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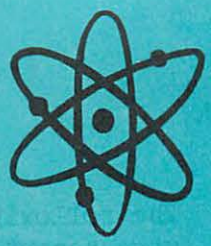

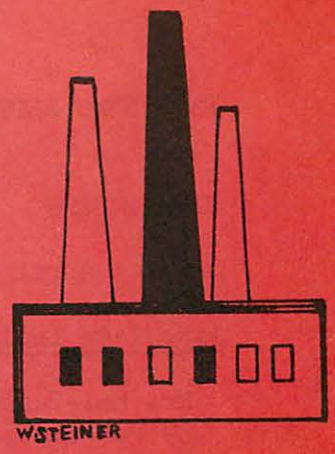

INTER-SOCIETY Color COUNCIL

NUMBER 147 May, 1960

Send News Letter Items to Editor,
Warren L. Rhodes
Graphic Arts Research Department
Rochester Institute of Technology
Rochester 8, New York

Other correspondence to Secretary,
Ralph M. Evans
Color Technology Division
Eastman Kodak Company
Rochester 4, New York

THE ANNUAL MEETING

Each ISCC meeting has its own charm and flavor. Participants this year had an opportunity to enjoy many unusual events. Outstanding on the program was the banquet speaker, James Johnson Sweeney, Director, Solomon R. Guggenheim Museum, New York City. His discussion of the museum and his observations concerning "taste makers" and "taste breakers" were delivered in the setting of the Philadelphia Museum of Art. The delightful film from the Guggenheim Museum charmed the viewers.

Cocktails and dinner surrounded by treasures of art are certainly different than the same fare in a restaurant.

The tradition of the one-day Problems Subcommittee meetings prior to the Annual Meeting is firmly established. The meetings were well attended and active.

Kudos to the meeting committees for the success of the 29th Annual Meeting, and to the speakers and chairmen. You have made us newly aware of the diversity of ISCC and of the magic in the word "color".

NEW MEMBERS The following applications for individual membership were accepted at the last Board of Directors' meeting held on April 10, 1960.

Associate Individual Members	Particular Interests:
Mr. Hal-Curtis Felsher 39 Powerhouse Road Roslyn Heights, New York	Dispersion of colorants in different media; light-fastness of colorants; phosphorescent pigments.
Mr. Tirey L. Ford 1369 Industrial Road San Carlos, California	Color Television - Color Photography.
Mr. Louis A. Graham American Viscose Corp. Technical Service Dept. Box 455 Marcus Hook, Pa.	The preparation, manufacture, color measurement and control, sales promotion and selection of colors for American Viscose Corporation's solution-dyed rayon and acetate fibers known as "COLORSPUN". Consultant to Chemstrand Corp. on colored Acrilan and to Avisun Corp. on colored polyolefin fibers.
Mr. Howard Ketcham 101 Park Avenue New York 17, New York	Graphic, architectural, interior, product design, visual identity programs, exhibitions, writing, lecturing.
Mr. Leon Gordon Miller 1220 Huron Road Cleveland, Ohio	Color control and color styling in industrial design.
Mr. William A. O'Brien Celanese Fibers Co. P. O. Box 1414 Charlotte 1, N. C.	Measurement and specification of color of textile products.
Mr. Robert L. Sawyier 245 Market Street San Francisco, California	Theoretical and practical approach in the field of illumination.
Mr. Norman A. Schoelles 387 Parkside Road Harrington Park, New Jersey	Technical problems of color reproduction; psychology of color.
Mr. W. R. Spiller Harris-Intertype Corp. 55 Public Square Cleveland 13, Ohio	In relation to all the printing processes.
Mr. Kenneth G. West Hallmark Cards, Inc. 25th & McGee Kansas City 41, Missouri	Control in color separation photography, color control on the press, development of new ink pigments for 4-color printing.

Affiliate Individual Members

Mr. Howard H. Boxmeyer Minnesota Mining & Mfg. Co. St. Paul 6, Minnesota	Developing new colors and blends for the asphalt roofing industry.
Mrs. Marion H. Christman 202 Shillington Boulevard Shillington, Pa.	Determine color features and coordination of color in building materials and design - particularly interested in kitchens, bathrooms and color of paint in relation to bricks, stone or exterior and interior basics.
Mr. Kurt Pfahl Hallmark Cards, Inc. 25th & McGee Kansas City 41, Missouri	Quality control and research for printing process and other colors, in lithography, gravure, letterpress and silk screen.
Dr. Laurence Schmeckebier Lowe Art Center Syracuse University Syracuse 10, New York	Problems of color perception.
Mr. John Woschitz, Jr. 2875 Centre Street Montreal, Quebec Canada	1. Its practical applications in the paint industry. 2. Educating personnel in the "science of color".

EUGENE W. COMMERY DIES

ISCC member Eugene W. Commery, internationally known residential lighting authority, died unexpectedly in his sleep shortly before midnight May 25 in a motel at Allendale, S. C.

Mr. Commery and his wife were returning to their Miami (Fla.), home by automobile from Cleveland. They left here Sunday after a two-week visit during which he attended an Advanced Lighting Conference at Nela Park.

Mr. Commery was formerly supervisor of residential lighting for the General Electric Co., serving 42 years with the Lamp Division here prior to his retirement in 1958.

He was born in Cleveland 66 years ago. He was a graduate of Lakewood High School and of the 1916 class of Case School of Applied Science (now Case Institute of Technology). He was an electrical engineer.

Notable among his many contributions to the home lighting industry where the designs of the crystallized "Celestial Room" exhibited in 1956 at the San Francisco Museum of Art, and the lighting for Ronald Reagan's Santa Monica Mountain home.

He was author of GE's most widely read publication, "See Your Home in a New Light," of which more than 10 million copies were distributed. He was also co-author of the book, "How to Decorate and Light Your Home," published in 1955 by Coward-McCann, Inc.

Mr. Commery was a fellow in the Illuminating Engineering Society, an honorary member of the American Institute of Decorators, a technical adviser to the Certified Lamp Manufacturers' program for better home lighting, a representative on the United States National Committee of the International Commission on Illumination, and a developer of lighting design for the New York World's Fair houses in the Town of Tomorrow.

Mr. Commery is survived by his wife; a daughter, Mrs. Walter J. Boyce; and a grandchild.

NEW OFFICERS AND BOARD MEMBERS

The News Letter likes to introduce to you the new officers and board members which you have elected. We admit that it may be doing things a little backwards to permit you to find out about their backgrounds after they have been elected, but this way we do not publish any biographies unnecessarily.

President: G. L. (Tiny) Erikson, Executive Vice President, Braden-Sutphin Ink Co.

Born: November 17, 1898 in Central Sweden of American citizen parents. Came to America in 1902.

