Inter-Society Color Council Newsletter

NUMBER 232
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COVER DESIGN – DONALD M. GENARO AND VALERIE PETTIS OF HENRY DREYFUSS ASSOCIATES, NEW YORK CITY
COVER PRINTED BY PROGRESSIVE COLOR CORPORATION, ROCKVILLE, MARYLAND
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CONSULTANT – MIMEOFORM SERVICE, INC., WASHINGTON, D.C.

APPLICATIONS APPROVED FOR INDIVIDUAL MEMBERSHIP

Applicant	*Member-Bodies and Interests*
Mrs. Patricia L. Barnes 157 East 18th Street New York. New York 10003	CAUS, CMG. Job interest and experience in coordinating, styling, marketing, merchandising, promotion and publicizing in both domestic and European fashion markets. Also interested in color Symbolism (occult science). (She is also a member of the National Home Furnishings League, Fashion Group, Trends, and Shoe Women Executives.)
Mr. John Bohman 251 Wincott Drive Weston, Ontario, Canada	AATCC, FSPT. Interested in marketing of apparatus for colour measurement. (He is also a member of the Canadian Society for Colour.)
Mrs. Christine K. Bolcar Dutch Boy Paints 195 Clinton Road W. Caldwell, N.J. 07006	Interested in pigment evaluation and use in colorants; color matching in paints.
Mr. Paul Britt Manager Color/Marketing E. I. du Pont de Nemours & Co. 945 Stephenson Highway Troy, Michigan 48084	CMG. Styling new colors and the subsequent manufacture and control by instrumental techniques.
Mr. Thomas M. Chambers E. I. du Pont de Nemours & Co. P.O. Box 1217 Parkersburg, W. Va. 26101	SPE. Colorant formulations, measurement of color and color differences, and weatherability of colorants.
Mr. John S. Christie 8826 Lewinsville Road McLean, Virginia 22101	ASTM, FSPT, OSA, TAGA. Interested in standards and instrumentation.
Mrs. Sandra S. Collins 8230 Stedman Houston, Texas 77029	New to the field of color science: would like to learn all she can about the art and to apply this knowledge to her everyday job.
Mr. Donald J. Combs 3634 Naamans Drive Claymont, De. 14703	Main interests in color are color matching, research and development, and quality control. His work relates to thermoplastics products and matching services.
Mr. William D. Darrow 27 Patton Road Newburgh, N.Y. 12550	OSA, SMPTE, SPSE. Interested in color instrumentation – advance color control to new applications. (He is also a member of the Society of Photo-Optical Engineers.)
Mr. William R. Dawes P.O. Box 73496 Baton Rouge, La. 70815	Classifying, colors, color matching and control, computer applications, graphics, reflectometry. (He is a former member of the ISCC.)
Mr. Samuel D. Denopoulos 34 Emerson Avenue Dracut, Mass. 01826	FSPT, SPE. Particular interest in color are as related to PVC and polyurethane coated fabrics. Involvement includes control of incoming raw materials, visual and instrumental color matching and color analysis, color-product development, pigment dispersion and grinding, color quality control, aesthetic ink and topcoat finishing.
Dr. Haig C. Donoian 1195 Severn Ridge Webster, N.Y. 14580	ACS. Analysis of colorants, specification tests for colorants (Pigments and Dyes) for Xerographic toners. (He is also a member of the American Institute of Chemists.)
Mrs. Lois E. Dowd 250 Prospect St., A509 E. Orange, N.J. 07017	ACS. Computer color matching and color difference. (She is also a member of the New York Printing Ink Club.)
Mrs. Maria L. Fago de Mattiello M. J. Haedo 2378 Florida (F. G. Mitre) Buenos Aires, Argentina	OSA. Interested in the determination of the psychophysical parameters of color. (She is also a member of the Asociacion Argentina de Luminotecnia.)
Mr. Michael R. Genaro 195 Clinton Road W. Caldwell, N.J. 07006	FSPT. Interested in color systems standards control and sales aids (color cards).
Dr. Leon M. Greenstein The Mearl Corporation Ossining, N.Y. 10562	ACS, FSPT. Theory and applications of interference pigments.
Mr. Robert J. Harmacek, Jr. Fasson, Div. of Avery Products 250 Chester Street Painesville, Ohio 44077	Custom color matching for the Graphic Arts Industry, particularly plastic films.
Mr. Oscar G. Hauser Xerox Corporation 800 Phillips Road Webster, N.Y. 14580	Interested in color additivity in toner structures. (He is a member of the American Physical Society.)
Mr. Thomas B. Hotopp Corning Glass Works Corning, N.Y. 14830	Colored glasses for optical use.
Mr. Dennis L. Johnson Ameritone Paint Corp. 18414 S. Santa Fe Ave. Compton, Ca. 90221	FSPT. Application of computers to formulation of architectural and industrial coatings. Currently working with an ACS 300 color matching system.

Mr. Peter K. Kaiser
Dept. of Psychology
York University
Downsview, Ontario
Canada

OSA. Particular interests in color include color vision and heterochromatic photometry. (He is also a member of the Canadian Society for Color and the CNC/CIE.)

Mr. Fred Lafferman
3447 Carriage Hill Circle
Apartment T-1
Randalestown, Md.
21133

ASTM, FSPT, NPCA. Research and development of chemical coatings, especially camouflage. Establishing color standards in u.v., visual, and infrared region. Development of camouflage pigments. Development of computer program for camouflage color matching.

Dr. Owen Lewis
Xerox Corporation
800 Phillips Rd., B-129
Webster, N.Y. 14589

Reproduction, basic models in general, color processing by eye-brain. (He is a member of APS, IEEE, and the Society of the Sigma XI.)

Mr. Thomas J. Loomis
RD #2, Powderhouse
Road
Corning, N.Y.14830

Specifying color and transmittance tolerances of glass reasonably and maintaining correlation between many facilities world wide. Understanding color perception and how color is perceived thru a filter glass such as tint, etc. (He is a member of the ASQC.)

Mr. Peter Marconi
15 Cowden Street
Worcester, Mass. 01603

Interest in color concerns matching, computing and dispersing.

