

# Inter-Society Color Council *News*

## VIGNETTES FROM THE PRESIDENT'S DESK

It is my pleasure to inform you that a new journal on color has just appeared on the horizon. The journal is simply called "Couleurs" and it is a new version of the "Couleurs," a French journal dealing with all aspects of color. The journal will be issued quarterly and the annual subscription rate is 110 French Francs for foreign countries (approximately \$25), the address of the editor is: EREC, Etude et Realisation de la Couleur, 68, Rue Jean-Jaures 92800 Puteaux, France. The editorial staff includes scientists, teachers, architects and artists.

The titles of the articles in the first issue are:

Identification of pigments through their properties in turbid media—Remarks on the activity of the Colorist Council—Color of veal meat—Historical evolution of ideas about color.

The next issue will deal with such topics as color in cosmetics, history of color (continuation), report on CIE activity, technical news and information.

## News from the ISCC Projects Committees

Our Projects Committees are for the most part very active, some more, some less.

The ISCC Committee on Artists' Material is busy working on various aspects of artists' materials. The work of the committee is closely intertwined with that of ASTM D1.57 and the NBS Standing Committee for Artists' Oil Paints. A summary of the committee's activity is given in the November-December 1978 *Newsletter*.

The ISCC Committee on Human Response to Color is planning a program for their April meeting that will deal with the "Responses to Color in the Interior Environment." This will certainly be a very interesting program and of interest to many.

Committee 34 on Color Differences is currently cooperating with the CIE committee on color-differences by collecting visual color-difference perception data for one color center, but for several surface texture characteristics. Presently they are evaluating the 3-D aspect of the analysis of the visual data.

The ISCC Project Committee 35 on Color and Appearance Matching of Living Tissue is very active in pursuing the dissemination of the knowledge of the principles of color as related to dental applications.

The primary goal for the Committee on Indices of Metamerism is to find better ways of mathematically describing metamerism. Statistically valid experiments are now being designed for a round robin test in judging sets of metamers under various sources.

Committees on Colorimetry of Fluorescent Materials and Procedures and Material Standards for Accurate Color Measurements, are contemplating a joint project to develop and/or identify suitable material standards for measurement of fluorescent materials.

I believe that a word of thanks to the committee chairmen is in order for their dedicated work and for their donation of time and expertise to the endeavors of the ISCC. The best

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way to show our appreciation to them would be to get involved in their activities by bringing to their attention pertinent color problems and suggest ways and methods of dealing with such problems.

## ISCC BOARD OF DIRECTORS MEETING

The Board of Directors of the ISCC met at Williamsburg, VA on Sunday, February 11, 1979.

One new member-body was approved: the Entomological Society of America. The European Gemological Laboratory was approved to become a sustaining member. Fifteen new individual members were also accepted into the Council, two of them as student members.

Reports were received from the President, President-Elect, Secretary and Treasurer, and from Board members who act as observers on various Council committees. A proposed budget for 1979, submitted by the Treasurer, was approved.

Considerable time was devoted to discussing the results of the recent survey of readers of the *Newsletter*. The response (43%) had been exceptionally good, indicating a high degree of interest. The results showed that the majority of members read the *Newsletter* regularly and rate the content good or satisfactory. Nevertheless, there were suggestions for improvement and the Board formulated plans for implementing some of these suggestions.

It was decided to set up a public relations committee to study and coordinate ways of increasing people's awareness of the Council's existence and activities.

Legal implications of the use of the word "standard" in the written scopes of some of the project committees were discussed and it was decided to seek expert advice on this problem.

The Study Group on long range planning was instructed to look into ways of marking the Council's Golden Anniversary, which will occur in 1981.

Tentative dates were chosen for Williamsburg Conferences through 1984 and Annual Meetings to 1981. The Treasurer was instructed to make appropriate arrangements.

Alan Robertson

## APPLICATIONS APPROVED FOR INDIVIDUAL MEMBERSHIP

October 22, 1978

Ms. Jean R Auvil  
1694 Chimney House Road  
Reston, Virginia 22090

Mr. Charles E. Baldwin, III  
Juniper Farm  
131 Newton Street  
Weston, Massachusetts 02193

Ms. Joy Brother  
4327 Wickerfield Drive  
St. Louis, Missouri 63128

Ms. Joan M. Burgasser  
Thonet  
491 East Princess Street  
York, Pennsylvania 17405

Dr. Tak-Fu Chong  
Hong Kong Polytechnic  
Institute of Textiles and Clothing  
Hung Hom, Kowloon, Hong Kong

Ms. Carol Crawford  
85 Mantle Road  
Painesville, Ohio 40077

Dra. Hortencia Susana Sadi de Pons  
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1437 Buenos Aires  
Argentina

Mr. R. L. Donofrio  
Electro Optical Lab.  
Electronic Components Group  
Electronic Tube Division  
GTE Sylvania  
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Seneca Falls, New York 13148

Mr. Edward A. Fink  
Architectonic Design and Research  
Associates  
737 North 3rd Street  
Philadelphia, Pennsylvania 19123

Dr. Henry-W. Fradje  
35, bld Malesherbes  
75008 Paris, France

Miss Deborah J. Gilbert  
Corning Glass Works  
Coating Technology Department  
MP-9-3  
Corning, New York 14830

Dr. Robert A. Glass  
National Bureau of Standards  
BR-A313  
Washington, D. C. 20234

Mr. Paul John Grayson  
68 Leonard Street  
Belmont, Massachusetts 02178

Lt. Daniel G. Henderson  
Commandant USCG  
GEOE - 4A/61  
400 7th Street, S.W.  
Washington, D. C. 20590

Ms. Peggy Elena Hoover  
1189 Lundy Drive  
Simi Valley, California 93065

Dr. Dana E. M. Kennan  
1412 South Salisbury Boulevard  
Salisbury, Maryland 21801

Mr. David G. Kretschmaier  
2121 New World Drive  
Columbus, Ohio 43207

Mr. Hugh Laverie  
1505 Bethel Road  
Columbus, Ohio 43220

Ms. Helen McCrea  
Color and Fashion Consultant  
5763 Gravenstein Highway, South  
Sebastopol, California 95472