Education: Chicago public schools

Employment: Sherwin-Williams Co., Chicago, Chemist in Dry Color and Dyes, 1915-1920; Sunbeam Chemical Co., Cable, Wisc., Chemist-Supt., Dyes and Colors, 1920-21; Manz Corp., Chicago, Chemist - Ink Dept., Supt. - Printing Ink and Colors, 1921-25; American Bread Wrapper Co., Chicago, Supt. - Ink Dept., Colored Inks, 1925-26; Braden-Sutphin Ink Co., Cleveland, Plant Supt. and Research Chemist, 1926-46, Executive Vice President 1946 to present.

Awards: First Distinguished Service Award of the National Printing Ink Research Institute, 1952; L. A. Ault Award, National Association of Printing Ink Makers, 1956.

Government Serivce: War Production Board, 1942-46 as Dollar a Year Man, Chief of Printing Ink Unit, Chemicals Bureau.

Memberships: American Chemical Society, 1920 to present; American Oil Chemists Society, A.A.A.S.; TAGA (Former president); NAPIM, Director, Member of Technical Committee; National Printing Ink Research Institute, Director, Former Chairman, Research Committee; Printing House Craftsmen's Club; Litho Clubs; Lithographic Technical Foundation, Research Committee; Research and Engineering Council of the Graphic Arts, Executive Committee; ISCC, individual member, 1936 to present, Representative of NAPIM since they joined ISCC; A.S.T.M. - D.1.

Hobbies: Lecturing on color (30 years); swimming and exercising at YMCA; badminton, volleyball, baseball, etc.

* * * * * *

Board of Directors: Charles W. Jerome, Senior Engineer, Engineering Laboratories, Sylvania Lighting Products.

Education: Bachelor of Science Physics, Massachusetts Institute of Technology, 1934.

Employment: Research Laboratories, Interchemical Corporation, mainly on color analysis problems, microscopy, and rheology, 1934-41; Engineering Laboratories, Sylvania Lighting Products, color analysis and electrical measurements on fluorescent and electroluminescent lamps, 1946 to present.

Government Service: World War II, Ordnance Corps, Lt. Col.

Memberships: Electrochemical Society; Optical Society of America; International Commission on Illumination, U. S. Committee; Inter-Society Color Council; Fellow of the Illuminating Engineering Society.

* * * * * *

Board of Directors: Tyler G. Pett, Kopp Glass, Inc.

Born: July 18, 1911 in Jackson, Michigan

Education: Jackson Junior College, Jackson, Michigan; Hillsdale College, Hillsdale, Michigan, B. S. Chemistry, minors physics and mathematics, 1933; University of Michigan, summers 1936-39, M. S. 1939, major physics.

Experience: Instructor, Jackson Junior College, chemistry and physics, 1934-43; Instructor, University of Michigan, Physics Department, 1943-44; Glass Technologist, Bausch and Lomb Optical Company, control and specification of color as well as measurement of physical properties of glass at elevated temperatures, 1946-55; Physicist, Kopp Glass, Inc., Swissvale, Pa., color and physical properties of glass, 1955 to present.

Government Service: Physicist, Engineer Board, U. S. Army, Corps of Engineers, Ft. Belvoir, Va., worked on development of Sniperscope -- "got into color via the backdoor" (infrared), 1944-46.

Memberships: American Ceramic Society, Glass Division; Illuminating Engineering Society; Inter-Society Color Council representing the American Ceramic Society.

Other Activities: Christian Education of Children, Superintendent of Church School, St. James' Episcopal Church; Assistant Chairman of W. D. Boyce District of the Boy Scouts, East Boroughs Council in charge of health and safety. Married Helen Bailey of East Liverpool, Ohio, M. A. Sculpture and Fine Arts, University of Michigan, 1937.

* * * * * *

Board of Directors: Roland E. Derby, Jr., President, Derby Co., Inc.

Born: April 5, 1925 in Lowell, Massachusetts

Education: B. S. Massachusetts Institute of Technology, M. S. Lowell Technological Institute.

Employment: Textile Aniline and Chemical Co., dyestuff application and manufacture, 1946 to present; color measurement service to textile and related industries. (This service has resulted in considerable research activity concerned with application of color measuring instruments to color problems in textiles and related areas. This research has produced a number of papers on these topics), 1949 to present; consultant on color problems concerned with color standards, color measurement, and color matching; on the staff at Lowell Technological Institute -- at present teaching a senior course entitled, "Atomic and Molecular Structure," 1949 to present; President of Derby Co., Inc., concerned with research and development in dye application, at present time.

Hobbies: Hunting, fishing, flying, gardening

* * * * * *

THE COLOR COUNCIL OF CANADA

The spring sessions of the council have brought many speakers well known in the ISCC. On March 8th Dr. Günter Wyszecki discussed "Contemporary Problems in Colorimetry". Dr. Wyszecki is a member of the National Research Council of Canada. His topic covered:

1. Standard Observer

   History, 1931 C.I.E. Standard Observer (2°), work on 10° observer by Stiles-Burch and Speranskaya, field trials with special reference to recent NRC field trials, future work, outlook.

2. Color Rendering of Light Sources

   Definition, work of C.I.E. Expert Committee on color rendering, spectral band method, color shift method, new statistical approach (Stiles-Wyszecki), future work, outlook.

3. Uniform Color Space

   UCS diagrams, color order systems, work of OSA committee on uniform color scales, regular rhombohedral lattice systems, basic geometrical concepts (curvature of color space).

   This subject could only be briefly mentioned because of lack of time.

On Tuesday, March 29th a joint meeting sponsored by the Board of Education, City of Toronto; the Board of Health of the City of Toronto; the Toronto Teachers' Council; and the Colour Council of Canada. The topic, "Colour Vision Deficiency," was discussed by a panel of the following individuals:

Professor W. E. Carswell, School of Architecture, University of Toronto (Chairman)

Mr. R. E. S. Jones, Inspector of Special Education, Board of Education

Dr. A. G. S. Heathcote, Board of Health, city of Toronto

Mr. Arthur C. Morris, Harbord Collegiate, Past President Toronto Teachers' Council

Mr. E. L. Palin, Assistant Principal, Ryerson Institute of Technology

Mr. Gene W. Butt, Ontario College of Art, President of the Colour Council of Canada

The panel asks, "Are you colour-blind or is a member of your family colour-blind?" It is estimated that there are 30,000 persons in Toronto who have some colour vision deficiency. The Board of Education in cooperation with the Board of Health has authorized colour vision tests to be commenced in 6th grade of the public schools.

On April 12th the speaker was Dr. E. C. Williams, Director, Division of University Extension, University of Toronto. His topic was "Psychology Related to Form in the Third Dimension". The problem was neatly illustrated on the announcement with the illusion of curvature of parallel lines as they pass around the center of a series of radiating lines. According to the announcement, "In some psychology the significance of an experience is never static, immutable, or absolute but dynamic, variable, and relative. An experience may change in appearance and in meaning as the pattern changes."

A film, courtesy of the Canadian Kodak Company Limited, was presented at the Annual Meeting of the Colour Council Tuesday, May 10th. The film is entitled, "A New Use for Colour Photography".

