Inter-Society Color Council *News*

Number 285 JULY-AUGUST 1983

PANTONE, INC. COLORS NEWSLETTER

A very generous donation of paper and color printing from Pantone, Inc. has restored the color spectrum to the front page of the NewsLetter. The ISCC Board of Directors wishes to express its thanks to Pantone, Inc. for this tangible expression of support and help.

CALL FOR MACBETH AWARD NOMINATIONS

Every two years your Inter-Society Color Council is honored to be able to present the Macbeth Award. The Macbeth Award Fund was established by Mr. Norman Macbeth, Jr., in honor of the memory of his father, Norman Macbeth.

Nominations for the Macbeth Award are now being considered by the Macbeth Award Committee, Robert Hoban, Chairman. Individuals, or groups of individuals, interested in having a specific nomination considered by the committee should submit such nominations as soon as possible to Bob Hoban: Sandoz Colors & Chemicals, 400 Monroe Road, Charlotte, NC 28205 (phone: 704 372-0210).

Rules governing the nominations for the Godlove and Macbeth Awards are given on pages 31 and 32 of the By-Laws Booklet of ISCC. Please note that the confidentiality of the nomination is of the utmost importance. The person or group must insure that the nomination is *not* discussed with the proposed nominee. Should any of the information required in the By-Laws be difficult to obtain without the risk of such disclosure, information should be omitted from the nominating letter.

The other members of the Nominating Committee are: Barbara Schirmeister, Anna Bliss, Dick Hunter and Bill Thornton.

BOUND COPIES OF THE NEWSLETTER

Five sets of Volume 7 of ISCC newsletters (1975 - 1982, Nos. 234-281) are now bound for permanent record and reference. Set No. 3 is filed with the Science and Technology Division of the Library of Congress in Washington, D.C. Set No. 2, which was originally filed with Dr. Judd, is filed with the Cooper-Hewitt Museum of Design, Smithsonian Institution, 9 East 90th Street, New York City. The seven volumes in each set contain all numbers of the newsletters, beginning in 1933. The other sets are filed with the Secretary (Set No. 1), the Newsletter Editor (Set No. 5), and Dorothy Nickerson (Set No. 4).

The binding of these volumes has been done over the years by the William Norwitz Company of Washington, D.C.

GRUM NAMED AS HUNTER PROFESSOR

Franc Grum, former senior head of Photometrology at Kodak Research Laboratories, has been appointed the Richard S. Hunter Professor of Color Science, Appearance and Technology at RIT. Grum recently retired after 32 years with Kodak, where he directed research in photometry, radiometry, and color-image stability and evaluation. He is also the president of the U.S. National Committee of the International Commission on Illumination (CIE) and a past president and long time member of the ISCC.

As the Hunter Professor, Grum will concentrate on three major functions:

1. He will provide undergraduate and graduate courses in the science of color, color measurement and color appearance, including classical color and color imaging. Grum began teaching Color Systems, an undergraduate course, at RIT two years ago. This autumn he plans to launch the first of a series of undergraduate and graduate courses. One course will cover basic colorimetry as defined by the CIE.

2. He will direct the establishment of the Munsell Color Science Laboratory for research and development in the science, measurement and appearance of color, and oversee the publication of the laboratory's research.

3. And Grum will establish a program to implement the recommendations of the National Bureau of Standards and help stabilize international standards.

"I'm very excited," Grum said about heading RIT's color science program. "I think we at RIT can really form a center of excellence in the field. We will be the only color science center in this country, and one of the very few in the world."

Extracted from RIT Newsletter (with editorial changes)

ALEX MUNSELL – 1895-1983

Alexander Ector Orr Munsell died of a heart attack on March 26, 1983 at Beekman Downtown Hospital in New York City. He was 87 years old. On Sunday May 15, 1983 a Memorial Meeting was held at the Church of St. Ann and the Holy Trinity in Brooklyn Heights by a number of his friends who announced establishment of an Alex Munsell Memorial Fund "to carry on work in the spirit of Alex's lifelong activity."

The New York TIMES headline – "Gave Away Inheritance" –recalls the sensational news he made, beginning in the early depression days of the 1930's when he gave away the fortunes inherited from the maternal side of his family, from his grandfather, from two aunts, and finally from his mother. (His

grandfather, Alexander Ector Orr, had been a prominent merchant in New York, director of a number of banks, railroads, and insurance companies, chairman of the rapid transit board of New York that built the New York subway.)

But it is not of AEOM's devotion to Marxism, his primary interest beginning in the early 30's (Carl Marzani called him "that unusual combination of a practicing Christian and a practicing Marxist"), that we want to recall here. Rather, it is to his earlier contributions to, and continuing interest in, the field of color science and in the Inter-Society Color Council, that we call attention. For it was Alex Munsell who, in 1921, took over control of the Munsell Color Company, established in 1918 to carry on the business of handling publication of books, charts, and school supplies for use in teaching the Munsell system of color notation developed by his father, Albert H. Munsell.