Ms. Eunice Robinson Miles  
P.O. Box 404, Maple Court  
Mahopac, New York 10541

Mr. Hugh G. Neil  
Special Instruments Lab., Inc.  
312 West Vine Avenue  
P.O. Box 1950  
Knoxville, Tennessee 37901

Dr. Shalini S. Patwardhan  
Bhupal House, 1st floor  
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Dadar, Bombay 400 014  
Maharashtra-India

Mr. Robert L. Pfeiff, Head  
Photography, Visual Communication  
The Banff Centre, School of Fine Arts  
Banff, Alberta, Canada T01 OCO

Mr. Ted Reyda  
Herman Miller, Inc.  
Administration-West  
Zeeland, Michigan 49464

Mr. Robert Safir  
287 Broadway  
New York, New York 10007

Mr. Anthony Schulz  
Harshaw Chemical Company  
3400 Bank Street  
Louisville, Kentucky 40212

Mr. Akira Uchida  
Toyo U.S.A. Rep. Office  
1444 McGaw Avenue  
Irvine, California 92714

February 11, 1979

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Mr. Allesandro DeGregori  
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European Gemological Laboratory  
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New York, New York 10036

Mr. Gary G. Field  
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Pittsburgh, Pennsylvania 15212

Mr. Mark David Gottsegen  
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University of North Carolina  
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Ms. Ros Green  
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Mr. Francis R. Hewitt  
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Mr. Norbert L. Johnson  
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3M Company  
St. Paul, Minnesota 55101

Dr. Ronald Kurzeja  
20 Lake Drive  
East Windsor, New Jersey 08520

Mr. Hideichi Misono  
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Aichi-ken, 471, Japan

Mr. Richard A. Pinamonti  
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3M Company  
St. Paul, Minnesota 55101

Dr. R. P. van Oort  
Dept. of Prosthetic Dentistry  
A. Deusinglaan 1  
Groningen, The Netherlands

#### NEW DELEGATE – FOR INFORMATION ONLY

Dr. Jack J. Hsia  
National Bureau of Standards  
Bldg. 220, Room A321  
Washington, D. C. 20234

#### NOTICE: SPECIAL RATES FOR STUDENTS

The registration fee for student members of the ISCC will be \$1.00. The Board agreed to the reduced fee for students at its latest meeting. Please note, however, that you must be a student member; being a student is not enough in itself to get the

special rate. Of course, if you are not now a member, you can apply for membership at the meeting. At this price you cannot afford not to attend the Annual Meeting.

#### MEETING OF THE COMMITTEE ON HUMAN RESPONSE TO COLOR AT THE 1979 ANNUAL MEETING

By invitation of the Chairman, Mrs. Barbara Schirmeister, AISD delegate, developed the program for the forthcoming session with members from the American Society of Interior Designers.

MR. MICHAEL RABIN, ASID, will speak on "Color Decisions for Health Care Facilities."

PROF. MARY BUCKLEY, ASID, IDSA, painter and teacher at Pratt Institute, will present "Abstract Modes and Attributes of Color" and report on her involvement in the Margaret Gate Institute and in the Manhattan Psychiatric Center.

DR. JOSE RAUL BERNARDO, AIA, environmental psychologist and practicing designer, will discuss "Cultural Use and Behavioral Effect of Color."

MR. EVERETT BROWN, FASID will give his views on Color in Merchandising, Manufacturing and Living. His talk is titled "Color as the Wedding Ring."

It is hoped that this program will be of interest to many who otherwise have little opportunity to hear members from a specific group on their interests and views on Color.

Alexander F. Styne, IDSA, Chairman, Committee on Human Response to Color.

#### ISCC NEWS READER SURVEY OR THE NEWS LOOKS AT ITSELF

The ISCC Publications Committee conducted a reader survey in January with the dual objective of determining membership satisfaction with the *ISCC News* and soliciting constructive suggestions for improvement. The Board of Directors reviewed results of the survey at their Williamsburg meeting and considered it a great success in achieving these objectives.

Briefly, questionnaires were mailed to a randomly selected 10% sample from the entire membership. By Feb. 6th, 43% of those sent had been returned. The Committee was pleased that half of those took the extra time to provide comments or suggestions. They found it especially gratifying that 72% always read the *News*, and in general rate the content above average.

The Committee, encouraged by the Board, plans to individually answer questions raised by respondents and has already generalized the returns into a program of improved content for the *News*. Readers should soon see the following changes in content as a result of suggestions received in their survey.

- Addition of news reports on color research activities—the where, what, and who of color research
- More comprehensive and timely reports on color meetings—including foreign meetings when possible
- More concise member body reports

The suggestion to include more technical articles in the *News* also emerged from the survey. The Board noted that as an endorsing society of color *Research and Application* the ISCC directs technical articles to that journal rather than the *News*. The agreement between the ISCC and the publisher of the journal states that the ISCC does not intend to publish tech-

nical articles in its newsletter, but of course the newsletter should provide reference to and news of technical accomplishments in color.

Ed Cairns

## KASSON S. GIBSON DIES

Dr. Kasson S. Gibson, a distinguished physicist at the National Bureau of Standards from 1916 to 1955, died on January 5, 1979, two days before his 89th birthday. Early in his career, Dr. Gibson earned world-wide recognition in the fields of spectrophotometry and visibility of radiant energy.

Kasson Stanford Gibson was born January 7, 1890, in Afton, N.Y. He graduated from Norwich, N.Y., high school in 1908. He was the second of four boys in his family and was valedictorian of his class. His father, a graduate of Cornell University (AB 1879) with AM from Hamilton College, was superintendent of Norwich public schools (1898-1919). Kasson Gibson attended Cornell University and earned an AB (1912) and PhD (1916). He was elected to Phi Beta Kappa and Sigma Xi. In an unpublished autobiography<sup>1</sup> he describes how he happened to major in physics.

"A major had to be chosen and I chose physics, for no particular reason that I can now remember. My father had expected me to go into high school teaching and wanted me to attend New York State Teachers College in Albany after graduation from Cornell. Under the influence of members of the Physics Department, however, I chose to stay on at Cornell, accepting a position as instructor in physics and working for a PhD degree. During this period I lost all desire to be a high school teacher. My father was most agreeable to the change of plans, and he and my mother were greatly pleased when I received my doctor's degree.

