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Franc Grum's untimely death in an automobile accident. Franc had long been associated with the ISCC. He actively contributed to the Project Committees, serving as the chairman of Committee No. 18, Colorimetry of Fluorescent Materials. Later, while President-Elect of the ISCC, he also served as Member-Body Liaison. As President from 1978 to 1980, he organized the Board of Directors and the Executive Committee, ensuring that each member had a specific, well-defined task. Franc worked for 32 years at Eastman Kodak and was a senior research laboratory director. He retired from Kodak in 1982 to start the Munsell Color Science Laboratory at Rochester Institute of Technology, a degree program to train our future color scientists. During this time he continued serving on the ISCC Nominating Committee. He was also always available to our members to help with a problem, whether technical or organizational. In recognition of his many technical contributions and a lifetime dedicated to the advancement of color science, the ISCC presented him with the 1985 Godlove Award.

Recognizing the value of the color science program started by Franc, the ISCC Board of Directors voted last February to donate \$2,500 to the Franc Grum Memorial Scholarship Fund. This donation, in memory of the several outstanding ISCC members who recently passed away, would help continue Franc's work by assisting a graduate student in the Color Science, Appearance and Technology program. Your Board of Directors endorsed this Scholarship Fund by voting to support it. Individual members of that Board have shown their personal commitment by making their own separate contributions to this Fund. As you ponder year-end gift giving, I strongly urge you to consider a donation to the RIT Franc Grum Memorial Scholarship. An RIT information sheet on the Scholarship is enclosed with this copy of ISCC News. Your donation will contribute to a graduate student's education, helping ensure a supply of future color scientists. It will help continue the work to which Franc dedicated the last few years of his life. And, it is a great way to show our appreciation for what Franc did for us through furthering color science as well as strengthening our professional society.

Sincerely,
Allan B. J. Rodrigues
ISCC President

LETTER FROM PRESIDENT RODRIGUES

Grum Memorial Scholarship

November 11, 1986

Dear Fellow Members of the ISCC,

A year ago last Christmas, we were all shocked to hear of

ADMINISTRATIVE NOTICE

Amendments to By-Laws

Voting Delegates are hereby informed that the By-Laws Committee has proposed amendments. Justin Rennilson, Chairman, submitted recommendations in writing to the Board of Directors at its Philadelphia meeting, October 17-18, 1986. The Board voted approval of the proposals. Voting delegates will receive ballots in 90 days.

The amendments will provide that persons belonging to the Individual Member Group (IMG) shall be eligible to hold office or a directorship and not just Delegates from Member Bodies. The proposed changes add the words "and individual members" after "accredited delegates" in the first sentence of Section 2 of both Articles III and IV. The sections will then read:

Article III -- Officers

Section 2. Eligibility, Time of Election, and Assumption of Duties

The four officers shall be elected by the voting delegates from among the accredited delegates *and individual members*.

Article IV -- Directors

Section 2. Eligibility

The nine (9) directors to be elected shall be elected by the voting delegates from among the accredited delegates *and individual members*.

The amended sections clarify the rights and privileges of individual members as stated in Article I -- Membership, Section 5 (b).

This notice satisfies the first stipulation of Article X -- Amendments of the By-Laws, that proposed amendments be published in the Newsletter ninety (90) days before voting shall take place.

ISCC DIRECTORS

Candidates for Election

Three directors are elected each year to serve a three-year term. Six people have been selected by the nominating committee for the 1987-1990 term. In alphabetical order they are:

Roy Berns, IMG

Norman Burningham, IMG

James Grady, DCC

Treva Pamer, IMG

Evelyn Stephens, IMG (Pr 40)

Jacqueline Welker, FSCT/C (Pr 25P)

If you know of other capable members who would serve if elected, send their names and qualifications for office to the Secretary. A biographical sketch and a picture are also desired. It is late to add more names this year, but it is not too early to begin thinking about who you would like to have on the Board of Directors next year.

Elected Directors, 1986-1989

At the Board Meeting in Philadelphia in October, your Editor snapped a picture of the three Directors elected last year for the term 1986-1989. Do you know them? Their names were announced at the Annual Meeting in Toronto, and their names appeared on the back of the two previous issues of the *News*. If you don't know their names, look at the back page of this issue. In the photograph below they appear in alphabetical order from left to right.



ANNUAL MEETING PROGRAM PREVIEW

Philadelphia, April 5-7

The 1987 Annual Meeting will be held April 5-7, 1987, at The Barclay Hotel, Rittenhouse Square (18th and Locust Streets), Philadelphia, Pennsylvania. The theme: Industrial Applications of Color Science. This meeting will run two and one-half days with the first half-day General Session on Sunday afternoon devoted to invited and contributed papers on Industrial Applications of Spectrophotometry. There will be a Wine and Cheese Reception early Sunday Evening. The Monday Morning General Session will be devoted to invited and contributed papers on Industrial Applications of Colorimetry. It will be followed by a buffet lunch. The afternoon session will be split between Project Committee Meetings and two successive workshops followed by contributed papers.

The Tuesday Morning General Session will consist of invited papers and contributed papers, presented sequentially, followed by the Awards and Business Luncheon. In the afternoon there will be a repeat of the two Monday afternoon workshops, in reverse order, and these will be run simultaneously with additional Project Committee meetings.

This Annual Meeting should be particularly interesting because of the number of invited and contributed papers that will be given. Philadelphia is also an interesting city; so plan to

come early or stay on after the meeting to visit Independence Hall, the Franklin Institute Science Museum and Planetarium, the Pennsylvania Academy of Fine Arts, the Please Touch Museum for the younger members of the family, and finally the United States Mint. All of these places will be less crowded in April than in June, July, or August.

GODLOVE AWARD RECIPIENT, 1987

Charles D. Reilly

At the ISCC Board of Directors Meeting, October 1986, the announcement was made that Charles D. Reilly, retired from the Du Pont Company, is to receive the 1987 Godlove Award at the Annual



Meeting in recognition of his long-term contributions to the field of color science. Reilly's career has been dedicated to the advancement of color science and its applications. Now retired, but still serving as a consultant, he was formally a Research Fellow at Du Pont where he guided programs in color technology for over 20 years. He served with distinction as an OSA Fellow on the Optical Society of America Committee on Uniform Color Scales, originating and developing the cube-root color equations used to specify this committee's colors. His cube-root color difference equations, published in 1958, served as the basis for the CIE LAB (1976) equations. Reilly also served as Chairman of the CIE Technical Committee 3.2 on Color Rendering.

Reilly's work resulted in the development of many color instruments. The best known were the Colormaster and Du Color colorimeters, pioneering innovations in their day. He has also been an inspiring teacher to many workers in the field of color. For proprietary reasons, he has not been permitted to publish extensively, but his nonproprietary contributions are well known to those who served on committees with him. His work on the OSA-UCS committee has been documented in the committee report by David MacAdam, (JOSA, December 1974) and referred to by Dorothy Nickerson in her published history of the work of the committee.

BOARD OF DIRECTORS MEETING, 10/17-18/86

Partial Report

The Board met in Philadelphia, Pennsylvania, at The Barclay Hotel, the location of the 1987 Annual Meeting. All officers were present. Directors Kaiser, Rennilson and Walter were absent. Three persons not members of the Board were present

at the invitation of President Rodrigues, namely Hugh Fairman, project coordinator; Harry Hammond, Interim Editor, ISCC News; Louise Stall (Moore College of Art, Philadelphia), Arrangements Co-Chairman for the 1987 Annual Meeting.

Four Executive Committee Actions were approved.

1. Bonnie K. Swenholt as ISCC News Editor, effective January 1, 1987.

2. Authorization of the budget for the 1987 Williamsburg Conference (\$6325).

3. Appointment of Ms Mary Ellen Zuyus as Publicity Chairman.

4. Approved ISCC sponsorship of the distribution of the Annotated Bibliography on Color Order Systems prepared by Fred Billmeyer, provided it is free of copyright restrictions. Faber Birren has offered to fund a printed and bound edition of the work. Mimeoform Services will handle distribution. Postage and handling costs are to be paid by the recipients.

