ISCC

News Letter Committee:

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Newsletter

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Send News Letter Items to Editor,
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BRUSSELS SESSION OF THE INTERNATIONAL COMMISSION ON ILLUMINATION

Following is an abstract of the USNC-CIE secretary's report of the 14th Session of the International Commission on Illumination, held in Brussels, Belgium, June 15-24, 1959. More than 500 delegates from 24 countries, including 52 delegates from the U.S.A., attended the Session. Among the officers elected to serve for the four year-period ending in 1963, when the 15th Session of the Commission will be held in Vienna was A. A. Brainerd (U.S.A.), Vice President.

During the first week of the Session parallel meetings were held at which 16 Committees of Experts, who work continuously in the field of activity assigned to them, reported on the progress and status of their work, and 13 Secretariat Committees reported on the advances which have been realized in their fields during the past four years and presented bibliographs covering that period.

Three of the reports of Committees of Experts were prepared and presented by U.S. Chairman of the following Committees:

1.3.1	Colorimetry	D. B. Judd, Ch.
3.1.1.2	Causes of Discomfort in Lighting	S. K. Guth, Ch.
3.3.3	Airborne Lighting	T. M. Edwards, Ch.

During the last two days of the Session 23 papers were presented, three of them by U. S. delegates as follows:

A general method for specifying the quantity of interior illumination from performance criteria, by H. R. Blackwell

The effect of specular reflection on visibility, by ..... D. M. Finch(U.S.A.)
Chorlton and
Davidson (Canada)

An analogue computer for the predetermination
of luminance paterns, by ..... P. F. O'Brien

Results of the work transacted and reported upon at the Technical Meetings and the papers which were presented plus the discussion thereon will be published in a Proceedings which will be available early in 1960. Among the technical Recommendations adopted tentatively, those of color interest are given below.

Although the Recommendations have been only tentatively approved they will become effective six months after their tentative approval unless objection is entered by any National Committee. Anyone desiring to comment on or object to any of these Recommendations should communicate with Mr. L. E. Barbrow, Secretary of the U.S. National Committee, C.I.E., National Bureau of Standards, Washington 25, D. C.

A limited number of copies of the secretary's report, which includes the tentatively approved Recommendations, are available from Mr. Barbrow, as are a complete list of the papers and technical committee reports presented at Brussels, and preprints of those documents at a nominal price.

RECOMMENDATIONS

COMMITTEE E - 1.3.1. - COLORIMETRY

1. It is recommended that the international comparisons of chromaticity coordinates (x y) of fluorescent lamps shall be based upon measurements of spectral distributions of radiant flux reduced by computation in accordance with the 1931 CIE Standard Observer and Coordinate System.

   Note 1. By current practice this method is applied chiefly to fluorescent lamps used as standards. Individual lamps in any international comparisons may, if desired, be evaluated in terms of standards of the same spectral type by means of either physical or visual colorimeters. If physical colorimeters are used, they should be carefully adapted to the 1931 CIE Standard Observer by spectrum templates or by filters. Visual colorimeters with more than three primaries should be preferred to those having only three primaries.

   Note 2. This recommendation is scheduled to become effective 1st January, 1961. Until then, it is understood that National Laboratories will use for calibrating their fluorescent lamp chromaticity standards the procedures available to them which they deem to yield results in closest accord with the 1931 CIE Standard Observer and Coordinate System, and will include in each report a description of these procedures.

2. For the colorimetric specifications of opaque specimens the perfect diffuser is recommended for ultimate adoption as the reference standard.

   Note. Adoption of the ideal standard will supersede magnesium oxide and should be accompanied by a recommended set of absolute spectral reflectances of magnesium oxide or other working standards.

3. It is recommended that tristimulus values of object colours be expressed on a scale having tristimulus value Y = 100 related to the perfect diffuser under identical illuminating and viewing conditions in the case of opaque specimens, or to the perfectly transparent, non-diffusing filter in the case of transmitting specimens.

4. The use of the following chromaticity diagram is provisionally recommended whenever a diagram yielding colour spacing perceptually more nearly uniform than the (x,y)-diagram is desired. The chromaticity diagram is produced by plotting $4X/(X + 15Y + 3Z)$ as abscissa and $6Y/(X + 15Y + 3Z)$ as ordinate, in which X, Y, Z are the tristimulus values corresponding to the 1931 CIE Standard Observer and Coordinate System.

