Inter-Society Color Council *News*

NUMBER 263 NOVEMBER-DECEMBER 1979

ISCC ANNUAL MEETING

The annual meeting of the ISCC will be held this year in Rochester, New York, April 20-22, 1980 at the Holiday Inn in downtown Rochester. I suggest that you check into the courtesy van for those coming in from the airport otherwise the fare is in the region of $6.00. It is my understanding the hotel makes frequent trips to and from the airport. Bonnie Swenholt, one of the program chairmen, informs me we are in for a very exciting program and looking over the notes I have received I am convinced of it.

During the board of directors meeting in Rochester last September I arrived early so that I could scout around the city, and found many interesting museums and places of historical significance. The program scheduled for Monday (April 21, 1980) night to be held at Rochester Institute of Technology (RIT) is in the final stages of planning. There will be a demonstration by the Graphic Arts Research Center, which will carry the reproduction process from the original photography through to the press run. Arrangements have been made to bus members from the Holiday Inn to the RIT campus. The downtown area of Rochester has changed considerably in the past few years, and many fine stores are available for the ladies wishing to shop, many of them enclosed and connecting for easy accessibllity. Buses can be used to reach many of the galleries close to the city center, among them the Museum and Science Center and the International Museum of Photography, etc.

Since many have asked that the ISCC rotate its location from New York City occasionally, let's make sure we support this move and let's have a great turn out at our Annual Meeting.

JSD

SYMPOSIUM ON COLOR AND APPEARANCE INSTRUMENTATION SCHEDULED FOR MARCH 1981

A symposium on instrumentation for measuring color and appearance in the coatings industry will be held March 24-26, 1981 at the Executive West, Louisville, Ky. The 2½ day meeting will be sponsored jointly by the Federation of Societies for Coatings Technology, the Manufacturers Council on Color and Appearance, and the Inter-Society Color Council.

The program will be divided between "hands-on" workshop sessions and general oral presentations about gloss and appearance, color difference and quality control, spectrophotometry, and colorant formulation. The format of the program is being designed to offer a "working meeting" environment, and registrants will be invited to bring samples with them.

General program sessions are under the direction of Dr. Robert T. Marcus, of PPG Industries, Inc., who chairs the Federation's Inter-Society Color Council Committee. Arrangements for the workshops and instrument displays are being handled by Charles Leete, Executive Director of the Manufacturers Council on Color and Appearance.

Complete details will be available shortly. Meanwhile, further information may be obtained by contacting the Federation of Societies for Coatings Technology, 1315 Walnut St., Suite 832, Philadelphia, Pa. 19107.

PROCEEDINGS AIC COLOR '77

Adam Hilger Ltd. has announced the appointment of Heyden and Son, Inc., 247 South 41st Street, Philadelphia, PA 19104 as their distributor for the USA, Canada and South America for all of the books they publish. This includes "Color '77."

Please send all orders to Heyden and Son, Inc. instead of S. L. Davidson, Treasurer, Inter-Society Color Council.

The price of "Color '77" is now $75.00 per copy.

SUB-COMMITTEE 25-P

At the last board of directors, Jacqueline K. Welker (PPG) was approved as the co-chairman with Joyce S. Davenport, (DeSoto) of the sub-committee 25-P. The group are quite busy working on data for the presentation at the annual meeting in Rochester, N.Y. The committee recently met to discuss their latest work at the PPG Oak Creek facility November 15th 1979. Members attending were Ed Cairns (DuPont), Al Keay (Harmon Colors), Joyce Davenport, and Hostess Jacqueline Welker (see photograph).

From left to right: Davenport, Cairns, Welker, and Keay.

NEWS OF MEMBER-BODIES

To The Delegates of Member-Bodies

May I take this opportunity to wish all of you a very happy and prosperous year in 1980. Thank you for sending news items of your organizations and delegations. I hope you will continue to keep me informed. I have enjoyed talking to many of you by telephone and hope that in the coming year I shall be able to chat with many more of you.

The quarterly report covering the activities of the ISCC and its board of directors will be in the mail in the next few days.

My term as Chairman of the Color Marketing Group delegation has been completed, as are the terms of two very excellent members Morris Gall and Nadine Gross. The elected replacements will be announced shortly.

The Entomological Society of America also announces a change, the liaison officer will now be Mr. W. Darryl Hansen, Executive Director who replaces Mr. James S. Parker.

Joyce S. Davenport

Color Marketing Group (CMG)

Spring 1980 Meeting

CMG announces that it will hold its Spring 1980 meeting in the City of Philadelphia at the beautiful Fairmont Hotel, May 2-4, 1980. The theme for this meeting will be "Color On Parade" and will feature, among many other subjects, the many facets of Roto-Gravure and tours of a plant and a museum. A more detailed agenda will be available in the next few weeks. CMG anticipates a record attendance. For further details contact the CMG national office at 1000 Vermont Avenue, N.W., Washington, D.C. 20002.

Regional Meeting

The newly decorated Celanese show room in the Merchandise Mart at Chicago was the meeting place for the CMG regional meeting. The meeting was held on January 6, 1980, and the host was Jim Brown of Celanese.

