



Inter-Society  
Color Council  
Newsletter

**ANNUAL REPORT ISSUE**

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### IRIDESCENT FILM

The iridescent film and explanatory material included in this issue of the *Newsletter* are provided by Dr. Leon M. Greenstein, Henry L. Mattin Laboratories, The Mearl Corporation, Ossining, N.Y. and Mr. Scott A. Cooper, Decorative Film Division, The Mearl Corporation, Peekskill, N.Y. During his talk, "Iridescence, Natural and Synthetic," presented at the Banquet of the Annual Meeting, Dr. Greenstein described properties of the film and distributed samples of it.

# ANNUAL REPORT ISSUE

## REPORT OF THE PRESIDENT ROLAND E. DERBY, JR.

This will be a brief report of the ISCC activities during my term of office.

We have continued our program of symposia, with the ideas of developing discussions and general knowledge in the field of color. I consider one of the most significant developments to be the publication of our new journal *Color Research and Application*. It has been a continuing discussion for many years by the Board of Directors that we were desperately in need of such an appropriate medium for publication of significant articles covering the broad range of all aspects of color.

In addition, the association of the ISCC with the Munsell Color Foundation is most important in view of long-term potential for development of research in the field of color.

## REPORT OF THE VICE-PRESIDENT CHARLES W. JEROME

The value of the Inter-Society Color Council to its Member Bodies is a constant concern of the Board of Directors. In a continuing effort to stimulate and coordinate the work being done by the diverse groups that constitute the ISCC, the Board frequently discusses ways and means of maintaining active interest and participation by all the Member Bodies. The major requirement for this is a constant two-way communication between ISCC and its Member Bodies, a communication carried on through the network of the Member Body Delegates.

How well this works and its effectiveness is determined by the delegates. Some of these are very active and make their presence felt in the ISCC operations, while others are very inactive and seldom heard from. A problem to which we have given much thought is how to help and encourage the delegations to fulfill their statutory responsibilities without, in any way, restricting their activities, independence, or autonomy.

During the past year a set of guidelines for ISCC delegates has been drawn up and presented to the delegations for their consideration and comments. These were discussed at a meeting of the Delegation Chairmen during this annual meeting. Twenty-one attended, representing sixteen Member Bodies. Out of this meeting have come several suggestions and ideas for more effective cooperation between the ISCC and the Member Bodies, which can be incorporated into the proposed guidelines for the information and assistance of the delegations.

Your new President-Elect, Franc Grum, was present at the above meeting as Chairman of the Delegation from the Optical Society of America. He will be carrying on the responsibilities for ISCC-Member Body relationships for the

next two years. I can only hope that what has been accomplished will give him a head start in this activity.

In the Inter-Society Color Council there is a vast storehouse of talent and ability in the widely diverse fields of color. We hope you will be motivated to share your expertise by joining in the activities of the Council, especially those of the problems subcommittees. I urge you to get involved. This is particularly aimed at the newer and younger members. Don't be bashful! Your participation will not only be welcome but is earnestly solicited. The opportunities are many and you will find that your participation can increase substantially your enjoyment in being a member of this unique organization and the fellowship that goes with it.

## REPORT OF THE SECRETARY FRED W. BILLMEYER, JR.

With the adoption of revised By-Laws taking effect at the end of the 1976 Annual Meeting, the number of Directors in the Council was increased from five to nine with staggered 3-year terms. This necessitated the one-time-only election of nine new Directors taking office at this time, three having terms of 1 year, three of 2 years, and three of 3 years. Accordingly, the following Officers and Directors were elected by the Voting Delegates in January:

President-Elect: Mr. Franc Grum, OSA, SPSE

Secretary: Dr. Fred W. Billmeyer, Jr., AChS, SPE

Treasurer: Mr. S. Leonard Davidson, AChS, FSCT

(The Vice-President, Mr. Charles W. Jerome, IES, automatically succeeds to the Office of President, and the Past President, Dr. Roland E. Derby, Jr., AATCC, CAUS, is also a member of the Board of Directors).

Directors with terms of 3 years: Ms. Joyce S. Davenport, CMG, FSCT; Mr. Calvin S. McCamy, SPSE; Dr. Frederick T. Simon, AATCC, CMG.

Directors with terms of 2 years: Dr. Ferguson M. Clydesdale, IFT; Mr. Leroy C. Noyes, MCCA; Mr. Raymond Spilman, IDSA.

Directors with terms of 1 year: Mr. Seymour Cammanday, AChS; Mr. William D. Schaeffer, GATF; Mr. Alexander F. Styne, IES, IDSA.

Subsequent to the election, it was ascertained that Mr. Noyes was leaving the color field and found it necessary to resign as a Voting Delegate from the MCCA and as Director. The Board of Directors, on advice of the Nominating Committee, appointed Dr. Henry Hemmendinger, MCCA, to fill the vacancy as Director for a 2-year term.

Following the procedures of the new By-Laws, the Board of Directors elected the following three new Honorary Members of the Council: George B. Gardner, Walter C. Granville, and William J. Kiernan.

The revised By-Laws, the newly adopted Constitution and Standing Rules, and the Statement of Organization

and Functions (appended to the By-Laws in the past) were printed in 5½ x 8½ inch format and distributed to all members of the Council. Additional copies are available from the Secretary.

The Membership List will be reprinted this year, in order to re-establish the routine of issuing it in the year new Officers are elected. It will hereafter be reprinted at two-year intervals. The list should issue during the summer. It will be distributed to all members of the Council, and additional copies will be available from the Secretary.

It is customary to include in this report some indication of the size of the Council. The exact figures reported vary from year to year depending upon what statistics are called out from the computer at which time. This year, I can report that as of January 1, 1976, the total membership of the Council was 838 (compared to 833 on January 1, 1974), and the total paid membership (IMG and library subscriptions) was 629 (compared to 604 two years ago). The number of Member Bodies remained at 28, unchanged since the merger of the AIID and NSID into the ASID early in 1975.

I regret to report the following losses by death during the last year of Council members: H. L. Logan, IES; Gordon Mackinney, IFT; Bernard Murray, IMG; and Yoshio Sugiyama, IMG.

A substantial supply of new ISCC letterhead stationery has been received. We are deeply indebted to the Nekoosa Edwards Paper Company and the Pantone Press for the generous contributions making this possible, and for the efforts of Richard S. Hunter and William D. Schaeffer in making the necessary arrangements.

As Editor-in-Chief, I would like to report on the status of the independent journal endorsed by the Council, *Color Research and Application*. The first two issues of this quarterly will have appeared by the time this report issues. They contain about a dozen papers, ranging in subject matter from technical to art and design. Most of them are written by ISCC members. Manuscripts are being actively solicited, especially in the less technical areas such as art, decoration, design, and education. There are now over 600 subscribers. The third issue of the journal, to be published in September, is expected to carry the papers presented at the 1975 ISCC Annual Meeting Symposium titled "Heart of the ISCC: Problems Subcommittees." Subsequent issues will carry papers or abstracts of all the lectures presented at the ISCC Williamsburg Symposium on Instrumental Colorant Formulation, January, 1976. The Board of Directors asks ISCC members to support its endorsement of *Color Research and Application* by subscription and by seeking out worthy manuscripts for submission.

As Chairman for Arrangements, I wish to report that plans for the Third Congress of the AIC, COLOR 77, are proceeding on schedule. Dr. Gunter Wyszecki, Program Chairman, has announced the speakers and topics for nine Plenary Lectures, and over 85 prospective attendees have indicated their intention to present contributed papers. Mr. Charles G. Leete, Exhibits Chairman, is accepting reservations in this area. Four CIE Technical Committees will hold meetings in the five days just prior to COLOR 77, at the same location.

The work of the Secretary's Office has been made in-

initely easier for the past several years by the efficiency of my secretary, Mrs. Claudia L. LeBarron. Mrs. LeBarron retired earlier this year, and her many friends in the Council will be pleased to learn that in May she became the mother of a baby girl. She expects to continue to work actively on the social program for COLOR 77.

#### MEMORANDUM

TO: Executive Committee

FROM: Fred W. Billmeyer, Jr. DATE: 6/1/76

The deadline for contributions to the Annual Report issue of the *Newsletter* is today.

Ever since I became Secretary, I have set the goal of having a *complete* Annual Report issue, with a report from or a few remarks about every member body, problems committee, and standing committee. I'm sure you have no idea how much time, effort, and money for phone calls this takes. This year I simply can't do it.

As I write, I am missing reports from one officer, two Standing Committees, 13 Member-Bodies (out of 28) and 11 Problems Subcommittees (out of 15).

If any of you wish to try to get the missing reports, please do. Otherwise we will have a very short Annual Report.

#### REPORTS OF THE TREASURER AND FINANCE COMMITTEE S. LEONARD DAVIDSON, TREASURER

It is my pleasure to report to you that this year the Inter-Society Color Council remained solvent. A large part of the solvency was due to the interest received from savings accounts and certificates of deposits. The excess of income over expenses in the general fund was only \$35.76. The total assets of the Council, as of December 31, 1975, were \$16,552.17. This does not include the \$1,724.75 in unpaid IMG dues for the years 1974 and 1975. We have not included, in these expenses, the deduction of \$500.00 for covers for the *Newsletter*, or the cost of insurance for bonding the Secretary and the Treasurer for one year. Nor have we included dues as billed but dues as received instead.

Actually, our income over expenses was greater than is shown, because \$406.60 was transferred to the Godlove Award Account for the boxes for the awards for the next 11 years. The actual audit of the report will be made by our auditors later in the year.

We have presented a budget to the Board after its approval by the Finance Committee. This is also attached, indicating a slight surplus (\$5.00) in the current expense account fund for 1976. Since then we have had the Williamsburg Conference, and our budget estimate is off by approximately \$300.00. So, we started the year with a larger surplus than we had planned on.

I would like to thank all of the members of the Finance Committee, the Officers, Board of Directors, and my Secretary, Ms. Peggy Schaffner, who assisted me in performing my duties as Treasurer of the ISCC and Chairman of the Finance Committee.

INTER-SOCIETY COLOR COUNCIL  
1975 GENERAL FUND

INCOME

Dues — IMG and Member Bodies		\$10,514.25
Publication Sales		
Newsletter	\$ 461.40	
Royalties	<u>295.71</u>	757.11
Use of Mailing List		130.00
Refund — Moore Business Forms		116.80
Annual Meeting Reservations and Registrations	4,855.00	
Cost of Dinner and Expenses	<u>(3,242.99)</u>	<u>1,612.01</u>
Total income — General Fund		\$13,130.17

EXPENSES

President's Office		31.96
Secretary's Office		2,400.00
Treasurer's Office		195.31
Newsletter		8,046.59
Printing Membership List		1,194.17
Bank Charges		20.91
Audit		250.00
International Colour Association Dues		41.00
To Godlove Award Account		406.60
Board of Director's Meetings		213.87
Binding News Letters		224.85
Color 77 Planning Meeting		<u>69.15</u>
Total Expenses — General Fund		\$13,094.41
Excess of Income over Expenses	\$ 35.96	
Interest from Savings Account and Certificates of Deposit	<u>\$ 859.64</u>	
Total Income to be added to asset balance		\$ 895.40

INTER-SOCIETY COLOR COUNCIL  
ASSETS AND LIABILITIES  
DECEMBER 31, 1975

ASSETS

Cash in Bank — Regular Checking	\$ 6,611.45	
Cash in Bank — Savings	<u>3,764.00</u>	\$10,375.45
Certificates of Deposit		9,749.34
Prepaid Expenses		
Unexpired Insurance	110.67	
News Letter Covers — Balance	<u>220.00</u>	<u>330.67</u>
Total		20,455.46

LIABILITIES

1976 Williamsburg Conference	3,809.44	
I.H. Godlove Award Fund	<u>93.40</u>	<u>3,902.84</u>
Total		\$16,552.62**

Balance I.H. Godlove Award Fund \$ 783.17

\*\*Does Not Include \$1,724.75 in Unpaid IMG Dues.

INTER-SOCIETY COLOR COUNCIL  
I.H. GODLOVE AWARD FUND  
1975

Cash Receipts		
Interest — Savings Account	\$ 43.97	
From General Fund	<u>406.60</u>	<u>\$ 450.57</u>
Cash Disbursements		
Reubly Process Co. — Boxes	<u>406.60</u>	<u>406.60</u>
Excess of receipts over Disbursements		\$ 43.97
Cash in Savings Account 12/31/75		\$ 689.77
Due from General Fund		<u>93.40</u>
Balance I.H. Godlove Award Fund		\$ 783.17

INTER-SOCIETY COLOR COUNCIL  
Budget 1976

	<u>1975</u>	<u>1976</u>
	<u>Budget</u>	<u>Actual</u>
INCOME		
Annual Meeting		
Net	\$ 1,000	\$ 1,612.01
Member Body		
Dues	2,175	2,025.00
IMG Dues	9,000	8,489.25
Royalties	250	236.24
Other	500	879.72
Williamsburg (Net)	—	—
Total	\$12,925	\$13,242.22

1976  
Budget

\$ 1,000  
2,025  
8,500  
225  
500  
2,400  
\$14,650

## EXPENSES

President's Office	250	31.96	200
Secretary's Office	2,400	2,400.00	2,400
Treasurer's Office	300	195.31	350
Newsletter	8,000	8,090.79	9,000
Newsletter Binding	200	224.85	—
Membership List			
Printing	1,000	1,149.97	1,000*
Audit	300	250.00	300
International Colour			
Association Dues	40	41.00	45
By-Laws Printing	—	—	1,100
Board of Directors			
Meetings	—	213.67	250
Total	\$12,490	\$12,597.55	\$14,645
Difference	+\$ 435	+\$ 644.67	+\$ 5.00

\*By Board action, to comply with change in officers in 1976.

#### REPORT OF THE MEMBERSHIP COMMITTEE ROBERT F. HORAN, CHAIRMAN

The files of the committee were received and reviewed by the new Chairman during the past year. Several new organizations are being solicited to become Member Bodies. Presently there are 28 member bodies. Eighty individual members were approved since the last annual meeting and the total paying membership stood at 629 as of January 1, 1976.

A subcommittee was appointed to develop a system whereby the interests of the members can be kept in a readily accessible file to permit rapid dissemination of pertinent information to them. It consists of R. F. Hoban (Chairman), W. Benson, F. W. Billmeyer Jr., R. M. Johnston-Feller.

The responsibility for nomination for Honorary Membership has been transferred to the Membership Committee. New nomination forms have been designed and printed and are available from the Secretary's Office. Three members were elected to Honorary Membership this year. They were:

George B. Gardner  
Walter C. Granville  
William J. Kiernan

#### REPORT OF THE PUBLICATIONS COMMITTEE WILLIAM BENSON, CHAIRMAN

You have received six reports from the Publications Committee over the past year. Since all of you know what is in those reports, there is not much point in going over them again. I should point out, in case some of you did not notice, that the cover of the *Newsletter* was changed somewhat with the first issue of the current calendar year, the January-February issue. The cover was changed because Mr. Donald Genaro, a member of the Publications Com-

mittee, was kind enough to point out that the cover had never been arranged to match either one of the original two designs for it. Unfortunately, it was impossible to achieve an exact match with either of the designs for several reasons, but the current cover is as close an approximation to one of them as could now be achieved. I wish to thank Mr. Genaro for pointing out the discrepancy and express my regret that it was not possible to eliminate it completely.

One area in which we have met with rather indifferent success over the past year has been increasing the coverage of meetings of other organizations. The only solution I can see to this difficulty is to try a little harder.

Another area that we need to improve is the coverage of artistic use of color. Any suggestions or contributions you may have on this topic will be particularly appreciated.

#### MINUTES OF THE ANNUAL BUSINESS MEETING

The 1976 Annual Business Meeting of the Inter-Society Color Council was called to order by the President, Dr. Roland E. Derby, Jr., at 9:10 a.m. on Tuesday, April 27, 1976, in the Gold Ballroom of the Statler-Hilton Hotel, New York City.

