

INTER-SOCIETY COLOR COUNCIL

NEWS LETTER No. 87

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GRAVURE TECHNICAL ASSOCIATION JOINS COUNCIL

By vote of the delegates at our 19th annual meeting on March 8, the recently formed Gravure Technical Association, Inc., became the twentieth member Body of the Inter-Society Color Council. This group, of which John E. Hazel is secretary, has its headquarters in Room 4800, 30 Rockefeller Plaza, New York 20, N.Y. One of the Gravure Technical Association's purposes is the collection and dissemination to its members of technical and scientific knowledge, and one of its objectives is the maintenance of standards and qualities in gravure processing and/or printing of all kinds. Since color is an important matter in this field, particularly in regard to technical-control problems, it seems a logical step for them to join the ISCC. Association with the ISCC should prove mutually profitable, and we are glad to welcome them to membership. Active and associate membership of the G.T.A. consists of about fifty of the large gravure companies in this country, Canada and Mexico. They will be represented in the ISCC by the following delegates: Mr. Oscar Smiel of Intaglio Service Corporation, New York; Mr. Ed. Velten of Art Color Printing Company, Dunellen, N.J.; and Mr. Matt Romano of the Philadelphia Inquirer.

NEW INDIVIDUAL MEMBERS

We welcome to individual membership in the ISCC the following persons, their applications having been accepted at a meeting of the Executive Committee held on the evening of March 8.

J. Bertram Bates, Graphic Arts Development Laboratory of the Sun Chemical Corporation at East Rutherford, N.J., interested in color problems since 1948, particularly in problems of color control with the G.E. spectrophotometer. Mr. Bates is a member of TAPPI, the Society of Rheology, American Chemical Society, American Crystalline Association.

John Blomshield, New York City, artist and teacher, interested in color since 1920, particularly in methods of instruction for fine and commercial artists, in color reproduction, color for the designer, reduction of chroma by using complementaries rather than grays, elimination of black in lowering values, raising and lowering values without excessive loss of chroma, general interest in contemporary thought on the subject. Member Artists Equity Association.

L.S.C., Note
B34
HMB
JJC
KIM
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MAB
H204
MLC

Roland E. Derby, Jr., Lowell, Mass., interested in color since 1942, trained at M.I.T. and Lowell Textile Institute, now in charge of color laboratory of the Derby Company, interested particularly in problems connected with color matching in the textile field and chemical analysis by colorimetric procedures. Member AATCC, OSA, American Chemical Society, Society Dyers and Colorists.

Forrest Lee Dimmick, New London, Conn. Dr. Dimmick former chairman of the ISCC, long a member and a former chairman of the APA delegation to the ISCC, becomes an individual member. As has happened before, it is usual, when the interest of a retiring delegate is sufficient, for him to retain his contacts with the ISCC by the class of Individual Memberships provided for this very purpose. Dr. Dimmick is particularly interested in color systems, the discrimination of small color differences, color theory, etc. He is a member of APA and OSA.

J. A. Ernst, Los Angeles, California, has been interested in color since 1948, studying at the Chouinard Art Institute, and in developing visual aids for teaching color in art schools. Mr. Ernst is a member of the local California Color Society.

Karl Fink, art director of the Rahr Color Clinic, New York, interested in color since 1931, particularly in color systems, nomenclature, industrial standards, printing, illumination and photography.

Adolph H. Humphreys, Fort Belvoir, Va., interested in color since 1934, chiefly from a military point of view, dealing principally with paints and fabrics of all types. Formerly with Maryland Institute, and Rinehart School of Sculpture in Baltimore. Problems of particular interest are color of natural objects, terrain, etc., color specifications and applications.

Clarence Still Lynch, architect, New Hyde Park, Long Island, has recently become interested in color, particularly in color as affected by illumination in architecture and interiors. Member of A.I.A.

Jerry Nees, Minneapolis, Minn., interested in lacquers, pigments, color matching lacquers to paints, in inks, pigments vehicles, colors. Member American Chemical Society, Industrial Chemists Forum.