Technical Association of the Pulp and Paper Industry (TAPPI)

The Optical Methods Committee will meet during the national TAPPI meeting on February 24-27, 1980 at Atlanta, Georgia. All interested persons are invited to attend.

Graphic Arts Technical Foundation

A forecasting report entitled *Technology in 1980 and the 80's* was published by the Graphic Arts Technical Foundation earlier this month.

The report will be distributed to all registrants attending the Foundation's Intertech 80 Conference on January 29-30, 1980 in Washington, D. C. GATF's Intertech Conference is an ongoing series of technical meetings sponsored by GATF to examine technical developments and economic trends expected in the graphic communications industries.

Five major areas of interest to all graphic arts managers are reviewed in GATF's new report: Material Resources, Printing, Human Resources, Environmental Legislation, and the Economic Outlook.

GATF experts offer their views on the future use and development of new color scanners and previewers, the progress being made in the automation of image-assembly operations, the developments on the horizon for integrated and nonconventional prepress systems as well as high-speed collating and binding lines, and the projections for the paper supply and printing markets that are growing.

Optical Society of America

Topical Meeting on Recent Advances in Vision
Sheraton Sandcastle, Lido Beach, Sarasota, FL
April 30-May 3, 1980

Objective. This meeting will provide an opportunity for researchers in the psychophysics and electrophysiology of vision to present papers on their recent work and to discuss issues of mutual interest. Topics that will be covered are adaptation kinetics, spatial frequency, temporal resolution (flicker), color discrimination, eye movements, binocular vision, perceptual development, photoreceptor excitation, retinal transmission mechanisms, retinal and cortical processing (both spatial and spectral). Original contributions on related topics are also solicited.

Meeting Sessions. There will be two meeting sessions on each of the four days, one in the morning and one in the late afternoon. Each oral contribution will be alloted a 15-minute time limit. The daily sessions will be arranged so that related topics in psychophysics and electrophysiology appear in the same session. There will be *no parallel sessions,* and this will enable researchers with interests in related topics to interact directly. The program committee's plans are sufficiently flexible so that the time limits may be extended if the nature and number of the submitted papers warrant it. Depending on the contributions received it may elect to group some papers in a symposium format. A major goal of the meeting is to further interchanges among the researchers in different areas but with common interests in similar problems and issues.

Arrangements. The meeting will be held at the Sheraton Sandcastle Hotel (813/388-2181), located in Lido Beach, Sarasota, Florida. A block of sleeping rooms has been reserved at the hotel for participants for the nights of Tuesday, April 29-Saturday, May 3, 1980. Rates will be $35 for single occupancy and $40 for double occupancy. All reservations must reach the hotel by Monday, April 14, 1980. After that date, the balance of the rooms will be released back to the hotel on an as-available basis. It is most important that meeting attendees make reservations by using the attached card in order to ensure that they receive the low accommodations rate. These special rates only apply to the blocked dates. The hotel requires a one night's deposit to confirm reservations. Sarasota is a charming resort community offering the finest in dining and entertainment, numerous motels, beautiful beaches, and a wealth of cultural activities, not to mention superb shopping. The Sheraton Sandcastle is located directly on the Gulf of Mexico at 1540 Benjamin Franklin Drive on Lido Beach. Sarasota-Bradenton Airport is 15 minutes by taxi or limousine (approximately $6.00) and is served by Eastern, National, Florida Airways and Sun Airlines.

The registration fee for the meeting is $50.00. Full-time students may register at no charge.

CANADIAN SOCIETY FOR COLOR

Directory of Color Experts

The Canadian Society for Color is initiating a service to facilitate the solving of problems involving color. Have you ever encountered a problem in your color work and wished to have

the name of someone who could help? We have established a directory of color experts. This will be a living directory; changing, growing and evolving as necessity dictates. Thus far, our directory has about 70 entries and is growing.

These entries were obtained by asking members of the Canadian Society for Color to complete a directory classification form. Thus, our records contain people who have identified *themselves* as experts in various areas. We shall feel free to amend these classifications and identification of expertise as experience dictates.

To use the service one needs merely to identify the area(s) of the color problem from the list provided. Send this information with your name and address to: Dr. P.K. Kaiser, Department of Psychology, York University, 4700 Keele Street, Downsview, Ontario M3J 1P3.

We will send you the name(s), address and phone numbers of those people who have indicated, to us, an expertise in your problem area. We will also tell you if an initial consulting fee will be requested by these people. Some do, others don't.

This service is free to Canadian Society for Color members, others will be charged a nominal fee of $10.00.