Mr. Raymond P. McCully
Kinleith Technical Dept.
N Z Forest Products, Ltd.
Private Bag
Tokoroa, New Zealand

Particular interests in color are color difference and fluorescence. (His company is a member of TAPPI.)

Mr. Robert Neubauer
404 Sport Hill Road
Easton, Ct. 06612

Relationship to package design. Graphic painting. (He is also a member of the Packaging Institute and the Package Designer's Council – a former member-body.

Ms. Jen Nemeth
27 Crestview Road
Toronto, Ontario
Canada M5N IH5

Interested in color in 2D design, i.e., color and motion; psychology and symbolism of color; color systems for computer aided textile design. (She is a member of the Colour Group of Great Britain.) She is Chairman, Fashion Department, Ryerson Polytechnical Institute.

Dr. Noboru Ohta
Division of Physics
National Research Council
Ottawa, Ontario
Canada

OSA, SPSE. Color reproduction, color photography, colorimetry and color matching. (He is also a member of the Canadian Society for Color, Chem. Soc. Japan, Appl. Phys. Soc. Jap., Soc. Photo. Sci. Tech. Jap.)

Mr. Joel Pokorny
950 E. 59 Street
Chicago, Ill. 60615

OSA. Interested in the mechanics of color vision and color blindness. He is Assoc. Prof. of Ophthamology and Behavioral Sciences at the University of Chicago. (He is also a member of the Association for Research in Vision and Ophtholmology.)

Mr. Richard E. Resk
85-14 158th Avenue
Jamaica, N.Y. 11414

The effects of opaques to block out gold colored metal in shade matching of dental restorations. (He is a member of the National Assoc. of Dental Laboratories – National Guild of Dent. Tech.)

Mr. Craig A. Reynolds
336 Greens Farms Road
Westport, Ct. 06880

Textile color matching and graphic arts exposure lamps.

Mrs. William Rider
AMWAY Corporation
7575 East Fulton
Ada, Michigan 49301

Dyes and pigments as to how they relate to cosmetics – color matching.

Mr. Ralph R. Robertson
CONCHEMCO, Inc.
Box 37
Kansas City, Mo. 64127

ACS, ASTM, FSPT, NPCA. Interested in color matching, color control, exterior performance. (He is also a member of the National Coil Coaters Assoc.)

Mrs. Mitra Saed
6 Farshad
Kheradmand Janoobi
Tehran, Iran

ACS. Mrs. Saed is Lecturer and Head of the Textile Engineering Department, Tehran Polytechnic.

Mr. Stephen Schultz
1435 Provost Street
Ville Brossard
Quebec, Canada

FSPT. Interested in color difference, color matching and color control. (He is also a member of the Canadian Society for Color.)

Miss Mary L. Seman
3579 Highway 46
Apartment 32A
Parsippany, N.J. 07054

Industrial interest in color includes colorant formulation and standardization. Additional interests involve pigments – evaluation of such on the basis of hue, strength, durability and "money value."

Mr. Donald H. Smith
2226 Sycamore Lane
Kalamazoo, Mich. 49001

TAPPI. Interested in colorimetry. (He is also a member of the Instr. Society of America.)

Mr. Charles E. Van Stone
80 No. West St.
Norwalk, Ohio 44857

SPE. Custom coloring of plastic concentrates.

Mr. Duane G. Wahl
Bell Telephone Labs.
2525 Shadeland Ave.
Indianapolis, Ind. 46206

SPE. Main interests in color are: specification, measurement and inspection, and quality control of color on both raw materials and finished products. Also in

color formulation using primarily ABS, PVC, and plasticized vinyls.

Mr. John G. Yerks 69 South Main St. West Hartford, Ct. 06107	Interested in tooth shading and visual arts.

FOR INFORMATION ONLY:
New Delegates

New Delegate from TAPPI

Mr. Rolland Aubey 100 Wis River Drive Pt. Edwards, Wis. 54469	ASTM, GATF, TAPPI. Control of paper production. Chairman, TAPPI Optical Methods Committee.

New Delegate from ASTM

Mr. Erik F. Barkman Reynolds Metals Co. 4th & Canal Streets Richmond, Va. 23261	ACS, ASTM. Color anodized aluminum, organic colors, inorganic colors in anodic oxides. (He is also a member of ASM, TIMS, AES, ISO, AUA, PEI.)

REPORT FROM THE TECHNICAL ASSOCIATION OF THE GRAPHIC ARTS DELEGATES MILES F. SOUTHWORTH, CHAIRMAN

The TAGA Color Committee met at the TAGA meeting in St. Paul, Minn., in May, 1974, to discuss some problems dealing with process inks that may be of interest to the Council.

There was some discussion dealing with a trend to printing heavier ink film thickness with the magenta ink. Quite often densities of 1.40 and even 1.50 as measured with the green filter are encountered. These heavier magenta ink densities give better reds but can cause some problems in making the separations. Special masks are sometimes used. The equivalent neutral density requirements will have to be readjusted.

It was felt that more work should go into the study of process ink standardization for lithography. Comparisons of research into color separation and printing problems would more easily be made if there were a standard ink to be used. It was not felt that printers should be dictated to as to what ink to use but rather that the standard ink should be available if desired.

A subcommittee was established to survey the availability of existing ink standards. They will collect samples of available ink standards now in existence. These will be distributed to the Color Committee members in attendance for comment as to whether they would be suitable for lithographic process ink standards. Some work will then be done during the year to further check these standards. A report will be made next year to the Color Committee on the findings and recommendations of the subcommittee.

There was also some discussion of the need for color reflection standards for densitometry.

The titles of the papers presented at the St. Paul meeting in May, 1974, dealing with color are as follows:

Line Separations from Transparencies for Textile Printing Using a Monochomator – R. D. Warner and R. E. Maurer.

A Computer Program for Tracing Tone Reproduction – Robert Loekle.

PDI Compudot Electronic Screening System – Brian Chapman.

Electronic Screening of Color Separations with Laser Beam Exposure – Dr. J. Uwe Gast.

NEW INTERIOR DESIGN SOCIETY ORGANIZED

The images of the "new" professional interior designer of the 70's shared the spotlight with the birth of a new national organization of interior designers here, during the first joint national convention of the American Institute of Interior Designers (AID) and the National Society of Interior Designers (NSID). Two years of planning by a Consolidation Committee culminated in an overwhelming vote by the members to consolidate into one organization.

