INTER-SOCIETY COLOR COUNCIL

NEWS LETTER

NUMBER 145 January, 1960

Send News Letter Items to Editor,
Warren L. Rhodes
Graphic Arts Research Department
Rochester Institute of Technology
Rochester 8, New York

Other correspondence to Secretary,
Ralph M. Evans
Color Technology Division
Eastman Kodak Company
Rochester 4, New York

1960 ANNUAL MEETING
PHILADELPHIA MUSEUM
COLLEGE OF ART
PHILADELPHIA, PA.

Creative Color is the theme for the 29th Annual Meeting of the Inter-Society Color Council to be held at the Philadelphia Museum College of Art, Philadelphia, Pa., Monday and Tuesday, April 11, 12, 1960.

Three well qualified speakers will lead a symposium on this theme at the Tuesday afternoon session. Two other events will add to the meeting: an exhibit on "Creative Color" at the Philadelphia Museum College of Art and the Banquet in the Arenberg Gallery of the Philadelphia Museum of Art followed by an illustrated lecture by James Johnson Sweeney, Director, Solomon R. Guggenheim Museum.

The program is arranged as follows:

Sunday, April 10	Sheraton Hotel
9:30 a.m.	Board of Directors' Meeting
Monday, April 11	Philadelphia Museum College of Art Broad and Pine Sts.
All day	Subcommittee Meetings of the Problems Committee
Tuesday, April 12	Philadelphia Museum College of Art Broad and Pine Sts.
9:00 a.m.	Annual Business Meeting with reports from delegations and committees

12:30	Luncheon
2:00 p.m.	Symposium - "Creative Color" with Walter C. Granville as Moderator. The three speakers are: Neil Welliver, Asst. Professor, Dept. of Art, Yale University Lester Beall, Designer Brookfield Center, Conn. Robert Riley, Director, Industrial Research Division The Brooklyn Museum
Banquet Session	Philadelphia Museum of Art Benjamin Franklin Parkway at 26th St.
6:00 p.m.	Informal Reception - Arenberg Gallery
7:00 p.m.	Dinner - Arenberg Gallery
8:30 p.m.	Illustrated Lecture in the Van Pelt Auditorium Speaker: James Johnson Sweeney, Director, Solomon R. Guggenheim Museum, New York City

Co-Chairmen for the 29th Annual Meeting are Dean Emanuel Benson of the Philadelphia Museum College of Art, and Walter C. Granville, outgoing President of the ISCC. Other members of the Program Committee are Katherine Chandler, Cynthia Drayton and Helen D. Taylor.

A block of rooms is being reserved at the Sheraton Hotel in Philadelphia and a room reservation card will be included with the Annual Meeting Announcement and Advance Registration blank that will be sent to all delegates and members toward the end of February. Extra registration blanks may be obtained by writing to the ISCC Secretary.

THE NEW ISCC OFFICERS FOR 1960-1961

A count of the ballots at the office of the secretary revealed that all candidates recommended by the nominating committee were elected.

President	G. L. Erikson, NAPIM
Vice-President	William J. Kiernan, ASTM
Secretary	Ralph M. Evans, SMPTE
Treasurer	Norman Macbeth, IES
Director	Roland E. Derby, AATCC
Director	Charles W. Jerome, IES

Director	Tyler G. Pett, ACS
Director	Warren L. Rhodes, TAGA
Director	Walter C. Granville, OSA, PI (Outgoing President)

Ballots were sent to three voting delegates from each Member-Body of the Inter-Society Color Council. The marked ballots were returned to the office of the secretary where they were counted by C. James Bartleson, SPSE, and Sidney M. Newhall, APA, on December 28, 1959. Of the 84 ballots mailed (28 Member-Bodies) 67 were returned.

NEW MEMBERS

The following applications for individual membership were accepted at the last Board of Directors' Meeting held in Rochester, New York, on December 7, 8, 1959.

Associate Individual Members	Particular Interests:
Mr. Martin Grayson 7359 N. Sheridan Rd. Chicago, Illinois	Graphic Arts reproduction. Light, Pigments, Paper - Do some educational work in this field.
Mrs. Anne G. Phillips 3840 Long Beach Blvd., Long Beach 7, California	Paints (interior and exterior); dyes for fabrics, wallpapers.
Mr. Bruce W. Preston Manufacturing Research Office, G-1 Tool and Die Bldg. Ford Motor Company 3001 Miller Road Dearborn, Michigan	Color measurement and instrumentation and their industrial applications in the fabrication and receiving inspection of paints, plastics, vinyl coated fabrics, and other automotive materials.
Mr. W. G. Spangler 14 Charles Place Chatham, New Jersey	Evaluation of detergents (with Colgate, Palmolive Company, member AOCS).
Mr. William H. Tingle P. O. Box 772 New Kensington, Pennsylvania	Evaluation and development of instruments and methods for measurement and control of appearance of aluminum and aluminum finishes.
Mr. Roderick Q. Vogel Sylvania Electric Productc, Inc. Seneca Falls, New York	Color measurements of self-luminous bodies; color specifications and standards; and color measuring instrumentation.
Affiliate Individual Members	
Dr. Edward G. Feldmann American Pharmaceutical Assoc. 2215 Constitution Ave., N.W. Washington 7, D. C.	Coloring materials employed in pharmaceuticals.

Mr. Charles W. Hamilton
Allied Paper Corporation
1608 Lake Street
Kalamazoo, Michigan

Color trends in industry -
Color trends in consumer goods.
The psychology of color.

Mr. Michael D. Sember
Ladd, Southward & Bentley
300 W. Washington
Chicago, Illinois

Paper, advertising and sales.

Mr. Robert J. Styles
Vogt Manufacturing Corp.
100 Fernwood Avenue
Rochester 21, New York

Color matching of plastics.

DEAN FARNSWORTH DIES
DECEMBER 27, 1959

Dean Farnsworth, Commander, MSC, USNR, died quietly on December 27, 1959, at the Bethesda Naval Hospital. His wife was with him, and her brother and his wife. His illness had been a long and painful one, beginning early during a tour of duty in which he was attached to the Office of Naval Research Branch Office in London (See News Letter No. 142, July 1959). Immediately following the 1959 CIE meeting in Brussels he returned to the U. S. and was admitted to the hospital on June 29, where for some weeks he was on the critical list; the cause was a cancer which started at the base of the tongue. His tongue and jaw were affected, and thus his speech, and the endema gradually closed the throat so that eating became a problem. In spite of this, in August and September, and even into October, during months when the cancer itself seemed arrested, and even while his strength continued to fail, he was able occasionally to leave the hospital for short drives, or to sit out in a friend's garden.

During those intervening months his interest in color matters never failed - his technical library was gradually assembled in his room; he read, and even set up experimental equipment to study or prove a number of points he had been thinking about but never before had time actually to "look at". Some thoughtful friend remembered his interest in fish and provided him with a lighted tank that gave him many hours of pleasure. Chatty letters from old friends about matters of mutual interest were one of the brightest spots in these months; Dean was naturally a modest man about his accomplishments, and the fact that so many professional friends took time to write him was something that gave him a deep satisfaction, for all - directly or indirectly - succeeded in telling him how much his professional accomplishments were appreciated by fellow scientists. He had a wonderfully inquiring mind, he was never bound by the orthodox approach, his enthusiasm and interests were not confined to color and vision, they ranged from music and the theater to people and their problems, from rock garden plants to the intriguing game of GO.

Commander Farnsworth was born in Kansas in 1902. He went to Southwestern (Kansas), then Northwestern, and later to New York University. From 1926-29 he taught scene design at Northwestern, from 1929-38 he was concerned with stage designing and lighting techniques for the theater and television. From 1932-43 he was research associate of the Department of Psychology at New York

University, being awarded an M.A. degree in 1942. Between 1943 and 1957 he was Head of the Human Engineering Branch, Medical Research Laboratory, of the U. S. Naval Submarine Base, New London, Connecticut. From 1957-59 he was attached to ONR in London.