   Note 1. The colour spacing afforded by this chromaticity diagram is known to be perceptually more nearly uniform than the CIE (x y) chromaticity diagram for observation of specimens subtending between 1° and 4°, having negligibly different luminances ($\Delta Y \to 0$) and surrounded by areas of chromaticity not much different from that of CIE Standard Source C. The specimens forming a pair whose colour difference is being considered must be of similar size and shape, and these factors, and the separation of the specimens, should be the same for all pairs.

   Note 2. An equivalent form of the recommendation is to plot : $4x/(-2x + 12y + 3)$ as abscissa and $6y/(-2x + 12y + 3)$ as ordinate, where x y are chromaticity coordinates according to the 1931 CIE Standard Observer and Coordinate System.

COMMITTEE S - 1.4.1. - PHOTOPIC AND SCOTOPIC VISION

1. It is recommended that the concept of luminance, which represents an additive property of radiation and which is defined on the basis of the expression $P_\lambda V_\lambda d_\lambda$ be retained as necessary for the theory and practice of illuminating engineering.

2. Given : a) that the luminosity or subjective brightness of a given physical stimulus depends on a wide range of factors (adaptation, the angular size of the stimulus, its exposure time, etc...) of which account cannot be taken in a definition of the kind referred to in Recommendation 1, and

   b) that luminance is independent of all these factors,

   it is recommended that the CIE definition of luminous flux (on which the definition of luminance depends) be modified to make perfectly clear that it rests on the notion of an ideal selective receptor representing the average eye. The provision of a suitable modification in the wording of the definition of luminous flux and the consequent adjustments of any other definitions that may be entailed, are referred to the Committee responsible for definitions.

   N.B. A suggested wording for such a modified definition of luminous flux is given by the Secretariat Committee S - 1.4.1. in its report to the 14th Session of the CIE, paragraph IV, subsection 3.

3. It is recommended that studies intended to clarify the concept of luminosity or subjective brightness and to establish its properties for a wide range of conditions of observation should be continued, taking particularly into consideration the notion of "equivalent luminance" referred to in the Secretariat Report.

MEASUREMENT OF COLOR

Les Journées Internationale de la Couleur, three days of international meetings on color, were held June 25-27, 1959 in Brussels under the auspices of the Centre d'Information de la Couleur, Paris. A similar series of sessions was held in Amiens in 1957, and in Toulouse in 1958. The first of the three days was devoted to papers on the measurement of color, and this account has been prepared for the News Letter at the request of Cdr. Dean Farnsworth who has been acting as our foreign correspondent during his tour of duty as Scientific Liaison Officer in London for the Department of the Navy.

About 70 persons attended the sessions, America being represented by Balinkin, Farnsworth, Judd, and Wyszecki. There was an exhibit of apparatus (single-dispersion prism spectrophotometer with null-method automatic recording modeled after Hardy, single-dispersion prism abridged spectrophotometer and template colorimeter, filter colorimeter with cathode-ray tube attachment to show amount and character of chromaticity deviation of test sample from standard, these three being from the Université de Louvain, an exhibit of the Octochrome system of automatic colorant formulation, an exhibit from Tintometer Ltd. showing visual colorimeters based on the Lovibond glasses, and an artificial-daylight illuminator for color comparisons by a combination of fluorescent lamps and incandescent lamps, and a library of recent books on color). Most of the eleven papers were presented in French, and the following summaries are based on the preprints and on my notes.

M. Bertrand, Engineer, Association Francaise de Colorimetrie, Enquête sur les appareils et les principes de mesures colorimétriques (Study of the instruments and principles of colorimetric measurements). Measurements were made on 11 transparent glass filters and about the same number of opaque specimens by means of eleven spectrophotometers and six photoelectric colorimeters. Five of the spectrophotometers (identified only by the letters A,B,C,D,E) agree within 0.001 in x and y and 0.5% in Y. The other spectrophotometers agreed within 0.005 in x and y and 5% in Y. The photoelectric colorimeters agreed within 0.010 in x and y and within 10% in Y.

F. Braun, Université de Louvain, La relation de Neugebauer et l'impression en couleur (Neugebauer's relation and printing in color). Neugebauer's relation gives the fraction of the paper covered by inks of all three primary colors (cyan, yellow, magenta), inks of two primaries, ink of one primary, and not covered at all as a function of the fractions of the total area covered by the primary inks derived on the assumption of a random distribution of dots. This relation has been checked by measuring the reflectance at 550 mu of 200 binary and ternary combinations (all possible combinations for six fractional coverages, 0, 20, 40, 60, 80 and 100%) of one set of three primary inks laid down in the usual way in regular patterns of dots. It is concluded that Neugebauer's relation applies sufficiently well to dots laid down in regular patterns in spite of the assumption made that the location of each dot is perfectly random. A method of predicting the fractional coverages of the three primary inks required to match any color within the gamut of the system is developed from Neugebauer's relation.

