INTER-SOCIETY COLOR COUNCIL

NEWS LETTER

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REMEMBER! APRIL 6 - STATLER HOTEL, NEW YORK CITY - 24th ANNUAL MEETING

DR. GATHERCOAL DIES

December 27, 1954 marked the end of the career of the man who sparked the formation of the Inter-Society Color Council. Dr. Edmund Norris Gathercoal, who was born in Sycamore, Illinois, on December 23, 1874, first became interested in the color descriptions used for pharmaceuticals during his study of the ninth revision of the United States Pharmacopoeia. One term in particular "blackish white" impressed him as illogical. After much work on his part, the most objectionable of the color designations were eliminated from the next revision; but, by this time, his interest in color had grown and he persuaded the U. S. Pharmaceutical Convention to incorporate in its decennial meeting in Washington in May 1930, an exhibit of color systems and measuring instruments with the regular exhibits of pharmaceutical products and processes. Interest grew so rapidly and with it more material for the exhibits, that the step child appropriated most of the space of the mother exhibit. At this time, it was decided to hold a meeting of those interested in color and this was done under the name of the Organization Committee of the National Color Convention based on the far-seeing suggestions and organizational plan proposed by Dr. Gathercoal. The present name, the Inter-Society Color Council, was used at and following the second meeting of this group.

Dr. Gathercoal was elected the first Chairman of the ISCC and served from 1931 to 1933. On September 18, 1931, he wrote to Mr. Irwin G. Priest, in charge of the Colorimetry Section at the National Bureau of Standards, proposing the problem of developing a system of color names to be used in describing the colors of drugs and medicines in the U.S.P. and the National Formulary. This problem was studied by a committee of the ISCC and two reports were written by Dr. I. H. Godlove outlining the plan which was followed in developing the ISCC-NBS system of color designations published in 1939. As chairman of the Revision Committee, Dr. Gathercoal arranged to have the National Formulary give financial support to this work, and it is to his foresight and drive that we owe the early and successful completion of the ISCC-NBS system. Soon after this, he retired from teaching and went to his summer place in

Pentwater, Michigan, where he continued his botanical studies finally migrating to Bradenton, Florida, where he spent the past few years.

I had the opportunity and pleasure of knowing and working with Dr. Gathercoal for a number of years. His writing in connection with the early history of the ISCC give direct insight into the thinking of a trained scientist, a man of deep religious conviction and a leader who thought in terms of the future as well as the present. He was quiet but forceful, a prodigious worker, a driver, a man of many interests. He was a member of the revision committee of the U.S.P. from 1920 to 1940, chairman of the revision committee of the N.F. from 1929 to 1940, vice president of the American Pharmaceutical Association in 1922 and president in 1937. He was awarded the Remington Medal by the A.Ph.A. in 1936 for outstanding contributions to the field of pharmacy. He taught pharmacognosy at the University of Illinois from 1907 to 1940 and his main fields of research and writing were the cultivation of drug plants and the development of standards for drugs and medicines. In spite of his many publications which have built for him a lasting monument, we sense in his passing a scientific as well as a personal loss. The Inter-Society Color Council may well mark the passing of the man who contributed as much if not more than any other toward its formation and early growth.

Kenneth L. Kelly

WASHINGTON AND BALTIMORE COLORISTS

On March 14 the Washington and Baltimore Colorists held a dinner meeting at the Y. W. C. A. at which time Mr. Kenneth A. Freeman, Chief of the Color Certification Branch of the Food and Drug Administration, was the speaker. He discussed "Color in Food" from the viewpoint of the Food and Drug Administration's work in certifying the coloring materials that may be used legally in food products that are processed for human consumption. It is a most interesting subject, and one very important to the health protection of the American public. The meeting was arranged by a committee consisting of Waldron Faulkner, chairman, Mildren F. Trimble, and Francis Scofield. This meeting had originally been called for February, but was postponed.

PHILADELPHIA-WILMINGTON COLOR GROUP

At a meeting held at the Philadelphia Textile Institute on January 26, the Philadelphia-Wilmington Color Group heard Mr. W. N. Hale present a comprehensive and stimulating discussion of the Munsell Ssytem of Color Notation. Mr. Hale is Assistant Manager of the Munsell Color Company. In his talk, which was provided with interesting illustrations, Mr. Hale described the application of the Munsell system to industry, education and science. At the informal dinner preceding the meeting, some 25 members of the group held their own discussion of color problems. Represented in this group were people from the paint, dyestuff, textile, plastics, printing and leather industries, among others.

The next meeting is schedules for April, and one other meeting this year is planned.

COLOUR COUNCIL OF TORONTO

On January 11, the Colour Council of Toronto held a rather unusual type of meeting. We quote from "Colour Comments," edited for the Toronto Group by ISCC past vice-president C. R. Conquergood:

"The January meeting of the Colour Council of Toronto, will go down in history as our first 'fun night.' The most of the program was given over to group contests, and the names of the contests provided no clues to the laughs that were created as

some group tried to pass a questionable entry. These games may be played by anyone at a house party. Divided into small groups, chosen by drawing table numbers, each group had a leader and a recorder (some of them had to write so fast, that the writing was difficult to read afterward). The four main contests were to list the names of colours, which took their names from flowers, fruits and vegetables, songs with a colour name in the title, and phrases describing a mood in which a colour word was used. While the attendance was small, it was large with colour interest. Miss Doris Thistlewood had all the arrangements well planned. The personality of the evening was the character who wandered in as Professor Characteritis, complete with mortar-board hat and gown, with other disfiguring disguises. With trueish classroom technique he proceeded to 'character analyze' the members, who had previously chosen their favorite colour chips. His demonstration possibly proved that character analysis by colour is at least as effective as tea-cup reading, or even astrology."

On February 8, Mrs. Dorothy Lash Colquhoun addressed the group on "Colour in Food." We have no details of this meeting as yet.

The March 10 meeting will hear an address by our own Walter C. Granville, who will speak on "Colour-Principles and Practices." The Colour Council has sent us a very attractive meeting notice which contains a photograph of Mr. Granville and a biographical sketch.

MONTREAL COLOUR COUNCIL

A letter from Mrs. Lissa Taylor, secretary of the Montreal Colour Council, informs us that this organization is in the process of changing over to the Canadian Colour Council. Since much organizational work is in the offing, they have discontinued meetings of the Montreal Group as such, and will report proceedings through the Advisory Committee of the Canadian Colour Council. They have promised us a publicity release in a short time.

