BVP-360 — High Technology Introduces a New Era Field/Studio Camera

Resolution Requirements for HDTV Based Upon the Performance of 35mm Motion-Picture Films for Theatrical Viewing

Some Considerations in Using CCD Imagers in Broadcast-Quality Cameras

SP-3 Three-Chip CCD Color Camera

Improved Tone Scale for Television Applications Through Modified Process VNF-1

The Objectives of Lighting

Performance Characteristics of HMI-Type Lamps

Art Direction in Colorization

Color Correction Techniques — Analog and Digital

The Producer's Guide to Special Visual Effects Production

Several papers on color were presented at the Society's 18th Annual Television Conference on February 10-11, 1984, in Montreal, Canada:

Image Quality from a Non-Engineering Viewpoint

Perceptual Considerations for High-Definition Television Systems

Psychophysics and the Improvement of TV Image Quality

Some Factors in the Evaluation of Image Quality: A British View

Why Better Pictures?

On Picture Quality in Television Systems

High Quality on Cable TV Including MDS

Digital LSI and Image Processing — The Road to Improved TV Image Quality Awards and honors for outstanding technical achievement were presented to several recipients during 1984:

The Journal Award for a motion-picture article went to Wilfried Liekens, Agfa-Gevaert Co., for "Psychophysical Relationship of Image-Quality Characteristics of Motion-Picture Color Films," published in the September 1983 SMPTE Journal.

In recognition of his distinguished contributions to the improvement of the interface between motion-picture film and television imaging systems, Bengt Modin, Swedish TV, was awarded the agfa-Gevaert Gold Medal for the design and development of an A&B telecine operation to accommodate 16-mm films where the original negative is cut in A&B format. This system takes advantage of the image quality of color negative when transferred to video, and it enables video techniques to be used for dissolves, superimposed images, titles, etc.

The Herbert T. Kalmus Gold Medal Award, which recognizes outstanding contributions in the development of color films, processing, techniques, or equipment useful in making color motion pictures for theater or television use, was awarded to Christoph Geyer, Geyerwerke GmbH, for his work in the design, engineering, construction, and application of total immersion wet printing gates and the liquid support systems for such installations.

Allen J. Trost, Ampex Corp., the recipient of the Alexander M. Poniatoff Gold Medal for Technical Excellence, was honored as a specialist in video signal system design whose work has had significant impact on most of the video tape recorders manufactured by his company, both in design and engineering project management responsibility.



In recognition of distinguished leadership in the development of new techniques or equipment which has contributed to improvement of the engineering phases of television and theater television, Ricahrd S. O'Brien was awarded the David Sarnoff Gold Medal Award for the planning and realization of advanced television production facilities and for significant contributions to the technical literature of television production.

Outstanding technical contributions to the progress of engineering phases of the motion-picture and/or television industries is recognized by the Progress Medal Award. Joseph A. Flaherty, the 1984 recipient, was cited for the conception and leadership in the implementation of new technology, including engineering news gathering, off-line electronic editing systems, electronic cinematography, high-definition television, and his contribution to the establishment of a world-wide compatible standard for the digital coding of television signals.

The Society's Committee on Television Video Technology is currently developing a recommended practice specifying the coordinates for the colorimetry of the red, green, and blue phosphors used in professional television picture monitors.

Appended is a list of papers on color published in the SMPTE Journal during 1984.

#### **Papers Published in the SMPTE Journal Volume '93 1984**

S. J. Powell, C. Didier, B. Gagny, K. J. Carl., J. W. Erwin, and I. A. Halman, "Eastman Color LC Print Film 5380/7380," 228-234, March.

M. Achiha, K. Ishikura, and T. Fukinuki, "A Motion-Adaptive High-Definition Converter for NTSC Color TV Signals," 470-476, May.

H. Sakata, "Masking of Chrominance Pattern Movement and Its Application to Color Television Signal," 552-560, June.

J. van den Berg and N. V. Rao, "Modern Trends in Color Broadcasting Camera Systems," 561-565, June.

D.A. Richardson and W. C. Gungle, "The Care and Handling of Sylvania Brite Arc and Brite Beam Lamps," 588-591, June.