Prof. Munsell, an artist and art teacher at the Massachusetts Normal Art School, had developed the Munsell color system to provide a means for describing color in terms of a simple notation. This he described in 1905 in his book, "A Color Notation," and by 1915 in a set of color charts published under the title: "Atlas of the Munsell Color System." By 1917 friends in the graphic arts industry, Arthur S. Allen and Ray Greenleaf, who were enthusiastic about the industrial possibilities of use and application of the Munsell system of color notation, had suggested (in a visit of March 27, 1917) formation of a Munsell Color Company with Allen and Greenleaf stockholders, A. H. Munsell majority stockholder.

Following Prof. Munsell's death, June 28, 1918, when the company was hardly established, but with an office in New York, his friends carried on. Among other things Arthur Allen did during that time was to request the Bureau of Standards to undertake the fundamental standardization of a set of Munsell cards. The resulting report, published in 1920 by the Bureau (Technologic Papers of the Bureau of Standards No. 167) called attention to the importance of the system and made proposals for its improvement.

Alex Munsell, following his junior year at Harvard, had been drafted into the army and had spent some time overseas. It seems likely that after his return to civilian life this Bureau of Standards report helped to make him listen to his father's friends and let them persuade him to drop the medical studies he had started at Harvard in order to take on the active presidency of the Munsell Color Company. Legal changes were first made that put all stock into Munsell hands, his Mother as principal stockholder. Alex took over in July 1921. My six year association with the Company began a few months later, in October 1921, at headquarters then located at 220 Tremont Street in Boston.

(Much of the history of these early days is contained in a paper originally published in the December 1940 number of the Journal of the Optical Society of America, Vol. *30;* republished in 1977, with two other historical papers, 1969 and 1975, in Vol. 1 of COLOR RESEARCH AND APPLICATION.)

From his earliest days with the Company, Alex Munsell was greatly influenced by Irwin G. Priest, chief of the Colorimetry Section of the Bureau of Standards and an active leader in the Optical Society of America's outstanding Committee on Colorimetry. I quote from the 1940 history:

"Mr. Munsell was neither a business man nor an artist. His interest lay, rather, in scientific fields, and from the beginning he left much of the handling of the business of the Company to others, while he concentrated on the scientific aspects of the Munsell work. The writer's first memory of A.E.O. Munsell is that of his enthusiasm upon his return from the 1921 October Meeting of the Optical Society of America where he had met and talked with I.G. Priest. It was at that meeting that he first heard of Carl W. Keuffel's direct-reading spectrophotometer, later described before the O.S.A. One was ordered on the spot and was delivered in New York to the Munsell Research Laboratory during the next year."

As the quotation indicates, a Research Laboratory was soon established. This was separate from the Company, provided for by funds contributed by A.E.O.M., his Mother, and his sister Margaret. It was founded as a memorial to A.H. Munsell to carry forward the application of A.H.Munsell's particular contribution, namely: "a simple and practical notation, or method of writing color."

In early 1922 the Company was moved to New York. But, more and more, the burden of handling a school supply business irked Alex Munsell, so in the spring of 1923 the entire stock of Munsell crayons, water colors, drawing papers, etc. was turned over to other companies; the only things the Munsell company intended to continue handling were the production and sale of *ATLAS* papers, charts, disks, and Munsell publications. In the spring of 1923 the Munsell Color Company moved from New York to Baltimore, Md., into quarters more suitable for its more restricted business needs, large enough to take care of the growing needs for laboratory space, but primarily to be nearer to the Bureau of Standards and to the Johns Hopkins University where Alex Munsell intended to do such graduate work as might help him to carry out the very general laboratory plans he was developing under Mr. Priest's guidance.

As reported in some detail in the 1940 history: "Under the advice and inspiration of I.G.Priest the Munsell Research Laboratory broadened its activities. During a three- to four-year period it supported considerable research activity in its own laboratory, and in those of the Bureau of Standards." Much of the work at the Bureau covered a wide field; most of the work in Baltimore was aimed at specification of an improved series of papers to represent the Munsell system. In 1927 the investigative work came practically to a halt. A studied revision of the standard papers was made, and the results published in 1929 as the *MUNSELL BOOK OF COLOR* to distinguish it from the *ATLAS OF THE MUNSELL COLOR SYSTEM* which it was intended to replace. Funds for the Research Laboratory were continued for a few years more, but were discontinued in the early 30's.

Alex Munsell should be credited with making all this basic work possible. During those early years he became active in the work of the Colorimetry Committee of the Optical Society of America under whose auspices the far-reaching "Troland" report was published in 1922. He provided funds for publishing

the color charts that the O.S.A. committee circulated as part of its basic questionnaire on color terminology. He was one of O.S.A.'s representatives to the organizing meeting of the Inter-Society Color Council in 1931. He was the I.S.C.C.'s first treasurer; he was elected in 1932 to be its second chairman but in 1933 resigned before he could take office. For all the years since then, whenever the I.S.C.C. has met in New York and he could do so, he has attended its annual meetings. His interests, however, increasingly turned to other fields, to fields of social problems.

It may, therefore, have been a welcome suggestion to him in the early 40's that led to the establishment of the Munsell Color Foundation in 1942. In this way, by gift he and his Mother turned over ownership and thereby direction of the policies of the Company to a non-stock, non-profit Foundation, its chief purpose similar to that of the I.S.C.C.: "to further scientific and practical advancement of color knowledge." As a "trustee representing the donor" he remained on the Foundation's Board of Trustees until the sale of the Company to Kollmorgen in 1969/70, a sale of which he approved. He then resigned, breaking his last official link with the Foundation.