(Note: Mr. C. C. Pettet, president and general manager of the Canadian Paint Varnish and Lacquer Association, "the national trade association of the paint industry," has been in correspondence with ISCC officers, and has received copies of our by-laws, and whatever information was requested that they could use in establishing a Canadian Colour Council. From Mr. Pettet we understand that it is the organization's intention to emphasize the use of color by industry and at the same time co-ordinate the use of color among those industries that produce items which go to make up a finished effect. We have referred him to many of our very well-known Canadian members who are active in the color field - indeed it may be that some of them have been active in the formation of this new group. We shall be glad to hear more about their plans, and to report them in the NewsLetter. We wish them well in this undertaking. Ed.)

APRIL COLOR SYMPOSIUM FOR AMERICAN CERAMIC SOCIETY

A joint all day session on color has been arranged for several divisions of the American Ceramic Society when they meet in Cincinnati April 24-28 for their annual meeting. This joint session has been arranged following the suggestion of Mr. J. C. Richmond of the National Bureau of Standards, program chairman of the Enamel Division of the American Ceramic Society and a delegate to the Inter-Society Color Council. Indeed, the arrangement of this session may be considered as an activity of the ACS delegation to the ISCC since several of the other delegates - Messrs. Balinkin, Gibson, and Patrick are also participating in the program, and all of the delegates helped to plan the program.

The morning session, April 26, will be devoted to papers on the fundamentals of color and color measurement. The afternoon session will be built around the theme of color control in the ceramic industry. Following is the list of speakers and subjects:

I. A. Balinkin	Introduction to Color
R. S. Hunter	Instrumental Methods of Color and Color Difference Measurement
J. C. Richmond and W. N. Harrison	The Evaluation of Small Color Differences Part I - Visual Observations
H. Keegan	Part II - Spectrophotometry
H. K. Hammond, III and R. S. Hunter	Part III - Colorimetry
R. F. Patrick	Establishing a Color Control Program Utilizing Instrumentation
H. I. Becker, Jr. and F. L. Michael	Color Control in the Enamel Industry
A. J. Werner	Color Control in the Glass Industry
R. L. Gibson	Color Control in the Dinnerware Industry
W. H. Merry	Color Control in the Sanitaryware Industry
H. Goodrich	Color Control in the Tile Industry
C. Foss	Past, Present, and Future Influence of Color

Guests who may be interested in this color session will be welcome. The meetings will be held at the Netherlands Plaza Hotel.

FATIPEC COLOR MATCHING CONVENTION
May 22-27 - Spa, Belgium

A communication has been received from the Federation of Technical Associations of Paint and Printing Ink Industries in Continental Europe (FATIPEC) with announcement of their third biennial convention to be held at Spa, Belgium. This convention organized by the Belgium Association (ATIPEC), will be held during the week of May 22-27. The theme of the convention will be: "Colour and Colour Matching: Theoretical and Practical Aspects." FATIPEC corresponds, in scope and aims, to the Federation of Paint and Varnish Production Clubs in the United States and the Oil and Colour Chemists' Association in Great Britain. Together these three groups represent a coordinated technical alliance of considerable stature. Liaison between the foreign associations and our Federation is accomplished through the Federation Liaison Committee, of which Mr. Robert W. Matlack is chairman.

Further information, provided by the preliminary announcement, suggests the need for common study and debate of everyday problems in colorimetry, color coordination, and color harmony. The proposed program is divided in five sections, as follows:

Section I: Scientific and technical description of color. Colour Harmony.

Section II: Colour measurement: methods and instruments.

Section III: Colour matching. Scientific matching and colour tolerances. Practical colour matching. Maintenance of colour standards and reference samples.

Section IV: Standardization and specification. Terminology for standardization purposes. Colour charts and systems.

Section V: Technological factors other than colorimetric to be considered in colour measurements.

It is presumed that each day of the convention will develop aspects of problems concerned with each section, as they apply to the technology of the paint and printing ink industry. French, German, and English are the three official languages of the convention. Each country member is expected to present a plenary lecture covering the broad aspects of each section. Belgium reports plans to cover the scientific and technical description of color and color harmony. A commercial exposition related to the subject of the convention will be held in conjunction with the technical program.

The Federation of Paint and Varnish Production Clubs will be officially represented by Mr. Paul O. Blackmore of Interchemical. Mr. Blackmore is planning to present a paper outlining the status of color technology in the United States as it applies to the finishes industry.

Discussion and collaboration with our European associates on such a major scale should certainly produce information of considerable interest to Council members. The Federation is anxious to make as much as possible of this available to the Council as well as to members of their constituent clubs. Direct information can be obtained by communication with the FATIPEC III, Secretary General, 32 rue Joseph II Bruxelles, Belgium.

Ralph E. Pike

HEIDELBERG MEETING
June 8-9

The international discussion of problems in color metrics, for which an announcement was sent to each ISCC delegate and member with the January News Letter, should be a great success. Americans working in this field will be well represented if all who now plan on it are able to go, among them ISCC members Judd, Balinkin, Farnsworth, Middleton, Helson, MacAdam, Pike, Glasser, Balcom, Nickerson. Others who plan on attending either the FATIPEC congress (and there are many Americans in this group) or the CIE meeting in Zurich, should plan to include the Heidelberg meetings if at all possible. It is the sort of international discussion session that occurs only once-in-a-lifetime, possible at this time because so many color technologists will be in Europe attending these other more regularly scheduled meetings. Write to Dr. M. Richter, Berlin-Dahlem, Unter den Eichen 87, if you can plan to attend. Air mail is quick, so do not hesitate to write directly if there is further information you need. The three sessions include discussions of color adaptation and the influence of surrounding fields; problems of color vision, especially of tritanopia and of viewing very small fields; problems of color space, color systems, and color tolerances. Each session will open with two invited papers, to be followed by general discussion on the assigned topic. It is not expected that there will be any published report of the discussions, so one must attend if he wishes to know what goes on!

CIE MEETING IN ZURICH
June 13-22, 1955

With discussions on revision of the CIE Standard Observer and new types of chromaticity diagram in the offing, the CIE meeting in Zurich this June promises to be of vital importance to all those concerned with color. Among other topics which will be considered are a standard source for colorimetry of fluorescent materials, methods for the measurement of whiteness, and standard angular conditions of illumination and observation for reflectance measurements.

In a report recently issued by Dr. Deane B. Judd in his capacity as chairman of the

CIE Technical Secretariat 1.3.1 (which deals with colorimetry), Dr. Judd outlines the progress made on these problems. With regard to the CIE Standard Observer, many scientists in this country and in England have been working on revision of the 1931 values. One striking result of this work is that the photopic luminous-efficiency function is related to the age of the observer. It is possible that the values finally adopted by the CIE will represent average normal vision of observers of 30 years of age. In addition, work on redetermination of the color mixture functions is progressing actively, and enough new data may be forthcoming by June to make revision practicable.