Frank J. Roetzel, of Color Marketing (Division of Magil-Weinsheimer Co.), Cleveland, Ohio, interested in all problems connected with the duplication of various materials, both in color and in texture. Mr. Roetzel, as sales manager for Color Marketing, has become well known in recent months to many members of the ISCC because of his company's many applications of the McCorquodale Process to problems of color duplication. By this process a great many different and separately matched colors may be laid down on paper at a single time, thus greatly reducing unit costs for large productions. If the reputation of his company for fidelity of color matching can be maintained at the level promised, with adequate control of all contributing factors, we shall find ourselves entering a new era in this new field of color duplication.

Alfred C. Webber, E. I. duPont de Nemours, Arlington, N.J., has worked with color since 1942, in the development of colors for plastics, and with applications of objective measurement of color and color differences. Mr. Webber belongs to ASTM and the OSA.

Michael J. Zigler, Wellesley, Mass. Dr. Zigler, former chairman of the ISCC and long a member and chairman of the APA delegation to the ISCC becomes an individual member. Dr. Zigler is particularly interested in change of sensitivity to different wave lengths during dark adaptation, stereoscopic acuity, and color vision. See item in this issue concerning Dr. Zigler's work in the laboratory of visual research at Wellesley.

VISUAL RESEARCH A laboratory of visual research at Wellesley College, **LABORATORY SPONSORED** Wellesley, Massachusetts being sponsored by American **AT WELLESLEY** Optical Company, Southbridge, Massachusetts is now nearing the end of its third year. The laboratory is located on the fourth floor of Pendleton Hall and includes several darkrooms, a drafting room, a workshop, and various items of standard visual equipment. Here, Dr. Ernst Wolf and Dr. Michael J. Zigler are collaborating in a program of visual studies.

One function of the laboratory is to provide experimental information bearing upon visual problems which arise in discussions between American Optical executives or which are received in correspondence with representatives of other organizations. Another is to carry forward a program of study regarding the effects of exposure to different kinds of radiation upon the sensitivity, acuity, and general efficiency of the eye. Some preliminary study also has been made as to how the discomfort occasioned by long exposure to the modern television screen can be minimized. The extent to which the automobile headlight momentarily impairs visual efficiency is also being explored.

A first joint publication by Dr. Wolf and Dr. Zigler coming from this laboratory is scheduled to appear in the Journal of the Optical Society in April or May. This study shows how the dark adaptation function, both the segment depending on the retinal cones and that depending on the rods, assumes a lower position as the size of the testfield is made larger. Functions are exhibited for square testfields subtending 2.5, 5, 10 and 20 degrees of angle at the eye both for central stimulation and 6 degrees from the fovea in the temporal field. These results are interpreted to signify that the distinction between photopic (cone) and scotopic (rod) vision, is not fixed but functional, varying with certain special conditions, one of which is the size of the testfield.

COLOR CODE Color codes are used for many purposes in factories. Here **FOR GEARS** is one for gears, as reported in Textile World for December (p. 170, 1949). It is a 2-color code, reported in use in an unnamed mill, that is painted in circles on the gears. On medium and large gears a 3/4" circle of color is painted on the web of the gear near the hub to represent the first figure in the number of teeth. For the second figure a similar color is painted on the web near the outer rim. For larger gears, over 100, the color for 10 is used for the first figure.

<u>Color</u>	<u>Number of teeth</u>	<u>Color</u>	<u>Number of Teeth</u>
Red	1	Purple	6
Yellow	2	Pink	7
Green	3	Brown	8
Dark Blue	4	Light Blue	9
Orange	5	Slate	10

CALIFORNIA As is stated by Mrs. Louisa A. King of the popular **COLOR SOCIETY** California Kings, Secretary of this active group, "the

California Color Society is still alive and healthy." The remark was contained in a letter from Mrs. King, dated January 22, which listed the new officers. A card dated February 5, described a meeting to take place ten days later; and a letter dated February 20, from Dorothy Felton, Publicity Chairman, also covered this meeting.