Areas

Color vision (physiology)

Color perception (psychology, subjective factors)

Chemistry

Color mixing: pigments
light

Color in Art and/or design

Theory: Vision
colorimetry
television
mixing of pigments
mixing of light

Pigments and dyestuffs

Color television

Color standards

Nomenclature

Measurement: colorimetry
spectrophotometry
spectroradiometry

Computer matching

Photographic reproduction

Lithography

Photo-mechanical reproduction

Silk screen

Application medium: printing – ink
food
paints –artist
paints – commercial
industrial coatings

Application medium: plastics
textiles
ceramics
rubber

Application mode: marketing
interior design
graphic design
safety
signage
information systems
packaging
visual impact

Other: _____

THE COLOUR GROUP (GREAT BRITAIN)

Colour Group Program for 1980

Date	Place	Topic	Speaker(s)
2/6/80	City University	Instrumental Methods	
2:00 p.m.	Dame Alice Owen Building	Colouring Textiles	
		1. Predicting the dyeing recipe	K. McLaren
		2. Evaluating the match	
		(a) J & P Coats method	R. McDonald
		(b) Marks & Spencer method	P.F. Taylor
3/5/80	City University	Joint Meeting with	J. Moore
2:30 p.m.	Main Building	C.I.B.S. on Spectroradiometry	D. Wharmby
4/2/80	Royal Institute of	Colour in Architecture	Various
2:30 p.m.	British Architects		
5/14/80	Royal Institution	Annual General Meeting	
2:00 p.m.			
2:30 p.m.		Colour in Heraldry	R. Brocklebank

Scottish Section

3/5/80	Heriot Watt Univ.	Colour co-ordination in	A.C. Hardy
4:00 p.m.	Edinburgh	architecture	
5/7/80	College of Food	Annual General Meeting	J.B. Hutchings
3:30 p.m.	Technology,	(Scottish Section)	
4:00 p.m.	Glasgow	Colour in food	

JAPAN COLOR RESEARCH INSTITUTE

The Japan Color Research Institute (JCRI) has produced color cards representing the five color cards of Guideline published by the chairman, Dr. A. R. Robertson in *Color Research and Application 3,* 149 (1978).

Accepting his suggestion, JCRI is willing to distribute them to researchers who want to purchase them:

(A-series) *The five Guideline colors.*

These are near the nominal central color as much as possible and spectrophotometric data measured by JCRI are with them. Lacquering on paper, the sample is finished matt which the amount of 60° specular gloss is smaller than 5%. The cards which have a size of 8 cm X 11 cm are bound and a set of them goes into a plastic case. Price is $140.00 including the postage.

(B-series) *The five sets of samples around Guideline color.*

Each set consists of 20 samples with random color differences of 0.0 to 3.0 CIELAB unit from the central color. No spectrophotometric date is with them. Price is $600.00 including the postage. If it is necessary for you to show all of the spectrophotometric data of them, JCRI will be possible to accept your offer, but you must add $1000.00 to the payment of B-series mentioned above.

For more information write to Dr. Genro Kawakami, c/o Japan Color Research Institute, 1-19, Nishiazabu 3 chome, Minato-ku, Tokyo 106.

ABSOLUTE METHODS FOR REFLECTION MEASUREMENTS

A report in English, concerning "Absolute Methods for Reflection Measurements" has been published by the Commission Internationale de l'Eclairage (Publication No. 44). The publication is the result of active cooperation between different countries and has been produced by the members of CIE Technical Committee 2.3 (Materials) whish has representation from 25 countries. This report gives the theory and procedures by which measurements of reflectance or reflectance factor made with reference to real physical standards are transformed to absolute values relative to the perfect reflecting diffuser. The material has been classified into principles of measurement: Goniometric methods; Methods used in hemispherical irradiators; Methods using hemispherical or spheroidal mirrors; Methods using Kubelka-Munk theory; Methods based on the theory of integrating sphere (the two Taylor's methods, the Benford method, the Sharpe-Little method, the Double sphere method).

Copies of this document, CIE Publication No. 44, may be obtained postpaid at $21.00 each from: Dr. Jack L. Tech. Secretary, U.S. National Committee, CIE, National Bureau of Standards, Washington, DC 20234.

Payment should accompany the order and should be made payable to "U.S. National Committee, CIE." Canadians may obtain copies by sending a check payable to "The Receiver General of Canada, Credit National Research Council" with their order to "Publications Distribution Office, National Research Council of Canada, Ottawa, Ontario, K1A OR6."

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Chromatic-Adaptation Effects and Color Appearance at Various Illuminance Levels, *Kohtaro Takahama, et al.*

A New Microcomputer-Controlled Stectro-Radiometer for the Development and the Quality Control of Light Sources, *Mamoru Tominaga, et al.*

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19th Quadrennial Session of the CIE, *F. W. Billmeyer, Jr.*

El Color y su Medicion (Color and Its Measurement) by Roberto Daniel Lozano. Reviewed by *N. Rodriguez.*

AUTHOR INFORMATION ON NEW BOOK FROM WILEY

John Wiley & Sons recently published *Coloring of Plastics* (220 pps., $25.00) edited by Thomas G. Webber. A useful handbook for chemists and technicians who color plastics, many of whom have had little formal training in the subject.

Dr. Webber is a Color Consultant. He earned Ph.D., M.S., and B.S. degrees in organic chemistry from Harvard University, the University of Illinois at Urbana, and Brown University respectively. Dr. Webber is a member of the Society of Plastic Engineers, the Inter-Society Color Council and the American Chemical Society. He is a resident of Vienna, West Virginia.