M. E. Edelmann, Association Francaise de Colorimétrie, Fondements scientifiques de la normalisation des couleurs primaires en reproduction par trichromie (Scientific bases for the standardization of primary inks for three-color reproduction). The choice of inks for three-color reproduction is fundamentally based on achieving the maximum color gamut, and this leads to the conventional choice of cyan, yellow, and magenta inks. To obtain the maximum chromaticity gamut, it is sufficient to choose inks yielding the maximum purity, but this yields in the printing process mixture colors of rather low reflectance; so the maximum color gamut is obtained by means of inks of higher reflectance than those yielding the maximum purity. Various combinations of inks were tried in an effort to find a criterion for this choice. One criterion tried was to adjust the transparent white pigment content of the primary inks until the "vivacity factor" suggested by G. Biva should be a maximum. Visual appraisal of the results of these trials showed that the best combinations were intermediate to those having maximum purity and those having maximum "vivacity factor", but rather closer to those having maximum purity.

B. Jamart, Laboratoire Professionel des Industries Vernis Peintures á Bruxelles, Tolerances colorimétriques pratiques dans le domaine de la peinture (Practical colorimetric tolerances in the domain of painting). Colorimetric measurements have been made on the Hardy spectrophotometer and on the Hunter Multipurpose Reflectometer on 13 groups of specimens, all members of each group having been judged visually as acceptable in color for the purpose. It is concluded (1) that accepted paint formulations differ by a rather large number of NBS units, furthermore the normal requirements can be very different for different purposes (carriage green, cream, metallic furniture, highway paints), (2) that for successive supplies of pigments by pigment manufacturers the deviations are generally small, (3) that in applying the specimens of the same paint and the standard, one will use the same method of application (filmograph by preference), the same thickness of film on the same support, and the same drying conditions, or else appreciable differences may already be introduced, and (4) that by comparing the results from the Hunter Multipurpose Reflectometer, which is an ancestor of colorimetry, and those from the "Hardy", one can say that the first can be of use in paint laboratories for the purposes proposed.

L. F. De Kerf, Scientist, Gavaert Photo-Producten N.V., Mortsel, Belgium, L'application des calculatrices automatiques dans le domaine de la colorimétrie (The application of automatic computers in the domain of colorimetry). The introduction gives a good summary (with good bibliography) of the development of automatic calculations of colorimetric quantities and shows how European studies have supplemented American work which preceded it. Author's Abstract: A theoretical study, like the determination of the range of colors which can be produced by an hypothetical subtractive system and the verification of the color-reproduction properties of such a system, needs a lot of calculations. A very efficient tool for such calculations is the electronic calculating punch. A description of such a calculator, the IBM 604-004, and the numerical analysis of the mentioned problem are followed by an exhaustive exposition of the required programs. The table look-up to transform the spectral density of the dye mixtures to their spectral reflectance or transmittance, is replaced by direct computation. A simplified formula of Hastings is used for this purpose. The tristimulus values are computed by the weighted-ordinate method. The color differences are calculated by the well-known formula of Judd-Hunter. Square root extraction is performed by the Newton-Raphson method. Finally some considerations are given about the application of other difference formulas, like

that based on the Adams space, and about the possibilities of more powerful machines, like the IBM 650 magnetic drum computer.

Georges Leblanc, Chief of Illumination Service, Compagnie Clémancon, Un controle des nuances de la lumiére et ses applications dans les équipments hospitaliers (A control of the chromatic character of light and its applications in hospital installations). The control of light (Chromon) is a method of supplying a desired color by additive mixture of lights and measuring it at the same time. The equipment is of interest for scenic illumination (theater, television, and motion pictures) and hospital lighting both for producing a known desired ambiance and for the detection of color differences.

Miescher and Hofmann. Experimentelle Bestimmung "farb-kräftigster" Optimalfarben in Abhangigkeit von Umfeld (Experimental determination of the "strongest" optimal colors as a function of surrounding field).

