

Inter-Society Color Council News

FIRST TWO ISCC TECHNICAL REPORTS AVAILABLE

The first two *ISCC Technical Reports* are now available and may be purchased from the Secretary. As noted in the Report for the Board of Directors in *Newsletter 254*, these are reports on ISCC Projects (formerly, Problems Committee reports) that are not directly suitable for journal publication because of their length or nature.

ISCC Technical Report 78-1, "A Comparison of Several Proposed Methods for Evaluating Daylight Simulators in the Ultraviolet Range," was prepared by David H. Alman and Franc Grum, based on work of Task Group IV of the ISCC Committee on the Colorimetry of Fluorescent Materials.

In this report, a proposed method of evaluating the quality of daylight simulators for their use with uv-range-excited fluorescent colors is studied. The suitability of the hypothetically derived spectrofluorometric data employed in the proposal is studied by comparison to spectrofluorometric data on real uv-excited fluorescent materials. No important differences between the two sets of data are observed. The proposed method of assessing daylight-simulator quality based on asymmetric radiometric weighting of the effective excitation of the source with a fluorescent sample is compared to methods employing a symmetric radiometric weighting of effective excitation, a metamericism index for change of illuminant using fluorescent:non-fluorescent metamer pairs, and a recent proposal by Ganz. Significant differences in the evaluations of real daylight simulators are obtained when different evaluation procedures are employed. Recommendations are made as to which procedure may be most suitable for the purpose of assessing daylight-simulator quality for use with uv-excited fluorescent colors.

The price of *ISCC Technical Report 78-1* is \$2.50 prepaid to ISCC members for individual use and \$5.00 to libraries. A "long abstract" of this report is being prepared for publication in *COLOR research and application*.

ISCC Technical Report 78-2, "Guide to Material Standards and their Use in Color Measurement," was prepared by Ellen C. Carter and Fred W. Billmeyer, Jr., based on work of the ISCC Committee on Procedures and Material Standards for accurate Color Measurement.

This Guide provides an introduction to material standards and their use for the standardization of color-measuring instruments. It is recognized that accurate standardization is essential if color-measuring instruments are to produce useful results. Standardization, which may be divided into the steps of calibration, performance testing, and diagnostic testing, requires the use of material standards of known, and in some cases certified, properties. The Guide defines and describes various types of material standards and gives procedures for their use in assessing instrument parameters affecting color measurement. It then discusses desirable properties of material standards and provides tables of commercially-available standard materials, material standards, and standardization services for color measurement. (It is hoped that these Tables

NUMBER 255

JULY-AUGUST 1978

can be updated periodically.) Typical standardization procedures are then provided as examples, and the Guide closes with a Glossary and an Annotated Bibliography.

The price of *ISCC Technical Report 78-2* is \$5.00 prepaid to ISCC members for individual use, and \$10.00 to libraries. A paper based on this report is being prepared for submission for publication in *COLOR research and application*.

MEMBERS URGED TO PROTEST PLANNED NBS CUTBACKS IN SPECTROPHOTOMETRY

It has come to the attention of the Executive Committee that the program in spectrophotometry at the National Bureau of Standards is scheduled to be virtually eliminated in fiscal year 1980 (beginning October 1, 1979), and that most of the personnel associated with the program may be reassigned to other areas as early as October, 1978.

The Executive Committee is deeply concerned over the repercussions to United States commerce and industry engaged in color measurement should these planned reassignments take place. In question are the calibration and distribution of material standards, research essential to the development of new standards badly needed in many areas, and consultation services associated with the development and use of such standards.

The letter following this item, signed by President Franc Grum on behalf of the Executive Committee and through it the ISCC, expresses these concerns. The Executive Committee urges all ISCC members who are concerned, on a personal basis or through their employers, to write similarly to register their concern and their desire that our national standardizing laboratory not abandon all interest in spectrophotometry, the heart of color measurement.

Letters should be addressed to The Honorable Juanita M. Kreps, Secretary of Commerce, Department of Commerce, Washington, D.C. 20230. Please send a copy to Dr. Ernest Ambler, Director, National Bureau of Standards, Washington, D.C. 20234. It would be greatly appreciated if you would send a blind copy to the ISCC Secretary also.

The Honorable Juanita M. Kreps
Secretary of Commerce
Department of Commerce
Washington, D.C. 20230

Dear Madame Secretary:

As President of the Inter-Society Color Council, I have been charged by the Council's Executive Committee with the responsibility of expressing to you their deep concern over recent developments restricting the nature of spectrophotometry and of associated services to be expected from the National Bureau of Standards. Since the Council is comprised of principally thirty-five national organizations of the professionals interested

in color measurements and other aspects of spectrophotometry, the Executive Committee feels that its concern reflects that of a significant segment of the population involved in commerce. Both the development of standards and the provision for consultation on practical problems, which are the services referred to, have been very valuable to government and industry, and it is not likely that such services can be effectively assumed by any other government agency in this country.

For the past fifty years, the U.S. has pioneered the development of methods and standards for the measurement of color and other spectrophotometric attributes of materials. Beginning in the 1930's, the National Bureau of Standards has provided leadership to both government and industry in the United States and in the world by formulating the methods now used to specify colors and geometric light distributions of many different materials. Some of the specific matters studied at the NBS were traffic signals and signs, airplane and airport lights, paints, plastics, ceramics, oils and dental materials. The NBS calibrated and issued standards used in appearance evaluation of all these materials.

Then for a short period of time, there was a void in the activity in this field at NBS. This nonactivity in the area of spectrophotometry at NBS was felt very badly throughout the U.S. electro-optical industry and it was costly. The industry was forced to turn to the National Standard Laboratories of other countries, such as Canadian National Research Council, National Physical Laboratory in Teddington, England and to Physikalisch Technische Bundesanstalt in Germany. Finally, the NBS has responded to the needs of industry in this area and resurrected a spectrophotometry group. This group soon found out just how badly this activity is needed. In just a few years, great progress has been made and the state-of-the-art of spectrophotometry once again has taken an advancing step. One should remember that spectrophotometry is used in all branches of science and is a basic tool for evaluation and specification of materials. The advent of new materials and the rapid evolution of technology in electro-optical field urgently demands an expansion of the field of spectrophotometry.

As a result of the important pioneering work and its present continuation, the American industry, which is vitally concerned with evaluation of its products, came to rely on the Bureau of Standards as an unbiased and effective source of material standards for reference. Such calibrated reference standards are essential if different organizations and companies are to communicate confidently about colors and other optical characteristics of materials. These types of standards are imperative, *conditio sine qua non*, for industry to meet the specifications of various regulatory agencies.

It is shocking news indeed that NBS plans to discontinue altogether its research and development and its services in supplying reference material standards for spectrophotometry. The industry needs reference standards from a government source in order to maintain the traceability of its measurement to government standards and this is a must not only in American industry, but also in international industry, which depends on instruments purchased in the United States and needs to have available material standards such as those supplied in the past by the NBS.

In addition to supplying standards, the NBS has also provided valuable consulting services on related problems to both government agencies and industry and has carried out research and development in the field for which they were best equip-

ped to carry on. Now it appears that, with organizational changes, even the practical consulting services are likely to be "phased out," with the likelihood that practical knowledge resulting from many years of experience will be irreparably lost.

The ISCC therefore respectfully requests that the Department of Commerce, as a service to government and industry, continue to maintain through the National Bureau of Standards, the calibration and issuance of material standards for spectrophotometry, visual diffuse densitometry and photometry, and to make every effort to advance the state-of-the-art of this so vital field for industry. Also, the NBS should make effective provision for continuation of consulting services on theoretical, practical and applied spectrophotometry.

Photometry, spectrophotometry and radiometry are the most basic to the whole field of optical radiation measurement. We believe also that the Prestige of NBS and hence of the U.S. would be badly tarnished by not having strong programs in these basic areas.

Very truly yours,
Franc Grum, President
Inter-Society Color Council

VIGNETTES FROM THE PRESIDENT'S DESK

As I occasionally reminisce about our last Annual Meeting and what characteristics made the "good" things good, I am drawn among other things to the Workshop on Color in Use. Being a very results oriented person, I enjoy most of all seeing our joint labors being utilized in very practical and useful ways — ways that utilize the God-given talents that we have.

A very good example of this has recently come to my attention through our colleague, Mrs. Pearl McGown, who has supplemented her artistic flair for the design and manufacture of hooked rugs with a color course which she made up based on the Munsell Color System. She has used this course in the McGown Teacher Workshops of hooked rugs "so that they can put the (Munsell) chips together in various color harmonies in planning the rugs which they are making."

She is currently conducting her 28th Teacher Workshop in as many years and has written a book "Color in Hooked Rugs" where she shows a color tree which she devised to help demonstrate the principles of color harmony.

It delights me to hear from our members on how they have been able to put the science of color to use for them in their professions.

ANNUAL MEETING, 1978

Acceptance Remarks by the President

Fellow Officers, Members of the Board, Delegates, Members and Friends:

The Annual Meeting Program clearly spells out "there will be no after luncheon speakers," however, the temptation is too big and the opportunity too great for me to pass by this opportunity without saying a few words.

First of all, I want to express my sincere thanks to Mr. C. Jerome for the fine guidance during the past two years. Chuck, it was indeed a pleasure and privilege to work with you and your Board members and officers.

Next I would like to thank you all for your confidence in me to serve as your President. I accept your decision with a sense of humility, anxiety, and a promise that I shall do my

best. I believe that it is a challenge to preside over this unique organization that scarcely has a parallel. I have been involved with the Council for many years, and I must tell you that it has been most gratifying for me. Through my involvement, I have been fortunate in making many friends and acquaintances, not only with the recognized experts in the field of color, but also with many of those seeking the advice to the solution of problems in color vision, color appearance, measurement, and appreciation. I have listened to these problems and I have observed the exhibition of expertise and dedication of those who served. Yes, I have seen dedicated people at work willing to share their knowledge with those of us who were seeking advice.

Through the Problems Committee activities, I learned just how little we know about certain specific aspects of color and how many problems are yet waiting for practical solutions, waiting for you and me to bring about the solutions to these problems.