However, his interest in the Inter-Society Color Council continued. In 1981, at the 50th anniversary meeting of the I.S.C.C., April 26-28, I sat next to him at the annual luncheon. As we looked around I noted that of all those present only he and I had also been present fifty years before at the meetings in 1930 and 1931 that resulted in the formation of the I.S.C.C. It must have been a sobering thought to him, as it was to me, for a few days after my return to Washington I received a most unexpected letter from him.

The letter, dated April 30, 1981, was a long one. He asked for answers to 17 numbered questions, all concerned with those early days of 50 years before, and about the people involved in the early ISCC history. On a carbon copy of his letter he asked me to check the names of those who *were* present. I made notes in the margins opposite each question that could be checked or answered briefly, and returned it to him. He had not remembered where the early meetings were held, or who was there. But of some of those present he indicated what he now best remembered. He asked about F. G. Cooper, art editor of the original LIFE magazine – what did he contribute, either at the founding meeting, or before? He remembered a booklet, and drawings Cooper had made for explaining the Munsell system; he would search for his copy and send me "a color xerox of it." About Charles Bittinger he remembered quite a bit, – about Prof. Gathercoal not so much. He remembered L. A. Jones as a serious, methodical person who stressed the necessity for the "Inter-Society" aspect of the ISCC; M Rea Paul he remembered as dynamic – he asked for the name of the Lead company he worked for (it was National Lead). Deane Judd he remembered most vividly (but that, I believe, was from the Foundation contacts in later years). Item 14 was: "Well, well, well: who would ever have thought that only 4 days after the wonderful, epoch-making Golden Jubilee meeting of the I.S.C.C. that I would be writing you this letter?"

His letter ended with the following paragraph: "I write this letter with a deep sense of *gratitude* for that day in 19?? that you first entered the Munsell Color Company office (*was* it on Tremont Street? and did I have a small Ford truck, with which I shuttled back and forth from Malden, Mass.). I won't "go-on-&-on" any further." He signed it: "Sincerely, A.E.O.M.; Alex Munsell."

When news of Alex Munsell's death came to me last March through an item in the New York TIMES, I thought of that last letter of his, and determined then that at least to the color public, as represented by members and delegates of the Inter-Society Color Council, I would recall to them that in the early part of his career Alex Munsell did a lot for color, for by taking over the Munsell Color Company in 1921, and establishing its research laboratory, he helped to continue the work of A. H. Munsell by standardizing and making available on a sound scientific basis the samples that represent a simple color notation based on measured scales of hue, value, and chroma. While his active work in color grew less and less after 1930, color science remained his second interest to the last.

It is with gratitude that I *also* remember that day in 1921 when I first walked into that office at 220 Tremont Street in Boston. I could not then foresee how much my contact with Alex Munsell and the color ideas of his father would change my life by introducing me to the fascinating and rewarding field of color science.

Dorothy Nickerson
July 23, 1983

MINUTES OF THE APRIL, 1982 MEETING OF PROJECT COMMITTEE NO. 32 IMAGE TECHNOLOGY

Paula Alessi assumed the position of chairperson for the session in LeRoy DeMarsh's absence. Twenty-one people attended.

Paula stated the scope of the committee as follows:

The concern of this image technology committee relates to color problems common to photography, printing, television, and other video display devices. A primary function is to provide a forum for discussion among workers in such problem areas as illumination for color reproduction and for the photographic or television studio and determination of achievable colorant gamuts.

At the conclusion of the April, 1981 meeting held in New York City, committee members agreed to tackle the specific problem of colorant gamut determination. Members were encouraged to search for procedures to compare color gamuts among various technologies: video displays, textile printings, photographic reproductions and the like. In the past year virtually no work was done in this area. So the question of whether or not there was still interest in tackling colorant gamut problems was thrown out to the floor. The answer was a resounding YES!

People were interested in exploring the determination of achievable colorant gamuts in hopes that they might find answers to many of the following questions:

1. Will self-luminous displays work as teaching tools?

2. Should the gamut of video display phosphors be limited so that a more exact color copy of the CRT can be sent to a hard-copy printing device?

3. Which type of color space is most appropriate to use for colorant gamut calculations – an opponent red-green, yellow-blue system or a hue, saturation, lightness system?

4. If CIE L*a*b* or L*u*v* color spaces are used, should the reference white be taken as the perfect reflecting diffuser or should it be the scene white that the particular imaging system is capable of producing?

5. What happens to television phosphor gamut if color correction is put in the transmitter or in the receiver? Or, what happens to photographic reflection print dye gamut if color correction is put into the system?

6. What are the effects of light and dark surround viewing on colorant gamuts?

7. What are the effects of chromatic adaptation on colorant gamuts?

8. How do different types of illuminants alter the achievable colorant gamuts?

9. Given film as an input medium how can the gamut achievable by television or video display phosphors be related to that of a photographic reflection print system?

