Inter-Society Color Council *News*

NUMBER 266 MAY-JUNE 1980

WILLIAM D. SCHAEFFER

Dr. Schaeffer received the TAGA Honors Award at the Annual Conference held in Williamsburg, Virginia on May 6, 1980. Dr. Schaeffer was cited "for his outstanding service to the technical advancement of the graphic arts industry through several research groups involved in ink, paper, surface chemistry, environment, and printability; and for his service to TAGA as paper presenter, board member, officer, and President."

OTHERS HONORED

1976
Michael H. Bruno
Paul J. Hartsuch
Frank M. Preucil
John A.C. Yule

1977
Albert R. Materazzi
Robert E. Rossell
Earl I. Sundeen
William C. Walker

1978
Bernard R. Halpern
Francis L. Wurzburg, Jr.

1979
Harvey F. George
Richard E. Maurer
John McMaster

1980
Philip E. Tobias

APPLICATIONS APPROVED FOR INDIVIDUAL MEMBERSHIP

Board of Directors Meeting, February 2, 1980

Mr. David E. Browne
7907 W. Nantucket
Wichita, Kansas 67212
SPE. Spectrophotometry, color matching and control, and a source for a continuation of education in the field of color. Ponca Pellets, Inc.

Mr. Eugene C. Bulinski
920 Hunterhill Drive
Roswell, Georgia 30075
Lithographic ink pigments-working properties, strength, vehicles etc. Optical properties of color, strength, Opacity Chemical Interaction/ *Color Hue* and *Hue Error* Grayness Factor and Gray Balance. (Former delegate GATF)

*Mr. Ernest Exposite
Sterngold
60 Viaduct Road Extension
Stamford, Connecticut 06907
Translation of the data gathered on a new instrument into CIELAB and formulating materials to cover the range of human dentition.

Ms. Roberta Greenberg
138-40 78 Drive
Kew Garden Hills, New York 11367
Textile related. Home fashions area.

Mr. Jeffrey R. Hagerlin
RR 1 Box 119A
Pierceton, Indiana 46562
Computer assisted color matching, learning various color theory and applying it to my present responsibilities. Armstrong Products Co. (ASQC)

Mr. Michael A. Hammel
4710 Bethesda Avenue
Bethesda, Maryland 20014
ASTM, SPE. The advancement of colorimetry and the promotion of instrumentation for the analysis of color and color related properties. To increase communication between interested (and not so interested parties. (Gardner Laboratories)

Mr. James W. Joudrey
Cities Service Company
Columbian Chemicals
PO Box 300
Tulsa, Oklahoma 74102
AChS, FSCT. Computer-color matching.

Miss Patricia A. Kulikowski
Westinghouse Corporation
Architectural Systems Division
4300 36th St., S.E.
Grand Rapids, Michigan 49508
Psychological perception of color in the office environment as it relates to the level of office lighting; marketability of various colors in the systems furniture industry.

Mr. J. L. Richard Landry
1812 Redwood Court
Allentown, Pennsylvania 18104
Instrumental color control.

Mr. Paul A. McManus
240 Gleneagle Drive
Sherwood, Oregon 97140
TAPPI. Psychology of color; basis of color theory; problems of the formation of a colored image.

Mr. Fred L. Maves
3M Company
Decorative Products Division
PO Box 33331, Bldg. 42-3W (46)
St. Paul, Minnesota 55133
SPSE. Implementing good color science techniques in production facilities in an effort to realize color control; then to identify and minimize raw materials and process variations to further enhance acceptable color production.

Mr. Richard E. Moore
4300 36th Street, S.E.
Grand Rapids, Michigan 49508
General and sophisticated color selection and matching. Also color application to fabric and research on color application to new surfaces such as Micarta.

Mr. J. J. Rennilson
3777 Ruffin Road
San Diego, California 92123
ASTM, OSA. Color computation from spectroradiometric data, spectral reflectance, transmission; color of retroreflectors. Gamma Scientific.