"All members of my doctorate committee were conducting research that required the use of spectrophotometers. It was thus natural that I began my research by the use of spectrophotometers. Professor F. K. Richtmyer, who had been supervising some of my work as instructor in the Physics Department, recommended me for my first NBS position in 1916.

"At NBS the most influential persons in guiding and counseling in my work were (1) Mr. I. G. Priest, Chief of the Colorimetry Section until his death in 1932, and (2) Dr. E. C. Crittenden, at first Chief of the Electrical Division and later Associate Director of NBS. It is a pleasure to record that whatever standing I may have achieved in the international field I owe in considerable part to Dr. Crittenden.

"By far the greatest part of my research work related to spectrophotometry — (1) the development of spectrophotometric instruments, techniques, procedures, and nomenclature, (2) the selection and calibration of spectrophotometric standards, and (3) the use of spectrophotometers (a) in the determination of the spectral luminosity (visibility) factors, (b) in the development of reproducible daylight and color temperature filters, (c) in the analysis and specification of signal colors and glasses, of the Lovibond and Munsell color systems, and of miscellaneous materials, (d) in the analysis and design of spectral filters of various kinds, and (e) in the standardization of national and international photometric, colorimetric and photographic scales.

"Practically all of my research work was done in a national standardizing laboratory (NBS), and the type of work that I did was greatly influenced by this fact. I was able both to work alone and to cooperate with others, in and out of NBS.

"One very significant fact emerges, however, which indeed is well known in scientific work: as soon as my administrative duties were greatly increased, my output of publications showed a marked decrease. During the period from 1916 to 1931, I had no administrative duties and my list of referenced titles averages 3.2 per year. In 1932 I became chief of a small NBS section (5 to 7 people) and the corresponding list of titles in the period 1932-1940 continues at closely the same rate. In 1941 I became chief of a much larger section, formed by the merger of the former photometry section with the colorimetry-and-spectrophotometry section, with a total personnel varying from 25 to 45 over the next 14 years. I also served as assistant division chief during this time and was appointed to NBS administrative committees such as personnel, efficiency-rating, and incentive awards. During this period (1941-1954) my list of referenced titles drops to about 1.1 per year. The war doubtless contributed to this drop, also, but not as much as it did for many others."

At the time of his retirement, Dr. Gibson had published over 100 papers.

There are two outstanding pieces of work by Dr. Gibson and his associates that have had a tremendous impact on the field of color measurement. The first was the work carried out with E. P. T. Tyndall on the visibility of radiant energy and published in 1923.<sup>2</sup> The data from this work was pooled with that of other researchers around the world to provide the spectral sensitivity data for the "standard observer" adopted by the International Commission on Illumination (CIE) in 1924. These data form the basis for the definition of light-radiant energy of which the human observer is aware. The data were so carefully collected and analyzed that the standard observer (for a 2° visual field) has never been changed, although there is evidence that a small improvement could be made in the adopted values at the violet end of the spectrum. The fact is that if the work of Gibson and Tyndall had been given more weight, the adopted values would have been closer to those that would be advocated now, 55 years later!

After more than 50 years, the liquid filters developed at NBS with Raymond Davis<sup>3</sup> (known as Davis-Gibson filters) are still used in conjunction with an incandescent lamp to realize standard CIE sources B and C, representing average sunlight and daylight, respectively.

Kasson Gibson was a great scientist and a very humble man. He took little time to recite his achievements or to seek recognition. He enjoyed people and he liked to write poems for special occasions.

Those of us who were privileged to be associated with him in any capacity will long remember his kindly manner and sincere affection for us.

### References:

1. Intellectual Autobiography of Kasson S. Gibson. Prepared at the request of the American Institute of Physics for the project on the History of Recent Physics in the United States. (Undated.)
2. K. S. Gibson and E. P. T. Tyndall, The Visibility of Radiant Energy, Bulletin of the Bureau of Standards, v 19, 1923-24, p. 131. (Sci. Paper 475).
3. K. S. Gibson and R. Davis, Filters for the Reproduction of Sunlight and Daylight and the Determination of Color Temperature, Bureau of Standards Misc. Pub. M114, 1931. Harry K. Hammond III

## IN TRIBUTE: DEANE B. JUDD

In 1950 Faber Birren saw a new book of his enter the world of color. The title was *Color Psychology and Color Therapy*, and the publisher was McGraw-Hill of New York. The dedication, on a page by itself, was to Deane B. Judd, a token of admiration by Birren. This went through two printings. Then in 1961 the copyright was taken over by University Books of New Hyde Park, New York, and a new chapter was introduced. The work continued to sell moderately but consistently and became something of a basic reference source. A number of printings were made. Subsequently the publisher became Citadel Press of Secaucus, New Jersey. Recently, in 1978, a first *paperbound* printing has been issued—still with the Deane B. Judd dedication. This means that Birren and his cherished guest Judd have been circulating about in the field of color for a period of 28 years!

## NEWS OF MEMBER-BODIES

### American Society for Testing of Materials (ASTM)

#### ASTM Works Actively on Artist's Paints

Joy Turner Luke, active ISCC member and Chairman of the Subcommittee on Artist's Paints and Related Materials, reports that ten active task groups met or reported progress at the meeting held January 29, 1979, in Atlanta, Georgia, in conjunction with the biannual meeting of the ASTM Paint Committee.

The Task Group on *Preparation of Samples for Colorimetric Determination* discussed measurements of spectral reflectance, contrast ratio, and film thickness, made on draw-downs by three of five scheduled participants. Preliminary data indicated that thickness variation of the sealed paper support was causing inaccurate results.

The Task Group on *Lightfastness of Pigments* reported that eight new pigments suggested as suitable for artist's paints were tested in both oil and acrylic vehicles by Henry Levison, Task Group Chairman, and were found to have good lightfastness properties.

Based on recent illumination studies at the National Gallery of Art, Levison is extending his exposure tests to accumulate 50,000 langleys rather than the 25,000 langleys which was earlier deemed to be the equivalent of 100 years normal indoor exposure. Correlation of these exposures with the use of both ISO and the AATCC Blue Wool standards is planned.