10. How does one select the maximum number of colors that can be readily differentiated on any of these imaging systems? In particular, how should the spacing of the maximum colors achievable be chosen and how should the aim points and their tolerance specifications be written?

What really needs to be done in answering these questions is to develop the specifications and limitations for the various imaging systems and determine what are the achievable gamuts associated with them.

Before adequate solutions can be sought it was felt that it is necessary to catalog what has already been done in the area of colorant gamut determination for photography, printing, and television. The chairperson volunteered to formulate a bibliography citing all the published colorant gamut work up to the present.

Then it was decided that the meeting of this image technology committee in April, 1983 would consist of a series of presentations from workers in the areas of photography, television, printing, and video display. The main emphasis of these presentations would be to communicate how colorant gamuts are defined and calculated in these image technology areas. The following members offered their assistance in setting up these presentations:

Milt Pearson – printing
Paul McManus – video display
Roland Zavada and LeRoy DeMarsh – television
Paula Alessi – photography

Hopefully these presentations will give members a clear picture of what the current methods of colorant gamut determination are. With such information as our foundation, we can attempt to formulate how the committee may collectively go about answering some of the important questions which have been cited here. The ultimate goal would be to associate the realistically achievable gamut for one imaging system with that of another.

1983 ANNUAL REPORT
PROJECT COMMITTEE NO. 32
IMAGE TECHNOLOGY
PAULA ALESSI, CHAIRMAN

The chairperson, Paula J. Alessi, called the meeting to order with only ten people present.

Paula reviewed the objectives of ISCC Problem Committee No. 32. For the short term it was desirable to discuss the definition of colorant gamut and outline how it is calculated for each imaging system (photographic, printing, television and other video display units). Two speakers addressed this short-term goal: Paula J. Alessi for photography, Milt Pearson for printing and Paula J. Alessi presenting data from Paul McManus on video display. Two long term objectives were outlined. First the committee hopes to formulate a comparison of the colorant gaumts of each system realizing that the images they produce are viewed under different viewing conditions where chromatic adaptation and induction must also be considered. Second, if the colorant gamut approach is successful, the committee would like to work through the same methodology to compare the color reproduction capabilities of each imaging system.

Paula also made the attendees aware of a bibliography that the committee has put together to catalog literature references for the topic of imaging system colorant gamuts. Copies may be obtained from Paula.

The three presentations began. First Paula described the use of the Munsell Color Cascade as a yardstick by which to determine the potential gamut of color space achievable by any imaging system. She cited an amateur photographic reflection print system as an example. The Munsell color cascade was photographed two pages at a time. Each page was separated by a Munsell gray sample of value 5.0 so that the prints could be properly balanced. The prints as well as the original cascade were spectrophotometrically measured with 45°/0° geometry on a Zeiss DMC-26 spectrophotometer. CIE L*, a*, b* calculations were done for CIE illuminant C. Two types of data presentation were discussed. First the data from the 48 hue numbers were sorted into 36 metric hue angles from 0° to 350° in 10° intervals and metric lightness (L*) vs metric chroma (C*) plots were made at constant metric hue angle (H°a*, b*). Second polynomial interpolation techniques were used to calculate and plot a* and b* values for all 48 hue numbers at five levels of constant L*. Results from answering the gamut question without confounding it with the exact colorimetric reproduction question agreed among the two plot types. The photographic system gamut was restricted compared to the cascade itself, but not to the same degree in all areas of color space. The photographic system fell short in achieving the saturation levels of the cascade's light yellows and dark blues. Reds and greens did not approach the saturation limits of the cascade especially in the mid lightness ranges. The photographic system came closest to the cascade's colorimetric gamut position for cyans and magentas. Paula was hoping that the Imaging Tech-

nology committee would adopt her proposal by trying to apply the same methodology to other imaging systems so that cross-comparisons in colorant gamuts could be made.

Milt Pearson discussed an alternative approach for characterizing the colorant gamut of a printing ink system. This approach was based on examining the color saturation limits of the printing ink set. This calculation scheme starts at white (no ink present) and gradually increases the amount of one ink or pair of inks until a maximum amount is present. Once this maximum has been achieved, the remaining inks or ink are added until all three are present at their maximum amount and a black is achieved. These calculations were done in Hunter L, a, b space. Such an approach provides a measure of the gamut of the basic colorants used in a printing ink system. It provides a convenient method for comparing the gamut of two or more ink sets. This scenario could also provide a common basis for comparison of the basic colorant gamuts of the imaging systems that are of interest to this committee. Similar calculations have already appeared in the literature to characterize the potential gamut of color space achievable based only on the phosphors of a television system, the dyes of a photographic system and the inks of a printing system. However, such calculations don't reveal the true color space gamut once those television phosphors, photographic dyes or printing inks are used in a system where the images produced are not only a function of the basic colorants used to compose them but also of other constraints inherent in the particular system.