Mr. Bruce Rusnak Weber Service Center 4264 Strausser St., N.W. N. Canton, Ohio 44720	Chromaticity measures, human perception.
Mr. Raoul J. P. Schoumaker Westinghouse Corporation Architectural Systems Division 4300 36th St., S.E. Grand Rapids, Michigan 49508	IDSA. To use colors for a better and living environment; to get information on the relation of color and productivity.
Mr. Charles P. Schreiner Westinghouse Corporation Architectural Systems Division 4300 36th St., S.E. Grand Rapids, Michigan 49508	Our product becomes a major element in interior office spaces and I am interested mostly in the psychological aspects of color as they relate to motivation and productivity.
Mr. Michael Symes Sadolin & Holmblad Ltd. Holmbladsgade 70 DK-2300 Copenhagen S. Denmark	Prediction and correction of color using instruments and computers. Application of microprocessor control to production of color batches.
Mr. Leonard J. Ulicny 2701 Broening Highway Baltimore, Maryland 21222	AChS. Use of turbid medium theory to predict result in investigations of cadmium pigment systhesis. Color characterization of these pigments.
Dr. Henry K. Wren Faribo Industies, Inc. PO Box 24 Faribault, Minnesota 55021	AChS. Pigments, dyes, coatings.
Mr. Harry I. Zeltzer, O.D. X-Chrom Corporation 57 Grant Street Waltham, Massachusetts 02154	Sharing mutual experiences for greater understanding of color vision deficiency. (X-Chrom manufactures a colored contact lens used to aid the red-green color blind.)

*In a change of corporate representative, Mr. Lewis Selander was replaced by Mr. Ernest Esposite.

DETROIT COLOUR COUNCIL

The Detroit Colour Council, a new sustaining member of ISCC, held a panel discussion May 19 on government regulations concerning pigments for coatings and plastics. Moderator Dennis Collier of BASF-Wyandotte led a spirited discussion with panelists Michael Dunn of Kohnstamm, Michael Ott of duPont and David Hudson of Ford Motor.

Guest speaker for the Fall meeting on September 9 will be Phylis Kay of Blue Ridge-Winkler, speaking on color selection and marketing, with a few predictions for the future. For information call William Longley, Ford Motor Co., 313-323-3826.

W. V. Longley
Program Chairman
Detroit Colour Council

Editor's note: The Detroit Colour Council was incorrectly identified as a member-body in the previous issue of the newsletter.

OPTICAL SOCIETY OF AMERICA

1980 Annual Meeting

SYMPOSIA

A list of symposia topics and a partial list of speakers follows:

Brightness. The dependence of brightness upon luminance, chromatic color, and perceptual context will be treated.

Perceptual Context – Alan Gilchrist, State University of New York, Stony Brook.

Brightness as a Concept within Models of Vision – Carl R. Ingling, Jr., Institute for Research in Vision.

Light as a True Visual Quantity – Luminance and Chromatic Color – JoAnn Kinney, USN Submarine Base.

Spatial Sinusoidal Stimuli in Vision. This symposium will review recent breakthroughs in multiple spatial-frequency-tuned channels both from the psychophysical and the neurophysical point of view.

Cat Retinal Ganglion Cells and Grating Patterns – Christina Enroth-Cugell, Northwestern University.

Spatial Analysis by Central Visual Neurons – Anthony Movshon, New York University.

Spatial Properties of Chromatic Channels – R. Frank Quick, Jr. – Carnegie-Mellon University.

Toward a Model of Suprathreshold Spatial Vision – Hugh Wilson, University of Chicago.

Stochastic Stimuli in Vision. This symposium will treat three topics: dynamic random-dot stereograms; dynamic random-dot cinematograms; and nonlinear analysis using noise.

Probing Nonlinear Systems with Dynamic Noise – Stanley Klein, Claremont College.

Probing the Fly's Visual System with Stochastic Stimuli – Werner Reichardt, Max Planck Institute for Biological Cybernetics, Fed. Rep. of Germany.

Random-Dot Arrays in Movement Perception – Robert Sekuler, Northwestern University.

