

# Inter-Society Color Council News

## JOYCE S. DAVENPORT, PRESIDENT-ELECT

For those of you who may have caught the inadvertent omission of the name, Joyce S. Davenport, President-Elect, from the last page of a recent issue of the News, my apologies.

The Editor

## 1983 GODLOVE AWARD

Nominations are invited to potential recipients of the 1983 Godlove Award of the ISCC. Nominations may be submitted by Member-bodies or by individual members of the Council. They should be sent to the Chairman of the 1983 Godlove Committee:

Mrs. Bonnie K. Swenholt  
Eastman Kodak Company  
Building 69, 8th Floor  
Rochester, NY 14650

and must be received by January 10, 1983.

## Basis of Judgment for Godlove Award

The Godlove Award is to be given for contributions to the subject of color. The contributions of an individual shall be examined in light of the Aims and Purposes of the Inter-Society Color Council given in Article II of the Constitution.

The merit of a candidate shall be judged by his contributions to any field of interest related to color whether or not it is represented by the Member-bodies. The contribution to color may be direct, it may be in the active practical stimulation of the application of color, or it may be an outstanding dissemination of knowledge in color by writing or lecturing, based on original contributions by the nominee.

The candidate must be a member of the Inter-Society Color Council (a delegate, an individual member, a retired member, or any honorary member). Former members of the ISCC, who may not be "retired members," may be considered.

The candidate need not have been active in the affairs of the Council.

Citizenship, place of residence, age, or other personal circumstances shall not be considered in the granting of the Award.

## Information Required for Nomination

1. Name and address of nominee
2. Professional affiliation (company, institution, etc., if any)
3. Title (present or most recent) and duties
4. Other professional society affiliations and any positions held
5. Nature of interest and activities in color
6. Evidence of the contribution made in encouraging the scientific, artistic or industrial use of color
  - a. In own organization (for company or employer)
  - b. In own aspect of color expertise in own industry or

Number 280

SEPTEMBER-OCTOBER 1982

professional group

- c. In outside-interest contributions in color (other industries, for example)
  - d. In national activities
  - e. In international activities
7. Writing or speaking done in support of scientific, artistic or industrial use of color. (Attach list of publications, talks, patents, etc., if possible — the list should be representative, not necessarily complete.)
  8. Additional general background information
  9. Source of Nomination
    - a. Member-body — Give name of person in Member-body who prepared the nomination
    - b. Individual member — Give name
    - c. Award Committee

Note: Confidentiality of the nomination is of the utmost importance. The nominator or nominating group must insure that the nomination is not disclosed to the proposed nominee. If any of the above information cannot be obtained without risking such disclosure, the information should be omitted from the nominating letter.

## NOMINATIONS FOR ISCC SERVICE AWARD

The ISCC Service Award Subcommittee is soliciting nominations for the first ISCC Service Award. This award was established by the Board of Directors in 1980 so that individuals who gave outstanding service to the Society could be recognized in a special way. Service could be in the form of organizational, clerical or technical.

The information required for nomination for the Service Award is:

1. name and address of nominee
2. professional affiliation (company or institution, etc. if any)
3. title (present or most recent and duties)
4. other professional society affiliations and any positions held
5. nature of interest and activity in color
6. evidence of service given toward the advancement of the ISCC
7. additional general background information
8. source of nomination

The Service Award Subcommittee members are as follows: Mr. Calvin S. McCamy, Mr. Charles W. Jerome, Dr. Paul H. Hoffenberg and Mr. Ralph Stanziola (Chairman).

Please send nominations to the Chairman, c/o Applied Color Systems, Inc., P.O. Box 5800, Princeton, NJ 08540.



## WILLIAMSBURG CONFERENCE

"Color and Illumination — Man Lights and So Colors His Environment" is jointly sponsored by the ISCC and the Illuminating Engineering Society of North America. It will be held in Williamsburg, Virginia, on February 6-9, 1983. A very thought-provoking and exciting program has been planned for the Williamsburg Conference by general chairmen, William A. Thornton and Charles W. Jerome.