A. Petre, Chemical Engineer, A.I.G., and d'Hondt, Chemical Engineer, A.I.G. des Encres Dresse, S.A. Le systéme octochrome de contretypage automatique (The octochrome system of automatic color formulation). The choice of primaries has been revised to improve the gamut but the number of chromatic primary inks is still 8. Each ink obtained by this system is composed of some amounts of 2 neighboring chromatic primary inks plus some amount of gray ink plus some amount of white ink; it is specified by three numbers giving the relative proportions of these four amounts. The general method is to measure the color of the specimen to be reproduced by means of a photoelectric colorimeter (Lv 30, see next paper). The three parameters evaluated by the colorimeter are related to the three ratios of amounts of primary inks by a series of graphs. Detailed instructions for making the graphs for each new set of primary inks are given.

H. Weise, Farbforschungslaboratorium der Bundesanstalt für mechanische und chemische Materialprüfung, Berlin, Die Farbabstände im Farbsystem der DIN - Farbenkarte (Color differences in the color system of the DIN color cards).

J. Peters, Professor, Université de Louvain, Le photocolorimétre differentiel á écran cathodique LV30 (Differential photo-colorimeter with cathode-ray screen LV30). The light is incident from an incandescent lamp alternately by means of a rotating Wollaston prism on specimen and standard, the angle of incidence being about 6° from the perpendicular. The reflected light is caught in an integrating sphere with three photo-cells mounted in the sphere wall. The responses from the three photo-cells are combined in such a way as to determine the position of a luminous spot on a large cathode-ray screen. In its first form the filters used for the photo-cells were three Wratten filters complementary to the primary inks used in color printing. In its present form tristimulus filters are used. The tri-green filter gives to its photo-cell a spectral sensitivity proportional to the luminous-efficiency function of the human eye, and the output of this cell read on a milliammeter is proportional to the luminance factor of the specimen. The deviations of the luminous spot on the screen from its center are proportional to differences in alpha and beta, respectively, of the Hunter system, where the center of the screen corresponds to the chromaticity of the standard. By marking off the screen in a system of numbered hexagons, the amount and direction of any chromaticity divergence of the specimen from the standard may be quickly noted, and hundreds of inspections may be carried out daily.

D. B. Judd

M. Richter, Professor, Dr. Ing. habil., Bundesanstalt für Materialprüfung, Berlin. A-t-on besoin d'une notion nouvelle dans la métrique des couleurs? Démonstrations. (Is there need for a new concept in the measurement of colors? Demonstrations.) This demonstration lecture showed the dependence of the color perception on adaptation. The new concept suggested is that measured by tristimulus values. In OSA terminology this concept is called color. The German meaning for "Farbe" and the French meaning for the term "couleur" is equivalent to the OSA expression "color perception".

Dean B. Judd

NPVLA ANNUAL COLOR SURVEY

The News Letter again received the annual statistical survey of trade sales of paints, exterior oils, interior oils, enamels and latexes from the National Paint, Varnish and Lacquer Association. According to president Joseph F. Battley, a careful comparison of reported data shows that there is little or no difference in the color trends of regional and national manufacturers.

In addition to using the Munsell color system, ISCC - NBS color names were used to designate the colors. To improve accuracy and eliminate much of the human probability for errors, a color-difference meter was used to classify colors. Colors with a Munsell value from 1 through 3 were classified as dark; 4 through 6 as medium; and 7 through 9 as light. Colors with a chroma of less than 1 were classified as neutral.

Inquiries concerning the availability of the Color Survey should be addressed to the secretary, Allan W. Gates, at the Association, 1500 Rhode Island Ave., N.W., Washington 5, D.C.

NEW LEATHER COLORS FROM TANNERS COUNCIL

Two Fashion Guide booklets for Leather Colors have been received from the Tanners' Council of America - one for Fall and Winter, 1959, and one for Spring and Summer, 1960. They contain a wide variety of surprising colors : surprising because leathers are now made in so many colors, and surprising because of the variety and ingenuity of the color names. For example, some of the fall and winter colors for women's footwear, handbags and accessories are: "Oyster is a light warm, grayish-neutral with a pearly tint of Blue Points on the half shell." Jute, Olive Seed, Chutney, Goldfinch, Nugget, Kumquat, Paprika, Briarwood Town Brown, Corsica, Seaweed, Winesap, Gentian Blue, and Slate Gray.

Men's footwear are destined for an equally romantic fall and winter with color names such as: Hemlock - a medium, olive brown developed in a grain like the rippling surface of a pond. It is the leather color that best shows the Italian influence. Java - a new Continental color - correct for town wear from morning coffee to supper after the theatre. Caribou, Briar, Meerschaum, American Burgundy, Bracken, Wild Turkey, Hawthorn, Vintage, Stag - is the natural deerskin color in a butter-soft glove tannage. This is the leather and the color for pure relaxation - for a slip-on, or a soft soled moccasin or a folding travel slipper. Nutmeg, Rocky Tan, Ginger, Antique Brass, Guardsman Red and London Gray.