The President; the Vice-President, Mr. C. W. Jerome; the Secretary, Dr. Fred W. Billmeyer, Jr.; and the Treasurer, Mr. S. Leonard Davidson, presented their annual reports to the Council. Mr. Davidson's report was combined with that of the Finance Committee, of which he is Chairman. The reports of the Treasurer and the Finance Committee were approved by vote of the Voting Delegates present, as required by the By-Laws. The above reports are printed in the Annual Meeting issue of the *Newsletter*.

Reports of the Chairmen of other Standing Committees followed: Membership, Mr. R. F. Hoban; Publications, Dr. William Benson; and Problems, Ms. Ruth M. Johnston-Feller. After general remarks, Ms. Johnston-Feller introduced the four Problems Committee Coordinators and the Chairmen of the Problems Subcommittees. None of these gave an extensive oral report, except that Mr. Floyd Cole reported for Mr. Tony Pentz, Chairman, on the first meeting of the Subcommittee for Problem 36, Color Acceptability Standards. Ms. Johnston-Feller closed her presentation by describing a new problem proposed by Ms. Joy Turner Luke on a comparison of color terms as used by artists and by scientists.

The following reports were then given by Chairmen of Member-Body Delegations or their alternates: Dr. Thomas G. Weber for the Society of Plastics Engineers Color and Appearance Division; Dr. Angela C. Little for the Institute of Food Technologists; Mr. Franc Grum for the Optical Society of America; Dr. John Ackerman, representing Mr. Emil Wich, for the Dry Color Manufacturers Association; Mr. Raymond Spilman for the Industrial Designers Society of America; Ms. Ruth M. Johnston-Feller for the Federation of Societies for Coatings Technology; Ms. Joyce Davenport, representing Mr. L. A. Graham, for the Color Marketing Group; and Mr. Harry K. Hammond, III, for the American Society for Testing and Materials.

After closing comments by Dr. Derby, the meeting was

adjourned at 10:55 a.m.

Respectfully submitted, Fred W. Billmeyer, Jr.,  
Secretary.

### REPORT FOR THE BOARD OF DIRECTORS

The ISCC Board of Directors considered several matters of unusual importance for the future of the Council during the past year. Foremost among these was the approval of a Constitution, extensively revised By-Laws, and Standing Rules, which were submitted to and voted upon favorably by the Voting Delegates, and finally printed and distributed to the membership of the Council. Among the outstanding changes in the By-Laws are:

- Enlargement of the Board from nine to fourteen members, consisting of five officers — the President, Past President, President-Elect, Secretary, and Treasurer — and nine Directors. To achieve continuity, the Directors serve for three-year terms with three of the nine being elected each year. The officers serve for terms of two years as in the past.

- Establishment of an Executive Committee consisting of the five officers, with responsibility to take all action necessary to govern the Council between meetings of the Board.

- Creation of a mechanism for the election of Honorary Members. Any member of the Council can nominate any person who has rendered outstanding service to the Council or to the field of color for Honorary membership, using a form available from the Secretary. The form is circulated to the Board of Directors, who may elect the nominee to Honorary membership after a 60-day waiting period.

The Board is considering further changes in the By-Laws. It is quite probable that a category of Student Member will be added during the coming year, and the question of representation of the Individual Member Group is being reconsidered in an encouraging way.

The Board also considered the possibility of changing the location of the Annual Meeting more seriously than at any time in the recent past. The study of this problem is continuing, with an analysis of attendance patterns for the past eight years, and a questionnaire to the entire membership scheduled for the near future.

Along the same lines, the Executive Committee, at its first meeting on April 27, proposed a change in format of the Annual Meeting for 1977, in which the Problems Subcommittee Day would remain on Monday, but Tuesday would begin with a Symposium, followed by a luncheon, with speaker, and the Annual Business Meeting in the afternoon. There would be no banquet, but the possibility of a late afternoon reception to close the meeting was not ruled out.

The Board has initiated plans for two future Williamsburg Conferences, for which space has been reserved at the Williamsburg Lodge and Inn on February 5-8, 1978, and February 11-14, 1979. The 1978 Conference will be organized by Mr. Calvin S. McCamy on the subject of color reproduction in the graphic arts, photography, and television. His proposed format embraces a small number of papers presented in the mornings, afternoons free, and

organized discussion in the evenings. The 1979 meeting will be devoted to color scaling, including color spaces and color differences. Mr. Max Saltzman, Director of Long Range Planning, has been requested to prepare a recommendation for the Chairman and format of this Conference.

The Board continues to support and cooperate with the Munsell Color Foundation through its designated Foundation Trustee, Mr. S. L. Davidson. At a recent meeting, the Foundation's President, Mr. Norman Macbeth, described to the Board the Foundation's plans for a fund-raising campaign with a 3-year goal of \$500,000 and an ultimate goal, including bequests, of \$1,000,000. With this level of funding the Foundation can become a significant source of funds for grants supporting its objectives, which are essentially the same as those of the Council.

The Board has endorsed the preparation of and reviewed drafts of two new documents designed to clarify procedures and objectives for the operation of Council activities. One, prepared by Mr. C. W. Jerome as Vice-President, is designed to inform Chairmen of Member-Body Delegations of their duties and to encourage closer interaction between the Member-Bodies and the Council as a whole. The second, prepared by Ms. Ruth M. Johnston-Feller as Chairman of the Problems Committee, describes the organization and working of the Problems Committee for the benefit of Problems Subcommittee Chairmen.

Finally, the Board has directed that publicity be given to two matters of policy which may not be clear to the membership of the Council:

**Fiscal Policy.** The ISCC is a non-profit organization and is so recognized by the Internal Revenue Service. The Council must not deliberately make a profit if its tax status is to be maintained. However, it also must not risk its financial solvency unduly if it is to survive. In scheduling events such as the Annual Meeting and the Williamsburg Conferences, the Council's Finance Committee directs the Treasurer to set the registration fee high enough to cover fixed costs (including printing programs, gratuities, projection equipment, and others) at the lowest anticipated level of registration. Obviously, the fee must be set well in advance, and it may be that registration higher than, or expenses lower than, what could have been conservatively anticipated, may result in a small profit for the event, which is used to defray other Council expenses as indicated in the annual report of the Treasurer. At its meeting on April 25, the Board voted "to reaffirm the Council's philosophy not to make a profit, but to remain solvent while furthering its aims and purposes, and (to reaffirm) its reliance on its Board of Directors to see to this" (excerpt from the Minutes of the April 25, 1976, Board meeting).

**Publication Policy.** The Board of Directors asked the Editors of the *ISCC Newsletter* and the independent commercial journal *Color Research and Application* to clarify in print the relations between their publications and the Council. The following statement, quoted from the Minutes of the April 25, 1976, Board meeting, reaffirms Council policy in this respect: "The *Newsletter*, not *Color Research and Application*, is the official organ of the Council. Official reports of the Council should appear in the Annual Report issue of the *Newsletter*. Other coverage of any Council or outside function printed in the *Newsletter* ap-



pears there at its Editor's discretion. (*Color Research and Application*) is completely independent, and has and will continue to solicit and print separate features. . ."

(This Report was prepared by the Secretary).

#### REPORT ON THE 1976 WILLIAMSBURG CONFERENCE

The Inter-Society Color Council's Special Technical Conference on Instrumental Colorant Formulation 1976 was held in the Cascades Conference Center, Williamsburg, Virginia, January 25-28, 1976. Approximately 110 people attended. The Program Committee of the Conference selected a format of many short papers in morning and afternoon sessions, with evenings free. The Conference had as its general theme the progress made in the field since the first ISCC Williamsburg Conference, considering the same subject just ten years earlier.

The 1976 Conference opened with a reception on Sunday evening, January 25. The papers presented on the following days, with titles and Chairmen of the sessions, were as follows:

*January 26, 9 AM - 12 AM*

Chairman Eugene Allen

Where are we after 10 years?

Max Saltzman — "Computer Color Matching — A View from Retirement"

E. I. Stearns — "Where Instrumental Color Matching is Today"

Roland E. Derby, Jr. — "The Color Matching Problem (and its Relation to Colorant Formulation)"

How do you make those calculations?

William H. Venable, Jr. — "Standardizing Measurements to Optimize Color Formulation"

Henry Hemmendinger — "Measurement Variations and Formulation Accuracy"

E. I. Cairns, D. A. Holtzen and D. L. Spooner — "Determining K and S for Pigments"

*January 26, 2 PM - 5 PM*

Chairman Max Saltzman

How do you make those calculations? (continued)

Eugene Allen — "Radiative Transfer Theory in the Practice of Colorant Formulation"

Frederick T. Simon — "The Concentration Function — A Story of Success or Failure?"

S. E. Orchard — "The Missing Variable: Internal Surface Reflection"

J. A. Keitch — "Is the Saunderson Correction Correct?"

*January 27, 9 AM - 12 AM*

Chairman Fred W. Billmeyer, Jr.

Is computer color matching working as we would like?

Roland Connelly, Lou Graham and William L. Acree — "Who are Your Best Dyers Today, Machines or Men?"

Robert St. John — "Eight Million Formulations Later, Where are We Now . . ."

R. F. Hoban — "A Decade of Computer Colorant Formulation Expertise"

Ralph Stanziola — "Computer Color Control, What is Needed — Is it Worth the Trouble?"

Malcolm McKenzie — "CCM — Fact Not Fiction"

*January 27, 2 PM - 5 PM*

Chairman Roland E. Derby, Jr.

Any chance of solving those special problems?

Hugh R. Davidson — "The Advantages of Semiautomatic Computations"

E. Ganz — "Problems of Fluorescence in Colorant Formulation"

Milton Pearson and Irving Pobboravsky — "Color Reproduction in the Graphic Arts"

Ruth Johnston-Feller — "The Problem of Measuring and Matching Goniochromatic Materials"

Gene Stutz — "Color Matching/Correction/Adds — New Approaches, Techniques, Calculations and Improvements"

*January 28, 9 AM - 12 AM*

Chairman Gunter Wyszecki

How do we know when we have a good match?

Fred W. Billmeyer, Jr., and Ruth M. Rich — "Color-Difference Perception and Scaling"

Rolf G. Kuehni — "Small Color Difference Formulas and Color Tolerance"

K. McLaren — "The Case for CIELAB"

K. Hoffmann — "Color Changes of Dyeings in Spectrophotometers with Reversed Optics"

The Conference closed with a luncheon on Wednesday, January 28, followed by an address on "Evolution of Color in 19th Century Painting" by Professor Richard J. Redd.

The Conference Committee consisted of Dr. Roland E. Derby, Jr., General Chairman; Dr. Edwin I. Stearns and Dr. Eugene Allen, Co-chairmen for Program; Mr. George B. Gardner and Mr. Franc Grum, Co-chairmen for Arrangements; Mr. S. Leonard Davidson, Chairman for Finance; and Dr. Fred W. Billmeyer, Jr., Chairman for Registration.

The journal *Color Research and Application* has announced that it will publish either full paper or abstract of all the technical papers presented at this Conference in the near future.

(This report was prepared by the Secretary).



## REPORT OF THE MACBETH AWARD COMMITTEE FREDERICK T. SIMON, CHAIRMAN

Citation on the Presentation of the 1976 Macbeth Award to Richard S. Hunter

It is my distinct pleasure and honor to introduce the recipient of the Macbeth Award of the Inter-Society Color Council for the year 1976, Richard S. Hunter. The Macbeth Award is given biennially to a person in recognition of recent important contributions, preferably within the past ten years, to the field of color. The award itself was established by Norman Macbeth, Jr. in memory of his father, one of the early members of the ISCC. It is significant that Norman Macbeth, Sr., like the awardee, was known for his practical scientific and commercially important developments related to color such as the Macbeth Illuminometer and the founding of the Macbeth Daylighting Corporation.

Although the recent publication by the awardee of his book entitled *The Measurement of Appearance* is an important basis of conferring the award, it is fair to say that this book is only a culmination of many years of Richard Hunter's active and productive career. Those of you who have been engaged in color have undoubtedly been affected in some way by the work of Dick Hunter. He has made many important scientific contributions to the solution of color problems in paint, plastics, paper, food, ceramics, textiles, printing inks, and so on. As a matter of fact, there is little that affects color or appearance that has not been examined with the view towards quantifying the appearance property that is of interest. It has been a marvellous combination of great scientific achievement that has characterized his ability to understand the problem and come up with a practical and sometimes "homey" solution to quantify the variable in question. This uncanny knack for taking a direct approach to a situation is what I know him for, and I would like to share with you some background and a few reminiscences that you may find interesting.

Back in the days just before World War II when the army was being reactivated, I was at the Quartermaster Depot in Philadelphia and concerned, among other things, about the acceptance of uniform fabric for color. I had just come from American Cyanamid and Ed Stearns' influence concerning the use of spectrophotometers to "measure color." Of course, colorimetry through spectrophotometry was much too slow in those days, so when I was made aware through the Bureau of Standards of Hunter and his work on tristimulus colorimetry, which was many times faster, I thought that was an answer. The NBS publication, "A Multipurpose Photoelectric Reflectometer," was a revelation to me and this led to the first of a long series of attempts to grade textile samples with instrumentation. Even with Dick Hunter's generous help, it was not to be with the barrier-layer cell and galvanometer systems of that day.

Our paths crossed many times in the intervening years in technical meetings where the staunch support for a systematic approach to defining appearance was surely to be heard. The origin of many ASTM and TAPPI test methods can be traced directly to the clear insight and perseverance of Dick Hunter. What patience he had in dealing with vol-

untary organization committees, how many thousands of measurements were made, at no cost mind you, to prove to a finicky committee chairman that a reliable statistic could be obtained from proper measurements. At least many of these organizations recognized him: he received the ASTM Award of Merit in 1961, The Armin J. Bruning Award of the FSPT in 1962, the TAPPI Award in 1969 and the OSA David Richardson Medal in 1970.

Coupled with the work was a series of publications over the years that are an important part of the scientific literature. One that deserves special mention is the 1942 NBS circular C429, "Photoelectric Tristimulus Colorimetry with Three Filters," which defines the problem and then gives a state-of-the-art solution.

Perhaps it might be more understandable to review a bit of history. We will treat Dick Hunter historically through his instruments since they are really inseparable. Let's go all the way back to 1934 when, before his photoelectric days, the eye was used as a detector in both a reflectometer and a glossmeter. By 1937, he had developed the first multipurpose photoelectric instrument, which is still being made by Gardner. After he left the Bureau in 1946, he developed the Gardner Color Difference Meter and worked with Dorothy Nickerson on the Cotton Colorimeter. The first instrument developed after forming Hunter Associates Laboratory was the D-1 Turbidity Meter; although only one of these instruments was sold, in the next year the tomato colorimeter, a commercial success, came into being. The gonio effects of reflected light have been an abiding interest with relatively humble beginnings in 1953 to the present versatile instrument of today. The multiangle glossmeter in its present form is the world renowned D16. Next came the original D25 colorimeter which has undergone many modifications until today it is the leading colorimeter with nearly 1000 sold. The D38 colorimeter was a special device developed for the Army Quartermaster, I suppose to accomplish what we found impossible to do in 1940. Another version of the colorimeter is the D-44 on-line color monitor and closed-loop control system. The latest in the goniometer is the D-47 Dorigon Distinctness Of Reflected Image instrument. The most recent development is the D-54, a spectrophotometer which scans about as rapidly as a colorimeter can cycle and make three readings. When this is coupled with a self-contained microprocessor, it can make colorimetric calculations at equivalent speeds. Under Dick Hunter's vision and guidance we have come full circle during a thirty-six year period! I know of no man who has contributed so much to the science of color and yet has kept both feet firmly planted on the ground of practicality, making it possible through his instrument developments to accomplish a measurement rather than depend on a personal judgment. And as we all know, behind every successful man is a great woman, so we salute you, Elizabeth. And I present to this audience here present, the 1976 Macbeth Award recipient, Richard S. Hunter!

## REPORT OF THE PROBLEMS COMMITTEE RUTH M. JOHNSTON-FELLER, CHAIRMAN

The description of the organization and operation of the Problems Committee, "Organization of the Problems Committee of the ISCC and Guide for the Subcommittees" has been completed and will be presented to the Board of Directors for approval for publication and distribution to the Council members.