Paula Alessi presented the slides sent by Paul McManus from Tektronix. Paul focused on the significant variables affecting the color gamut of an ink jet system attempting to reproduce a digitized image. First he showed a picture done by dot-pattern halftoning from an image stored in digitized form. The obvious problem characteristic of the system was poor color rendering, patterning, especially in the background, and loss of acutance. The causes are many. First droplet size cannot be usefully modulated meaning that optical density must be controlled by the use of a dot placement pattern with a concomitant loss of acutance. Second mechanical variations in the writing mechanism causes variations in dot separation or dot overlay. This in turn can affect control of color and cause objectionable patterning if the errors vary across the page. He also showed how colors coming from the same dyes, in the same amounts but applied on different papers affected their colorimetric position in the 1976 UCS u', v' system for two different illuminants (equal energy and daylight fluorescent). Dr. Fred Billmeyer pointed out that chromatic adaptation should be taken into account when comparing the appearance of colors under two different illuminants. More information on the chemical and physical interaction between ink and paper was provided by a comparison of the color range achievable by a particular ink jet system applied to coated and uncoated papers. Finally, Paul illustrated the problem of light fastness of the inks used and how it affects color appearance.

Finally, Richard Ingalls reminded us all that the topic for the 1984 Williamsburg Conference is Color and Imaging. He was open to suggestions for speakers.

Unfortunately, there were not enough active committee members present to discuss the direction to take for the coming year. Paula will send a poll to active members outlining the approach that she and Milt presented and requesting which or what combination of the two should be implemented in the future.

Paula J. Alessi

ASTM COMMITTEES ON PAINT AND APPEARANCE MEET IN NASHVILLE

Two ASTM Committees involved importantly in Color and Appearance met in Nashville, Tennessee, June 26-29, 1983. The Optical Properties Subcommittee of the Paint Committee has drafted a proposed "Practice for Defining, Selecting, and Maintaining Color Standards." The Subcommittee is embarking on a revision of Method D2244 on "Instrumental Evaluation of Color Differences," that will describe more explicitly how to use instrumentation to evaluate color differences among painted specimens and not simply list the different color scales and color difference equations.

Material in D2244 that is of general interest will be transferred to the Appearance Committee, specifically to the Subcommittee on Colorimetry and Spectrophotometry. This latter Subcommittee has drafted a proposed practice for colorimetry of fluorescent materials as well as a revision of E308 whose revised title is "Method for Color Computation in the CIE System." A task group of this subcommittee met for two hours in Louisville at the time of the ISCC annual meeting to decide how many tables of weighting functions could be included in the revised method. Nine of the twelve task group members were present or represented by proxy so the meeting was very fruitful. Widely divergent points of view were presented. These ranged between the two extremes: (1) that no tables other than the basic ones be supplied with the method and (2) that as many as 52 tables should be supplied. In the end it was agreed that tables of weighting functions (products of source and observer) should be included for 9 CIE illuminants (A, C, D50, D55, D65, D75, F2, F7, and F11), two observer functions (1931 standard and 1964 supplementary) and two integration intervals (10 and 20 nm); 36 in all. Hugh Fairman and Ed Stearns have prepared tables.

Other appearance methods are being revised and updated by these two committees as well as other committees dealing with appearance attributes and announcements will appear in ISCC News as they are published. The Appearance Committee is sponsoring a symposium on Review and Evaluation of Appearance: Methods and Techniques, to be held in Montreal, Canada, 23 May 1984. Prospective authors have been requested to send a "submittal form," title, and 300-500 word abstract to Kathy Greene at ASTM, 1916 Race Street, Philadelphia, PA 19103, telephone 215-299-5414. Abstracts of papers were to have been submitted by 1 August, but there is a good likelihood that they will still be considered if submitted promptly. The Symposium Chairman, Justin Rennilson, is Vice-Chairman of the Appearance Committee and an ISCC member. He has just formed his own company, Retro-Tech in LaMesa, California, specializing in solving problems in measurement of retro-

reflection and the application of retro-technology.

Other ISCC members that are deeply involved in ASTM activities include Nick Hale of Hale Color Consultants, Chairman of the Appearance Committee, and Charles Sherman of Sherwin-Williams, Chairman of the Optical Properties Subcommittee of the Paint Committee.

Harry K. Hammond III

FIRST CALL FOR NOMINATIONS FOR THE GODLOVE AWARD

ISCC has the honor and opportunity of presenting biennially, in odd-numbered years, its Godlove Award. The Godlove Award Fund was established by Mrs. Margaret N. Godlove in memory of her husband Dr. I. H. Godlove. The fund was presented and accepted by the Inter-Society Color Council in 1956. The recipients of the Macbeth, Godlove and other ISCC awards are listed in your ISCC Membership Directory.

The Chairman for the 1985 Godlove Award Committee is Milton Pearson; 16 Colleen Way, Pittsford, NY 14534. Nominations are governed by the rules listed in the By-Laws on pages 29-32, and should be carefully followed.

MUNSELL FOUNDATION ASSETS TO FUND NEW COLOR SCIENCE LABORATORY AT RIT

The board of directors of the Munsell Foundation has voted to dissolve the foundation and turn over its assets for the establishment and maintenance of a Munsell Color Science Laboratory at RIT. The foundation plans to transfer assets of approximately $250,000 to the institute's School of Photographic Arts and Sciences, which will administer the new laboratory by the end of this year. Never before has a foundation voted to dissolve itself in order to donate assets to an institution of higher education.