Dean joined the ISCC in 1938, listing his special interests as "Science" under the following headings: 1, Establishment of an equal-chromaticity psychological color solid; 2, Uniform system of correlation and nomenclature of scenic paints and gelatines; 3, Means for definite description of partial "color-blindness". The last ISCC News Letter reprinted a lecture on Color Vision and the Printer that he gave in November, 1958 in London; in late September, 1959 he entered objection with the USNC-CIE to adoption at Brussels of Provisional Recommendation No. 4 for use of the chromaticity diagram described therein for use as a CIE-UCS diagram. Thus, from his early career to the very end, he held to the same objectives.

One of the last things he did along this line was to supply a statement for the USNC regarding a provisional uniform chromaticity diagram. He felt sure that the interim, as well as final diagram must be curvilinear; he referred to his paper (No. 26) at the NPL 1957 symposium, A Temporal Factor in Colour Discrimination, in which he showed that the three principal existing studies, Munsell, MacAdam and Wright, could be converted to plane curvilinear diagrams with no more deviation than he felt could be claimed for the observations. He further showed (Fig. 5) that the three could be reconciled by a simple systematic reduction in the yellow-blue dimension (which was related to the time variable involved in each experimental method). At the request of someone (I believe at Phillips Lamp Works) for the UCS diagram he would recommend, he developed in 1959 while in London an empirical chart for observations made under Source C, and last October while in the hospital he finally succeeded in digging out a copy of this chart for use in regard to his objection to the CIE proposal. He proposed that this chart* be used for plotting and analyzing color difference data until we learn more about uniform chromaticity.

Others will compile a record of his papers and contributions to the color field--in fact, Dr. Walter Miles and his former colleagues at New London are doing this. Here we may mention that the Naval Research Reviews, October 1959, on page 19, carried a page about Commander Farnsworth's contributions to Navy research on color vision, with reference to an article in the August 5, 1959 Stars and Stripes which described and illustrated the Farnsworth work 1943-57. At the time of his death Commander Farnsworth was a Trustee of the Munsell Color Foundation.

But here, not only do we wish to honor him and pay tribute to his enthusiasm and contributions to a life of color study, but we wish to acknowledge a real sense of loss of a most likeable companion. Whether in the depths of a most serious discussion in the laboratory, or over a highball discussing how to popularize color vision problems for THINGS OF SCIENCE, or how to find a new and different type of award to honor Dr. Godlove, to each problem he brought a sense of fun, of living! He had a visual type of mind; tables and formulas annoyed him, he needed to visualize a problem, and once he was able to do this usually he could solve it. His investigations covered a wide range: our sub-

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* Copies will be made available on request to Miss Nickerson.

marines are more habitable today because of Commander Farnsworth; it was his group that determined the most suitable color for lifesaving equipment; they developed sunglasses for the Navy and Air Force, and the use of control codes that do not rely on color; he is well known for the Farnsworth Lantern and the Farnsworth-Munsell test for color vision.

It is with a sense of real loss that we report his death to the ISCC, a feeling that is shared by many who already have written to express it both to Mrs. Farnsworth and to mutual friends in the ISCC. Among the many letters received the one to Walter Granville, as ISCC president, from G. S. Chamberlin, Chairman of the Physical Society Colour Group, is quoted in the next item. An expression of our loss has been forwarded to Mrs. Farnsworth. For others who may wish to write her, the address is Gales Ferry, Connecticut.

We shall miss you, Dean. Sleep well.

Dorothy Nickerson

BRITISH COLOUR GROUP EXPRESSES SYMPATHY

Under date of January 11, the following letter has been received from the Physical Society Colour Group, addressed to the president of the ISCC:

Dear Mr. Granville,

I have just heard of the tragic death of Commander Dean Farnsworth, and should like to let the ISCC know how we grieve with you at the loss of such an outstanding man. I count myself fortunate to have known him well during his time in England, and held him in great esteem, as did all our members, as is shown by electing him to serve on our committee, which he did with distinction. Apart from his great ability as a scientist we welcomed him as a charming and wholly likeable personality.

We share with you in feeling a deep sense of loss at his departure, but enriched at having known him.

I have written to Mrs. Farnsworth to express our thoughts.

Sincerely yours,

(signed) G. J. Chamberlin
Chairman
Physical Society Colour Group

THE COLOUR COUNCIL OF CANADA

"High Fidelity in Colour" was the topic of the January 12th meeting of the Canadian Council. C. A. Watters (Schmidt Printing Ink) and L. H. Taylor (Heinz Jordan and Co.) described the relationship between Pelikan artists colours and Schmidt printing inks..."which now enables the printer to give a true reproduction of the original design."

The November meeting was a panel discussion on "Should Institutional colours in hospitals, schools etc. be planned by colour experts?"

It was, as stated in the monthly notice, truly, "Fighting Words!" The panel consisted of:

Mr. W. Duthie of the Research and Planning Department, Manufacturers Life Insurance Co., who acted as Moderator.
Mr. Stan Bloss, Construction Co-ordinator, Toronto Board of Education.
Mr. Wm. A. Howard, Colour Consultant, T. Eaton Co. Limited.
Mr. John Layng, M.R.A.I.C., B. Arch. Architect
Mr. Garry Walker - Student, Ontario College of Art
Miss Joanne Leslie - Student, Ryerson Institute

JAPAN SOCIETY OF COLOUR MATERIAL (SIKIZAI KYÔKAI)

History: The Japan Society of Colour Material was inaugurated in January, 1927, on the desire of specialists in various fields in Japan interested in coatings, pigments and printing inks. The Society has inevitably had certain vicissitudes, but, due to the untiring cooperation extended by the members as well as to the unstinted assistance by all circles concerned, it has now greeted the 32nd anniversary of its foundation.

The membership of the Japan Society of Colour Material is distributed among the various fields concerned with the research, manufacture, sales, and use of all kinds of coatings, pigments, printing inks and colours and of their materials. Most of these organizations, including public offices, companies, factories and commercial stores, together with certain volunteers, are listed among its special members, while a majority of the scholars, researchers, engineers and persons of learning and experience concerned with these organizations and schools are numbered among its regular members. At the present moment, the members of the former category are 150 and that of the latter, 1,500.

Objective and Task: The objectives of the Japan Society of Colour Material is to effect the progress and development of the pigments, coatings and printing inks and to propagate knowledge about them. The Society undertakes the following enterprises in order to achieve such objectives:

1. Editing, publication and distribution of magazines or books.
2. Holding of research and lecture meetings, instructive courses, study and discussion meetings as well as inspection excursions.
3. Research and investigation.
4. Proposing and extending cooperation.
5. Cooperation with public utility businesses.

The Sikizai Kyôkai Si (Journal of the Japan Society of Colour Material), the organ journal of the Society, is published every month, and contains a rich variety of literature and data, both domestic and foreign, on valuable researches and studies conducted about colour material. Being distributed freely to its members, the Journal is contributing substantially to the smooth execution of business by those concerned with colour material.

Management: Deliberation of important affairs related to the Japan Society of Colour Material is conducted by its Council while the actual management of the organization is entrusted to its Board of Directors. The Editing Committee is in charge of the editing and publication of its organ journal and other publications. (1959)

The address is: Japan Society of Colour Material
Tohan-Bldg., 1-5, Kanda-Sudatyô, Tiyoda-ku, Tokyô, Japan

THE PHYSICAL SOCIETY
COLOUR GROUP

Here are reports of the last two Colour Group meetings. The report of the November meeting was written by Mr. C. L. Boltz, a member of our Committee, who is the scientific correspondent of the British Broadcasting Corporation; he has broadcast the substance of this report on their "Home Service". (You might like to know that the Colour Group is showing a large exhibit on "Colour Adaptation" in the Physical Society's annual exhibition.)