Founded in 1807, John Wiley & Sons is one of America's oldest publishing houses. It is eminent in science and technology, social science, business, and medicine.

PRODUCTS AND SERVICES

Computer Newsletter for Engineers Now Available

Engineers around the world are receiving their first issue of a unique publication, *Engineering Computer Applications Newsletter* (ECAN).

Great opportunities have been created by advances in computer technology. Computers on a chip, inexpensive microcomputers, and powerful desktop computers have opened new possibilities to engineers. However, the options are overwhelming, and the results are uncertain.

ECAN provides the necessary information and guidance. It tells how to obtain and effectively use microcomputers and desktop computers to increase productivity and profits.

Experiences of other engineers, computer capabilities *and limitations,* guidelines, new developments, costs, and literature reviews will be abundant. Computer jargon will be minimal.

The publisher, Engineering Computer Applications, Inc. of Colorado, is offering charter subscriptions for 12 monthly issues at the reduced rate of $24 ($30 overseas airmail) to anyone referencing this release. The premier issue is available *free of charge.* The publisher's address is 5 Denver Tech Center, P.O. Box 3109 – M21, Englewood, Colorado 80111.

XL-211 HAZEGARD® System – Speedy Haze Measurements

Gardner Laboratory's new XL-211 Hazegard system for measuring haze, transmittance and reflectance offers the latest in speed, convenience and versatility though priced lower than earlier models. Because source and receptor modules are spaced 5½ inches apart and the light beam axis is almost 8 inches above the base plate, all kinds and sizes of materials, even extra large specimens, can be easily measured, on-line or off, in a lighted room. Specimens are placed in an exterior holder or held by hand, a button is pushed, and readout follows in just a few seconds. The system conforms to ASTM Method D 1003 and an accessory is available for evaluating abrasion resistance of transparent plastics by ASTM Method D 1044. To facilitate measurement of low haze, the instrument has a times ten (X10) switch. Power supply, circuitry, controls and readout display are all built into one compact unit.

LIGHT BOOTH – Critical Color Matcher

A new light booth designed to allow the critical color matching of materials by visual technique has been announced by Gardner Laboratory, a division of Pacific Scientific Company. Fully featured, more compact and significantly lower in price than equivalent competitors, the Colorgard® Light Booth is useful in any industry where color is important because it will allow more careful control of products by providing a variety of controlled light sources within a confined, neutral enclosure. Standard light sources include filtered daylight, incandescent (home lighting), cool-white fluorescent (store lighting), and ultraviolet. This new lighting system conforms to ASTM Standard D 1729 and is available in either a booth or suspended luminaire version.

Macbeth to Present Color Seminars

Macbeth, A division of Kollmorgen Corporation, presented its seminar, entitled "The ABC's of Color," in seven cities during the first six months of 1979. The seminar was so well-attended, and the comments of the attendees so favorable, that thirteen presentations of the seminar have been scheduled by Macbeth, from September 1979 through May 1980, in order to fill the demonstrated need of industries dealing with color.

The ABC's of Color provides a good understanding of the problems associated with the measurement, specification, and control of color. The seminar will be particularly useful to people working in the paint, textile, cosmetics, plastics, food, paper, pharmaceutical, and retailing industries. The use of standards, lighting and viewing conditions, and instrumentation will be discussed and demonstrated. Attendees are urged to bring color samples of any materials with which they are having problems, for discussion with the technical experts who will be on hand to provide solutions.

The first day is devoted to lectures and practical demonstrations. The fee for the first day is $95 and includes reference material and lunch. The second day, for which there is no charge, is an informal session of hands-on use of lighting control and instrumentation.

The locations and dates are: Los Angeles, California, February 7-8, 1980; Houston, Texas, February 14-15; Atlanta, Georgia, March 6-7; Washington, D.C., March 27-28; Charlotte, North Carolina, April 16-17; Chicago, Illinois, April 24-25; St. Louis, Missouri, May 1-2; and Boston, Massachusetts, May 15-16.

Additional information and application forms can be obtained from Jeanne M. Dolan, Macbeth, Little Britain Road, PO Box 950, Newburgh, New York 12550 (Phone: 914/561-7300).

Pantone® Announces New Bindery Division

Pantone, Inc. – leading publisher of books on color specification and control for the graphic arts industry – has announced the formation of a new Bindery Division.

The new Bindery Division will offer a wide variety of mechanical binding services using the most modern and sophisticated equipment available today. These services include spiral and Wire-O bindings, plastic combs, posts and rivets, etc. The Bindery Division will also offer many additional services – such as cutting, collating, drilling, inserting, special assembly, packing, and fulfillment.

Mr. Morgan Coleman has been named General Manager of the Pantone Bindery. Mr. Coleman has been in the bindery and paper converting business for the last 23 years. He is a Past Director of The Binding Industries of America and a Charter Member of the BIA Standards Committee.

Mr. Frank M. Cenciola has been named Plant Manager of the Pantone Bindery. Mr. Cenicola will be responsible for quality control and productivity.