W. Markle, "The Development and Application of Colorization," 632-635, July.

K. Iwabe, K. Yamauchi, and F. Ukigaya, "Development of a Real-Time Registration Adjustment System of a Color Camera," 639-641, July.

Y. Sugiyra, Y. Nojiri, and K. Okada, "HDTV Laser-Beam Recording on 35mm Color Film and Its Application to Electro-Cinematography," 642-651, July.

K. Ryu, "Dimmable HMI Lighting System for a TV Studio," 667-671, July.

H. Mathias, "Image Quality from a Non-Engineering Viewpoint (Point of View)," 712-716, August.

W. F. Schreiber, "Psychophysics and the Improvement of Television Image Quality," 717-725, August.

B. Wendland and H. Schroder, "On Picture Quality of Some Television Signal Processing Techniques," 915-922, October.

T. Fukinuki, Y. Hirano, and H. Yoshigi, "Experiments on

Proposed Extended-Definition TV with Full NTSC Compatibility," 923-929, October.

G. Chouinard and J. N. Barry, "NTSC and MAC Television Signals in Noise and Interference Environments," 930-942, October.

B. Hisdal, "Acceptability of Picture Tube Colorimetric Reproduction," 943-947, October.

#### **REPORT FROM THE SOCIETY OF PHOTOGRAPHIC SCIENTISTS AND ENGINEERS DELEGATES RUSSELL H. GRAY, CHAIRMAN**

No report has been received.

#### **REPORT FROM THE SOCIETY OF PLASTICS ENGINEERS, COLOR AND APPEARANCE DIVISION DELEGATES ANTHONY J. PENTZ, CHAIRMAN**

No report has been received.

#### **REPORT FROM THE TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY DELEGATES S. J. POPSON, CHAIRMAN**

No report has been received.

#### **DR. GUNTER WYSZECKI 1925-1985**

On 22 June 1985, Dr. Gunter Wyszecki lost a long battle against leukemia and the world of color science lost one of its greatest figures. A longtime employee of the National Research Council of Canada, Wyszecki was acknowledged internationally as a leading expert on colorimetry and color vision.

Born in Tilsit, Germany, Gunter Wyszecki received his university training in mathematics at the Technical University of Berlin and was awarded a Dr.-Ing. degree for a study on normal and anomalous trichromacy. In 1953, he won a Fulbright scholarship and joined Dr. Deane B. Judd in the colorimetry and photometry section of the U.S. National Bureau of Standards. Here he began a close association with Judd which lasted until the latter's death in 1972 and included co-authorship of the second and third editions of the well-known text-book "Color in Business, Science and Industry."

In 1954, Wyszecki went back to Berlin to work for a short time in Dr. Manfred Richter's colorimetry laboratory at the Bundesanstalt für Materielprüfung.

In 1955, he returned to North America to join the National Research Council of Canada (NRC) in Ottawa, where he worked until his death. Under his leadership from 1960 the Optics Section of the Council became one of the world's leading groups in colorimetry, color vision, photometry, radiometry and related fields. Wyszecki was appointed Assistant Director of the Division of Physics of NRC in 1982.

In 1984 he served as Chariman of NRC's task force on the Institute of Optics, a new facility which will be built in



Quebec City. He was the driving force behind the planning of the Institute and was appointed by NRC to be its first Director.

Internationally, Wyszecki was best known for his scientific contributions to and leadership in the International Commission on Illumination (CIE). He was Chairman of the CIE Colorimetry Committee from 1963 to 1975. During this time the Committee developed many important recommendations in colorimetry, including 1 nm tables of the color-matching functions of the 1931 and 1964 Standard Observers, 1 nm tables of Standard Illuminants A and D65, the addition of integrating-sphere geometries to the recommended geometries for color measurement, the change from smoked magnesium oxide to the perfect diffuser as the primary standard of reflectance factor measurements, the 1974 ( $U^*V^*W$ ) uniform color space and color difference formula, the 1976 CIELUV and CIELAB uniform color spaces and color-difference formulae, and the special metamerism index for changes in the relative spectral composition of illuminants. The Committee also conducted important studies of standard daylight sources, chromatic adaptation, whiteness evaluation and color terminology.