The Task Group on *Tinting Strength of Pigments* has begun a cooperative test to determine the minimum number of groups of hues required to cover the range of tinting strengths in yellow, orange, and red cadmium colors. Participants are being asked to select from a graduated series of cadmium colors, groupings that include the hues which are comparable in judging tinting strength.

A Task Group on *Investigation of Present Test Methods Applicable to this Subcommittee* circulated two reports for comment in an attempt to compile, and develop if necessary, simple test methods to indicate inferior artist's paints. Two levels of testing may be desirable, one by which the artist can obtain a rough evaluation of his paints; the other for use by testing laboratories that is capable of producing results with good repeatability and reproducibility.

The Task Group on *Pigment Identification through Instrumental Equipment* reported that ASTM Standard Method for Chemical Analysis of Phthalocyanine Blue and Green Pigments, D3256-73, accurately revealed the presence of phthalocyanine blue pigment in artist's acrylic emulsion paints. Thirty-five paints labeled cobalt and cerulean blue bought off-the-shelf were analyzed and phthalocyanine blue pigment was present as an adulterant in twelve of them. Task Group Chairman, T. Pamer, reported that all blue pigments used in artist's paints can be identified by using the ASTM Method and X-ray diffraction techniques.

The Task Group on *Definitions of Terms* has a list of forty-one defined terms needed to ensure communication between artists and other groups and for use in ASTM standards.

The Task Group on *Vehicles, Lightfastness and Distensibility* is conducting two studies: one to determine a suitable support for exposing clear mediums and varnishes, the other to determine if the presence of a slower drying oil than linseed oil will lessen the embrittlement in fast drying artist's colors which contain cobalt or manganese pigments.

The Task Group on *Identification of Vehicles* used a set of known vehicles to evaluate different instrumental methods for determining the binder in off-the-shelf artist's oil paints. Correlation with the degree of polymerization of the oil was obtained, but the methods did not differentiate between types of oil, such as linseed, poppy-seed, or safflower. Use of high-pressure liquid chromatography was suggested.

The Task Group on *Tests on Dried Paint Films* reviewed pertinent ASTM test methods, some of which will need minor revision for testing artist's paints.

The Task Group on *Toxicity Determination* held a short discussion on toxicity in artist's paints and the need for care in evaluating literature on toxicity.

The Subcommittee Chairman distributed a questionnaire for use in compiling a revised list of pigments approved for use in artist's paints. The list contained in NBS Commercial Standard CS 98 published in 1962 was based on permanency, but it needs revision and additional information.

Anyone interested in the work of this Subcommittee should contact the Chairman, Joy Turner Luke, Studio 231, Box 18, Route 1, Sperryville, VA 22740, telephone 703, 987-8386.

### Dry Color Manufacturers' Association (DCMA)

#### Alkali Blue Subcommittee Formed By DCMA

The Dry Color Manufacturers' Association has established a new Subcommittee to provide manufacturers of alkali blue pigments with a forum to discuss technical areas of common interest. The Subcommittee, which is part of the Organic Section of the DCMA Ecology Committee, will represent the views of DCMA member companies and others interested in the production of alkali blue pigments. The Subcommittee will explore technical concerns of interest to alkali blue producers.

The Subcommittee is now in its formative stage and would welcome participation by both DCMA members and those manufacturers of alkali blue pigments that are not members of the Association. DCMA President Michael Pisetzner of Sun Chemical Corporation has appointed Paul Malchick of Chemetron Corporation and E. D. Compton of Sherwin-Williams Company the co-chairmen of the Subcommittee.

The Dry Color Manufacturers' Association is an industry trade association representing large, medium and small pig-

ment color manufacturers throughout the United States and Canada, accounting for approximately 95% of the production of color pigments in this country. Foreign pigment manufacturers with sales in the United States and Canada and domestic suppliers of intermediates to the pigments industry are also members of the Association.

Persons or firms interested in taking part in the activities of this Subcommittee are invited to contact DCMA Offices, Suite 100, 1117 North 19th Street, Arlington, Virginia 22209. The telephone number is 703/525-9483.

#### DCMA Announces 1979 Meeting Dates

The Dry Color Manufacturers' Association would very much appreciate your including the dates of its meetings in your meetings' calendar. All monthly meetings are being held at The New York Athletic Club, 180 Central Park South, New York City, and are as follows:

April 4; May 9; September 5; October – date open – Biennial Midwest Meeting (dates to be announced); November 7; December 5.

#### Graphic Arts Technical Foundation (GATF)

##### Color Communicator

A new prepress color viewing and color generating device, which permits its user to assign dot area values to any given process color on a desired printing surface, has been developed by GATF Research Technologist, Richard D. Warner.

Called a Color Communicator, GATF's newest quality control instrument is a quick and easy way to view, describe, and identify a color in terms of dot area combination of process colors.

It can be used to see variations in lightness or hue of a particular color, determine what color will be generated from a set of halftone tints, observe what effect different substrates have on color, and provide specific information on percent dot area combinations of process colors needed to match given color samples.

GATF's new Color Communicator can be used by salesmen in guiding a customer toward the selection of a desired color; it can be employed by color separators to check separations against original copy; and it can be used by strippers to obtain a first approximation of the tint values that should be considered when making prepress proofs. It can also be used by educators to introduce their students to process colors, dot areas, and halftones. The Color Communicator can be an equally valuable tool for art designers, dot etchers, pressmen, and anyone else in prepress or press areas.

The Color Communicator consists of four calibrated, sliding, linear halftone, process color wedges that have a complete tonal scale from 0% dot area to 100% dot area.

Made of a durable plastic and in a very portable size, 5-1/8" x 16-1/8" x 1/2", GATF's Color Communicator is easier and faster to use than a color chart.

All requests to purchase a Color Communicator should be sent to the Order Department at the Foundation. Those requesting additional information on the GATF Color Communicator can obtain a brochure by writing to Terrence M. Mahoney, GATF's North American marketing manager.