President Rodrigues reported as follows:

1. On recommendation of the Board, he informed Mr. Richard Hunter that ISCC wished to dedicate the 1987 Williamsburg Conference to him and his accomplishments. Hunter and his wife, Elizabeth, were invited to attend the conference as guests of ISCC, and they have accepted.

2. Six Godlove Awards based on the design of Mrs. Majorie Ingalls have been ordered at a cost of \$350 each. One half of the cost has been prepaid.

3. On behalf of ISCC, a letter was sent to Dr. David Wright for presentation in a book of commendations at the Colour Group Symposium in London on his 80th birthday, November 19, 1986.

4. Request was made for board approval of appointments to standing committees as follows:

Awards Committee: — Bergen, Ch

1987 Godlove: — Thornton, Ch; Allen, R & M Ingalls, Hemmendinger, Zwick

1988 Macbeth: —

Service: — Stanziola, Ch; Hoffenberg, McCamy, Billmeyer

Arrangements: — Burningham, Ch; Stahl, Co-Ch.

By-Laws: — Rennilson, Ch; Vontury, Swenholt

IMG Liaison: — Besnoy, Ch

Member-Body Liaison: — Davenport, Ch

Membership: — Burton, Ch

Planning: — Luke, Ch; Besnoy

Problems: — Fairman, Ch; Alessi, Connelly, Rich

Publications (ISCC News): — Hammond, Ch; Swenholt, Alessi, Webber

Publicity: — Zuyus

AIC Liaison: — Rodrigues

COLOR Liaison: — Alman

Ad-Hoc

Secretary's Computer: — Commerford, Rich, Swenholt, Walter

Role of Member-Bodies: — Zwick

Meetings: —

1987 Williamsburg: — Alman; Philadelphia: — Howard, Stanzola

This is a partial report. More information will appear in next issue.

NEW ISCC MEMBERS

24 Applications for Individual Membership Approved at Board of Directors Meeting October 18, 1986

Dr. Michael H. Brill
Science Applications
International Corp.
803 West Broad Street
Falls Church, VA 22046

Dr. Brill's interests in color include artificial intelligence, computer vision, and physics, with particular emphasis on color constancy, theoretical models of color perception, color rendering of light sources and color reproduction.

Ms. Valarie A. Cook
P.O. Box 71
West Point, GA 31833

Ms. Cook is a color engineer in West Point-Pepperell's color matching lab. Her particular color interests are color perception, measurement, matching and color sorting, with reference to textile dyeing.

Ms. Pamela S. Cortner
Nortech, a division of
Enron Chemicals
Clinton, MA 01850

Ms. Cortner's work relates to color concentrates for the plastics industry. Her color interests are in quality control, color matching, processing as well as pigment structure, stability and new developments.

Mrs. Dottie R. Cutler
National Spinning Co.,
Inc.
P.O. Box 191
Washington, N.C. 27889

Mrs. Cutler's work involves formulations for yarn dyeing. Her concerns are interpretive differences with different surface appearance, lack of generally accepted color difference systems in this country for textiles. One particular color interest is for a better understanding of, and ability to, set color tolerances for different customer needs.

Mrs. Mary Ann Dvorch
Xerox Corp., Webster
Research Center
800 Phillips Road
Webster, NY 14580

Mrs. Dvorch's work relates to research on laser printers and color systems. Her particular interest in color is hard copy printing, specifically with laser printers.

Ms. Luba Fox
Fox Den
14621 Union Avenue
San Jose, CA 95124-3597

Ms. Fox provides custom design and coloring services for her home furnishings and finishes clients. Color interests include correctly identifying

colors, matching colors, and specifying for clothing, display, interiors, florals and lighting.

Mr. Richard Giardina
The Erie Ceramic Arts
Company
3120 West 22nd Street
Erie, PA 16505

Mr. Giardina's work involves the production of color, reflectance (density) and gloss standards of porcelain enamel on primarily steel substrates for science and industry.

Ms. Patricia Gray
Patricia Gray Interiors,
Inc.
5801 Mayview Circle
Burnaby, B.C.
V5E 4B7 Canada

Ms. Gray's work involves choosing colors for interiors & exteriors of homes, offices, hi-rises and recreational facilities. She is interested in how people relate to different colored environments, their reactions to one color over another, and to color trends.

Mr. Ole Koustrup Hansen
ON Computer
Electronics A/S
Kigkurren 6-8, D
DK-2300 Copenhagen S
Denmark

and electronically produced colorspace.

Mr. Hansen's company, ONCE, works in the field of Computer Aided Tinting, color measurement, color imaging (electronically) and colorant dispensing. His particular color interests are color matching

Mr. Lawrence R. Hoth
Pacific Scientific
Instruments Division
275 London Place
Wheeling, IL 60090

Mr. Hoth's work involves instrumentation for measurement. He has worked with food companies to QC the color of their final products, and paint companies in the application of color matching systems to their uses.

Mr. Robert M. Jameson
American Olean Tile
Company
1000 N. Cannon Avenue
Lansdale, PA 19446

Mr. Jameson's work relates to product development and research on ceramic tiles, specifically the development of colored ceramic glazes and bodies, computer color formulation of colored ceramic products, measured and visual assessment of color difference, and the creation of color groupings for product sorting.

Ms. Ann Campbell
Laidlaw
Burlington Industries
Corporate Research &
Development
P.O. Box 21327
Greensboro, NC 27420

Ms. Campbell's work for Burlington concerns instrumentation, colorant formulation on textiles and in solutions, techniques for calibration and measurement, and video display of colors. She recently received a M.S. in Textile Chemistry from Clemson, where Prof. F.T. Simon was her thesis advisor.

Ms. Elizabeth S. McCoy
48 Byron Road, #4

Ms. McCoy is employed by the US Army Natick RD&E Center. She

Chestnut Hill, MA 02167 provides research services on textile products for military use. Her color interests are in instrumentation, color formulations, and color acceptability.

Mr. John Osborne
42 Industrial Street
Toronto, Ontario, Canada M4G 1Y9
Mr. Osborne has been employed as a lithographer (pre-press) for 22 years. His color interests include color assessment (analyzing originals for reproduction), color control during the reproduction process, and aligning the color gamut of electronic prepress equipment to "real life" conditions.

Mr. Richard W. Riffel
Milton Roy Analytical
Products Division
820 Lindon Avenue
Rochester, NY 14625
Mr. Riffel received his color education at RIT under Dr. Franc Grum. His company works on new instrumentation and research. His particular color interests include computer color matching, quality control applications and printing applications of spectrophotometry.

Mr. Robert Roberts
Sandoz Chemicals
Corporation
4000 Monroe Road
Charlotte, NC 28205
Mr. Roberts provides control and marketing services to the paint, fibers and plastics industries. His color interests are in strength measurement of metamer pigments in synthetic polymers, correlation between fibers and insertion moldings using the same colorants.

Dr. Andrew G. Roth
Berkshire Plastic
Surgeons, Inc.
510 North Street,
Suite 20
Pittsfield, MA 01201
Dr. Roth is a plastic surgeon, providing excisional and/or laser therapy of pigmented skin lesions. He worked on Laser design and construction at Cornell. His particular color interest is in finding a better approach to the problem of the pigmented lesion (birthmark).

Ms. Robin Russell
138 Andrews Street
Woonsocket, RI 02895
Ms. Russell is a recent graduate of the textile program at the University of Rhode Island. She is employed by the US Army Natick RD&E Center, and works with textiles for military use. Her color interests are color matching, shade evaluations, and color measurement.

Mr. Michael J. Shannon
Michael Shannon Design,
Inc.
154 St. Nickolas Ave.
Englewood, NJ 07631
Mr. Shannon provides services in the design and communications (promotion) for interior furnishing materials. He has served as Director of Design for Dunstar Furniture Co. and Formica Corporation. He is interested in the effect of color on the human mind.