The move will bring a potential of over 13,000 designers together in the new society, which will be known as the American Society of Interior Designers (ASID), making it the largest organization of its kind in the world.

Little known until after World War II, the dynamic development of the field of interior design is still an unintentional but fairly well-kept secret. The leaders of these two leading organizations have struggled for professionalism. Once competitors, in recent years they have been working together in the National Council for Interior Design Qualification (NCIDQ), to establish uniform standards for professionalism. This has been accomplished, and there is now in use a comprehensive examination, which is open to all designers and offered as a universal qualification for professional status.

Once considered the exclusive luxury of the affluent, the designer is as many things as there are specialists in the medical profession. Inflation has prompted a "natural market" for their help to avoid making costly mistakes. Office managers are using their services to get the maximum productivity from each square foot of high-priced space – not unlike apartment dwellers who seek a larger lifestyle than their quarters seem to offer. Restoration is a relatively new preoccupation among Americans, and perhaps the newest field is helping people select old homes, remodelling and furnishing them for private use or resale.

As their talents, abilities, and potential have expanded, these interior designers, who will soon become members of ASID, have continuously imposed self-regulation and self-improvement for the benefit of the profession and the public.

A COLORFUL ENVIRONMENT FOR THE MENTALLY DISTURBED

This is the title of an article by Faber Birren that appeared in the Winter 1973 issue of Art Psychotherapy (Vol. 1, No. 3/4). Birren is on the ISCC Subcommittee for Problem 33,

Human Response to Color, and has had broad personal experience in the application of color to neuropsychiatric facilities. In his article he sets forth what he considers to be practical color recommendations, with actual colors specified in Munsell notations. He promises to send a copy of his story to anyone requesting it. Write to 184 Bedford Street, Stamford, Ct. 06901.

THE "COLOR AROUND US" EXHIBIT AT THE BOSTON MUSEUM OF SCIENCE

A previous issue of the *Newsletter* noted "Color Around Us" exhibit at the Boston Museum of Science. Dr. Richard Land of the Division of Engineering and Applied Physics at Harvard University graciously contributed the following description. It will give those of you who will not be able to attend some idea of what the exhibit is like. I hope that it will provide a stimulus for some of you who might have the opportunity but neglect to take advantage of it. Dr. Land's observations follow.

Once the Fogg Art Museum, then under the directorship of Agnes Morgan, had committed itself to preparing an exhibit "Color in Art" as a tribute to Arthur Pope, there was interest in showing the more technical aspects of color as well. Arrangements with the Museum of Science were enthusiastically initiated, and Howard T. Fisher, who, with James M. Carpenter, participated in planning the Fogg exhibit and particularly the fine catalogue, acted as advisor and coordinator for the technical exhibit. Despite delays and difficulties with the design of the exhibit, about a thousand square feet of space on the second floor of the Science Museum were devoted to a black, walled walk through "Color Around Us."

The exhibit began by emphasizing the perceptual character of color, then demonstrated fundamentals before indicating a few uses that depend on these fundamentals. Further, contrast and context color effects were considered, and the exhibit concluded with uses of color in practical and artistic circumstances.

The introduction for the Fogg catalogue written by Professor Fisher begins with considerable directness, "Color is a psychological phenomenon. It exists exclusively in the mind of the beholder." The first exhibit in the Science Museum offers two disks, much like Benham tops, where the viewer may adjust the speed of rotation. When the disks are stopped, it is clear they are half black and half white with black arc shaped lines spaced in an ordered pattern. When the disks are rotating about six times a second most people quickly recognize not just gray lines but red and blue looking features as well. With more subtle adjustment of speed and observation one can also see indications of green, yellow, purple, and a variety of tints.

The next group of interactive demonstrations covers fundamentals of light. A large plastic prism may be rotated in a beam of white light while the spectrum is observed on a white screen. Three disks of colored plastic, magenta, cyan, and yellow, can slide along in front of an illuminated white surface so that one may investigate subtractive mixtures. Depressing a button above a rear projection screen produces three spots, which eventually merge and lie one on the other to make a white spot in the center of the screen, an additive mixture.

The exhibit participant then is invited to walk into a small room where the illumination changes over a period of several minutes. Initially an ordinary white light illuminates the occupants, their clothing and the various posters on the walls. Then a shutter closes on the white source and opens admitting light from a sodium arc lamp (street light type). After observing the effects of monochromatic yellow light, the shutter changes giving experience with a mercury light and, finally, a UV source before returning to the white light.

Two wall murals demonstrate other color phenomena. An American flag pattern is painted in yellow, cyan, and black. After one has fixated on the flag for a few seconds, one looks at a white panel with a single fixation point to see the proper red, white, and blue pattern. The second mural is actually only part of a large roadside billboard in which one may clearly see the dots of the four color process, which, when one enters the exhibit, blend to give the full color rendering of the poster.

The most common daily experience with additive color mixing is spectacularly demonstrated with television. A corner of the exhibit area is blocked off to house the projection screen, four by six feet, of an Advent color receiver. The program material is a special video tape that includes parts of familiar educational network shows like ZOOM and a section using video synthesized images with sophisticated colorizing effects. So that the observer may more clearly appreciate the additive process, there are four usual color receivers along the front of the exhibit area, one tuned to each of the single electron gun colors, and the fourth showing the usual color image. The Advent image is remarkable both for its clarity and saturation of color, very nearly looking life-like when people are observed on the screen.

Four color spaces are represented by models. The Pope color space is most clearly demonstrated by having both a cylindrical model and an unrolled three dimensional model, both using plastic and white cord to indicate filled color space and having color swatches indicating orientation within the space. There are also models of the CIE space, the Munsell space, and part of a space representing printing inks.

A continuous running multiple slide show and numerous sliding plastic panels deal with effects of color contrast, shadows, and filters. Several large panels are devoted to illustrations of color used in advertising, signs, and signals, including a traffic light, barber pole, and the like. The final area of the exhibit shows many examples of color in nature, using both pictures and objects enclosed in cases, while, above, several systematically colored sculptural solids rotate and, in the far corner, rear-projected lumiamages evolves, both artistic uses of color as demonstrated in the earlier exhibits.