After serving from 1975 to 1979 as Chairman of the Action Committee, Wyszecki was Vice-President of the CIE from 1979 to 1983 and President from 1983 until his death.

He was the author or co-author of eighty-six scientific papers which ranged from highly theoretical mathematical treatises such as his 1968 paper (with W.S. Stiles) on "Intersections of the spectral reflectance curves of metameric object colors" to reports of extensive and elaborate experimental studies such as his 1971 papers (with G.H. Fielder) on "New color-matching ellipses" and on "Color-difference matches." As well as the book "Color in Business, Science, and Industry" mentioned above, Wyszecki was the author of a book "Farbsysteme" published in German in 1960 and co-author, with W.S. Stiles, of "Color Science: Concepts and Methods, Quantitative Data and Formulas" which has become the "bible" of countless color scientists throughout the world. He also served on the editorial boards of Color Research and Application, Die Farbe, Metrologia, and Vision Research.

Honors that Wyszecki received during his career included the Deane B. Judd Award of the International Colour Association, the Godlove Award of the Inter-Society Color Council, the Merit Award of the Canadian Society for Color, and the Bruning Award of the Federation of Societies for Coatings Technology. He was a Fellow of the Royal Society of Canada, the Optical Society of America, and the Illuminating Engineering Society of North America, the founding President of the Canadian Society for Color, and a member of the Inter-Society Color Council and the Canadian Association of Physicists.

In addition to his activities in International and National Committees and Societies and his numerous publications, many of us knew Gunter Wyszecki for his incisive questioning and commentary at conferences and colloquia on color and in informal discussions. He had an uncanny ability to get to the heart of a matter by penetrating through the often confused and irrelevant words of others so that the prime and central

issue was exposed and clearly expressed. He will be sorely missed.

Gunter Wyszecki leaves a wife, Ingeborg, a daughter, Joana, a son, Wolfgang, and a host of friends throughout the world.

Alan R. Robertson

## DETROIT COLOUR COUNCIL

The DCC Color Difference Committee has reached agreement on a standardized automotive test method for color difference determination of colored parts and materials. The method will be balloted for approval through SAE and, when approved, will be issued as SAE Recommended Practice J1545. The committee, composed of auto company engineers, supplier company color specialists and advisors from instrument company manufacturers and consultants, agreed to a 3-component color difference system in terms of Delta L-C-H, computed for Illuminant D65 and the 10° standard observer. The practice speaks in detail to the need for correct sampling and measuring technique for coatings, textile material, plastics and other colored trim.

In conjunction with ISCC member bodies MCCA and FSCT the DCC will conduct an educational symposium in June, 1986 on implementation of the SAE recommended practice. Details are not yet complete.

The September DCC program featured a panel of stylists who discussed the trend toward automotive color styling with mica-based pigments to modify metallic colors with a pearl-like quality. The November program will explore the issues of artificial daylight equipment for examining automotive parts and will feature speaker Cal McCamy of Macbeth.

W. V. Longley

## COLOR HARMONY — WALTER GRANVILLE

Walter Granville posed the question, "Color Harmony: What is it" at the ISCC Annual Meeting in Pittsburgh on April 16 and then answered the question with the aid of some splendid displays and his usual wit and insight. Walter is a past president of the ISCC who has made, and continues to make, a major contribution to the ISCC. His experience and sympathetic attitude make him a key individual in bridging the gap between technical and artistic use of color. It was great to have Walter and Gini at the meeting and those who had an opportunity to visit with them were fortunate.

Joy Turner Luke

## MEETINGS

### New Technologies of Art

The Contemporary Arts Group is sponsoring a fall conference on "New Technologies of Art." The conference will cover the most advanced ideas and experimentation in the areas of computers, Xerox, light, lasers, video and new techniques in graphic reproduction. Speakers will be major artists, scientists and technologists to focus attention on these areas and avenues for collaboration.