Although the (x,y)-chromaticity diagram is widely used in this country and others, it is interesting that the CIE has never recommended any particular form of chromaticity diagram. At the forthcoming meeting, the Secretariat Committee plans to propose formal adoption of the (x,y)-diagram, but may also propose the MacAdam 1937 (u,v)-diagram as a supplementary diagram to be used whenever it is important to avoid confusion arising from gross distortions in chromaticity spacing. It is quite likely that many alternative chromaticity diagrams will be up for discussion, among which may be the (u_1,v_1)-diagram which was proposed at the 1951 CIE meeting, the Adams' Chromatic Value diagram, and possibly a chromaticity diagram based on the MacAdam ellipses.

Dr. Judd's report concludes with a list of references on spectrophotometry, colorimetry and related subjects, which are pertinent to the subjects brought up in the report.

Eugene Allen

FABER BIRREN TO ADDRESS INTERNATIONAL CONGRESS

The use of color in industry for functional purposes to increase human productivity and reduce accidents has become accepted practice throughout America. To explain and illustrate these new principles, Faber Birren, color consultant of New York, has been invited by the U. S. Department of State to attend the First World Congress on the Prevention of Occupational Accidents in Rome, April 2-6. He will present a review of technical and scientific developments in the United States and will further meet with various industrial, labor and government groups in Italy.

For some twenty years Faber Birren has been active in this field. He is the author of three books on this particular subject and over 40 articles. Color specifications have been written by him for leading American industries such as Du Pont, International Harvester, Caterpillar Tractor, Aluminum Company of America, Revere Copper and Brass. He has also prepared comprehensive manuals of standard color practice for the U. S. Navy and Coast Guard.

A safety code for color, devised in collaboration with Du Pont in 1943-4, has now become a national standard and has been widely applied in other countries. Birren has gained a leading position in his field and has appeared at numerous industrial and medical conferences, presenting research data and case histories on the practical benefits of color in factories, offices, schools, hospitals.

According to carefully supervised research, Birren estimates that the actual cash value of good illumination and color in industry is equal to $148.42 per year per worker. It is hoped that the great success achieved in this country will lead to equally beneficial results abroad.

GAY COLORS URGED FOR BRIDGE

A gay, brightly-colored bridge would tend to discourage suicide leaps from the Clifton suspension bridge, an architect of Bristol, England, suggests. (From Washington Evening Star, Feb. 26, 1955)

ISCC COMMITTEE APPROVES NEW AO H-R-R PSEUDO-ISOCHROMATIC PLATES

Our Subcommittee on Problem 11, Color Blindness Studies, after considerable editing and revision by correspondence, has agreed on a statement to be included with the AO H-R-R Pseudoisochromatic Plates soon to be made commercially available by the American Optical Company. This statement indicates the contributions made by members of the subcommittee to development of the test and their satisfaction with the final result. The final wording agreed to is as follows:

"The AO H-R-R Pseudoisochromatic Plates were developed by LeGrand H. Hardy, Gertrude Rand, and M. Catherine Rittler as an outgrowth of the work of Inter-Society Color Council Subcommittee on ISCC Problem 11: Color Blindness Studies. They are designed to serve a threefold purpose: (1) as a screening test to separate those with defective color vision from those with normal color vision, (2) as a qualitative diagnostic test to classify type of color defect (whether protan or deutan, tritan or tetartan), and (3) as a quantitative diagnostic test to indicate degree of the defect (whether mild, medium or strong.)

"A preliminary edition was checked on 600 subjects with normal color vision and 150 subjects with defective red-green vision by the authors of the test (LeGrand H. Hardy, Gertrude Rand, and M. Catherine Rittler, H-R-R Polychromatic Plates, Journ. Optical Soc. Amer., 44, 509 (1954), on 65 subjects of defective red-green vision by Sloan and Altman (Louise L. Sloan and Adelaide Altman, Evaluation of H-R-R Plates for Measuring Degree of Red-Green Color Deficiency, Technical Report, Project N60NR 243-07, Wilmer Ophthalmological Institute), on 300 subjects of normal color vision and 19 subjects of defective red-green vision by Schmidt (Ingeborg Schmidt, Comparative Evaluation of the Hardy-Rand-Rittler Polychromatic Plates for Testing Color Vision, Project Number 21-31-013, USAF School of Aviation Medicine, Randolph Field, Texas, June 1952), and on several score of subjects by Farnsworth (unpublished data obtained by Cdr. Dean Farnsworth at the U. S. Naval Medical Research Laboratory, U. S. Naval Submarine Base, New London). The present edition has been checked against the preliminary edition on 160 subjects with normal color vision and on 100 subjects with defective red-green vision by the authors of the test. No similar validation of the plates designed to detect the rare tritan and the controversial tetartan form of defective blue-yellow vision has as yet been possible because of the difficulty of finding suitable subjects.

"The members of the ISCC Subcommittee have reviewed the results of the validation study of the present edition, and agree that the AO H-R-R Pseudoisochromatic Plates, if properly administered, may be expected to detect and classify red-green color deficiency reliably, and give an indication of the degree of defect. Proper administration includes the use of an illumination of 10 to 60 footcandles approximating CIE Source C as specified in the instructions.

"ISCC Subcommittee on Problem 11: Color Blindness Studies

Deane B. Judd, Chairman
Forrest L. Dimmick
Dean Farnsworth
Carl Foss
Walter C. Granville
Dorothy Nickerson
Gertrude Rand
Louise Sloan Rowland"

COLOR COURSE AT U.S.C. The University College (late afternoon and evening classes) of the University of Southern California has been giving a course in color that may be of interest to those concerned with the availability of such instruction in our educational institutions. The course is listed under the Department of Fine Arts and is given for two semesters with 3 units credit (or credit hours) for each semester. During the Fall Semester the student is familiarized with the physical properties of color and light; considerable time is devoted to a study of the eye and the visual process; consideration is given to the psychological factors in the development of a functional and harmonious use of color; and the student is also given the opportunity to prepare a short report dealing with color as it applies to his particular field of interest. Inasmuch as the first term is devoted mainly to what might be called a study of basic principles, the second term is given to a more detailed study with emphasis placed upon the use of color in the graphic arts, commercial art, industrial design, painting, the theater, cinema, television, and architecture (such as basic problems in schools and hospitals, etc.). Recommended reading includes such books as Introduction to Color by Evans, The Retina by Polyak, History of Color and other works by Birren, Basic Color by Jacobson, and the Munsell Book of Color. (Ed. note: We find an important omission in Judd's Color in Business, Science, and Industry, perhaps because of its so-recent date, 1952.) The instructor for the U.S.C. course in color is Mr. John W. Boylin, who also teaches at the San Bernardino Junior College.