This year, for the first time, the Subcommittee Chairmen and the Problems Committee members held a meeting during the time of the Annual Meeting, April 26. The minutes of this meeting follow this report. The meeting brought out several suggestions for changes which will be presented to the Board of Directors for approval.

(1) The Monday Program of subcommittee meetings should be divided into 1½ hour units so that more subcommittee meetings can be held without conflicts with other subcommittee meetings. The chairmen of the subcommittees should select the number of units required for their annual meeting and should estimate the expected attendance and report these to the Problems Committee Chairman by mid-January. It is hoped that this will allow Council members to attend more Subcommittee meetings in rooms of appropriate size.

(2) If some subcommittees wish to schedule Monday evening meetings, they should so advise the Problems Committee by mid-January.

(3) Each Subcommittee Chairman will decide whether he wishes to give an oral report at the business meeting in addition to the longer written report submitted annually for publication in the *Newsletter*.

During the past year, a new Problem Subcommittee was established, number 36, which will work on acceptability standards for visual evaluation. It met for the first time at the Annual Meeting and planned an excellent program under the leadership of Tony Pentz of Rohm and Haas.

## MINUTES OF A MEETING OF ISCC PROBLEMS SUBCOMMITTEE CHAIRMEN, APRIL 26, 1976

This meeting, called to order at 6:00 p.m. in the ISCC Secretary's Suite, was attended by the following: Ralph Besnoy, Dr. Fred Billmeyer, Jr., Dr. Ellen Campbell Carter, Floyd C. Cole, Joyce S. Davenport, Milo D. Folley, George B. Gardner, Franc Grum, Harry K. Hammond III, Robert F. Hoban, Ruth M. Johnston-Feller, Rolf Kuehni, Calvin S. McCamy, Allan Rodrigues, Dr. Frederick T. Simon, Raymond Spilman, Dr. Robert C. Sproull, Charles D. Sweeny, Bonnie K. Swenholt, and Dr. Thomas G. Webber.

Ruth Johnston-Feller, Chairman of the Problems Committee, opened the meeting with a word of welcome and said the presence of so many Subcommittee Chairmen was evidence of their interest and dedication to this most important activity of the Council. Proceeding to the first item on the agenda for discussion, "Organization of the Problems Committee of the ISCC and Guide for the Subcommittees," she noted that she had prepared the material for this guide many months ago. At this point, it had been reviewed by both the four coordinators of the Problems

Committee and by the Board of Directors. As a result of these reviews, a number of revisions had already been made. Comments and criticisms of the Subcommittee Chairmen should be received in the near future so that the final version can be prepared and distributed to Council members for information and guidance.

Johnston-Feller said that the main reason for this meeting was to provide an open forum for the discussion of activities of the Problems Committee and that she would welcome any comments.

Carter recommended that each Subcommittee be informed of progress being made by all other Subcommittees. Kuehni also agreed that he would like minutes of other Subcommittee meetings during the year. Grum said as a practical matter such communications should go to the Chairmen, who would be responsible for distribution to their Subcommittee members.

Grum brought up the problem of inadequate space for some Subcommittee meetings at the Monday session. Johnston-Feller said incoming President Jerome had already asked that an estimate of attendance for each Subcommittee be available by January so that the best possible room assignments could be made.

Besnoy asked about publishing the agenda for these meetings in the Annual Meeting Announcement with a check list on the pre-registration blank to indicate which meetings the individual would probably be attending. Grum said this was a good idea but it is difficult to get everyone's agenda several months before the Annual Meeting. There is also a problem where an individual has an interest in two different Subcommittee meetings which because of time and space constraints are held at the same time. Grum wondered about continuing Problems Committee Meetings into Monday evening. Billmeyer observed that over the years the Directors have sought solutions to these problems but generally have felt that it was desirable to leave Monday evening free. Also summaries of the activities at the Monday meetings should be reported at the Tuesday Business meeting. One new trend is the increasing use of guest speakers at Problems Subcommittee meetings. Maybe the program should be arranged so that those meetings with guest speakers would not run concurrently. Kuehni observed that the Subcommittee meetings at Annual Meeting time tend to be an educational effort for noncommittee members and he does most of his serious Committee business by telephone or correspondence.

Hammond said having one and one-half hour sessions would eliminate concurrent sessions but Johnston-Feller said she would hesitate cutting the regular three hour time. Simon proposed the concept of one and one-half hour units with the possibility of choosing one or two units, and Swenholt agreed this should be a workable idea.

Johnston-Feller then said the spirited discussion had generated three items on which the group already showed some consensus.

The first item was the concept of one and one-half hour units, and, assuming there was general agreement, she would recommend that all Subcommittee Chairmen decide by January how many units would be needed for their Annual Meeting Monday session as well as provide at the same time an estimate of attendance so that room assign-

ments could be worked out as equitably as possible. A motion was made and seconded to adopt item one as Problems Committee Policy, and the vote was unanimous.

As item two, she would suggest that Monday evening Subcommittee Meetings be scheduled at the discretion of the Subcommittee Chairman but this request should also be made by January. The meeting schedule will continue the lunch period of two hours because this time is used to good advantage by many to hold luncheon meetings. Under discussion Folley said he would prefer the banquet to be held on Monday night with possibility of Tuesday departure. Billmeyer said that this had been tried at one time but considered unsatisfactory by the Board. A motion was then made, seconded and passed that item two be adopted.

Johnston-Feller said item three concerned the manner in which the Problems Committee would report at the Tuesday morning business meeting. Davenport said she would like an extensive report from each Subcommittee, but McCamy noted the three minutes normally allocated for each report was obviously inadequate for any real progress report. Besnoy and Swenholt both wondered if the four Coordinators could not provide an overview of each general area. Carter said she felt the longer written reports in the Annual Meeting Minutes made the verbal reports at the meeting unnecessary. Johnston-Feller said she definitely felt that it was important to introduce each Subcommittee Chairman at the Tuesday Business Meeting and the three minutes at least gives the Subcommittee Chairman an opportunity to be recognized and get some credit for the work he or she is doing. There still is the problem for individuals to obtain recognition by their Companies for the work being done, in many cases involving both Company time and money. After further discussion, the group agreed that each Subcommittee Chairman would be introduced at the Business Meeting but would let Ruth know in advance if a brief verbal report would be given.

Another subject briefly discussed was that of publication of Subcommittee reports and it was emphasized that this should be done promptly since it gives purpose to the activities. Credit should always be given to the people who have done the work and to those who sponsored it.

Also on the agenda was the question of occasionally presenting an in-depth report of a completed problem during the Tuesday afternoon symposium. Grum said he thought this was important from the standpoint of imparting information and also giving the Problems Committee work proper recognition. He recommended a forty-five minute report at next year's Annual Meeting from Problem 25D, Determination of the Strength of Colorants: Dyes Section.

Johnston-Feller concluded the meeting by saying the success of this session would argue well for another get-together next year. The motion for adjournment came promptly at 7:00 p.m.

Respectfully submitted,  
George B. Gardner  
Problems Committee Secretary, Pro Tem

#### REPORT FOR SCIENCE AND MEASUREMENT PROBLEMS SUBCOMMITTEES FRANC GRUM, COORDINATOR

All five Problems Subcommittees in this group held very successful meetings during the ISCC Annual Meeting, April 26-27, 1976. The meetings were well attended, and in some cases the meeting rooms were much too small to accommodate the large number of participants. It was very refreshing to see a fair number of younger color enthusiasts getting involved in various color measurement problems dealt with by various Problems Committees. Their active participation and involvement clearly indicates that the ISCC Problems Subcommittees indeed have a mission to fulfill in working with color problems encountered in practice. This activity can be further strengthened by an influx of new active participants who bring a fresh outlook into the activity and who present new problem areas in color measurement and evaluation yet to be explored.

In visiting the individual sessions one can say that, thanks to the dedicated chairmen, they were well organized. The discussions on selected topics were carried out in depth and positive conclusions were made relative to the future working program.

Summaries on individual Problems Subcommittee activities are appended as received. Here are a few observations and comments on some Subcommittees, with emphasis on those which did not submit a written report.

**Problem 18 (Colorimetry of Fluorescent Materials)** discussed at the meeting the work on visual appraisal of fluorescent white materials and made plans for publication of this completed work. As for the future, the Subcommittee decided to work on the evaluation of daylight sources in the ultraviolet with real fluorescent samples. A task force (TF-IV) has been formed to carry out this work, and a well-defined working program was established. The Task Force is chaired by Dr. D. H. Alman presently at NRC in Ottawa.

**Problem 22 (Procedures and Materials Standards)** has as its primary program at this time to produce a document "Guide for Standards." This is a badly needed document for all those who are involved with practical measurement problems. The session was very lively and a number of expert suggestions were given in regard to the proposed guide.

**Problem 27 (Indices of Metamerism)** planned its experimental program. A number of participants promised to supply the samples for the planned interlaboratory test that will be performed under well-defined conditions. Allen Rodrigues, Co-chairman with Ralph Besnoy, has randomly selected areas of color space based on commercial considerations for which standards and metamers will be prepared. Dr. Ruth Rich explained and outlined the procedure to be used in visual evaluations and experimentation. The metamers will be assembled and the evaluation will start immediately.

**Problem 34 (Color Difference Problems)** as usual attracted a full house of participants. The main topic of discussion pertained to the evaluation of six sample sets representing small and medium color differences. Evaluation of two sets was successfully completed and further evaluation is in progress.

Problem 35 (Color of Living Tissue) had a lively meeting reviewing past work and making plans for the future as evident from the enclosed report.

I cannot conclude this report without saying a warm thanks first to all the Chairmen and then to the active members, all of whom are dedicating their time and talents to working on a problem of concern to science, arts, and industry and thus, a problem of concern to ISCC.

**REPORT OF THE SUBCOMMITTEE FOR  
PROBLEM 6 – SURVEY OF COLOR TERMS  
ROBERT L. SERENKA, SR., CHAIRMAN**

During the past year Robert L. Serenka took over as Chairman following the resignation of C. J. Bartleson. The files were transferred and inventoried. A new scope was prepared and submitted (see below). Following input from all interested Member-Bodies a draft of color terms will be prepared, as discussed in the scope, and submitted for review, revisions, and subsequent approval. A meeting was held at the Annual Meeting, and member assistance was solicited.

R. F. Hoban, Coordinator

**SCOPE OF SUBCOMMITTEE FOR PROBLEM #6  
SURVEY OF COLOR TERMS**

Various organizations involved in color work tend to develop a jargon or glossary of terms familiar only to those engaged in that particular area of interest. Similarly, the various Member-Bodies of the Inter Society Color Council communicate effectively with color jargon within their respective areas of expertise, but sometimes encounter difficulties when communicating with other Member-Bodies. It is desirable to develop an integrated listing of color terms, to document this listing through publication of the terms, and to distribute this listing of color terms to all interested parties. The goal of this subcommittee is to accomplish the above-mentioned items in order to provide a comprehensive listing of color terms similar to those published by the ISCC in 1939 and 1949.

**REPORT OF THE SUBCOMMITTEE FOR  
PROBLEM 7 – SURVEY OF AMERICAN COLOR  
SPECIFICATIONS  
ROBERT F. HOBAN, CHAIRMAN**

This Subcommittee is on standby status and has been inactive for the past year. Copies of the 1974 report "Survey of American Color Specifications" are available from the ISCC through the Subcommittee Chairman (Robert F. Hoban, Sandoz Color & Chemicals, Route 10, East Hanover, N. J. 07936) at \$5.00. Comments on the report, particularly those that will supply material needed for its eventual revision, are earnestly solicited.

**REPORT OF THE SUBCOMMITTEE FOR PROBLEM 10  
COLOR APTITUDE TEST  
BONNIE K. SWENHOLT, CHAIRMAN**

The annual meeting of the Subcommittee for Problem 10 was attended by approximately 14 people. The fact that the new edition of the C.A.T. was not available during 1975 as was anticipated created an agenda of "what to do," exclusively, rather than "what has been done."

It was generally agreed by those present that it would be desirable to submit a proposal for an enlarged scope for the subcommittee which would include evaluation of other available color tests as well as the C.A.T. Proper interpretation of the scores of any color test is more likely to occur if these scores can be correlated with those obtained with other tests that have been validated as reliable single tests.

Dr. Fred Billmeyer brought to the meeting a set of tests which was produced by the Japan Color Research Institute. This battery of tests is designed to measure ability in color naming, color memory, assessment of color attribute difference, color scaling and recognition of color matches vs. small color differences. While the use of the color naming test in this country would require considerable experimental work to establish its applicability, it could readily be used as a learning tool. The committee expressed an interest in exploring the use of these tests next year.

Mr. Frank Borrelle was present as a representative of the Federation of Societies for Coatings Technology. He reported that the supply of the current edition of the C.A.T. was sufficient for approximately one year. He also reported that chips for producing the new edition were on hand and assured us that at least one test would be available shortly. It was agreed that Mr. W. N. Hale would deliver a test to Mr. Herb Aach of City College of New York. Mr. Aach offered to acquire validation data with the aid of his students. Unfortunately, circumstances arising since that time make it impossible for Mr. Aach to proceed as planned. Ms. Joy Turner Luke has also expressed a willingness to participate in the program with the aid of her students as observers. Several others in various industries are planning to participate in the experiment. Mr. Lou Graham will enlist the aid of a statistician to suggest statistically valid experimental design and data reduction. The logistics of the experimental work are not yet firm since the efforts of Mr. Aach are difficult to replace.

Although 1975 seems to have been a lost year, the "spirit of '76" still exists and supports the belief that this year will provide the data required for the release of the new edition of the C.A.T.

**REPORT OF THE SUBCOMMITTEE FOR PROBLEM 18  
COLORIMETRY OF FLUORESCENT MATERIALS  
FREDERICK T. SIMON, CHAIRMAN**

June 25, 1976

Dr. Fred W. Billmeyer  
Dept. of Chemistry  
Rensselaer Polytechnic Inst.  
Troy, N. Y. 12181



Dear Fred:

The report for the ISCC Problem 18 should be coming from Roland Connally. I contacted him again today but extracted no promise from the secretary as to when the notes will be typed.

I will keep after him.

Sincerely,

Frederick T. Simon  
Sirrime Professor in Textiles  
Clemson University  
Clemson, S.C. 29631

The report will be published later if received. See also the brief note in the Coordinator's Report preceding the Subcommittee reports in this issue ) F.W.B.

**REPORT OF THE SUBCOMMITTEE FOR PROBLEM 22  
PROCEDURES AND MATERIAL STANDARDS FOR  
ACCURATE COLOR MEASUREMENT  
ELLEN C. CARTER, CHAIRMAN**

The meeting was called to order at 9:05 AM on Monday, April, 26, 1976, by the chairman, Ellen Carter. Dennis Osmer acted as secretary. Approximately 25 people were in attendance.

The first hour of the meeting was devoted to presentations describing three national programs relating to standards. Franc Grum discussed the Council for Optical Radiation Measurements (CORM), which traced the history and basic objectives of this group. CORM has the basic purpose to be a liaison from industry to the NBS. He also outlined the work sections of CIE TC2.3. Harry Hammond described the TAPPI Collaborative Reference Program for Paper and Board Test Instruments. This program allows independent laboratories to document their testing capabilities for any of 38 different tests periodically. This section of the meeting was concluded by presentations from Charles Leete and Henry Hemmendinger on the MCCA-NBS Collaborative Reference Program for Color and Appearance. The over 100 participants select up to 9 tests for comparison several times a year.

The remainder of the meeting was devoted to the committee's work on a guide for standards. Copies of the rough draft of the guide were distributed. An open discussion of the direction and content of the guide followed. James Davidson agreed to survey the suppliers of materials and standards as well as standardizing laboratories for the guide. Anyone with information in this area please direct it to him or the chairman.

The meeting was adjourned at 12 noon. However the members involved with writing the guide met for an additional hour of discussion from 4 to 5 PM that afternoon. It was agreed to aim for a unified draft of the guide to be completed by the end of this calendar year.