The new officers are Miss Elizabeth Franklin, Chairman; Dr. C. L. Graham, Vice-chairman; Mrs. Louisa King, 5027 Long Beach Ave., Los Angeles 58, Secretary; Mr. Harold Benriter, Treasurer; Mr. Herbert Palmer, Membership Committee chairman; Mrs. Dorothy Felton, Publicity Committee chairman; Mr. Albert King, Exhibition Committee chairman; and others not yet designated.

Mrs. Felton writes that on October 17, Ralph Evans of Eastman Kodak addressed three hundred interested Colorists at Art Center School, Los Angeles, on the subject of "Depth Perception in Color Photography." His lecture was profusely illustrated with color slides. On December 8, 1949, the new and old members met at dinner at Taix Restaurant in Los Angeles. Here eminent charter-member, Albert King, spoke authoritatively on "Six Colors with a Unique Relationship." On January 8, 1950, Mr. and Mrs. Gustave Plochere, inventors of the Plochere Color System, entertained Mr. and Mrs. Walter Granville at a cocktail party and buffet-supper party at their very attractive La Canada home. On January 11, Mr. Granville, with a welcome that "fairly shook the earth," talked to a large and enthusiastic group of people whose application of color was varied enough to be stimulating to any speaker. Mr. Granville, who is a member of the Color Standards Department of Container Corporation of America, and a very active member of the ISCC, was visiting the West Coast and New Mexico (Santa Fe) with Mrs. Granville on a pleasure trip unmixed with business. Mr. Granville's subject before the Color Society was "Color in Relation to Human Comfort." This proved to be an explanation of the psychological and physiological reactions of people as a result of the use of color harmony in exteriors and interiors. In addition, Mr. Granville consented graciously to talk to the students of Art Center School and Chouinard Art School on "Color Notation."

On February 15, a symposium of unusual interest was held at Art Center School on the topic "What Color Means to Me." Five prominent painters with "positive personalities and definite attitudes" discussed their ideas on color from the technical, emotional and psychological views. Paintings by the artists were shown, and were used to point out analyses and reflections. Questions from the audience were welcomed. The artists were: Loser Feitelson, Abstract Modernist, Moderator; Emil Bistram, Abstractionist, School Director; Boris Fischinger, Abstract Paintings and Films; Oscar Van Young, Romantic Realist.

The members of this group were warmly received by the large audience not only for the honesty and simplicity of their approach to the subject but also for their humor and friendliness.

LECTURE ON COLOR STANDARDIZATION We have received notice of a lecture on color standardization led by Mr. Harry J. Keegan of the National Bureau of Standards on March 3 in the lecture room, East Building of that Bureau. This lecture was part of a seminar on standardization. Principles involved in the standardization of color were explained by illustrations with Munsell painted papers, dyed textile systems, sets of plastic colors, printing inks, porcelain ceramics on steel, and other reflecting materials such as are used in the forthcoming federal color card for paint. In addition, the signal-light specifications for color were explained for the traffic-control lights,

railway signal lights, water-borne identification lights, blinking wing-tip aeronautical lights, and other sets of transparent color systems. Mr. Keegan has long been engaged, in work of the nature indicated, in the Bureau, and is an effective speaker thoroughly versed in the subject; and in consequence the lecture proved to be a very successful one.

OPERATION RAINBOW From every point of view the annual meeting of the ISCC on March 8 was a great success. The morning discussion of current problems, the reports from the various member bodies, the four afternoon addresses in the art and decoration field, the "Operation Rainbow" dinner and the illustrated evening lecture by Ralph Evans were all of high quality and ran off promptly on schedule. In the morning the Gravure Technical Assoc. Inc. was voted in as the twentieth national association (21 with the individual member group). The afternoon program was prepared by the four other most recent members (named below).