Dirty Buck is still popular among the children's colors along with Indian Smoke, Chipmunk, Cowboy, Bantam Red, Red Wagon and Gray Squirrel.

The Fashion Guide for 1960 Spring and Summer is calmly optimistic. According

to the Guide, American fashion learns from the experiments of foreign designers, moving steadily along. We take the best from them and with our native good taste steadily improve our very own American fashions. Thus, fashion moves toward the Spring and Summer of 1960 in a clear American pattern - beautiful, functional, suitable wearing apparel for a lively nation that works hard and plays hard. Some of the 1960 fashion predictions include: Shoulders will have a new width, new subtle cuts and patterns. The wandering waistline will return to normal; belts and cummerbunds and sashes will encircle small waists. Skirt length will be selected to be the most becoming to the wearer. The majority will fall just above mid-calf. Flowers will be packed on prints, stacked on millinery, and tucked in belts and under collars.

Again, the range of leather colors - and color names - for the Spring and Summer fashions is surprising and fascinating. Newsletter readers who are interested in more detail may write to the editor.

DEAN FARNSWORTH ILL

Commander Dean Farnsworth's many friends in the Inter-Society Color Council will be grieved to know that he has found it necessary to retire from active duty on account of illness. He is at the Naval Hospital, (Tower, 11th floor), Bethesda, Md. where he has been since shortly after his return to this country immediately following the C.I.E. meetings in Brussels. At Brussels he took an active part in committee sessions despite increasing pain and disability.

Dorothy Nickerson has sent us a copy of a letter received by Commander Farnsworth from the Chief of Naval Research, Department of the Navy. The letter, dated July 20, speaks so well for itself that we reprint it below so that ISCC members may share it with us. To Commander Farnsworth, our warm and affectionate wishes. Ed.

Department of Navy
Office of Naval Research
Washington 25, D. C.

From: Chief of Naval Research
To: Commander Dean Farnsworth, MSC, USNR

1. The Chief of Naval Research notes with deep regret and sympathy that your present painful and weakening illness has made necessary your detachment from the Office of Naval Research Branch Office, London, where you have performed in a consistently outstanding manner in furthering the Navy's research program. Pursuing your liaison duties with American and European research investigators with a dedication few men can achieve, your scientific reports, lectures to schools and other organizations, and stimulating personal relationships with leading scientists have all contributed immeasurably to the field of color vision, human engineering, and psycho-physics. Your accomplishments have won high acclaim throughout Europe and this country, thereby enhancing the reputation of this Office, and particularly of our London Branch Office, as well as the United States Navy whose uniform you wear.

2. Increasingly handicapped by a debilitating illness during your last months in London, you nevertheless drove yourself to use whatever time permitted by your treatments to continue with your work. You were selfless enough to consider the scientific usefulness of reports on your treatments. Your brilliant

research activities together with your extreme courage and tenacity of purpose exhibited in the face of the above circumstances have not only resulted in the concrete advancement of science and the technological progress of the U. S. Navy but have made a spiritual contribution which will long be remembered. Nothing could be more in keeping with the highest traditions of the United States Naval Service.

(S.) R. Bennett

EVERETT CALL WITH A.I.M.

Everett R. Call has been appointed Director of Marketing Research for the American Institute of Marketing, Inc. A.I.M., located at 1000 Vermont Avenue, N.W., Washington 5, D.C., is a research firm with full facilities to perform all types of statistical, marketing and economic services. We are glad to report that Mr. Call will continue to pursue his interests in the color field, especially his work with ISCC subcommittee on Problem 23, the very active subcommittee of which he and Helen Taylor are co-chairmen.

WILFRED D. SINCLAIR PASSES

Wilfred D. Sinclair, color stylist, and consultant for the paint division of Canadian Industries Limited, passed away on August 12th, in Toronto. Funeral services were conducted by Canon Arthur Smith D.D. of Christ Church, Toronto.

Mr. Sinclair joined Canadian Industries in 1929, in the sales division. In 1944 he was named supervisor of C-I-L's color conditioning section, and was appointed color consultant in 1954. He was an active member of the Colour Council of Canada, and served as its executive as well as editor of "Colour Comments". He was also a member of the I.S.C.C.

He has been a popular speaker on many phases of color as well as a brilliant writer.

He leaves his widow, and a large number of friends and associates to mourn his passing.