There is yet another uniqueness of this organization; that is, its composition and its aim to bring together artists, designers, scientists, engineers, and teachers. What a wonderful aim this is — working together for better understanding of the wonders of color, both those given to us by creation as well as those built by human hands and genius.

As to the future, I am not in the position to give you any promises for I know too well that I alone, with the members of the Board, can not be very effective without your active and sincere participation in all affairs of the Council. For being an organization such as it is, I believe that the Council has the responsibility to maintain the dialogue among members to the utmost effectiveness and to strengthen its future activities along these lines. This goes not only for the Member Bodies, but also for IMG members. We must strengthen the activities of the Problems Committee. Their projects should have substance, should be manageable, and the results should be more visible. The projects should be centered on the application of theoretical knowledge to the practical problems.

Our future meetings and conferences should be well organized so that they will stimulate discussion and interaction. This can be achieved with proper planning and with your participation.

Yes, my friends, the ISCC is a unique organization and my only wish is that I would possess the eloquence of diction to really express my humble desire to make at least a token contribution to furthering the aims and purposes of the Council. I am inviting all of you to get involved. If you see things going the wrong way, speak up — any constructive criticism will always be welcome. Please call on me or on Board members on any concern that you may have for you can be sure that I will not only respond to your calls but will call on you for help. If you feel that we have problems, do not despair or fall into pessimism because of it; on the contrary, these problem should compel us to act. It is up to us all — not only up to officers and Board members to make this organization such as we want it to be.

Thank you.

Franc Grum

Report of Delegation Chairpersons Meeting Franc Grum, Chairman

The Delegation Chairpersons Meeting was well attended with nearly two thirds of the delegations represented. There was ex-

cellent exchange of ideas and discussion concerning responsibilities of the delegations, their Societies, and the Council. The value of jointly sponsored meetings between ISCC and member body societies was pointed out and discussed.

Chairpersons were reminded that written reports to the Council of their Society's activities are currently due, and in the discussion that followed, it was agreed that this report would include a bibliography of papers on color which have been published in their Society and related fields. It was also suggested that these could be compiled and published yearly by the ISCC as a reference manual of current work.

The cooperation of member bodies in promoting the Journal of Color Research and Application by supplying membership information to Wiley was again requested. Ms. Joyce Davenport was introduced as the new liaison person for the member bodies.

The meeting ended with a positive note of increasing communication during the coming year.

Report of the Subcommittee for Problem 34, Color Difference Problems — Ruth M. Rich, Chairman

At the 1977 annual meeting Rolf Kuehni resigned as chairman, agreeing to remain as caretaker until a new chairman was found. At the October meeting of the Board of Directors, Ruth Rich was appointed as the new chairman. Robert Zeller of Pfizer has agreed to be secretary, since Therese Commerford did not wish to continue in that capacity.

Robert Marcus and Rolf Kuehni are preparing a report of the subcommittee's experimental round robin on small color differences.

At the 1978 annual meeting it was agreed that a new experimental program would be initiated. This subcommittee will work to cooperate with the goals of the CIE TC 1.3 subcommittee on color differences, and, to this end, the variable of texture was selected as being suitable for study. A few persons expressed willingness to prepare sample sets, all of one color but in different materials. A visual experiment will be drawn up to find the color difference perceptibility ellipsoids at this location in color space. The method will be evaluated for one color set, and, if it is suitable, data will be collected for several other sets.

Supplement to Report from the American Ceramic Society Delegates — F. Joseph Von Tury, Chairman

The past year in the industrial ceramic whiteware industries has not seen any significant trends develop in the color field. Off white colors such as Bone and Oyster shades are the most recent fashion in the construction related fields of sanitary ware and wall tile. Earthtone brown and yellow colors still remain popular in the dinnerware and artware markets.

William G. Coulter

Report from the Society of Plastics Engineers Color and Appearance Division Delegates — W. J. Cunningham, Chairman

The Annual Technical Conference (ANTEC) of the Society was held in Montreal in April of 1977. The Color and Appearance Division (CAD) sponsored a panel discussion on liquid color and the discussion was well attended.

Another successful Regional Technical Conference (RETEC) was co-sponsored by the CAD and the New England section in October of 1977, with the theme "The Law and

You." The papers presented were:

The Toxic Substances Law
Colorants for Plastics – HEW's viewpoint
Questions and Answers
Acceptable Colors for Food, Drug and Cosmetic Packaging
Limitations on Organic Pigments
Regulations on Inorganic Pigments
A New Approach to Chrome Yellow Replacement
Pigments for USP Applications
Color and Appearance Standards and the Law
Colorants in Plastic Toys
Copies of the Boston RETEC and the ANTEC preprint are available from SPE headquarters, 656 W. Putnam Avenue, Greenwich, CT, 06830.

"Color Management and Control for Plastics Fabricators" is the title of a new adventure by the division. This seminar, held in Elgin Illinois, on September 21 was given by Bob Swain and Vic Mimeault and was so successful that it was repeated on March 16, 1978.

During the week of April 24-28, 1978, the *Society of Plastics Engineers* met in Washington for their Annual Technical Conference and the CAD had two sessions with six papers on Monday the 24th. The seminar, "Fundamentals of Coloring Plastics" was repeated this year.

For our next RETEC, the CAD will be back in northern Ohio in the fall of 1978 at Sawmill Creek Lodge in Huron on October 5 and 6. The theme of "Coloring of Plastics XII" will be *Automotive Color*. Bill Longley and Barry Meyers have developed a program with a series of papers involving all phases of color including: color matching, color measurement, color styling, color processing and colorant applications. As is usual, many ISCC members will contribute.

This year we are proud to report that one of our own, Dr. Fred W. Billmeyer, Jr. a member of the CAD Board of Directors for many years, was the recipient of the ISCC's Macbeth Award.

Three color articles appeared in *Plastics Engineering*, the official publication of the Society. They were:

Using Liquid Color to Best Advantage, J. P. Snow, Jr. and W. P. Arnheim – June
Additives for Plastics – Colorants, T. B. Reeve – August
Using Chromaticity Diagrams for Pigment Selection, D. Osmer – September

Workshop 4 – Color Trends in the Home Fashion Industry

Moderator: Nadine Bertin

Reporter: Nadine Bertin

This evening we are going to talk briefly about color and design and the various directions American style is in right now, and which way it is going in architecture, interiors, furniture and accessories.

These days, we see color around us everywhere we look. There is color in architecture whether it is traditional or modern.

There is color used in interior architecture on beams and framing windows, no longer are architectural motifs hidden, on the contrary, color accentuates them.

John B. Ritch, Jr.

Jerard L. McCowin

Jerome H. Heckman

Michael J. Dunn

Frank L. Fasano

John Dickenson

Eric H. Hill

Robert F. Sharrock

Margaret Burns

Chuck Williams

Copies of the Boston RETEC and the ANTEC preprint are available from SPE headquarters, 656 W. Putnam Avenue, Greenwich, CT, 06830.

"Color Management and Control for Plastics Fabricators" is the title of a new adventure by the division. This seminar, held in Elgin Illinois, on September 21 was given by Bob Swain and Vic Mimeault and was so successful that it was repeated on March 16, 1978.

During the week of April 24-28, 1978, the *Society of Plastics Engineers* met in Washington for their Annual Technical Conference and the CAD had two sessions with six papers on Monday the 24th. The seminar, "Fundamentals of Coloring Plastics" was repeated this year.

For our next RETEC, the CAD will be back in northern Ohio in the fall of 1978 at Sawmill Creek Lodge in Huron on October 5 and 6. The theme of "Coloring of Plastics XII" will be *Automotive Color*. Bill Longley and Barry Meyers have developed a program with a series of papers involving all phases of color including: color matching, color measurement, color styling, color processing and colorant applications. As is usual, many ISCC members will contribute.

This year we are proud to report that one of our own, Dr. Fred W. Billmeyer, Jr. a member of the CAD Board of Directors for many years, was the recipient of the ISCC's Macbeth Award.

Three color articles appeared in *Plastics Engineering*, the official publication of the Society. They were:

Using Liquid Color to Best Advantage, J. P. Snow, Jr. and W. P. Arnheim – June
Additives for Plastics – Colorants, T. B. Reeve – August
Using Chromaticity Diagrams for Pigment Selection, D. Osmer – September

Workshop 4 – Color Trends in the Home Fashion Industry

Moderator: Nadine Bertin

Reporter: Nadine Bertin

This evening we are going to talk briefly about color and design and the various directions American style is in right now, and which way it is going in architecture, interiors, furniture and accessories.

These days, we see color around us everywhere we look. There is color in architecture whether it is traditional or modern.

There is color used in interior architecture on beams and framing windows, no longer are architectural motifs hidden, on the contrary, color accentuates them.

There are 3 very strong general styling "Looks" that are running on a course right now in this country. This is an interesting phenomenon to note as it is the first time in our memory that three equally strong design directions are running concurrently.

The first of these is *rustic*,

The next is *romantic*,

And the third is *modern*.

In *modern* we also have new ways of designing furniture – softer sectionals that you carry away from the store and put together yourself or the new plastic molded type of furniture for indoors and out.

Then there are hybrids or combinations of these 3 strong trends, for instance romantic/rustic or romantic/modern: a flowered and ruffled fabric bedroom with the newest bath equipment.

Or rustic/modern: room combining modern architecture and furniture with rustic woods, collections of American memorabilia, and of course the perfect combination occurs in the in the kitchen, where new equipment is married to wood.

Lots of today's fabrics are flowery and romantic, and with all the roses around us House & Garden current color promotion is "Romantic Roses." However, it does not have to be flowered to be romantic, here, a cloudscape on sheeting, but romantic patterns do exist in wallpapers, carpeting, and bedding.

Please note the pale pastel romantic coloration of the solids in these sheets as well as the pale flowers on the pillow case. This by the way is 100% cotton a runaway best seller, which proves that people really are going back to naturals.

Speaking of naturals, they are all over the house.