The above information was prepared at the request of the editors by ISCC member E. Taylor Duncan who has been taking the 1954-55 course, and who, from all reports, seems well pleased with it.

There must be a number of such color courses being given at various educational institutions throughout the country, and we suggest therefore that any member acquainted with such a course -- whether aimed principally in an art, science, or business direction -- send full particulars to Associate News Letter Editor Dr. Eugene Allen, at American Cyanamid Company, Bound Brook, N. J. so that he may compile an item concerning other such courses for the next issue of the News Letter. We believe many members would find the information both interesting and useful.

DR. GIBSON RETIRES AT N.B.S. On the evening of January 27, 1955 several scores of friends and co-workers at the National Bureau of Standards met for dinner to pay tribute to Dr. K. S. Gibson on the occasion of his retirement. Many thought him far too young to retire - Dr. Briggs added to a list of famous unanswered questions another: "Why should Kasson Gibson wish to retire at 65?" But he has had the courage of his convictions, and has retired as planned long ago, so that now he will garden, take three-dimensional pictures of his flowers with the beautiful new and complete outfit presented to him by his friends, and work when he gets around to it on the subjects or projects that interest him most. He has such a number of varied interests that we believe he will continue to be a busy man - but busy in a casual, happy sort of way! As toastmaster, Dr. Judd called upon a number of persons to pay tribute to various phases of his professional career. And not one, among the several, failed to make prominent mention of one of Dr. Gibson's outstanding qualities - his friendly and cooperative personality. Dr. Astin, the Bureau's Director, went back to the files and found letters of recommendation dated in 1915 from three outstanding men of optics of the last generation - Dr. Nichols, Dr. Merritt, and Dr. Richtmyer. As long ago as that, among high praises for his professional training and aptitude, particularly in the field of spectrophotometry, each of these men referred to Dr. Gibson's pleasing personality.

His professional accomplishments will be listed in other places - all one has to do is consult the pages of the Journals of the National Bureau of Standards and the Optical Society of America to find plenty of evidence - but here we wish only to include a poem read to him at the luncheon given him on his last day at the Bureau by the women of his own immediate section. Written by Florence L. Douglas, who formerly worked in Dr. Gibson's section, it expresses well the feeling that is shared by many more than those who were present when it was read.

IN WORDS OF ONE SYLLABLE

At a dinner in his honor, we heard Dr. Gibson praised;
Heard some N.B.S. officials describe deeds which us amazed.
Some extolled his profound learning
As a basis for his earning
Recognition and a fame that's mighty rare;
Others wondered why his hurry
To escape from work and worry,
Just to occupy a soft, old rocking chair.

Admiration expressed warmly by the members of his sex,
Just won't do a person justice if he is a bit complex;
Couched in terms so scientific,
Apt, precise; 'twill be terrific---
But it simply will not have the Woman's Touch.
So the women of this section
Hope to cure this sad defection,
Pointing out exactly why he's liked so much.

It is more than his attainments, tho these surely play a part;
One respects a brainy leader, but respect won't warm a heart.
Kasson's gifted with both talents,
Keeps them both in subtle balance;
He's the kind of perfect boss all persons seek.
He sparks fun and brings much joy to
Genius and hoi polloi, too,
Making an association that's unique.

Men will tell you that most women do not know or give a hoot
Whether Kelvin was a man or something sort of absolute.
They, 'tis said, will chew the fabric
Tiresomely monosyllabic,
Flound'ring deep in meaningless verbosity;
Have their minds thrown out of kilter
With the Davis-Gibson filter,
Mystified with factored luminosity.

But emotions they are sure of, and that surely isn't news;
They know why this group's been happy, and they know the word to use.
It's pronounced just like the stuff which
Charmed the lovely Maid of Norwich,
But it's not the same, for heaven's sake above.
Men would ponder and would weigh it,
But, by gum, they'll let us say it:
What this section gives to Kasson is its LOVE!

1955 FALL AND WINTER COLORS ISSUED BY T. C. C. A.

From Estelle Tennis, executive secretary of the Textile Color Card Association, we have news of significant advance color trends that are presented in the Regular Edition of the 1955 Fall and Winter Color Card for Woolens and Worsteds, which this association has issued to its members. This new edition of 40 colors, portrays twelve harmonizing groups of important basic tones, together with featured collections of vibrant sports hues called Harvest-Time Colors and frosty winter pastels called Shades of the Sky.

In this preview of fashion colors for the coming autumn, much emphasis is placed on warm golden, amber and coppery tones, deepening into dark chocolate brown. Sand, fawn and earth browns further stress the strong feeling for the beige to brown scale. Animated brick, burnt orange and red pepper variations add zest to the fall spectrum. In the red gamut, preference is expressed for the bluer note, as shown in glowing rosy and garnet types. Lively peacock, parakeet and duck blues with an undertone of green also hold a firm position in the winter colorscape, along with lapis and a blackish sapphire shade. Medium and darker graphite grays also have a place in this fall forecast.

Glowing Starlight Shades and romantic Colors of Versailles share the spotlight as featured color themes in the regular edition of the 1955 Fall and Winter Color Card for Man-Made Fibers and Silk also issued to T.C.C.A. members. In addition to these special promotional groups, this new card containing 40 colors presents the important basic shades in harmonious tone-on-tone arrangements. Prominent in this range are orangy tile, copper and amber tones, as well as golden spice, coffee and deep carbon brown. Rich vibrant reds are represented in geranium, cranberry and ruby shades.

Blues stressed in the advance fashion forecast include muted graphite or slate tones and animated lighter than royal versions. Turquoise, peacock and duck blues also receive emphasis. Plum and cyclamen are pinkish variations of the mauve theme. In the gamut of greens, a sparkling emerald hue is considered promising, with subtle yellow-tinged olive and bronze also included in the fall spectrum.

UNITED STATES ARMY STANDARD COLORS FOR SEWING THREADS AND SLIDE FASTENER TAPES

At the request of the Quartermaster General, The Textile Color Card Association has issued two standard colors for sewing threads and one standard color for slide fastener tape to be used for the new green uniform for men of the Army. The sewing thread colors, assigned the T.C.C.A. Cable Numbers 66034 and 66041 respectively and their official designations, are:

SHADE E (U. S. Army Green): Used for sewing all items of clothing in Green (Shade No. 44), as Army green uniform.

SHADE X (U. S. Army Tan 3): Used for sewing all items of clothing in Tan (Shade No. 46), as shirting for wear with Army green uniform.

The above shades supplement the colors already in the sixth edition of the U. S. Army Standard Color Card for Sewing Threads (Cable Nos. 66019-66035) and its Supplement (Cable Nos. 66036-66040), issued previously.