NEW VISUAL AIDS FOR STANDARDIZING AND COMMUNICATING PRODUCT APPEARANCE-STP 258

The ASTM has announced the availability of a new paper covered book (36 pages). The book is the product of a symposium which was organized to focus attention on the problem of product appearance specification.

Contents

Introduction--J. M. Hemphill.
Status of ASTM Methods and Standards for Appearance Evaluation--I. Nimeroff.
Visual Aids in the Textile Industry--J. B. Goldberg.
Potential Uses of Closed Circuit Television for Product Inspection--R. Vendeland.
Summation--G. W. Ingle.

Price of the book is $1.60 to ASTM members; $2.00 to non-members. Send order to: American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pennsylvania.

FPVPC CHANGES NAME TO FSPT

The "Official Digest" now carries the new name, "Federation of Societies for Paint Technology". The old name, Federation of Paint and Varnish Production Clubs, was dropped and the new one adopted because the constituents felt that the new name better reflected the objectives and activities of the organization.

ABSTRACT OF TWO JAPANESE ARTICLES

By letter of March 21, 1960, Mr. Yoshio Sugiyama of Osaka Industrial Research Institute, Ikeda City, Osaka, Japan, very kindly sent me reprints of two recent papers by him. The first is entitled Comparison of Different Color-difference Formulas by Using Rank Correlation Method (Letter to the Editors), J. Appl. Phys. Japan 28, 668-9 (1959): UDC 535.6. In it Mr. Sugiyama lists in tabular form for 19 groups of colored samples the rank-correlations between visual judgments and calculations by seven color-difference formulas. The formulas in the order of increasing correlation are: Godlove-Adams, Godlove, Adams chromatic value, Judd, Nickerson, MacAdam, and Modified MacAdam.

The second paper is entitled On the L/Y Ratio, J. Appl. Phys. Japan 28, 681-7 (1959): UDC 535.643.2. The English Abstract prefacing the paper is reproduced verbatim:

"Heterochromatic brightness of colored samples is measured with Munsell value scale standards. The samples are divided into two groups: one is of medium luminous reflectance and the other of high luminous reflectance. Contour lines of the ratios of observed heterochromatic brightness L to luminous reflectance Y are drawn on C.I.E. (x-y) chromaticity diagrams by inter- and extrapolation methods. The differences between the observed data and the data obtained in previous investigations are found very small in the direction of -B axis. This is considered explainable on the one hand by the displacement of luminosity curve and on the other hand by the theory of color vision that the sensitivity of three receptors are non-linear in color perception."

Kenneth L. Kelly

COLORS ON CORRUGATED CONTAINERS

The News Letter received a delightful booklet written by Howard Ketcham. The booklet, "How to Select Customer-Catching Colors on Corrugated Containers," was published by Stone Container Corporation, Chicago.

In this booklet, the reader learns that a corrugated container is no longer just a box. It, too, has joined the ranks of packages, wrappers, etc. as a salesman for products.

Additional copies may be obtained from John Dinges, Stone Container Corporation, 4200 West 42nd Place, Chicago 32, Illinois.

CREATIVE LIGHT DESIGN

The following article is of broad general interest to members of the ISCC. It is reprinted from Interior Design Magazine, November, 1959 with permission of the author, Gerald B. Ewing. Mr. Ewing is a lighting consultant and lighting designer. His work includes the new Time-Life Building.

Creative Light Design

by Gerald B. Ewing

Visual design is not something created anew, something realized from scratch—picked at and poked along on a drawing board; but the singing beauty of the world around us, put to man's purpose through the creative artist. The poetic principle governing visual design is a combination of the obvious with subtle suggestions and conjured memory associations of a million years of evolution. The artist in visual design, like all artists, wakes in inner man his power of perception, gathers all the longings and emotions of man together and creates to satisfy, delight, awe and inspire.

Our basic senses have never changed. Perception for beauty, governed by the laws of nature, unfolds in repetition to the expectant excitement of man, who is satisfied and inspired by that which he anticipates, and already reveres. We must judge all visual design by its ability to meet these needs, for man is a creature who delights in visual beauty that leads the eye to suggest even more beauty and satisfaction hidden within its core.

We seem to have lost the art and understanding of light and visual beauty. We must become aware of the basic principles of light in terms of human perception, before we can design with it as a vital part of our contemporary architecture.

Because of the technology involved in producing artificial light, it has unfortunately been allowed to become associated in our minds, and used in our architecture, as a mechanical utility. We have thus denied ourselves the fundamental use of the one medium which could create for us the desired visual environment all true architecture must possess.

Unlike natural light, which we accept as an integrated part of our everyday environment, the words—artificial light—give us a mental picture of the lighting fixtures in vogue at the moment, instead of the actual effect created by the light itself. The general practice today is to design the building in terms of cubic feet and building material, and then apply the lighting fixtures—considered by the architect as a painful necessity, something which he wishes he could do without—unless at times he feels that acres of slick plastic ceiling will give a contemporary look to an otherwise old idea.

Light must be reaffirmed in the right order of thought in our architectural design—not last, but first! For man's contact with the world around him is a visual contact, and this world of vision is the basis for all his comprehension, emotions and memory. We are all instinctively aware that man's direct relation to his world is through sight, and that sight is our ability to see light. However, we seem to forget this naive fact when we design architecture.

When we see an old cathedral which takes advantage of the natural phenomenon of the sun's position in the sky in relation to the human observer, we realize it is not actually the stone we see but the light reflecting from its surface, and because of this the whole visual effect changes as the sun moves across the sky. We know that the architect of this building understood the play of natural light and its relationship to man and man's mind, and used his stone as reflective planes to arrange his visual effects in terms of light. The interiors of these buildings were also arranged to catch the light, creating for man the moods and illusions he understood and had feeling for. So we can say that light was the actual medium with which these designers worked.

Contrary to present practice, creative light design cannot be approached from the negative end of analysis. The scientific basis for light design is not the mechanical measurement of radiant energy, but the effects of radiant energy on the human mind. In the same way that the basis of music composition is the theory of harmony, which is the relationship of chord formations in terms of their emotional effects on humanity, so light design is a unification and flow of thought related to man's ability, through his optic nerves and mind, to receive and evaluate a visual illusion. Whereas music and noise are two different things, so are light design and illumination—the difference being that music and light design have an order, arranged in terms of human reception. Light design in these terms dictates not only the basic conception of the architecture, but encompasses every inch of space, every color, vista and illusion of form.

In the sun's light, our eyes and sensibilities have become conditioned to accept and react to light which

is reflected and directed from a single source. This single directional source allows our ultimate perception, adding depth, sparkle, and color to all objects. Only on a grey day do we fail to see so well, and feel depressed—when the light has been diffused by an overcast sky to produce an all-over monotonous, shadowless, effect.

We must take a creative approach to light design, knowing where to put the light, and perhaps more important—where to take it away. We must learn to use light as a medium of expression, creating poetry of vision by a dynamic use of light, shadow and color.