Random-Dot Arrays in Stereopsis – Christopher W. Tyler, Smith Kettlewell Institute of Visual Sciences.

SHORT COURSES

The program of short courses will be continued at the 1980 meeting. Eleven courses will be offered on Monday, October 13. Each course will run for four hours. Tuition for the courses is separate from the registration fee and is $40 for each course. Preregistration for the course is necessary. A registration form will be sent with the advance program. Topics and lectures are as follows:

Monday, October 13, 8:30 a.m. – 12:30 p.m.

Linear Systems Analysis of Human Vision, Arthur Ginsberg, Wright Patterson AFB.

New Developments in Laser Science and Technology, Roger Haas, Lawrence Livermore Laboratory.

Optical Communications, Elsa Garmire, University of Southern California.

Seeing Through the Atmosphere, Freeman F. Hall, Jr. NOAA/ERL Wave Propagation Laboratory.

Solid State Detector Arrays, William J. Helm, Aerojet Electro Systems.

Testing of Optical Surfaces, Daniel Malacara, Instituto de Astronomia, Mexico.

Monday, October 13, 1:30 p.m. - 5:30 p.m.

Computer Aided Optical Design, Robert R. Shannon, University of Arizona.

Optical Bistability, Hyatt Gibbs, Bell Laboratories.

Optical Coating of Components of Optical Systems, Philip Baumeister, Optical Coating Lab., Inc.

Optical Radiation Measurements, Richard Becherer, MIT Lincoln Laboratory.

Principles and Applications of Polarized Light, Charles Koester, Harkness Eye Institute.

VISION LABORATORY OF THE CENTER FOR HUMAN INFORMATION PROCESSING AND DEPARTMENT OF PSYCHOLOGY – UNIVERSITY OF CALIFORNIA AT SAN DIEGO

This laboratory was established in 1974 when Robert M. Boynton and Donald I. A. MacLeod were recruited to fill faculty positions in the Department of Psychology. More recently, Carol M. Cicerone and Mary M. Hayhoe have been added to that faculty. In addition, Allen L. Nagy is doing full time research in the laboratory. The laboratory has also typically included several graduate students and a postdoctoral fellow each year, and so far it has produced four Ph.Ds.

Much of the research in color has been concerned with peculiarities of the blue-cone system of human vision. Research on minimally distinct borders has shown that B cones do not contribute to the perception of short contours (11, 12, 13). Discriminations mediated by B cones were found to differ from those which depend by R and G cones in the following ways:

Slight separations of the fields being compared improve B-cone discriminations, have little effect on R, G-cone discriminations if based on chromatic differences, and are deleterious for comparisons that introduce luminance differences (3).

B cones do not contribute to luminance as measured by flicker photometry (7).

Discriminations of small color differences that depend only upon B-cones obey different laws than do those based upon R, G-cones (4).

As mapped by a psychophysical technique. S-cones are sparsely distributed in the human retina (14).

The temporal response of B-cones is sluggish (2).

The response of the B-cone system is altered by the usual method of isolating B-cone responses using long-wavelength selective adaptation (15).

Other work in color vision has established the following:

Subjects who are dichromatic by conventional tests (protanopes or deuteranopes) have shown a residual function of the supposedly missing cone type, as revealed by color naming and color matching experiments (9, 10).

There is evidence for a fourth cone type in heterozygous female carriers of dichromacy.

In normal observers, colored backgrounds selectively suppress the red or green cone contributions to luminance, causing flicker photometric sensitivity to approach surprisingly closely the sensitivity of a single cone type (6).

In addition to these experimental studies, a textbook on "Human Color Vision" has been published (1), and there has been an interest in color systems and color models. A physiologically meaningful chromaticity diagram has been developed (8), as well as smoothly differentiable equations based upon the Smith-Pokorny fundamentals, which should be useful for developing models of chromatic discrimination (5).

References

1. Boynton, R. M. *Human color vision.* Holt, Rinehart, and Winston, 1979.

2. Boynton, R. M. and Baron, W. S. Sinusoidal flicker characteristics of primate cones in response to heterochromatic stimuli. *J. Opt. Soc. Amer.* 65, 1091-1100 (1975).