Mr. Kenneth Jacobs has been named Marketing Manager of the Pantone Bindery. Mr. Jacobs has a varied background in marketing and sales.

Hunterlab Shademaster

For complete information on the ShadeMaster – Hunterlab's new shade sorting system, please write or call for the descriptive new brochure. The ShadeMaster's microprocessor flexibility, effective software and precise optical engineering make this system superior for off-shade problems.

Shade sorting is accomplished by a push of one button in a choice of three shade sorting programs: Hunter L,a,b; CIELAB; or CIE metric hue angle. Other features include automatic calibration, complete listing and printout of specimen by lot and shade number, and an optional memory system for mass storage of product standard color values and tolerances.

For further information: Hunter Associates Laboratory, Inc., 11495 Sunset Hills Road, Reston, Va. 22090. Telephone: (703) 471-6870.

Hunterlab Repeats Three Day Workshop

Hunterlab's 3-day workshop scheduled for January 23, 24, and 25, 1980 attracted more than 25 participants by December 1, 1979. Due to this over-whelming response, the Education Department has scheduled another 3-day session for February 13, 14, 15, to accommodate the overflow of students.

The course will be held at Hunterlab's facilities in Reston, Virginia. The Workshop is a practical approach and provides appearance technologists with a basic knowledge of color science, color scales and techniques for the measurement of color. Other aspects such as gloss, haze, distinctness-of-image, luster, etc. are also covered.

The course includes a four-hour laboratory session with "hands-on" use of the instruments. Ample opportunity is provided for each student to measure his product on any of the Hunterlab instruments.

Because space is limited, call the Appearance Science Department at Hunterlab as soon as possible to assure your space at the Workshop.

Hunterlab Introduces the D25-9 Microprocessor Colorimeter

Hunterlab has adapted microprocessor technology to the needs of colorimetry by designing this flexible, yet simple to operate instrument.

Flexible because: It's equipped with four internationally accepted color scales as standard: memory storage for up to 10 difference product standards – ideal for quality control of your products. A choice of five optical sensors and special optional industrial package programs give you specific features for your measurement requirements.

Simple to Operate because: Its totally automatic standardization and simultaneous display of color scale values eliminate many steps. The optional self-contained printer gives you a quick and convenient permanent record. Write or call Hunterlab for more information.

THE COLOUR GROUP (GREAT BRITAIN)

Report of the 144th Meeting of the Colour Group held on 4th April 1979 at The City University, London

This meeting of the Group took the form of an "Any Questions" session. The members of the panel were J.G. Holmes (Chairman), R.W. Brocklebank, G.J. Chamberlin, R.J. Fletcher, R.W.G. Hunt, and Enid Verity.

Q1 – What is a tristimulus unit?

A1 – Dr. Hunt said that tristimulus units were used solely in the spectral colour matching experiments carried out by Wright and Guild in the late 1920s. The amounts of red, green, and blue primaries required to match the reference white light were defined as 0.3333 tristimulus units and in any subsequent colour matching, the amount of spectral stimulus matched was equal to the algebraic sum of the tristimulus units of the primaries.

Q2 – Can colour trends in fashion be predicted?

A2 – Mrs. Verity replied that, in New York, House and Gardens had data going back over 40 years from which trends in the popularity of colours could be predicted. Nowadays there is much less acceptance in a single colour as a fashion colour; colours move in groups e.g. "neutral" colours, browns, pastel colours, metallic colours. Most colour ranges, particularly those made with man-made fibres, are determined years ahead because the fibres are produced in enormous quantities in predetermined colour ranges.

Q3 – We are taught – and we believe – that visual responses are additive, but nearly all colouring mechanisms are subtractive. Is this why colour is so mysterious?

A3 – Dr. Hunt pointed out that there is persistent confusion about so-called primaries. Artists are quite incorrigible, and mix red, yellow, and blue; and they first influence school children. Cyan, magenta, and yellow would be better, as used by printers.

Mrs. Verity agreed that it was definitely an educational problem. Many aids like colour circles are simply wrong. There was a time, e.g. French Impressionist, when art colour was based on science. This has lapsed again. On the other hand, scientists cannot appreciate subtle artistic points.

Q4 – How can the colour of wet objects, e.g. fish, be adequately assessed in the presence of specular reflections?

A4 – The main suggestion was to carefully regulate the angle of illumination and viewing. The use of viewing tnnnels and hemispherical viewing cabinets was also suggested. One speaker pointed out that with gemstones polarisers could be used for inspection, although these did marginally alter the colour.

Q5 – Is 'colour harmony' any more than an old wives' tale?

A5 – Colour harmony is a matter of taste and individual opinion. The Brevald System gives a good basis for choosing harmonious colours, but in Germany, it is possible to pick out schemes done by arthitects on this basis and they are extremely boring. Ideas change with the times – orange and magenta, at one time thought to be a "clash," is now acceptable. Design, shape, area, lighting – all take their part in assessing the effect of any colour combination.

Q6 – Mineralogists have always used Illuminant C; as D65 is now the preferred illuminant, what should they do?