Colour Scientists and the Land Experiments

The meeting of the Colour Group of the Physical Society on 11 November was given up to a discussion of the experiments and theories of Dr. Edwin H. Land, who in a striking series of demonstrations and a paper to the National Academy of Sciences (Proc. Nat. Acad. Sci. 45, 115, 636 (1959)) expounded a view of colour perception, in the natural-image situation, that seemed to strike at the classical view that certain wavelengths of light must enter the eye to cause a sensation of colour. Out of classical views has come, of course, the trichromatic theory of colour vision.

In a signed article in The Scientific American in May 1959 Dr. Land made the statement: "Color in the natural image depends on the random interplay of longer and shorter wavelengths over the whole visual field." Francis Bello, in an article starting on p. 144 of the May number of Fortune, entitled "An Astonishing New Theory of Color," went further. He wrote: "A theory of color that has stood for nearly three hundred years has suddenly been overthrown. In a series of startling experiments, Edwin H. Land, the brilliant founder and heir of Polaroid Corp., has shown that the eye does not need 'red' wavelengths of light to see red, does not need orange to see orange, (etc.) .....purple. By using black-and-white photographs in combination with various filters, or light sources, Land can produce images of scenes and objects that appear to possess the original gamut of color - yet, according to classical theory, only one, or, at most, two colours are "really" present. ....every textbook dealing with color will have to be rewritten."

It seems likely that Land gave his support to this article. The information could have come only from him.

The impact of the Fortune article and other publications was immense and some science journalists followed it up.

Scientists reacted fairly promptly. I consulted Professor W. D. Wright in June and found that he had expressed himself on the matter by transatlantic telephone to Land.

The outcome eventually was a long and detailed appraisal by Dr. Deane B. Judd, of the National Bureau of Standards, and the leading colour scientists in U.S.A. This was mimeographed, dated August 28, 1959, and sent to many colour scientists. Copies may be obtained from Judd. In it he quoted Helmholtz, a pioneer of the trichromatic theory, on the great importance, in the viewing of a coloured scene, of the effect of 'successive contrast' as the eye moves about, and on the importance of our automatic discounting of the colour of an illuminant. Judd has argued that the trichromatic theory could predict qualitatively some of the Land results. He makes a quotation from Land: "Color in images cannot be described in terms of wavelength and, in so far as the color is changed by alteration of wavelength, the change does not follow the rules of color-mixing theory." To this Judd comments: "This is quite wrong .....the method was published nearly 20 years ago."

On the demonstrations Judd in his summary says: "Projections from the same two photographic records may result in images producing substantially the same object-color perceptions regardless of choice of pairs of projecting lights. This was discovered by Land, but is derivable from previously developed principles which also indicate which pairs of projecting lights give substantially identical results."

(Editor's note: Dr. Judd's appraisal of Dr. Land's work is scheduled to appear in the March 1960 Jol. Optical Society of America.)

Coming now to the Colour Group meeting on 11 November, it was opened with a long paper by Mr. M. H. Wilson of the Goethean Foundation. This included very striking demonstrations of some of the effects described by Land. Mr. Wilson quoted older sources (also quoted by Judd) to show that many of these effects were known, some 150 years ago, some 60 years ago. Another demonstration came from the work of Arthur Karp of the Engineering Laboratory at Cambridge, and described in a recent article (Nature. 184. 4687. 710 (1959)). Land had said that regularly graded squares of grey showed only tints and shades of red when illuminated by red light and white light. Karp, on the other hand, had shown that once the squares were separated by white (or transparent) background bars and in a white surround, colours appeared. Mr. Wilson's dramatic demonstration of this provoked applause from the colour-group audience. The explanation of this, according to Karp, is to be found in successive contrast due to eye movements, each colour recognized being a combination of one of the original two primaries with the complementary of the other.

Several speakers took part in the discussion that followed. Professor W. D. Wright pointed out that some of the Land effects were elaborations of Goethe's colour-shadow effects described 150 years ago. However, what Land had achieved was to make us realize how defective our colour education was and how necessary it was now to get quantitative data on subjective phenomena. Mr. Adams (cf PATRA) underlined the significance of the fact that Land had shown no landscapes in his demonstration projections, and landscapes have fewer identifiable and separately coloured objects with highlights. Dr. W. N. Sproson (B.B.C. Research) showed a C.I.E. chromaticity chart with the range

of colours marked on it that were obtainable with Land-type two-colour projection. This range was seen to be small. (In this connection Mr. Wilson had shown the remarkable heightening effect of adding a third colour projection.) Dr. R. A. Weale (Institute of Ophthalmology) reminded members that a film made by Commander Farnsworth showing what the world looked like to a deuteranope had demonstrated how much such a colour-defective did actually see in a scene.

The general result of this meeting and the appraisal by Judd and the article by Karp is that now no serious colour scientist, aware of everything that has happened, can accept Dr. Land's work as being much more than brilliant demonstrations of known effects of object-colour observation (as distinct from the fixated-eye view of a tiny patch of coloured light in a dark surround in a colorimeter).

The cat may have been set among the classical trichromatic pigeons, but it has retired now to its cage, and the pigeons are back at their normal activities, but with a wary eye more than usually open as a result of what has been learned.

On 9th December the Physical Society held a meeting in London, in which Mr. J. Procter (Pilkington Brothers Limited) spoke on "The Chemistry of Coloured Glasses" and Mr. B. Boorman gave a review of "Recent Work on Signal Lights".

Mr. Procter discussed a convenient system of classification of the types of coloured glass, from a chemical viewpoint, and went on to consider the various chemical and physical properties of glass that affect its colour. The production of "colourless" glasses and the accurate reproduction of desired transmission characteristics were also dealt with.

There was a brief discussion, principally about the difficulties of producing a truly neutral type of glass.

Mr. Boorman opened his paper by pointing out that all work on signal lights was "recent" in the history of man. He traced the history of signal lights from earliest times to the present day, and discussed the recent introduction of a series of C.I.E. colour specifications for them in detail. The paper was followed by discussion which centered on the topic of the choice of limits for signal colours.

At the Physical Society's Annual Exhibition in January 1960, the Society's Colour Group staged a novel exhibit consisting of 21 models designed around the theme "Colour Adaptation". The idea was to demonstrate that colour is subjective, and that the perceived colour sensation is the result not only of the actual energy distribution curve of the sample, but also of the conditions of observation and the state of adaptation of the observer's eye. The visitor was led by easy stages through the various pitfalls for the unwary observer. He was then shown how it is possible to avoid these errors in the measurement of colour and to ensure agreement between different observers by accepting the standard conditions of international usage.

These exhibits, contributed by members, were a source of great interest to visitors, who waited their turn very patiently in a long queue in order to see the exhibition. During the five days, visitors were passing through the exhibit slowly and with a fascinated look on their faces, at the rate of about 150 per hour. Judging by the copious notes being taken, the teaching of colour physics in schools and colleges in Great Britain is likely to be enlivened in the near future by some new demonstrations.

The exhibits, all of them colourful and well lit, showed the hazards of simultaneous contrast effects, the gullibility of the brain in accepting all kinds of greys as "white", the startling change of perceived colour when illumination levels are varied, Maxwell's spot from metameric pairs of samples, and Bidwell's classic feat of making a red lamp appear green by the interposition of a spinning disc.

The exhibit next proceeded to illustrate the effect of successive contrast, with some hilarious and almost painful after-image experiments, which aroused much discussion.

To many visitors the "high spot" of the show was the opportunity to become small children again and play with the knobs and controls which cast various coloured shadows on a screen to illustrate that a coloured beam and a white beam can produce most brilliant, beautiful (and to some visitors incomprehensible) complementary colours. Then logically followed the well-known Van Gogh-like scene in full colours, (which was shown two years ago at a Physical Society Exhibition Discourse) produced by three projections in register through carefully chosen blue filters. Next came an example of the much talked of two-colour projection of a scene, which was accepted by most viewers as giving a nearly full colour gamut.