3. Boynton, R. M., Hayhoe, M. M. and MacLeod, D. I. A. The gap effect: chromatic and achromatic visual discrimination as affected by field separation. *Optica Acta* 24, 159-177 (1977).

4. Boynton, R. M. and Kambe, N. Chromatic difference steps of moderate size measured along theoretically critical axes. *Color Research and Application* 5, 13-23 (1980).

5. Boynton, R. M. and Wisowaty, J. J. Equations for discrimination models. *J. Opt. Soc. Amer.* (in press).

6. Eisner, A. The contribution of different cone types to luminance while the eye is adapted to colored backgrounds. Ph.D. dissertation, UCSD, 1979.

7. Eisner, A. and MacLeod, D. I. A. Blue cones do not contribute to luminance. *J. Opt. Soc. Amer.* 70, 121-123 (1980).

8. MacLeod, D. I. A. and Boynton, R. M. Chromaticity diagram showing cone excitation by stimuli of equal luminance. *J. Opt. Soc. Amer.* 69, 1183-1186 (1979).

9. Nagy, A. L. The alrge-field substitution Rayleigh matches of dichromats. *J. Opt. Soc. Amer.*, in press.

10. Nagy, A. L. and Boynton, R. M. Large-field color naming of dichromats with rods bleached. *J. Opt. Soc. Amer.* 69, 1259-1265 (1979).

11. Valberg, A. and Tansley, B. W. Tritanopic purity-difference function to describe the properties of minimally distinct borders. *J. Opt. Soc. Amer.* 67, 1330-1335 (1977).

12. Tansley, B. W. and Boynton, R. M. Chromatic border perception: the role of red- and green-sensitive cones. *Vision Research* 18, 683-697 (1978).

13. Tansley, B. W. and Glushko, R. J. Spectral sensitivity of long-wavelength sensitive photoreceptors in dichromats determined by elimination of border percepts. *Vision Research* 18, 699-706 (1978).

14. Williams, D. R. Foveal structure and color vision. Ph.D. dissertation, UCSD, 1979.

15. Wisowaty, J. J. and Boynton, R. M. Temporal modulation sensitivity of the blue mechanism: measurements made without chromatic adaptation. *Vision Research,* in press (under revision).

GOLDEN JUBILEE OF COLOUR IN THE C.I.E. 1931 - 1981

Next year sees the 50th anniversary of a very important development for people concerned with colour namely the establishment of the C.I.E. 1931 standard observer.

The Colour Group (Great Britain) has decided to organise a two-day Symposium to be held on Monday and Tuesday 28th - 29th September 1981 at Imperial College, London England. Invited lectures will be given on topics covering the work leading up to the C.I.E. 1931 standard observer and subsequent developments and on the application of the C.I.E. recommendation in a number of areas.

The Symposium will be opened by Professor de Boer, President of the C.I.E. and speakers will include R. Best, F.W. Billmeyer Jr., B.H. Crawford, M.B. Halstead, H. Hemmendinger, J.G. Holmes, R.W.G. Hunt, D.L. MacAdam, K. McLaren, W.D. Wright and G. Wyszecki. The closing lecture will be given by Dr. J. Schanda, Chairman of the C.I.E. Action Committee.

It is hoped that the Proceedings will be published as a book, a copy of which will be included in the Symposium fee.

Full details, including cost, will be available from:

Miss Margaret B. Halstead, Thorn Lighting Limited, Jules Thorn Lighting Laboratories, Great Cambridge Road, Enfield, Middlesex, England.

COLOUR 80, BOMBAY, INDIA

The newly formed Colour Group of India (CGI) held its First Conference on Colour Technology entitled "Colour 80" on February 12, 1980 at the Hotel Taj Mahal, Bombay. It brought together artists, color scientists, technologists and designers from all over India to give the organization a rousing start. Color technology has received increasing attention in India during the last ten years, thanks to the efforts of the Founders of CGI, who have done an admirable job of adapting color science to the particular needs of a developing country.