The ISCC-IES Conference on Color and Illumination is directed toward satisfying the aims and purposes of the sponsoring societies: to promote communication between creative workers in coloring and in lighting; to understand, to enjoy, and to exploit to the benefit of all the enormous gamut of variations in coloration which may be brought about by joint control of colorant and illuminant. For this purpose, speakers have been selected from a wide variety of color- and lighting-related fields, providing a program of varied hue and dimensions that will enrich the experience of every participant. Come and participate — not only to listen, but to question and comment. Ample time will be reserved for open discussion and for informal presentation of new data and ideas.

The Conference program includes the following invited presentations on illumination and color in: "The Care and Comfort of the Hospitalized Patient," by Bill Beck of Donald Guthrie Foundation; "The Esthetics and Psychological Aspects of Lighting," by George Clark of GTE Sylvania; "Photography," by Roy DeMarsh of Eastman Kodak Company; "Daylighting," by Ben Evans of Virginia Polytechnic Institute and State University; "Architecture," by Raymond Grenald of R. Grenald Associates; "Interiors," by Rita Harrold of Westinghouse Electric Company; "Energy Conservation," by Al Hart of General Electric Company; "Merchandising," by Bob Hillman of Sears, Roebuck and Company; "Office Lighting," by Jim Kaloudis of Meyer, Strong, and Jones; "Public Places," by Candace Kling of Kling Lighting Design; "The Work Environment," by Allan Lewis of the State University of New York; "Paintings and Illustrations," by Joy Turner Luke of Studio 231; "The Theatre," by Jim Nuckolls of Incorporated Consultants Ltd.; "The Museum," by Ed Robinson of the Smithsonian Institute; "Colorants and Color Matches," by Allan Rodriguez of E. I du Pont de Nemours and Company; "Teaching Students of Architecture and Design," by Bob Smith of the University of Illinois; "The Esthetics of Interior Spaces," by Alex Styne of Recio and Styne.

A descriptive brochure has been mailed to members. Please place your application form in the mail for receipt by November 30, 1982. Attendance will be limited to 100, so we urge you to get your reservation in early.

Further information on the Conference can be obtained from the general chairmen, Charles W. Jerome and William A. Thornton, Westinghouse Lamp Division, 1 Westinghouse Plaza, Bloomfield, New Jersey 07003. For the descriptive brochure with registration form, write the Publicity Chairman, Dr. Fred W. Billmeyer, Jr., Department of Chemistry, MRC 217, Rensselaer Polytechnic Institute, Troy, New York 12181.

## ISCC CREST

The ISCC blazer crest is available to the membership in response to many requests for an identifying insignia. The crest is transferable and features a clutch-pin fastening. The crest represents support for the ISCC and may be worn to Member Body meetings, lectures and classes. You will be publicizing the ISCC as well as demonstrating your membership.

A limited supply is available at \$22.00, including postage and handling. The lettering and design are in five colors on a silver-gray background with a gold braided border. Two sizes are available: 3-5/16" diameter and 2-5/8" diameter. If you do not indicate the desired size, or the size requested is exhausted, you will be sent what is available.

Be proud to display your membership and participation in the ISCC, and send for your crest at this address:

Stephen F. Bergen  
1 Colonial Woods Drive  
West Orange, NJ 08052  
(201) 325-2221

## ANNOUNCEMENT

In April, an additional dimension will be revived at the ISCC's annual meeting as a response to the wishes of the membership. Three workshops will be held during the meeting, scheduled for maximum attendance. They are as follows:

1. Color Education, chaired by Nancy Jo Howard, Stephen F. Bergen, and Evelyn Stephens.
2. OSA Uniform Color Scales, cooperatively organized by Dorothy Nickerson, Linda Taylor and Joy Turner Luke.
3. Illumination, chaired by William Thornton.

The overseeing committee for these workshops would welcome comments or suggestions concerning future workshops so that interest will be kept at a high level. These workshops can only be successful if supported by ISCC members. The level of education and learning will grow to higher levels at the Annual Session if the membership will help these workshops fly.

Joy Turner Luke  
Stephen F. Bergen

## NEWS OF MEMBERS

### Art Exhibition "On Color"

Mary Salstrom organized a recent exhibition at Prince Street Gallery in New York City. It included seventeen invited artists and brought together American figurative artists who are colorists. The show successfully established the variety of innovative approaches of these artists as well as their ability to move the viewer in a dynamic and often lyrical way.