Mr. Stephen A. Sheckler
Mr. Sheckler is a student of the

405 West Fern Street
Philadelphia, PA 19120
Philadelphia College of Textiles and Sciences, majoring in color science.

Mr. Kim Vlaun
172 Emerson Place
Brooklyn, NY 11205
Mr. Vlaun is an international student at Pratt Institute, seeking a MFA in painting. He plans to teach and is involved in putting together a color course for painters, and devising a system and method for training color memory.

Mr. Saadat Yazdani
Arabian American Oil
Company
Dhahran 31311
Saudi Arabia
Mr. Yazdani's work relates to photographic processing quality control. His interests are in color film processing, mostly with E-6, C-41, EP-2.

Received 16 October 1986:

Mr. Brian C. Baby
433 Walnut Drive
Sunbury, OH 43074
Mr. Baby is a teacher of Joseph Albers color design at Mount Vernon High School and Kenyon College. His particular color interest is in bi chromate gum printing.

Miss Grace Walls
500 North York Road,
Apt. C1
Hatboro, PA 19040
Miss Walls is a student at the Philadelphia College of Textiles and Sciences, majoring in interior design and taking Dr. Howard's course, "Introduction to Color Science."

HELP WANTED

Color and Appearance Terms

The computer color vision community has one foot in the area of the optics of materials — paints, plastics, textiles, paper, metals, etc., which are the objects they must portray — and the other in computer science techniques. Conversely, the people involved in solving color and appearance problems in material sciences must be able to put one foot into the field of computer science. An example is translating computer-generated image designs into actual materials.

Each of these two areas has developed terminology for color and appearance attributes as a result of its own unique background. For efficiency in inter-communication, a joint effort should be mounted to provide lists of terms and their definitions used in these two very different but overlapping disciplines.

The ISCC Project 6, "Survey of Color Terms," has been on standby status since 1980 awaiting the issuance of new nomenclature promised from the CIE (not yet issued). The Scope of this Committee is so broad (to include terms used by all member-bodies) that the goal seems hopelessly unachievable. Can this scope could be rewritten and subdivided into man-

ageable portions? An alternative would be to establish a new project.

Is anyone interested in working on such a project? Please contact the ISCC Project Committee Coordinator:

Hugh S. Fairman
John L. Armitage and Company
P.O. Box 215
Andover, NJ 07821
(201) 786-6502

Give him your comments early, so that the matter can be discussed at the Williamsburg Meeting, February 8-11, 1987.

Those already contacted and expressing enthusiasm for the project include ISCC President Allan Rodrigues; Hugh Fairman; Steven Shafer, Computer Science Department, Carnegie Mellon University, Pittsburgh, who is willing to serve as organizing Chairman of such a committee; Paula Alessi of Kodak, Chairman of ISCC Project 32 on "Image Technology;" F. W. Billmeyer, Jr., who heads a Task Force in ASTM E-12 on appearance terms; and Harry Hammond, interim ISCC News editor.

Ruth M. Johnston-Feller

More Help Desired

Professor Werner Spillman of Winterthur, Switzerland, desires to obtain various editions of Munsell Books of Color and related material for his library in the Department of Architecture, Winterthur Polytechnic. He points out that it is almost impossible to find people in Europe who have old editions. He would be pleased to acquire:

Munsell Atlas of Color (1915)
Munsell Book of Color (1929, 1943)
Munsell: A Color Notation (1905, 1913, 1916, 1926, 1946)

He would also be pleased to be able to acquire Japanese Color Atlases and other works based on the Munsell System. If you have any of the above items that you would be willing to part with, contact Professor Werner Spillman, Winterthur Polytechnic, Department of Architecture, CH-8401 Winterthur, Switzerland.

Please keep the Editor informed by sending him copies of correspondence.

NEWS FROM DETROIT

Color Council Activities

DCC completed 1986 activities with strong emphasis on education. The September program featured Nancy Jo Howard of Philadelphia College of Textiles and Science, Roy Berns of Rochester Institute of Technology and Lou Graham of Burlington Industries. This group discussed color technology education opportunities at undergraduate and graduate levels and with in-house industrial training.

DCC supported two local color education courses. David Alman of DuPont taught a course in color technology at Eastern Michigan University and drew 35 students for this first session. A group of industry specialists were guest lecturers at a course in Color Marketing and Design at the Center for Creative Studies in Detroit. DCC contributed financial assistance for both courses and aided in publicity.

The November program centered on weathering of automotive materials. It featured Rick Mathew of Americhem, Sue Wagner of Ciba-Geigy and Rudy Leber of Atlas Electric Devices. The 170 member audience heard a lively discussion on auto industry efforts to standardize on meaningful tests for color fastness.

The speaker for the March, 1987, meeting is to be Tom Doherty, now retired from Uniroyal.

The DCC elected Robert Schneider of Ferro Corporation as President for 1987.

FABER BIRREN

An Interview

(Editor's Note: Members of the staff of the Color Association of the United States (CAUS), an ISCC Member Body, interviewed Faber Birren (F.B.) this past summer in his Stamford, Connecticut, office. The results reproduced here with permission are from the CAUS Newsletter of October 10, 1986.)

CAUS: Wherein lies the uniqueness of Americans as consumers of colored products?

F.B.: We are the only people in the world who tire of a color and get rid of something even though it is still usable. Forced obsolescence simply doesn't apply. When redecorating, people seldom buy the same product in the same color. Therefore, color trends go on automatically.

CAUS: Where do you see this trait particularly?

F.B.: In smaller items. It's inherent in Americans who have money to want to buy four Swatch watches, and although it isn't economical, the pleasure people derive from color purchases is a sight to behold. Reasonableness is not necessarily a part of color responses. It seems as though even if you have a wide range of colors people will concentrate on a limited number of them.

CAUS: How important is regionalism in determining color choices?

F.B.: Not very. A region's amount of sunshine and daylight hours influences color selections. Of course. However, it is more important to think in terms of consumer versus contract products.

CAUS: How do you know whether or not someone will be receptive to trendy color looks?

F.B.: The color world may ultimately be divided into two groups, the moderns who like change and the traditionalists who don't. The moderns tend to live in cities.

CAUS: What should an executive know about color?

F.B.: Color is important in architecture. Most architects dislike color because it detracts from form, and although the problem is diminishing as more and more interior design departments have been added to architectural firms in the last ten years, an executive may still wish to call in an interior designer or lighting expert to help solve a color or lighting problem in the workspace.

CAUS: Is there a life span to color logo?

F.B.: Logo in color, like in type, is pretty permanent. You want people to remember it so you don't easily change something. Coca Cola red plus the identifying type were kept recently while changes were made in just about everything else. Even a bad label that works — Budweiser — is kept for identification. Very little in packaging is read. You need the color to attract.

CAUS: Which are your favorites among the many books you have authored?

F.B.: I can only think in terms of effort or how successful a book has been. This explanation becomes a bit autobiographical. It was during the Depression. I had taken a course in color theory, and when I came to New York and saw how well Will Durant's *Story of Philosophy* had done, I said to myself, I'm going to write *The Story of Color* (1941). Twenty years later, the book was printed in paperback and it still sells today. Collecting information is the hardest part of writing a book. I've worked the hardest on *The History of Color in Painting* (1965, 1981).

CAUS: If you were a young man and wished to enter the color field, in which area would you specialize?

F.B.: My interest has always been outward, objective rather than subjective. I like to interpret the reactions of others and of current research by making practical applications. I would probably work in lighting and illumination today because computers have now created new needs in designing office spaces. I have done much interesting work with two groups — the mentally disturbed and the mentally retarded. Both these groups are terrifically responsive to color. Color, particularly brilliant color, distracts them, takes their minds off their inward focus. If color has any psychotherapeutic value, it is that it can distract you. You track home and office trends at the Association. That is an intellectual exercise determining what they want. In a mental institution, however, you tell them what they want.

CAUS: Do you have a favorite color?

F.B.: Yes. Maroon. I'm a red person under control.