**General Outline for "Guide for Standards"**

- I. Scope
- II. Terms and Definitions
- III. Applications Section
  - A. Differentiation between calibration and diagnostic checks.
  - B. Differentiation between instrument types
  - C. Discussion of Instrumental parameters for calibration
  - D. Discussion of the significance of the measurements
  - E. Possible extension to short discussion on densitometers
- IV. Materials and Techniques Section
  - A. Properties of a physical standard
  - B. Division into Hierarchy of Standards (Absolute, transfer, and instrumental — were these the three decided on?)
  - C. Table of materials available for standards
  - D. Table of Calibrated Standards available
  - E. Table of Standardizing Services available
  - F. Discussion of Pitfalls when employing standardizing techniques
- V. Literature Section — annotated

**Appendices**

1. Alphabetical listing of terms and reference to the location of their definitions in Part II
2. List of Collaborative Reference programs the user may want to join

**Section responsibilities**

Section I — Ellen Carter  
Section II — Jack Christie and Bill Venable  
Section III — Bob Marcus  
Section IV A — E — Jim Davidson  
Section IV F — Ellen Carter  
Section V — Dennis Osmer  
Appendix 1. — Jack Christie and Bill Venable  
Appendix 2. — Dennis Osmer

**REPORT OF SUBCOMMITTEE FOR PROBLEM 25D  
STRENGTH OF COLORANTS: DYES SECTION  
CHARLES D. SWEENEY, CHAIRMAN**

The subcommittee's latest paper, "Reproducibility of Dye Strength Evaluation by Spectrophotometric Transmission Measurement," was published in Volume 8, Number 2 of *Textile Chemist and Colorist* (February, 1976). This paper summerized the results obtained from round robins involving acid, disperse, direct, and basic dyes.

The subcommittee is currently engaged in a reflectance round robin in which sample pairs are applied to specified

substrates. The relative dye strength is then determined by reflectance factor measurements. Data have been gathered on disperse dyes applied on polyester and acid dyes on nylon. Samples of direct dyes for cotton were distributed at the annual meeting.

The subcommittee is engaged in the study of the determination of standard depth and is also working on a seminar in conjunction with the AATC on the strength determination of dyes by transmittance and reflectance measurements.

**REPORT OF THE SUBCOMMITTEE FOR  
PROBLEM 25F – DETERMINATION OF THE  
STRENGTH OF COLORANTS: MASS-COLORED  
FIBERS SECTION**

**RICHARD BACHE, CHAIRMAN**

This committee has been very active and has run a round robin to determine the feasibility of testing pigments for fibers in a plastic plaque. The test results indicate good correlation. The individual reports will be summarized and submitted for group action. A test procedure for producing the plastic (resin) plaques will be circulated to members of the committee and discussed at the next meeting, scheduled for September 1976.

R. F. Hoban, Coordinator

**REPORT OF THE SUBCOMMITTEE FOR PROBLEM  
25P – DETERMINATION OF THE STRENGTH OF  
COLORANTS, PIGMENTS SECTION**  
**JOYCE S. DAVENPORT, CHAIRMAN**

During the past year, fourteen participants of subcommittee 25-P evaluated two sets of pigments.

One was an organic, Phthalocyanine Green (Du Pont), and the second was an inorganic Cadmium Lithopone Red (Glidden). Both samples, unknown to participants, were 10% weaker than the standard. Each participant was asked to evaluate the pigments using his own method of testing.

Considering the extreme diversification of the test parameters, the end results were most encouraging but not conclusive enough to consider publishing. The inorganic pigment results were somewhat closer in correlation than the organic pigment. The test program proved to be an excellent round robin control series for some of the participants. Sam Huey of Sherwin Williams reported a 2½% deviation based on ten locations recording their results. Du Pont also had good results, showing satisfactory repeatability within various laboratories. Suggestions were made to participate in another round robin, limiting the testing to a single end product, e.g. an industrial finish. A larger test sample (3 lbs.) would also be required. Discussing the results of the subcommittee meeting, it was decided to accumulate more data on the type of instruments used and whether Saunderson's correction and specular included were also part of the method.

A valuable and important conclusion of the meeting was a discussion of the "Pitfalls" of each method, which

resulted in a decision to accumulate each participant's synopsis in this area.

I wish to thank all participants for their interest and encouragement in this project.

**REPORT OF THE SUBCOMMITTEE FOR PROBLEM 27  
– INDICES OF METAMERISM**  
**RALPH BESNOY AND ALLAN B. RODRIGUES,  
CO-CHAIRMEN**

An initial search for a starting direction was undertaken by surveying the membership regarding the questions on metamerism they would like answered by this committee. My co-chairman and I are pleased with the progress made so far.

Since any exercise involving color requires properly prepared samples, a first step is an experiment designed to maximize the information obtained from visual evaluations of the samples and subsequent mathematical treatment.

The design requires a minimum of ten metamers per standard and "by using rank order as the visual task and the pair comparison analysis, the best of both worlds of scaling is used."

We thank Dr. Ruth Rich (Rensselaer) for her design efforts thus far, and we shall require her assistance once again when the data have been obtained.

The committee has been fortunate to have three volunteers (Dr. J. Davidson – Munsell; Mr. A. Rodrigues – Du Pont; and Mr. C. Sherman – Sherwin-Williams) each to prepare a standard (each in a different area of color space) and the ten metamers.

In order to have controlled viewing conditions, Dr. W. Thornton (Westinghouse Lamp Division) constructed a portable light booth (displayed at the meeting) containing a number of the lamps of interest.

This design will be modified by Dr. Thornton as dictated by the number and size of samples and to facilitate shipping to and from participants in the round robin visual evaluations.

In addition, Dr. F. Billmeyer (Rensselaer) discussed general and special indices of metamerism as a means of describing the magnitude of metamerism for a given pair of samples. Anyone desiring a copy of Dr. Billmeyer's "Notes on Indices of Metamerism" should write either to Dr. Billmeyer or myself.

Dr. E. Allen (Lehigh University) volunteered to evaluate any data obtained from the experiment. I would like to add that anyone who would like to participate in any or all aspects of this experiment would be welcome. Please contact me or my co-chairman, Allan Rodrigues.

Ralph Besnoy

**REPORT OF THE SUBCOMMITTEE FOR PROBLEM 30,  
COLOR IN THE BUILDING INDUSTRY**  
**MILO D. FOLLEY, CHAIRMAN**

After the 1975 Spring meeting, the chairman submitted to the National Council for the Arts an application for funds

to construct a model folio. This was suggested at the 1975 meeting as a possible source of funding for the activities of this committee. No action has been noted on the application.

The 1976 Spring meeting was attended by 30 members, some of them for the first time. The status of the folio was discussed, and its importance as a teaching tool was noted. It was felt that the folio would be a must for all schools or colleges who taught or used color.

Waldron Faulkner presented an outline, "The Presentation of Colored Materials" and led a discussion on problems of displaying printed samples. In collaboration with George Drake of McGraw-Hill Company, they are proposing a standard format for illustration of colored products. They will present an illustrated outline for industry use for approval of the committee at its next meeting. It was noted in subsequent presentations at the meeting that colors are affected by the immediate environment.

Richard S. Hunter, 1976 recipient of the Macbeth award, presented a paper on the "Specification of Color and Appearance of Materials Used in the Building Industry." This was a review of a similar paper presented at the Plastics Conference in 1975 but with orientation towards building materials. This paper will be rewritten to be included in the folio and will contain data on gloss with some information on texture.

Dr. Henry Hemmendinger and others gave comments on the Universal Color Language stating that recent developments in designation systems may provide a more usable system than the Munsell. As this program is 5 years or more away, it was felt we should continue with the Munsell notation.

Several members suggested we contact the foundations created by major manufacturers as a source of development funds.

The Chairman, and others, discussed the problem of the Council's being dominated by the technical and scientific members to the disadvantage of the arts and the users groups. Changes are being made in the leadership to insure more participation by the user groups. The committee was encouraged to continue to enroll members, particularly architects, decorators, artists, and tradesmen.

The recent activity in the use of massive color for buildings is of interest to the committee and it was hoped that we might find a way to bring the architects involved into the committee. A future program that showed this work would be of interest to the Council.

#### **REPORT OF THE SUBCOMMITTEE FOR PROBLEM 32 — COLOR PROBLEMS IN PHOTOGRAPHY AND PRINTING CALVIN S. McCAMY, CHAIRMAN**

The principal activity of the subcommittee is the preparation for an ISCC Symposium on Objectives of Color Reproduction to be held in Williamsburg, Virginia, on February 6, 7, and 8, 1978. Edwin J. Breneman, of Eastman Kodak, will be the Papers Chairman, and C. S. McCamy, of Macbeth Division of Kollmorgen Corporation, will be the General Chairman. This will be a sequel to the symposium on the same subject, in the same place, in 1971.

Papers will stress developments in the interim. An effort will be made to increase the amount of discussion.

A report on the meaning of "neutral" in color television broadcasting is being completed by Leroy DeMarsh of Eastman Kodak, and will be considered by the subcommittee for issuance as an official ISCC document.

The subcommittee has made its needs for information on reflection standards known to the chairman of the problem subcommittee dealing with physical color standards, in general.

#### **REPORT OF THE SUBCOMMITTEE FOR PROBLEM 33 — HUMAN RESPONSE TO COLOR ALEXANDER F. STYNE, CHAIRMAN**

At the annual meeting of Subcommittee 33, Dr. William Beck of the Donald Guthrie Medical Foundation reported on the efforts of the College of Surgeons to establish some guidelines for the environment in the operating room and formed a committee to investigate this problem approximately 10 years ago. Through this activity Dr. Beck became involved in the IES Committee for Hospital Lighting about 1972 and his subcommittee has since then been rewriting a booklet concerned with surgical and general lighting in operating rooms. So far his findings have shown that surgical lights are designed mostly by people who have little or no first-hand experience in operating rooms and that guidelines for operating room lighting are issued by manufacturers. Nobody seems to have made any valid studies on the most desirable color temperature, either. The IES recommends a color temperature from 3200 K to 6500 K, which allows most light sources, without consideration for their color-rendering index. No in-depth search has been made to find surface colors suitable for operating rooms, except that under the auspices of the committee of the College of Surgeons on the Operating Room Environment (CORE) experiments are being conducted by one of their members in Chicago. In his search for guidance on the hospital environment Dr. Beck conferred with the late Dr. Judd, who suggested as color suitable for drapes and sponges, as well as operating room walls, a salmon color described by him as the color of raw beefsteak. This color was rejected by the surgeons for the reason that it might have a bad psychological influence on patients. Dr. Beck pointed out that in actuality the patients do not see the walls nor the draperies or equipment in the operating room at all because by the time they are brought into this space they are already sedated and unconcerned. Showing some slides of operations in progress, Dr. Beck pointed out that very little blood is visible during an operation under normal circumstances. He mentioned that he was squeamish at the sight of blood, for instance during boxing matches.

In speaking of patient rooms, he noted that a good percentage of patients are not completely confined to their beds, but are up and about a good part of the time. Dr. Beck mentioned the studies that he had made on patients' self-observation and their preferences for different types of light color. He found that, for instance, blondes and brunettes have different preferences for illumination of

their own skin color, and this poses a problem in the selection of light sources for patient rooms. He believes that self-observation of the patient has a tremendous psychological influence on his well-being.

Experimentation with color identification of patient rooms with pastel colors proved a problem with older patients, who appeared to need saturated colors for easy identification.

Dr. Beck believes that patterns have definite importance, especially where children are concerned, and mentioned that patterns had also been tried in operating rooms as well as in rooms for adult patients as visual relief. Contrary to views expressed by Faber Birren in his writings, Dr. Beck believes that objective studies on color temperature of light sources as well as on the effect of surface colors on patients can be made.

Mr. Albert Muller of Brookhaven National Laboratories reported on his search for a possible scientific basis for color therapy. He investigated various color therapy institutions in Switzerland and came up with very little evidence. In the United States he finds that the majority of color therapists are working "underground" but encountered a chiropractor, Dr. Whitehouse, who had already been investigated by FDA and therefore did not mind having his work described and showing his instrumentation to Mr. Muller. Mr. Muller has found, so far, that the majority of filters used by Dr. Whitehouse in conjunction with a tungsten-halogen source are indeed of a broad-band nature, and therefore their effect on cone cells of specific color receptivity cannot be proven. He mentioned the work by Dr. Wurtman and by Dr. Wolbarsht who has come up with an as yet unproven theory which leads him to believe that red and green cones are located in the central fovea whereas blue receptive cones are on the parafovea. He is in the process of constructing instrumentation that would permit exposure of patients to narrow band-pass type filters and hopes to find further evidence of physical influences by which color therapy can indeed result in behavior modification of patients. Discussion of this paper was fruitful as it brought out the fact that Dr. Whitehouse reported on beneficial effects of his color therapy combined with drugs. It appeared that no controls had been used at all.

Professor John Flynn explained with skillfully selected slides the scientific basis for the visual evaluation of observer reactions to impressions of space. He explained that his studies have so far concentrated on the evaluation of lighting systems and of visual clues which permit the occupant or observer to relate his impressions to the architectural and functional intent. His studies have proven that there is scientific substance to responses that were reported by the observers through the semantic differential evaluation method and whose results were then presented and measured by the multi-dimensional scaling method originally developed by the Bell Telephone Laboratory for the measurement of responses to sound. His slides described the facilities of the lighting laboratory at the Pennsylvania State University, where the use of a scaled-down laboratory simulator from which colored slides can be made eventually permit the introduction of surface color as an additional factor in the study of the spatial evaluation. He related his presentation to the quest of Dr. Beck's committee for the

need of a scientific basis on which designers can then develop performance specifications for specific spaces.

The session showed new facets of the broad problem in which the committee is interested. The three speakers deserve the gratitude of the Council for their contribution to this thought-provoking meeting.

#### **REPORT OF THE SUBCOMMITTEE FOR PROBLEM 34, COLOR DIFFERENCE PROBLEMS ROLF G. KUEHNI, CHAIRMAN**

During the year, the committee pursued its evaluation of six sample sets representing small to medium color differences. These sets consist of approximately 30 samples each, distributed randomly but about evenly around a standard in the chromaticity diagram with only minor lightness differences. Visual evaluations have now been completed, consisting of perceptibility evaluations as well as acceptability evaluations. For two sets, visual scales have been determined and calculations have indicated surprisingly high correlations between the visual scales, as well as between visual scales and representative color difference scales. Following completion of similar evaluations for the other four sets, the committee expects to issue a report on the findings. The chairman is particularly anxious to express his gratitude to all the committee members and their associates for extensive help in these evaluations. While a consensus regarding the desirability of determining additional data was established, the direction such work ought to take was not decided on as yet.

In the second part of the very well-attended meeting of the committee during the 1976 ISCC Annual Meeting, Dr. W.A. Thornton of Westinghouse Electric Corp. presented a talk on a new model of color difference perception, which was followed by a lively discussion. The pertinent reference is a just published paper: Thornton, W.A., "Theory of Color Difference Perception" *Die Farbe* Vol. 24 (1975).

#### **REPORT OF THE SUBCOMMITTEE FOR PROBLEM 35, COLOR AND APPEARANCE MATCHING OF LIVING TISSUE ROBERT C. SPROULL, CHAIRMAN**

All of the delegates of the American College of Prosthodontists to the Inter-Society Color Council are included in the membership of the Subcommittee for Problem 35. The annual report of the ACP to the ISCC contains information relevant to the activities of the Subcommittee for Problem 35 but is not repeated in this report.

A new organization, the American Academy for Esthetic Dentistry, was organized in Chicago on October 26, 1975. Several members of the Subcommittee for Problem 35 are charter members of this new group dedicated to improved esthetics. The Academy has listed its goals as follows:

1. To foster greater awareness of esthetic principles and techniques.
2. To foster communication and research among all disciplines so that their combined efforts can be co-



ordinated to achieve the ultimate total esthetic results.

3. To promote esthetics in dental school curricula. Esthetics is one of the prime reasons patients visit the dentist; yet few, if any, dental school curricula devote a course to esthetics.
4. To influence dental manufacturers to continue to seek the ideal restorative materials; to seek additional grants for research and development of new methods and esthetic techniques encompassing physiological and biological principles.
5. To help combat false claims by overzealous individuals or manufacturers and to require meaningful research of dental materials before release to the profession.