The ultimate natural furniture collection is by George San Angelo and here are a couple of their furniture styles.

People are living alone more and more by choice. Here an all white one-room studio apartment divided by a bookcase.

People are doing things with their hands in new inventive ways. Angelo Donghia shows us how to slipcover a chair without any sawing.

We are refinishing furniture, learning how to design with paint and redecorating houses.

Nature is what we all carve and greens, trees, plants, and greenhouses are blossoming all over, leading us to live with move and bigger plants, even in a bedroom.

Let's talk a bit about color, the colors on walls today are warm and fresh in the yellow geranium and peach variations.

On the other hand some people like strong color: here is a color saturated room and color on floors.

Here is a family using color to brighten up a storage space and here is Color used as a strong accent in monochromatic rooms.

These strong sales of shades of Terracotta and Sienna which zoomed to the top in a very short time are still going on along with the naturals.

And there is color in plastics in tabletops which of course leads us to kitchens, the most important room in the house today, where everybody is cooking and everybody is gathering.

Well, where are you going to get all the goodies to put into those greenhouse rooms and delicious gourmet meals of your own greenhouse or at least pots which is an activity that many people are devoting a great deal of time these days because food and nutrition are so important.

There is even color in preserves, and color makes any food look special.

Color certainly changes the aspect, the mood and sometimes, seemingly even the shape of rooms. Watch at what color can do:

A. In a bathroom – going from one set of primaries to another.

B. Here only the covers on the furniture change. Watch the furniture go from basic beiges to strong greens to a brilliant primary color print.

In this room watch the floor as the carpeting changes and thereby seems to change the very shape of the room.

And here – the ultimate fun with color in a given space. A room we built in our studios and had designer Tom Britt take from an original white shell through the use of various paint colors, including painting a white stripe across the ceiling from pastels through neutrals through rich dark color again seemingly changing not only the room's mood but its shape.

And that is the power of color in interior design today. . . !

Note: The preceding was a presentation at the 1978 Annual Meeting and was accompanied by photographs, to which the preceding refers. It is given as a memorandum to those who attended the meeting and as a record of events at the meeting.

INTERCOLOR 79

Intercolor – The Colour Makers' Exhibition & Conference

Recent developments and plans for the International Exhibition of Colour Technology (INTERCOLOR 79) and its associated International Conference at the Schweizer Mustermesse, Basle, Switzerland, from 20-24 March 1979, are reported by the Organisers.

Demands for stand space for the display of materials, process plant, machinery, instrumentation and allied services essential to the production of pigments and dyes and their end-products – paint, plastics, textiles and printing inks – have shown a marked increase in recent weeks. Exhibition and Conference Organiser, Mr. Leslie Newman reports that contracted exhibitors already include many major industrial suppliers. Space enquiries are being processed daily and keen interest is being shown by manufacturers and suppliers from Germany, Switzerland, Holland, the United Kingdom, USA, France, Italy and Hungary.

INTERCOLOR 79 is sponsored by the Inter-Society Color Council and Schweizerische Vereinigung der Lack und Farben Chemiker. Both the exhibition and conference are organised jointly by Mack-Brooks Exhibitions Ltd and the Schweizer Mustermesse.

Conference Committee Formed – "Colour at Work"

The conference has now received approval and sponsorship from leading trade and technical associations in Europe and North America. The inaugural meeting of the INTERCOLOR Advisory Body on 24 April led to the formation of the Conference Sub-committee and the election as chairman of Dr. P. L. Walraven, Fédération Européenne de la Couleur. This committee meets in Amsterdam in June to decide the overall content of the conference under the provisional title "Colour at Work".

Other members of the sub-committee are Dr. Ing H. Terstiege, Bundesanstalt für Materialprüfung (Germany); Mr.

Jegher, Schweizerische Vereinigung der Lack und Farben Chemiker; Mr. A. O. Willemin, Schweizerische Vereinigung für die Farbe; Mr. D. J. McConnell, The Colour Group (Great Britain), a representative of one of the French industry's trade organisations and Mr. L. Newman of Mack-Brooks Exhibitions Ltd.

Companies wishing to participate in either event should contact Mr. L. Newman, Mack-Brooks Exhibitions Ltd, 62-64 Victoria Street, St. Albans, Herts, England AL1 3XT. Telephone St. Albans 63213; Telex 266350.

VIGNETTES FROM THE PRESIDENT'S DESK

The 137th meeting of the Colour Group (Great Britain) that was held on May 3, 1978 had on its program three interesting lectures. Two of these will be of interest to the American College of Prosthodontists and to our Problems Committee on "Color and Appearance Matching of Living Tissues."

The first lecture was by Dr. F.J.J. Clarke on "Influence of Fluorescence on the Measurement of the Colour of Teeth."

The abstract follows:

The general problems of determination of spectrophotometric and colorimetric properties of fluorescent samples are briefly covered. At present no measurements on such samples under CIE recommended geometries of irradiation and viewing can be carried out to a known absolute accuracy, even by standardising laboratories, and the systematic errors achieved in practical measurement are unacceptable for many industrial purposes. The peculiar problems of attempting to measure the colour of teeth are described. The difficulties with living teeth are formidable, but to our surprise turned out to be no worse than those found with teeth from cadavers. A metrological horror story is unfolded.

The second lecture by J. W. McLean, O.E.B. was entitled: "Reproducing the Colour of Teeth in Artificial Materials." The abstract follows:

Human enamel contains approximately 97 percent by weight mineral matter, mostly in the form of hydroxyapatite crystals. These crystals are very small and are bound together with a collagen matrix. Enamel is very translucent and can transmit up to 70 percent light through a 1mm thick section. The dentine which forms the main body of the tooth contains about 70 percent by weight of hydroxyapatite crystals. In dentine these are smaller and the collagen matrix constitutes 30 percent of the total volume. Dentine is more opaque and will generally transmit about 30 percent light on a 1mm thick section.

The total colour effect in a natural tooth is derived from a combination of light directly reflected from the tooth surface combined with light that has been reflected from the dentine and which has already undergone some internal reflection and refraction. The dentine is the prime source of colour and the reflected rays of light which are emitted via the enamel are modified by the thickness and degree of translucency of the enamel. In addition, natural teeth will fluoresce under ultra-violet radiation and it is thought that the "fluors" (i.e. the compounds causing fluorescence) in natural teeth are organic in nature, are possibly protein, and that the fluorescence may be due to the energy transfer from phenylalanine and tyrosin to tryptophane. In addition, part of the inorganic matrix of teeth is also fluorescent since the inactivation of the protein by heat does not cause complete failure of response of teeth to ultra-violet radiation.

Methods of reproducing the colour in natural teeth with artificial materials will be shown. This will include the use of "prismatic" dental porcelains which also fluoresce, together with the means of strengthening these materials by the use of metal-bonding techniques, which do not markedly affect colour. Other materials such as resins and glassionomer cements can also be made tooth coloured. The problems of achieving perfection in colour match will be discussed.

COLOR '77, A YEAR LATER

Since a little more than a year has passed since COLOR '77 and the proceedings have been published, several members were asked to write about what seemed most important in the meeting from the perspective of the passing of a year, and they were asked to review the papers in the proceedings that most interested them. Responses to this request follow.

Esthetics, Art, and Color

Though this report is somewhat belated, here are a few notes on matters of color, color harmony, art and esthetics, as presented in Troy, New York, during July, 1977 at the Third Congress of the International Color Association. There were sessions in Color in Art, Design, and Architecture; Color Appearance; and Color Subjects of General Interest.

High on this writer's list was the brief talk of David MacAdam on the OSA Uniform Color Scales. Shown were a series of magnificent color slides illustrating concordant scales (398 in all), each beautiful to behold. Simply put, Munsell scales run horizontally and vertically; Ostwald scales run vertically and obliquely in two directions. The OSA scales move in many directions and "suggest new color harmonies and combinations." All this may well promise new dimensions of color beauty in the future.

W. D. G. Cox of England spoke of The Changing Colour Space of Nineteenth Century Painters. Cox noted that painters of the nineteenth century radically changed their conception of color order and color space. The multilayer technique using transparent materials was replaced by a single-layer opaque method. This was individual to Impressionism and Neo-Impressionism schools of painting in which a divisionist use of small dots of color called upon the vision of the viewer to participate in the effect seen.

Cox refers to The Natural System of Colours by Moses Harris, perhaps the first color circle ever presented in full-hue (ca 1766) and which was based on red-yellow-blue primaries. There is further reference to the French Chevreul who greatly influenced modern art and who emphasized dramatic contrast effects. Plus the English Turner, one of the most remarkable of all color innovators in art (who knew of the color circle of Harris and did variations on it).

Terry Walker of the U. S. further commented on Turner as one of the greatest of all colorists in art. Turner knew of the work of Moses Harris and also held great admiration for Goethe's Theory of Colours.

In a short talk by this writer, Color Systems, Theories and the Artist, questions are asked as to prominent influences in the color expression of painters. Obviously significant were the works of Goethe, Chevreul, Moses Harris – and Ogden N. Rood of the U. S. whose writings on physiological optics inspired the French Neo-Impressionists. While Munsell and Ostwald are important to academic color theory and training, they have been

less revered by artists than painters like Kandinsky, Itten, Klee, and Josef Albers.

Personal and subjective views on color seem to have more appeal to artists than strictly objective and technical approaches. The artist is usually dominated by a feeling of self-endowment and tends to resist the logic and reasoning of others. Ostwald, for example, knew of the German Bauhaus, visited there and exhibited some of his charts. Yet Wassily Kandinsky, who taught at the Bauhaus, stands today as a giant of abstract art and color expression, while Ostwald's views and eminence have declined.