The presentation has apparently been popular with visitors to the Science Museum, and they plan to maintain the exhibit through Christmas.

Richard Land

SPSE HELD 14TH ANNUAL FALL SYMPOSIUM

The Society of Photographic Scientists and Engineers met in Washington, D.C. on October 23-26, 1974. Since some of the sessions were directly related to color, they are given here so that you may seek further information if you are interested in some of the papers but did not learn of the meeting.

SESSION V: **Color Negative-Positive Systems, Including Photofinishing**

Chairman: H. Stein, Berkey Photo.

Critical Needs of the Photofinishing Industry: H. Carhart, Jr., Carhart Photo.

The Whys and Wherefores of Today's Color Processing Chemistry: Charleton C. Bard, Eastman Kodak Company.

Practical Aspects of the Bleach Fixing Chemistry for Color Print Papers: H. Ishikawa, K. Mogaki & Sh. Nakamura, Konishiroku, Japan.

A New Color Assembly and Data Acquisition System for Photofinishing Plants: B. Fergg & F. Hujer, Agfa-Gevaert, Munich.

A New Scanning System for Printing Color Negatives: W. Grossmann, Gretag, Switzerland.

SESSION VI: **Sensitometry and Densitometry for Process Control**

Chairman: Calvin S. Mc Camy, Macbeth-Kollmorgen.

Invited Paper: **Review of Densitometry**: Calvin S. Mc Camy, Macbeth-Kollmorgen.

Color: Densitometer vs. Eyeball: W. F. Vogelsong, Eastman Kodak Company.

Improved Color Printing Accuracy by Spectral Sensitivity Simulation in an On-Easel Densitometer: Kenneth J. Edwards, Jr., Edwards Custom Color.

Processing Uniformity Studies; Agitation Effects: F. Smola & L. Kenney, Eastman Kodak Company.

Questions on Natural Color: Norman Rothschild, Popular Photography.

SESSION VII: **Color Reversal Materials for Optical and Television Projection.**

Chairman: D. K. Bullock/A. Mehta, Philip A. Hunt, Chemicals/Dynacolor Corp.

Invited Paper: **Recent Improvements of Color Reversal Film**: G. Benoy & R.G.L. Verbrugghe, Agfa-Gevaert, Mortsel.

The Interface of Film and Television: H. Starbird, NBC News.

A New Processor and Process for Super 8 Color Reversal Film: G. L. Borton, T. C. Jessop & H. R. McNair, Eastman Kodak.

The Corrosion of Steel in Acidic Dye-Bleach Solutions: E. Kramp & R. Schaller, Ciba-Geigy.

A Rapid Access Reversal Color System: G. Vanreusel, Agfa-Gevaert, Mortsel.

Further information about the Society or the meeting could be obtained from Robert H. Wood, Executive Director, SPSE, 1330 Massachusetts Avenue, N.W., Washington, D.C. 20005.

BOOK REVIEW

Packaging, the Contemporary Media, by Robert G. Neubauer, Van Nostrand Reinhold Company, New York, 1973.

Package design is a visual art. However, creative expression devoted to it is less concerned with individual and personal feeling than with an effort to appeal to the feelings, reactions and compulsions of the public at large. While it is difficult to judge esthetic quality in a personal work of art (representational, non-objective, realistic, abstract), with a package the measure of quality is quite definite – the "beautiful" package is the one that sells; the "ugly" package is the one that does not.

Bob Neubauer, author of *Packaging, the Contemporary Media*, has been both a fine artist and a commercial one. He studied painting and illustration, and, as a young man, devoted his talents to package design, building up a highly successful studio and serving many of America's leading business organizations.

Retail selling these days is dominated by the self-service principle. In supermarkets, drugstores, and syndicate stores, millions of persons pushing carts or carrying baskets are left free to look for the products they need and to purchase, on visual impulse, many things they did not have in mind when they entered the store. What stops their eyes? What inspires them to search?

Bob Neubauer probably knows as much – or more – of human responses to shape, design, and color as most others in his field, and he generously shares wide knowledge and experience with his readers. Indeed, his book on packaging is, in itself, a fascinating package. Interspersed throughout with dozens of illustrations, a person merely has to leaf through the pages to be treated to a broad historical and contemporary view of the great packaging world. Being a scholar and avid collector, Bob Neubauer contrasts packages of old from his large personal collection with contemporary packages.

In the text there is tempered and wise advice on packaging trends, package shapes and trademarks, the vital importance of color, the need for constant freshness and change, functional considerations of package utility (aero-

sol, convenience of opening, re-use), secrets of good merchandising and marketing, package displays, processes and materials, plus a series of case histories of packages.

While the book would be quite indespensable to a package designer, manufacturer, or retailer, most of us who take delight in sentimental memories of the past might wish to keep it on the parlor table to relish pictures of old wood pill-boxes, tins and bottles of distemper cures, cough remedies, whisky, pain repellers, cut plug tobacco, hair restorers, stomach bitters, rifle powder, and many other products. Though the contents have long since been used, the packages remain cherished mementos of the past.

No doubt Bob Neubauer these days is desiginig equally significant packages for the future.

Faber Birren

BOOKS NOTED

Color in Art, Fogg Art Museum, Cambridge, Mass., 1974. The contents include: "An Introduction to Color" by Howard T. Fisher, "Color in Art" by James M. Carpenter, "The Form of the Color Solid" by Arthur Pope and Howard T. Fisher, and "Transforming and Scaling the Color Solid" by Howard T. Fisher. The book is 136 pages and contains 5 color charts, 8 full color reproductions, 38 black and white reproductions, and 45 diagrams. The price is $11.00. The book was published as a catalogue for the Color in Art exhibition at the Fogg Art Museum. An announcement of the exhibit and a brief article by Howard T. Fisher were given in a previous issue of the *Newsletter* (November-December 1973, No. 227, pp. 10-13). An attempt will be made to publish at least one review of this book in the near future.

The Perception of Color, Ralph M. Evans, John Wiley & Sons, Inc., New York, N.Y., 1974. An attempt will be made to publish at least one review of this book in the near future.