Mutual interests of the AAED and the Subcommittee for Problem 35 indicate that a close and cooperative liaison will be maintained in the future.

A dental porcelain system based on the Munsell Color Order System has been marketed by the J. M. Ney Company of Bloomfield, Connecticut. A book to accompany the porcelain, *Color in Dentistry* by Paul Lemire and Bruce Burk (a Subcommittee 35 member), has also been published. A complimentary copy of the book has been presented to the Subcommittee.

Dr. Michael MacEntee and Dr. Romauld Lakowski, the University of British Columbia, Vancouver, Canada are beginning a research project on Color Properties of Teeth. They have been given names of others known to be working in this area and invited to join the Subcommittee. Others interested in this problem are invited to contact them.

Janet Volie, Department of Ophthalmic Optics and Visual Science, The City University, London, England is writing a thesis on *Defective Colour Vision in Industry*. A copy of the United States Army research paper by Sproull, *A Survey of the Color Education in the Dental Schools of the World*, has been sent to her. A copy has also been sent to the Academy for Esthetic Dentistry.

The Department of Engineering, University of Wisconsin, conducted a course entitled *Designing the Color, Light and Visual Environment for Human Performance* on September 29th and 30th, 1975. The sections relating to lighting and color requirements for living and working areas and the section on research activities related to the luminous environment were especially relevant to dentistry. Affiliation with the ISCC resulted in notification concerning the course and is appreciated. Several members of our Subcommittee attended.

I want to thank Bruce Burk for acting as secretary since our meeting in Washington, D.C. in November, 1974. Bruce has faithfully reproduced and sent out the notices as I have sent them to him, but the geographical separation of our locations has presented problems, especially in answering foreign correspondence. My wife, Peggy, has been doing all my typing for years, so I've decided to make her the official secretary of this Subcommittee. Her location is perfect, and she gets my meals on top of that. I have doubled her salary, but since she's been working for nothing it won't be an expense. So—our appreciation to Bruce and welcome Peggy.

## REPORT OF THE SUBCOMMITTEE FOR PROBLEM 36 — COLOR ACCEPTABILITY STANDARDS ANTHONY J. PENTZ, CHAIRMAN

The first meeting of Problems Subcommittee 36, Color Acceptability Standards, was held on April 26, 1976. The background of the problem was reviewed and the scope presented to those in attendance. The subcommittee was formed to fill a need which exists in industry for color acceptability standards. Most of the discussion concerned the probable extent of the subcommittee activity and considered possible ways to attack the problem. By the end of the meeting, the activities of the subcommittee were divided into three task groups:

**Design Task Group** — Responsible for developing an experimental design to accumulate and interpret visual acceptance data from a reasonable number of observers. This group will specify the viewing conditions, the number of samples required about a centroid, the number of observers, etc.

**Materials Task Group** — Responsible for obtaining financial support and the preparation of the samples to be used in the data collection step. This group will specify the material of the samples, the number of centroids to be developed, etc.

**Samples Task Group** — Responsible for collecting samples showing commercially acceptable matches in use in industry today.

The members of the committee will be contacted for their preference of activity.

## A Brief History of Problems Subcommittee 36, Color Acceptability Standards

The fact that a need exists in industry for color acceptability standards occurred to Dr. Thomas G. Webber while he was preparing a paper for presentation to a Society of Plastics Engineers Regional Technical Conference. His paper, "Colorants for Plastics: The Buyer-Seller Dialogue," was presented in October, 1974, and was recently published in the first issue of *Color Research and Application*. In April, 1975, at the 44th Annual Meeting of Inter-Society Color Council, he presented his concept on behalf of SPE as a potential new problem that ISCC might consider. He proposed a dual set of color standards grouped about a centroid. One set of samples would represent "close" tolerances, and the other set "commercial" tolerances. This was an active meeting, with much discussion both pro and con.

In May, 1975, the SPE Color and Appearance Division Board of Directors assigned the problem to its Standards Committee and authorized the expenditure of funds to prepare samples to illustrate the concept. In August, 1975, Tom Webber and I visited Davidson Colleagues to discuss the preparation of samples. At the conclusion of this meeting, Mr. Hugh Davidson agreed to prepare twelve samples about an orange centroid with six samples being close to the centroid. The other six would be displaced in the same directions as the first six, but at about twice the color difference. The six samples at each level showed variations in hue, yellow to red, lightness-darkness, and saturation-

desaturation. Because the steps in yellowness-redness appeared large, Mr. Davidson also prepared intermediate steps of hue variation. The samples were prepared in acrylic lacquer using pigments with known outstanding durability to achieve the best permanence economically available.

At the September, 1975, meeting of the SPE-CAD Board, the samples were exhibited and the basic concept of the problem accepted.

In November, 1975, I visited Dr. James G. Davidson at Macbeth Division of Kollmorgen Corporation to review possible methods of displaying and packaging the samples. Macbeth Corporation prepared the exhibit card with the sample grouping shown at the first meeting of the Problems Subcommittee.

At the January, 1976, meeting of the SPE-CAD Board, approval was given to submit the problem to ISCC. The ISCC accepted the problem at the January, 1976, meeting of its Board of Directors, and assigned it to Problems Subcommittee 36.

Anthony J. Pentz

#### SCOPE COLOR ACCEPTABILITY STANDARDS

The many industries involved in buying and selling colored materials have no *visual* color difference *acceptance* standards to serve as guides. Acceptability is not based solely on perceptibility; differences in lightness are generally more acceptable than differences in chroma (saturation) or differences in hue. In addition some end-use applications require much closer tolerances than others. The purpose of the Subcommittee is to determine color differences which are acceptable at two levels of tolerance, 'tight' and 'commercial,' for a representative group of colors.

The method proposed to accomplish this is detailed as follows:

1. Accumulate samples which represent typical commercial differences in various regions of color space.
2. Accumulate visual acceptability data on these samples for the levels described above, from as many observers as is reasonable.
3. Prepare representative samples of the results.

This proposed Scope for a new Problems Subcommittee was submitted by the Color and Appearance Division of the Society of Plastics Engineers, Inc., who will undertake to lead this effort.

#### REPORT FROM THE AMERICAN ARTISTS PROFESSIONAL LEAGUE DELEGATES FRANK C. WRIGHT, CHAIRMAN

The Bicentennial Celebration is an occasion for reviewing, evaluating, adjusting our sights, and making such changes as our judgment indicates in the light of experience, new technology, and a fresh look at those things which are important and useful.

The Inter-Society Color Council has grown. Its activities

during the past year have brought the problem-solving functions into sharper focus, and in our view; its value to us all, as individuals and as organizations, has increased. We salute the high abilities and high motivation of those who serve with the durability necessary to bring it all together.

Those of us involved in the visual arts, both fine arts and commercial arts, have seen a great "Sea-change" during the past year. One after another, the critics, the publications, the art galleries and the artists have turned from abstraction to realism.

Coherent communication is back, and not in its old brown-gravy garb. Out of all of the wild experimental extremes has come a re-evaluation of stunts, shock-art, and the here-today-gone-tomorrow promotion of facts.

Public sophistication in visual arts has grown. Photography is practiced by many millions, and the leisure creative arts have grown into an immense new industry. New cameras have simplified the process of picture making, and as a result the public is developing a new confidence and a new self-directed creative approach toward visual arts and crafts. The popularization of contemptuous and incomprehensible junk art has all been seen — too much of it — and as the public begins to evaluate it, the individual is encouraged to think "anything they can do, I can do better."

And they can! Kids and senior citizens are doing remarkable work. Women with jobs are turning to beautiful petit-point designs. Busy executives are painting competent pictures, nights, week-ends, and vacations.

Out of all of this will come more beauty, more fine craftsmanship, more sophisticated judgment, and more integrity.

#### REPORT FROM THE AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS DELEGATES ROLAND E. DEBRY, JR., CHAIRMAN

Research Committee RA36 "Color Measurement Test Methods" has worked on the following projects during the year of 1974:

- Volume "Color Technology in the Textile Industry." Manuscripts for this volume were completed by the end of the year and ready for submittal to AATCC Headquarters. Publication of the book is expected in 1976.
- Testing procedure "Determination of the Light Blocking Effect of Curtain Materials." A revised version of this proposed procedure was approved by the committee by letter ballot and was submitted to the Technical Committee for Research for approval.
- Evaluation procedure "Instrumental Measurement of Textile Materials for the Determination of Color Difference." After several revisions the latest draft is presently undergoing committee approval by letter ballot.
- Evaluation procedure "Instrumental Evaluation of Standard Depth and Equality of Depth of Dyeings." A draft of this procedure has been discussed by the committee and is currently being tested in a round-robin.

The following special conferences were sponsored by the AATCC, and books of papers are available from AATCC Technical Center, Research Triangle Park, N.C. 27709:

Symposium on Printing Technology  
New York, New York, Jan. 8-9, 1975.

Symposium on Textile Industry and the Environment  
Charlotte, N.C., May 28-29, 1975

Symposium on Knit Fabrics Testing  
New York, New York, Nov. 18, 1975

AATCC Technical Conference  
Chicago, Ill., Oct. 15-17, 1975

The following color-related paper was published in 1975 in *Textile Chemist and Colorist*:

"Standard Laboratory Dyeing Procedures for Synthetic Fibers," Northern Piedmont Section, March, page 32

(Report prepared by Rolf G. Kuehni, Chairman, RA36)

#### REPORT FROM THE AMERICAN CERAMIC SOCIETY DELEGATES F. J. VON TURY, CHAIRMAN

Conferences on color, jointly sponsored by the ISCC and the ACers, have been held in conjunction with several recent Annual Meetings of the ACers. The Design Division of the ACers sponsored and organized these events. We have had excellent cooperation with the ISCC, which has provided speakers to join the ACers delegates in the forums.

There has been increased endeavor to broaden the interest and activities of the Design Division, and for the purpose of revitalizing the Division, a seminar was held at the 78th Annual Meeting of the ACers, which took place in Cincinnati in May of this year.

At the conclusion of the meeting, Dr. Stephen D. Stoddard, leader of the Ceramic Section at Los Alamos Scientific Lab and newly-elected president of the ACers, expressed the opinion that, under the "umbrella" of the Design Division, the interests of industry, the arts and crafts, and the cultural aspects of ceramics can be well served. In the new set-up, the Division will put greater emphasis on color interests in the ceramic industry and will publish more articles on new ideas and new developments in color.

At the same meeting there was a Bicentennial Exposition of the Society. The Design Division exhibit included a story about the ISCC and its relation to the ACers. On display were reprints of papers on color, a list of participants in meetings on color arranged by the delegates, and photographs taken at meetings. Newspaper and magazine reprints concerning color in the ceramic industry were also exhibited.

The next session on color will take place at the 79th Annual Meeting of the ACers in Chicago, April 23-28, 1977. We expect designers and colorists from the area to participate.

In 1975, at the Society's Fall Meeting of the Structural Clay Products Division, a paper on "Brick in Charleston Architecture," and another on "Producing Distinctive Brick Colors and Textures from Spodumene Ore Residues," were presented. At the Whiteware Division's Fall Meeting, talks were given on "Colors and Designs of Ceramic Tile Chosen by Decorators." The author, W. R. Boakes, described the colors and designs of the premium-priced ceramic tile found in the "trade shops" of Miami's Decorators Row. In these tile the use of modern, highly stable stains is minimized; instead the colorants are oxides or oxide-stain combinations. Also presented was a paper on "Automatic Decal Application Machine."

At the 78th Annual Meeting in Cincinnati in May, the following papers on color were presented: "Colors for Ceramic Glazes" by R. A. Eppler of Glidden-Durkee Div., SCS Corp. (Whiteware Div.). F. J. Von Tury, in his talk "Ceramic Design Comes of Age," given in the Art and Design Seminar, reported on the valuable information gained by the colorists and designers in our industry through membership in the ISCC.

A ceramic mural created by F. J. Von Tury, "The Ceramic Tree," will be installed in the Metuchen, N.J. Public Library in June. The mural is composed of large hand-crafted, textured panels and arranged in the shape of a tree, representing a growth pattern. Applied on the panels are glaze, texture and color research tiles, along with some of Von Tury's best ceramic work. In the center of the mural are three brilliantly colored flames, representing heat; and a sculpture of hands working on the potter's wheel, representing creativity and craftsmanship.

Colors in the ceramic industry are essentially the same as in past years. Fashionable colors in home furnishings — reds and deep blues — have created some interest. Earth tone colors and yellows are still favored.

Research continues in screening colors; glaze, body, and engobe stains; underglaze and overglaze colors; acid and alkali resisting colors; weather resisting colors; high fire convexing colors; and high and low fire enamels and colors.

There has been a continued increase in the production of decorated tile. Printed designs on matte finishes, sculptured wall tiles in glazed finish, and one or more color prints, are in demand.

Old wall and floor coverings in public buildings are being replaced with vivid color ceramic material. The stable colors and durability of ceramic material is once more proven to be a great advantage.

Among problems that the color manufacturer faces are: fast firing that influences the color, price competition, and some innovations in manufacturing systems.

In my travels in Central Europe last summer, I found that colorists and manufacturing establishments have great interest in ISCC activities.

I am happy to say that the ACers delegation is seeking various ways to stimulate cooperation and to increase communication among the ISCC, the delegation and the Society.

**REPORT FROM THE  
AMERICAN CHEMICAL SOCIETY DELEGATES  
CHARLES A. GARLAND, CHAIRMAN**

Dr. Garland has indicated that this Delegation has been inactive and is in need of thorough revision, including a new chairman able to devote more time to the needs of the Delegation. He wishes to encourage all members of the American Chemical Society who are interested in representing their Society for the Council, and vice versa, to indicate their interest to him or to the Secretary.

The Secretary concurs and wishes to point out an opportunity here for some of those who feel that IMG's can't get recognition in the Council. Since the AChS has over 100,000 members, we ought to find 10 among our IMG group willing to form an active Delegation. Let's hear from you chemist-colorists!

F.W.B.

**REPORT FROM THE AMERICAN COLLEGE  
OF PROSTHODONTISTS DELEGATES  
ROBERT C. SPROULL, CHAIRMAN**

At its annual meeting in San Diego, October 21-23, 1975, a new committee was officially created within the American College of Prosthodontists and was designated the Color and Color Matching Committee. Present at this first meeting were Drs. Steve Bergen, Jack Preston, Donald Smith, Kenneth Turner and Robert Sproull, Chairman. All are delegates from the ACP to the ISCC.

The aims and goals of the committee as decided at the initial meeting are as follows:

1. Monitor and evaluate current literature on color and color matching and disseminate the information to other committee members or interested persons.
2. Evaluate commercial developments relating to color matching in dentistry.
3. Establish guidelines for dental office and dental laboratory illumination.
4. Search for and evaluate color matching aids relating to the clinical and research problems of color matching in dentistry.
5. Evaluate the feasibility of creating a logical shade guide using presently available porcelains.
6. Establish liaison with and offer assistance to researchers seeking to match maxillo-facial appliances to human skin.
7. Constantly evaluate the need for additional areas of attention.
8. Work with the Inter-Society Color Council through the subcommittee for Problem 35, Color and Appearance Matching of Living Tissue.

Steve Bergen presented a completed version of his work on "A Training Program to Improve the Dentist's Color Matching Skills." He plans to submit an article to the *Journal of Prosthetic Dentistry* relating to his studies.

The American Dental Association yearly publishes a volume entitled *Advances in Prosthodontics*, which is a compilation of abstracts, published the previous year in

*Oral Research Abstracts. Advances in Prosthodontics*, 1975, Volume 6, for the first time, included a comprehensive review article, which was described as "dealing with a subject of current interest to prosthodontists." The honor of this pioneering article was given to Drs. William Culpepper and Kenneth Turner (a subcommittee 35 member) for their manuscript "A Review of Color Matching in Dentistry." Further indication of the growing awareness of the importance of color in dentistry is contained in a comment by the editors that the article was "written to evaluate the current state-of-the-art and, perhaps, to provide impetus to further research."