Faber Birren

Design

Any evaluation is, of course, dependent on expectations and a frame of reference. The conference at Troy meant an escape from the scramble of commercial designing, color consulting, and forecasting for domestic and foreign clients. Like a nomad, I've searched far and wide for fuel for my information base that will hopefully propel me and convince my clients of the validity of decisions. In this connection, I share a great deal with other 'creative' sorts but can lay a claim to an original facet, that is, having a Futurist's orientation. Without sounding like a testimonial, may I say that Futurism has provided a framework and a sense of direction, even if it means guessing correctly from a selected group of scenarios. So much for that, but we'll see later that Color '77 included a very futurist-oriented contributor, who enlarged the scope of the conference with his paper. Once the design community grasps the significance of his work, the entire profession will have to alter its way of thinking. Down the line, even fashion people, who normally are not concerned with abstract concepts, will benefit.

One naturally expects that a conference of this scope will offer the very best of recent thinking on color, with the major emphasis on the more technical and scientific aspects.

One would have to be less than candid not to recognize that the implications of science and technology are diametrically opposed to the fashion world, with home furnishings and industrial design somewhere closer to some technological aspects. However, those of us who share with business management considerable responsibility for right, or profitable, decisions have long learned to come directly to the sources of scientific and technical innovation. As the future develops an even more complicated technology, which business will have to cope with, the designer will have to learn to capitalize on the scientific process. Relying on intermediaries or proselytizers will become less and less satisfactory.

My first, and lasting impression, was meeting some of the luminaries of the color world itself. People, who up until that point, were *disembodied* names on texts, articles, or books. Despite the various nationalities, perspectives, and disciplines, color provided a community of interest that surpassed the petty, local "politics" that one encounters in a professional career. Color '77 offered a framework that happily was fair-minded and open to all kinds of possibilities. Here's where a designer relates and can feel at home despite the differences in method.

The planned and unplanned social events enlivened the proceedings, although many of them had an excitement all of their own.

A book display included with other exhibits opened up my

eyes (and pocketbook) to Frans Gerritsen's *Theory and Practice of Color*. My painting hasn't been the same since utilizing his theories. Commercial designing has benefited as well by incorporating greater subtleties and exercising more control of the color ingredient.

However, the creative process involves many facets above and beyond the application of color principles. Gestalt psychology has recognized that the response of an individual in a given situation is a response to the whole and not to one of its components. We can see enormous pressures exerted by institutions and trade groups to bureaucratize color selection. This color-by-consensus approach is beginning to limit our choices, just when the greater world's societies are themselves undergoing vast dislocations and laying claim to greater individual expression, in the context of ecological soundness. It's a trend already begun and promises to be one of the main features of future social structures.

It's as if the response or future needs were anticipated by Shigenobu Kobayashi, President of the Nippon Color & Design Research Institute, Tokyo, Japan. "The Theory of the Color Image Scale and its Application" (B26) partakes of the scientific mainstream of world-wide research devised by the American, C.E. Osgood, on the measurement of meaning. Vital correlations bring color closer to the human Gestalt experience. Kobayashi's concepts presented at the Conference are just a small hint of the larger body of his work that still remains in the original Japanese. His axes of "warm - cool," "soft - hard," and "clear - shaded" offer a structure or system for identifying correlating aspects to color. Here is a tool for designers, particularly if they are responsible for color systems or color applications on a corporate or even national scale. This image scale has the potentiality for the future as societies emerge with fuller expressions of diversity, greater awareness of the self in its environment, as already noted. I believe his work represents the scope necessary for the future, just as Munsell's work carried us into the earlier part of the 20th century with a color scale.

Sachie Minato, also from Japan, addresses himself directly to the matter of color application with "Color In Industrial Design." He cogently discusses the functional aspects of color and the discernment of trends through analysis of color usage. He, too, deals with color coefficients, such as light-dark, cheerful-gloomy, and other opposed pairs, in order to arrive at a clearer formulation of color preferences and systematic relationships. Minato's approach could have broader application than industrial design and, I feel, is even better suited to fashion, capturing more of its elusive qualities, heretofore not attempted.

Having done color for the automotive industry, I was most attracted to "The Development of the Color Simulator" (A311) by Akira Kodama and Takeshi Yano. Designers are often inhibited by industry because their experiments allegedly cost "too much." The simulator devised by the authors would lessen the problem.

In my career, I have found that the most important thing is not an individual color as much as combinations that are critical to design. Anders Hard (B35) submits a preparatory paper that I foresee generating great future possibilities for the designer in any industry.

A very sophisticated paper, "Effects of Surface Colors of Walls Under Different Light Sources On The 'Perceptual Magnitude of Space' In A Room" (B28) also opens up the color

field to physical environment and its relationship to human response. The approach as outlined by Erdal Aksugur suggests great potential to the designer of today and perhaps more so for the designer of the future.

A creative designer can begin to make even further correlations from the intrepid research of the Color '77 contributors. It is resources such as I've outlined, and many others not mentioned, that provide the artist or designer with material for his or her own creative process.

In summary, we need to acknowledge Witold Chroscicki's contribution and admonition in "Visual Bases of Color Knowledge" (B37). He strikes a rather sensitive note lamenting the lack of communication among professionals from different fields of color knowledge.

As a designer and futurist, I seem to have instinctively gravitated toward those who see color in a broader context. But it is interesting to see that scientists and artists alike seem to have shared interests, after all.

"Knowledge of the rules which govern the relative changes of color in the effects of interaction of color, as well as the influence of light on color, brings us nearer to a situation where we will be able to act consciously of the visual formation of our environment."

Helen D. Vincent
Continued in next issue.

HARRY HELSON, 1898-1977

Harry Helson died on October 13, 1977 in Berkeley, California after an extended period of failing health. His creative activities and wide interests continued until his final illness.

He was born in Chelsea, Massachusetts, on November 9, 1898. He spent his early years in New England and retained a fondness for its people and places all his life. After graduating from high school in Bangor, Maine, he attended Bowdoin College where he majored in psychology and philosophy. His choice of field was influenced by the fact that his foster parents, the Dyers, were very much involved in Spiritualism, and seances and lectures by visiting Spiritualists were an important feature of his life in Bangor. However, such experiences led to an interest in philosophy and science rather than the occult. Following Bowdoin, he went to Harvard for graduate work in philosophy, and, by the end of his second year, he had decided to write a Ph.D. dissertation on the then-new Gestalt psychology, rather than to address a philosophical problem. His thesis required that he translate over 200 original studies from German, and it culminated in the first complete exposition and critique of Gestalt psychology published in English. This work was a harbinger of a life-long devotion to scholarship but did not portend the experimentalist that he subsequently became.

An academic career, which began at Cornell in 1924, continued with appointments at the Universities of Illinois and Kansas, Bryn Mawr College, Stanford University, Brooklyn College, the University of Texas, Kansas State University, York University, and the University of Massachusetts. His longest association was with Bryn Mawr College, where he built an extremely productive laboratory of experimental psychology. During World War II, he served as Co-Director of the anti-aircraft fire-control laboratories at the Foxboro Company for the National Defense Research Committee, and later was Director of the Radiobiological Laboratory of the University of

Texas and the U.S. Air Force. Other extra-academic activities included membership on the U.S. delegation to the International Commission on Illumination (CIE) and service as a delegate to the Inter-Society Color Council from the American Psychological Association. He also served as a member of the National Research Council.

While his published research covered areas of psychology as diverse as discrimination learning in the rat and factors influencing torque sensitivity, his major interest and enduring contribution was in the formulation of adaptation level theory. His interest in problems of adaptation began at the start of his career at Cornell, where, with Deane B. Judd, he constructed a spherical apparatus in which the eye could be completely flooded with chromatic illumination. The principle of color conversion, which followed after many years and many hundreds of observations, brought order into a puzzling array of findings in color vision. It showed how the perceived hue and saturation of a sample could be related to the operation of an internal norm that determined the neutral point of functioning under given conditions of stimulation. Among the phenomena of color vision explained by adaptation level theory are reversals of classical contrast, the "Land colors," and color rendition under fluorescent and incandescent sources of illumination. Helson's adaptation level theory, which grew out of his work in vision, has subsequently found wide application in all fields of psychology, reflecting a basic principle of organismic functioning which extends beyond perceptual phenomena to judgments involving aesthetic, social, and cognitive factors.

Harry Helson had wide intellectual interests, and corresponded and collaborated with scientists in many disciplines. This broad perspective was coupled with the ability to ask the right questions about a problem. His standards of intellectual achievement were extremely high, and while he received many honors, these were the rewards rather than the motivation for his work. Among the awards which were most meaningful to him were the Howard Crosby Warren Medal, given by the Society of Experimental Psychologists, the Distinguished Scientific Contribution Award of the American Psychological Association, and the I.H. Godlove Award of the Inter-Society Color Council.

While professional contributions can be described easily, it is more difficult to convey the qualities which characterized Harry Helson as an individual. He is remembered as an engaging, outgoing person, who transcended the formality in which his generation was trained. And many younger scientists are indebted to him for acts of generosity and kindness at critical points in their lives. He is survived by his wife, Lida, whom he married in 1926, and by two children and seven grandchildren. His son, Henry, is a mathematician at the University of California, Berkeley, and his daughter, Martha, is a psychologist at the University of Connecticut.

Martha Wilson

NEWS OF MEMBERS

Japanese Color Seminars

To mark the fiftieth anniversary of the founding of the Japan Color Research Institute, Faber Birren was invited to give a series of lectures during the weeks of May 14 and 21. Seminars were held in Tokyo and Osaka, with special tours of the temples, shrines and gardens of historic Kyoto and Nikko. Supporting the affair were such organizations as the Color Science

Association of Japan, Japanese Standards Association, Japan Chamber of Commerce and Industry, Japan Fashion Color Association, Japan Safety Appliances Association, and other groups concerned with industrial design, interior design, architecture, textiles, pottery, machinery.

Birren's talks were on environment, color merchandising, and the personal meaning of color preferences. A special talk was given on colorists in art for the Nippon Design College in Tokyo.

To commemorate the anniversary, the Japan Color Research Institute has produced a Practical Color Coordination System (PCCS). On some 22 charts, 5,000 individually mounted color chips will be displayed, making it one of the most extensive collections of color ever attempted. Mr. Takashi Hosono, Chairman of the Board, stated that a set of the material will be sent to the National Bureau of Standards in Washington. The set presented to Faber Birren will be added to his Color Collection at Yale.