Co-sponsors for the conference are the Graduate School of Architecture, Departments of Art and Computer Science of the University of Utah and the Utah Arts Council. The dates are October 25-26, 1985.

If you wish to be placed on the mailing list for future pro-

gram information and registration, please send a postcard (print or type) with your name, address and telephone number to Dan Burke, Utah Arts Council, 617 E. South Temple, Salt Lake City, UT 84102.

Anna Campbell Bliss

## ANNUAL MEETING – 1985

All photos by TGW (except Walter Granville)

Left to Right  
Dorothy  
Nickerson  
and  
Joyce  
Davenport



S. Leonard  
Davidson



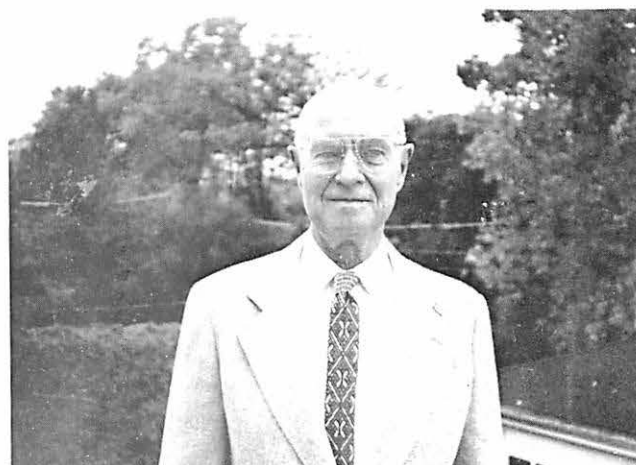
L-R. Ed Connor, Treasurer, Joyce Davenport, President  
Teresa Commerford, Secretary, Allan Rodriaues, Pres.-Elect



L-R. Ed Connor, Shelhugh Stewart, Peter Kaiser



Franc Grum



Walter Granville

## CALENDAR

### AATCC

Color Measurement Principles and the Textile Industry,  
Research Triangle Park, NC

### AIC

Interim Meeting, June 19-20, 1986, Ryerson Polytechnic  
Institute, June 19-20, 1986

### COLOR MARKETING GROUP

Fall National Meeting, September 22-25, Minneapolis, MN

### FEDERATION OF SOCIETIES FOR COATINGS TECHNOLOGY

Annual Meeting, October 7-9, 1985, St. Louis, MO

### ISCC-CSC 1986 ANNUAL MEETING

June 16-18, 1986, Ryerson Polytechnic Institute, Toronto

### ISCC 1986 WILLIAMSBURG CONFERENCE

February 9-12, 1986, Williamsburg, VA

### ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA

Annual Conference, July 21-25, 1985, Detroit, MI

### NATIONAL RESEARCH COUNCIL CANADA

Seminar on Photometry and Radiometry, October 21-22, 1985,  
Ottawa, Ontario

### OPTICAL SOCIETY OF AMERICA

Annual Meeting, October 14-18, 1985, Washington, DC

### SOCIETY FOR INFORMATION DISPLAY

1986 International Symposium, May 6-8, 1986, San Diego, CA

### SOCIETY OF PHOTOGRAPHIC SCIENTISTS AND ENGINEERS

Second International Congress on Advances in Non-Impact  
Printing Technologies, November 4-8, 1984, Arlington, VA

1. Any person interested in color and desirous of participating in the activities of the Council for the furtherance of its aims and purposes . . . shall be eligible for individual membership (By-Laws, Article I, Section 2). Application forms for individual membership may be obtained from the Secretary (address given above).
2. The Council promotes color education by its association with the Cooper-Hewitt Museum. It recommends that intended gifts of historical significance, past or present, related to the artistic or scientific usage of color be brought to the attention of Cooper-Hewitt Museum, 9 East 90th Street, New York 10028.

*Deadlines for submitting items to be included in the Newsletter are: February 15, April 15, June 15, August 15, October 15, and December 15; in other words, the fifteenth of the even-numbered months.*

Send newsletter items to:

Ms. Mary Ellen Zuyus  
Hunter Associates Laboratory, Inc.  
11495 Sunset Hills Road  
Reston, VA 22090

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