The Color Matching in Dentistry articles Part I, II and III written by your chairman and submitted through the American College of Prosthodontists to the *Journal of Prosthetic Dentistry*, the official journal of the ACP, were published in April and May, 1973 and in February, 1974. Permission has been obtained for Dr. Henry U. Frajder of Paris, France to translate and publish the articles in French.

The April 1976 issue of the *Journal of Prosthetic Dentistry* published an article by Jack Preston entitled "A Systematic Approach to the Control of Esthetic Form." It details his method of checking the appearance of the completed fixed partial denture *before* the bridge is begun and irreversible procedures instituted. Such a procedure insures that the color matching efforts expended to complete the restoration will not be in vain.

Many of the members of the ACP delegation to the ISCC are involved in a planned colloquium on dental porcelains to be called "Dental Porcelain—The State of the Art." The colloquium, originally scheduled for this year, was rescheduled for 1977 due to funding problems. Researchers, clinicians, technicians and manufacturers from around the world are to be invited. Color matching problems have been given a prominent part in the meeting.

**REPORT FROM THE AMERICAN INSTITUTE  
OF ARCHITECTS DELEGATES  
WALDRON FAULKNER, CHAIRMAN**

On May 5 a lecture was presented in Washington, D. C. by Waldron Faulkner at the Annual Meeting of the American Ceramic Society. The subject was *Architecture and Color*. It covered the use of color standards in the ceramics industry.

During the past year a new project has been started by a task force under ISCC Subcommittee for Problem 30, Color in the Building Industry. This study is on "The Presentation of Colored Building Materials." The task force includes the AIA delegates to the Council. Its objective is to improve the use of color in the producers' literature so that colored building products will be more correctly and usefully presented to architects and others.

The American Institute of Architects has been a member-body of the Council for twenty-five years and the question is sometimes raised as to whether this membership is of value to the architectural profession. In order to answer this question, a list was compiled of the activities in which the AIA and the ISCC have collaborated during that period. The list follows:



Activities in Which the AIA and the ISCC Have Collaborated  
(Where no name appears, the author or speaker was Waldron Faulkner)

- 1949 Color Symposium at the AIA Convention in Houston, Texas. "Color" was the theme of the convention. It was arranged by members of the ISCC and the AIA staff. Five ISCC members gave lectures. Summary was published by AIA.
- 1950 Symposium on "Color as Used in Architecture, Design and Decoration," held at Annual Meeting of ISCC. Summary published by ISCC.
- 1951-52 Waldron Faulkner, president of ISCC.
- 1952 Article on "Color Symbolism" published in May number of AIA Journal.
- 1954 Article on "Color in the Hospital" published in September issue of AIA Journal.
- 1955 Article on "Color Harmony" published in November issue of AIA Journal.
- 1956 Lecture on "Color in Church Architecture," at Pittsburgh Chapter of AIA.
- 1958 Lecture on "What the Architect Can Expect of Paints," at Annual Meeting of Paint, Varnish and Lacquer Association.
- 1952-58 Report on "Color of Indiana Limestone" by ISCC Subcommittee for Problem 17 completed. Report was published in part in AIA Journal. This became ISCC Subcommittee for Problem 33, "Color in the Building Industry," which is still functioning with Milo Folley, AIA Delegate to ISCC, as chairman.
- 1960 Panel discussion on "Problems of Color in Buildings" at Conference of Building Research Council.
- 1961-62 Article on "Color in Building Industry," published in February issue of AIA Journal. Lectures on "Color" given at Washington Metropolitan Chapter, Virginia Chapter, and Baltimore Chapter.
- 1963 Lecture on "The Use of Plastics in Buildings" at Annual Meeting of Paint, Varnish and Lacquer Association and published in its Annual Report.
- 1963 Reviews of two books by Faber Birren, *Color for Interiors* and *Color — A Survey in Words and Pictures*, published in AIA Journal.
- 1964 Lecture on "Color in the Building Industry," at Annual Meeting of the American Ceramic Society. Published in *Ceramic Bulletin*.
- 1966 Meetings held at Octagon of Task Force set up by AIA Committee on Building Materials and Systems.
- 1970 "Universal Color Language" developed by Task Force and endorsed by AIA Board of Directors.
- 1972 Book on *Architecture and Color* by Waldron Faulkner published by John Wiley & Sons. Now sold by AIA Bookshelf. Reviewed in this country, in Japan, and France. Is being translated into Italian for publication in Italy.
- 1972 Lecture on "The Universal Color Language" given at AIA Convention in Houston.
- 1973 Lecture on "Color, Pattern, and Related Visual Influences in Architecture" by John E. Flynn, AIA Delegate to ISCC, at symposium on "Color Vision" at National Academy of Sciences.
- Lecture on "Color in Architecture" by Waldron Faulkner at same symposium. Both lectures published by National Academy.
- 1973 Second Edition of *Architectural Renderings* by Albert O. Halse, AIA Delegate, published by McGraw-Hill Book Company.
- 1974 Lecture on "Architecture and Color" given by Waldron Faulkner at Yale School of Architecture and other groups.
- 1975 Review of *The Psychology of Color and Design* by Dr. Deborah T. Sharpe published in January edition of AIA Journal.
- 1975 Lecture on "Architecture and Color" at Annual Meeting of the American Ceramic Society.

For the current year the ISCC Sub-committee on "Color in the Building Industry" plans to include a study on "The Presentation of Colored Building Materials." Its objective is to improve the use of color in the producer's literature so that colored building products will be presented more accurately and usefully to architects than they are today.

#### REPORT FROM THE AMERICAN PSYCHOLOGICAL ASSOCIATION DELEGATES SIDNEY STECHER, CHAIRMAN

No report of communication was received from the Chairman up to July 2, 1976.

#### REPORT FROM THE AMERICAN SOCIETY OF INTERIOR DESIGNERS DELEGATES ANNA CAMPBELL BLISS, CHAIRMAN

At the annual meeting of the American Society of Interior Designers in July at Los Angeles, two sessions were devoted to color. Former chairman, Don Stevenson, gave a report on the ISCC meeting with a discussion of the papers presented for problems 33 and 30. He noted the efforts being made to promote the acceptance of the "Universal Color Language" and presented a number of projects illustrating new directions in color use.

Visual and psychological aspects of color important for the designer were discussed and illustrated in a slide presentation by Anna Campbell Bliss.

Color is obviously an important area and one of great interest for our membership. With the problems of merger of AID and NSID being resolved, we plan to expand our delegation to ISCC. We have received approval from our Board to investigate the formation of a color study group and will report on its development in the near future.

#### REPORT FROM THE AMERICAN SOCIETY OF PHOTOGRAMMETRY DELEGATES ANTHONY E. SALERNO, CHAIRMAN

No report or communication was received from the Chairman up to July 2, 1976.

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

Color-related activities continue in several ASTM committees, particularly D-1 on Paint, D-20 on Plastics, and of course E-12 on Appearance. Gloss and color-difference methods are being revised, and a recommended practice on degree of metamerism is under development.

The Annual Meeting of the ASTM, June 27 – August 2, 1976, in Chicago, will see progress on these matters.

Through the International Organization for Standards, ISO, the ASTM has been able to obtain international acceptance for a number of its tried and proven test methods dealing with color.

ASTM members receive much useful information from contacts with ISCC members and from material published in the *ISCC Newsletter*. We therefore recommend that the ASTM continue to support the ISCC as a member body.

**REPORT FROM THE COLOR ASSOCIATION OF  
THE UNITED STATES DELEGATES  
MIDGE WILSON, CHAIRMAN**

For years, color trends were closely linked to fashion and fabric developments, with Paris the oracular source. Currently, economic influences dominate, with greater emphasis placed upon color as a merchandising factor. The preponderance of synthetic yarns over natural fibers, the extensive use of white and natural tones and the dominance of market giants are all cost-related elements.

In this dollar-oriented rather than fashion-oriented market, color provides individuality and variety. A few seasons ago, specific shades could be identified as "the orange," "the green," or "the red" of the season. While over-all color directions continue to evolve, manufacturers now turn to individual applications of these colors to present their own identifiable color "look."

A currently important example of economic influences on color trends stems from the Tense Triangle. Previously, "fashion" styling shied from taking any inspiration from a "trouble spot" (such as Japan, following WW II), because reactions of consumers might affect sales negatively. Today, the opposite is true — fresh styling inspiration (and this includes men's wear and home furnishings as well as women's wear) is derived from Russia (the boots, the tunics, the beautiful embroideries and, yes, watch for the return of full skirts and petticoats), the Peoples' Republic of China (the straight no-size jackets and pants; the quilted coats and luxurious colorings of ancient brocades and china) and the oil countries (romantically referred to as Persia and the Arabian Nights) with rugs, jewelry, ceramics and pillows as inspiration. This new area of influence shifts emphasis from "ethnic" to "exotic" styling, with growing use of turquoise, magenta, violet, and purple and an atmosphere of regal luxury. Potential problem areas, only recently has each been opened to trade and travel. They offer new markets, with favorable wage scales. Thus, with a calculated eye on international tensions, styling inspirations are closely linked to economic activities.

The men's wear market may also anticipate benefits, sparked by Women's Lib activities. Liberalized divorce customs, changes in attitudes toward alimony, and a growing number of men living singly means that, in many instances, men are being freed from added financial responsibilities, giving them an increased share of income to spend upon themselves. This potential for expanding sales in men's wear will be reflected in a wider variety of wardrobe items, a grading-up in quality and more attention to self-expression. Colors too, will reflect this growing elegance.

Twice recently, when the market was experiencing a business decline, the prevailing color mood proved to be dull — several seasons ago with the "funky" tones and, more recently, with the "dusties" — confirming once again the close relationship between dull colors and dull business! As the color cycle swings into clear tones and combinations of bright colors, one can only take this as an optimistic omen, with corresponding expectations of expanding business conditions.

**REPORT FROM THE COLOR  
MARKETING GROUP DELEGATES  
LOUIS A. GRAHAM, CHAIRMAN**

Since the last annual meeting of the ISCC, the Color Marketing Group met twice. On April 27 - 30, 1975, the location chosen was Dallas, Texas. It was encouraging to note that the depressed national economical situation and the sour Dow-Jones averages did not take too much of a toll on the attendance of our members. Chairholders came from home bases on both the east and west coasts.

The theme for the meeting was "Two Hundred Years of Color." The program covered many diversified aspects of color and its application.

1. "Two Hundred Years of Furniture" — Malcolm Dunn.
2. "Two Hundred Years of Color in Art" — Arthur Adair.

3. "Organization of Color" — Dr. James Davidson.
4. A C.M.G. Five Person Panel.

"Color in Advertising" was the fascinating subject discussed by Victor G. Bloede, Chairman of the Board of Benton and Bowles, Inc. It's amazing how many excellent commercials are produced and never seen by the viewing public. A special treat and enlightening afternoon for C.M.G. Chairholders, was a tour of the Dallas Apparel Mart. Color trends and directions were discussed and analyzed in closed session groups.

Crown Center, Kansas City, was chosen for the October, 1975 meeting.

The program was well organized and most informative and began with a presentation by Everett R. Call.

1. "Color Must Equal Profit" — Everett R. Call, N.P.C.A.
2. "The Universal Color Language" — Louis A. Graham, Burlington Industries.
3. "Who Wants Science In Their Designs" presented by Frederick T. Simon, Clemson University was an informative and intriguing presentation covering the sophisticated instrumentation used to create intricate designs practically instantaneously.
4. "Color Directions in Action" presented by Richard

Hoffman — DeSoto, Inc. was a review of his new wallpaper designs book using the C.M.G. color forecasts.

5. Profit through Color and Daring — James H. Horner, Pres. Jorges Carpet.

6. Another excellent presentation was given by C.M.G. Chairholder Paul W. Britt, E. I. du Pont, the subject "New Styling Tools for the Automotive Industry."

The Chairholders attended workshop group sessions to arrive at their color directions for 1977. C.M.G. members come from all areas of industry and from all parts of the American Continent — and they enjoy the opportunity to meet and share their knowledge with other members.

Invitations to attend each others presentations are a frequent occurrence and enthusiastically accepted.

Starting this year, 1976, C.M.G. has organized regional meetings throughout the country to enable members to meet and discuss color trends on a regional basis; arriving at a consensus and submitting these to the reviewing board.

This system should pinpoint color trend movement by area as well as the data from individual members.

Over the last three years I have been watching the applications for ISCC membership and have frequently noticed many of C.M.G. becoming individual members. I know you will find them enthusiastic and talented additions to the Council.

The Color Marketing Group will be holding its next meeting in Boston, Massachusetts, May 2nd - 4th. The topic will be "Where Have All the Colors Gone?" This includes a topic pertaining to the success and failure of colors from the 1976 C.M.G. Color Directions Palette. The praise and criticism generated will flow from all areas of color application, paint, flooring, wallcovering, appliances, automotive, etc. It promises to be another exciting and profitable meeting.

(Report prepared by Joyce S. Davenport)

#### REPORT FROM THE DRY COLOR MANUFACTURERS' ASSOCIATION DELEGATES EMIL A. WICH, CHAIRMAN

The regular monthly meetings of the Dry Color Manufacturers' Association continue to feature speakers on various aspects of color related to the color consuming industries.

The Association celebrated its 50th Anniversary at a meeting held in Holland, Michigan, on May 28-30, as guests of Chemetron Pigments Division of Chemetron Corporation.

A Committee is supervising a feasibility study being done by a consultant, Equitable Environmental Health Inc. The study, based on questionnaire returns from DCMA member companies manufacturing azo pigments, will advise the possibility of making a meaningful epidemiology study of health problems possibly connected with azo pigment manufacture.

Two other projects of the Epidemiology Subcommittee are related to efforts being made by Mt. Sinai School of Medicine and the National Cancer Institute to investigate worker health problems in the printing ink industry.

Grants of \$1,000 each have been made to Clemson University and Rensselaer Polytechnic Institute for their continuing studies of color measurement.

The board has also made available funds to cover \$200 each as grants to the Society of Plastic Engineers, Federation of Societies for Coating Technology and National Association of Printing Ink Manufacturers for the best paper presented on color at one of their meetings.

The award to the Society of Plastic Engineers in 1975 was divided by R.J. Kennedy and J.F. Murray of the Hilton-Davis Company for their paper Internal Pigmentation of Low Shrink Polyester Molding Composition with Flushed Pigments.

#### REPORT FROM THE FEDERATION OF SOCIETIES FOR COATING TECHNOLOGY DELEGATES RUTH JOHNSTON-FELLER, CHAIRMAN

The delegates from the FSCT to the ISCC make up the membership of the ISCC Committee in the FSCT, one of about thirty standing committees. As a standing committee, it is required to submit two reports to the FSCT Board of Directors annually. These reports are published in the *Journal of Coatings Technology* for all members to read. We try to include items about color which would be of interest as well as news about ISCC activities. This means of communication keeps the members of FSCT informed about the ISCC.

The 1975 Bruning Award, presented by the FSCT for outstanding work in color, was awarded to Lyman P. Hunter, retired from Bennett's and an honorary member of the FSCT. He was honored as one of the developers of tinting concentrates to be used in orderly color mixtures in retail paint stores.

Definitions of color terms were completed and submitted to the Definitions Committee to be included in the FSCT Glossary of Terms used in the paint industry. About 400 color terms were defined. The entire Glossary will be completed by the end of 1976.

The program for the Annual Meeting for 1976 to be held October 27, 28, and 29 at the Sheraton Park Hotel in Washington, D.C. will include a group of papers concerning color. Of general interest are two papers on color fashions through the ages. Mr. Morgan Phillips, of the Society for the Preservation of New England Antiquities, "Color and Architectural Styles from the 17th through the 19th Century," and Bonnie Bender of PPG Industries, "Color Styles in the 20th Century and into the Future." (These titles are not finalized, but do indicate the nature of the talks to be presented.) The Problems Committee of the ISCC will present a summary of the activities carried out by the various ISCC Subcommittees at the meeting also. In addition, several technical papers involving color will be presented.