CAUS: How does one track color?

F.B.: In order to find out what is coming in look for what is going out. On this chart of preferred colors from 1933 to 1960, you can see that in 1933 when residential walls were painted in light colors (ivory, buff, and cream accounted for 50% of sales for residential wall paint and pale blues, peaches, and light green were also popular) upholstery and carpeting

were mostly rust and olive. Around 1936, there was a shift from rust and olive green to burgundy and royal blue. A shift from the burgundy-blue era to an epoch of green occurred in the post-WWII period. All greens — soft avocados, emeralds, chartreuses, forest greens — were popular. A pale green was then the top seller in automobiles.

CAUS: What advice would you give a color consultant?

F.B.: The average person has strong color ideas. Train yourself to be objective. Observe rather than dictate. A colorist needs to act a bit like a trained sociologist.

Faber Birren Color Award

Sixth Annual Show by Stamford Art Association

"Color is simply the greatest show on earth," wrote Faber Birren, internationally known color consultant and author of numerous books and articles on the subject, "Every moment it floods us with information and sensation delineating everything we see, even our dreams. We use it in countless ways to express ourselves and to assess others. Color reaches the heart, mind and spirit alike. It can be the visceral thrill of a scarlet uniform; the pleasure of a Picasso painting; the soul-solace of a violet twilight sky. For sheer dynamic range, no other medium can touch it. Color is among the richest experiences our senses offer."

The Stamford Art Association, 39 Franklin Street, Stamford, Connecticut presented the Sixth Annual Faber Birren Color Award Show opening with a reception on Sunday, October 19, 1986, and running through November 15 at their three-story townhouse gallery.

Funded and endowed by this dynamic octogenarian who has devoted his life to color and whose latest book "Color Perception in Art," came out this year, it is the only national competition solely devoted to the exploration of color.

Its 487 entrants from almost every state, Canada, Japan, Holland and Mexico were juried by painter, Gabor Peterdi; owner of the Branchville-Soho Gallery, Paula Reens; sculptor, Irving Sabo; and painter-muralist, Alton S. Tobey. Juror for the 46 works selected by the panel was Barbara Haskell, Curator of Paintings and Sculpture at the Whitney Museum of American Art in New York. Noting that the exhibition "offered a wide range of subjects and was stylistically diverse as well as reflecting its time — more realistic and personal than ten years ago," she chose "The Third Element" an acrylic by Marianne Pitner of Bethel, Connecticut, as First Prize Winner. Three Merit Awards went to Ann Bagby of Winchester, Tennessee, for her oil, "Three for Lunch;" Carol Baker of Brooklyn, N.Y., for an untitled pastel; and Gail Wegodsky of Athens, Georgia, for her oil, "Watermelon Still Life." The first prize winner received \$1,000 and the three Merit Award winners received \$250 each.

ISO/TC 187, Color Notations

The International Organization for Standardization (ISO) has organized a new Technical Committee (TC) for the purpose of determining a procedure for deriving perceptual color notations." Note that the emphasis is on specifying color on a visual perception basis, as opposed to the usual numerical specification obtained from instrumental measurement. A U.S. Technical Advisory Group (USTAG) was formed in ASTM Committee E-12 on Appearance of Materials. It is designated Subcommittee E-12.07 on Color Order Systems.

The first meeting of ISO/TC 187 was held in Stockholm, September 2-4, 1986. Delegations from nine nations attended. Representatives were also present from the International Commission on Illumination (CIE) and from the International Association of Consumers Unions. The two U.S. delegates were Nick Hale and Calvin McCamy, both well known members of ISCC.

The Swedish Secretariat of the TC proposed a series of terms with definitions for each. Many of these terms were already defined by the CIE, and the majority of those present were reluctant to accept substitute or alternate definitions. The CIE representative, Heinz Terstiege (West Germany), endorsed this view. After discussion, a Working Group (WG), with Lars Sivik (Sweden) as Convener, was appointed to address this subject.

A series of principles thought to be pertinent to the committee scope was proposed by Sweden. After discussion the matter was referred to a second WG, Convener Alan Robertson (Canada). There is a U.S. member on each WG.

Our hosts graciously provided both lunch and dinner, interspersed with lectures on the use of the Swedish Natural Colour System in such fields as architecture and product design.

In the interest of minimizing travel time and cost, it was agreed that future meetings would be held only in conjunction with other international or national color society meetings. It is expected that the Working Groups will conduct much of their business by correspondence and only meet in person when deemed necessary. They may plan to meet in Venice, Italy, at the CIE meeting in June 1987. The U.S. Delegation suggested that it might be possible to schedule a meeting of TC 187 in the U.S. in conjunction with an ISCC meeting.

Jan Ollner, Swedish Standards Institution, who was earlier elected Chairman of the Meeting was elected to be Chairman of TC 187 for the next three years, the usual ISO/TC meeting cycle.

Reported by Nick Hale, Head, U.S. Delegation.

Venice Biennale

The Venice Biennale is one of the premier international art exhibits. The Summer, 1986, show included a section on Color Order Systems. The emphasis was on *color* rather than *system*, resulting in an exhibit including almost all color collections

published over the past several centuries.

The curator took his cue from a book by Gerritsen, augmented by input from whomever he consulted, resulting in a small amount of information on a large number of color collections. Color charts were available for Munsell, DIN-6164 (German standard), and Ostwald systems, but only Munsell was displayed in a three-dimensional format.

The major amount of exhibit space was devoted to about a hundred colored balloons suspended in positions to define the Coloroid System, little known outside of Hungary.

The Optical Society of America (OSA) was asked to display their Uniform Color System (OSA-UCS). OSA Headquarters decided to send Joy Turner Luke to set up the exhibit, though it was to take place right after the ISCC/AIC meetings in Toronto, Canada. Joy and others prepared a number of color charts, but repeated efforts to obtain further information from Venice could not be obtained; so the exhibit of OSA-UCS never materialized. Meanwhile, the Curator had separately asked David MacAdam to contribute some of his excellent color charts, which he did, but these were not exhibited.

The combination of a curator, apparently without personal knowledge of the field, using an unsuitable reference book (on sale at the desk), failing to properly communicate with potential contributors, deciding not to display the MacAdam color charts, and depending on advisors with parochial interests, resulted in an exhibit of little interest to viewers. Had more emphasis been placed on fewer systems, the viewing public could have learned which color collections have had an impact in the past and which are currently useful.

Nick Hale

Science and Art Conservation

The *1987 Year Book of Science and the Future*, published by the Encyclopedia Britannica contains a 19-page article with color illustrations on science in the service of art conservation, *Science at the Galleries*, written by Dr. Robert L. Feller, Director of the Center on the Materials of the Artist and Conservator at the Mellon Institute. Feller has contributed a steady stream of noteworthy papers, articles and 2 books to the field of conservation since the early 1950's. Some of these are listed at the end of this report for the benefit of those interested in the longevity of paper, pigments and varnishes.

The Encyclopedia Britannica article describes how science has been able to add to knowledge about materials used by artists throughout history. The information gathered through a wide range of techniques has proved valuable in dating works of art, and sometimes in exposing forgeries. Different manufacturing processes, the substitution of synthetic versions for ancient natural pigments and dyes, and the ability in some cases to pinpoint through analysis a specific region where pigments originated, has made it possible to settle a great many questions involving the origin of art works.

The colorant known today as ultramarine blue entered the artist's palette as the ground-up gem stone lapis lazuli from a remote region of Afghanistan. "For centuries kings, queens, and popes often specified that the blue pigment in their richly commissioned portraits and church decorations be natural ultramarine made with genuine lapis from this site. By measuring the relative amounts of sulfur atoms of weight 32 and 34 (the isotope ratio) found in the stone, scientists today can say with considerable confidence whether the pigment in a work of art came from this historic location. There are several other major sources of lapis lazuli; the contaminating extraneous minerals often differ sufficiently that these, as well as sulfur isotope ratios, can be used to characterize the source. Thus it is possible to distinguish lapis from Afghanistan, from the equally famous region of Lake Baikal in Siberia, or from Chile can be distinguished. If, for instance, lapis from South America can be identified in a painting supposedly from the medieval period in Europe, one can immediately suspect that the work is a forgery. Feller points out that synthetic lapis lazuli, the pigment ultramarine, was first manufactured between 1826 and 1828, thus providing another way of identifying modern forgeries.