### Award to Lawrence Herbert

Lawrence Herbert, President of Pantone, Inc., received the very first Research and Development Award of the International Association of Printing House Craftsmen at their 63rd Annual Convention in Lancaster, Pennsylvania. The chairman of the Association's Research and Development Committee said, "Mr. Herbert was enthusiastically chosen by the Board of Judges to receive the first award."

## NEWS OF MEMBER-BODIES

### Report of Delegates of American Society for Testing and Materials

ASTM continues to draft new standards and revise old ones dealing with color and appearance. Much of the appearance-standard activity is carried on in the committee dealing with Appearance of Materials (E-12) though several of the specific materials committee have optical property subcommittees that are quite active, notably the Paint Committee (D-1) and Plastics Committee (D-20).

During the year (1981) new methods have been published for Reflection Haze of High-Gloss Surfaces (D 4039), Specific Luminance of Horizontal (Highway) Coatings (D 4061), Coefficient of Retroreflection of Retroreflective Sheeting (E 810), Colorimetry of Retroreflectors Under Nighttime Conditions (E 811), Describing Retroreflection (E 808), Photometry of Retroreflectors (E 809), Identification of Instrumental Methods of Color or Color Difference Measurement of Materials (E 805), Definitions of Terms relating to Appearance of

Materials (E 284). In addition important editorial corrections were made in Instrumental Evaluation of Color Differences of Opaque Materials (D 2244). Drafts are currently being prepared for revisions of some widely used methods such as Haze and Luminous Transmittance of Transparent Plastics (D 1003), Visual Evaluation of Color Difference of Opaque Materials (D 1729). A number of proposed methods are under development including Visual Evaluation of Metamerism, Visual Evaluation of Gloss Differences Between Surfaces of Similar Appearance, Color Measurement with 45/0 Geometry Tristimulus Colorimeter.

Methods cited above by number are already published in the Annual Book of ASTM Standards. They are also available separately for a nominal charge. Information about new methods or revisions of old methods can be obtained from appropriate committee members. Contact ASTM headquarters for name, address and telephone number.

A paper entitled "Progress and Possibilities in Appearance Analysis" by Robert Brady, Richard Hunter and William Venable was published in ASTM Standardization News, November 1981.

Richard Hunter has obtained ASTM approval to collect all the basic documents on appearance evaluation published by various technical societies and to publish the annotated compilation as a Special Technical Publication of ASTM.

Richard S. Hunter completed the maximum permissible six years as chairman of Committee E-12 in January 1982 and was succeeded by William N. (Nick) Hale. Mr. Hunter was given the Award of Merit and made a fellow of the Society 20 years ago. He was made an Honorary Member of the Society in 1981. Among the thirty thousand current members of ASTM there are only 123 living honorary members.

Harry K. Hammond III, Chairman

### Color Association of The United States

The prediction that color will be the theme of the 21st Century was the intriguing thought that emerged from a meeting which we recently had in Paris with Dr. Francois Parra, head of "Centre Francais de la Couleur." We spent several hours discussing the growing role of color in the lives of people all over the world, preliminary to Dr. Parra's departure for a 3-day seminar on color which took place in Budapest on June 8, 9 and 10 under the theme of "The Dynamics of Colors." The subjects of *Color and the environment* and *The effect of color on the human psyche* were featured at this International Conference. Dr. Parra was among the principal speakers.

The French Color Center also published a quarterly review "Information Couleur." In a recent issue, a striking example of the role of color to change consumer perception of a product was given:

*Marie Brizard* has been known since 1735 as a liqueur fancied by old ladies. Sensing the possibility in the developing market of young people who were using the product not so much as a liqueur but with water or on the rocks, management decided, while keeping the shape and size of the bottle, to make a radical change in the color and graphism of the label.

In order to express the new product's orientation, the following changes were made: the gold, which evoked an image of rich sweet taste, was replaced by a silver suggesting a feeling of "cold." The blue was hardened and ombre'd to communicate the same idea of coolness and to express the idea of a long drink. The changes were made comparatively recently. Today, the majority of consumers is composed of people less than 35 years old.