PRODUCTS AND SERVICES

Graphic Arts Research Center (GARC), Rochester Institute of Technology

GARC will conduct a four-day Color Seminar for Pressmen on January 28-31, 1975. The fourth day has been added to this seminar by popular demand to provide more time for practical applications, particularly in the area of densitometry. Hand calculators are provided to help participants work through the problems in this area. Also, color control in the pressroom is emphasized rather than the production of color separations and plates.

The subject covered in the course of the seminar include the selection of color ink sets; ink laydown sequence; the gamut of printed colors; the problems of reds; and the effect of paper on printed color. Also included are discussions of color densitometry; evaluation of printed sheets; control of dot gain and trapping; how strong to print color; and standard illumination for color viewing. A review of color proofing and its relation to press printing rounds out the program.

"This four-day seminar appears to answer industry's needs," says William Siegfried, GARC Director of Training. "Like our other four-day seminars, it seems to provide just the amount of time needed for a useful, hands-on learning experience away from regular job responsibilities."

Cost of the program, including tuition, supplies, and special reference material is $300.

For more information, contact William Siegfried, Director of Training, Graphic Arts Research Center, Rochester Institute of Technology, One Lomb Memorial Drive, Rochester, New York 14623. Phone: (716) 464-2758.

GARC announces the availability of a new device for determining the screen angle and screen ruling of halftone images. The Screen Pattern Analyzer and Rescreening Key (SPARK) consists of a pattern similar to Fresnel Zone Plates and twelve halftone tint areas on transparent film approximately 3¼ x 7 inches. SPARK can be used to evaluate halftone images on film and paper, as well as on the projected image on the ground glass of a camera.

When used on ground glass, SPARK enables the cameraman to determine the optimum screen angle for rescreening and halftone copy without the necessity of blurring the halftone image with special rescreening filters or other mechanical and optical devices.

SPARK can also be used to evaluate multicolor halftone images such as duotones and process color reproduction printed on paper. In this case SPARK simultaneously shows the screen ruling and the screen angle of each individual color.

Cost of the kit, complete with instructions, is $10.00 prepaid. Write to Catalog Orders, Graphic Arts Research Center, RIT address.

Eastman Kodak Establishes Four New Graphic Arts Scholarships

Four scholarships have been established by Eastman Kodak Co., Rochester, N.Y., available to any student in the United States interested in pursuing a career in the graphic communications industries. The announcement was made recently by Dr. Albert Materazzi, Board chairman, National Scholarship Trust Fund, and manager, Quality Control and Technical Department, U. S. Government Printing Office; and Lester E. Goda, Jr., director, Graphic Arts Product Programs, Graphic Markets Div., Eastman Kodak Co.

Dr. Materazzi said, "The scholarships will be administered by the National Scholarship Trust Fund, an affiliate of the Graphic Arts Technical Foundation, Pittsburgh, Pa., beginning in the fall of 1974. This year, an Eastman Kodak Scholarship will be given to a freshman, a sophomore, a junior, and a senior college student. Thereafter, a new freshman, each year, will receive a scholarship."

For further information on the Eastman Kodak Scholarships and other scholarship funds available for studies in graphic communications, contact: National Scholarship Trust Fund, 4615 Forbes Ave., Pittsburgh, Pa. 15213.

ATLAS COLOR-CHEX

The Atlas Color-Chex is an approach to the problem of visual color matching. A patented system that isolates the samples from outside sources of illumination, it possesses the following features: rotating sample holder to eliminate specular gloss, direct readout of the viewing angle, fluorescent, incandescent and black light sources with individual on/off controls, choice of 3 fluorescent color temperatures, 7500 k, 6500 k, and 5000 k and convenient table top design. The price is about $400.

A POSTSCRIPT TO HALLOWEEN

Dr. Robert Marcus, a former student of Dr. Billmeyer's and now at PPG Industries, relayed a description of the color "pumpkin" that appeared in his local paper to Dr. Billmeyer. Pumpkin was described as "a strong orange that is lighter than mandarin orange; redder, less strong and slightly darker than Princeton orange, redder and duller than cadmium orange, and redder and deeper than cadmium yellow" (The Pittsburg Press, Oct. 20, 1974). Dr. Marcus commented, perhaps dryly, "I'm not sure that agrees with our color chip." Dr. Billmeyer sent your Editor the description, the chip, and his estimate of the chip, Munsell 6YR7.3/9. Dr. Billmeyer is silent on the color of the pumpkin itself.

WITH AN EYE TO FUTURE . . . .

The *Graphic Communication Weekly* noted that Council issued a press release this summer on the Third Congress of the International Color Association, Color 77, three years in advance. Their heading had ring to it: "Color the Color Council Cautions."

THE COLOR SCIENCE ASSOCIATION OF JAPAN

Dr. Genro Kawakami, Secretary of *Acta Chromatica,* recently sent the Editor the latest issue of *Acta Chromatica.* His covering letter pointed out that the first issue of *Acta Chromatica* was published in 1962 and was described in the *Newsletter* of March-June 1962 (No. 158-159). The journal has been published once a year since 1962, with the exception of 1966, 1968, and 1970, when none was published. The editorial board changed two years ago, and the current editor is Dr. T. Azuma of the Toshiba Science Institute of Tokyo Shibaura Electric Co., Ltd. Manuscripts or orders for subscriptions can be sent to:

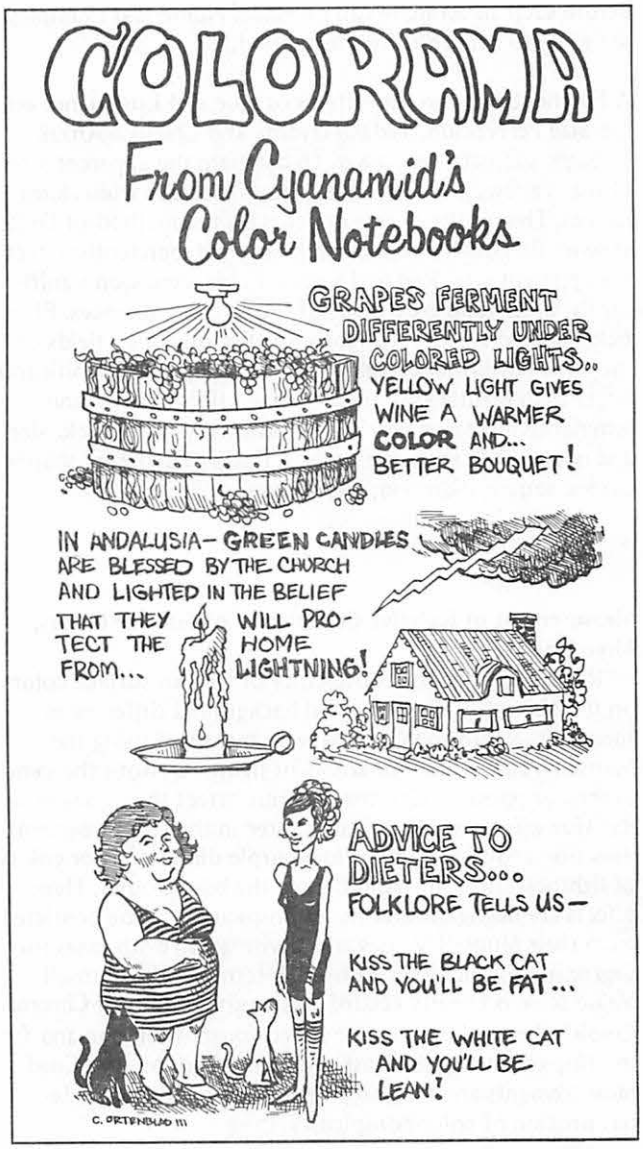
Nihon Shikisai Gakkai (Color Science Association of Japan)
c/o Department of Ophthalmology
Tokyo Medical College Hospital
7-1, Nishishinjuku 6 chome, Shinjuku-ku
Tokyo, Japan 160.

If you would like to buy the latest issue, you may write to Prof. T. Indow at the following address:

c/o Department of Psychology
Keio University
Mita, Minato-ku
Tokyo, Japan 108.

The price of a copy is $7.00.

Titles, authors, and abstracts of papers from *Acta Chromatica,* Volume 2, Number 4, December 1973, are given in the following paragraphs.



Reproduced courtesy American Cyanamid Company, Dyes and Textile Chemicals Department.

Rod Intrusion in Large-Field Color Matching, W. S. Stiles and Gunter Wyszecki.

When color matches are made with large, centrally fixated fields of more then 2° angular subtense, it is inevitable that the images of the color stimuli being matched will extend over areas of the retina which contain rod as well as cone receptors. A numerical method is proposed which permits making an estimate of whether the rods may contribute to the color matches made in the large field. It is shown that both the luminances of the stimuli being matched as well as their relative spectral power distributions must be known

before such an estimate can be made. Numerical examples are given to demonstrate the method.

A Further Study on the Effects of Hue and Luminance on the Size Perception, Tadasu Oyama and Chizuko Anzai.

Eight subjects were asked to compare the apparent sizes of red, yellow, green, blue and gray fields of various luminances. The results of size matches by the method of limits showed that both hue and luminance independently affect the apparent size. Red and yellow fields were seen significantly larger than grey fields of the same luminances. Blue fields tended to appear slightly smaller than gray fields of the same luminances. Light gray fields appeared significantly larger than middle gray fields. These effects of hue and luminance increased nearly proportionally to the field size and occurred in the same ways in fields of different shapes: circles, square, diamond, and triangle.

Measurement of Relative Conspicuity of Surface Colors, Miyo Kasuya.

Relative degrees of conspicuity of various surface colors on the Munsell Value 4 neutral background differing in their Hue, Value and Chroma were measured using the Munsell Value scale. For colors of lightness about the same as the background, Chroma and Hue affect their conspicuity. Hue-effects are elliptical, greater in the red-blue-green direction and less in the yellow-purple direction. For colors of lightness differing from that of the background, Hue-effects are negligible and their conspicuity can be predicted from their Munsell Values and Chromas. In both cases the degree of conspicuity measured in terms of the Munsell Value scale is linearly related to the square root of Chroma. Empirical equations were obtained for that relation and for the Hue-effects by the least square method. More refined measurements are necessary for a more quantitative determination of color conspicuity.

The Apparent Colors of Small Objects, Takashi Hasegawa.

Appearance of colors presented in small visual angles under different surrounding conditions was measured by the binocular color-matching technique. Stimulus size was 2 degrees (reference), 30, 10 or 1 minute in visual angle. Comparison stimulus size was constantly 2 degrees. A large shift in hue of apparent colors with change of the stimulus size was observed. The shift was not monotonous. Decrease in saturation of perceived colors was not found in the dark surround even though the size of stimulus was 1 min. in diameter. In the bright surround, on the other hand, it was observed in some cases. Brightness also changed with the stimulus size and its change was related to shift in hue.

These features of color appearance in small objects suggested that chromatic signal and brightness signal in the retina were processed in close relation with each other and let to the central area, and that "small-field tritanopia" might be due to an effect induced from the surrounding field. The activities of an assumed color mechanism were also discussed.

Derivation of Spectral-Reflectance Functions of Object Colors with Good Color Constancy, Kotaro Takahama and Yoshinobu Nayatani.

A theoretical method is developed for deriving spectral-reflectance functions of object colors with the best index of color constancy. The analysis is conducted by use of the simplex method in linear programming theory. A numerical example is given in the case of two test illuminants, standard illuminant A and a common type of fluorescent lamp, provided that standard illuminant D_{65} is the reference. The derived spectral-reflectance functions by the present method may be applicable in designing some of dye and paint products with a good color constancy.

A New Method of Specifying Subjective Color Rendering Properties of General Light Sources, Yoshiaki Watarai.

A new method to specify the color rendering property has been developed.

We introduced a concept of color space distortion. The distortion can be expressed as a deformation of octagon formed by the chromaticness coordinates of eight test colors. The deformation resulted either from a series of referance illuminant or from a test light source. By comparing shape and size of the two octagons, a set of parameters, ΔM and k, are extracted.

These parameters can describe a whole behavior of color shift vectors inclusively, and are considered as principal components of color rendition. The higher-order terms, ΔFi and ΔFa, are also extracted through this method. They describe the local distortion of color space.

The difference between the test source and the reference illuminant in the whole aspects can be expressed by quantities ΔM and k. The subjective effect of color rendition is closely related with this manner of difference. Accordingly, these parameters are allowed to have the definite meaning in the subjective color rendition.