To illustrate the tolerance of colour judgment, there was shown a series of colour transparencies, each slightly different in colour balance, but not enough for the average viewer to notice the difference until the first and last were viewed simultaneously, when the gulf between them was obvious. Experiments on the measurement of subjective colour, 2^{o} and 10^{o} matching fields, the variance of a colour match with a bipartite field when viewed against different backgrounds (so long only as the whole background was uniform in colour) and working models showing the troubles which arise from illuminating or viewing samples at varying angles.

A final exhibit showed an idealised layout for a colorimeter which fixed and standardised all the variables which had been shown to cause discrepancies and difficulties.

A. W. S. Tarrant
Hon. Sec. Colour Group

INDUSTRIAL DESIGNERS INSTITUTE

The IDI announced results of the election of officers at the Twenty-First Annual National Conference. John S. Griswold, Chairman of the Board, H. Creston Doner, National Chairman, Leon Gordon Miller, Executive Vice President, Theodore G. Clement, National Secretary, Eugene Bordinot, Jr., National Treasurer.

The honor of Fellow of the Industrial Designers Institute was conferred on LEON GORDON MILLER and H. CRESTON DONER for their signal services to the Institute.

In commemoration of IDI's twenty-first anniversary, the Institute's rarely bestowed Silver Medal was presented to GENERAL LAWRENCE WHITING, Chairman of the Board of the American Furniture Mart. It was at the instigation of General Whiting and under his sponsorship that a small group of designers banded together in 1938 to form the professional organization which is now nation-wide and representative of all fields of industrial design.

Principal speaker at the Annual Conference (October 23) was Dr. Burleigh B. Gardner, executive director of Social Research, Inc., Chicago. His title was "Why Search for Motivation Research?" A summary of his talk will appear in the next issue of the News Letter.

Another feature of the conference was an exhibit by IDI in the American Furniture Mart. The display will "travel" to important U. S. cities.

The Development Plan for the Central Area of Chicago was presented to the conference by Ira J. Bach, Commissioner of City Planning, city of Chicago. The new plan presents a challenge in design as well as planning. With a target date of 1980, the plan includes the consolidation of railroads and transportation facilities, a government center, new urban housing, a Chicago campus for the University of Illinois and many other facets of beauty and convenience geared to the life of a major industrial city.

(The text of this interesting talk may be obtained from the News Letter Editor.)

TANNERS' COUNCIL OF AMERICA

The Color Bureau of the Tanners' Council of America has announced the new leather colors for Fall and Winter 1960. The colors are too numerous to mention but, as always, sound intriguing enough to make anyone want a pair of shoes in each color.

The American woman is learning to use shoes and accessories in a truly inspired manner to dress up or dress down her general look. The beautiful leather colors for 1960 makes it so easy to achieve that well dressed look.

The group of men's colors is small in number but the colors are powerful in their wide coverage and their complete coordination with the new American fashions. There is no element of risk or experimentation in these colors. They are proven successes in their respective fields. They will be the colors advertised and promoted nationally -- the "highs" for the second half of 1960.

DIFFERENCE BETWEEN MUNSELL FOUNDATION AND COMPANY

Ed. note: In answer to questions in the last News Letter, page 24, about the Munsell Color Foundation, we have asked Dorothy Nickerson to reply. She does so as follows:

Dear Editor: Since it has been my privilege to serve as trustee designated by the ISCC on the Munsell Color Foundation's Board of Trustees since 1942 when the Foundation was established, I am glad to make clear for News Letter readers the distinction that exists between the Munsell Color Foundation and the Munsell Color Company.

The Munsell Color Foundation, Inc. is a non-profit organization established in 1942 in order (1), to further the scientific and practical advancement of color knowledge according to aims and purposes similar to those of the ISCC, (2), to receive and hold the stock of the Munsell Color Company, Inc. and vote it in such a manner as will, in the opinion of the Board of Trustees, best accomplish these purposes, and (3), to acquire by gift or otherwise property and assets and to dispose of them in ways that will further the purposes of the Foundation.

Present trustees are Deane B. Judd, special trustee designated by the National Bureau of Standards, Dorothy Nickerson, special trustee designated by the Board of Directors of the Inter-Society Color Council, and Blanche R. Bellamy, special trustee, who, as incumbent manager of the Munsell Color Company, represents the company. Present trustees at large are Dr. Royal Bailey Farnum and Dr. Leon L. Winslow (both of whom have spent a lifetime in the art education field). The late Comdr. Dean Farnsworth was also a trustee at large. Mr. A. E. O. Munsell serves as trustee representing the donors, who were Juliet E. Orr Munsell (now deceased) and her son, Alexander E. Orr Munsell.

The Munsell Color Company is a separate corporation that functions independently under policies set by the Foundation. If and when there are sufficient profits from the operation of the company, they will go to the foundation for disbursement in accord with the purposes of the Munsell Color Foundation which are "to further the scientific and practical advancement of color knowledge, and in particular, knowledge relating to standardization, nomenclature, and specification of color; and to promote the practical application of these results to color problems arising in science, art, and industry."

To date the profits of the company have not been sufficient to allow the foundation to carry out its purposes under its own name as a separate organization except in a few limited instances. However, the purposes of the foundation are carried out as far as is feasible within the operation of the company, under recommendations made by the foundation. The company operates on a very limited budget and can expand its activities only as it makes enough money to do so. For years it operated "in the red," with losses covered by contributions from the Munsell family, but it has managed to stay "in the black" since the stock was transferred to the foundation. It must continue to do so for it has no endowment or other funds to provide it with income beyond what it makes from the sale of color standards, charts, and related materials and services.

Present directors of the Munsell Color Company, Inc. (appointed annually by the Munsell Color Foundation as stockholders) are: Dr. Sidney M. Newhall, Charles O. Page (legal adviser), Carl E. Foss, Edgar T. Wagner (auditor), and Blanche R. Bellamy, manager.

A full history of the proposal and establishment of the Munsell Color Foundation, and the Council's participation in this, will be found in ISCC News Letters Nos. 40, 41, 43, 44, 47, March 1942 through May, 1943. In No. 51 there is a story concerning presentation to the Foundation of Dean Farnworth's first royalty check for the Farnsworth-Munsell test, an action that he hoped might establish a precedent and thus a fund that might some day grow to be a real factor in color research. The death of Mrs. A. H. Munsell, and her part in the establishment of the Foundation, was reported in News Letter No. 79, 1948.

Dorothy Nickerson

JAPANESE PRODUCTION OF MUNSELL BOOK

The following announcement has been received from the Munsell Color Foundation:

Since 1954 the Japan Color Research Institute(JCRI), under the direction of Dr. Sanzō Wada, has been engaged in the preparation of a color sample book intended to show the colors defined in the Final Report of the O.S.A. Subcommittee on the Spacing of the Munsell Colors (JOSA 33, 397-405; 1943). The institute requested, and has been accorded, the cooperation of the Optical Society of America and the Munsell Color Foundation in this difficult undertaking. The Institute was informed of the work of the OSA Committee on Uniform Color Scales and was advised that this work was expected to result by about 1965 in a new definition of an ideal Munsell system possibly embodying important improvements in uniformity of the color scales. It was suggested that preparation of a color sample book based on the present Munsell renotations be pushed forward with all possible speed lest it become obsolete too soon after its completion.

Dr. Wada, and the members of the staff of the Institute, were so greatly interested in the progress being made by the OSA Committee on Uniform Color Scales (Progress Report, JOSA 45, 673; 1955) that they published a Japanese version of the report (Journal of the Illuminating Engineering Society of Japan, 40, 8, January 1956). They were not discouraged by the prospect of the appearance of improved color-spacing data five or ten years from now; on the contrary, they have proceeded with preparation of their color sample book based on the Munsell renotations.