Papers at the conference ranged from a philosophical understanding of color to the very practical problems of its industrial control. Dr. (Mrs.) Shalini Patwardhan spoke about understanding color, how we perceive it and the physical and emotional aspects associated with it. Dr. Fred Billmeyer submitted a note on "a concept of color" examining the influence of each phenomenon which determines color and the influence color has on industry. Dr. R. V. Rao discussed the relationship between color and life, viewing this relationship in the tradition of the ancient hindu philosophers.

Other papers discussed

The theory and practice of computer color matching in textiles, paints and plastics.

The practical problems faced by a supplier and a customer in negotiating color specifications.

The role of color in textile designs.

S. P. Chandavarkar, President of CGI, closed the meeting with a crystal-ball look at color achievements expected in the near future. The enthusiastic attendance at the meeting would forecast a very successful future for CGI.

A. B. J. Rodrigues

BENHAM JOINS AMERICAN COLOR CORPORATION

American Color Corporation announced today the appointment of Frank E. Benham as vice president for marketing with overall responsibility for sales for the company's four divisions.

Benham will also interface with numerous trade associations on behalf of American Color, according to Doug Brazell, president of and founder of the firm that specializes in making high-quality color separations for web offset printers.

The appointment for Benham follows a long and successful career with Eastman Kodak Company where he was assistant to the director, graphic arts market development, Graphics Markets Division, with the task for overseeing the division's trade association relations.

In his new job, Benham will be working out of the Phoenix headquarters of American Color. The company also has manufacturing facilities in San Diego, Calif., Denver, Colo., and Houston, Tex.

His many activities with trade associations include committee chairman, Input Copy Requirements Committee for Gravure Reproduction; member, Customer Relations Committee and 1980 Convention Committee; all within the Gravure Technical Association (GTA).

He is also on the Customer Services Steering Committee of the Graphic Arts Technical Foundation, is a voting member of the Inter-Society Color Council, and is a committee member of the GTA's Committee on Standard Viewing Conditions.

COLOR RESEARCH AND APPLICATION

Volume 5 Number 2 Summer 1980

Articles

The Color Rule: A Device for Color-Vision Testing, *P. K. Kaiser and H. Hemmendinger.*

A Color Metric from Opponent-Color Visual Channels, *D. C. Rich.*

Absolute Identification of Colors in the Munsell Notation: Trainability and Systematic Shifts, *T. Indow and M. Watanabe.*

Evaluation of Automotive Color Matches, *W. V. Longley.*

Matrix Partitioning Applied to Colorant Formulation with Four or More Dyes, *H. W. Holdaway.*

The Concept of Colourfulness and its Use for Deriving Grids for Assessing Colour Appearance, *M. R. Pointer.*

Determining Pigment Optical Properties for Use in the Mie and Many-Flux Theories, *F. W. Billmeyer, Jr., P. G. Chassaigne, and J. F. Dubois.*

The Coloroid Color System, *A. Nemcsics.*

Color Forum

Observer Metamerism, *F. W. Billmeyer, Jr., and M. Saltzman.*

Observer Metamerism in College-Age Observers, *M. A. Nardi.*

The Gloss Trap in Diffuse Reflectance Measurements, *W. Budde.*

Meeting Reports

Sixteenth Color Symposium of the Hungarian Chemical Society, *J. D. Schanda.*

Society of Plastics Engineers Conference on Color Control, *W. V. Longley.*

NATIONAL BUREAU OF STANDARDS (NBS)

NBS Spectrophotometry Programs

The following current and planned spectrophotometry programs in the NBS Radiometric Physics Division for the coming year will be discussed briefly below:

(1) Measurement Assurance Programs (MAP's);
(2) Solar energy related standards;
(3) Standard Reference Materials (SMR's); and
(4) Densitometry

Measurement Assurance Programs

The two areas selected for MAP's are diffuse reflectance and retroreflectance. The diffuse reflectance package will contain one set of filters and two sets of reflectors. The neutral density filters have nominal transmittances of 92, 70, 50, 25, 10, 1, and 0.1%. The reflectors have nominal reflectance of 87, 65, 35, 10, 2 and 0% for 45°/0° reflectance measurements, and there will be a similar set of 6 reflectors for 6°/hemispherical reflectance measurements (specular included).