The new color for slide fastener tape, assigned the T.C.C.A. Cable No. 66524, and its official designation is:

SHADE X (Green): Used for slide fastener tape for wool trousers of Army green uniform.

This tape color supplements the second edition of the U. S. Army Color Card of Standard Shades for Slide Fastener Tapes (Cable Nos. 66503-66523).

These sewing thread and tape colors have been distributed to Quartermaster Depots throughout the country. The cards are widely used by firms requiring authentic U. S. Government color standards, including manufacturers of clothing and equipage for the U. S. Army.

DR. BALINKIN HAS DONE IT AGAIN! Landed in color on the front page, we mean! Yes, he has done it again, for on the front cover of Cincinnati's PICTORIAL ENQUIRER for Sunday, January 16, we found his picture demonstrating to a most attractive and colorful young lady student a few of his classroom color demonstrations. And on page 17 there is another page of illustrations in color, one the after-image American flag set up on the lecture table with several other color demonstrations, and a further view of the same table with his vibrating cord demonstration of how color can change with wavelength, and a series of glasses filled with substances that he uses to demonstrate how chemical substances affect color. As the item says: Dr. Balinkin "delights audiences all over the nation with his demonstrations of color phenomena" and "to illustrate his lectures Dr. Balinkin has built devices which produce spectacular displays of the mysterious properties of color and light."

In a note discussing these pictures Dr. Balinkin says it was fun to make these pages in color. He also said that he would be glad to furnish a copy to any News Letter reader who might ask for them: Address Dr. I. A. Balinkin, Professor of Experimental Physics, University of Cincinnati, Cincinnati 21, Ohio.

RECENT CORRESPONDENCE FROM DR. E. Q. ADAMS A recent letter from Dr. Elliot Q. Adams of Cleveland, who is still working part time in the School of Medicine of Western Reserve University where they have a laboratory devoted to ocular physiology, suggests a study of blue-yellow blindness (tritanopia and tetartanopia) as an ISCC project. "Even if the proportion of such is one in ten thousand, there would be over 100 (Ed. note: Well over, by our calculation!) in the continental U. S." "A needle-in-haystack proposition to be sure, but some of the routine color-defect screening tests might be modified to detect such." He suggests too that he intends to put another circular patch (5Y 5/6), a sort of buff, to indicate the confusion zone for tetartanopes, on to his copy of the recently published Farnsworth Demonstration Chart of "What the Color Defective Person Sees." (This is the chart that was provided ISCC members as a dinner favor at last year's banquet - through the courtesy of Dean Farnsworth and of the Munsell Color Company, both of whom worked hard to get a sufficient number of charts mounted in time for the annual meeting of 1954!) (It should be noted also that charts for testing for tritanopia and tetartanopia are included in the new AO Hardy-Rand-Rittler pseudo-isochromatic plates for testing color defectives.) Do others interested in this subject agree with Dr. Adams about the advisability of working together within the ISCC to discover and study as many cases as possible of these rare cases of color vision defection?

Another very interesting comment from Dr. Adams' letter: "Did I mention to you telling Dr. Richard Wallen of the W.R.U. Psychology Department that I believed the Young-Helmholtz and the Hering theories corresponded to the biological activities

in layers of the retina about 1/1000 inch apart?" "The notion that the theories are so close together (histologically) struck him as something new." "In any case Prof. Hering played safe: 'Ueber die ersten, unmittelbaren Wirkungen des Lichtes im peripheren Auge sagt meine Theorie gar nichts aus.'"

And still another interesting comment: "Report No. 253 from New London led me to write Dr. Dimmick, telling him that I think submarines offer another field of usefulness for orthoscopic spectacles, i.e., ones whose lenses may be regarded as cut from a single spherical lens, - positive or negative, - large enough to cover both eyes." "I have been urging the use of such spectacles for school-children, without visible results." "Incidently our British friends are a bit 'forwarder' in this field than the American optometrists and ophthalmologists, but they stress factory applications."

We are always glad to hear from Dr. Adams, for he never fails to suggest a wealth of new ideas.

AMERICAN LEATHERS IN NEW COLORS, TEXTURES, FINISHES

The Leather Show, which opened March 1 at the Waldorf-Astoria, showed leathers that would have been deemed incredible only a few short years ago. Smooth leathers have a depth and patina which unveils nature's artistry in every skin; suede napped leathers are rich and lustrous and even sculptured to provide new effects for the shoe designer; grained leathers softly enhance the natural markings which distinguish types of leather. In fact, American tanners are now demonstrating that style, quality, and even luxury are available for the volume market. From the Tanners' Council Color Bureau, Helen Taylor, Director, we have their write-up on style, fabric, and color for the Fall and Winter of 1955. From it we note that natural leather tones will be available in many colors: vanilla, a pale, cream neutral; pine, with the soft glow of long and loving polish; honey, smoothly golden and sweetly toned, beautiful with black, elegant alone; wild honey, close to honey, but "with just that small extra special tang that the lucky hunter finds in some wild hive on a high sunlit branch;" benedictine, color of a thousand uses; ginger, the transparent preserved ginger that comes in rattan-encased jars from the Orient, smooth and pungent, a color to spice any shoe wardrobe; java, a truly fashionable brown; tropic tan, classic for trim and combination; russet, the essense of Autumn color; one good green - avocado; the wood tones, white bark, fruitwood, maple, briarwood, and in the same series camel, smoke, and goldendale; the classic browns in cognac, walnut, chestnut, town brown, brownie, and brown berry; warm blues - the peaceful colors - Cezanne, Flight, and Admiral blue; then Parma Violet (perhaps for Perkin!); fire tones in flame, Basque - the children's red, scarlet, cherry red, and garnet; then the quiet grays to calm the color explosion in fabrics - grey onyx, charcoal, gunmetal, and black. Unprecedented, indeed! Some of us can remember childhood days when the chief use of leather was shoes - and they came in black, brown, and a summer or nurses' white! It is a far more colorful world we live in today, and we are glad to note the increasing participation in this trend by the American tanner.

THE TWELVE WHITES

An article of this name appeared in the January issue of "Endeavour," a quarterly review published by Imperial Chemical Industries Ltd., London. The author is E. N. Willmer, a zoologist who has become interested in structural properties of the eye, particularly in relation to color vision. The article explains that the sensation of white can be produced in many different ways, of which twelve are described. The most familiar, of course, is irradiation of the eye by an appropriate mixture of all wavelengths at

once, or by two complementary wavelengths. Less familiar is the sensation of white caused by looking at yellow light with the central fovea only. White can also result from the desaturation of colors at high luminance; on the other hand, white is also seen by a dark-adapted observer looking at colors of very low luminance.

Many colored demonstrations help to make the article effective and interesting.