Anne V. Robinson

Anne V. Robinson, an interior designer on the staff of TLA-Lighting Consultants, Inc., Salem, MA, was elected Vice President of the firm at its annual meeting June 13, 1978.

Ms. Robinson is a graduate of New England School of Art and became a member of the TLA staff in October of 1975. Her duties in this new position include the responsibility for TLA's expanding activity in commercial and residential lighting design.

Genro Kawakami

Prof. Kawakami retired from the Japan Color Research Institute at the end of March of this year. He is now a professor at the Tokyo Institute of Polytechnics, where he teaches general electronics, illuminating engineering, and colorimetry, and he retains his association with the Japan Color Research Institute as a part-time consultant.

NEWS OF MEMBER-BODIES

To The Delegates Of Member-Bodies

As your new liaison officer I would like to thank the various delegations for their prompt and kind response to my request for updating the delegations, both directly or through Dr. Billmeyer.

In my second communique to the delegation chairman, I mentioned there appeared to be some confusion regarding the number of voting delegates. There are three per delegation, which includes the chairman.

I hope each of you received the information regarding the cutbacks in the spectrophotometry program at the National Bureau of Standards. The protest letter should be sent to the Secretary of Commerce, the Honorable Juanita M. Kreps, with a copy to Dr. Ernest Ambler, Director, NBS, Washington.

I have been encouraging all of you to send information regarding your society meetings and activities to Dr. William Benson, editor of this newsletter and/or myself. I am sure you would be surprised how many ISCC members, in what appear to be unrelated fields, will enjoy your reports. It is always difficult to find the time but even a few sentences is better than nothing. This report and my delegation report from CMG are being written at 35,000 feet as I wend my way via Denver to

Calgary Alberta, so you see I do practice what I preach.

There is a movie being shown during flight time which guarantees to improve my general knowledge. I missed the title but I am sure many of you will be familiar with the production and its subject, the United States Patents Office, and the outstanding people who shared their inventions with the world. At the present moment, Dr. Peter Carl Goldmark is looking out from the screen. What a remarkable man and how fortunate many of us are to have known such a pioneer. Whether or not we knew him as a member of the ISCC and as recipient of the first Macbeth Award, there is no doubt he has touched our lives significantly.

By the way, the president-elect Franc Grum stopped in Chicago for plane connections and took the opportunity to visit me for a couple of hours at DeSoto Inc. We chatted during a cafeteria lunch and whirlwind tour of our research facilities and, for the time we had, much was accomplished.

I will be attending the board of directors meeting in Columbus, Ohio on October 22, 1978. If there is anything you wish me to convey at that time please let me know.

Joyce S. Davenport

Color Marketing Group (CMG)

BI-ANNUAL REPORT

"Color Me Canada" was the theme of the Color Marketing Group's Spring meeting. The location was Montreal, a most appropriate place, for color seems to be interwoven into the daily lives of the people and their city. One becomes immediately aware of the intensive color usage. Look around and one sees color graphics everywhere. The homes are painted in bold exterior colors — not the timid whites and pale shades of some regional areas south of the border. Even their underground transportation, the Metro, sports attractive colors and magnificent stained glass entrances. Montreal boasts one of the largest botanical gardens on the northern continent, a place to feast on the colors of nature. Montreal has a labyrinth of stores and boutiques below ground level — a city beneath a city, where one can shop in comfort, summer or winter.

The registration was CMG's largest to date and the presentations received large attendance.

The three day program was quite diversified, with emphasis on our very successful "Color Directions" workshops. The completed color palette will forecast the 1980 directions.

Sunday evening began with a sightseeing tour of the city, followed by a reception and dinner at the Old Fort Museum, located very close to the Expo '67 site. The dinner and entertainment was at "Le Festin Du Gouverneur," taking one back to the rollicking festivities of the 17th century.

Tony Levine from the Ministry of Industry and Tourism for Ontario was an extremely witty master of ceremonies.

CMG's presentations for Monday included Jerry Clark of CIL Ltd., Tony Levine on the "Psychology of Color," and Norman Ray — District manager of Hercules Canada, Ltd. — who briefly discussed in simplistic terms technical vocabulary of the paint and pigment industry. David Beech, also a member of CMG, showed traditional color trends and furniture of French origin adapted to the Quebec life-style.

Lucie Duranceau graciously replaced Mary Egan-Haines who was taken ill. Lucie, who teaches at Dawson College in Montreal in the Department of Visual Arts, discussed the curriculum of her art students. Her concern, as most academic lec-

turers, was the preparation of her graduate students for business life and to be able to "sell themselves" to their prospective employers, a point I can sympathize with and understand.

Tuesday, after the presentations of the newly formed Education, Marketing and Technical committees, Mr. Jean Marie Linteau of Sico Inc. discussed the emergence of his company, founded in 1937, into a dynamic and significant Canadian paint company.

Leo Chevalier, a top Canadian fashion designer, was unable to attend — business demanded he stay in New York with his new fur collection. But, we were by no means cheated by his absence for Mary Stephenson (Board of Directors Fashion, Canada) stepped in to discuss the booming Canadian fashion industry — which is not influenced by Paris and makes a point of showing their collections ahead of Paris to prove it. Mary was a delightful speaker who impressed and charmed her audience — we were fortunate to have the opportunity to talk with her later during an executive and board reception.

The meeting came to a grand finale with dinner speaker Dr. R. W. Baguley, economist of the Royal Bank of Canada, and a sumptuous fashion show. The magnificent gowns for evening wear, sport clothes, swimwear etc. showed definite individuality of design — the latest slinky, swivelling gait of the models and their lovely smiles as they sashayed up and down the ramps tended to distract one from the transparency of some of the exquisite fabrics. The colors were very clean, pure shades, with the browns and neutrals still very popular for sportswear.

Don't get the impression that CMG was all play — far from it. There was a lot of hard work, but being such a congenial group of people, even that was fun.

NORTHEAST REGIONAL MEETING

As I have mentioned in previous reports, CMG is emphasizing the importance of communication and the strengthening of its regional meetings. A very successful and well planned meeting was recently held by our Northeast Regional Group at Hauska House, Saylorsburg, Pa., Bill Marley's home in the Poconos. The program was as follows:

Morning Session

Color Directions: Market Reports.

Resilient Floorcovering: William Marley, GAF Corp., Arthur Hopkins, The Flintkote Co.

Carpet: Yale Forman, Yale Forman Designs.

Drapery: John Rinderman, Division of Styling, Burlington House.

Wallcovering: Richard Wass, Katzenbach & Warren; Rodney Moore, Panta Products.

Domestics: Julian Tomchin, Wamsutta.

Fashion: Lillian Charity, Coordinator of Creative Services, Celanese Corp.

Leather & Accessories: Patricia Barnes, Color Marketing Consultant.

"Selling CMG": Jack Siderman, Executive Vice President, Pantone, Inc.

"Selling Yourself": Carol Piesner, President, C. R. Piesner Co.

Technical Directions: "Computerized Design & Color", Joseph D. Martin, Vice President, Sci-Tex Corporation.

Educational Directions: "Education — Who Needs It?",

Daisy Goldsmith, Fashion Communications.

Planned poolside get togethers had to be abandoned due to rain which resulted in longer work sessions. Some interesting notes to share with you —

Flooring — Woodgrain Butcherbloc is a strong leader. The sheet and tile floorings show bright clean colors, though major sales are in off whites and neutrals.

Carpet — The neutrals are still very strong with warm shades of apricot, brick and terra-cotta.

Drapery — The off whites and neutrals which would again support and strengthen the flooring and carpeting.

Wallcoverings — Depending on the market — high styled individualistic design multi-color offerings, tend to indicate dark green backgrounds, whereas the mass market appears to be demanding color combinations which include rust, brown and accent blues.

Wearing Apparel — According to Lillian Charity, Celanese Corp., the fall colors for 1979 in both men and womens wear are now being shown. They represent strong moves in neutrals with an almost iridescent look — grays with slubbed color threads giving the multi-colored look, with emphasis on ribbed fabrics, i.e. corduroy.

Leather & Accessories — Pat Barnes — Leather comes in every color of the rainbow. The trend will be to mix leather with fabric, glazed chintzs, straws and open weaves, etc.

Afternoon Session

Devoted to the three new directional committees: Marketing, Technical, and Educational.

There were 53 in attendance, one-third of whom had been CMG members for many years, one-third new members and the balance, guests.

ANNOUNCEMENT OF FUTURE REGIONAL MEETINGS

The Southern Regional group plans their meeting for Sept. 22nd and 23rd, 1978 at the Holiday Inn, Route 123, Clemson, South Carolina.

Sept. 23rd, 1978 — Color Science Laboratory, Clemson University.

9:00 AM "Color Perception"

Speaker: Fred Simon
Professor, Textile Dept.
Clemson University
Report on Color Directions 1980
Presentation of CMG for Prospective Members
Yale Forman and Lou Graham

12:00 Noon Adjournment and lunch on your own
Guests and prospective members are welcomed and encouraged.

"Color On The Move" — CMG's annual fall meeting will be held at the Plaza Hotel, Detroit, Michigan, November 12th - 14th, 1978. As one would expect, this meeting will be orientated to the automotive industry and will have speakers representing American Motor Company, Chrysler Corporation, Ford, and General Motors, as well as Bell and Howell and Cranbrook Academy of Art. The program will include a tour of the Henry Ford Museum, Dearborn.

Western Regional Meeting

The meeting will include — National and Regional reports, color directions, presentations on Marketing, Technical and Educational Directions.

Contact: S. de Leon, CMG, P.O. Box 1339, Santa Monica, CA, 90400, for reservations.

Joyce S. Davenport
Chairman

Dry Color Manufacturers' Association (DCMA)

DCMA Moving Offices to Washington

DCMA is moving its headquarters to the Washington, D. C. area, effective July 3, 1978.

Because of the 52 year old association's increased activities in the governmental affairs area, the DCMA membership voted earlier this year to relocate in the Washington area.