Reprinted from CAUS Newsletter

## GRUPO ARGENTINO DEL COLOR

The GAC activities for 1982 included the following:

### a) Conferences

April 6: "*Colour in Plastic Arts*," by G. Aparicio and I. Saderman.

May 4: "*Colour in the Automotive Industry*," Lic. J. L. Buena Romero: "Development of Finishing Colours for the Automotive Industry." Mr. R. A. Giron: "Application of Finishing Colours in the Industry."

July 22: "*Color in Architecture*." Arq. Alfredo Gonzalez: "Point of View of an Architect." Sr. Raul Loza: "Point of View of an Artist."

September 14: "*Whiteness and Fluorescence*," Lic. A. A. Alvarez: "Quantitative Evaluation of Whiteness." Lic. R. D. Lozano: "Psychophysical Aspects of Whiteness Perception."

November 2: "*New Techniques in Instrumentation*."

### b) Courses

June 15-24: "Fundamentals of Color Science," Professor Lic. R. D. Lozano.

October 7-21: "Colour Formulation," by Dr. A. Troparevsky and Lic. A. A. Alvarez.

### c) Symposium

August 19: "Colour in Foods." Four papers were presented:

1. "Nonenzymatic Browning in Liquid Model Systems," by S. L. Resnik.

2. "Kinetic of Colour Formation by Nonenzymatic Browning in Systems of Food Models," by C. Petriella, S. L. Resnik, J. Chirife and R. D. Lozano.

3. "Colorimetric Determination of Chilled and Frozen Meat Products," by N. E. Zaritsky and A. E. Bevilacqua.

4. "Needs of an Objective Measurement of Colour in Foods and a Summary of What Has Been Done in This Respect at INTI," by R. D. Lozano.

## MEETINGS

### The Forsius Symposium on Colour Order Systems

*The Forsius Symposium on Colour Order Systems*, a Midterm Meeting of the International Colour Association, will be held in Kungälv, near Gothenburg, Sweden, on August 26-30, 1983. Sigfrid Aron Forsius (1550-1624) was a Swedish scientist who published one of the earliest known color circles.

The Forsius Symposium will be a forum for discussions on the philosophy of, the need for, the principles behind, and the usefulness of various Colour Order Systems. The intention is to allow as much time as possible for free discussions focused on certain subtopics, each of which will be introduced by an invited lecturer. Each session will be led by a moderator who will be asked to give a short conclusion of the discussion.

As the number of participants has to be limited, preference will be given to those who contribute to the topics by submitting papers. These will not be read at the Symposium but circulated beforehand to form the basis of the discussions. By permission of the moderator of a session an author may show a few slides in order to clarify parts of his ideas. Contributions in the form of posters will also be accepted as a background for discussions.

The Symposium will take place at the Nordiska Folkhögskolan in Kungälv, a historical town beautifully situated 18 km north of Gothenburg on the Swedish west coast. It is a boarding school with good facilities for both formal and informal discussion, exhibitions and working groups. Meals will be served in the main building and living accommodation will be provided in the adjoining bungalows of eight single (or double) rooms with wash-basin in each. Guests have to share toilets and shower facilities. It is possible to accept about 80 participants and there will also be room for a few accompanying persons.

Total costs are calculated to be a maximum of U.S. \$400, including conference fee, proceedings, and board and lodging. Alternative lodging, at considerable extra cost, is available at a nearby first-class hotel.

The Symposium will open with an evening introductory lecture on Friday, August 26. Discussions will be held on Saturday and Monday, with excursions on Sunday. The meeting will be conducted in English. The Symposium will close on Tuesday, August 30, in time for participants who are also attending the 20th CIE Congress in Amsterdam to make convenient connections. Gothenberg has an international airport, and there are good bus connections to Kungälv.

The following subtopics are suggested, but consideration will be given to proposals for additional topics and for lecturers. Such proposals should be received by January 31, 1983.

Why Colour Order Systems? — history of — need for, Different Basic Concepts — philosophies and paradigm according to perception — physics — physiology — technology — meaning, Basic Attributes — dimensions — variables — quantities — units, Colour Spaces and Models — mathematical — graphical — semantic — spacing principles, Experimental Evidence — methods — relevance — generality — implications — complications — objections, Physical Exemplifications — colour samples — instrumental measurements — mixtures, Applications — industry — environmental design — art — research.