We see by contrast—dark against light, light against dark—and by color differences which can be grouped generally as warm against cool, cool against warm. In sunlight, all objects in the total field of view receive equal illumination from the straight rays of the sun, and all shadows fall at the same angle and with the same value of darkness. In artificial lighting, with a point source, the intensity of the illumination changes with distance from the source, as well as the size and edge gradient of the cast shadows. These factors make an artificially lighted scene fundamentally different in aspect, from natural sunlight.

On a day with an overcast sky, we have an effect of all-over, even, illumination that is approximated artificially by the 'luminous ceiling' in architecture. This diffusion of the light, washes out form, texture, and color, in the same manner as nature's 'grey day.' We cannot, of course, duplicate the conditions of the natural sunlight artificially, as we have neither the distance nor intensity of the sun to work with. We can, however, approximate certain basic effects produced by the sun; but before we learn "how to do it" we must first learn the basic principles and effects that we are trying to duplicate.

The following illustrations will show how the addition of greater amounts of artificial light, producing higher general lighting levels, tend to diminish differences of contrast by which we see; and that footcandle levels are nearly meaningless in the conception of architectural lighting design, as the eye adapts itself equally well to various lighting levels.

Part I: Artificial and Natural Lighting

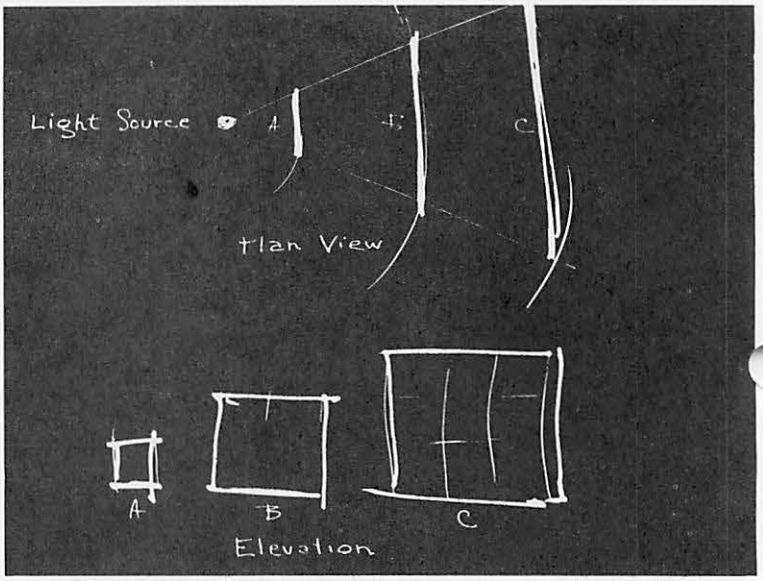

Figure A

From a point source of artificial light, the candlepower varies inversely with the square of the distance. The three areas a, b, c represent the increase in area over which the same amount of light from a point source must be spread. As the distance increases, the brightness of the surface decreases in proportion.

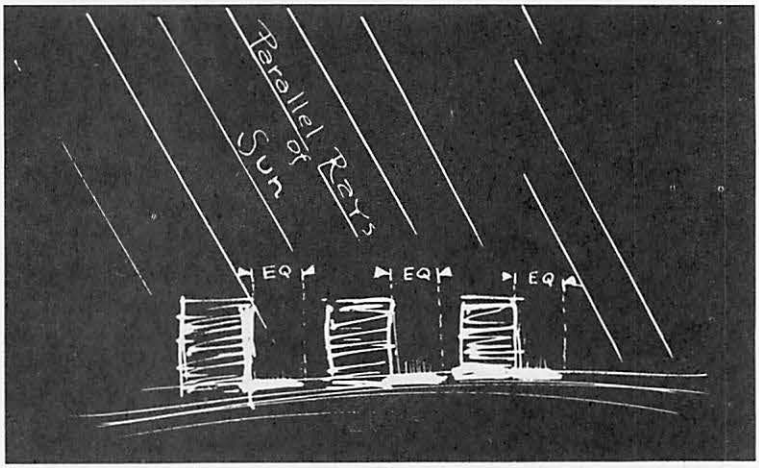

Figure B

Shows the natural effect of sunlight that cannot be duplicated artificially over large areas. Sunlight casts equal light and equal shadows on objects regardless of distance.

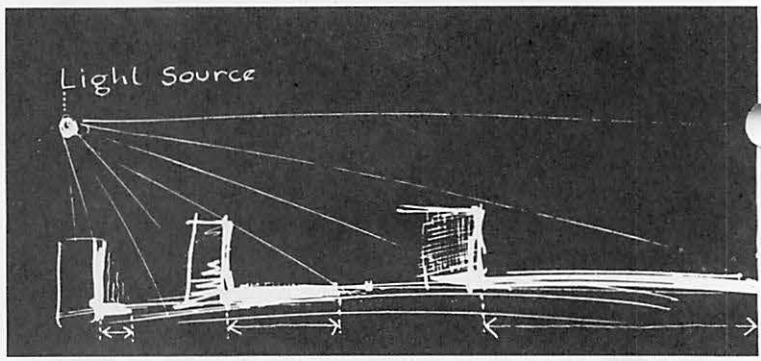

Figure C

Shadows from artificial point sources increase in size and become lighter with distance from the source.

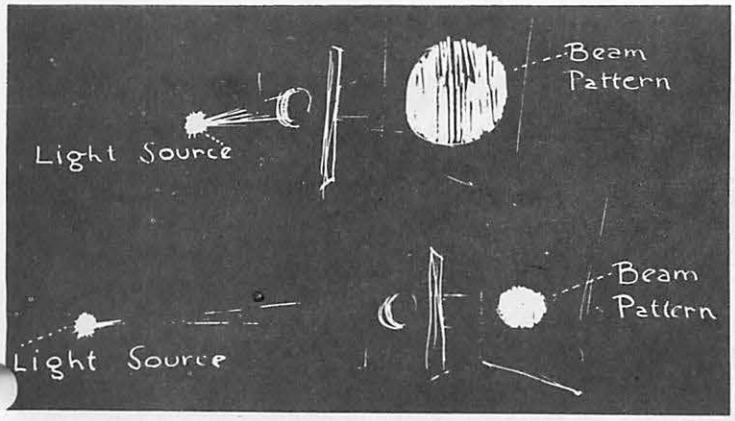

Figure D

With a point source, the size of a light beam through an aperture is determined by the distance of the source.