## COLOR RESEARCH AND APPLICATION

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Color Identification and Nomenclature: A History. *F. Birren.*

Let's Say Goodbye to the Color Circle. *H. Küppers.*

Color Properties of Liquid Crystals and Their Application to Visual Arts. *D. M. Makow.*

Evolution of the Color Diagram. *F. Gerritsen.*

Measures of Colour Appearance in Colour Reproduction. *R. W. G. Hunt.*

**Forum.** Color-Difference Terminology. *W. V. Longley.*

**Meeting Reports.** ISCC 1978 Annual Meeting. *R. M. Rich.*

**About the Authors.**

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**Forthcoming Color Meetings.**

**Book Reviews.** *Das Grundgesetz der Farbenlehre (The Fundamental Law of Color Science)* by Harald Küppers. Reviewed by *R. G. Kuehni.*

**Books Briefly Noted.**

#### AIC

At its recent meeting the Board of AIC decided to form a Study Group on Color Education. The purpose of this Study Group is to collect information on the ways in which color is taught in different countries including content, methods and demonstrations. It is intended to collect and disseminate such information that could be helpful to teachers of color on both undergraduate, graduate and university level. Anybody interested in the work of this Study Group is urged to contact the Chairman, Dr. J. Schanda, Research Institute for Technical Physics of the Hungarian Academy of Sciences, P.O.B. 76, H-1325 Budapest, Hungary, who is just putting together his membership list and will be delighted to receive your cooperation.

#### CIE

##### New CIE Publications

Two new documents have recently been published by the International Commission on Illumination (CIE).

Recommendations on uniform color spaces, color difference equations, and psychometric color terms are contained in Supplement No. 2 to CIE publication No. 15. This supplement has been produced by the members of CIE Technical Committee 1.3 (Colorimetry) which has representation from 27 countries. Two color-difference formulae are recommended:

– CIE 1976 ( $L^*u^*v^*$ ) – CIELUV formula

– CIE 1976 ( $L^*a^*b^*$ ) – CIELAB formula

The first formula is specially useful in cases where color lights are mixed additively (color television for example) and the second formula in cases of colorant mixtures (textile and dyestuff for example). Seven new terms are recommended. They are defined by using the parameters of the CIELUV and CIELAB formulae.

CIE publication No. 41, Light as a True Visual Quantity: Principles of Measurement, has been produced by the members of TC-1.4 (Vision) which has representation from 24 countries. This report discusses the many reasons why measurements of light may not be related to visual impressions of the amount of light. These include inadequacies in  $V(\lambda)$  itself; the use of  $V(\lambda)$  in situations for which it is not appropriate, such as a large or a dim field of view; and the assumption of linear additivity of different wavelengths. Many methods are available to photometrists that will overcome these problems and that will allow visually meaningful measures of light to be made. These methods are discussed in the report and procedures are recommended for provisional use, for photopic, scotopic and mesopic conditions. One potentially very useful solution is the calculation of a new psycho-physical quantity as a mathematical combination of existing CIE photometric and colorimetric quantities. An appeal is made for additional research in this area.

Copies of these documents, CIE Pub. No. 15, Supplement No. 2 (\$14.00) and CIE Pub. No. 41 (\$23.50) may be obtained postpaid from:

Dr. Jack L. Tech, Secretary  
U.S. National Committee, CIE  
National Bureau of Standards  
Washington, D. C. 20234

Payment should accompany the order and should be made payable to "U.S. National Committee, CIE." Canadians may obtain copies by sending a check payable to "The Receiver General of Canada, Credit National Research Council" with their order to "Publications Distribution Office, National Research Council of Canada, Ottawa, Ontario, K1A 0R6."

### Spectrophotometry Group Conforms to New CIE Recommendations

Color calculations made by the spectrophotometry group in conjunction with special calibrations will now include chromatically coordinates, color space parameters and psychometric color terms recommended in Supplement 2 of CIE Publication No. 15 (see previous article) in addition to the usual 1931 CIE tristimulus values and chromaticity coordinates. Chromaticity coordinates for the CIE 1976 UCS diagram will replace similar coordinates for the CIE 1960 UCS diagram. The color space parameters for the CIELUV color space will replace the color space parameters for the CIE 1964 ( $U^*V^*W^*$ ) space. In addition a second set of color space parameters for the CIELAB system will be given. Finally, a number of psychometric color terms which are quantitatively defined in Supplement 2 are calculated for the CIELUV and CIELAB systems.<sup>1</sup> These new values are calculated for the four standard CIE illuminants and can be calculated for other specified illuminant temperatures. They are also calculated for both the 2° and 10° observers. The Munsell renotation and ISCC-NBS color names will continue to be given. For further information contact:

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National Bureau of Standards  
Washington, D. C. 20234

<sup>1</sup>For an interesting discussion of the new recommendations, see the following article: R. W. G. Hunt, "Colour Terminology," Color Research and Application, 3, No. 2, Summer 1978.

### NBS Technical Note 988, "Detector Spectral Response from 350 to 1200nm Using a Monochromator Based Spectral Comparator"

This NBS Technical Note, by Antonio Corrons of the Instituto de Optica, Madrid, Spain, and Edward Zalewski of NBS, is the report of a study of several classical detector measurement techniques.

The method of relative spectral detector response measurement based on filters of known transmittance and a spectral irradiance standard lamp was used to measure the responsivity of a thermopile. The thermopile was then used in conjunction with a monochromator based spectral comparator to measure the relative spectral response from 350 to 1200 nm of several other detectors. Several auxiliary experiments to evaluate the accuracy of these techniques are described. The estimated accuracy of relative spectral response measurements using these techniques and this particular instrumentation was found to range from 3 to 7% depending upon the type of detector being measured and the spectral region under study. Finally, the effective transmittance of several filters was measured to evaluate the accuracy of the relative spectral detector response measurements. It was concluded that the effective transmittance test is not a reliable way to judge the accuracy of detector response measurements.

NBS Technical Note 988, issued December 1978, can be ordered from the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402, SD Stock No. SN 003-003, price \$1.20.

Reprinted from *Optical Radiation News*, NBS, Department of Commerce, January 1979.

### CANADIAN SOCIETY FOR COLOR

This year (1979) the Canadian Society for Color will hold its VIIth annual meeting on April 26 and 27 at the University of Guelph, Guelph, Ontario.