Techniques mentioned in the article that have proved fruitful in examining art works include: neutron activation analysis, emission spectrographic analysis, thin-layer chromatography, high-pressure liquid chromatography, electron microscopy, X-ray fluorescence analysis, biologic staining techniques, carbon-14 dating, autoradiography, infrared and ultraviolet photography. Feller briefly describes some of these processes and gives examples of their application in obtaining information, such as the identification of lapis lazuli; or perhaps in revealing an artist's individual technique in creating a painting. Feller points out that even the atmospheric testing of atomic bombs in this country during the 1950s and 1960s left tell-tale evidence; elevated levels of carbon-14 in paper and linseed oil derived from plants of that period.

The article also describes the use of modern techniques and materials to conserve the priceless art works severely damaged in the flood of the Arno River in Florence, Italy, November 1966. It closes with a discussion of the current situation in the conservation field and the comment that, "The practicing artist, too, needs a scientific grounding in the materials he wishes to use. Artists of the past had a limited variety of materials and techniques at their disposal and knew very well the value of extended training in their use. Today so many new materials abound that much help is needed to understand their properties and assess their long-term behavior."

Submitted by Joy Turner Luke

Editor's Note: Luke and Feller selected a few of his publications to serve as background for anyone desiring reference material on the subject. Feller also offered to assist anyone

desiring more information. Write Dr. Robert L. Feller, Director, Research Center on the Materials of the Artist and Conservator, Mellon Institute, Carnegie-Mellon University, 4400 Fifth Avenue, Pittsburgh, PA 45221.

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The Color of Things

An article with this title by Philippe Brou, Thomas R. Sciascia, Lynette Linden and Jerome Y. Letrtvin was published in the September 1986 issue of *Scientific American*. It purports to deduce an engineer's model of a color vision

mechanism from their creation of "Color *Illusions* on a computer display screen." The "unconventional" notion the authors have *discovered* is that perceived color does not depend slavishly on the light from each object!

The statement is made that "Today color constancy, if it is mentioned at all, is treated by a skeptical footnote in textbooks on vision." In the opinion of the authors, this presumed skepticism is not hard to understand. There follows an assertion that the skepticism is wrong and that investigators of a century ago recognized color constancy as a *serious problem*. Through a rather tortuous path of "logic" based on observations of color constancy and then of colored shadows "the opposite of color constancy" and the disappearance of color boundaries with the eye fixated at a point, they rediscover the fact that the stationary eye is "blinded" and further deduce from this that "the processing of color determinants by the cones and their intimately associated retinal apparatus offers a reliable system — one that is preferable, we think, to any deferred processing by more central tissue, such as the visual cortex."

In fairness I will mention that there are several pages devoted to a description of the effect produced by various arrangements of colored hexagons. A more critical review of this article might result in a paper as long as the one reviewed. In my opinion, this article clearly illustrates the need for a vigorous effort by ISCC to support and extend color education.

B. K. Swenholt

Pantone Color News

The Fall 1986 Issue of Pantone Color News contains a number of interesting items, such as The Color Purple, Corning Colorings, Designer's Profile — Mario Buatta, Sparkle and Shimmer, Turning Black and White into Gold, The History of Khaki (first installment), and Visual Perception and Mental Images. Many of these articles make reference to specific colors in the Pantone Matching System. Instead of having the ISCC Editor reproduce these items in whole or in part, why not accept the Institute's invitation to be put on their mailing list? To receive the next issue, send your name, company, address and firm's business to Pantone Color Institute, 6324 Variel Avenue, Suite 319, Woodland Hills, CA 91367. The Institute is also conducting a survey on whether you favor colorization of black and white films. There has been a lot of discussion on this subject. See Institute article "Turning Black and White into Gold." If you are not familiar with the technique involved, a brief description of the patented process is contained in "Adding Color to Black and White Film," ISCC News No. 303, September-October 1986, page 22.

NBS Research on Reflectance Standards

For evaluating the performance of spectrophotometers and colorimeters, stable and durable standards are needed in achro-

matic colors, such as white, gray and black as well as chromatic colors in various degrees of saturation. Staff members of the Radiometric Physics Division, National Bureau of Standards (NBS) reported their investigations of the reflection properties of pressed polytetrafluorethylene (PTFE) powder in 1981.¹ A laboratory intercomparison study of these standards was carried out with the cooperation of ISCC Project 22 on Materials for Instrument Calibration. The study was published in 1985.² In 1986, exploratory research has been conducted on the characteristics of PTFE powder mixed with carbon black, pressed into disks, and sintered.³ Disks have also been prepared from mixtures of PTFE and phosphor powders that will withstand the high temperature required for sintering, about 370°C. Further information can be found in the referenced articles.

¹V. W. Weidner and J. J. Hsia, *Reflection properties of pressed polytetrafluorethylene powder*. J. Opt. Soc. Am. 71, 856-861 (1981).

²V. R. Weidner, J. J. Hsia, and B. Adams, *Laboratory intercomparison study of pressed polytetrafluorethylene powder reflectance standards*, Appl. Opt. 24, 2225-2230 (1985).

³V. R. Weidner, J. J. Hsia, and K. L. Eckerle, *Exploratory research in reflectance and fluorescence standards at the National Bureau of Standards*, Optics News v 12, n 11, 18-20 (November 1986).

COLOR RESEARCH AND APPLICATION

Articles in Winter, 1986, Issue

Anyone who attempts to explain color measurement to others knows the difficulty in making the CIE system of colorimetry understandable; there seem to be many obscure and arcane mathematical transformations and arbitrary decisions involved, and there is no clear relationship between the CIE system and human color vision. Robert M. Boynton, an expert in the latter field, was likewise concerned with these problems, and has proposed to the CIE *A System of Photometry and Colorimetry Based on Cone Excitations* that is simple and direct in its derivation from the now-accepted cone response functions of the eye without the need for mathematical "tricks." It is intended to supplement, not replace, the CIE 1931 system, as a teaching tool and for the benefit of those working in color-vision research. The present article is based on Boynton's presentation to the CIE in 1983.

A large fraction of color measurement has been carried out with integrating-sphere instruments since the days of the Hardy spectrophotometer, but few workers realize the nature and importance of the systematic errors that are inherent in the use of this geometry. Frank J. J. Clarke and J. Anne Compton discuss the major sphere errors and the corresponding *Correction Methods for Integrating-Sphere Measurement of Hemispherical Reflectance*. They list no less than ten errors

that must be understood and considered for achieving the best accuracy in color measurement by this means.

We have mentioned several times, and published a special supplement issue on, the role of color in computer displays. Any user of a color computer terminal or monitor knows that it takes the proper adjustment of the relative brightness of the display figures and the background to achieve the best recognition of the information being displayed. But what are these best conditions? Alan R. Jacobsen has studied *The Effect of Background Luminance on Color Recognition*, and his article provides some pertinent results.

Many of us interested in the history of color — an interest that, I observe, increases as one gets older — are more familiar with developments in the United States and Europe than those in other countries. Japan is a case of interest, because it was only about a century ago that it emerged into the modern world. Kohji Ogata tells us about *The First Color Education in Japan*, translating and illustrating in color those parts of the earliest material that have not been lost over the years.

A renewed interest in color-constant colors of objects has led to articles by Berns *et al.* and by Brill and coauthor within the last few issues of this journal. Now William A. Thornton takes a different, less mathematically complex, approach to *Improving the Color Constancy of Object Colors*. As might be expected by those who know him (and as was anticipated by Berns and myself in our research), Thornton relates the criteria for achieving color constancy to the three wavelength bands of maximum response of the human visual system as he defines it.