The new address and telephone number are:

Dry Color Manufacturers' Association
Suite 100
1117 North 19th Street
Arlington (Rosslyn), Virginia 22209
703/525-9483

The Rosslyn offices are located on the new Washington Metro subway system, only five minutes from National Airport in one direction and the center of downtown Washington in the other, and less than ten minutes from Capitol Hill. It is a ten minute walk from the offices to Georgetown.

The DCMA is an industry trade association representing large, medium, and small pigment color manufacturers throughout the United States and Canada, accounting for approximately 95% of the production of color pigments in this country. Foreign pigment manufacturers with sales in the United States and Canada and domestic suppliers of intermediates to the pigments industry are also members of the Association.

DCMA Announces 1978-1979 Meeting Dates

October 4	DCMA Monthly Meeting and Fall Outing Fiddler's Elbow Country Club Bedminster, New Jersey
November 8	DCMA Monthly Luncheon Meeting Princeton Club, New York
December 6	DCMA Monthly Luncheon Meeting and Annual Christmas Party New York Athletic Club, New York
January 3	DCMA Monthly Luncheon Meeting New York Athletic Club, New York
January 31	DCMA Monthly Luncheon Meeting (February) Princeton Club, New York
February 28	DCMA Monthly Luncheon Meeting (March) Princeton Club, New York
April 4	DCMA Monthly Luncheon Meeting New York Athletic Club, New York
May	Open — pending selection of site for the biennial mid-west meeting.
June 17 - 20	DCMA Annual Meeting The Greenbrier, White Sulpher Springs, West Virginia

Federation of Societies for Coatings Technology

News brief from societies

KANSAS CITY—Several high school teachers attended May meeting. Three \$50 bonds were presented to students with prize-winning entries in Science Fair. Paul Sara, Educational Chairman, demonstrated the method of manufacture of toluidine red and Hansa yellow and presented a kit for doing same experiment to each teacher present.

PITTSBURGH—The June meeting was "Bring-A-Guest" Night. The speaker was Ms. Bonnie Bender, Manager of Color Marketing for the Coatings & Resins Div. of PPG Industries, who spoke on "Color Power—How to Make it Work for You."

Meeting Dates for 1979

Feb. 28	Western Coatings Societies' Symposium and Show. Fairmont Hotel, San Francisco.
Mar. 2	
March 14-17	Southern Society Annual Meeting. Dutch Inn, Buena Vista, Fla.
Apr. 5-7	Southwestern Paint Convention of Dallas and Houston Societies. Shamrock Hilton Hotel, Houston.
May 3-5	Pacific Northwest Society Annual Symposium. Vancouver, B.C.
May 17-19	Federation Spring Meetings. Hilton Hotel, New Orleans.
Oct. 3-5	Federation's 1979 Annual Meeting and Paint Industries' Show. St. Louis Convention Center.

Graphic Arts Technical Foundation (GATF)

November 3-4: Seminar on "Art and Copy and the Reproduction Process," Syracuse, N.Y.

November 6-10: "Printing Orientation Program," GATF Technical Center, Pittsburgh, Pa.

November 10-11: Seminar on "Color Reproduction Systems for Printing," New York, N.Y.

November 11: Seminar on "Troubleshooting in Your Printing Plant," Minneapolis, Minn.

November 20-21: Workshop on "Radiation-Curing Inks/Systems," GATF Technical Center, Pittsburgh, Pa. For more information, contact: Special Programs Department, GATF, 4615 Forbes Avenue, Pittsburgh, Pa. 15213.

November 27-29: Workshop on "Ink Technology," GATF Technical Center, Pittsburgh, Pa.

December 1-2: Seminar on "Web Offset Printing," Toronto, Ont.

December 9: Seminar on "Paper and Ink Problems in the Pressroom," Buffalo, N.Y.

December 11-15: "Printing Orientation Program," GATF Technical Center, Pittsburgh, Pa.

January 8-10: Workshop on "Process Quality Control in Printing," GATF Technical Center, Pittsburgh, Pa.

January 11-12: Workshop on "Color Printing Standards and Controls," GATF Technical Center, Pittsburgh, Pa.

January 12-13: Seminar on "Color Stripping," Miami, Fla.

January 15: Seminar on "Troubleshooting in Your Printing Plant," Los Angeles, Calif.

January 15-19: "Printing Orientation Program," GATF Technical Center, Pittsburgh, Pa.

January 17: Seminar on "Troubleshooting in Your Printing Plant," San Francisco, Calif.

January 20: Seminar on "Troubleshooting in Your Printing Plant," Seattle, Wash. For more information, contact: Special Programs Department, GATF, 4615 Forbes Avenue, Pittsburgh, Pa. 15213.

Industrial Designers Society of America (IDSA)

IDSA Opens New Headquarters

Beginning May 1, IDSA will launch an exciting new chapter in the history of the Society with the opening of a new national headquarters and a full-time staff in Washington, D.C.

The new national headquarters is located in the heart of Washington, D.C. approximately five minutes from the White House. This move should assist IDSA in gaining greater public exposure for the profession with government, other professions and business and industry associations. In addition, the newly-renovated townhouse was chosen for its suitability to represent the profession of industrial design to the public. IDSA will have use of a conference room and reception area for public gatherings.

Please take note that beginning May 1 the new address for the Society will be:

Industrial Designers Society of America
1717 "N" Street, N.W.
Washington, D.C. 20036
Tel: (202) 466-2927

All members who may be passing through Washington, D.C. are invited to visit the headquarters at any time.

HFS News

The Consumer Product Technical Interest Group (CPTIG) of the Human Factors Society invites all interested designers to join in an active and growing special interest organization. CPTIG currently has about 250 members consisting of Industrial Designers, Design Managers, Human Factors Specialists and various other disciplines. The group has sponsored such activities as a Design/Human Factors symposium, technical sessions and workshops at the Human Factors Society Annual Meeting and various regional meetings. The only requirement to join is a \$3.00 annual membership fee. If interested, please contact: H. Bradley Hammond, Associate Professor, Department of Industrial Design, University of Cincinnati, Cincinnati, OH 45221.

Optical Society of America

1978 ANNUAL MEETING

JACK TAR HOTEL AND GOLDEN GATEWAY HOLIDAY

INN — SAN FRANCISCO, CALIFORNIA

OCTOBER 30—NOVEMBER 3, 1978

Symposium on Recent Developments in the Psychophysiology of Color Vision — Russell DeValois, Presider

9:00 AM, November 1, 1978. Role of the ERG in the Study of Primate Color Vision. D. van Norren, Institute for Perception, TNO. The most peripheral cells of the primate visual system are almost inaccessible to single-cell experiments. With the electroretinogram, if carefully handled, relevant information about early processing can be obtained. (Invited Paper)

9:30 AM. Genetics of Red-Green Color Blindness. Thomas P. Piantanida, SRI International. Developments during the last half decade that have challenged our tenuous understanding of the genetics of red-green color blindness will be presented. (Invited Paper)

10:00 AM. Thresholds of Color Differences: A New Look. Robert M. Boynton and Naotake Kambe, University of California, San Diego. With specific theoretical intent and improved experimental procedures, liberal thresholds of chromatic difference are measured along axes of tritanopia and (fusion) deutanopia throughout chromaticity space. (Invited Paper)

Color I — Charles E. Sternheim, Presider

10:45 AM. Study of Minimally Distinct Boarder and Flicker Photometry with Chromatic Adaptation. Alvin Eisner and Donald I. A. MacLeod, University of California, San Diego. The equivalence of minimally distinct boarder and flicker photometry is extended to conditions of chromatic adaptation. Normal observers generate protanopelike and deutanopelike spectral sensitivities under such conditions.

11:00 AM. Substitution Pupil Response Exposes Chromatic Mechanisms. Vasant D. Saini and Gerald H. Cohen, University of Rochester. By analyzing pupillary responses to alternation between spatially identical but spectrally different visual fields, we have isolated three chromatic mechanisms and the scotopic mechanism.

11:15 AM. Large-Field Red-Green Discriminations of Dichromats with Rods Bleached. Allen L. Nagy and Robert M. Boynton, University of California, San Diego. Color-naming data indicate that most dichromats are able to discriminate large-field, long-wavelength stimuli both when dark adapted and with rods bleached.

11:30 AM. Autosomal Recessive Incomplete Achromatopsia with Deutan Luminosity. Vivianne C. Smith, Joel Pokorny, and Frank W. Newell, University of Chicago. Visual function is described in incomplete achromatopsia characterized by deutan photopic luminous-efficiency function. Residual color vision is trichromatic, mediated by a rhodopsin photoreceptor.

11:45 AM. Report of a Pedigree Involving the Tritan Color Deficiency, K. E. Higgins, D. N. Brooks, and G. Gottschalk, Pennsylvania College of Optometry. This report describes a pedigree in which the tritan deficiency is evidenced without the accompanying signs of hereditary dominant optic atrophy.

12:00 PM. Notes on Calibrating Maxwellian Optical Systems. Steven L. Buck and Walter Makous, University of Washington. Field size, distance from focal plane, and other aspects of the Maxwellian view affect troland values obtained with the Macbeth illuminometer or the SEI photometer.

Color II — Robert M. Boynton, Presider

1:30 PM, November 1, 1978. Area-Reciprocity Law for Wavelength Discrimination. Robert W. Massof, F. W. Fitzke, and

Stuart J. Starr, Johns Hopkins University School of Medicine. Wavelength discrimination is inversely proportional to stimulus area raised to a power between 1/3 and 1/2. The area exponent is the same for the fovea and the periphery; only the reciprocity constant changes with retinal position.

1:45 PM. Duration Thresholds for Lights of Varying Purity. Stephen A. Burns, University of Chicago. Duration thresholds depend on both dominant wavelength and colorimetric purity in hue substitution. Detection of brief pulses can be mediated by the short-wavelength-sensitive photopigment.

2:00 PM. Rod Receptors in Color Vision. Homer B. Tilton, Bell Technical Operations Corporation. Solid evidence exists that the rods contribute to neural color signals under certain circumstances. We present a possible model for this action.