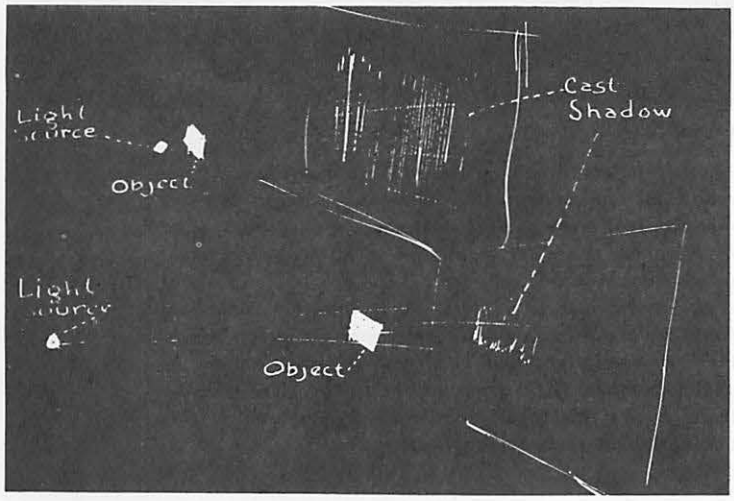

Figure E

With a point source, the size of the cast shadow is determined by the distance between source and object.

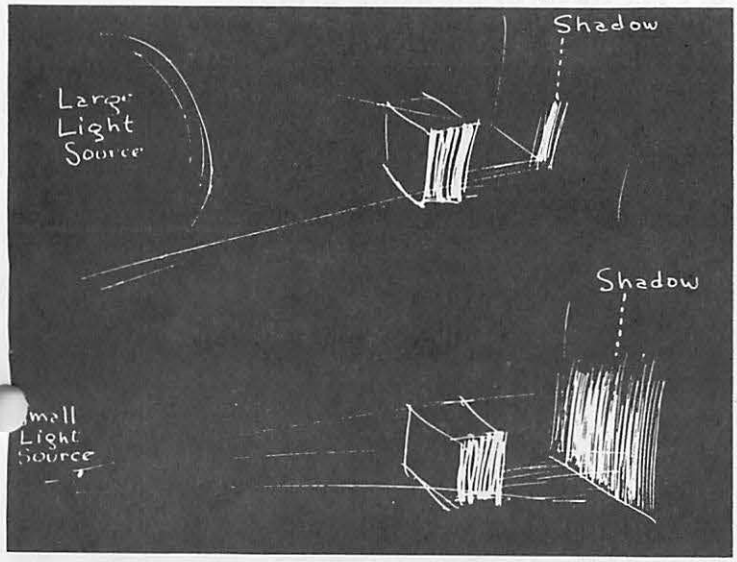

Figure F

Large source creates small shadow.

Figure G

Small source creates large shadow.

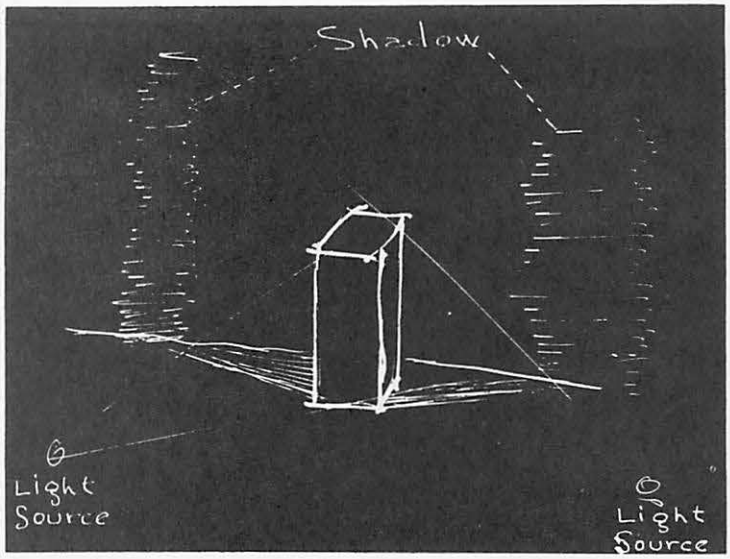

Figure H

Multiple sources create multiple shadows.

Conclusion

An artificial point source of light creates effects never found in nature. This instinctively bothers us and diminishes our visual acuity unless properly used by the lighting designer.

Part II: Shortcomings of the Footcandle Method

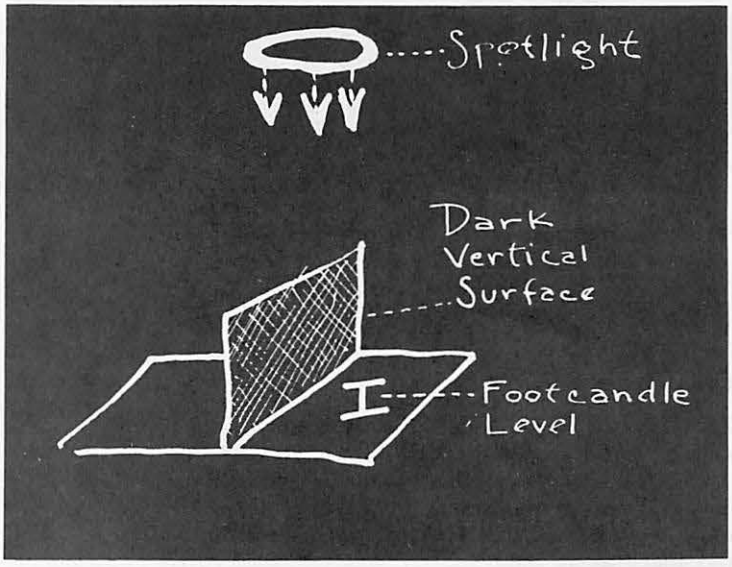

Figure I

Horizontal surface lighted to a certain level of illumination (I) by a spotlight with parallel beam; the vertical illumination is practically zero.

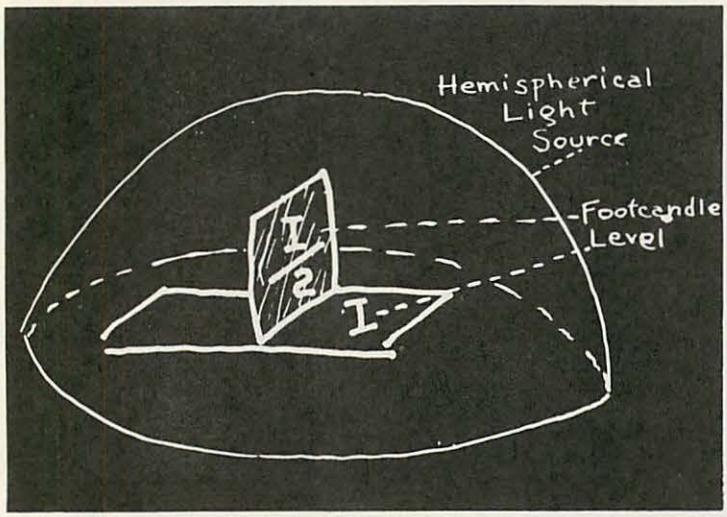

Figure J

Same surfaces with all-over hemispherical lighting, with the same illumination (I) on the horizontal plane; the vertical plane illumination now equals one-half the horizontal illumination.