Scott Wilson, chairman of delegates from the American Designers' Institute, whose title was "Color Problems in Industry Design" discussed in a very interesting way the problems and difficulties of the designer by means of typical examples. Such were store design, the printing and fading of table linens and napkins, packaging problems, and color in the RCA record changers and in its plant. The Victorian period was described as a "second dark age" when colors were dull, dark, and dingy; a gentleman could wear only white shirts, especially white pajamas, then two decades ago came a color renaissance, beginning on the beaches of France. Women wore more color; but there is a lag of several years between the colors on their persons and in interiors. Whereas color styles begin in the upper income brackets and work down to the lower-priced merchandise, in home furnishings draperies lead the trends, followed by wallpaper and then table linens. There was some stress on the functional point of view, without neglecting the personal nature of color reactions. We were told that lawyers like browns while vice-presidents prefer mahogany and polished brass; yellow is the sunlight color, while cerise associates with hot-rhythm music.

Waldron Faulkner, chairman of delegates from the American Institute of Architects, discussed the "Color Problems of the Architect." He began by saying that the men who design buildings have, for many centuries, been color blind. (Your editor once wrote to a famous archaeologist, that nearly all of his colleagues, who dig for buildings and other remains of ancient cultures, are color blind.) Though color was prolifically used on the buildings of antiquity, it has more recently joined the ranks of the unemployed. Stained glass was a feature of the Gothic cathedrals; it was used only in interiors by the Romans, but somewhat also on exteriors in Romanesque buildings. But Notre Dame was polychromed, and the Italian Renaissance employed color on the outside as well as on the inside. But color was used less and less in the Georgian era; and now color on buildings can be described as "three shades of café-au-lait. Why, asked Mr. Faulkner, "has this (previously happy marriage been followed by divorce?" Explanations were given in answer. But it was stated that in the past quarter-century "color and architecture have gradually become at least bowing acquaintances." Modern architecture with its new outlook toward science opens the door to a new interest in the use of color. Modern scientific research has developed new ideas in the field of color and new materials for construction using color. Without cramping the creative imagination of the architect, science can now help him to master new esthetic principles and theories of color harmony and their application. It was mentioned that color was the main interest in a recent AIA symposium. It seems worthwhile to formulate "what every

architect should know" about color: the rudiments of its theories, the functional effects of color, color preferences and harmony, how to put harmonies into paint, the limitations of pigments utilizable on exteriors, the needs of well worked-out systems of color chips (to aid thinking, specifications and elimination of costs of color reproduction, etc.). The color scientist can help the architect to a better understanding of color, to a better selection of colors, to translating color ideas into paint and to better color coordination, both with the interior and with other exteriors.

Karl Bock of the American Institute of Decorators, did not wholly agree with the preceding or the following speaker. For he stressed somewhat the inability of the scientific approach to give much aid to the decorator. A rather active sense of humor was employed in softening the warning to color scientists that color interiors must not be considered on too-coldly scientific a basis, maintaining that it "is a personal thing." Home colors should be adapted to functional uses, with modifications to suit individual choices of color combinations and associations. He stressed the study of nature and the great masters of painting, while the following speaker pointed out that nature can become quite monotonous, uncolorful and uninviting, for example, in the late fall. It was stated that progress would be most accelerated by fostering collaboration of decorators, architects and the manufacturers of various kinds of materials all associated together in ensembles. He recommended also reducing the number of colorants (pigments, etc.) to be mixed, and such special studies as research in heat-resisting colors.

The last speaker, Egmont Arens, of the Society of Industrial Designers, spoke on the Dynamics of Color. As the title of his talk indicates, he stressed the fact that color preferences, reactions and trends are not static, but change with the seasons, with the general mood of the public and with function. DuPont charts showed that while other colors were largely used in auto bodies before 1929, black returned rapidly during the depression. Merchandise may be in a great variety of colors in boom times, but merchants will not stock up big inventories in hard times. But red, yellow and magenta are the shock colors, which may be needed to stimulate sales in depression. Gay people choose different colors from serious people.