The Munsell Foundation promoted education in color science. It was founded as a memorial to Professor Albert H. Munsell, founder of the Munsell Color Corporation and originator of the Munsell system of color notation. The proceeds of the stocks and bonds that formed the foundation were used for student grants.

The trustees have set only two conditions in making the gift to RIT: that the facility bear a sign reading "Munsell Color Laboratory" and that it be directed by an advisory committee made up of the former trustees of the Munsell Foundation.

"The board of directors of the Munsell Foundation wholeheartedly supports RIT's efforts in color science research," said S. Leonard Davidson, treasurer of the foundation, in presenting an initial part of the gift to the institute. "We hope that in addition to the foundation's providing funding for the laboratory, RIT will call upon board members for guidance and other support."

When Franc Grum was asked about possible objectives for the laboratory, Grum said, "There are situations in color measurement for which instrumentation is currently either inadequate or nonexistent. We want to develop methodologies, instrumentation, or both to cope with specific problems. For example, inks and some paper coatings fluoresce, so that the eye sees a mixture of reflected light and fluorescence when it looks at a printed object. Yet the instruments we now have to measure color don't pick up the fluorescence. We need to deal with this and other complex metrology problems."

"Electronic imaging is another problem area," Grum continued. "What parameters need to be measured and controlled? The technology is so new that these questions have not been answered."

Grum is seeking more equipment for the laboratory, including a spectrophotometer, photometers, radiometers, and equipment for color imaging.

Extracted from RIT Newsletter

NBS MEASUREMENT ASSURANCE PROGRAM FOR SPECTROPHOTOMETRY

The National Bureau of Standards is in the process of establishing a Measurement Assurance Program (MAP) to assist laboratories involved in calibration of spectrophotometers. The first step has been the preparation and calibration of neutral density glass filters for evaluating linearity of photometric response. Sets of filters have been assembled to provide nominal transmittances of 92, 70, 50, 25, 10, 1, and 0.1 percent at a wavelength of 548.5 nm. Filters are to be available in 3 sizes: 38 mm diameter aperture in 51x51 mm holder, 25 mm diameter aperture in 51x28 mm holder, and 30x8 mm aperture in a cuvette holder. A detailed report is contained in the paper by Kenneth L. Eckerle, Victor R. Weidner, Jack J. Hsia, and Karen Kafadar, "Measurement Assurance Program Transmittance Standards for Spectrophotometric Linearity Testing: Preparation and Calibration," J. Res. NBS Vol. 88, No. 1, Jan.-Feb. 1983, p. 25-36. A copy of the paper may be obtained by addressing your request to one of the authors at NBS, Washington, D.C. 20234. The filters are to be used in the MAP packages only and are not for sale.

Harry K. Hammond III

MEETINGS

CIE 20th Quadrennial Meeting to be Held in Amsterdam

At least 50 U.S. Delegates will attend the meeting 30 August to 8 September 1983, originally scheduled to be held in Warsaw, Poland. However, a year ago it was decided that a meeting in Warsaw might better be held four years hence and so the meeting location was changed to Amsterdam, The Netherlands, through the courtesy of the Dutch National Committee and CIE President, J. B. de Boer of The Netherlands.

Former ISCC President, Franc Grum, now serves on the CIE Action Committee. He chaired CIE Technical Committee TC-2.3 on Materials until 1982 when he moved to the Action Committee. Klaus Mielenz of NBS was appointed to succeed Grum as Chairman of TC-2.3. Mielenz has also taken over the duties of Secretary of the U.S. National Committee.

Of much interest to ISCC members will be the meeting of TC-1.3 on Colorimetry. Each country has only one member on

each technical committee, but a member can have many advisors, The U.S. member of TC-1.3 is C. James Bartleson, also an ISCC member. The International Chairman is Robert Hunt, recently retired from Kodak, Great Britain. The Colorimetry Committee has been working on a number of projects. One or the most important of these is the revision of CIE Publication 15 on Colorimetry. The present edition was published in 1971. The revision has just been approved by the Colorimetry Committee and will now be submitted for approval to the National Committees of each member country, about 36 in all. After approval by these bodies, the revised document will be published, probably some time in 1985. We will know better after the Amsterdam meeting. The availability and price will be brought to the attention of ISCC NEWS readers. You may already be aware that CIE documents can be purchased from the Secretary, U.S. National Committee, CIE National Bureau of Standards, Washington, D.C. 20234. The Secretary endeavors to maintain a small stock of each document as a convenience to those desiring to procure CIE documents for their organization or private libraries. Another important CIE document that has been in the process of revision for some time is the International Lighting Vocabulary, under the jurisdiction of TC-1.1 on Terminology. The third edition, published in 1970 contains about 900 terms with definitions in four languages, English, French, German and Russian. The fourth edition will contain approximately 2,000 terms. Both the third and fourth editions have been joint projects of the CIE and the International Electrotechnical Commission (IEC).

The draft of the 4th edition of the vocabulary has been approved by all the National Committees, but they have requested numerous editorial changes. These are now being considered, but making even editorial changes takes time because the proposed changes must be accurately translated into the wording of the definition in each of the other three languages. For this reason, the 4th edition may not be available until late 1984 or early 1985. Whenever it is made available, ISCC NEWS will carry an announcement. Meanwhile specific questions on terms or definitions may be directed to the U.S. member of TC-1.1, Joseph Richmond. Address correspondence to him at Room B-250, Building 221, National Bureau of Standards, Washington, D.C. 20234, or call 301, 921-3281.