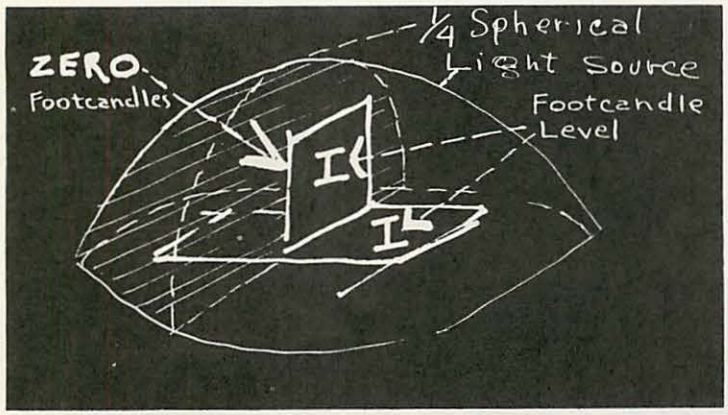

Figure K

Same surface with ¼ spherical illumination. Horizontal surface remains same (I); vertical surface facing illumination is similar to horizontal surface (I); vertical surface on opposite side from source equals zero.

Conclusion

This illustrates the fallacy of considering only the footcandle readings on the horizontal surface. Although Figs. I, J, and K all have constant footcandle readings (footcandles are always measured on horizontal surface 30" above floor), the vertical surfaces vary in each illustration which would cause entirely different visual effects architecturally and different visibility of a task on the working plane as our eyes adjust to the total field.

Part III: Glare

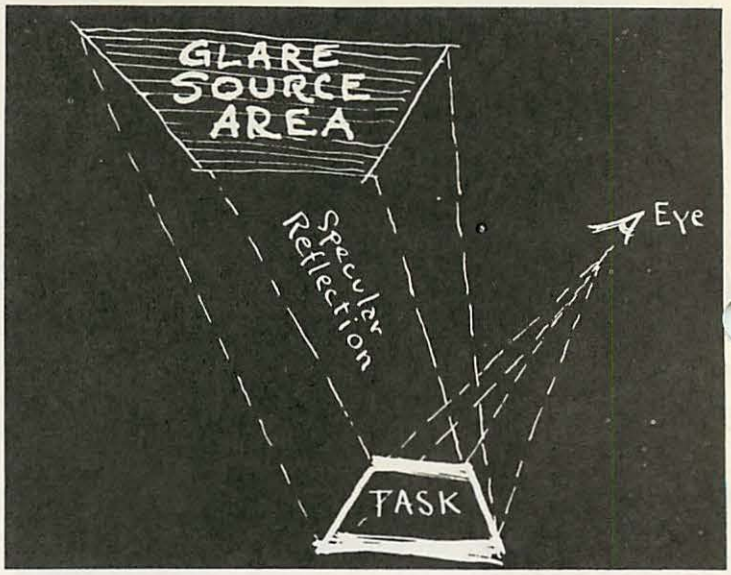

Figure L

Another fallacy in giving too much importance to footcandle measurement on the horizontal plane is the fact that the light meter, unlike the human eye, is not affected by glare. On the meter, light from all directions is added to a total which becomes meaningless in terms of visual acuity as light from a glare source must be subtracted from the light in favorable directions. In other words, there is good light and bad light and they cannot be added together. Light from source in the glare area detracts from visual acuity and must be subtracted from totals of light from favorable directions.

Part IV: Natural Lighting Effects

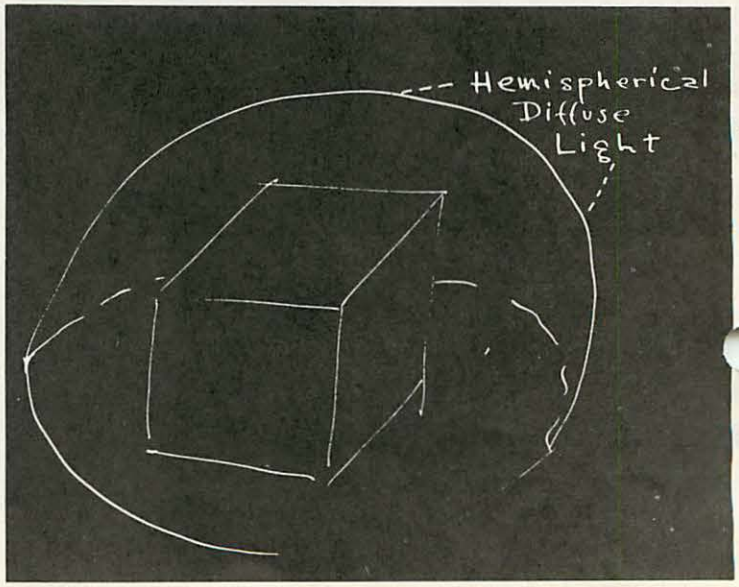

Figure M

Diffuse light from all directions obliterates shadows giving the same dull effect to a room as an overcast sky gives to a gray day.

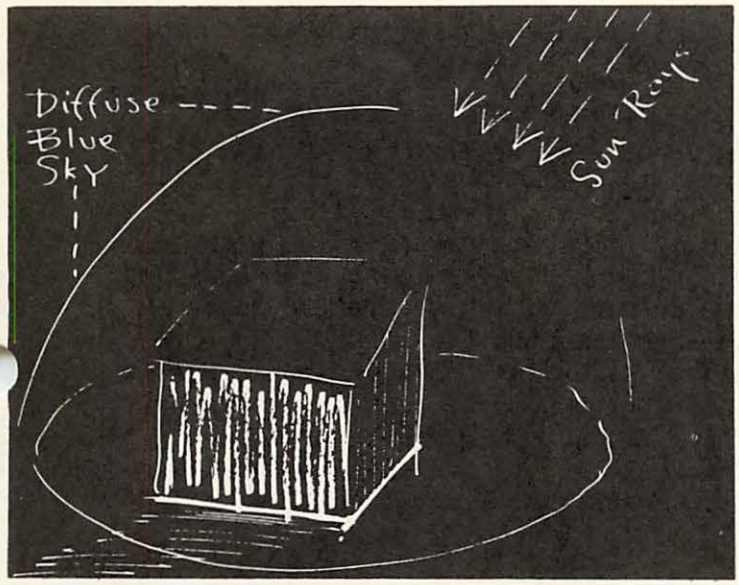

Figure N

A sunny day gives objects the best visibility. The warm straight rays of the sun casting well defined shadows help us distinguish form, space, color and texture. Here, the all-over diffuse light from the blue of the sky creates transparent, cool shadows. If we desire a bright, cheerful room, we must capture in our architecture these lighting effects of the sunny day.