A6 – Dr. Hunt explained that the major weakness of D65 was that it is an illuminant and not a source but that approximations to D65 were possible using xenon sources or even filtered tungsten for matching the UV content of daylight transmitted by window glass. Mr. McLaren said that there was no significant difference between the two as far as visual radiation was concerned but that the deficiency of Illuminant C in the ultra-violet was very marked: as this would be important in the case of fluorescent materials one of the newer sources would be preferable. Dr. Nelson, who was professional involved in mineralogy, said that he had always found Illuminant A adequate.

Q7 – Can the team suggest any reason why the human eye evolved so that light has to pass thorugh nerve endings, ganglion cells, bipolar cells, synapses, and blood vessels before reaching the light-absorbing pigments?

A7 – Dr. Hunt pointed out that this structure had certain advantages; behind the light sensitive cells there is an absorbing pigment to prevent halation. Dr. Moreland pointed out that plenty of invertebrate eyes were built the other way.

Q8 – The incidence of colour blindness among primitive races is much less than that among industrialised nations. Why should this be so?

A3 – The panel did not really answer this question although several comments were made. Unripe berries may make you ill and so good colour vision is important. Iso-frequency contours for colour dificiencies in Britain follow the old boundaries between different invading forces.

Q9 – It is known that when a photon is absorbed by a molecule of visual purple, cis-trans isomerism occurs. Is it known how this causes an impulse to be sent along the optic nerve?

A9 – Dr. Moreland said that Dartnell's model suggested that as a molecule changed its shape it exposed triggering electrical charges.

Q10 – Why do we thank of the shape, structure, and substance of an object as real, but we seem to think of colour as an added property of the object?

A10 – The concensus of the panel was that there was no particular reason; it was natural to colour things we make because natural things were coloured, e.g. butterflies, sunsets, rainbows.

Q11 – After consultation with a Doctor (presumably medical) "an insipid grey" has been selected for local ballot papers to distinguish them from the white to be used in the General Election. Bearing in mind that blue, red, green, and yellow have political implications and that at least some of the voters will have defective colour vision what colour would the team have chosen?

A11 – Discussion resulted in the Secretary sending a letter to *The Guardian* pointing out the problems of lighting which might well render the slight distinction between grey and white impossible to see – especially late at night in a smoke-laden atmosphere. Without an actual sample of the "grey" it was difficult to tell whether or not it was suitable, a "mechanical" difference such as a cut-off corner was thought to be a better idea.

It will be seen that the questions covered a wide range of subjects and that the answers varied as to their depth! Indeed many of the comments made, but not reported here, may have been more useful to the questioner.

M.R. Pointer

Reprinted from the newsletter of the Colour Group (Great Britain).

Report of the 145th Meeting of the Colour Group held on 16 May 1979 at the Royal Institution, London

The meeting opened with the business of the Annual General

Meeting for 1979. Following the presentation of the reports from the Secretary and Treasurer, and the election of officers to the Committee, Miss Margaret Halstead presented her retiring Chairman's Address; the title of the presentation was a 'Touch of Enlightenment.' In her opening remarks Miss Halstead told us that the thought of having to give a Chairman's Address was a good reason for not becoming Chairman. However, she assured us that it was an honour to have been Chairman of the Group for the past two years, and that she had enjoyed it very much! The talk was a delightful trip through time taking a look at the lighting of the day; it was profusely illustrated and contained much interesting, and at times amusing, information.

The natural place to start is with daylight, "After all, it has been with us since the beginning of time and assuming that the first men had some form of colour vision, they must have been able to appreciate the awe-inspiring colours that can be seen in the sky." At some stage man discovered fire and it is conjectured from archeological reasoning that this happened in China some 350,000 years ago but only 250,000 years ago in Europe. No doubt the primary importance of fire was for heat and probably its significance for improving foodstuffs was discovered by some careless cavewoman who left a haunch of meat too close to a fire one day. Its value for scaring away wild animals must also have been recognised early on and one may conjecture that the first torch may have been a burning brand hurled in the direction of some unwelcome animal visitor to the fireside. One can be fairly sure that fire was not chiefly important as an illuminant at that stage and we simply do not know when illumination became the servant of man.

And so the story unfolded, lamps were described that were known to exist 15,000 years ago at Lascaux in France. The Romans manufactured lamps in great quantities and even set up factories in remote parts of their Empire such as Britain. They were obviously efficiency experts as they realised that better use of kilns could be made if small lamps were packed between larger pots. Multi-spout lamps were commonplace and were not very extravagant as tests on a single-spouted Roman lamp showed that one pint of oil provided about 50 hours of light.

An alternative light source to the oil lamp was the candle. Although ceremonial torches of wax and resin may have been known by the Egyptians the first positive evidence of the candle comes from the Romans in the 1st century A.D. when Pliny the Younger described candles made from the threads of flax coated with pitch and also rushlights made from rush stems peeled on one side and dipped in wax. However, the candle was regarded as inferior to the lamp at this time since a rough translation of a quote from Martial in the second half of the 1st century runs "I'm sorry the footman has walked off with your lamp – you'll have to put up with a candle." And so life rolled on and the techniques of manufacture improved. Candles were first moulded in the 15th century, torches were used for lighting outdoors. But there were drawbacks; candles needed constant attention to work efficiently, they were susceptible to draughts, they gave off smoke and were generally messy, and a major hazard with them was, of course, fire. In 1835, out of 471 fires in London, the cause of 380 of them was established; 36 were due to accidents with candles and a further 74 to burning of bed or window curtains.