Persons wishing to take part in this Symposium are invited to submit papers under any of the listed subtopics. Accepted papers will not be read at the sessions but will be duplicated and circulated to the participants in advance as a basis for the discussions.

A short abstract of maximum 100 words should be sent to

the Papers Committee no later than January 31, 1983. Both written papers and poster papers will be accepted forms of contribution. The Papers Committee will make their decisions known no later than February 1983. Accepted written papers and summaries of poster papers, both of maximum five A4-pages, must be submitted by April 30, 1983 at the latest. Papers and Summaries will be copied in black and white as received, and distributed before July 31 to participants who have paid an entry fee of U.S. \$125. A poster paper should not exceed two posters of 70 x 100 cm; it must be self-explanatory and the material must be brought and mounted by the author. As the number of participants is limited, preference will be given to those who submit papers.

The Forsius Symposium will be arranged for the AIC by The Swedish Colour Centre Foundation in collaboration with The Swedish Colour Group, the Department of Psychology at the University of Göteborg, SIS, The Swedish Standards Institution, and the Scandinavian Colour Institute. For further information, contact the Secretariat of The Forsius Symposium, Box 14038, S-104 40 Stockholm, Sweden.

### **Seminar on "Efficient Operation of Paint Lab"**

A 1½ day seminar on "The Efficient Operation of an Up-to-Date Paint and Coatings Laboratory" will be sponsored by the Federation of Societies for Coatings Technology, April 26 and 27, 1983, at the Hilton Plaza Inn, Kansas City, MO.

The program will feature presentations designed to help paint and coatings manufacturers re-evaluate the efficiency of their laboratory procedures. All areas of laboratory design will be discussed, from the planning of a new facility to remodeling an existing one, and will include R&D procedures for both architectural paints and industrial coatings as well as quality control operations for raw materials and finished products.

Well-known coatings industry personnel, experienced and knowledgeable in their fields, will comprise the panel of speakers.

Seminar sessions will be developed and programmed by Royal A. Brown, FSCT Technical Advisor, in cooperation with the Federation staff, which will be responsible for other arrangements.

Complete details will be made available later. In the meantime, further information may be obtained by contacting the Federation of Societies for Coatings Technology, 1315 Walnut St., Suite 832, Philadelphia, PA 19107.

### **Graphic Arts Technical Foundation**

The schedule of topics and speakers has been set for "Creating a New Image in Difficult Times," the 1983 InterTech conference to be sponsored by the Graphic Arts Technical Foundation (GATF) on January 18-19, 1983, in Pittsburgh, Pa.

The conference is designed especially for members of the printing and publishing industries. Users of integrated systems and other innovations in economics, management, and equipment will give most of the presentations.

One of the five InterTech sessions, "Innovations through Skills and Technology," will include eight discussions by ex-

ecutives experienced in utilizing new methods. Several of these presentations will be "In Preparation for Digitized Graphics to Plate by 1985," by Robert Tipton, manager of technical services for Science Press, and "Waste Recovery for Energy Generation and Savings" by Richard Miller, president of Case-Hoyt/Rochester.

The next session will be "Customer Relations: The Love Affair That Never Ends." To be included during this session are "Considering Your Customers in Technological Changes," by Francis Canzano, Jr., vice-president/sales for Acme Printing Co., Inc., and "A Marketing Plan to Improve Customer Communications," by Ben Prieb, vice-president/sales for Jacob North Printing Co.

### **SCHEDULE SET FOR INTERTECH**

Users reports on "Getting Plates to Press Efficiently" and "Electronic Image Processing" will also be held. Some of the presenters will be David E. Smith, printing supervisor, Green Bay Packaging, Inc.; D.S. Pedley, corporate vice-president/administration, the Lanman Companies; and Ken Giordano, vice-president/color reproduction, and Keith Meredith, vice-president/sales, both from Autumn Graphics, Inc.

For more information on InterTech '83, contact C. Dwight Horner, manager of technical workshops, Graphic Arts Technical Foundation, 4615 Forbes Avenue, Pittsburgh, PA 15213; phone: 412/621-6941.