Papers published in the *Journal of Coatings Technology* for 1975 which might be of interest to ISCC members are the following:

1. Collins, E.A., Davidson, J.A., and Daniels, C.A., "Review of Common Methods of Particle Size Measurement," May, p. 35.
2. Hofner, O., "Lightfastness of Organic Pigments as a Function of Their Particle Size Distribution," Oct., p. 64.
3. Kerker, M., Cooke, D.D., and Ross, W.D., "Pigmented Microvoid Coatings — Theoretical Study of Three

Models," April, p. 33.

4. Louisville Society for Coatings Technology, "Organic Yellow Pigments as Replacement for Chrome Yellow," July, p. 75.

5. Nielsen, P.L., and Wicks, Z.W., Jr., "Effect of Internal UV Absorbers on Photodegradation of Urethane Coatings," Feb., p. 30.

6. Pappas, S.P., and Kuhhirt, W., "Photochemistry of Pigments — Studies on UV Curing and Energy Transfer," Nov., p. 42.

7. Southern Society for Coatings Technology, "Cold Storage of Drying Standards," Aug., p. 56.

8. Tahan, M., Molloy, R., and Tighe, B.J., "Comparison of Reflectance and Related Methods for Studies of Film Surface Deterioration. IV. Artificial Weathering," Mar., p. 52.

9. Wicks, Z.W., Jr., and Kuhhirt, W., "Calculation of Absorption of UV Radiation by Photosensitizers in Pigmented UV Curing Coatings," Nov., p. 49.

10. Wojtkowiak, J.J., "Instrumental Method for Determining Degree of Aluminum Flake Orientation in Acrylic Coatings," Oct., p. 79.

#### REPORT FROM THE GRAPHIC ARTS TECHNICAL FOUNDATION DELEGATES WILLIAM D. SCHAEFFER, CHAIRMAN

No report or communication was received from the Chairman up to July 2, 1976.

#### REPORT FROM THE GRAVURE TECHNICAL ASSOCIATION DELEGATES OSCAR SMIEL, CHAIRMAN

The Gravure Technical Association's color problems this year were rather simple and not related at all to the proofing inks used by engraving supply houses in our industry. As was reported in 1973, our G.T.A. Ink Standard Color Charts were approved and accepted by the gravure industry. Groups I, III, and V are now being used by all engraving supply houses and until the next printing, due about a year from now, no change in the hues of these proofing inks is anticipated.

For those not acquainted with the differences among the three groups, due to editorial preferences, costs, and kind of paper stock used to print supplement and magazines, let me explain here and now that Group I inks are used for printing on 30 lb. newsprint, used mostly by Sunday Supplements such as Parade Magazine, Family Weekly, etc. These inks use yellow, red, Mallory blue, and black. Group III inks are reserved for Seventeen and T.V. Guide Magazines printed on a machine-coated stock. They are more expensive inks, and much cleaner in hue such as yellow, magenta, cyan, and black, similar in hue to offset or letterpress inks. Group V inks are somewhere in between Groups I and III in hue using yellow, red, blue, and black, and are preferred by all other magazines such as Woman's Day, Family Circle etc. using machine-coated stock.

The one color-problem that we had to resolve this year of 1976 was the shade of white or degree of whiteness of

the proofing paper used by engravers for submission of proofs to clients and advertising agencies. After many months of surveys and studies, the magazine publishers settled on an off-white shade that was not too grey nor too warm in appearance. This is now the standard for proofing stock used by engraving supply houses. Unless something radically or technically new develops in our industry, now that we have our Lighting and Viewing Standards, Proofing Ink Standards, and Proofing Paper Standards, I see nothing in the near future that would tend to affect the color concepts presently prevailing in the rotogravure industry.

#### REPORT FROM THE ILLUMINATING ENGINEERING SOCIETY DELEGATES C. W. JEROME, CHAIRMAN

During the past year the IES Color Committee has continued its experiments on the visual assessment of illuminants for their visual clarity. In general, it has been found that comparable visual performance can be obtained at a lower light-level with sources of high color-rendering properties than with sources of poorer color rendering. Another major effort has been on the discriminability of the ANSI safety colors. It has been found that there are some general lighting sources being used extensively under which the safety colors can be confused to an extent that prevents their performing their designed function. Means for detecting this shortcoming in sources and suggestions for eliminating the problem, are under consideration.

At the IES National Technical Conference last year the following color-related papers were presented:

"The High Visual Efficiency of Prime Color Lamps" by W. A. Thornton.

"Power in Spectral Bands as an Evaluation of Color Rendering Properties of Light Sources," by C. W. Jerome.

"Roadway Visibility as a Function of Light Source Color" by J. A. Buck, T. K. McGowan and J. F. McNelis.

In addition, in *Lighting Design and Application*, the Society's monthly magazine, W. A. Thornton, R. Corth, and G. S. Evans have given a survey of the new fluorescent light source colors as well as an analysis of visual and non-visual applications. And Luke Thorington has discussed the spectral-power distribution for light sources. The considerations to be weighed in the design of this distribution include visual perception, psychological response, energy conservation, health and safety, performance, practicality and costs, teleological arguments, and legality.

In addition to the IES Color Committee, the Illuminating Engineering Research Institute (IERI), a trust affiliate of IES, has conducted studies for many years on the effects of lighting on the environment. Color has been one of the parameters of many of these. For example, Helson and Lansford studied the role of spectral energy of source and background color on the pleasantness of object colors, the results of which were published in *Applied Optics*, July 1970. Dr. Judd interpreted these in his article in *Lighting Design and Application* pointing out that establishing the pleasantness of colors is a complicated business and quite controversial; an expert designer might choose a color combination that he honestly favors only to find that his client rejects it.



Dr. Helson's study was extended by Prof. Semmelroth of the Cleveland State University. He developed formulae for predicting color pleasantness, which gave results that mesh closely with those contained in the Helson report.

IERI has also studied ways to establish psychological scaling of emotional and aesthetic reactions to the illuminated environment. These are aimed at showing the way for the lighting designer to provide for effective seeing while helping the architect to meet his need to produce aesthetically pleasing surrounds. The results have led to multidimensional scaling of psychological parameters which are beginning to explain the meaning of quality of luminous environments in terms of physical measurements.

A pilot study was conducted at University College, London, by Hopkinson and Hawkes and a related study in the United States at the University of California at Berkeley by Blaisdel, and Kimmel supplemented the British findings. Multidimensional scaling is now being used to examine the effects of light and color on overt behavior, and on impression and subjective reactions at Kent State University by Flynn, Spencer, Martyniuk, and Hendrick.

Another current project being sponsored by IERI is by Bartleson at City University, London, on chromatic adaptation. He is investigating the changes in surface color perception with variation in quality of illumination.

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

**Telephone Message**

June 24, 1976

To: F. W. Billmeyer, Jr.

Mr. Raymond Spilman called to say that he will have no report for the IDSA.

**REPORT FROM THE INSTITUTE OF  
FOOD TECHNOLOGISTS DELEGATES  
ANGELA C. LITTLE, CHAIRPERSON**

During the past year, activity in colorimetry of foods centered largely around efforts of individual investigators throughout the world, many of whom are members of the Institute of Food Technologists. In the 1975 *Food Technology Abstracts*, more than 250 references are to be found under the heading *colour*, ranging from color of alfalfa protein concentrate to color of worts, with apples, meats, chickens and eggs, pasta and potatoes, sausages, and tomatoes in between. In addition, there are about 100 references on *colorants* and a like number on pigments.

Two of the IFT delegates, F.J. Francis and F. Clydesdale, wrote a book entitled, *Food Colorimetry: Theory and Application* (AVI Publishing Co.) and G. Mackinney and A.C. Little wrote, on invitation, a chapter in the *Encyclopedia of Food Science* (AVI Publishing Co.) entitled, 'Color of Foods.'

The chapter proved to be Professor Mackinney's final contribution to the literature, as his death followed shortly thereafter, on January 11, 1976. Our delegation has thus been deprived of an important member, one who played a very active role in bringing IFT into ISCC several years ago and who, in fact, was the first Chairman of the delegation.

The 36th Annual Meeting of IFT will be held June 6-9, 1976 at Anaheim, California. A Symposium on Color Measurement of Foods, chaired by A.C. Noble of the University of California, Davis, will be presented and will include the following participants: F. Clydesdale (University of Massachusetts), D. Kropf (Kansas State University), T. Philip (University of Arizona), J. Yeatman (Consultants), A. Kramer (University of Maryland), and A.C. Little (University of California at Berkeley). Clydesdale, Yeatman, Kramer, and Little are all current members of this delegation, and, with the planned attendance of Francis, we shall be able to hold a delegates' meeting that should include all but one of the present members.

We look upon this occasion as a rare opportunity to identify potential additions to our delegation and to discuss thoroughly the direction and kind of program we want to pursue. Some of us have begun to talk about a joint publication that will provide guidelines to methodological approaches, help to standardize color terminology among food scientists, and offer a basis for future growth in this area of application.

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

The MCCA and SPE will sponsor a RETEC at Cherry Hill, New Jersey on September 21, 22, 1976. Also, arrangements have been initiated for exhibits at the International Colour (AIC) Congress to be held in Troy, New York, 1977. Both exhibits will feature color measurement and formulation equipment.

The Collaborative Reference Program continues to grow in the number of participants and in its scope. The latter is exemplified by the inclusion of Retro-Reflective Materials for highway signs in the Collaborative Reference Program and the establishment of the MCCA Advisory Committee.

The Fourth Annual Conference — "Problems Testing in the Color and Appearance Collaborative Reference Program," sponsored by MCCA, was held at the National Bureau of Standards, Gaithersburg, Maryland on April 22, 1976. Both participant attendance and interest was very high.

The MCCA, in conjunction with the National Bureau of Standards and the U.S. Justice Department, has issued the 1976 edition of Automotive Paint Colors.

The MCCA is cooperating with the National Bureau of Standards and the National Research Council in the establishment of the Absolute Reflectance Scale and intermediate gloss standards.

The MCCA will exceed its 1976 guarantee for advertising space to the new journal COLOR RESEARCH AND APPLICATION.

# **REPORT FROM THE NATIONAL ASSOCIATION OF PRINTING INK MANUFACTURERS DELEGATES D. M. KIRKPATRICK, CHAIRMAN**

During the past year, the NAPIM and the GATF have collaborated with other technical societies to draw up guidelines for new color standards for web offset printing. NAPIM feels that this is a great accomplishment which should be very beneficial to the entire graphic arts industry.

The recommended color standards for advertising material for web offset publications were adopted by nine allied associations for use throughout the industry beginning March 1, 1976.

The newly approved quality and consistency minimums were announced at a press conference in December sponsored jointly by the American Association of Advertising Agencies, Inc., American Business Press, Inc., the association of specialized business publications, and the Magazine Publishers Association, Inc.

Cooperating with them in drawing up the guidelines were the American Photoplasmakers Association, Association of National Advertisers, Business/Professional Advertising Association, Graphic Arts Technical Foundation, National Association of Printing Ink Manufacturers, and the Platemakers Educational and Research Institute.

The purpose of the new program is to coordinate industry controls in order to minimize problems when the printer is asked to reproduce varied materials supplied from around the country.

"The basic benefit will be consistency," a spokesman pointed out. "Our goal is to give the advertiser in the printed product that which he okayed in the progressive proof. In addition, revision of the formulations of the 'standard' second colors will enable them to be matched more easily and consistently with combinations of the process colors whenever necessary."

The new industry standards are based on four new procedures:

1. Establishment of standard proofing stocks.
2. Establishment of proofing ink formulations for pigment strength, hue, tack, etc.
3. Issuance of Standard Color References on which all densitometric readings will be based.
4. Mechanical specifications for advertising reproduction material.

A committee made up of members of each of the endorsing groups has been established to review the standards on an annual basis.

The new standards are contained in a 14-page booklet which is available from AAAA, ABP, and MPA. The booklet details proofing ink formulas; densitometry; standard second and four color process.

In addition, a section provides detailed information on the recommended standard mechanical specifications including general requirements for black and white, two color and four color reproduction, along with proofing, composition, and materials shipment information.

For the last decade the graphic arts industry has been dependent on the now out-of-print letterpress version of the "Recommended Standard Second Colors for Business Publications." These were originally issued in 1951 and

revised periodically, the last being in 1966.

Most agencies, engravers, and publishers have continued to refer to that booklet for so-called standard second colors, Mr. Mill said. In 1964, a letterpress version of the "standard" four color process inks came out with the industry approval.

Growth of the offset process resulted in the establishment in 1973 of a joint committee of AAAA and ABP to establish a review for the need of an update on "standard" second color inks, four color process inks, proofing stock, and ink densities; the committee was joined in the review by MPA.

The results of this tripartite group's work, along with subsequent meetings with committees from APA, API, GATF, NAPIM and PERI, established the newly-announced standards for use throughout the industry. In addition to hue and strength of inks, and a specific proofing stock, the committee has put a special emphasis on the proper use of densitometers in conjunction with these new standards.

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

In accord with its custom, the NPCA has again supported the ISCC as an observer member-body and has not submitted an annual report. (F.W.B.)

# **REPORT FROM THE OPTICAL SOCIETY OF AMERICA DELEGATES FRANC GRUM, CHAIRMAN**

During 1975, 17 papers listed under the subject heading "Color" were published in the *Journal of the Optical Society of America*; 4 additional papers were listed under "Colorimetry;" 3 more were listed under "Color Vision." An interesting paper, "Developmental Color Perception," by Rosslyn Gaines and Angela C. Little, dealing with the investigation of surface color perception to several age levels has been published in the *Journal of Experimental Child Psychology*, 20, 465 (1975).

At the Annual Meeting of the OSA held in Boston in October, 21 contributed papers were presented in three half-day sessions on color. Several other contributed and invited papers relating to color vision were presented in three more sessions on physiological optics, electrophysiology, and visual perception.

During the Annual Meeting of the Optical Society of America in Boston, the ISCC Problems Committee held a session at a special meeting of the OSA Color Technical Group. The topic of this meeting was the work of the Problems Subcommittees of the Inter-Society Color Council. Participating at this meeting were R. Derby, the President of the ISCC, standing in for R. Johnston-Feller, the Chairman of the Problems Committee; F. Grum, Chairman of the Problems Committee Group for Science and Measurement; and C. S. McCamy, Chairman of the Group for Pictorial Reproduction Problems. After the presentation of the ISCC Problems Subcommittee's activities, there was

an extensive discussion on the activities described. Finally, F. Grum invited the OSA Color Group to reciprocate the presentation in the form of a symposium at one of the ISCC Annual Meetings. Two other meetings of the Color Technical Group were held, one jointly with the Vision Technical Group, at which occurred extended and lively discussions of the contributed papers on color. The meetings of the Color Technical Group were attended by about 100 people. The special meeting was arranged and chaired by Franc Grum.

The preparation of color samples to illustrate the regular rhombohedral selections of color by the OSA Committee on Uniform Color Scales is nearly completed. To illustrate full steps, which are about 20 FMC II units, or about 2 Munsell chroma steps of yellow at Value 6, 406 colors will be made. 134 additional colors will be made to split full steps at about Value 6 and at two levels lighter and darker than that, for all hues and saturations out of two full OSA Committee steps. Sets of the 540 color samples should be ready for distribution by the Optical Society before the end of 1976.

A Committee has been appointed by OSA to arrange for revisions and publication of a new edition of "The Science of Color" the 1953 profusely illustrated book that was the report of the Optical Society's Committee on Colorimetry. A few copies of the original edition of the book, with its 25 color plates, are still available from the Washington Office of the OSA. Because of the great increase in cost of publishing color plates, many of them will have to be omitted from the new edition. Therefore, all conceivably interested who do not have copies of the original edition are strongly advised to order copies as soon as possible before the small remaining supply is exhausted.

The text and tabular material of "The Science of Color" will be greatly revised and brought up-to-date but most of the color illustrations and the discussions that center on stress will probably have to be eliminated.

Dr. Rudolf Kingslake, a former president of the OSA and Ives Medallist, is Chairman of the Committee on revision. Professor John Lott Brown, Director of the Center for Vision Research at the University of Rochester and David MacAdam are the other members of the Committee.

The following papers on color were published in 1975 in the *Journal of the Optical Society of America*.