COLORIMETRIC DATA NOW AVAILABLE FROM SEVERAL SOURCES

Recently the secretary's office received, through the courtesy of Individual Member O. H. Olson of the Armour Research Foundation, Chicago, booklets describing the type of colorimetric information now available for research use to the scientific public through use of their G. E. Recording Spectrophotometer and I.B.M. equipment. The following information can be obtained:

Spectrophotometric curves (for transmittance or reflectance);
Tristimulus (XYZ) values and trichromatic coefficients (xyz) for C.I.E. light sources A, B, or C from suitably supplied data, or from the above described curves;
Color Difference calculations based on Adams' Chromatic Value space

The weighted ordinate method using 10 mμ intervals is used for all tristimulus value computations. Results will be returned within one week of receipt of data. Information regarding costs, and instructions for submitting requests may be obtained from Computer Center - Div. R, Armour Research Foundation, Technology Center, Chicago 16, Ill.

We know also of the following two laboratories where similar data may be obtained for scheduled fees, and if there are others we shall be glad to carry this information in the News Letter for the service of our readers if such laboratories will let us know what the service is that they are prepared to supply, and a schedule of fees.

For many years the Electrical Testing Laboratories, 79th Street and East End Ave., New York 21, N. Y. have been equipped to supply spectrophotometric and colorimetric, as well as photometric information on a commercial testing basis. They will be glad to supply information regarding costs and instructions for submitting samples or data.

More recently the Davidson and Hemmendinger laboratory at 76 North Fourth St., Easton Penn., has been equipped with a G.E. Recording Spectrophotometer and the Librascope Automatic Tristimulus Integrator. Spectrophotometric curves may be obtained, also tristimulus values for C.I.E. Source C or other light sources. The D & H laboratory is also prepared to handle a wide range of color measurement and specification problems, including the painting of color and color-difference samples conforming to custom specification, and will quote prices on request.

SMALL QUANTITIES - SMALL PRICE

Have you ever needed 500 or 1000 illustrations in color and had to give up because the price for such a short run was so high? We pass along to those of you with this experience recent news that has come to us of a firm in Princeton, N. J. that specializes in short-run color printing. The illustrations we have seen are excellent, and the prices for a color image around 6x7½ is $125.00 for 500 copies, and for about 7x9 size it is $130.00, with moderate additional costs for additional copies. They promise normal delivery to be two weeks from the receipt of order, with special one week service at additional cost. Their advertising copy states that Princeton

Polychrome Press in cooperation with the Eastman Kodak Company has developed for commercial use a Three-Color Photomechanical System, and that while much publicity has been given this "simplified system" their press is the first printer to set up specifically to do ONLY this type of color printing. These people have been mentioned by such a number of our members that we pass along this general information about them so that anyone interested can get in touch with them directly: Write Princeton Polychrome Press, Inc., 8 Charlton St., Princeton, N. J., and ask for information, and for illustrations of their work.

COLOR IN FOOD AND PLANTS

In LIFE's special article on FOOD (January 3,,1955) there were a number of photographs in color regarding research work of considerable interest to News Letter readers: A photograph of lighting plants with a spectrum projected in total darkness (as done by H. A. Borthwick at the U. S. Department of Agriculture Research Center, Beltsville, Md.) notes how "red light aids growth in some plants, hinders it in others"; A picture of a group in New Orleans tasting yams under red light trying to tell the difference between dehydrated and the normal vegetable (since color affects taste, the judgment table is bathed in red light to make the yams look more alike); A picture taken at the California Institute of Technology, where studies of photosynthesis are being made under a $10,000 grant from G.E. showing different colors of fluorescent lamps lighting a group of plants under study.

MUNSELL RENOTATION SAMPLE BOOK

A short note in the February issue of the Journal of the Optical Society of America states that the Japanese Color Research Institute is preparing a color sample book of the Munsell Renotations. The present Munsell book of color is, of course, based on Munsell notation, and while Davidson and Luttringhaus (Journ. Opt. Soc. Am. 41, 9 (1951)) produced and mounted dyed wool fabrics in a renotation book, and other special series have been produced, no collection of samples based on renotation is commercially available in book form. The new collection will therefore be a very useful one.

The Japanese Color Research Institute is under the direction of Dr. Senzō Wada, and the entire project is being supported by the Agency of Industrial Science and Technology.

HESSELGREN'S "COLOUR ATLAS"

In the July, 1954 News Letter, Dr. Robert W. Burnham, then Chairman of Delegates from the American Psychological Association, presented a brief review of a report by Sven Hesselgren (ISCC member), "Subjective Color Standardization," published by Almquist and Wiksell, Stockholm (1954), 19 pp. The review was based on the above monograph and concerned a new color atlas developed by Hesselgren, but no fair appraisal could be made at that time because the atlas itself was not available. The present more extensive review was prepared at the request of Mr. Walter C. Granville, Director of the ISCC, who made the full atlas available to Dr. Burnham, and it is based both on Hesselgren's monograph and his atlas. Dr. Burnham's review follows:

The Hesselgren color atlas was developed to be of practical use to artists and others interested in the "creation of our milieu." It was designed to take into account "formal aesthetic values" which depend on the "structure" of the perceptual dimensions of color. Economic considerations dictated the use of black and white plus ten basic pigments, which are readily available on the market and frequently used. The color "norms" were selected to illustrate what Johansson has called "the natural system of colour perception," and is, according to Hesselgren, based on the attributes of colours that are directly observable."

The atlas comprises 507 color samples and is divided into three sections. The first section is a manual which includes a brief description of the system, an appendix containing pigment "recipes" for each color, a reflectance chart for interpretation of the lightness scale, and a description of the physical and chemical characteristics of the pigments. The manual also contains 26 plates, as follows: one hue circle, 24 constant-hue charts, and one color chart illustrating mixtures of the basic pigments. A second section contains two sets of the 507 samples; each set is arranged in four hue groups. Each sample is 5 cm. wide by 10 cm. long. The third section is an index of all the colors and contains five samples of each color. These samples are also 5 cm. by 10 cm. Some of the samples for a particular color are glossy and some are mat. All samples are coated on a thin white paper. The atlas, or separate glossy or mat samples up to 50 cm. by 40 cm., may be obtained from T. Palmer A/B, Riddargat 12, Stockholm, Sweden.