To check the accuracy of the JCRI production, Dr. Wada has submitted to the Munsell Color Foundation samples of each notation painted. Beginning in 1956, samples (2-inch squares) were submitted in groups of 10 to 12 hues at a time, until by October 1958 samplings for each of the 40 hues (a total of 920 paintings) had been received with reports on their chromaticity coordinates and daylight reflectance. These paintings have been inspected visually by the three special trustees (Bellamy, Nickerson, Judd) of the Munsell Color Founda-

tion, and, where visual observations failed to check the reported notations, check measurements were made on a GE spectrophotometer, either at the National Bureau of Standards or in the laboratories of Davidson and Hemmendinger. Reports of these data were submitted to Dr. Wada who has authorized the repainting of all production which failed to meet his tolerance. To date, satisfactory productions of all but 113 colors have been completed. A recent letter from Dr. Wada (November 1959) reports that repaintings of these 113 colors will be forwarded "in the near future".

When completed, it is intended that these 920 samples of 40 hues be published in book form which eventually will be available for purchase anywhere in the world. It is anticipated that the Munsell Color Company will act as distributor for the publication in this country. There has been no final decision on price, although a tentative price of $125.00 per copy was mentioned by Dr. Wada in 1957.

Deane B. Judd

NOTES ON "COULEURS"

(Revue of the Centre d'Information de la Couleur). Published in Paris. (Volume No. 31). Last quarter of 1959.

Considerable space is devoted to the report on the International Meeting held June 25-27, 1959, in Brussels.

The work sessions covered the following:

The Measurement of Color

The Psychology of Color

The Esthetics of Color

The Teaching of Color

An account is also given of the C.I.E. Meeting in Brussels. This includes a paper by Dr. Judd on the laws of color mixture for specimens viewed over a wide angle.

A report is given the National Italian Congress on Color held in Padua June 6 and 7, 1959. This meeting was devoted to color in schools. This is part of the general theme of "Man and Color".

(See this issue of the News Letter and No. 142 July 1959, p. 1 for Dr. Judd's excellent reviews. See No. 143, 144 September-November 1959, p. 2 for review by Professor Le Grand.)

MORE PAPERS FROM JOURNEES INTERNATIONALE DE LA COULEUR

The following two papers were noted by title only in News Letter No. 142, July, 1959.

K. D. Hofmann and K. Miescher, Experimentelle Bestimmung "farbkräffigster" Optimalfarben in Abhängigkeit von Umfeld (Experimental determination of the "strongest" optimal colors as a function of surrounding field), Journées Internationale de la Couleur, Bruxelles, 25 June 1959.

Author's Summary:

The concept of colors of maximal chromatic intensity (K_{max}) developed on dyestuff concentration series dyed on paper[1] is reexamined using series of optimal colors of equal hue. These were produced with our new spectral color integrator[2]. Our preliminary results agree with our previous ones. K_{max} lies between the full color (of highest color moment) and the spectral color (of highest saturation). In general chromatic intensity (Farbkraft, Buntkraft) corresponds to Munsell's chroma. The functions suitable to calculate K_{max} depends on its hue and luminance of the surrounding field.

1 R. Rometsch, M. Thuerkauf, and K. Miescher, Exper. 14, 257 (1958).

2 M. Gasser, H. Bilger, K. D. Hofmann, and K. Miescher, Exper. 15, 52 (1959).

(So far I have received only the above summary in French, German and English.

--D. B. Judd)

Herbert Weise, Die Farbabstände im Farbsystem der DIN-Farbenkarte (Color differences in the color system of the DIN color cards), Journées Internationale de la Couleur, Bruxelles, 25 June 1959.

Author's Abstract:

The DIN Color Chart is based on a color system aiming at color series spaced uniformly as well as possible. Therefore little color distances may be evaluated by means of a simple difference formula in terms of the coordinates of the system. It seemed interesting to investigate how to express these color distances by other formulae mentioned frequently in the literature. In this paper the color distance measures following Nickerson-Stultz and according to the MacAdam ellipses were used for comparison. As a result it is found that there is no proportionality between these different color distance measures, but the differences are evaluated generally in the same sense. Further investigations involving visual judgments are required to decide whether one or another formula should be preferred.

(A complete translation of the German article (photocopy) may be purchased from the News Letter Editor at $2.50)

Deane B. Judd

LIGHT SOURCES AND
COLOR RENDERING

(Ed. Note: The January 1960 Journal of the Optical Society carries a paper on this subject by Dorothy Nickerson, prepared at the invitation of the Optical Society for their 1959 spring meeting. We have asked Miss Nickerson to prepare a summary for the ISCC News Letter. She has become expert in this field through her many years work in lighting of cotton classing rooms, work now standardized for the entire industry through ASTM's recently adopted D 1684-59T;* she served in the 1940's as chairman of ISCC's subcommittee on Problem 13: The Illuminant in Textile Color Matching; since 1952 she has served as chairman of the Illuminating Engineering Society's subcommittee on Color Rendering of Light Sources; since 1955 she has represented the United States as technical expert on the Color Rendering committee of the International Commission on Illumination (CIE- W 1.3.2). W. L. Rhodes)

* * * * * *

In 1939 the fluorescent lamp made its bow to society through widespread use at the New York World's Fair. Progress in lamp making has continued, and today we are faced on every side with problems of color rendering that formerly were of more academic than practical interest except to a few who were closely concerned with color matching problems.

The early carbon filament lamps of Edison operated at 2.6 lumens per watt, today's 60 to 500 watt incandescent lamps operate at 14 to 20; early Cooper-Hewitt mercury lamps operated at 13 lumens per watt, today's mercury vapor lamps at 37.5; carbon arc lamps, those used for motion picture work, operate today as high as 53, and sodium vapor lamps at about 50 lumens per watt. Fluorescent lamps reach efficiencies of more than 60 lumens per watt for several of the white lamps, and with a life expectancy that has increased to an average of more than 7500 hours. With lamps of such efficiencies we now have enough light from man produced sources so that it becomes practical to turn more attention to their color rendering properties.

With low lamp efficiencies only in such specialized cases as those of color matching was it practical to do much about it. Therefore in earlier years only a few people specialized in this field, chief among them Norman Macbeth, father of our present ISCC treasurer. It was he who established his early business on the specialty of "artificial daylighting," with the intention of providing lamps with color rendering properties as similar as possible to those of daylight, lamps that have been used as standards for many years in visual color matching work, particularly in textile, paint, and graphic arts fields, with a somewhat different lamp developed for color rendering by photographic processes for motion picture processes such as Technicolor.

Color rendering properties of light sources depend upon the spectral energy distribution of the various wavelengths that each may emit. If the daylight

* "Tentative Recommended Practice for Lighting Cotton Classing Rooms for Color Grading," American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pennsylvania.

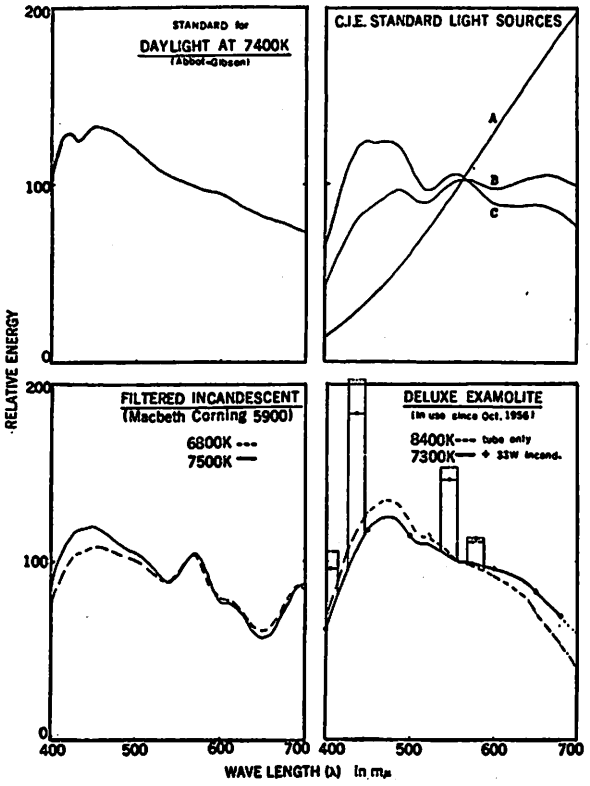

FIG. 1. Relative spectral energy curves for light sources in daylight range, with CIE standards *A*, *B*, and *C*, for comparison.