But the industrial designer is concerned with the effect color has on human beings, and how it can be used to affect their moods and behavior, especially their purchases. We can stir people with certain colors; we can catch their attention with the right ones, or we can facilitate their repose. Hence, color is a tool in the hands of a designer adapted to influence people into desired patterns of reaction. The artist is interested in his own reactions (hence less in dynamics), but the designer must study mass reactions. The color of a product may look good on the executive's desk, or it may rank high in surveys of color preferences; but that is not enough. The best criteria are sales records. In a supermarket, 25,000 to 40,000 items may compete for the purchaser's attention. Here "association colors," as the browns which suggest coffee, must give way to attention-getting colors: bright reds, oranges and yellows, which are often harsher. But even these can become monotonous if too often repeated. Mr. Arens told about an elevator operator, always working in a Chinese-Red elevator, who said he would murder his wife if she wore a red dress. The designer must decide how often and how fast he must change color schemes. The artist finds it difficult to put his reactions into systematic order; but the designer now has at his disposal scientifically ordered systems which he can employ to study and prognosticate color preferences and trends. He can put it into factories and offices to increase the feeling of well-being of workers, he can improve safety, eliminate eye-strain and increase output. Mr. Arens

forcefully demonstrated these ideas by means of several well chosen examples.

The dinner, ISCC Operation Rainbow, at 6:30, which was in charge of an able local committee under the chairmanship of Mrs. Helen D. Taylor, was also a huge success. Color was on every hand. Besides the many door prizes "worthy of a quiz program and all in color of novel application from neckties to plastic tableware" (New York Times of March 9), potatoes were dyed blue, sauces brilliant red, and peas were unusually green. Chairman Balinkin spoke forcefully and very wittily about aims and purposes of the ISCC and told something of its growth and active personnel. Retiring chairman Godlove presented to Dr. K. S. Gibson, guest of honor, a brochure of verses. The honoring took this form because (it was said) the latter's one vice is humorous verse; his many virtues were dwelt upon briefly.

The evening lecture, Seeing Light and Color, was an illustrated talk by Ralph M. Evans of Eastman Kodak, former ISCC Chairman and chairman of delegates from the Society of Motion Picture Engineers. Mr. Evans has given many lectures of a similar nature, varying from time to time in content and in degree of popular or non-technical nature, but all beautifully illustrated by masterly and carefully arranged color photography. As a famous elderly photographer who was present told the Editor, Evans gave him the explanations in simple language of many things he had long known but only imperfectly understood.

Many of the people attending the meeting in the New York Statler stayed over for the three-day session of the Optical Society of America in the same hotel. The last day (Saturday) of its program was almost wholly on color.

DR. JUDD We have been informed by Dr. K. S. Gibson, Chief, Photometry and
HONORED Colorimetry Section, National Bureau of Standards, that Dr. Deane B. Judd, former ISCC chairman, recently received the "Exceptional Service Award, Gold Medal, for Outstanding Contribution to the Public Service, the Nation, or Humanity." We reproduce here through the courtesy of Dr. Gibson, the citation read in connection with the award of the medal.

The Commerce Department awards its gold medal to Dr. Judd for outstanding scientific accomplishment in colorimetry and color vision and for his highly distinguished authorship in these fields. Dr. Judd has been with the Bureau of Standards for over 20 years. Since 1933 he has been in charge of the Bureau's colorimetric work, carrying on a program of research, developing test methods and instruments, initiating programs, and otherwise representing the Bureau in that field. It's in the field of color vision, however, that he has made his most outstanding contributions. He has more than 50 publications to his credit dealing with such subjects as color measurement, color systems and camouflage. Many of these papers have received national and international recognition. In 1937 he received the Journal Award from the Society of Motion Picture Engineers for a paper entitled "Color Blindness and Anomalies of Color Vision." The mathematical treatment of Color Blindness, combining theory and experiment, has afforded an understanding of the relations between normal and color-blind vision never before possible.

He has recently initiated, through the Division of Physical Sciences and the Optical Society of America, a long range program for the determination of uniform tridimensional color scales. Two of his present projects include preparation and issuance of standards relating to color in the petroleum industry and to the color and brightness of television screens. A third now coming to completion is a revision of the color names system first published in the National Formulary and U. S.

Pharmacopoeia and in description of the colors of building stone, soils, mica, rocks and textiles. He also has participated in international conferences in England, France, and Holland; is president of the Board of Trustees of the Munsell Color Foundation; and has been chairman of the Inter-Society Color Council.

The Department is proud to present its exceptional service award to Dr. Judd for his splendid contributions to science.