Harry K. Hammond III

AIC Meeting on Color Order Systems

The papers submitted for the Symposium have been preprinted and distributed to all registrants of the Forsius Symposium on Color Order Systems held at Nordiska Folkhogskolan, Kungalv, Sweden, August 25-29, 1983.

This symposium is in effect a mid-term meeting of the Association International de la Couleur (AIC). The Association has met every four years since the first meeting in Stockholm in 1969. The last regular meeting was held in Berlin in 1981. This mid-term meeting is dedicated to the memory of Sigfrid Aron Forsius, a Swedish scientist who in 1611 presented a three-dimensional color order space in a manuscript on Physics, kept in the Royal Library, Stockholm.[1]

The Symposium participants are to study the pre-printed papers before the meeting so as to permit the maximum amount of time for discussion. Contributions to the Symposium are of two kinds, written papers and abstracts of poster papers intended to be exhibited. Fifteen ISCC members from the USA and other countries have submitted written manuscripts or poster papers. Even with advance distribution, it is unlikely that three and one-half days will be sufficient to discuss each of the papers in as much depth as may be desired. Listed here are the names of the fifteen ISCC authors and the titles of their papers.

Billmeyer, Fred W. Jr.	Color-constant extensions of the Munsell Book of Color (with Berns, an ISCC student member & Sacher), and Munsell notations of the Natural Colour System (with Anna Bencuya)
Brill, Michael H. (not ISCC member)	Illuminant dependence of object-color ordering (with H. Hemmendinger, an ISCC member)
Hale, William N.	Color order systems: Who needs them?
Hunt, R. W. G.	A physiologically plausible colour order system based on the CIE 1931 standard colorimetric observer (with Michael R. Pointer)
Hard, Anders	Distinctness of border as a concept for a uniform colour space (with L. Sivik)
Ingalls, M. D. and R. D.	Small Color Difference Samples and Color Order Systems
MacAdam, David L.	Uniform Color Scales of Optical Society of America (illustrations to written paper)
McCamy, C. S.	The Establishment and Maintenance of Abstract and Concrete Color Order Systems
McLaren, Keith	A colour order system for industrial quality control
Nayatani, Yoshinobu	A Formulation of Nonlinear Model on Chromatic Adaptation for Various Nonselective Backgrounds (with Takahama and Sobagaki)
Simon, Frederick T.	The YCM system
Stenius, Åke S:son	CIELUV CIELAB Munsell and NCS axes transferred to the CIE Standard Colorimetric System
Styne, Alexander F.	The Universal Color Language – A World-Wide Communication Concept
Thornton, William A.	Illumination Dependence of Object-color Ordering. Experimental Considerations

Tonnquist, Gunnar	Should we have an ISO colour notation system?

There are, of course, other papers that look interesting, but I will not include all the authors and the titles of their papers. The preprinted papers have been bound into a report that can be ordered but I do not know the price.[2]

[1]Robert L. Feller and Åke S:son Stenius, "On the Color Space of Sigfrid Forsius, 1611," Color Engineering, Vol. 8 No. 3 June 1970, p. 48-51.

[2]Color Report F26, includes papers received in advance of the Forsius Symposium on Color Order Systems, obtainable from the Scandinavian Colour Institute, Box 14038, S-10440 Stockholm, Sweden.

Harry K. Hammond III

1983 COLOR AWARD

The Third Annual Faber Birren Color Award for creative expression with color, presented by the Stamford Art Association of Stamford, Connecticut, will be held in 1983 at the townhouse galleries of the Association, 39 Franklin Street, Stamford, Ct. 06901, from October 23 through November 12.

The Award for 1983 will be $1,000 for a single work in any medium related to color: painting, graphics, design, photography, textiles, sculpture, ceramics, illumination. Selection will be made by a special jury or juror.

Faber Birren established the Award in 1981 with an endowment fund that should continue it indefinitely into the future. The purpose is to encourage and recognize creative talent in the esthetic aspects of color.

LITHOGRAPHERS MANUAL AVAILABLE

The seventh edition of The Lithographers Manual has been completed by the Graphic Arts Technical Foundation and is now available to the industry. Three chapters have been revised or rewritten and a new section on color separation has been added.

The manual is available from GATF, 4615 Forbes Avenue, Pittsburgh, PA 15213.

EDITOR'S NOTE

The credit for the article titled "Quickening Color Tempos in Interior Products" in the May-June, 1983 issue of the News was inadvertently omitted. It was reprinted from the April 1983 issue of the Color Association Newsletter.

LETTER TO THE EDITOR

Good Grief!!

I saw my letter in #283 with a sinking stomach. 36°N is nowhere NEAR Greensboro, as I found out when I turned my atlas right-side-up. 62° N is more like it.

Besides, the grass isn't green here in the summer anyway – it's brown (whatever "brown" means).

Now I know what Charlie Brown feels like.