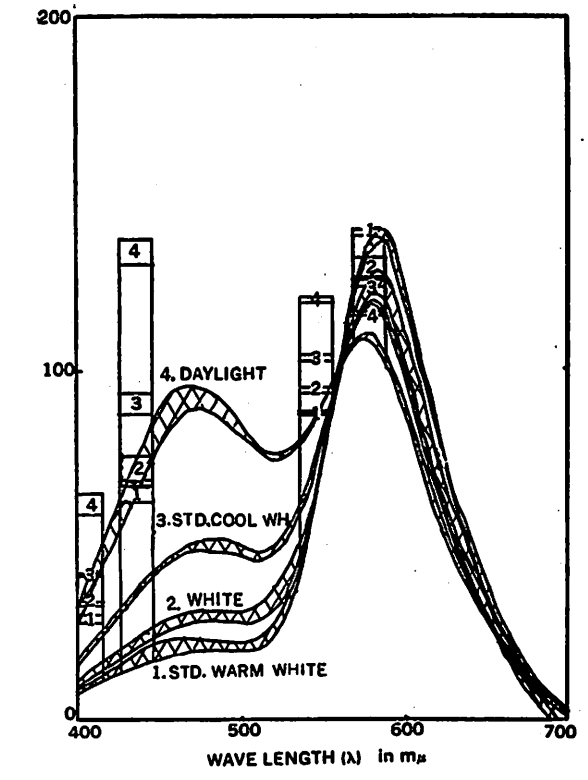

FIG. 3. Relative spectral energy curves for four white fluorescent lamps in current production. Cross-hatched areas indicate the narrow range of spectral differences for lamps of different manufacturers in this series of high lumen output lamps.

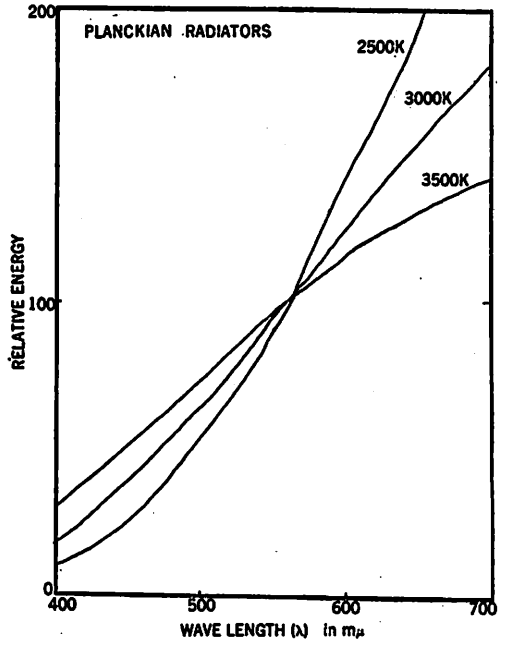

FIG. 2. Relative spectral energy curves, 2500 to 3500 K, that include the color range of incandescent lamps.

TABLE II. Chromaticity data for standards and sources in Fig. 1.

Identification	lu/w	Color x	Color y	Correlated C. T.
Abbot-Gibson at 7400 K		0.302	0.310	7400 K
CIE *A*		0.4476	0.4075	2850 K
B		0.3485	0.3518	4880 K
C		0.3101	0.3163	6740 K
Filtered incandescent		0.3081	0.3231	6800 K
Filtered incandescent	c. 3–5[a]	0.2996	0.3123	7500 K
Deluxe examolite, tube only	c. 46[b]	0.291	0.306	8400 K
Deluxe examolite+incand.		0.302	0.314	7300 K

[a] From Norman Macbeth (letter, February, 1959).
[b] From C. W. Jerome (letter, March 11, 1959).

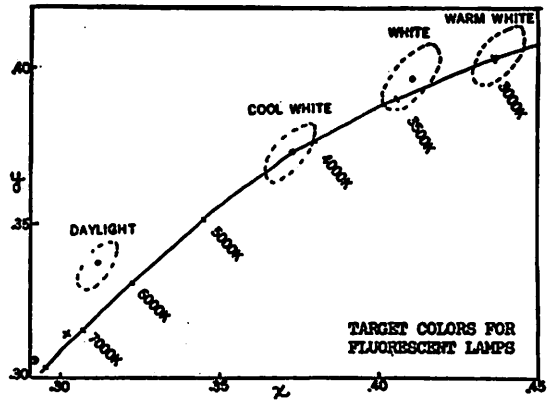

FIG. 5. Industry standards and tolerances for color of white fluorescent lamps. The curve represents the Planckian locus from approximately 3000 to 8000 K.

TABLE III. Approximate life, color, and light output of general service incandescent filament lamps commonly available for operation on 115–125 v circuits.

From I.E.S.[a] Handbook Table No.	Identification	Watts	Rated Av. life Hr	Rated initial l/w[b]	Mean l/w[b]	Approx. initial filament temp.[c] °K	Approximate color Color temp. °K	CIE x	CIE y
8–61	A-19 inside frosted	60	1000	13.9	13.1	2770	2820	0.450	0.407
	A-21 inside frosted	100	750	16.3	15.2	2860	2890	0.445	0.407
	PS 30 clear or inside frosted	200	750	18.5	16.3	2895	2925	0.442	0.406
	PS 30 clear or inside frosted	300	750	19.7	17.3	2935	2975	0.439	0.405
	PS 40 clear or inside frosted	500	1000	19.8	17.6	2945	3000	0.437	0.404
	PS 52 clear or inside frosted	1000	1000	21.5	18.0	2995	3050	0.433	0.403
	PS 52 clear or inside frosted	1500	1000	22.0	17.3	3040	3100	0.430	0.402

[a] Except color (see reference 14).
[b] Lumens per watt.
[c] The actual temperature of the tungsten filament is lower than that of a true blackbody when they are a color match, less than 100° at 3000K.

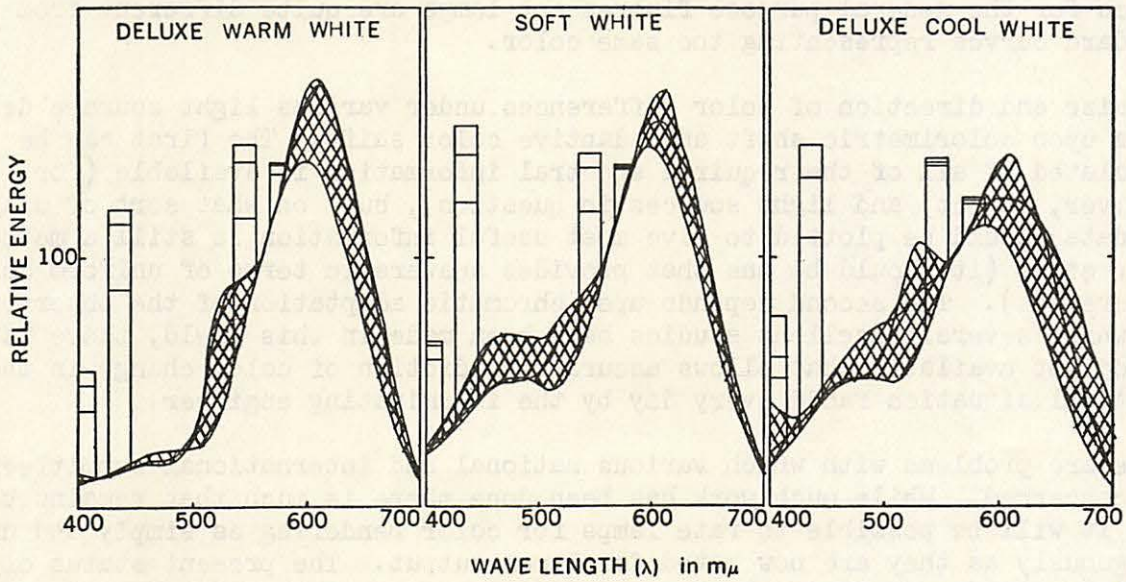

FIG. 4. Relative spectral energy curves for fluorescent lamps designed to provide improved color rendition. Cross-hatched areas indicate the wide range in spectral quality of lamps made by different manufacturers for this series.