C. R. Conquergood

ISCC AUTHORS IN JOSA

Three articles on color by ISCC members were published in the April 1959 issue of Journal of the Optical Society of America. "Some Color Demonstrations I Have Shown" by Deane B. Judd describe some interesting and unusual experiments. The "Blue Arcs of the Retina" demonstrated by Dr. Judd have no bearing on color measurement, nor on anything practical. "This is science in its purest form." The blue arcs are observed under special conditions when the nerve fibers coursing above and below the fovea in arc shaped patterns are stimulated.

Other demonstrations discussed by Dr. Judd are Maxwell's Spot shown with Miles filter, Desert island experiment with Priest charts, Color perceptions of protanopes and deuteranopes, Metamerism shown by Stearns textiles and Granville grays, Chromatic adaptation (Simultaneous and successive contrast), and Color rendition of light sources.

"Color Standards in Commerce and Industry" by W. D. Wright refers to the problem of color control. He uses an example of the automotive industry, describing the complexity of predicting the match of colors which may have had different amounts of stoving and different numbers of paint coatings.

COLOR STANDARDS IN COMMERCE AND INDUSTRY

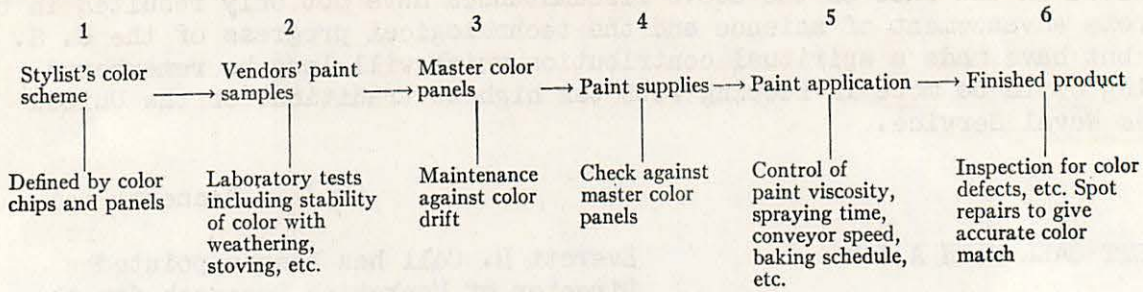

FIG. 1. Six stages in the coloring of a car body.

According to Dr. Wright, master panels of great permanence are required. (±0.0005 in x and y and ±0.005 in Y) To accomplish this would require that a spectrophotometer to detect changes with sufficient precision would have to measure B_λ with an accuracy of ±0.5%, which is beyond the capacity of most spectrophotometers.

At stages 2 and 4 (figure 1) a color difference meter could be used because the accuracy required is only of the order of ±0.002 in x and y for weathering and ±0.0005 to ±0.001 for batch repetition. "There seems little doubt that a reasonably simple and robust instrument with sufficient sensitivity to measure these differences accurately, would be welcomed by the industry."

The third article "Propagation of Errors in Colorimetric Transformations" by Gunter Wyszecki, National Research Council of Canada, is so specialized that those readers wishing to learn about this work are requested to refer to the article as it was published in JOSA.

SEMINAR ON COLOR AND COLOR CONTROL

Four active ISCC members will conduct a three-day Seminar on Color and Color Control. F. L. Wurzburg, Interchemical Corporation, Seminar director will open the sessions Wednesday, November 18, 1959 with the film "This Is Color". He will follow this with a lecture on the physical aspects of color. Dr. Sidney Newhall, Kodak Color Technology, will follow in the afternoon with a lecture and round table discussion of color vision - both normal and defective. He will cover such aspects as simultaneous and successive contrast, adaptation and other visual effects.

Warren Reese, MacBeth Corporation, will talk about illumination for color viewing on Thursday morning, following with a round table discussion. Mr. Wurzburg will discuss the broad subject of color specification, measurement, and control Thursday afternoon. Warren Rhodes, Rochester Institute of Technology, will describe and demonstrate some color measuring instruments on Friday morning. Friday afternoon is reserved for summaries, general discussions and instruction and practice with color measuring apparatus.

Each of the five sessions will consist of a 30 - 40 minute lecture by the leader followed by round table discussion. Color blindness and aptitude tests will be given to registrants in the evenings, and the staff will be on hand for consultation.

Additional information may be obtained by writing to: Harold Kentner, Assistant Director for Extended Services, Rochester Institute of Technology, 65 Plymouth Avenue South, Rochester 8, New York.