With this method we have been able to explain a variety of subjective color rendering aspects and also predict the preference of light sources.

A New System of Instrumental Color-Matching and Its Application to a Color-Matching of Mixed-Yarn, Yasushi Nakamura, Masanori Imooka, Leo Mori.

A new color-matching calculation system (Toshiba CMS-101) has been developed and has been operating in dye factory. This system was designed exclusively for practical use, and can be operated without any special knowledge about photometry and a computer. The computer in CMS-101 can perform both spectrophotometric matching and colorimetric matching, and has many functions which are useful for coloring work.

The experience in the dye factory has shown that the system gives sufficient solutions to many types of dye formulation. But an application of instrumental color-matching technique to some kinds of mixed yarn which causes cross-staining effects, was a remained problem. A computer program considering this problem has been made, and the accuracy of matching, on the bases of experiments, was 2.85 (mean color difference, by CIE 64 color-difference equation) about first recipe calculation, and 1.79 about corrected recipe calculation.

COLOR PLANNING CENTER OF JAPAN

The Color Planning Center of Japan was described in the *Newsletter* of July-August 1973 (No. 225), and abstracts of papers from several issues of *Color Communications*, its publication, accompanied the description. More abstracts from the same source follow. The number of the issue from which the abstracts are taken and the year in which the issue was published are given. A number in parentheses following a title indicates a series of papers on the same subject, for example, "(3)" means "third paper in a series."

Number 52, 1974

Color Preferences of Contemporary People (3)
Mr. Chijiiwa made a thorough research for one year on color preferences of contemporary people developing his previous findings reported here on the issues No. 41 and No. 42 About 1200 persons, from little children to men and women in their fifties were subject to this research on favorite colors and repulsive colors.

Overall, the order of color preferences begins with orange followed by white, yellow, yellow-green, pale-green, cream and red. And the tones of colors are, in the order of repulsiveness dark cloudy color, subdued color, pure color, achromatic color and clear light color.

Color as a System of Emotional Communication and Its Creation (5)
Mr. Shiraishi explains the relation between sense of hearing and visual sense on a harmony and introduces Moon & Spencer's theory of harmony. He also explains the color scheme which makes one color look as if there were two different colors, transformation of a color by a combination of Bezold effect and contrast.

Then he writes about the technique of color scheme and composition in relation to the change of the same color scheme by means of module unit.

Column: Color Communication
Mr. Suzuki reports about the trend of the sales of the solid colored cloths which have been made by public through Fujie Textile, featuring 30 colors of highly brilliant chrome.

Mr. Yanai reports on the merchandise planning of colors in Fashion done by textile makers.

Mr. Watanabe directs our attention to the special quality of color print by the SDB process which has been introduced to the market recently by Fuji Film.

Color and Plastic World—(5)
Perpendicularity and horizontality, the three primary colors of red, blue and yellow: Mondrian found the basis for this theory of the composition of a painting in there elements and advocated Neo-Plasticisme. His conception which can be regarded as the origin of contemporary abstract art, and his international influence are told hereby Mr. Nakahara.

Number 53, 1974

Color Preference of Contemporary People (4)
Mr. Chijiiwa reports here about the result of research on the preference of color of contemporary people using coloring pictures.

First he made children to grown-ups color nine kinds of coloring pictures: Then he analysed the colors used by them on the clothes, interior and daily utensils in the pictures. The frequency in the use of each color was measured and the difference in generations and sexes were extracted. It is Mr. Chijiiwa's impression that contemporary people tend to prefer orange and yellow, so that "the age of red" is now over.

Column: Color Communication
Mr. Okuzumi introduces the sale of "Uni-Rant 66" in Japan by Teneco Chemical's universal colorants. Mr. Ogawa predicts the fashion color tendency in the fall and winter of '74. Mr. Tamura of N.H.K. introduces briefly the development and application of color converter which, makes it possible to telecast a program changing the color of any particular part of a picture—for example, the color of the face.

To the Utilization of Computer Color Matching
Mr. Nakamura reports the present conditions in the application of color matching of dyed materials by computer in Seren Co.

Color as a System of Emotional Communication and Its Creation (6)
Mr. Shiraishi, as the final of this series compares color harmony by similarity with color harmony by contrast and explains the principles of color harmony by F. Birren, giving some examples from the practice work of his students.

Color Rendering Properties of Light Source and Its Application
Taking up the lighting sources currently sold in the market, Mr. Sugiyama explains the general nature of color rendering properties as well as the color rendering properties on a particular color, and he gives suggestions on the proper use of lighting sources.

Number 54, 1974

Color Specification System for Environmental color—Coloroid
We are delighted to introduce here the Color Specification System-Coloroid, the product of a research done by Dr. A. Nemcsics, a Hungarian Chromatist. He examined more than five thousand people as the object of this study and measured various kinds of feeling towards colors. With data obtained by this research he made a Color Specification System, based on all sorts of materials necessary for color planning, such as color harmony and influence of lighting.

A workable color specification system is most needed today, for it is very helpful in thinking about environmental

color.

So, we asked Mr. Minato to write about it.

From the notes of Visual Language
Interaction of Color and Form
Mr. Shutaro Mukai contributes an essay on Victor Vasarely's works on interaction between color and form, entitled "Notes on Visual Language" and taking up his four works, explains the method by which the colors in those works are treated as phenomena and analysis the basic principle of color formative art.

Column: Color Communication
Yoshiharu Iwata made a research on the color preference of people on vacuum cleaners. Although the red is used predominantly on the vacuum cleaners in Japan, there is considerably strong distaste against the red, made clear that the older generation prefers green while the younger generation likes red.

Mr. Akihiro Saito made a research on color for package designs of frozen food. He points out that he was impressed again by the importance of color in food packaging.

All the members of the editorial board of CPC express our deep grief over the death of Mr. Ralph M. Evans. We present a brief review of his achievement in this issue.

Color and Plastic World (6)
Kazimir Malevitc—Disappearance of Color
Kazimir Malevitch, advocate of "Suprematisme" has gone through three stages, i.e., "Periode of Black," "Periode of Color," and Periode of White," in the course of his creative activities. The distance he has covered—from black through color to white—is a paradox that calls for our attention to the interaction between formative art and color. It is also closely related to a search for "Infinity" in Malevitchs works. Mr. Nakahara points out it especially.