TABLE IV. Approximate life, color, and light output of seven white fluorescent lamps currently produced by most large lamp manufacturers.

From I.E.S.[a] Handbook Table No.	Identification	Watts	Rated Av. life Hr	Rated initial l/w	% lu at 3000 hr	Color[b] Correlated color temp. °K	CIE x	CIE y
8-98	*Hot Cathode, Preheat Start*[c]							
	Standard warm white (WW)	40	7500	69	88	3000	0.437	0.405
	Deluxe warm white (WWX)[d]	40	7500	49	88	3000	0.437	0.405
	White (W)	40	7500	66.5	88	3500	0.409	0.398
	Soft white (SW)	40	7500	46.5	88	. . .[e]	0.392	0.356
	Standard cool white (CW)	40	7500	66	88	4200	0.372	0.374
	Deluxe cool white (CWX)	40	7500	49	88	4200	0.372	0.374
	Daylight (D)	40	7500	60	88	6500	0.311	0.338

[a] Except color (see reference 14).
[b] Target colors for all except soft white are from Federal Specification W-L-116A, October 6, 1958 (and the proposed ASA C78.376/874, January 1959, in which tolerances are defined in terms of a 4-step MacAdam ellipse). The color of soft white is the average calculated from measurements of the soft white lamps for which curves are shown in Fig. 4.
[c] Hot cathode, instant start lamps are rated 1 or 2 lu/w less than preheat start.
[d] Also called home-lite.
[e] Too far from blackbody locus to assign a correlated color temperature.

color of samples is of interest, then in their inspection a light source should be used that provides a spectral energy distribution in the visual range as close to that of the required daylight color as it is possible to obtain. Such special purpose light sources are illustrated in Figure 1 by relative spectral energy curves, shown in comparison to standard curves, with chromaticity data provided in Table II. Color rendering of general purpose lamps are therefore shown, those for incandescent lamps in Figure 2 with relevant lamp data in Table III, with similar curves and data in Figures 3-5 and Table IV for fluorescent lamps in seven commonly available colors of white lamps, from the yellower "warm" whites to the bluer "daylight" color. Much of the problem of color rendering is implicit in these curves. Using as standards for the various colors a series of curves that consist of Planckian distributions from the yellower whites (around 3000K) up to 6000K and the Abbot-Gibson series from 6000K to limit-blue-sky, it is clear that curves for the general purpose fluorescent lamps are quite different from standard curves representing the same color.

The size and direction of color differences under various light sources depends upon colorimetric shift and adaptive color shift. The first can be calculated if all of the required spectral information is available (for observer, object, and light sources in question), but on what sort of diagram the data should be plotted to give most useful information is still a matter under study (it should be one that provides answers in terms of uniform color differences). The second depends upon chromatic adaptation of the observer, and while several excellent studies have been made in this field, there is no method yet available that allows accurate prediction of color change in the practical situation faced every day by the illuminating engineer.

These are problems with which various national and international committees are concerned. While much work has been done there is much that remains before it will be possible to rate lamps for color rendering as simply and unambiguously as they are now rated for lumen output. The present status of this work is discussed in the January 1960 Journal of the Optical Society, pages 57-69, under the title LIGHT SOURCES AND COLOR RENDERING, with references given to much of the recent work that has appeared in ILLUMINATING ENGINEERING and elsewhere. The accompanying curves and tables are from the J.O.S.A. paper, which readers who are interested in more complete information should consult. Reprints will be supplied on request (to the author) as soon as they are available.

Dorothy Nickerson

AN ARTIST'S VIEW OF COLOR SYSTEMS

One of the most interesting opportunities afforded by the ISCC to its scientifically trained members is the chance to discuss color problems with artists. Such discussions are always tantalizing and often frustrating. There seems to be a communications barrier between artists and scientists; but if any organization is to achieve a break-through, the Council should be able to. As a possible contribution in this direction I quote from correspondence that I have had in the past few months with Ted Sprague whose wife, Grace Sprague, has recently become an ISCC member.

(First letter addressed to the Journal of the Optical Society of America):

"This may be a crank letter, I am not at all sure, one way or the other. Let me say, at the outset, that I have at hand your book, "The Science of Color". Then let me place our interest in the subject. My wife has been a professional artist for 35 years, we have been married for 30. So we have been aware, she more than I, of various color problems.

"Of recent years her activities have been concerned with designing clothes for the actresses in the motion picture business. This may seem to you a far cry from a real interest in the physics of color, but it is not. The problems that an artist deals with are, I believe from years of observation, given more concentrated attention by artists than most people give to their business. These artists are not the out-of-this-world people so many believe, at least not the successful ones.

"The problems are of four classes: how we see color; the emotional responses of actresses and audiences to color; the chemical response of photographic emulsions, both color film and black-and-white, to color; and the physics of translating on a screen by a heavy-on-the-blue-end light source through filters that are not all that could be desired.

"As a result there are various colors she cannot use, - for one or more of the above reasons. For example, the brown group, which is so prevalent in nature; these are difficult for the camera to pick up. There is no such thing as brown light. Therefore much of the coloring that is done, has to be faked in one way or another to fool the camera into remembering chemically a color it really didn't see physically.

"We have tried, at one time or another, all the pigment color systems. Neither the Ostwald, nor the Munsell, however rational they may be, have been translated in production into what my wife calls "good" colors. By this she means she can't match what she sees with these pigments.

"It is not temperament, it is just simple truth. None of the color theories really work for a working artist, however adequate they may be for teaching art, or physical experiment...."

(Excerpt from reply: Judd to Sprague)

"Your remark that neither the Ostwald nor the Munsell color systems have been translated in production into what a competent color designer would call "good" colors is rather puzzling. I am sure that the colors chosen for the clothes of a motion-picture actress can be precisely specified in Munsell notation, and perhaps you are merely saying that many of the colors of textiles of interest to a designer are outside the gamut of colors producible by pigments....I am not at all clear as to what designers wish a pigment-color system would do for them."

(Excerpt from reply: Sprague to Judd)

"First, about the Ostwald and Munsell color systems - and others, for that matter. If we remember correctly, the Ostwald system was based upon the Weber-Fechner logarithmic threshold formula. Ostwald was a physical chemist who painted on Sundays, and Munsell was a teacher of painting who thought on Sundays. If you start with some color, using some arithmetic, logarithmic, or other exponential progression, your system will be rational, but not necessarily emotionally satisfying. ...We think that Ostwald's colors are all brilliant, but tuned like a piano, for concert pitch, rather than home use. Ostwald was too good a scientist to get his colors by diluting them with black. Munsell used a black to white in, we believe, an arbitrary scale of ten intervals to grey his colors. This is the lazy man's way; no good artist uses black to grey his colors. He uses the complementary color to get his greys, or greyed tones of chroma. Munsell's colors are largely pastels, as against Ostwald's, which are dyes.

(There follows five pages sketching an electrical theory of color vision.)

(Excerpt from second reply: Sprague to Judd)

"I see that I really didn't answer your letter, being so intent upon selling my own bill of goods. ...

"About the colors artists try to tell we-uns about, - artists do, they don't rationalize. Thirty years of marriage has taught me a small part of the lingo. Here is the problem, as I see it: What is the relation of the subjective reaction of people to color (or form) to the objective measures of color (or form)? ...Problem: Design a color system which is both objectively possible and subjectively satisfactory. ...

"No artist will ever tell you what he wants in colors; he doesn't know, knowledge not being his dish, but technique. He doesn't have to understand what he is doing in order to do it; it gets to be pure reflex.