COLOUR LECTURE BY G. J. CHAMBERLIN

"The Nature of Colour and Its Measurement" is the title of an interesting lecture prepared by Mr. Chamberlin for students at St. Andrew's University, Scotland in 1957. The lecture has been repeated by request in universities, technical colleges, and scientific societies in England, Scotland, Wales, Canada, Denmark and Norway.

In response to many requests Mr. Chamberlin (Tintometer Limited) has made the lecture, with notes on the demonstrations, available to science teachers. All demonstration equipment may be purchased from W. B. Nicholson, Ltd., Thornliebank Industrial Estate, Glasgow, Scotland.

It is Mr. Chamberlin's intention that the lecture should be a simple introduction for beginners in color. With its 32 excellent demonstrations, however, it becomes a rather extensive lecture covering physical, psychophysical and psychological aspects of the subject. It is the type of presentation which might appeal both to the naive student and to the worker with a more sophisticated understanding of the subject.

Demonstrations include illustrations of photopic and scotopic vision, the effect of the color of light sources, simultaneous contrast, after-images, subjective white, colored shadows, effect of surround colors, spectrophotometry, and visual colorimetry.

Inquiries concerning the availability of the lecture notes should be addressed to the author, Tintometer Limited, Salisbury, England.

EYES IN THE ANIMAL WORLD

Reprinted from Sight-Saving Review, Vol. XXIX, No. 2, Summer, 1959.

Remarkable photographs of animal eyes taken by Constance P. Warner appear in the National Geographic Magazine for April 1959. Mrs. Warner, widow of Dr. Carden F. Warner, an eye specialist, worked for 25 years in the field of eye care. When she began studying the eyes of animals she perfected methods of magnifying without a microscope which fully reveal the strange ocular devices of nature.

The strangest eyes are in the lower evolutionary orders -- reptiles, fish, birds, insects -- whose eyes have odd contraptions like diving goggles, windshield wipers and even bifocal lenses. Many creatures have an inner third eyelid which flicks across the eye to moisten and clean it; in birds these are lined with one-celled feathers and serve as feather dusters for the eyeball. For protection against glare the prairie dog has an amber-tinted lens, and the skate has slats like a venetian blind suspended from the upper border of the iris; the emperor penguin's round pupils shrink to a square in ice-dazzle. The gecko "interlocks the scalloped edges of its slit pupils to leave four tiny pinhole apertures."

Burrowing animals have contrivances to shield the eye against dirt; diving birds have a third lid, opaque or crystal clear, to absorb the shock of a power dive. Birds of prey and many swift-flying insects have large eyes to help them find their quarry; moles and burrowing snakes need only small ones. Mrs. Warner has found an amazing variety of pupil shapes: slit, oval, horseshoe, hourglass, keyhole and star among them. The horsefly has a wonderful green eye with 7,000 facets, each sending its picture to the brain. The upper facets project bright, coarse images and the lower ones fine detail, nature's bifocals.

COLOR MEASURING OF PRINTING INK

Color Measuring Instruments for the Printing Ink Industry by R. W. Bassemir (American Ink Maker, Vol. XXXVII, May 1959, pp. 52-53, 55, 127.) This report is a short, rather non-technical treatment of color measurement and instrumentation, apparently intended to introduce the subject to those who have had little or no previous background in the subject. The article briefly touches on the I.C.I. chromaticity diagram and uniform chromaticity scales - in particular the Hunter "L", "a", "b" scale.

Mr. Bassimer divides color measuring instruments into three categories: Spectrophotometers, for setting up and maintaining permanent standards; colorimeters, for rapid determination of color matches in production control. These are best used as color-difference meters with non metameric or slightly metameric matches. Densitometers are used for film thickness control.

The article contains photographs of the following instruments with brief descriptions and recommended applications: Bausch and Lomb Spectronic 20 with reflectance attachment. Beckman DK-2 Spectro-Reflectometer. Color Eye with abridged spectrophotometer. Colormaster Differential Colorimeter. Fischer-Davis-Bruning Colorimeter. Gardner Automatic Color Difference Meter. Hunterlab Model D-25 Color Difference Meter. General Electric Recording Spectrophotometer. Photovolt Model 610 Reflection Meter. Welch Densichron Reflection Densitometer.

PAINTING COLOR SELECTOR FOR LITHOGRAPHIC PLANTS

The National Association of Photo-Lithographers have published a Painting Color Selector for printing plants. The guide based on the DuPont "Color Conditioning" program recommends eight color schemes.