### **RADIOMETRY PUBLICATIONS**

The National Bureau of Standards has recently compiled a bibliography of publications by the NBS staff in the Center for Radiation Research. The list appears in Optical Radiation News, No. 40, July 1982. Inquiries may be directed to Robert L. Booker, B308, Metrology Building, National Bureau of Standards, Washington, D.C. 20234.

### **BLUE LIGHT TO RELIEVE THE PAIN OF ARTHRITIS**

The Volume 3, Number 2, 1982 issue of The International Journal of Biosocial Research reports on a controlled study by Sharon F. McDonald with the title, Effect of Visible Light-waves on Arthritis Pain. Some 60 female outpatients at a rheumatology clinic, ages 40 to 60, and suffering from arthritic pains, had left hands exposed within a cabinet illuminated under three conditions: red light, blue light, control (uncolored). The basic light source was a 40 watt incandescent bulb, and the red and blue color filters were of transparent plastic not entirely monochromatic. When the tests were conducted, the patients could, in one condition, see the light source, and in the other have no knowledge of what color — or lack of color — was directed over their hands.

An auditory sensory device was employed which the patients controlled. They were instructed to "Turn the dial to find a loudness of the tone that most closely matches the pain in your hand." A clinical audiometer recorded the responses, louder for pain, softer for reduced pain.

Here are a few quotes from the article.

"The predominant presence of shorter, more frequent blue lightwaves is more likely to be related to a reduction in the experience of pain than is the predominant presence of longer, less frequent (red) lightwaves, or the control condition."

"The longer the duration of exposure to the blue lightwaves, the more likely there will be a reduction in the experience of pain."

"It is not necessary to see the lightwaves in order to be influenced by them . . . This supports the postulation that a response to visible lightwaves is not dependent on the visual process."

If blue relieves or lessens the pain of arthritis, exposure time should be "from fifteen minutes to at least one-half hour."

Blue light, incidentally, has been therapeutically beneficial — and universally recognized by the medical profession — in counteracting the highly dangerous effects of hyperbilirubinaemia (pathologic jaundice) in affected newborn infants.

Faber Birren

## FOOD COLORS

The following article reprinted permission of the *Greensboro News and Record* was sent in by Lou Graham, ISCC President, as an example of what is presented to the public on color. Are there any members of The Institute of Food Technologists (or others) out there who would like to comment?

I'll never forget the surprise and amazement I saw (and shared) on the faces of a hundred high school students one wintry February morning almost 10 years ago.

Gathered for a weekly early morning young people's breakfast at an Episcopal church in my home state of South Carolina, the kids just weren't ready for the youth minister's sleight of hand at 7 a.m.

"The grits are pink, do ya believe that?" we kept saying to each other. "Oh, my gosh, I can't eat that this early," one squeamish diner mourned.

Sure enough, they were right. The grits were *pink*, pink in honor of St. Valentine's Day. An appropriate color choice, to be sure. But pink grits? I never really got over my dismay.

It was a little easier last March. Caught up in the raucous celebration of St. Patrick's Day in a delightful English pub in the historic Shockoe Slip district of Richmond, Va., I really didn't mind drinking green beer. After all, no one else seemed to mind. (I suspected many patrons were too inebriated to care what color they imbibed, but you never know.)

Still, both of the experiences underscore the high value eaters in general place on the color of their food.

- Ever eat purple eggs? Neither have I, and I don't plan to. Eggs are SUPPOSED to be yellow.

- What about brown orange juice? (Talk about eye-opener!)

There's no question that most of us wouldn't be comfortable dabbling in peculiarly colored food. Like red, green and yellow stoplights, food should be the color we're used to.

Or should it?

In a July 1980 report, a panel for the Institute of Food Technologists noted some interesting facts about food colors.

"The fact is, however," the report states, "that butter can be almost white in winter, a cola drink clear, and ripe oranges a mottled green, *unless* these foods are colored during processing. They are commonly made yellow, brown, and orange, respectively, by food colors, so that they will 'match' our preconceptions, and hence be more attractive.

"They are made that way by using the 29 food colors currently approved in the United States."