D. H. Kelly, "No Oblique Effect in Chromatic Pathways," *J. Opt. Soc. Am.*, 65, 1512 (1975).

N. Ohta and G. Wyszecki, "Colorimetric Significance of Mercury-Emission Lines in Fluorescent Lamps," *ibid.*, 65, 1354 (1975).

R. M. Boynton and W. S. Baron, "Simoidal Flicker Characteristics of Primate Cones in Response to Heterochromatic Stimuli," *ibid.*, 65, 1091 (1975).

P. L. Emerson and C. Semmelroth, "Flicker Model for Lightness and Brightness of Different Backgrounds," *ibid.*, 65, 1101 (1975).

R. A. Phillips and W. Kondig, "Recognition of Traffic Signals Viewed Through Colored Filters," *ibid.*, 65, 1106 (1975).

N. Ohta, "Generating Metameric Object Colors," *ibid.*, 65, 1081 (1975).

R. M. Rich, F. W. Billmeyer, Jr., and W. G. Howe,

"Method for Deriving Color-Difference-Perceptibility Ellipses for Surface-Color Samples," *ibid.*, 65, 956 (1975).

E. Allen, "Simplified Phase Function for Colorant Formulation," *ibid.*, 65, 839 (1975).

B. H. Billings, "Visual Fourier-Transform Spectroscopy with Single Crystal Plate," *ibid.*, 65, 817 (1975).

J. P. Comerford and P. K. Kaiser, "Luminous Efficiency Function Determined by Heterochromatic Brightness Matching," *ibid.*, 65, 466 (1975).

N. Ohta and G. Wyszecki, "Theoretical Chromaticity-Mismatch Limits of Metamers Viewed Under Different Illuminants," *ibid.*, 65, 327 (1975).

M. Pearson, I. Pobboravsky and T.A.C. Yule, "Design of a Printed Spectrum Using Modified Neugebauer Halftone Equations," *ibid.*, 65, 323 (1975).

A. Stenius, "Optimal Colors and Luminous Fluorescence of Bluish White," *ibid.*, 65, 213 (1975).

D. Nickerson, "Uniform Color Scales: Munsell Conversion of OSA Committee Selection," *ibid.*, 65, 205 (1975).

D. Lee and H. Stark, "Planimetric Analysis of Color Images Using Least-Squares and Related Algorithms," *ibid.*, 65, 191 (1975).

E. W. Marchand, "Diffraction Effects with Lenticular Projection Screens," *ibid.*, 65, 139 (1975).

D. B. Judd and D. Nickerson, "Relation Between Munsell and Swedish Natural Color System Scales," *ibid.*, 65, 85 (1975).

#### REPORT FROM THE SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS DELEGATES ROLAND J. ZAVADA, CHAIRMAN

Among the many topics discussed by engineering committees during the Society's 117th Conference, several concerned color and colorimetry: glossary of color terms, laboratory exchange of color materials, color television reference test film and slides, optical color bars for television test patterns, color temperature shift during projection, exposure indices for color camera motion-picture films, specification of color as reflected by motion-picture screens and methods for measuring it.

The working group on camera colorimetry completed a very important task by reaffirming the NTSC phosphor primaries as the basis for colorimetric standards in North America color television and proposing methods by which the broadcaster's color picture monitors can best display the NTSC camera signal. Work is continuing in three ad hoc groups on camera, monitor, and telecine colorimetry.

Two Draft SMPTE Recommended Practices, one on setting chromaticity and luminance of color television picture monitors and another on an illuminator of test pattern transparencies for television studio cameras, were approved for trial publication.

The papers program included presentation of "Matching Telecine and Direct-Projection Tone Scale of Color Film," "Evaluation of Color Rendering in Film and Television," and "Videoprinting — A Professional Color Tape-to-Film Transfer System."

The Jiffy Test Film used for aligning and checking 16-mm projectors is being rephotographed in color and will be avail-

able in 16-mm and super-8 formats.

In recognition of outstanding service in the development of color films, processing, techniques, or equipment useful in making motion pictures for theater or television use, the Society's Herbert T. Kalmus Gold Medal for 1975 was awarded to Dr. Hans Christoph Wohlrab for his substantial engineering contribution to the printing and sound recording equipment of the color motion-picture world in developing a unit that augments the production capability of a widely-used printing facility.

Technological progress in color and colorimetry is reflected in many new developments some of which are the subject of papers published in the *Journal of the SMPTE*:

Yoshida, Okio and Shimizu, Kazuo. New camera tubes for color television. *Jour. SMPTE*, vol. 84, no. 1, Jan. 1975, pp. 11-14.

Artyushin, L. F.; Bratchenko, V. N.; and Alekseeva, N. V. A method of testing the color separation characteristics of color television camera equipment. *Jour. SMPTE*, vol. 84, no. 6, June 1975, pp. 469-473.

Bartleson, C. J. Optimum image tone reproduction. *Jour. SMPTE*, vol. 84, no. 8, Aug. 1975, pp. 613-618.

Aldworth, R. C. The development and application of metal halide lamps for color filming and television. *Jour. SMPTE*, vol. 84, no. 2, Feb. 1975, pp. 70-76.

Baker, L. R. Pioneer/Jupiter real-time display system. *Jour. SMPTE*, vol. 84, no. 6, June 1975, pp. 481-485.

Rody, D. M. A 22-lb., ¼ in. portable color video camera/recorder system. *Jour. SMPTE*, vol. 84, no. 8, Aug. 1975, pp. 607-609.

DeMarsh, L. E. Progress report of the SMPTE working group on television studio/field camera colorimetry. *Jour. SMPTE*, vol. 84, no. 1, Jan. 1975, pp. 1-2.

Herman, Stephen. The design of television color rendition. *Jour. SMPTE*, vol. 84, no. 4, Apr. 1975, pp. 267-273.

#### REPORT FROM THE SOCIETY OF PHOTOGRAPHIC SCIENTISTS & ENGINEERS DELEGATES CALVIN S. McCAMY, CHAIRMAN

The Society of Photographic Scientists and Engineers held a tutorial seminar on Plain-Paper Copiers on September 12, 1975. The current state, trends, and expectations for the future were discussed. Although the program was not specifically on color copying, many of the developments point toward such applications.

At the symposium on "Application of Optical Instrumentation in Medicine IV," presented jointly with the Society of Photo-Optical Instrumentation Engineers, September 25-27, little was said about color, but the ability of the eye to interpret information presented in terms of gray levels ran through most of the discussion. Current technology displays x-ray images, ultrasonic image patterns, and thermal patterns in this way. All of these techniques are extremely important in medical diagnosis and preventive medicine. The most notable advances are in the field of the detection of breast cancer.

At the Annual Fall Symposium on Unconventional Photographic Systems, Dr. Rodney Shaw analyzed criteria for evaluating unconventional imaging processes. Fleming, Manthey, Bailey, Adin, and DoMinh described new imaging processes

developed at Eastman Kodak. Dr. George Bird outlined strategies for improving stability and fog-level in high speed organic imaging processes. Alan R. Gillespie discussed digital color manipulation and enhancement for display. Hauser covered additivity and proportionality of colored toners for xerography. Many other papers went into the photographic science supporting research on new systems.

Although color played no major role in the Winter Symposium on Micrographics, there were references here and there to the growing use of color in the microfilm field. There is increasing use in many areas, notably medical libraries and in the teaching of anatomy and pathology.

The 1976 Annual Conference and Seminar had Color Reproduction as a central theme, May 23-27, 1976. On the first day, there were seven papers on the formation of the latent image and both chemical and optical sensitization. There was also a seminar on photofinishing engineering.

In a session on visual aspects of color reproduction, W. D. Wright discussed the visual qualities of surface texture and their reproduction. He drew many interesting illustrations from the field of painting. George C. Higgins reviewed image quality criteria, showing the interaction between tone reproduction sharpness and graininess. Following those two papers, there was a panel discussion of them by Wright, Higgins, Heinz Nitka, and C. S. McCamy. A number of interesting aspects of the relationship between texture and image quality were discussed.

In a session on color measurement and control, McCamy described a color-rendition chart for quantitative or visual evaluations of color reproduction processes. Karel Staes gave a well-reasoned argument against the use of the CIE Color Rendering Index for evaluating photographic color reproduction. Remarks from the audience indicated something of a consensus that his position was well taken. Strickholm showed the advantages of using dichroic filtration for color correction in color enlarging and printing. Meyer introduced rapid access processing of the silver dye bleach materials used for amateur and professional color printing.

In a session on color recording modes and systems, Tamoto described a new digital color recording system similar in some respects to a graphic arts color scanner. McCord described the production of color images from land-sites images at the Eros Data Center. Peter Goldmark discussed his rapid transmission and storage system for educational television. The system makes efficient use of a combination of still and motion pictures as a basis for a broadly applicable system of broadcasting educational programs to learning centers. One of the most remarkable papers was the demonstration by Knop and Gale of colored transparencies containing no colorants, but made up of embossed plastic, of a type commonly used for food wrappers. The projector was a standard conventional projector, without modification. The process employs controlled first-order diffraction to produce the colors.

Taubes gave a case history on the importance of color in microfilming maps at the National Archives. Julius Weber gave an interesting talk with magnificent illustrations of colored micrographs of crystals. Ostroff, of the Smithsonian Institution, reviewed the preservation and restoration of photographs, including a remarkable restora-

tion technique employing nuclear radiation.

In a session on color reproduction methods, Meyer revealed a silver dye bleach material for automatic rapid-access direct-positive color portrait photography. Mailloux described the optical design and color balance considerations for a slide adapter linking a projector to a color copier, Kubodera displayed remarkable motion pictures taken through a microscope of dye formation during development. W.T. Hanson, Jr., described the imaging chemistry, the dyes, the emulsions, and the functions of the various layers of Kodak instant print film. The process is based on a high-speed direct-positive silver system. This is the first entry of another company into the field formerly occupied only by Polaroid.

In the session on sensitometry, Gruber described a xenon sensitometer with daylight or tungsten exposure. Burke described a sensitometer providing independent control of illumination and exposure time for studies of the reciprocity of these two quantities. McCamy reviewed the standardization of narrow-band densitometry, the search for ways of implementing the standard, and the recent development of a practical solution using pulsed-xenon as a source. Pearson showed how a reflection densitometer interfaced with a computer can be used to obtain quantitative statistical data on tone reproduction. VanArsdell described a new graphic arts exposure controller that calculates and controls half-tone exposure for midtones, as well as for highlights and shadows.

The Publications Chairman reports that the book, "Color: Theory and Imaging Systems," available from the Society headquarters is enjoying brisk sales, indicating a continued widespread interest in photographic color technology.

#### REPORTS FROM THE SOCIETY OF PLASTICS ENGINEERS DELEGATES THOMAS G. WEBBER, CHAIRMAN

The Color and Appearance Division (CAD) sponsored nine papers on coloring plastics at the Annual Technical conference in Atlanta, May 5, 1975. A paper on use of flushed pigments for thermoplastic polyester by Kennedy and Murray of Hilton-Davis was given the \$200 DCMA Award, administered by CAD.

A Regional Technical Conference in Cincinnati on September 23 was attended by 123. Eleven papers on coloring and decorating were presented; MCCA had an exhibition of color measuring instruments.

The SPE publication, *Plastics Engineering*, has had three papers on coloring during the past year. Several of our members contributed to the first issue of *COLOR RESEARCH AND APPLICATION*. The CAD Newsletter appeared three times.

We have a contract with Wiley-Interscience for a 450-page book, *COLORING OF PLASTICS*, an SPE Monograph. Authors have been assigned for all 25 chapters.

S. L. Davidson's color seminar at Cherry Hill, N.J. had the maximum attendance of 45. Another is planned for this fall in North Jersey.

CAD is sponsoring ISCC Problem 36, Color Acceptability Standards, A. J. Pentz, Chairman.

#### REPORT FROM THE TECHNICAL ASSOCIATION OF THE GRAPHIC ARTS DELEGATES MILES F. SOUTHWORTH, CHAIRMAN

The TAGA Color Committee heard a presentation given by Professor Jozef Cohen of the Psychology Department at the University of Illinois. The presentation was entitled "Euclidean Color Space — and Its Invariance." That presentation will be written and included as part of this report.

Robert Loekle was appointed to serve as chairman of the Color Committee. He will therefore be the chairman of the TAGA delegation to ISCC.

Some discussion followed regarding the selection of solid ink densities and their determination.

#### PAPERS DEALING WITH COLOR Presented at TAGA ANNUAL TECHNICAL CONFERENCE Philadelphia, Pa. — May 1976

"A Method for Establishing the Optimum Color Balance in the Trichromatic System of Color Reproduction," Francis L. Cox.

"Dye Transfer Mechanism in Heat Transfer Printing," Emery J. Gorodny.

"New Approaches to Graphic Arts Colorimetry," Russell H. Gray and Dr. R. P. Held.

"The GTA/RIT Reflection Density Reference," Miles Southworth.

"The Chromascope — A New Approach to Color Scanner Adjustment," Dr. Uwe Gast and Dr.-Ing. Rudolf Hell.

#### REPORT FROM THE TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY DELEGATES ROLLAND A. AUBEY, CHAIRMAN

The Optical Methods Committee of the Testing Division of TAPPI is responsible for the development of methods of evaluating the appearance properties of raw materials for, and products of, the pulp and paper industry. Included in its membership are representatives of manufacturers of pulp and paper products, dyestuffs, and pigments. Also included are representatives of instrument manufacturers, governmental agencies, and academic institutions. One of the major activities is a review program to make certain that all standard testing methods reflect the current state of the art.

Ongoing programs include review of methods of determining opacity, reflectance, gloss, and color matching and difference.

A very significant contribution was the publication in March, 1976 of a TAPPI Information Sheet (TIS 017-9) titled, "The Determination of Instrumental Color Differences." This publication provides the general introduction to the use of color differences and a list of the most likely



used equations to obtain them. Copies can be obtained by writing to the Technical Association of the Pulp and Paper Industry, One Dunwoody Park, Atlanta, Georgia 30341.

## GRAPHIC ARTS ODDITIES



**THE EMPEROR** of the Holy Roman Empire in the 15th century, forbade the use of paper for all official documents. These could only be written on vellum. Not until 50 years later, were paper mills erected in Austria and south Germany.



**D**uring the middle ages, patient scribes used a cow's horn to hold ink. When they started the day's work, it was clutched firmly in the left hand.



**In 1721** the "New England Courant" established by James Franklin, brother of Benjamin, contained essays by a society of literary gentlemen who were called a set of free thinkers, or "Hell Fire Club".



**T**here was a time when printers' marks, of which we have many illustrations, caused as much curiosity and excitement as the names of new automobiles did years ago.

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William Benson, Chairman  
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Send *Newsletter* Items to Editor:  
Dr. William Benson  
618 Constitution Ave., N.E.  
Washington, D.C. 20002

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(301)921-2983

Mr. William D. Schaeffer  
Research Director  
Graphic Arts Technical Foundation  
4615 Forbes Avenue  
Pittsburgh, Pennsylvania 15213  
(412)621-6941

## NOTES

1. Any person interested in color and desirous of participating in the activities of the Council for the furtherance of its aims and purposes . . . shall be eligible for individual membership (By-Laws, Article III, Section 2). Application forms for individual membership may be obtained from the Secretary (address given above).
2. The Council re-affirms its community of interest and cooperation with the Munsell Color Foundation, a tax exempt organization set up to acquire and use its funds to further aims and purposes very similar to those of the ISCC: to further the scientific and practical advancement of color knowledge relating to standardization, nomenclature and specification of color, and to promote the practical application of these results to color problems arising in science, art and industry. The Council recommends and encourages contributions for the advancement of these purposes to the Munsell Color Foundation. For information, write S.L. Davidson, NL Industries, P.O. Box 700, Hightstown, N.J. 08520.
3. The Council promotes color education by its association with the Cooper-Hewitt Museum. It recommends that intended gifts of historical significance, past or present, related to the artistic or scientific usage of color be brought to the attention of Christian Rohlfing, Cooper-Hewitt Museum, 9 East 90th Street, New York, New York 10028.