Ivory, combined with accenting greens and browns is recommended for job press room, shipping area, bindery room and composing room. The high reflectance of "Ivory" (78%) makes rooms appear large and airy as well as providing excellent seeing conditions.

Light green with medium green and "Sandalwood" is recommended for stripping, platemaking and pressrooms and for executive offices.

Light gray is a cool, neutral, passive color. It is good in areas where a non-disturbing environment is desirable, where difficult visual tasks are performed and where perfect color discrimination is necessary. It is recommended with greens and terra cotta for sales office, art and copy preparation, stripping opaquing and darkroom areas. Also recommended for pressrooms and shipping areas is a combination of aqua green and dusk green. Aqua greens make a flattering background for flesh tones.

"Blue Haze" walls and ceilings, medium green trim and doors, and "Pueblo Red" floors are suggested for men's toilets. "Pale Candy Pink" ceilings and walls with terra cotta trim and doors, and "Meadow Green" floors are recommended for women's toilets.

A dramatic effect is obtained in waiting room or lobby by combining "Mandarin Red" or "Sylvan Green" with "Rose Beige" walls. If greens and terra cotta are used as trim "Rose Beige" makes an excellent color for job pressroom, offset pressroom, or shipping area.

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For a quiet masculine atmosphere of executive offices the guide recommends "Sandalwood" walls, white ceilings with a trim of "Sunlight", "Apricot" or "Aqua Green".

Wise use of the color schemes, according to the booklet, will result in attractive and functional working conditions. The favorable reaction of plant personnel is desirable and frequently leads to a greater interest in their work.

NEW MULTIPURPOSE GLOSSMETER

A new photoelectric glossmeter has been designed by Hunter Associates for papers, paints, plastics, waxes, floor coverings, and textile yarns, fibers and fabrics. The instrument is constructed to measure both standard and new gloss tests by building elements of the incident and reflected light beams onto aluminum blocks which are mountable at either 75°, 60°, 45°, or 20°.

The optical and electrical units are in separate housings connected by cable. The instrument can thus be used:

1. With specimen on front,

2. Turned on its back with specimen mounted horizontally on top, or

3. With optical unit separate and mounted either flush in a table top for examination of large sheets or over a moving web for gloss recording.

For the paper industry, the new instrument will measure gloss of coated book papers by TAPPI 75° Method T480m-51, of waxed paper by TAPPI 20° Method T653sm-58, of low-gloss papers by contrast gloss, and of high-gloss castcoated and varnished papers by special narrow-aperture methods. A suction-type specimen plate is available to hold paper and plastic films flat for accurate gloss measurements.

For the paint, plastics, and floor covering industries, the new instrument will measure gloss by the long-established 60° method of ASTM D523, and also by the new two-parameter 60° method for furniture finishes (ASTM D1461). High-gloss measurements by the 20° method of ASTM D523 are possible, but low-gloss measurements of 85° sheen cannot be made.

A digital dial is used in the measurement arm of a null-balance bridge. This digital dial is operated either manually or by servo-motor.

COLORIMETRIC CHEMICAL ANALYTICAL METHODS

The Tintometer Limited (Salisbury, England) has announced the publication of the fifth edition of the book "Colorimetric Chemical Analytical Methods". The book has been rewritten and enlarged to 360 pages. Over 150 different tests are described in the book. Each book is sold with an offer of free copies of additional pages as they are issued for a period of two years.

The book is divided into sections, each clearly colour-coded to show its correct position in sequence. It is available at $7.50 from Curry and Paxton, Inc., 866 Willis Avenue, Albertson, Long Island, New York.

CANDIDATES FOR 1960-1961 OFFICERS AND DIRECTORS

In a letter dated September 22, 1959, Walter C. Granville, chairman of the Nomination Committee sent a slate of candidates for officers and directors for the term 1960-1961. Other members of the Nominating Committee are Mr. Waldron Faulkner and Miss Dorothy Nickerson. All of these candidates have agreed to run for office. Other names may be presented in accordance with the by-laws of the Inter-Society Color Council.

President	G. L. Erikson, NAPIM
Vice President	Wm. J. Kiernan, ASTM
Secretary	Ralph M. Evans, SMPTE
Treasurer	Norman Macbeth, IES
Director	Roland E. Derby, AATCC
Director	Charles W. Jerome, IES
Director	Tyler G. Pett, ACS
Director	Warren L. Rhodes, TAGA
*Director	Walter C. Granville, OSA

*According to the by-laws, Article 6, Section 1, the retiring president (in this instance, Walter C. Granville) automatically becomes a member of the board for a period of two years.

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