More recently, another foods expert noted that whenever we think of appetizing foods we usually identify them by their colors. Kenneth N. Anderson, an executive editor of Publishers Editorial Services, goes on to say in his article that colors are so important to food identification that definitions in Webster's Dictionary use colors to distinguish different foods. (Example: "Avocado: the pulpy green or purple edible fruit . . .")

"Color connotations often carry over to other products, whether they choose to be shoes or sheets, paints or pants," he writes.

Food colors matter so much, in fact, that some people feel a food has acquired a different flavor if it is an unexpected color.

The IFT report quotes from a 1958 study demonstrating how people reacted to sherbets with colors and flavors mismatched. The report showed:

"When the sherbets were white and made with any of the six test flavors (lemon, lime, orange, grape, pineapple and almond), the panel was confused and largely unsuccessful in identifying the individual flavors. Likewise, when the sherbet was deceptively colored, most judges made wrong identifications."

In that study, then, the color of food had two important effects on the eater:

- It outweighed flavor in the impression it made even though the flavor was pleasant and the foods tested were popular ones.
- It influenced the consumer's ability not only to identify the flavor, but also his or her estimate of its strength and quantity.

Scientific studies also seem to show a relationship between color and other sensory factors such as sweetness or tartness. For example, a 1979 study showed that adding a small amount of red dye to a beverage increased its apparent sweetness to a test panel by 5 percent to 10 percent. It also showed that adding a blue dye to a cherry-flavored beverage reduced the tartness perceived by the panel by about 20 percent.

Some experts believe the findings of the 1979 study may assist people on weight-control diets. If color affects perceived sweetness, then it is feasible food products could be manufactured with fewer calories per serving if the coloring produced the necessary illusion of a sweeter taste.

Anderson points out that experiments with food coloring reinforce what food processors and manufacturers have known for years about human attitude in flavor anticipation. "The customer expects a green apple to taste sour and a red apple to taste sweet although the color is in the peeling which is not eaten," he notes.

Along the same lines, most grocery store customers select a

red tomato over an orange one. And if you've detected a difference in the color of egg yolks, you may find it interesting to know that the richer-appearing color of the dark yolk mainly is due to the presence in the chicken's diet of a natural pigment called carotenoid.

### Color in the beginning

Coloring foods to increase their appeal is not a contemporary phenomenon but probably dates back at least 3,000 years when spices and condiments likely were used as colorants. For instance, one California scientist notes that color was emphasized in the preparation of banquets in Imperial Rome. The menus specified such items as cauliflower be served fresh and green on black platters.

Through the centuries, colorants likely were developed from naturally occurring minerals, plants and animals along with the spices that played a prominent role in the development of many early civilizations.

In the past, the history of food color suggests parsley juice was used to provide green colors, sandalwood as a source of red, egg yolk and saffron blended to produce a gold color and rose petals used for a rose-colored sauce.

### Problems with coloring

During the 1700s and the 1800s, reports show the value of food colors was exploited by some manufacturers in an effort to sell foods which were of poor quality or even spoiled. The IFT report quotes a 19th century source which exposed some dangerous coloring practices in London including:

- Pickles which owed their appetizing green color to copper sulfate, a poison which killed unknown numbers of consumers.
- Rainbow-hued candies that owed their colorful appearance to highly toxic salts of copper and lead.
- Used tea leaves tinted with black lead and other chemicals, dried and sold as "fresh" tea.

In spite of these findings, some of the deceptive practices continued until about 1900.

### Food colors today

Today, however, most of our modern food colors are taken from a variety of synthetic and natural sources, rather than from inherently poisonous compounds like copper, lead, arsenic and other heavy metals.

But the naming system for food colors, and understanding the various systems used by different groups remains highly confusing. According to the IFT report, the word "color" means the stimulus received by the brain when radiant energy

enters the eyes (in other words, we "see" green, blue, etc.) in the physical and biological sciences. It states, "The words 'colorant' and 'pigment' refer to the material which creates the color. When referring to foods, however, the words 'food color,' 'color,' 'dye,' 'pigment' have been used to mean" the same thing for many years.

Today, food colors are regulated by law in both Great Britain and other parts of Europe. In the United States, any color used must pass the safety tests of the U. S. Food and Drug Administration.