"The thing is - when you monkey with the "social sciences" it becomes pretty hard to put Man into the formulas -- yet without him in it, you have nothing at all, just a construction blueprint. This is really what the artist is trying to tell you - you've left Man out of the picture. Science shouldn't be objective - yet that is the aim. My Transfer Function puts him in - but only schematically, as yet. There are too many things I don't know, and I'm getting kind of old to learn."

I have not replied further to these letters, chiefly because I did not know what to say. Of course, I could point out that a Munsell notation can be given for every color in the Ostwald system; so it makes no sense to me to say that the Ostwald colors are all brilliant and the Munsell colors largely pastels. Furthermore, I could point out that, in general, a chromatic paint darkened by adding a complementary pigment can be matched by darkening it, chiefly with black pigment. Of course, this match is usually metameric; but the two colors have the same tristimulus values or Munsell notation, and so are treated as identical colors by the science of colorimetry. Then I am

reminded of Granville's report that the member of the famous Granville grays produced by mixture of black and white pigments was called Alcatraz gray by artists; whereas the grays produced by mixture of green, purple, yellow and white pigments was called a lively gray. When I compare the two grays on large panels side by side, I see the Maxwell spot on both; but one looks about as lively to me as the other, and I can not tell by looking at either one alone whether it was produced by black and white pigments or by complementary pigments. Maybe for artists, liveliness is a fourth attribute of color.

Both of these comments appear rather trivial, and more or less aside from Sprague's main point. I still don't know what artists expect a color system to do for them; nor even if they want a color system at all. Perhaps other ISCC members can supply the answers.

Deane B. Judd

LOOK PUBLISHES ARTICLE ON THE COLOR-BLIND CHILD

The January 9, 1960 issue of Look Magazine carried (pages 47-49) an article on the color-blind child. Dr. Judd, who assisted in the preparation of this article, was able to procure tear sheets of it for the News Letter. This graphic illustration of the difference between the normal color world and that of the red-green confuser should be particularly helpful to teachers using color to make school work more interesting. Such use is an aid to the normal-sighted; but can be a handicap to the color blind.

"THE AGE OF REASON FOR COLOR," FABER BIRREN

In the last issue of the News Letter we stated that Mr. Birren's article was included. Because of shipping schedules we were unable to mail the article with the News Letter. The reprint really is enclosed with this copy of the News Letter.

Ed.

RUSSIAN TRANSLATIONS CITED IN BIBLIOGRAPHY

In recent News Letters, (eg. 143-144) items from Russian journals have been cited in the bibliography. These items are sent to the News Letter by Rinehart S. Potts, Aero Service Corporation, Philadelphia.

Some of the listings indicated that translations were available. These citations were followed by "Order from ATS" or "Order from SLA". The meanings of these abbreviations are:

ATS: Associated Technical Services, Inc., P. O. Box 271, East Orange, New Jersey

SLA: Special Libraries Association, Translation Center, John Crerar Library, 86 East Randolph Street, Chicago 1, Illinois

The items with no listing as to "order from" are not yet available in translation. Inquiry may be made of the Office of Technical Services, Department of Commerce, Washington 25. Those who are interested may subscribe to TECHNICAL TRANSLATIONS, $12 yearly from the OTS.

ORDERING ARTICLES FROM THE NEWS LETTER BIBLIOGRAPHY

Many readers have requested reprints of the articles listed in the News Letter bibliography. Occasionally these requests can be fulfilled through the services of the Information Service of the Rochester Institute of Technology. This Service can provide photocopies of articles at 25 cents per page. These copies can be provided only if the article is available to be photographed. Frequently, however, the article is not available. In these instances, RIT suggests that readers refer their requests to the author or to the periodical. Either of these sources may supply reprints without charge. If all of these fail, the Information Service can usually search out other sources. These "other sources" may be somewhat more expensive.

Boiled down this means that if you want copies of the articles listed in the News Letter, we will do all we can to obtain them for you.

Editor

MISCELLANEY

The police and firemen of Rochester, New York are among the most colorfully shod in the country according to an announcement made by Kenneth E. Punnett, City Purchasing Agent. City police are wearing yellow boots while the firemen are wearing red boots. The change from somber black is strictly experimental. Why the switch? The new boots will cost less plus make the wearers more visible and help cut down on accidents.

* * * * * *

Color makes roads easier for drivers to see. On routes 36 and 61 near Minneapolis, Minn. there is a "color-keyed" interchange installed as an experiment.

Blue is used to designate deceleration lanes and exit ramps. The surfaces of the lanes and ramps are coated with a deflective substance that stands out sharply at night. Exit signs also have blue backgrounds. The color scheme is continued in blue delineators -- small stakes with reflectorized panels marking the edge of the roadway.

Approach ramps and acceleration lanes are coated with yellow material. The delineators and signs, visible to those entering the expressway and those already on it, also have the yellow theme. One more example of how color is not only pleasing to the eye but proves a safety feature.

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Industrial Designers Institute
Leather Color Guide for Footwear for the Spring and Summer of 1959 Tanners' Council of America
National Paint, Varnish and Lacquer Association 1958 Color Survey
Wilford Seymour Conrow 1880 - 1957 (Fischer)
Color - Its Measurement and Specification
Color Standards for the Industrial Designer
Colour in Surface Coatings - Its Appreciation Measurement and Control
Conference on Standards for Tristimulus Integrators Washington, D. C. May 14, 1958 (Grum)
Color Trends and Forecasting
Color in Telephones (Kiernan)
Colored Advertisements and Traffic Signals (Shipley)
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ISCC President Changes Address
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Colour Council of Canada
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Scope and Limits of Colour Measurement
A.I.A. File No. 25-B-21 Color in Relation to Illumination Levels (Macbeth)
The American Institute of Decorators
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Wilfred Seymour Conrow 1880-1957
Customer Preference Clinics by John W. Wingate
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F. Braun, Nouvelles Tables de la Colorimetrie (Pike)
New Type Color and Gloss Meters from Japan
Improved Color and Color-Difference Meter (Hunter Associates Lab.)
New Whiteness Reflectometer (Hunter Associates Lab.)
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Last Minute Note About Mr. Evans
Sears Roebuck & Company Seminar on Color Control
Color Planning for Business and Industry - A New Book by Howard Ketcham
Preferential Chromotropisms and the Visceral Activities of Consciousness (Burnham)
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Physical Society Colour Group
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Dan Smith Heads Interchemical Color Center
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Clarence Deutsch, President, Minnesota AID
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Material Standards for Colorimetry (Billmeyer)
NSID Newest ISCC Member Body
The Colour Council of Canada (Sinclair)
Physical Society Colour Group
IDI 9th Annual Design Award Presentation
Munsell Moves
AID Elects ISCC Member
F. H. Rahr Appointed to ETA MU PI
Dr. W. S. Stiles, Visiting Scientist at the National Research Council of Canada, Ottawa
Position Available
Review of "Goethe's Colour Experiments" (Evans)
Studies of Color from the Japan Color Research Institute
Japanese Imperial Festival Colors
Color in Human Activities (Burnham)
A Bonnet and a Pair of Mitts from Ch'ang-Sha
More Than Meets the Eye
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Brussels Session of the International Commission on Illumination
Measurement of Color (Judd)
NPVLA Annual Color Survey
New Leather Colors from Tanners' Council
Dean Farnsworth Ill
Everett Call With A.I.M.
Wilfred D. Sinclair Passes (Conquergood)
ISCC Authors in JOSA
Seminar on Color and Color Control
Colour Lecture by G. J. Chamberlin
Eyes in the Animal World
Color Measuring of Printing Ink
Painting Color Selector for Lithographic Plants
New Multipurpose Glossmeter
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Troisiemes Journées Internationales de la Couleur (Le Grand)
IVth Journées Internationales de la Couleur
Color in Architecture
Annual AID Public Exposition
Correction for Annual Meeting Issue
The Color Council of Canada
Thorne Shipley Returns to Miami
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