The retroreflectance package will contain one set of filters and two retroreflectors. The filters are to be used to check over all system spectral conditions. The reflectors will be nearly colorless retroreflectors. One will have optical properties similar to that of exposed beaded industrial grade retroreflective sheeting, and the other will be a prismatic reflector with optical properties resembling those of automotive safety reflectors.

Solar Energy Related Standards

The solar energy project, sponsored by DOE and coordinated by Mr. Joseph Richmond of the Thermal Processes Division at NBS, will provide diffuse and specular reflectance standards for checking performance of instruments used for solar reflectance measurements.

The solar diffuse reflectance standards activity is near completion. The set of standards contains one white ceramic reflector and one black porcelain enamel reflector. The standards were calibrated for 6°/hemispherical reflectance (specular included) from 250 nm to 2500 nm at selected wavelengths.

The solar specular reflectance standards are second surface mirrors of aluminum under a thin quartz plate. These standards will be calibrated from 250 nm to 2500 nm at selected wavelengths and at several selected angles of incidence.

Standard Reference Materials

Calibrations for the first surface aluminum mirror SRM's have just been started. These standards are being measured from 250 to 2500 nm at selected wavelengths and angles of incidence.

Vitrolite glass SRM's will be produced for the 6°/ hemispherical diffuse reflectance (specular included) in the visible spectral range.

Densitometry

Optical transmittance density SRM's are produced for photographic and related industries. They are comprised of x-ray film step tablets (SRM 1001), photographic step tablets (SRM 1008), and microcopy resolution test charts (SRM 1010a). The two new SRM's that are planned for FY 80 and 81 are reflectance step tablets and reflectance density cards.

Jack J. Hsia, Radiometric Physics Division, Room B306, Building 220, National Bureau of Standards, Washington, DC 20234, Tel: (301) 921-2453.

New Lamps Chosen for 100 Watt Luminous Intensity Standards

Over the years, NBS has experienced occasional shipping problems with the 100-watt, 120 volt, inside frosted lamp standards of luminous intensity (SP 250 items 7.6 B, C & D). Recently, procurement difficulties have also been encountered. Therefore, the decision has been made to shift to 100-watt lamps rated at 32 volts and about 3 amperes. In common with the older type lamp, the new lamp has a T-20 inside frosted bulb, medium bipost base and C-13 filament. The observed reproducibility of luminous intensity values for the two lamp types is comparable. The heavier filament of the new lamp should virtually eliminate shipping problems. As long as the present supply of 120 volt lamps last, NBS will offer both types. Customers should specify which type they prefer. If the change-over causes any problems, please contact either Mr. McSparron or Mr. Lewis at (201) 921-3613.

Nomenclature for Optical Radiation

Effective communication between workers in different fields concerned with optical radiation has been hampered for years by the diversity of nomenclature in the area. This diverse nomenclature has arisen largely because measurements of optical radiation are required in many scientific disciplines and industries – in fact almost every scientific discipline and industry is involved to some extent with optical radiation. There has not been any recognized single group or academic discipline to cover all of these fields. To mention only a few, the areas include lighting in all of its aspects, safety, comfort, display, signal etc., vision, television and photography, agriculture, oceanography, photobiology, medicine, remote sensing, radiant heat transfer, astronomy, communication and many more.

Efforts have been under way for many years to develop standard nomenclature for the entire field of optical radiation. Important steps in this process have been the adoption of USA Standard Z-7.1, first adopted in 1942 and revised in 1967, under the sponsorship of the Illuminating Engineering Society, and the International Lighting Vocabulary (ILV) first published by the International Commission on Illumination in 1938, and revised in cooperation with the International Electrotechnical Commission and published as the 2nd edition in two volumes, one in 1957 and the other in 1959, and again revised as a 3rd edition and published in 1970. The 3rd edition contains definitions of about 900 terms in four languages, English, French, German and Russian, and the words only in five other languages, Spanish, Italian, Dutch, Polish and Swedish.