Another topic incurring a wave of renewed interest is the formulation of fluorescent colors. Despite the difficulties inherent in their measurement, discussed in an extensive series of articles in this journal since its beginning, only recently have articles on computer color matching of fluorescent colors begun to appear, the first being by Bonham in the Fall, 1986, issue. Now Günter Döring writes on *Simplified Match Formulation for Fluorescent Color Specimens*. In a way the two articles are complementary, because Bonham describes how to achieve a reasonable first approximation to a match, while Döring is concerned with how to improve or adjust such an initial match to obtain a satisfactorily small color difference between standard and trial.

Fred W. Billmeyer, Jr.

PRIME COLOR IN CHINA

By William (Bill) Thornton

(Ed. Note: The Wizard of Prime-Color, Inc., 27 Harvard Road, Cranford, NJ 07016, wrote a private report on his recent trip to the Peoples Republic of China (PRC). It so interested your Interim Editor that he requested permission to publish it in ISCC News. The original report dealt only with the trip, but Thornton kindly added some information about the equip-

ment. His candid report on the trip itself makes interesting reading. Some of us have been to PRC in prior years, and many more will undoubtedly make the trip in years to come.)

A Chinese-born friend, with whom I had worked at Westinghouse many years ago, became interested in trade between our two countries, particularly the Chinese lamp industry. He suggested Prime-Color build them a state-of-the-art lamp-factory monitor, that is, a spectroradiometer capable of running and measuring all types of lamps, and of computing both modern and traditional lamplight characteristics. In recent years, color and color rendering became important to the Chinese, and I had corresponded with some of them about their technical papers and some of my own.

During the early months of 1986, my technicians and I built a very fancy piece of light-measuring equipment for the mainland Chinese which they had agreed to buy. Early in June it was shipped by the Flying Tigers. Then it sat at Beijing airport for weeks, awaiting customs action. Because of this, my trip to China — to be sure the equipment was working correctly, to be sure it would be fully utilized by its Chinese owners, and to give a series of lectures to them about lighting in general — kept being put off.

The spectroradiometer, as many of you know, is the supervisor of the lamp and lighting industry, the one instrument capable of completely monitoring the quantity and quality of light from any lamp or light source. The Prime-Color spectroradiometer, in addition to measuring traditional lumens, color, and color-temperature of lamplight, computes color-rendering index, color-preference index, color-discrimination index, and can be programmed also to compute brightness, visibility, color-acceptability, color-scheme stability, and the like.

When the instrument finally got to its owners, in working order, the trip was scheduled for the last two weeks in August. My friend, Ronald Koo, born in Shanghai, with whom I had worked at Westinghouse from 1956-68, and who promoted the Chinese-American interaction, agreed to shepherd me most of the way. We left for Hong Kong August 14 by Korean Airlines — my first trip anywhere near Asia.

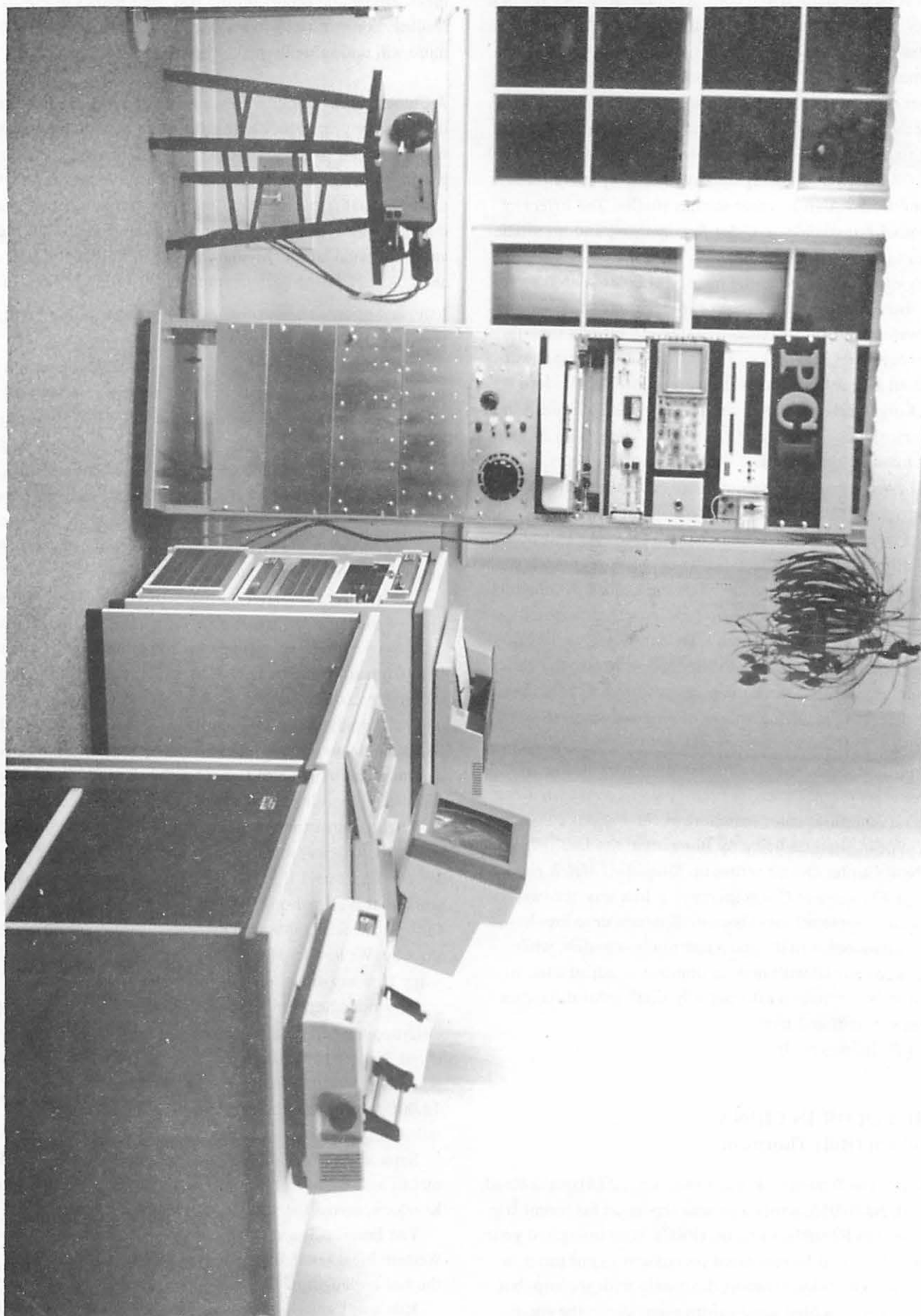
We stopped-over in Seoul, in a fertile, green region with little outcropping, forested hills, then reached Hong Kong after dark, about 20 hours after leaving Kennedy. We glided in over the pitch-dark South China Sea, into Kai Tak airport, with its 12,000-foot runway built right into Victoria Harbor like a two-mile-long barge.

Some of the Wu family — business associates of Ron Koo — met us at the airport, and put me up at the Empress Hotel in Kowloon, across the strait from Hong Kong Island.

The Empress is a very nice, modern hotel. It even provides Western breakfasts! I was thus insulated a while longer from the full onslaught of Chinese fare.

Ron and I saw the sights of Hong Kong for the next two

The Prime-Color, Inc., Lamp-Factory Monitor (before shipment)



days. It was HOT. We got drenched in a shower. I was introduced to real Chinese food, quite different from what one gets in Chinese restaurants in the US. I avoided asking what a certain dish was made of. Ron says the Chinese eat anything they can catch. I drew the line at chicken feet. At my urging, we went on a dinner cruise around the West end of Hong Kong Island, past Telegraph Bay and Waterfall Bay, to Aberdeen, where there are the most fabulously-lit floating restaurants one can imagine, brilliantly colored, blazing bright, as if consuming a thousand kilowatts apiece.