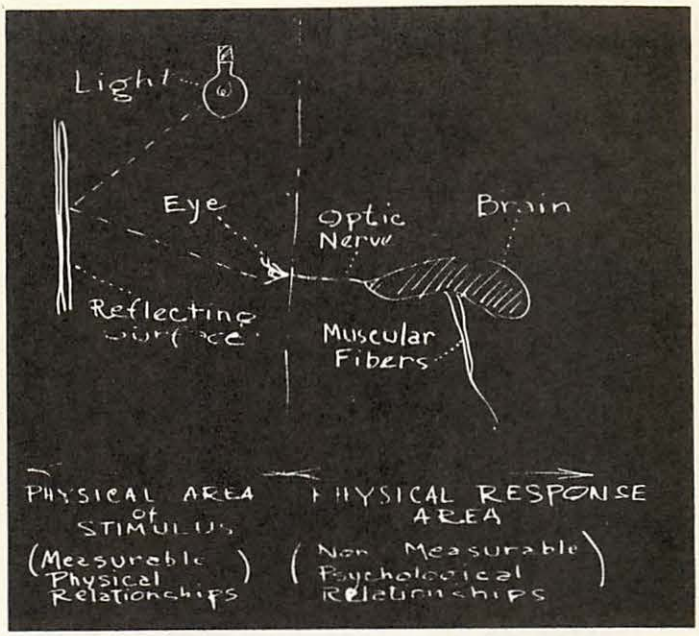

Figure O

The psychological analysis of our sensations brings out the fundamental fact that we see light not as a measurable physical factor but only in relation to the individual observer from his unique position in time and place.

Conclusion

Light design must go beyond the mere physical considerations of vision. What happens when we "see" in relation to consciousness cannot be probed by scientific analysis or abstract mathematics; it enters into the realm of psychology and philosophy. The most important factor for successful visual light design is the realization of the relationship between scientific anaylsis and the great force of human intuitive creativity. Light design deals with creating a relationship between the light source and the inherent emotional and biological needs of the human element involved. In designing with light, we are not dealing only with mechanical and physical elements of radiant energy; neither are we solely concerned with the principles of optics involving the human eye, but primarily with human perception in its final distilled form as compounded by the human mind.

Part V: Psychological Effects of Light

EXPOSURE STUDIES OF ORGANIC PIGMENTS IN PAINT SYSTEMS

The following is a summary of the work done by Vincent C. Vesce published in the Official Digest, 31, No. 419, Part 2 (1959). 143 pages.

After the death of Dr. J. J. Mattiello, Technical Director of the Hilo Varnish Company, a Past President for the Federation of Paint and Varnish Production Clubs, and editor of a five-volume series on "Protective and Decorative Coatings," the Federation established the Mattiello Lecture in his honor. Each year, at the Federation meeting, a distinguished scientist, working in the general field of paints, is invited to give a lecture on some subject of interest to him. For the 1959 lecture, Vincent C. Vesce, Technical Director of Harmon Colors, National Aniline Division, Allied Chemical Corp., gave this lecture, which has been reprinted as a separate publication by the Federation (Price $2.00).

Vesce, in the work reported here, has studied 77 different pigments, representative of all classes of organic pigments that may be expected to have any significant light-fastness. These were prepared in five different vehicles--an air-drying alkyd enamel, a melamine-alkyd baking enamel, a nitrocellulose lacquer, an acrylic lacquer, and an acrylic emulsion. Three dilutions with titanium dioxide were used with each pigment, the particular dilutions being chosen depending upon the usual uses of the pigment. The panels were exposed at Miami, Florida, on Bonderized steel panels, at 45° facing South. Panels were inspected at 3, 6, and 9 months. Exposed and unexposed control panels were measured on a G. E. Spectrophotometer and the Munsell renotations were calculated. Color differences, in N. B. S. units, between the exposed panel and the control, were calculated, using the Godlove formula. The results are given in 77 tables, which show the Munsell renotation of the unexposed and exposed pigments, in five vehicles at three different ratios of pigment to white. Only one exposure period, judged most significant for a particular series, is given.

It is not possible, of course, to summarize the tremendous wealth of data given in this report in a brief review. However, several general statements may be made. There is a full spectrum of hues available in any degree of lightfastness, but lightfastness is not a property of the pigment alone. It is influenced by the vehicle and by the amount of white pigment used. The choice of the most suitable pigment for a given end-use depends upon the vehicle to be used and the amount of dilution with white that is required. The vehicle also influences, to some degree, the original color and the change of color on exposure.

In 53 figures, color reproductions illustrate (as faithfully as possible within the limitations of four color process lithography) the differences between exposed and unexposed panels.

Anyone working with organic pigments will find this report an inexhaustible mine of useful information, as well as an excellent example of how modern methods of color measurement and the expression of color differences can be used to display the differences amongst pigments and pigmented systems. A bibliography of 110 references is appended.

Francis Scofield

Editor's Note: Through the courtesy of Harmon Colors a limited number of complimentary copies of Mr. Vesce's lecture have been set aside for members of the ISCC. To obtain a copy, address your request to Mr. F. F. Bingham, Harmon Colors, P. O. Box 14, Hawthorne, N. J.

A QUANTITATIVE STUDY OF REVERSAL OF CLASSICAL LIGHTNESS-CONTRAST

The following is a review by Dr. Sidney Newhall of an article by Harry Helson and Frederick H. Rohles, Jr. which was published in the American Journal of Psychology, 72, 530-538, December 1959.

The reversal of classical contrast investigated by Dr. Helson and Major Rohles is a form of the Von Bezold spreading effect. This effect consists in a reduction rather than enhancement of the perceived differences between a visual pattern and its contrasting background. Thus an obvious tracery of white lines breaking up a gray background into lesser areas yields the effect of lightening the background as a whole, but without vanishing into the background. Von Bezold showed that the effect holds for color; that hue and saturation differences are reducible as well as the lightness effects characteristic of achromatic patterns. It is as though the contrasting areas were partially mixed, blended, assimilated, or spread into each other; hence the expression "spreading effect." Ralph Evans first used this particular expression, but it is essentially equivalent to Von Bezold's "raümliche Ausdehnung" (spatial spread).

Helson's and Rohles' admirable study is concerned with perhaps the most important external physical condition underlying the occurrence of the spreading effect, viz., the dispersion of the contrast pattern. Helson devised a simplified Von Bezold pattern which was continuously variable in dispersion; and with this they proceeded to quantify the effect by establishing a functional relation between amount of dispersion and amount of observed effect.

The observer viewed a 7 x 11 inch gray card with its long dimension horizontal, and at a distance of 3 m. Half of the uniform gray card had been ruled over with vertical 1 mm white parallel lines and the other half with vertical 1 mm black parallels. The observer was asked to look for any apparent difference in the grays of the two halves of the card and to rate the difference. Fourteen such 7 x 11 inch gray cards were observed, and they differed only in the spacing of the overlay of parallel lines. On the card with the closest spacing the separation between adjacent lines, whether black or white, was 3 mm, while on the card at the other extreme the separation was 55 mm.

The investigators found that "the closer together the lines are spaced, the greater is the lightening effect of the white lines and the greater is the darkening effect of the black lines. At 3 mm separation, the white lines produce the effect of a very, very much lighter gray than the black-lined gray, and the black lines give the effect of a very, very much darker gray than the white-lined gray." Even with the greatest line separation used (55 mm or 1 degree subtense), there was still some slight spreading effect.