The hue circle in the manual illustrates the hue scale of the system, and the constant hue charts are organized to show scales of "saturation" and "lightness." They are arranged so that units of what Hesselgren (after Pope and Johansson) has called "brilliance" and "intensity" may also be estimated. Hesselgren implies that, although three color attributes are sufficient to specify a color, there are other (aesthetic) attributes which may also be scaled. If the term, color attributes, refers to the factors which are necessary and sufficient to define colors uniquely, then there need only be three. If it refers to all dimensions which can be scaled perceptually, then there may be even more than the five used by Hesselgren since a perceptual scale is frequently a function of the kind of judgment involved. Hesselgren has used the term attribute in the latter broader sense, although he recognizes that there are only three attributes required for unique specification. His justification for more than three attributes is pragmatic, and based on the fact that artists regularly make judgments about color which are represented by the five scales outlined in his system.

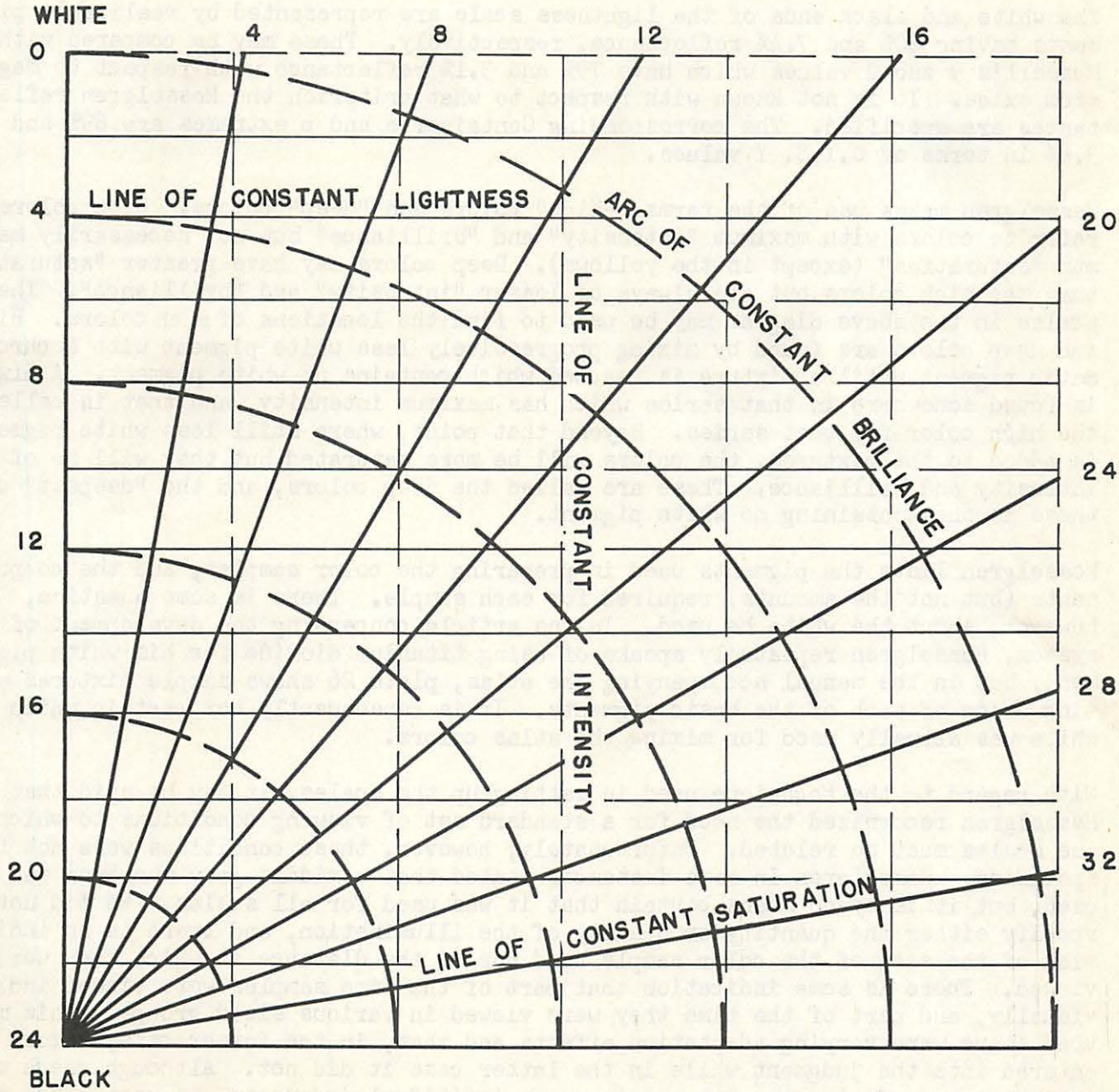
The fact that scales are a function of the kind of judgment made is illustrated by the analysis Bradley made of the Munsell system. He stated that "one may observe the approximately uniform contrast with neutral in a series of uniform chroma, and at the same time the greater saturation of the low values of the series (they appear 'stronger') and the lesser saturation of the high values." One thus finds that two colors at different lightness levels which look equally different from the gray at their respective levels may not, when compared with each other, appear to have the same "saturation." To find colors at different lightness levels having the same saturation, one must then compare directly the saturations of the color as such. There are, in other words, at least two kinds of judgment that can be made regarding the 'strength' of hue, and these two types of judgment lead to the formation of different scales. Hesselgren's intensity is equivalent to Munsell chroma and implies a judgment of <u>difference</u> from neutral, or contrast with neutral. It is not, though, a pure function of 'strength' of hue but is apparently the product of lightness and (what may be called) saturation: C = LS. Hesselgren's saturation, on the other hand, involves a judgment of <u>equal</u> 'strength' of hue for colors of different lightnesses. In the case of intensity there is a judgment of difference, and for saturation a judgment of equality. Actually, Hesselgren's observers judged only saturation and not intensity (chroma), but, as Bradley has pointed out, where either intensity or saturation has been scaled in an accurately constructed system, the other would be represented. This seems to hold true in Hesselgren's system, since a comparison with Munsell samples of a number of colors of equal intensity shows them to match almost exactly in Munsell chroma. The scales for intensity and saturation are quire different, however, as even a quick glance at

the atlas will show. Constant intensity is represented, as for Munsell chroma, by vertical lines parallel to the gray axis (see figure below), whereas constant saturation is represented by straight lines radiating upward away from the black (lower) end of the gray axis, as Pope, Johansson, Bradley, and others have suggested.

Brilliance, like intensity, turns out to be a function of both lightness and saturation, but instead of contrast with the scale of neutrals, it seems to represent contrast specifically with black. It is apparently similar to what Katz called "insistence" and which has been defined by Newhall as the attention-catching power of a perceived color associated especially with the lightness of achromatic colors and the saturation of chromatic colors. Brilliance is estimated in Hesselgren's system by a series of arcs concentric to the black point in a constant hue plane. It may be seen from the arcs that constant brilliance requires high lightness for colors of low saturation and low lightness for colors of high saturation.