2:15 PM. Simultaneous Color Contrast in Colored Hermann Grids of Equal Lightness and Saturation. R. Oehler and L. Spillmann, University of Freiburg. Hermann grids varying only in hue produced illusory hue shifts at the intersections of stripes and backgrounds were arranged in a color-opponent fashion.

2:30 PM. Directional Sensitivities of the Human pi Mechanisms. George A. Geri, Gillray L. Kandel, C. Roy Genter II, and Henry E. Breed, Rensselaer Polytechnic Institute. The directional sensitivities of pi-1, pi-4, and pi-5 were determined using the two-color threshold technique and both horizontal and vertical pupil traverses.

2:45 PM. Visibility of Chromatic Flicker Upon Spectrally Mixed Adapting Fields. Charles E. Sternheim, Charles F. Stromeyer III,* and M. C. K. Khoo,* University of Maryland. Sensitivity to a low-frequency flickering field is not controlled solely by fundamental color mechanisms that act additively.

*Harvard University

3:00 PM. Spatial-Frequency Selectivity with Chromatic Gratings. R. Frank Quick, Jr., and Robert N. Lucas, Carnegie-Mellon University. Red-green and blue-yellow gratings show independent detection of fundamental and third harmonic frequency, suggesting spatial-frequency selectivity in color pathways.

3:15 PM. Colored Pincushion Grids, Complements, and Color Vision. Roger D. McLeod, University of Lowell. Colored pincushion grids and their complements generate colored diagonals that foveally disappear. This and Fourier optics imply that color vision requires interaction of rods and cones.

3:30 PM. Functional Visual Field for Color Discrimination. Mitsuo Ikeda and Hiromi Kamata, Tokyo Institute of Technology. The functional visual-field size for detecting a colored target out of a background field made of randomly distributed two-colored chips was measured.

3:45 PM. Luminous Efficiency Functions Determined by Successive Brightness Matching. Mitsuo Ikeda and Hiroaki Shimozono, Tokyo Institute of Technology. Luminous Efficiency functions were determined by successive brightness matching by utilizing two different criteria, the equal brightness and the minimum flicker perception.

4:00 PM. Effect of Wavelength Range on the CIE Chromaticity System. Wun C. Chiou, Sr., U.S. Army Aeromedical Research Laboratory. Different wavelength ranges of color-matching

functions were used to calculate the chromaticity coordinate values. The effect of the selection of an extended-wavelength range will be described.

4:15 PM. Delimitation of Saturation in CIE Systems. Maria L. F. de Mattiello and Ricardo Arizaga, Consejo Nacional de Investigaciones Cientificas y Técnicas. An equal saturation plotting is proposed in the L*U*V* 1976 system that agrees with lines of constant metric saturation.

4:30 PM. Color-Difference Judgments Under Daylight and Incandescent Illumination. C. D. Reilly and P. M. Tannenbaum, E. I. du Pont de Nemours. Psychophysical experiments were conducted to determine the effects of chromatic adaptation on color-difference judgments in daylight and incandescent illumination.

4:45 PM. Evaluation of Color Discrimination in the White Region. Kazuo Honjyo, and Tamotsu Shimada, Hitachi, Ltd. Color discrimination for the near-white region is studied by the constant-stimulus method, where two color stimuli are simultaneously produced on separate television screens.

5:00 PM. Color Discrimination with Annular-Pupil Imaging. Martin I. Greenfield, University of Rochester. Color-matching experiments were performed to determine the change in color discrimination between circular and annular pupils.

5:15 PM. Chromatic Adaptation and the C.I.E., 1976, L*,a*,b* Color Coordinate System, Paul M. Tannenbaum and C. D. Reilly, E. I. du Pont de Nemours & Company. The C.I.E., 1976, L*,a*,b* uniform color coordinates were tested on chromatic adaptation data. Basic modifications of these formulas are required to account for these data.

5:30 PM. Newly Invented Halftone Screens and Improved Polychromatic Reproduction Process. Hua-kuang Liu, Lumin, Inc. A newly invented halftone screen with quantized halftone cells and its revolutionary improvement in color printing method and results will be presented.

Society of Plastics Engineers Color and Appearance Division (CAD)

Fall RETEC – Automotive Color

Have you ever wanted to pin down the automotive stylists on their color selection criteria? Would you like an update on pigmentation used for the 1979 model colors? Are automotive molders leaning away from pre-colored resin? How does the RPI Color Laboratory feel about the newly available spectrophotometers?

The twelfth in the series of Regional Conferences by the Color and Appearance Division will be the first to concentrate on the automotive color situation, from styling to end product quality. This conference, titled "Coloring of Plastics XII: Automotive Color," will be hosted by the Ohio Firelands Section, October 5-6, 1978 at Saw Mill Creek Inn near Huron, Ohio. Thirteen papers and a panel discussion will provide a wide range of subject matter for anyone involved in the process of producing colored automotive materials and parts.

The program is as follows:

"Panel Discussion: Automotive Color Styling." Moderator: Jon Hall, PPG Industries, Panelists: Jack Eason, American Motors; Robert V. Fritz, Chrysler, James E. Hothem, Ford

Motor Co.

A panel of automotive stylists will discuss the development of new colors, including the problems encountered. The panel will describe how and why decisions are made to change colors, sometimes even before they appear in dealer showrooms. Facts about the market and product influence these decisions which become a reality of design.

"Color Communication," Dr. James G. Davidson, Macbeth Division, Kollmorgen. The purpose of this paper is to offer a simple and concise method of answering the question "What is color?" from the psycho-physical standpoint of colorimetry. Included will be definitions of the three basic rules of colorimetry: color is relative; color is an aspect of appearance; color is affected by observational conditions. A common language is developed for visual and instrumental specification and communication of color from design to manufacture.

"Evaluation of Automotive Color Matches," Carol P. Muller, E. I. du Pont, CD&P. A variety of pigment matches for two popular automotive colors, dark red and beige, are compared in vinyl and polypropylene for automotive suitability of lead chromates, iron oxides, cadmiums, perylenes, high molecular weight azos and quinacridones. Lightfastness, hiding power, cost, dispersibility, heat stability and impact resistance will be reviewed to illustrate the "trade-offs" involved.

"Replacement of Heavy Metal Containing Pigments in PVC," John Graff and Dennis Osmer, Ciba-Geigy, Pigments.

For toxicological and environmental considerations many companies are considering replacing heavy metal containing pigments. This paper reviews some of the tools available for pigment selection based on colorimetric considerations and physical properties. Five standards containing chromate pigments will be matched and comparative performance data provided, including chromaticity plots, opacity, migration resistance, heat stability and lightfastness.

"Coloring Problems Associated with Coloring ABS and ABS Alloys," Michael Ferrell, Borg-Warner.

This paper describes colorant limitations of ABS alloys and flame-retardant grades as well as the problems of metamerism, special effects matching and regulatory restrictions. The colorist must be familiar with his company's polymers and the alloyed polymers.

"Color Control for Vinyl Processors," Carl H. Wollen, Vinyl Industrial Products. Having solved the compound problems of meeting specifications and matching color standards, the production process must be simulated through laboratory sample preparation. Absolute authority for compound and color approval must be independent of production supervision.

"Producing Molded-In-Color Vinyl Automotive Components," Richard R. Kozlowski and David J. Pond, Geauga Plastics.

Current needs for high gloss, transparent metallic colored body parts have placed a greater burden on fabrication and production of parts to meet requirements of the stylist and Assembly Quality Control. This paper will discuss the blending of skills of the vinyl compounder, color matcher, tool designer and processing supervisor to meet these needs. Basic automotive requirements are highlighted.

"Coloring and Decorating Plastics by Hot Stamping," Eugene Emily, Thermark. The hot stamp technique is used to apply solid colors, metals and designs such as woodgrain to plastic

surfaces. This paper discusses the problems of achieving and color matching the woodgrain design. Although the woodgrain appears as only one color to the casual observer, there are at least two and as many as five color layers. Color matching technique for woodgrains is very different from that used for solid colors.

"A Case for Color Concentrates in Molding Automotive Parts," Subhash C. Pahuja, Ampacet. This paper will describe the more common methods of pigmentation of natural resin for the manufacturing of colored automotive molded parts. Mathematical models are constructed to demonstrate the economic advantages of concentrate coloring. Also discussed are the more common problems encountered in manufacturing colored parts, including a trouble-shooting guide.

"Color Control of Concentrates for Automotive Plastics," William M. Arnheim III, Inmont. The establishment of color standards and test procedures for liquid and solid automotive concentrates is discussed with emphasis on relating test reproducibility to required color tolerance. Related considerations are sampling techniques and total error analysis.

"An Automotive Paint Color Collection for Forensic Evaluations," Charles G. Leete, Manufacturers Council on Color and Appearance. An auto paint reference collection and a computerized data supplement have been developed for use by state and local forensic science laboratories. Criminologists are asked to examine paint transfer samples from the scene of hit-and-run accidents. Classification of the paint helps determine the make, model and year of the vehicle involved. The simplest methods of paint characterization involve the microscopic examination of color, surface texture, surface markings, layer structure and matching of broken edges.

"Instrumental Shade Sorting for the Automotive Industry," Richard W. Harold, Hunter Associates Laboratory. The variability of visual judgment and increasing consumer awareness of shade variations intensify the automotive manufacturer's problem of sorting various shades of similarly colored yard goods. Color measurement has been available for some time but high instrumental precision, repeatable specimen measurement techniques and a rapid data handling system, all necessary for shade sorting, have been lacking. A system in wide use today is based on a three-digit shade number assigned to the various shades. Materials assigned to like shade numbers can be inventoried according to shade and later pieced together without noticeable shade differences.

"New Color-Measuring Instruments for Plastics," Dr. Fred W. Billmeyer and Danny C. Rich, Rensselaer Polytechnic Institute. A whole new generation of color-measuring instruments now available features unconventional approaches as well as advances in optics and electronics. Almost all now have microprocessors allowing measurements to be made in seconds, followed immediately by all necessary calculations. The traditional curve-drawing spectrophotometer has been replaced by various abridged spectrophotometers, and as these become less expensive, it seems likely they will soon replace tristimulus filter colorimeters.