In keeping with the interdisciplinary character of the Society the Theme will be 'Colour in Science, Art, Technology and Design.'

To accommodate the increasing interest in Color the format of the meeting has been considerably expanded. In addition to eight major speakers whose topics cover a broad range, a number of mini-symposia, poster sessions and exhibits on topics of special interest are being organized to fill the intervening time slots.

A book of Abstracts of the major presentations as well as symposium papers will be made available prior to the meeting to those who preregister. Contributions for symposium participation, poster session papers and exhibits are encouraged.

Major speakers for the meeting will be:

W.D. Wright, University of Waterloo (Optometry). "The Artist and the Scientist: Partners in Colour Technology."

R. Beauchamp, University of Waterloo (Optometry). "The Goldfish: An Electrophysiological Model of Colour Vision."

F. Billmeyer, Rensselaer Polytechnic Institute, (Dept. of Chemistry). "To be announced."

D. Lavigne, University of Guelph (Environmental Biology). "The Ultra Violet and Infra red as Colours."

C.J. Bartleson, Eastman Kodak (Research Laboratories). Banquet Speaker — "To be announced."

T. Trischler, University of Guelph (Fine Arts). "Color Photography."

Barbara Dodge, York University (Visual Arts). "The Artist's Materials: A History."

Nancy Keehn, Ontario College of Arts. "Colour Analysis in the Visual Arts."

Paul Arthur, Newton Frank Arthur Booth Inc. "To be announced."

Mini-symposium and poster sessions are planned which include the following topics: Colour and Graphic Arts, Colour and Formulation, Colour and Art Education, Colour Coding of Signs, Colour in Ceramics, Textiles and Foods. A somewhat larger symposium on Theories of Colour Vision as well as one on the Perception of Colour are also planned. Those who are interested in presenting papers in the above categories or who wish to organize a mini-symposium, talk or poster session on other topics related to Colour are urged to contact the Chairman of the meeting: Professor E. W. Abrahamson, Department of Chemistry, University of Guelph, Guelph, Ontario NIG 2W1.

## COUNCIL FOR OPTICAL RADIATION MEASUREMENTS REORGANIZES

In order to better fulfil its objectives of liaison with and advice to the National Bureau of Standards in the field of optical radiation measurements, the Council for Optical Radiation Measurements (CORM) has adopted By-Laws, appointed Officers and Directors *pro tempore*, and made plans for the election of Officers and Directors at its next Annual Meeting on June 20, 1979, at the National Bureau of Standards.

The aims and purposes of CORM, as set forth in its By-Laws, are:

- To establish consensus among interested parties on national industrial and academic requirements for physical standards, calibration services, and interlaboratory collaboration programs in the field of optical radiation measurements, including the measurement of the transmitting and reflecting properties of specimens.
- To establish national consensus on the priorities to be attached to meeting these requirements.
- To maintain liaison with the National Bureau of Standards and advise the Bureau of requirements and priorities.
- To assure that information on existing or proposed standards, calibration services, collaboration programs, and its own activities is widely disseminated to interested parties.
- To answer inquiries about such standards activities or forward such inquiries to appropriate agencies.
- To cooperate with other organizations, both public and private, to accomplish these objectives for the direct and indirect benefit of the public at large.

The Officers and Directors *pro tempore* of CORM are: President, E. S. Steeb, General Electric Company, Lamp Business Division, Nela Park, Cleveland, Ohio 44112; Vice-President, C. S. McCamy, Macbeth Division, Kollmorgen Corporation, Newburgh, New York 12550; Secretary-Treasurer, F. W. Billmeyer, Jr., Department of Chemistry, Rensselaer Polytechnic Institute, Troy, New York 12181; Directors, J. E. Eby, GTE Sylvania; F. Grum, Eastman Kodak Company; A.

R. Karoli, Eppley Laboratories; T. A. Luminello, Polaroid Corporation; and W. E. Schneider, Optronics Laboratories.

The 1979 Annual Meeting of CORM to be held at the National Bureau of Standards, Gaithersburg, Maryland, on June 20, 1979, will feature a symposium on the state of the art in commercial instrumentation for photometry and radiometry. All interested persons are invited to attend.

It is expected that a call for membership in CORM will be issued later this spring. For further information on membership and the Annual Meeting program, contact: Dr. Fred W. Billmeyer, Jr., CORM Secretary-Treasurer, Department of Chemistry, Rensselaer Polytechnic Institute, Troy, New York 12181.

## REPORT OF THE 139TH MEETING OF THE COLOUR GROUP

The first paper, by T. Troscianko of the City University, described an experimental study whose object was the investigation of colour appearance changes undergone by chromatic stimuli with achromatic surrounds. In addition, the subtense of the stimuli was varied in the range  $1/6^\circ$  to  $10^\circ$ . A magnitude estimation technique was used to provide numerical estimates of hue, colourfulness ("absolute saturation") and brightness.

The most interesting variability was evident in the colourfulness data, averaged from individual estimates by seven observers. For a colour of constant luminance, colourfulness was maximized near a brightness match with the surround. Colourfulness was decreased either by increasing the "whiteness" of the colour (by decreasing the surround luminance) or by increasing "greyness" (by increasing surround luminance). Hence, the colourfulness function has a clear maximum.

Changes in stimulus subtense also produced marked shifts in colourfulness. For related colours (colours appearing darker than the surround) colourfulness was maximized for  $1^\circ$  fields, fixated centrally. For unrelated colours no such effect was found; colourfulness increased slowly with stimulus subtense in the manner described in previous studies, e.g. those of Burnham.

An explanation of this phenomenon could be provided by the supposition that a  $1^\circ$  chromatic field represents the "fundamental" stimulus size in the traditional concentric stimulus/surround organization. It may then be more useful to consider the total induction on the central  $1^\circ$ , even if the physical stimulus is considerably larger. Luminance induction, the factor affecting the colourfulness of stimuli viewed with achromatic surrounds, will of course be expected to act optimally on the  $1^\circ$  fields.

Appearance data of a very small, (0.4 arcmin) centrally-fixated field were also presented. It was found here that the "tritanopic" appearance of such a field could yield consistent colourfulness and brightness scales, but no hue. This was suggestive of the idea that colourfulness is a fundamentally more useful dimension than hue for small-field viewing.