In a cited study by Dr. R. W. Burnham, there is an exploratory series, also by paired comparisons, which suggests a somewhat simpler design. He ruled green papers into square check patterns with white lines crossing at right angles.

Only white lines were used and the shape of the subdivisions remained constant. The size of these squares was varied by the separation of the parallels which varied from 1 to 16 per inch. Though the data were considered too limited for analysis, the observers' report of increasing lightening with increasing lines accords with Helson's and Rohles' quantitative results.

Neither they nor Burnham provide a simple physiological explanation; but both reports discuss various plausible factors pointing to complex causation. As Helson and Rohles specify, there are probably a number of factors involved in both contrast and reversed contrast, and whether the one or the other effect is actually observed depends on the net result of the interactions among the factors. Among the possibilities mentioned are the relative over-all light fluxes from the stimulus surfaces compared, power of suggestion, duration of exposure, adaptation level, local adaptation, and spreading of stimulation or diffusive mixture in the retinal image.

The latter factor seems especially promising to the reviewer; indeed it might well account for Helson's and Rohles' results and nearly all of Burnham's observations. Consider conditions which are known to produce or enhance the phenomenon and which at the same time could augment diffusive mixture at the retina, e.g., Von Bezold patterns, faulty focussing, viewing through nearly closed eyelids, viewing at a distance. Such a simple physical hypothesis may be shattered or supported by Dr. Helson's continuing research in this fascinating field. The immediate objective, however, is to envisage classical contrast and reversed contrast within the same frame of reference.

GERMAN COLORIMETRISTS TOUR USA

A group of German colorimetrists headed by Prof. Dr.-Ing. habil. Manfred Richter toured the United States during March and April. The group included representatives of textile dyeing, television, chemicals, plastics, automotive finishes and standards.

Their study was comprehensive and intensive. The itinerary included Kodak, DuPont automotive finishes, The Bureau of Standards, Davidson and Hemmendinger, and many other color centers.

In addition to pursuing color, these specialists investigated documentation and education. Dr. Richter was particularly interested in the News Letter bibliography since he is interested in documentation in relation to his wonderful abstracts in Die Farbe.

In spite of their busy schedule, the group found time to have dinner at the home of David MacAdam, meet with the Washington and Baltimore colorists, attend the OSA meetings in Washington, and the ISCC meetings in Philadelphia.

We enjoyed having these distinguished guests. We hope they enjoyed their visit and benefited as they expected to.

Ed.

THE LOGIC AND MAGIC OF COLOR

On the evening of April the nineteenth, 1960, a noteworthy exhibition celebrating the centennial anniversary of the Cooper Union was opened in the Cooper Union Museum, Cooper Square, New York. The exhibition entitled "The Logic and Magic of Color" was prepared under the supervision of Dr. Calvin S. Hathaway, curator of the museum, who is a member of the Council. The distinguished audience attending the opening of the exhibition included many members and friends of the Council. Two of these were Dr. Manfred Richter, the noted colorist, and one of his associates, Dr. Konrad Hoffman. The exhibition was the last visit of the five and one half week tour of the United States by German scientists.

Over three hundred items are included in the exhibition under the general divisions of Color and Light, Visual Phenomena and Color Perception, Nature and Color Chemistry, Meaning and Pleasure in Color, Systems Terminology and Color Measurement, and Color and Human Response. Fascinating demonstrations of the physics of color and light were developed by Professor Milton Stecher of the Physics Department, Cooper Union School of Engineering. Over eighty corporations and individuals were lenders to the exhibition of a wide variety of materials and exhibits. Seldom has such a comprehensive demonstration of color been shown in any one exhibition. The ardent colorist can find exhibits relating to his particular chosen field no matter what the interest.

An excellent catalog has been prepared and printed on colored stock with colored inks, used in accordance with research studies of Faber Birren to provide 80% contrast for maximum efficiency and minimum eye fatigue. A unique essay by Edward Kallop describes the general subject of color, tying in each article on exhibit with the delineation of the many aspects of color. Another unique feature includes five pages of selected references enabling the student of color to investigate further the background of the exhibits. Those who are in the New York Area, or visitors to New York, are urged to see this magnificent demonstration of color in the Cooper Union Museum. The exhibition will continue until the thirty-first of August, 1960.

W. J. Kiernan
Bell Telephone Laboratories

HUNTERLAB D36 DISTINCTNESS-OF-IMAGE GLOSSMETER

The Hunterlab D36 Distinctness-of-Image Glossmeter is the first photoelectric instrument to measure the capacity of surfaces to reflect images. It is applicable to the following high-gloss materials:

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Ceramics:	Porcelain enamel and wall tile
Metal:	Stainless steel, bright aluminum
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PRINTING INKS AND COLOR

Proceedings of the Fifth International Conference of Printing Research Institutes is scheduled to be published by Pergamon Press. The topic of this conference was "Printing Inks and Color". The conference was held at Lehigh University under the auspices of the National Printing Ink Research Institute.

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TINTOMETER LIMITED APPOINTS NEW REPRESENTATIVE

The News Letter has received notice that Hayes G. Shimp, Inc., 866 Willis Avenue, Albertson, Long Island, New York, is now the distributor for products and services of Tintometer, Limited.

Several references have been made in the News Letter to Lovibond glass standards and the Lovibond Color Scale. These references list Curry and Paxton as the distributor.

Any inquiries concerning Lovibond or other Tintometer products should be addressed to Hayes G. Shimp, Jr.

LIST OF ARTICLES ON COLOR RECEIVED BY NEWS LETTER

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"Color Trends and Color Merchandising," Edward Salas, Am. Paint & Wallpaper Dealer, 52, No. 5, p. 38 (1960).

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"Die Messung des spektralen Reflexionsgrades von Weiss-Standards, I: Die Messung des Kugelanstrichs," Wolfgang Budde, Die Farbe, 7, Nr. 1/3, pp. 17-24 (1958). II: "Die Messung beliebiger Weiss-Standards," Die Farbe, 7, Nr. 6, pp. 295-298 (1958).

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"Selection of the Optimum Source of Artificial Illumination for the Matching of Color," Phila. Paint & Varnish Prod. Club Illumination Committee, Off. Digest, 29, No. 394, pp. 1153-1158 (November 1957).

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"Some Color Demonstrations I Have Shown," Deane B. Judd, J. Opt. Soc. Amer., 49, No. 4, pp. 322-337 (April 1959).

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"Some Heterozygous Manifestations of Colour Blindness," R. W. Pickford, M. A., PH.D., D. Litt., British Journal of Physiological Optics, 16, No. 2, pp. 83-95 (April 1959).

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"Some Laboratory Techniques for Color Control in Production," New York Paint & Varnish Prod. Club, Off. Digest, 31, No. 418, pp. 1377-1394 (1959).

"Some Optical, Thermo-Optical, and Piezo-Optical Properties of Synthetic Sapphire," Myron A. Jeppesen, J. Opt. Soc. Amer., 48, No. 9, pp. 629-632 (September 1958).

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