Number 55, 1974

What is Environmental Assessment
Environmental assessment is now in the limelight as a new method of environmental development. Mr. Isobe who has long been engaged in this work in America gives here an illuminating explanation of the concept and method of technology assessment.

Environment and Color
The color decoration of building exterior of Dainichi Seika Osaka Plant was done by Mr. Ryoichi Shigeta with his color design. Mr. Kimura observes there may be something common between the relationship of environment and building decoration and the beauty of color of green tea in the tea bowl at the ceremony.

Color Planning of Plant Exterior
Here is the report of Mr. Shigeta about his work on the color design of building exterior of Dainichi Seika Osaka Plant.

According to Mr. Shigeta the color design which is different from the murals seen here and there already, may be called "Exterior Mural" in view of the rich possibilities of expression of color planning that covers the entire plan of plant construction. In making the choice of colors he was inspired by the colors of soil and tree around the plant as well as the package colors which are highly effective inside the plant.

Computor Color Matching of Kollumogen
The KCS-36 and 37 system of Kollmorgen is briefly explained here as the second installment of the computor color matching series.

Column: Color Communication
Mr. Yamawake introduces the development of a running Color Selecting Equipment whose source of light is red and green luminous diode.

Mr. Yoshino tells about the news of the enactment of an act in Miyazaki Prefecture for the protection of natural environment that includes the control of color.

Mr. Nagata explains the attempt to beautify by painting of concrete river banks of polluted rivers of Tokyo in the process of improving the quality of water of these rivers.

Color and Plastic World (7)
Robert Delaunay who searched for the abstractivism in painting "under the aspect of light," became a leading abstractionist in Paris in early twentieth century.

Mr. Yusuke Nakahara writes about the uniqueness of Delaunay in the avant-garde movement in European cities at the beginning of this century.

Number 56, 1974

Color Planning Model of School Building by Georges Patrix
We introduce the model of color planning of a school building called Costamagna Polychromie CES 900 with Professor Mukai's comment on it. Professor Mukai is impressed with the breadth of G. Patrix's designing activities making full use of colors. He points out that the color planning of the school building shows us what fun the color art is and that the color planning makes us imagine a school as a life space which makes children happy. Professor Mukai praises this happy planning which publicizes a method of using paints.

Sign Planning of Subway Station—Otemachi Station, Chiyoda Line
Mr. Akase who designed the sign system of Otemachi Station of the Tokyo Metropolitan Subway gives us the outline of his planning. Otemachi Station is one of the most complicated stations where four different lines of the metropolitan subway cross. This sign planning arranged with colors and graphic designs has turned out highly effective.

Beauty of Town and Shutter Art
Unagami picks up this current fashion of illustrating the building shutters in Ginza, Tokyo and elsewhere. He comments on this fashion in terms of the beauty of town.

Column: Color Communication
The textile designer, Isamu Tatsumi, introduces some of the recent fashions of youngsters in Europe, such as putting on old clothes of the 1920s and the 1930s, reproduction of cosmetics of the pioneer period in America and collecting old lamp shades and old French Dolls. He also tells us how effective the color scheme of the London shop BIBA is.

Mr. Miyaki maintains that the using of such building paints as powdered and water paint has come to turning point because of the oil shortage and the pollution problems.

Mr. Aizawa tells us about the borrowing by Italian furniture makers of old Japanese ways of painting finish with a modern sense.

Computer Color Matching Technique Exported
Mr. Ebi introduces the computer color matching called Kurabo Color Matching System with its merit. The system is exported to J. Miller & Co. of Australia and is bringing about good results.

Activities of Overseas Members of CPC (4)
Here we introduce "New York," one of Francisco Hidalgo's works which have recently arrived here.

Editor's note: These abstracts were contributed through the courtesy of Masaomi Unagami, Executive Director of the Color Planning Center.

BRITISH COLOUR GROUP

Report of the 105th Meeting at Imperial College, London

Defective color vision in industry, Janet Voke, City University.

Defective colour vision, affecting as it does some 8% of males, poses problems in industries where critical colour judgement is important. Such occupations include paint, printing, paper-making, textiles, dyeing, food processing, colour photography, chemicals and electrical concerns.

Greater use is now made of colour-coding for wires, pipes and colour light signals, and mistaken identification could give rise to serious hazards, particularly in the electrical and chemical industries.

Certain research work at City University is attempting to survey industrial jobs involving colour matching, particularly in the light of colour vision testing policies for employees. The handicap imposed by a colour vision defect may only be slight but in some colour industries a wrong colour decision could be disastrous. Simulated industrial colour tasks have been set up and the performance of colour normals and colour defective observers has been studied so far in electrical, textiles and printing areas. A comparison between these results and colour vision test performance by the colour defectives has been made. It seems likely that mild colour defectives who fail an Ishihara test might well be able to cope with some colour jobs in industries from which they are at present excluded. When the survey is complete it is hoped to give recommendations to industries on colour testing possibly in the form of an up-dated report similar to that carried out in 1946 by members of the Colour Group under the auspices of the Physical Society.

Light sources and Lovibond—a new nomogram. D. G. Chamberlain, Tintometer Ltd. The Lovibond-Schofield Tintometer and the Flexible Optic Tintometer are widely used subtractive colorimeters whose three scales, Red, Yellow and Blue were first related to the CIE co-ordinate system by Dr. Kenworthy Schofield in 1939.

These three scales and the compounds formed from them together cover a wider range of chromaticities than is provided by other sets of material standards.

However, since all three scales transmit freely in the far red, the chromaticity gamut formed by mixtures of the Yellow and Blue scales is limited in extent in the blue-green and green areas of the CIE triangle, although coverage is adequate for the measurement of any surface colour, while liquid samples can be matched by adjusting the path length.

In recent years there has been increasing interest in the measurement and standardisation of light sources and self-luminous samples such as signals for traffic control on roads or railways, television phosphors, road studs and self-luminous panels for aircraft cockpits.

Several methods were considered for extending the colour gamut into the green so that such samples could be tackled directly.

These alternatives and the method finally adopted of introducing a cyan filter into the reference field will be discussed.

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NOTE:

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.