The second paper was presented by B. Rigg of the University of Bradford and was concerned with indices of metamerism. Pairs of samples, that are metameric, match under one illuminant but do not match under other illuminants. The degree of mismatch can be quite different under different illuminants. There is a need to quantify the degree of mismatch. Two approaches are possible: firstly, to look at the differences in the spectral reflection curves of the mismatching samples or, secondly, to consider the colour difference that



the mismatch represents. This is a difficult problem to tackle practically because of the difficulty in producing metameric pairs of samples; it is easier to calculate metameric reflection curves and produce possible indices using these.

Calculations have been carried out for over 2000 pairs of reflectance curves simulating metameric pairs matching under D65. Delta E values were calculated for a wide variety of illuminants and the maximum Delta E value for any one pair taken to indicate the degree of metamerism. The correlation between various suggested metameric indices and these maximum Delta E values was examined. The results indicated that some indices based on differences between reflectance values worked well. Indices based on the Delta E value under a single illuminant, such as Illuminant A, were poor, but others based on the maximum Delta E value under three or four carefully chosen illuminants worked well. Experiments based on visual assessments on a limited number of real metameric pairs supported the conclusions drawn from the calculations. Observer metamerism was shown to be much smaller than illuminant metamerism.

M.R. Pointer

## EUROPEAN CONFERENCE ON VISUAL PERCEPTION

October 15-18, 1979  
Noordwijkerhout, The Netherlands

In March 1978 a Workshop on Sensory and Perceptual Processes was held in Marburg (BRD). Participants felt that there was a genuine need for such regular non-topical, meetings, in particular in the field of Vision Research, in Europe. The Dutch — i.e. the Netherlands Association for Biophysics and the Netherlands Foundation for Psychonomics — were asked to explore further possibilities for a meeting in Holland. As a result we may ask your attention for the following:

Time: 15 October before dinner — 18 October before dinner.

Location: Congress centre "De Leeuwenhorst," Noordwijkerhout, near Leyden.

Theme: Visual perception in man and other higher vertebrates, studied psychophysically or electrophysiologically. Other sensory modalities may be included if there is a definite need.

Language: English.

Papers: Papers are scheduled for 15 min. presentation time and 5 min. discussion time.

Papers will be selected on the basis of judgment by a team of international referees. Drs. H.B. Barlow, G. Baumgartner, C. Blakemore, O.J. Braddick, E. Eykman, A. Fiorentini, J.A.J. Roufs, B. Stabell and N.S. Sutherland consented to serve.

For more information write to: J.J. Vos, Secretary Organizing Committee, Institute for Perception, TNO P.O. Box 23, Tel. 03463-1444, 3769 ZG Soesterberg, The Netherlands.

## PRATT OFFERS ADVANCED TECHNIQUES COURSES FOR WORKING ARTIST

Pratt Institute has designed a series of advanced techniques courses in answer to the need of the working artist to develop more specialized skills in his art. The courses, which begin February 5th and run throughout the spring season, will be held at Pratt Manhattan Center, (160 Lexington Avenue at

30th Street). The courses feature prestigious Pratt faculty and known experts in the art field. Each course gives intensive instruction in newly developed and valuable techniques for the artist.

The course listings are:

1. TECHNICS, PAINTING PROCESS — Tomaso Puliafito, Professor of Painting at Pratt Institute and nationally exhibited artist. Dates: 15 Mondays 6:30 - 9:30 pm, February 5 - May 14th. The course will be an introduction to paint technology in fine and commercial art. Discussion on traditional and new materials, preparation, application and tools. Course Fee: \$195.00.

2. DESIGN PROCEDURES — Dale Clark, Design Director of Graphic firm, Ronald Emmerling, and adjunct associate professor at Pratt. Dates: 15 Mondays 7:30 - 9:30 pm, February 15 - May 14. Discussion of Design Studio procedures and techniques from layout, art reproduction, to copy and line fittings. Course fee: \$195.00.

3. EXPERIMENTAL ILLUSTRATION — Gerry Contreras, Chairman of Pratt's Communication Design Department and free-lance illustrator. Dates: 15 Tuesdays 6:30 - 9:30 pm, February 6 - May 15. A survey of illustration and a unique inventive view. Packaging information into visual forms to offer alternatives for art buyers in the current predictable market. \$195.00.

4. HOW TO PHOTOGRAPH WORKS OF ART AND REPRODUCE THEM IN PRINT — Malcolm Varon, noted photographer for museums, and Norman Sanders, Technical Director for Sanders Printing Co. Date: Wednesday, February 7, 9:00 - 5:00 at Malcolm Varon's Studio, N.Y.C. Date: Thursday, February 8, 9:00 - 5:00 at Norman Sander's Studio, N.Y.C.

5. ART AND ANATOMY — Salvatore Montano, Associate Professor at Pratt and nationally exhibited artist. Lectures on anatomy at Columbia's Medical School. Dates: 15 Thursdays 6:00 - 9:00, February 8 - May 17. The course will experiment with the metamorphosis of anatomical knowledge into the art of drawing the human figure. \$195.00.

6. FINE ARTS AND ILLUSTRATION — Joseph A. Smith, Associate Professor of Fine Art at Pratt and acclaimed illustrator and cartoonist for major publications. Dates: 8 Thursdays 7:00 - 9:30 pm, February 22 - April 12. A series of informal seminars for illustrators, designers, and art directors. Each class will feature a guest artist and illustrators. Class members will have opportunities to show and discuss their work. Course fee: \$125.00.

7. CHEMICAL HAZARDS IN THE ARTS — Marvin Charton, Pratt Professor of Chemistry and author of numerous publications on the subject. Dates: 8 Wednesdays 6:00 - 9:00 pm, February 21 - April 11. Survey of occupational hazards of chemicals commonly used by artists with practical solutions to problems of exposure. Course fee: \$125.00.

8. COLOR PHOTOGRAPHY OF FINE ART — Malcolm Varon, noted photographer for museums, foundations, and magazines. Dates: Thursdays 6:00 - 8:00, March 15 - April 26. A lecture workshop on photography of paintings and sculpture. Some photo experience is helpful as participants will photograph works of art for 35mm color slides.