One evening, the Wu family took us and some of their business associates to dinner in Kowloon. The conversation was non-stop, totally about merchandising and trading. It was conducted in a mixture of Italian, English, and Mandarin. Ron Koo speaks several Chinese dialects. As a result of the trip, I proudly try to speak about twenty words of Mandarin.

We flew to Beijing on CAAC (Chinese airline), were met by Ron's friend Mr. Xu, (pronounced shoo, with the lips rounded. The sound is common to German, French, and Chinese but not to English.) We put up in a government hotel in the rural environs of Beijing near the airport. Not a bad hotel — about like one in the States around 1940. The service is poor in government hotels. Ron says it is because the employees have no choice in where they work, no raises, no incentive, and have the job for life. The word 'service' is a poor choice. The employees come close to obstructing the wishes and needs of the patrons! However, Western-style incentive is beginning to find its way into some Chinese operations. There are, for example, a very few 'joint venture' hotels in and around Beijing, which are as flossy as any I've seen anywhere, and in which the service is astonishing: to get ahead of my story, I took Ron and a Chinese friend Xu He to lunch in one of these, and upon every return from the buffet our chairs were held for us.

We flew on to Shenyang, 400 miles northeast of Beijing, a large industrial city of 4.5 million, where my spectroradiometer had been delivered to the Hua Guang Lamp Company. The flight was in an old, battle-scarred 747, filled with passengers, but the airline, although somewhat out of date in its facilities, seemed to be run very competently — the Captain's landing, for example, was as slick as any I've encountered. In Shenyang we were met with great cordiality by Ni Ming Xiang, the plant manager, and several others, whom I later got to know very well. We were escorted to the Liaoning Hotel (Liaoning Province). It is situated on a great circle in the middle of the city. In the center of the circle is a huge statue of Mao, one of two surviving in China today according to Ron. The lamp company sent a car and driver for us at 8 am every morning, including Saturday and Sunday. There are few cars in Shenyang, but there are literally two million bicycles, and all of them are on the roads every day. Driving from the hotel to the plant was always an adventure, for the bicyclists acknowledge no ascendancy to the autos, and in fact seem to challenge

them constantly for the right of way. By constant tooting of the horn, and persistent elbowing through the maze of bikes, steady but slow progress can be made. I learned that most Chinese have never ridden in a car — only on bikes and trolleys.

The Liaoning is a large hotel, with large, old-fashioned rooms, a dining room with remarkable competence and range of menus, dancing (by Chinese only) to a live orchestra every evening. The music was not Chinese, but it was not modern American either. I suspect that it may have been of Russian derivation. The hotel had elevators. There was a service desk on every floor where laundry could be dropped or picked up. You don't drink the water from the tap. There is always a large thermos full of almost boiling water in the room together with teacups and tea-bags. There was also a small refrigerator with soda and beer. I tried the Chinese beer. It was so weak as not to be bad tasting. There was always weak, Chinese orange soda to drink and sometimes coffee.

Ron and I took a long walk at dusk the night we arrived. He tried to find a fruit shop. It was a fascinating walk. The streets were teeming with people. Everything was calm and the people were not unfriendly, however, without Ron's fluent Chinese and English, it would have been a very different experience. A Western face sticks out conspicuously. In fact I remember almost never seeing another while in China.

Despite a mosquito or two, I had my hotel windows wide open every night, to hear the sounds. Every morning a cock crew. By 5 AM carts drawn by small horses or donkeys would be moving in the street. Train whistles would start blowing, the beautiful chimes on the railway station would sound each hour. There were many people whistling and talking in the streets, and the continuous flow of bicycles would have begun. There was an unending sweeping of the streets, generally by women, with brooms fashioned from small tree branches. The city appeared to be very clean. I understand that crime is rare, perhaps because the punishment is severe.

Two young men, Geng Ming and Tai Yang, employees of the Lamp Factory, assigned to the new spectroradiometer, spoke some English. They were both extremely pleasant and friendly, as were all the Chinese with whom I dealt. A more senior man, Li Ying Pu, had, by the time I arrived, gotten a remarkable grasp of the whole instrument; in fact, by the time I arrived, they knew every connection at every point in the complex circuit, had analyzed my computer programs line-by-line, and were bristling with incisive questions. The spectroradiometer wasn't working right, but after a couple of days, and phone calls to my software-expert friend in Ann Arbor, we straightened it out; apparently the frequency of the electric power in China is a bit different from what I have in my facility in New Jersey. We were all no less than overjoyed when the huge gadget began to perk exactly right.

My friend Ron Koo, whose name is really Koo Ching Chong, brought, as a gift, a coffeemaker. I brought, as a gift, a slide-

projector. We had bought both in Hong Kong. It turned out that none of the Chinese drank coffee, nor had any intention of beginning, and the upshot was that the hosts very kindly plied me with coffee from morning to night — I finally shared with them the English apprehension that after drinking coffee too much, you walk around with wet, brown footprints. All day every day they were avid to learn what they could of color-science in general, and the use of the instrument in particular. In a few instances, I agreed to supply some special information uncalled for by our agreement, and was rewarded by a 'sank you very much' and having a hand held in both of theirs. All kinds of lamps are made at this factory — fluorescent, high and low pressure sodium, xenon, mercury, metal-halide, incandescent, ultraviolet, mercury-xenon locomotive headlights, quartz-halogen spotlights, the new compact single-ended fluorescent lamps — and the new spectroradiometer will run and monitor any of them; so as things turned out, relations could simply not have been better.

One day we met with a group of about ten phosphor people from Yingkou. They knew about prime-color fluorescent lamps and prime-color phosphors. Like much of the rest of the world they were particularly interested in them. We talked all afternoon, through an interpreter, refreshed periodically with peaches and pears. The fruit was delicious, but it had a different taste from what we are used to.

Late in the week, it was time for my scheduled all-day lecture on color, vision, and lighting. There were between 80 and 100 people present. They had come, I was told, from all over China. They were involved not only with lighting, but also with the measurement of light. Once we became familiar enough with each other, the give-and-take began, and some really interesting discussions took place. One young man, Hu Bo Zhao, Director of the China Lamp Testing Center in Beijing, acted as interpreter. He was superb. Thus we were able to go far deeper into technical matters than I had expected. I had prepared ten little talks illustrated with slides, mostly on subjects requested by my hosts. We went through these one after another. Their intentness, hour after hour, was astonishing. We stopped for lunch, were driven back to the hotel, then back to the conference room, where everyone had reassembled for another long session.

The next day, many who had attended the lectures the previous day came to the plant to examine the instrument, and to see it operate. Their questions and comments were what one would expect in a competent laboratory in the United States: their technical level is right up to par — only their facilities lack modernization. These people work all the time; their singleness of purpose is remarkable.

As I understand it, everybody in China has a job — that is, an assigned one. So unemployment is essentially zero. In recent years, competent people have been put into the demanding jobs. Under Mao the reverse was true, scholars were put out in

the fields and farmers ran the factories. The factories are encouraged to make a profit, and if they do so, the profits can be used to build new housing for employees. The Beijing environs, for example, are studded with modern high-rise apartments, many of which are reported to have been built with the profits from the factories, for use of factory people. Rents are so low, for everybody, as is food, that much of their small incomes can be hoarded for luxury items. Ron told me that, for the first time in centuries, there is a food surplus in China. On the other hand, people in general have never ridden in an automobile: On Saturday afternoon, following the visits by the lecturees to the new machine, the car, driver, and two of the young Chinese assigned to the new machine were made available to show me Beiling Park, In Shenyang, the palace and tomb of one of the emperors. My favorite lad, Geng Ming, perhaps 24 years old, spoke a little English. When he climbed into the car beside me, he commented that he had never before ridden in an auto.