Color Seminar For Fabricators

Under the sponsorship of CAD, the second seminar entitled "Color Management and Control for the Plastics Applicator" was conducted by Bob Swain of Chroma Corp. and Vic

Mimeault of Ferro at the Ramada Inn in Elgin, IL, on March 16. This was the same site as the first one, held on September 21, 1977, and attendance grew from 27 to over 35, largely by word-of-mouth as a result of the success of the first one.

The final report on this session is still in preparation, but we understand it attracted a greater number of fabricators than before and that it was very well received. Bob and Vic have expressed a willingness to hold this meeting in other areas as well, but they will need a local person to make arrangements and handle the logistics. If you'd like to have a meeting in your area and are willing to help set it up, please inform us or Bob (815-385-8100) or Vic (312-622-8922) directly.

Reprinted from the *SPE Color and Appearance Division Newsletter*, Spring 1978.

COLOR SCIENCE ASSOCIATION OF JAPAN (CSAJ)

The new officers of CSAJ for 1978-1979 are:

President: Dr. Leo Mori (member), Tokyo Shibaura Electric Co., Ltd.

Vice-President: Mr. Shigeru Watanabe, Fuji Photo Film Co. Ltd.

Mr. Yukihiko Harai, Kansai Television Broadcasting Co., Ltd.

Prof. Tadami Nakayama, Daido Technical College.

Two foreign color scientists have been guests of CSAJ. One was Prof. Dr. H. Zollinger, Technish-Chemishes Laboratorium ETH-Zentrum, Zurich. He presented a lecture on color-naming and the neurobiology of color vision. Prof. Dr. Zollinger has often visited Japan with his wife, and he is very interested in Japanese culture. For example, he has a stamp that he can use to put his signature on letters in Japanese characters.

The other guest was Mr. Faber Birren. Mr. Birren is well-known in Japan because his publications were translated into Japanese and used as textbooks in the reconstruction of Japan after World War II. The colorful public establishments, such as schools, hospitals, offices, workshops, to name a few, the colorful consumer goods, and many colored safety signs owe much to his writing.

Unfortunately, the Japanese had not been able to invite him to work with them in person during the reconstruction, so this was Mr. Birren's first visit to Japan. Mr. Birren spoke to the CSAJ on "Color Theorists in Art" at the Japan Design Special Training College on May 24. He also participated in a seminar sponsored by the Japan Color Research Institute in Osaka on May 18 and 19 and in Tokyo on May 22 and 23.

NATIONAL BUREAU OF STANDARDS (NBS)

6th Annual CORM Conference

The 6th annual CORM-NBS Technical Conference was held at NBS in Gaithersburg on May 17, 1978. The Conference this year was developed around four topics, all of which relate directly to CORM's (Council for Optical Radiation Measurements) function of providing data and justification to NBS as to the need for specific standards and measurement techniques. These four topics were flash radiometry, UV measurement problems, spectrophotometric measurement of fluorescent materials, and the detector response transfer program.

Prior to the technical sessions, aspects of the recent NBS

reorganization were discussed by James Leiss, Director of the Center for Radiation Research (CRR). In discussing the programs and functions of the Divisions within CRR, Leiss pointed out that the traditional distinctions between ionizing radiation and optical radiation are becoming blurred. For example, fusion and plasma activities within the Center cross the artificial barrier between optical and ionizing radiation (far UV and X-ray). The optical radiation activities of prime concern to CORM will continue to be found in the Radiometric Physics Division.

Leiss stressed the need for CORM and NBS to explore ways to utilize *both* industry and NBS resources in meeting the measurement and standard needs of the optical radiation community. He suggested that CORM consider the assignment of Research Associates to NBS and that CORM members should become involved in the Self Study Manual for Optical Radiation Measurements (including writing some chapters).

The session on flash radiometry measurements was a follow-up to the Flash Radiometry Workshop held November, 1976, in Rochester. Tom Luminello described the results of an intercomparison among five laboratories to measure several parameters of two pulsed xenon lamps. Both sources were photographic electronic strobes with a 0.8 msec flash duration. One was equipped with a UV-absorbing filter and the other with a tinted filter. Participants in the intercomparison were instructed to measure the time integrated illuminance, time integrated luminous intensity, and time integrated spectral irradiance, all at seven specific wavelengths. All of the laboratories used different instrumentation.

In discussing the results, Luminello noted that three of the laboratories would usually agree within 8% at wavelengths of 500 nm and above, while showing wide disagreement at 400 and 440 nm.

Ray Brown followed with a discussion of common mistakes to avoid in flash radiometry measurements. He discussed the pitfalls that can occur relative to light collection, monochromators, detectors, amplifiers, and readouts.

Don Osten presented the final talk in the flash radiometry session and described the performance of a diode array rapid scan spectrometer. This instrument utilizes a holographic grating with a detector head consisting of 512 diodes and can determine optical spectra much faster than conventional monochromator scanning instruments.

Woody Bickford presented the first talk in the UV Measurement Problems session and reviewed the chronology of source standards available for the UV and their associated uncertainties. He cautioned the audience about errors arising from a mismatch between the spectrum from a UV hazard and the spec-

tral sensitivity of the detector, especially in portable instrumentation. John Eby described the problems being encountered in conducting a round-robin measurement of the UV radiation from cool white fluorescent lamp sources.

In the session on spectrophotometric measurement of fluorescent materials, Fred Billmeyer noted that his talk was based on the joint effort of three groups; CORM, CIE TC-2.3, and the ISCC. There are large systematic differences in the results of the four common methods used to measure the components of the total spectral radiance factor. Billmeyer discussed the limitations and means of correction in order to achieve relative agreement among the four methods. The best results are obtained by using the two monochromator method with corrections.

Bill Venable, in projecting future NBS work, described a prototype instrument arrangement in which the fluorescent material would be illuminated with monochromatic radiation and detection would be with a tristimulus photometer.

In discussing the detector response transfer program, Jon Geist noted that the results from an earlier detector response intercomparison showed a 20% range on an absolute basis, but only a 5% range when comparing the ratios obtained between two different detector responses. Based on this, an extensive silicon detector characterization program was carried out. Laser sources were used to determine the responsivity of the detector packages over the wavelength range of 406-860 nm. An iodine laser that is being put into operation will allow future characterization up to 1100 nm; parametric mixing techniques will be used for wavelengths shorter than 406 nm. Geist also reviewed some of the problems encountered, e.g., hysteresis effects in the UV and non-linearity in the IR.

The previous day, there was a meeting between the CORM coordinators and NBS management. At an earlier meeting the number of coordinators had been expanded from five to ten. The enlarged lineup is as follows:

<i>OLD</i>	<i>NEW</i>
F. Grum* – Kodak	D. Adams – IBM
J. Eby* – Sylvania	W. Schneider – Optronics
A. Karoli – Eppley	F. Billmeyer* – Rensselaer
T. Luminello – Polaroid	C. McCamy* – MacBeth
E. Steeb – General Electric	U. Drews – Perkin Elmer

*Steering Committee

R. L. Booker
Radiometric Physics Division – NBS

Reprinted from *Optical Radiation News*, No. 25, July 1978.

FUTURE MEETINGS

ISCC Annual Meetings

1979: April 26-27 – Roosevelt Hotel, New York, N.Y.
1980: April 21-22 – Rochester, N.Y.

Williamsburg Conferences

1979: February 11-14
1980: February 4-6
1981: February 9-11

Graphic Arts Technical Foundation

1978: La Quinta, CA, September 28-October 1

The American College of Prosthodontists

1978: Las Vegas, Hotel Sahara, October 16-22

Dry Color Manufacturers' Association

1979: The Greenbrier, White Sulpher Springs, WV, June 17-20

Federation of Societies for Coatings Technology

1979: St. Louis Convention Center, October 3-5

The color reproduction insert is furnished by Westvaco's David Fream. Stock is Westvaco 80# Sterling Litho Gloss. Photographer, Phil Marco. Printer, Herwick & Held Printing Co., Pittsburgh.

1. Any person interested in color and desirous of participating in the activities of the Council for the furtherance of its aims and purposes . . . shall be eligible for individual membership (By-Laws, Article I, Section 2). Application forms for individual membership may be obtained from the Secretary (address given above).
2. The Council re-affirms its community of interest and co-operation with the Munsell Color Foundation, an independent private foundation devoted solely to the advancement of color knowledge in science, art, and industry. It serves as Foundation Associate of the Inter-Society Color Council. The Council recommends and encourages contributions for the advancement of these purposes of the Munsell Color Foundation. For information, write to 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.

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

Send *Newsletter* items to Editor:

Dr. William Benson
618 Constitution Ave., N.E.
Washington, D.C. 20002
202-546-1016

COMMITTEE ON PUBLICATIONS

William Benson, Chairman

Yale Forman
Harry K. Hammond
Bella Schwartz
Frederick T. Simon

OFFICERS, 1978-1980

President

Mr. Franc Grum Research Laboratories, Bldg. 81
Eastman Kodak Company
Rochester, New York, 14650
716-458-1000, ext. 77827

President-Elect

Dr. William D. Schaeffer Graphic Arts Technical
Foundation
4615 Forbes Avenue
Pittsburgh, Pennsylvania 15213
412-391-5000

Secretary

Dr. Fred W. Billmeyer, Jr. Department of Chemistry
Rensselaer Polytechnic Institute
Troy, New York 12181
518-270-6458

Treasurer

Mr. S. Leonard Davidson N L Industries
Hightstown Laboratories
P.O. Box 700
Hightstown, New Jersey 08520
609-443-2617

Past President, 1978-1980

Mr. Charles W. Jerome

DIRECTORS

1976-1979

Ms. Joyce S. Davenport
Mr. Calvin S. McCamy
Dr. Frederick T. Simon

1977-1980

Ms. Therese M. Commerford
Mr. Karl Fink
Dr. Alan R. Robertson

1978-1981

Ms. Bonnie Bender
Dr. Stephen F. Bergen
Mr. Edward L. Cairns