9. MONOTYPE: HOW TO MAKE A HANDPAINTED PRINT — Steve Vaubel, artist. Dates: 8 Wednesdays 6:30 - 9:30 pm, March 7 - April 25. Introduction to monotype, an unusual art form that combines the values of printing and painting.

This form provides the artist with a creative tool for expression. Course fee: \$125.00.

For information about future courses, write to: Nina Kurtis, Continuing Education, Pratt Institute, DeKalb Avenue & Hall Street, Brooklyn, New York 11205.

## **NEW NEWSLETTER COVERS WASHINGTON AFFAIRS FOR CHEMICAL INDUSTRY**

The Washington/Chemicals Letter began publications with its January 15 issue.

The weekly newsletter, a publication of the Anley-Jacob Corp., is aimed at every company that makes and sells or even just buys and uses chemicals. Reason: The \$100 billion chemical industry has become the most regulated in American history. So that it has become vital for executives in chemicals and related industries to keep up with events in Washington.

What does all this regulatory activity portend for an industry that has survived and thrived on innovation? Already development of new pesticides has been seriously stifled. Will this trend pervade the entire industry? Will U.S. industry be put at a disadvantage in the world market? It's hard to say now. But it is easy to see where to look for answers: To the Washington regulatory agencies, Congressional hearings and legislation and legal maneuvers by health and environmental groups.

That's where the editors of The Washington/Chemicals Letter will be looking. The editorial coverage will be geared at

keeping the busy executive abreast of the Washington scene. That means keeping up with some 45 federal agencies that are keeping an eye on the production, use, application, transport, distribution and disposal of chemicals.

In addition, The Washington/Chemicals Letter will be keeping an eye on the consumer, health, labor and environmental groups that are often the catalysts for new laws or regulations. And Congressional committees and subcommittees are constantly reviewing new legislation or investigating old regulations that impact on industry operations.

The four-page newsletter will bulletin the information gathered and analyzed in a concise and informative manner so the reader will know quickly what's happening and where to go for more details.

The readers will have the advantage of being ready when regulators hit. And they will have the competitive advantage of knowing how to position their company and products to take advantage of the changes regulations are bringing to the chemical industry. Readers will be able to take advantage of opportunities created by new laws and regulations. Opportunities that depend on staying informed. Opportunities that could prove valuable assets to a company.

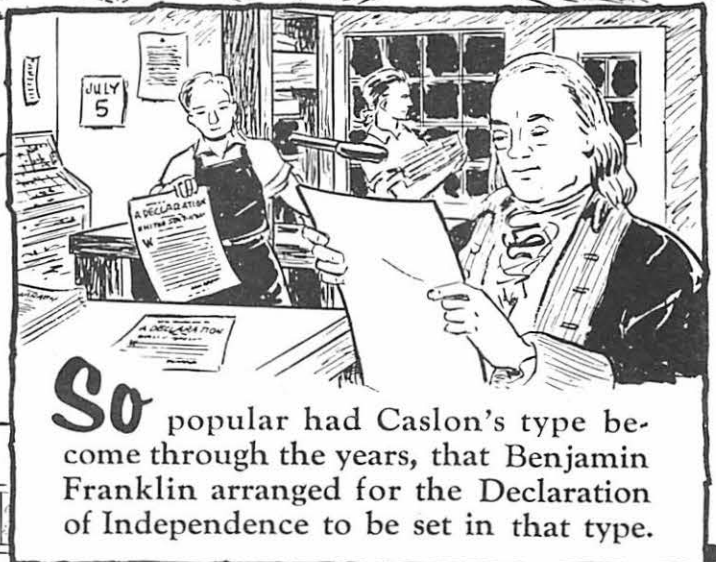
A 16-week introductory trial subscription to The Washington/Chemicals Letter is available for \$60. Cost of a full one-year subscription is \$192, with an \$40 additional charge for overseas mailing.

This space reserved for contributions from ISCC Member-Bodies.

# GRAPHIC ARTS ODDITIES



**R**oman numerals were still in use in the 14th century, and since it was impossible to add or subtract with them on paper, accountants used a counting board or an abacus.



**S**o popular had Caslon's type become through the years, that Benjamin Franklin arranged for the Declaration of Independence to be set in that type.



**B**ecause of the isolation of Iceland, the language has changed very little, and modern Icelanders can easily read the 800-year-old sagas of legendary kings and heroes.



**I**n 1832 in England, girls were employed at about 5 shillings a week to slap on the 3 or 4 colors on the first few pages of *Boys' and Girls' Penny Magazine*.

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## FUTURE MEETINGS

### ISCC Annual Meetings

1979: April 23-24 – Roosevelt Hotel, New York, N.Y.

1980: April 21-22 – Rochester, N.Y.

### Williamsburg Conferences

1980: February 4-6

1981: February 9-11

### Dry Color Manufacturers' Association

1979: The Greenbrier, White Sulpher Springs, WV, June 17-20

### Federation of Societies for Coatings Technology

1979: St. Louis Convention Center, October 3-5

Deadlines for submitting items to be included in the *Newsletter* are: February 15, April 15, June 15, August 15, October 15, and December 15, in other words, the fifteenth of the even-numbered months.

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1. Any person interested in color and desirous of participating in the activities of the Council for the furtherance of its aims and purposes . . . shall be eligible for individual membership (By-Laws, Article I, Section 2). Application forms for individual membership may be obtained from the Secretary (address given above).
2. The Council re-affirms its community of interest and co-operation with the Munsell Color Foundation, an independent private foundation devoted solely to the advancement of color knowledge in science, art, and industry. It serves as Foundation Associate of the Inter-Society Color Council. The Council recommends and encourages contributions for the advancement of these purposes of the Munsell Color Foundation. For information, write to S. L. Davidson, NL Industries, P.O. Box 700, Hightstown, N.J. 08520.
3. The Council promotes color education by its association with the Cooper-Hewitt Museum. It recommends that intended gifts of historical significance, past or present, related to the artistic or scientific usage of color be brought to the attention of Christian Rohlfing, Cooper-Hewitt Museum, 9 East 90th Street, New York, New York 10028.