Hesselgren's concepts of hue and lightness are not ambiguous and refer to the perceptual attributes associated with wavelength and luminance as in other color systems. His hue scale differs in certain respects from the Munsell hue scale, but is remarkably similar to the Ostwald hue scale. Although he claims to have visually equal hue steps, they are only equal within each quadrant of the hue circle. In addition, the perceptual size of the hue step varies from one quadrant to another. The cornerstones of the four quadrants are the Hering psychologically pure primaries, i.e., red that is neither yellow nor blue, yellow that is neither red nor green, green that is neither yellow nor blue, and blue that is neither green nor red. The hue steps are nearly the same as those in the Container Corporation version of the Ostwald system. There are 24 steps and they are, to a good first approximation, the same as the 24 steps of the Container system. Also, the hue scale starts at a yellow which is almost the same as the Container hue $1\frac{1}{2}$.

HESSELGREN CONSTANT HUE PLANE



A comparison of the lightness scale (which runs from 0 at white to 24 at black) with the Munsell value scale shows a clear curvilinear relationship; it is very much more nearly linear with respect to the Container gray scale. This would indicate the same kind of deviation from visual equality in the Hesselgren lightness scale as is found in the Container gray scale. Hesselgren did not specify what surround was used for the lightness judgments, so it is difficult to deduce the reason for this deviation. The lightness scales in his manual are mounted on a middle gray background, and there are obviously larger steps at both ends of the scale which could of course be due to the contrast induced in that situation.

The white and black ends of the lightness scale are represented by realizable pigments having 80% and 7.4% reflectance, respectively. These may be compared with Munsell's 9 and 2 values which have 79% and 3.1% reflectance with respect to magnesium oxide. It is not known with respect to what criterion the Hesselgren reflectances are specified. The corresponding Container a and p extremes are 89% and 3.6% in terms of C.I.E. Y values.

Hesselgren makes use of the terms, "high" colors and "deep" colors. High colors refer to colors with maximum "intensity" and "brilliance" but not necessarily maximum "saturation" (except in the yellows). Deep colors may have greater "saturation" than the high colors but are always of lesser "intensity" and "brilliance". The scales in the above diagram may be used to find the locations of such colors. High and deep colors are found by mixing progressively less white pigment with a chromatic pigment until a mixture is reached which contains no white pigment. A mixture is found somewhere in that series which has maximum intensity, and that is called the high color for that series. Beyond that point, where still less white pigment is added to the mixtures, the colors will be more saturated but they will be of less intensity and brilliance. These are called the deep colors, and the "deepest" of these is one containing no white pigment.

Hesselgren lists the pigments used in preparing the color samples, and the components (but not the amounts) required for each sample. There is some question, however, about the white he used. In one article concerning the development of the system, Hesselgren repeatedly speaks of using titanium dioxide for his white pigment, but in the manual accompanying the atlas, plate 26 shows sample mixtures with zinc oxide of each of the basic pigments. It is consequently not certain which white was actually used for mixing the atlas colors.

With regard to the technique used in setting up the scales, it may be said that Hesselgren recognized the need for a standard set of viewing conditions to which the scales must be related. Unfortunately, however, these conditions were not fully specified. Hesselgren in some instances stated that a middle-gray surround was used, but it is by no means certain that it was used for all scales. He did not specify either the quantity or quality of the illumination, and there is no indication of the size of the color sample used nor of the distance at which they were viewed. There is some indication that part of the time samples were viewed individually, and part of the time they were viewed in various sized groups. This means that there were varying adaptation effects and that, in the former case, memory entered into the judgment while in the latter case it did not. Although check observations were made in some cases using many individual judgments, in most cases the scale intervals were determined by the "collective" judgment of a group of from three to seven individuals. From the standpoint of accepted psychophysical methodology, this technique is, to say the least, unusual and may account for some of the obvious inaccuracies in scaling. A complete evaluation of the scaling must await

spectrophotometric analysis of the chips and comparison, perhaps, with Munsell renotation.

In those cases where a number of observers gave individual judgments of scale intervals, it would be possible to compute discrimination thresholds from the distributions of the judgments except that the distributions are reported in terms of arbitrary scales which cannot be transformed to meaningful units from the data reported.

There is some justification for not reporting C.I.E. (or other) standard specifications of the atlas colors. The atlas was designed as an aid to artists in mixing pigments, and very likely fulfills that purpose. The orderly arrangement of colors, and the recorded recipes for pigment mixture should be sufficient for an artist to find the nuances of color he requires. Hesselgren recognizes that different batches of nominally the same pigment will give different colors, and intended his atlas purely as a guide to mixtures using standard pigments.

The usefulness of the atlas for accurate color specification is limited by the fact "that for technical reasons, the tolerances of the various colors in this atlas cannot always be retained within the limits of the threshold values. Consequently, two color samples with the same color designation may be found to display a distinct difference in color ...." Hesselgren's remark that "the color atlas may be said ... to represent the first attempt to attain an ideal color standardization" ... implies accurate specification. Either the Munsell or the Container system can be used more effectively for that purpose.

(Signed) Robert W. Burnham

STORY OF LOVIBOND IN DYESTUFF REPORTER

From correspondent G. J. Chamberlin, Managing Director of the TINTOMETER, Ltd. of Salisbury, England, we have reference to an article by him which appeared in The American Dyestuff Reporter, January 3, 1955. It reports the story of Joseph W. Lovibond, 1833-1917, and the development of the Lovibond system of glass standards, which grew out of his needs as a brewer in Salisbury to keep a record of the color of his product. Today nomograms on an equal chromaticity projection are available for converting Lovibond measures into CIE values.

NEW ELECTRONIC COLOR MICROSCOPE

ISCC member Dr. Peter Goldmark has made many a mark in color. One of the most recent is told in newspaper accounts of his electronic color microscope shown early this year capable of enlarging living cells, by projection on a six foot screen, up to 15,000 times actual size. Some of its important applications to medicine include blood counts, consultation between surgeon and pathologist, fast diagnoses in cases of epidemics or national disasters, and facility in teaching large medical audiences, both in the classroom and at great distances.

KING SIZE MIRAGE

From Helen Taylor we have a note from the Philadelphia INQUIRER, dated from Rehoboth Beach, February 22, that describes a mirage seen that day - the whole of Cape May, N. J. turned upside down and suspended in the sky. The thing that caught our eye is the fact that it was reported as clearly visible in color, and that it lasted well over an hour, from 4 to 5 p. m., and was seen by hundreds of watchers.

COLOR AS A "MATERIAL"

Architect Walter T. Anicka of Ann Arbor, Michigan, is reported by the newspapers to hold that color is "just as much a building material as brick, stone, or wood." "You can't touch color, but you can see it. Visual impact is one of the chief materials to use on a house exterior."