A second revision of Z-7.1 was completed by the IES Nomenclature Committee in 1979, and published in the October IES journal as a proposed revision. This draft includes 130 new terms and definitions, and 80 revisions of existing definitions. While the published version has numerous typographical errors, it should serve a useful purpose until the revised Z-7.1 is adopted and published.

Much progress was made in the preparation of a 4th edition of the ILV in 1979, and the first draft, in English, is 80 to 90% complete, and will contain 1800 to 2000 terms and definitions. The remaining work of getting the terms and definitions translated into the several languages and obtaining approval of the various national and international bodies involved will require at least two more years.

Three NBS staff members, L.E. Barbrow, of the Office of Weights and Measures, J.C. Richmond, of the Thermal Processes Division, and F.E. Nicodemus, of the Radiometric Physics Division, have contributed significantly to both of these efforts. Barbrow is Vice Chairman of the IES Nomenclature Committee, Richmond is a member and Nicodemus is a consultant. Richmond is chairman of TC1.1 on Vocabulary of the U.S. National Committee of the ICI, and both Barbrow and Nicodemus are members.

New CIE Publication

A report in English concerning "Road Lighting for Wet Conditions" has been published by the Commission Internationale de l'Eclairage (CIE Publication No. 47). It is a Technical Committee Report, in English, of 96 pages, with 37 figures and 10 tables. The publication is the result of active cooperation between different countries and has been produced by the members of CIE Technical Committee 4.6 (Road Lighting) which has representation from 27 countries.

Until now the luminance distribution on dry road surfaces was used as a criterion of the quality of road lighting of traffic routes. However, in rainy climates, a road surface is moist or wet for a substantial part of the dark hours, during which time the lighting quality is reduced.

The aim of the report is to give information which facilitates the inclusion of wet conditions in the design of road lighting installations. The information covers most aspects of road lighting for wet conditions and is largely based on a collection of direct experiences.

Copies of this document, CIE Publication No. 47, may be obtained postpaid at $27.00 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.

Reprinted from *Optical Radiation News* U.S. Department of Commerce, National Bureau of Standards, April 1980.

PRODUCTS AND SERVICES

New "Picosecond" Camera

HADLAND PHOTONICS have announced a new addition to their range of ultra high speed cameras with the IMACON 500 system.

The camera is a single shot streak camera with time resolution of 2 picoseconds plus a "Synchroscan" system capable of multiple weep recording with a time resolution of 5 picoseconds.

The camera incorporates a brand new design of image tube, the EMICHRON, made by E.M.I., Electron Tubes with S20 cathode UV input window and fibre optic output.

The camera can incorporate a new directly coupled Reticon readout system, or can record on Polaroid or roll film, or by optically coupling to customer's O.M.A. systems.

Hadlands, concerned with the high international value of the £ have re-engineered their complete camera system to keep within world wide research budgets.

This space reserved for News contributions from ISCC Member-Bodies.

"I've heard a lot of talk lately about copyfitting problems . . . wouldn't it be a good idea to make ***all*** *the type just a little bit smaller?"*

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CALENDAR

ISCC Annual Meetings

1981: April 27-28 – Roosevelt Hotel, NY

Williamsburg Conferences

1981: February 9-11
1982: February 7-10
1983: February 6-9
1984: February 12-15
1985: February 9-13
1986: February 7-12

Dry Color Manufacturers Association

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

Optical Society of America

1981: Pick Congress Hotel, Chicago, Illinois, Oct.

Society of Plastics Engineers, Color and Appearance Division

1980: RETEC, Baltimore Hilton, October 13-15
1981: RETEC, Chicago.

1981: ANTEC, Boston Sheraton, May 4-7

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 cooperation 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:
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301-565-4948

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