Manufacturers still use some natural food colors today, but many are not suitable for modern processing and manufacturing methods. To be used in a canned, bottled or other type packaged food, a color now must be able to withstand such extremes as varying temperatures and lengthy storage in warehouses and grocery stores.

After years of testing and controversy over the use of food colors of various types, only seven artificial colors were permitted in the food supply in the United States, according to the IFT. Two other colors are permitted for limited application, but their use is governed strictly according to weight.

One of the most controversial cases involving food colors was Red No. 2. The dye had been used as a food color in the United States since 1908, but two 1970 studies in the Soviet Union showed the color was harmful.

After six years of debate, the FDA commissioner in 1976 said a study was needed to dispel all questions about the dye's effects before it could be shown to be safe and the provisional listing which the dye had been under was terminated. The IFT report states that, in 1980, the "Commissioner denied a long-standing petition for permanent listing (of the color as safe)" because there was no data to show it safely could be added to food.

### Color preferences

Whatever colors you prefer your food to be, a number of factors may influence your choices. It probably matters which colors you associate with good-tasting foods, what your parents liked to eat, the overall appearance of the food in addition to its color, the region of this country in which you were reared and the color of the first food you were served.

Recent work by food experts indicates color preferences and prejudices are learned from the first day you're introduced to food as an infant. For instance, if the ethnic roots of your family are Italian on one side, you might eat green spinach noodles today if you've an Italian relative who served them to you early in life.

Cecile Holmes White  
*Greensboro News & Record*

## CALENDAR

### ISCC Annual Meetings

1983: April 10-12 — Louisville, KY, Galt House

### ISCC Williamsburg Conference

1983: February 6-9 — Williamsburg, VA,  
COLOR AND ILLUMINATION

### American Association of Textile Chemists and Colorists

Color Measurement Symposium, March 8-9, 1983 —  
Greensboro, NC

### TAPPI

Coating Conference, May 15-18, 1983 — San Francisco, CA

### Optical Society of America

Annual Meeting, October 17-21, 1983 — New Orleans, LA

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

Send newsletter items to:

Ms. Mary Ellen Zuyus  
Hunter Associates Laboratory, Inc.  
11495 Sunset Hills Road  
Reston, VA 22090

## COMMITTEE ON PUBLICATIONS

Mary Ellen Zuyus, Chairman  
Yale Forman  
Harry K. Hammond  
Edward L. Cairns  
Frederick T. Simon

## OFFICERS 1982-1984

### President

Mr. Louis A. Graham  
Color and Dyeing Laboratories  
Burlington Industries  
P. O. Box 21327  
Greensboro, NC 27420  
(919) 379-1809

### President-Elect

Miss Joyce S. Davenport  
DeSoto, Inc.  
1700 S. Mount Prospect Road  
Des Plaines, IL 60018  
(312) 391-9426

### Secretary

Miss Therese R.  
Commerford  
U.S. Army Natick Laboratories  
Attn: DRDNA-ITCP  
Natick, MA 01760  
(617) 651-5467

### Treasurer

Mr. Edward T. Conner  
Gardner/NeoTec Instrument Div.  
Pacific Scientific Company  
2431 Linden Lane  
Silver Spring, MD 20910  
(301) 495-7090

### Past President

Dr. William D. Schaeffer  
Graphic Arts Technical  
Foundation  
4615 Forbes Avenue  
Pittsburgh, PA 15213  
(412) 621-6941

## DIRECTORS

### 1980-1983

Ms. Joy Turner Luke  
Mr. Ralph Stanziola  
Dr. William A. Thornton

### 1981-1984

Mr. Warren Reese  
Ms. Barbara Schirmeister  
Dr. Thomas G. Webber

### 1982-1985

Dr. Fred W. Billmeyer, Jr.  
Mr. Richard D. Ingalls  
Mr. Rolf G. Kuehni

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 reaffirms its community of interest and cooperation with the Munsell Color Foundation, an independent private foundation devoted solely to the advancement of color knowledge in science, art, and industry. It serves as Foundation Associate of the Inter-Society Color Council. The Council recommends and encourages contributions for the advancement of these purposes of the Munsell Color Foundation. For information, write to S. L. Davidson, 42 Kemp Avenue, Fair Haven, NJ 07701.
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 10028.