The fact that illuminants, however ineffective or troublesome, were known did not mean that they were freely available. The very rich people might burn tremendous quantities of wax for special occasions but there was no prodigality for the ordinary family of moderate means who might be economical to the point of parsimony. Even in court circles, the economics of lighting played an important role. At the court of Louis XIV in the second half of the 17th century, a candle was never relighted. Candle-ends were the perquisite of the ladies-in-waiting, who often realised more from selling them than they were paid as members of the King's household. Besides being a source of income for the ladies, candles were also a mark of favour for the gentlemen. There was a nightly ceremony when the king disrobed. A tall wax candle had to be held aloft while the king knelt in prayer. The time arriving for him to be left alone, he was solemnly asked to whom the candle should be given. Louis signified the man he chose to honour and the recipient proudly bore the candle away.

Having described the light sources that were available prior to the 19th century and discussed some of their drawbacks, Miss Halstead next addressed the question of how did they affect the pattern of life in those days? The main concerns of most people right through the ages have been work, home, travel, and leisure, and the types of lamps affected all of these things.

Many work activities ceased at nightfall and for the poor people the situation is summed up by the following short verse by St. John Honeywood who lived in the second half of the 18th century.

"When Derby saw the setting sun
He swung his scythe and home he run,
Sat down, drank off his quart and said
My work is done, I'll go to bed."

It is quite clear that work at night, with the exception of domestic tasks carried out by the womenfolk, was not common until the last century, and even then the lighting conditions were usually deplorable. It was the advent of electricity that made the most revolutionary changes in the lighting of work after dark. The arc lamp was demonstrated in a laboratory in 1810 but there were no machines capable of generating the electricity required. Surprisingly, there were some outdoor installations of carbon arc lamps in the second half of the century but they were few and far between except for building work. Some of the Railway Companies installed them in their London and Glasgow termini but no doubt this was also a publicity exercise. The cheap, easy to operate, universally applicable light source came with the invention and development of the incandescent lamp by Swan and Edison just one hundred years ago this year – in fact we've just celebrated the Swan Centenary. However, it was some years before electricity supplies became cheap enough for the lamps to oust other forms of lighting but there were many decorative lamps produced in the 1890's including this forerunner of the incandescent candle lamp. Having considered a few aspects of work, Miss Halstead then turned to the question of travel. Those who are old enough to remember the last war will recollect the difficulties of getting about in the blackout unless it was a reasonably clear moonlit night. It is interesting to consider that this was the state of affairs that existed for centuries when the only lamps suitable for travelling were the torch or link or horn lantern. The lighted street is obviously a necessary adjunct to travelling about with reasonable ease and even in Roman times the Justinian Code recognised street lighting as a tax item but it may have been only at festival times that such lighting was provided. According to Juvenal, to go out to supper in Imperial Rome without having made your will was to expose yourself to

the reproach of carelessness. In medieval London, the populace was not encourated to wander about at night after curfew tolled unless "he be a great man, or other lawful person of good repute or their certain passengers having their warrants to go from one to another with lanthorn in hand." As the lighting improved, the number of people moving about the towns at night either by foot or on horseback or in carriages increased. The latter vehicles required lanterns that provided illumination on the road well ahead of the horses so that the driver could pull up before trouble was encountered. Special lanterns were designed with silvered reflectors to direct the light forwards and also out through the side windows. The lamps were usually mounted a little below and behind the driver so that he was not blinded by the glare from the lamp. The acetylene lamp was obviously welcomed at the beginning of this century because of its much superior performance and of course electric lamps for automobile lighting have ensured that we can career over roads at alarming speeds that would not have been possible if such headlights had not been invented.

Having dealt with work and travel what is there left except leisure? Well I am quite sure that ordinary folk through all the ages until comparatively recently had little time for leisure except on Sundays and even then in medieval times villagers were expected to practice their archery. Entertainment such as we understand it today must have been restricted to holidays and religious festivals. The theatre was of course known to the ancient Greeks and Romans but the Mediterranean climate is such that the theatres and amphitheatres were open to the air and performances were given either by daylight or moonlight.

Gas lighting was first demonstrated in London at a lecture in the Lyceum Theatre in 1804 by the founder of the Gas, Light and Coke Company and in 1817 the same theatre was the first in London to have both stage and auditorium lit by gas. The employment of variations in gas pressure provided a means of dimming lights and Sir Henry Irving in the 1850's insisted that the house lights were dimmed while the stage show was on – a procedure that was not really possible before gas lighting.

In modern times our leisure activities have also been revolutionised by modern methods of lighting and mass spectator sports such as football and basketball are now carried on quite happily after dark. Other sports such as tennis and athletics can be indulged in by the individual if he should be lucky enough to have a sports centre in the neighbourhood.