Mark David Gottsegen
ISCC 37

IMEKO PROCEEDINGS AVAILABLE

The proceedings of the 10th International Symposium of IMEKO's Technical Committee on Photon-Detectors held at the Technical University of Berlin (West) from 20 to 22 September, 1982 is now available.

Thirty-five papers on one volume (310 pages) dealing with recent results in the field of photon-detectors and their applications include: progress in single-photon counting and timing by avalanche photodiodes – qualification of germanium photoelements for radiometric measurements – the quantum yield of silicon in the ultraviolet – the linearity range of Si-photodiodes – linearity of image photon counting systems – photoelectric properties of infrared photon-detectors near the absorption edge – the measurement of UV radiation used for water disinfection – novel developments in the techniques for the self-calibration of silicon photodiodes – low level light measurement with Si-photovoltaic cells – optimal design of side-by-side optical filters – the influence of the quality of tristimulous colormeter heads on the measurement accuracy – luminous flux measurements by means of a new goniophotometer – optical detection of defects of planks – measurement of the spectral transmittance of nearly opaque plastic sheets – CCD-matrix-arrays in traffic accident measurements – noise and linearity characteristics of photodetectors for fiberoptic communications.

Published by the IMEKO Secretariat, Budapest, Hungary. Edited by Dr. J. Schanda, Chairman of the Technical Committee – TC2

Distributor for the USA: U.S. Trade Research
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Los Angeles, Calif. 90025

COLOR BLINDNESS

Our loyal correspondent, Bernard Kramrisch of Manchester, England, sent a photostat copy of the following item from the August 14, 1982 issue of "Woman" published by IPC Magazines Ltd. of London, England.

"Being colour blind is a male disability-one in 12 men suffer from it compared to only one in 200 women. The defect, medically known as dyschromatopsia, is carried from fathers through their daughters to sons. Until recently you just had to learn to live with it – although in general people who are colour blind tend to be more intelligent. Now doctors in Japan claim success in curing over 10,000 colour-blind patients. These patients can marvel at the sight of a bright red rose or feel confident that the traffic light is truly green. The treatment is based on electronic stimulation, using a computer to get just the right rhythm and power.

Dr. Taketoshi Yamada and his group point out that the body is an electro-magnetic field, composed of 60 trillion cells, each with a structure similar to a magnet. The Yamadas' call their method J.P.J.C., which stands for Just Point, Just Channel. This combines the application of medical electronics with centuries old physiology. They claim that when there is an abnormality in the body there will be a place somewhere on the skin that will easily accept electricity – rather like acupuncture – and that when two or more of these points are stimulated

the patient's colour sense improves. Forty of these treatments is about average and the doctors are recording their data for use by the medical profession all over the world."

Color differentiation is the *sine qua non* for all dyers. Mr. Kramrisch once wrote at the beginning of a published article, "Perfect colour vision is a prerequisite for prospective entrants to any branch of coloration." How prophetic this is, but also how ironic from the standpoint of his own current career, teaching future generations of prospective textile dyers.

For the past few years Bernard has been afflected with growing cataracts in both eyes. After neglecting them for several years, he finally had them removed. His first reaction after the operation was, "The world took on a new look, and the brightness was dazzling. But what shook me was when colours appeared wrong (from previously-held opinions, ed.) but I was told that now I was seeing them correctly. One clump of flowers which I had regarded as dull red, I now saw as bright violet-red; the true colour as confirmed by Mrs. Kramrisch."

Apparently, in addition to decreasing vision, a dveloping cataract can distort the color and color-matching accuracy of even a dyer who never has been diagnosed as being color blind.

No Kramrisch student, past or present, should read this expose lest they find reason to suspect that for some time their respected pedagogue probably had feet of clay; discolored at that.

Reprinted from American Dyestuff Reporter.

THIS SPACE RESERVED FOR CONTRIBUTIONS

CALENDAR

AATCC
Color Measurement Principles, October 26-27, 1983
Research Triangle Park, NC

ASTM
Symposium on Review and Evaluation of Appearance, May 23, 1984 – Montreal, Canada

COLOR MARKETING GROUP
Fall National Meeting, October 9-11, 1983
Washington, D.C.

FEDERATION OF SOCIETIES FOR COATINGS TECHNOLOGY
Annual Meeting, October 12-14, 1983 – Montreal, Canada

ISCC 1984 ANNUAL MEETING
April 8-10 – Michigan Inn, Southfield, Michigan

WILLIAMSBURG CONFERENCE
Color and Imaging, February 12-15, 1984

OPTICAL SOCIETY OF AMERICA
Annual Meeting, October 17-21, 1983 – New Orleans, LA

SOCIETY FOR INFORMATION DISPLAY
International Symposium, June 5-7, 1984 – San Francisco, CA

SOCIETY OF PHOTOGRAPHIC SCIENTISTS AND ENGINEERS
Annual Conference, May 20-24, 1984 – Boston, MA

TAPPI
Annual Meeting, February 19-22, 1984 – Washington, D.C.

PANTONE, INC. COLORS NEWSLETTER

A very generous donation of paper and color printing from Pantone, Inc. has restored the color spectrum to the front page of the NewsLetter. The ISCC Board of Directors wishes to express its thanks to Pantone, Inc. for this tangible expression of support and help.

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.

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:
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