On one of the first evenings, the Hua Guang hosts put on a dinner for Ron and me. Countless friendly, engaging, polite, formal toasts — how happy they were to have us there, how happy we were to be there, and so on. — and unspeakable things to eat! The Chinese smile all the time, and, as far as I could tell after many days of close association, they mean it all the time. A smiling young chap came from the ministry of small industry in Beijing to organize the lecture and meeting that was to occur a few days later. There are 220 lamp plants in that part of China. After the dinner, the people of the host factory presented me with a gorgeous set of lacquerware — teapot, six cups, saucers, spoons, and a tray — light as a feather and hand-painted.

Restaurant tables are generally round, with a large lazy-susan in the center. Eight to ten dishes are placed on the lazy-susan, and then continually replaced by new and different dishes during the meal. Everybody keeps rotating the lazy-susan, and filling everybody else's plate and glass.

Eating tools consist of chopsticks, toothpick, and soup spoon and holder. The spoon is shaped like a little scoop. There was much meat-content to the dishes — fish, pork, beef, chicken. All the dishes appeared to be cooked with sophistication. Soups were varied and delicious. The Chinese use alcohol extremely moderately. The beer is weak, and wine is drunk by the milliliter. The driver was not allowed to have even beer.

Chinese teeth are white and handsome. Because the Chinese smile so much their teeth are much in evidence.

One afternoon, a car, driver, and two accomplices took me shopping for souvenirs, not where visitors are supposed to go, but to a department store where the Chinese go. Fascinating. Shop and farm tools in the basement — they looked good, but unaccountably all of them had a sheen of rust. Several upper floors contained predictable merchandise. The store was very plain, something like a Sears store in 1935. The place was

teeming. We stopped at a counter to buy a number of hand-held fans. In less than a minute, we were surrounded by a crowd of Chinese.

On the last evening, I gave a dinner for a dozen of the host people; by that time we knew each other well, I had picked up a (very) few words of Chinese, and we had a great time. Many toasts, infinite progression of fond farewells, promises on their part not to show up the next morning, as we had to start for the Shenyang airport before seven. But early the next morning they were there to see us off. At the Shenyang airport, we had had coffee and cake before flying to Beijing. I left a tip of two Hong Kong dollars, each worth 12 cents. Two little waitresses followed me nearly to the plane to explain that they cannot accept tips. That is the case throughout China.

At the arrival area of Beijing airport, a young man was holding a Prime-Color, Inc. banner! It was Xu He, with whom I had corresponded about a fine technical paper of his, published in the *Journal of the Optical Society of America*.¹ He had ridden an early-morning trolley across the huge city of Beijing, and then out to the remote area of the airport, to meet us. He stayed with us all day, and then invited us to his home for dinner. Much of the day was spent at the spectacular Summer Palace and the shrines and pagodas atop pine-covered hills, overlooking a large, man-made lake. We also visited the huge square containing Mao's tomb.

The next morning, Xu He was at the airport again, with a farewell present of two gorgeous silk pillow-covers. I flew the 1300 miles back to Hong Kong alone and stayed overnight at the Meridien Hotel in Kowloon. The next day I flew to Seoul, Korea, then on to Anchorage, Alaska, where we stopped for an hour, and finally Kennedy Airport in New York. It was a full and engrossing trip.

¹H. Xu, "Color-rendering capacity of illumination," *J. Opt. Soc. Amer.*, 73, 12, 1709-1713 (1983).

MEETING VIGNETTE

National Decorating Products Association

A brief telephone report was received on the 39th National Decorating Products Show, sponsored by this Association, at the Cerbantes Convention Center, St. Louis, Missouri, Friday through Sunday, November 21-23, 1986. This show is directed primarily toward paint stores and home decorating centers. Exhibited at the show were fifteen computer color matching systems for use in paint stores and decorator centers.

OBITUARY

Carl Foss, 1907-1986

It is with great sadness that I report the death of Carl E. Foss

on November 25, 1986, in Princeton, New Jersey. He had been ill for a number of years.

Foss occupied a unique place in the field of color. He had an unequalled comprehension of the theory and geometry of color atlases and color systems. He designed many color charts and standards for special uses, including Macintosh apple leaves (for determining tree nitrogen), tomato leaves, french fried potatoes, mayonnaise and hemoglobin.

Foss developed color charts and systems for the Martin Senour (paint) Company. He also originated the paint dispensing systems used by them, and later by others, in which eight to twelve concentrated colors are precisely dispensed by predetermined amounts into a white tinting base to make thousands of paints that match those made previously as shown on color cards in paint stores.

Foss began working about 1926 with Philip Ruxton, a printing ink maker in Chicago. While in charge of their "Color Vault" he produced a Munsell color tree with tennis balls. Later he joined the Munsell Color Company, developed three dimensional color-space models, and became President before he left about 1932 to join the newly formed research laboratories of Interchemical Corporation in New York as assistant director. At Interchemical in 1933 he encouraged the General Electric Company to produce the Hardy-type recording spectrophotometer. Interchemical bought the first machine GE produced. It was delivered in June 1935.

About 1940 Foss became an independent color consultant. One of his first jobs was to produce the color-chip stock for the Color Harmony Manual. Later, he made the stock for the third edition. During the war years he managed a classified NDRC research project located in the former stables of the Tiffany estate in Oyster Bay, Long Island.

In the graphic arts, he specialized in printed charts. He did the colors and background design for the Harry-Rand-Ritter Psuedotsochemoter notes for testing color blindness. Another chart for the color range by three-color process printing was titled "A trichromatic Cubic Color Space Dissection with Black Incremental Modification." Only Foss would come up with such an exactly descriptive title.

Carl Foss and his brother Wally shared an apartment with me in the late 1930's. He was also my boss. I have many memories of good times together including weekends at the laboratory working on projects such as the ISCC color matching aptitude test and tests for color blindness. Through all of this he was the teacher, I was the pupil. He was Vice-President of ISCC (1940) and a Director (1942). He became a fellow and life member of the Optical Society of America. He served on committees of both organizations with distinction, including OSA-Uniform Color Scales. He is survived by his wife Eleanor Scheuing, and a son, Stephen.

Walter C. Granville, Dec. 10, 1986

EDITOR'S CORNER

Your Interim Editor regrets the late submission to the printer of the manuscript material for this issue. He has several excuses: late arrival of important copy assigned to contributors, an extended Thanksgiving holiday, and finally a case of the flu that really slowed him down. A monthly publication schedule has been suggested but rejected. It could eliminate holding an issue for material that should not be delayed until the next issue comes out two months later. Input for this issue has been supplied by several people, the more the better. However, your Editor pleads for copy in text form, not outline, double-spaced, suitable for use without retyping. Most disappointing is the fact that a new editor appears not to be ready to take over as soon as we had hoped.

Harry K. Hammond III, Interim Editor

CALENDAR**1987****ASTM**

Committee E-12 on Appearance, Committee D-1 on Paint and Related Coatings, Hyatt Hotel, Tampa, Florida, January 25-27

ISCC WILLIAMSBURG CONFERENCE

"Geometric Aspects of Appearance," The Lodge, Colonial Williamsburg, VA, February 8-11

ISCC ANNUAL MEETING

"Industrial Problems in Color Science," The Barclay Hotel 18th & Rittenhouse Square, Philadelphia, PA 19103, April 5-7

DETROIT COLOR COUNCIL

Canadian Society for Color, Joint Symposium, Automotive Color Design, Cleary Auditorium, Windsor, Canada, May 27-29, Registration Information, Bob Schneider 800-521-9094, Bill Longley 313-337-5234

CIE, 21st SESSION

San Giorgio Maggiore, Venice, Italy, June 17-25

OPTICAL SOCIETY OF AMERICA

Topical Meeting on Color Appearance, Annapolis, Maryland, June 29-30

ILLUMINATING ENGINEERING SOCIETY

Annual Conference, Marriott Camelback Inn, Scottsdale, Arizona, August 2-6

FEDERATION OF SOCIETIES FOR COATINGS TECHNOLOGY

65th Annual Meeting and 52nd Paint Industries' Show, Convention Center, Dallas TX, October 5-7

OPTICAL SOCIETY OF AMERICA

Annual Meeting, Riverside Convention Center, Rochester, New York, October 18-23

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