And so in modern times we have a proliferation of types of lamp that we very much take for granted. We would do well to remember our ancestors who, in spite of the lack of convenience lighting, started us on the path to where we are today.

Reprinted from the newsletter of The Colour Group (Great Britain)

ISCC Annual Meetings

1980: April 21-22 – Rochester, N.Y.

Williamsburg Conferences

1980: February 4-6
1981: February 9-11
1983: February 7-10

Dry Color Manufacturers Association

1980: The Greenbrier, White Sulpher Springs, WV, June 15-18

Optical Society of America

1980: Sheraton Sandcastle, Sarasota, FL, April 30-May 3

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
636 Massachusetts Ave., N.E.
Washington, D.C. 20002
301-565-4948

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Inter-Society Color Council

January, 1980

49th Annual Meeting

The 49th Annual Meeting of the Inter-Society Color Council will be held at the Genesee Plaza Holiday Inn in Rochester, N. Y., on Sunday Evening, Monday and Tuesday, April 20-22, 1980. Please note that the location for this year's meeting is Rochester, N. Y., and not New York City. The Holiday Inn is in downtown Rochester, and there is a shuttle bus service from the airport to the Inn for those coming by plane.

The Eastman Kodak Company has kindly arranged to provide a reception for ISCC members and guests, to be held on Sunday evening, April 20, at the Holiday Inn, starting at 7:00 P.M. Preregistration for this event will be required.

The ISCC Project Committees will hold open meetings on Monday, April 21, beginning at 9:00 A.M. Two 1½ hour periods will be held in both the morning and the afternoon sessions to reduce conflicts resulting from simultaneous meetings as much as possible. Members and friends of the Council are urged to attend the Committee meetings, which are most diversified and provide a wide variety of topics involving various aspects of color in art, business and science.

A special event will take place on Monday evening. The Rochester Institute of Technology has invited the ISCC to tour their Graphic Arts Research Center and the School for American Craftsmen. A walk-through will allow participants to view the whole graphic arts process, from photographing the original object through separation, plate making, and printing on a press, to the finished product. Wine and cheeze will be served. Buses will be available to transport those wishing to attend the R. I. T. demonstration, leaving the hotel at 7:00 P.M. Preregistration for this event will be necessary.

The meeting on Tuesday, April 22, will open at 9:00 A.M. with a Symposium

titled "Graphic Reproduction from Theme to Finished Product," chaired by Frank Benham, Chairman of the ISCC Delegation from the Gravure Technical Association. Although details are not available at this time, the speakers will be J. C. Shekerow, J. Stanton, W. Rocap, C. Rinehart, and M. Southworth. They will present the viewpoints of photographers, platemakers, publishers and advertising agencies in graphic arts today.

The Annual Meeting Luncheon Tuesday noon will feature the installation of officers for 1980-1982 with William D. Schaeffer succeeding Franc Grum as President. During the luncheon the ISCC Macbeth Award will be presented to Dr. W. David Wright. Dr. Wright will present a short address.

The annual business meeting of the Council will be held immediately after the Luncheon on Tuesday afternoon. It is expected that the Annual Meeting will close by mid-afternoon.

A final program, registration form and hotel reservation card will be sent to the membership early in March. It is strongly suggested that all preregister at that time. As noted above, it will be mandatory to preregister for some events. We look forward to seeing you at our first meeting in Rochester in many years.

COLOR
research and application

Editorial Office
Department of Chemistry
Materials Research Center, Room 217
Rensselaer Polytechnic Institute
Troy, N. Y. 12181, U.S.A.

Telephone: (518) 270-6458

Dear ISCC Member:

As you know, the Inter-Society Color Council is one of the three associations that are endorsing the quarterly journal, "Color Research and Application". The journal is looking back at a successful fourth year and a good increase in the number of subscriptions. The publisher, John Wiley and Sons, Inc., has advised that the subscription rate will remain the same for 1980, i.e. $35.00 for general subscriptions and a very reasonable $20.00 for ISCC members. The journal is looking forward to a successful decade of the Eighties and to becoming "the" color journal, indispensable to the interested artist, the designer, technologist and scientist alike.

How can you as an individual member of the ISCC help in this quest? Actively, by writing a paper or encouraging someone you know to write a paper on any subject related to color. We are particularly looking for papers in the art and design fields and papers useful in industrial application of color. Passively, by becoming an individual subscriber to the journal. Statistical analysis indicates that the journal is largely being subscribed to by institutions. In order to grow further and become profitable, we need individual subscriptions. So why not consider it! With your own personal subscription you have your own copies at hand to read and refer to when you need them and not only when the library is open.

If you have thoughts and ideas on how to improve the journal further, how to make it more interesting and useful to the individual subscriber, please do not hesitate to pass them on to the Editor-in-Chief, Dr. F.W. Billmeyer, Jr.

Once more, why not become a subscriber! You help yourself, the field of color and the journal.

Sincerely yours,

Rolf Kuehni

Rolf Kuehni
Associate Editor

RK:sb