COLOR FUNCTIONS IN
SCIENCE ART AND
INDUSTRY

It is a regrettable fact that the instruction in color in most of our schools, colleges and universities is lagging behind the available knowledge of modern science of color. This condition, however, is changing gradually and a recent announcement by the University Extension, University of California at Los Angeles is a welcome sign of the times.

The objectives of a course in Color Functions in Science Art and Industry are stated to be "to provide an activity for stimulating the development of the general knowledge of color, to aid industry in color problems and to extend the knowledge of individuals interested in the broader aspects of this subject."

The course consists of a series of fifteen weekly evening lectures beginning Monday, February 13, and extending to May 22, 1950. The course fee is \$18.00. The titles of the subject matter presented and the names of the instructors are listed below:

1. Introduction to Color, Mr. Frank Wilbar
2. Luminous Radiation, Mr. Robert Bromberg
3. Spectrophotometry Applied to Color Measurement, Mr. Philip F. O'Brien
4. The Mechanism of the Eye, Dr. T. L. Jahn
5. Some Physiological Aspects of the Stimulation of the Eye with Light of Different Wave Lengths, Dr. F. Cresitelli
6. Psychological Properties of Color, Dr. George Mount
7. Psychological Properties of Color, Mr. John Lyman
8. Trichromatic System of Color Measurement I, Dr. L. Graham
9. Trichromatic System of Color Measurement II, Dr. L. Graham
10. Current Color Notation System, Mr. Frank Wilbar
11. Color Harmony - Some Factors that Influence Contemporary Theory and Practice, Mr. Albert H. King
12. Some Principles of Colorimetry, Mr. J. A. Widmer and Mr. V. C. Shaner
13. Color in the Photographic Industry, Dr. L. Graham, Mr. J. A. Widmer, and Mr. V. C. Shaner

14. Color Technology in Engineering and Industrial Design,
Mr. John P. Dobbins

15. Color in Architecture and Interior Design, Dr. Eugene G. Steinhof

Several members of the Inter-Society Color Council took an active part in helping to develop this program under the direction of Mr. Philip F. O'Brien. The good wishes of the Council are cordially extended for a success of this worthwhile undertaking.

I. B.

TOO MUCH The saddest word, we know about
TOO LATE Are those these issues are without.
 They're ones that didn't leave our pen,
 That didn't even reach our ken,
 Those futile stillborn quips profound
 That in News Letters can't be found.

 They missed the bus, we must confess;
 They came too late; our potent press
 Could cast them not in weighty lead.
 Those snappy things we might have said;
 The deadlines mark the silent spot;
 A thousand corpses, one bon mot.

I.H.G.

GLAZE AND Noting in a recent archaeological bulletin that the Hebrew word
GLASS COLOR for glaze had only very recently been understood and translated
 (hence was incorrectly used in the Bible), prompts the Editor to
comment some on the history of glazes and glass color. A little may be said too
about the Phoenicians or Canaanites who, along with the Egyptians, were among the
first to produce glass and glazes industrially.

We have previously discussed one specialty of the Canaanites, who were called Phoenicians after the 13th century B.C., namely the Tyrian or Royal Purple, the dye from a Murex mollusc which for a time was a monopoly of the city of Tyre. The cities of the Semitic (Canaanite) population of Phoenicia were Byblos, Tyre and Sidon, among about twenty formed into a loose federation. Their culture, as early as the 18th century B.C. was a Middle Bronze Age one with influences from Sumeria, Egypt and Crete. Earlier than this period, Sidon had improved upon the Egyptians' manufacture of glass, and enjoyed a monopoly of transparent glass, colorless or white as well as chromatic. Egyptian glass was opaque and colored in the mass until Roman times. Some authors have taken the view that the famous murals of Beni Hasan (early 19th century B.C.) portrayed glass-blowers at work; but according to later views, the pictured Asiatic technicians were iron-workers, though the date seems to the Editor too early unless they were from the Hittite country of Asia Minor. These latter authors say that no glass vessel has been found earlier than the 18th Dynasty (1570 B.C.). It was stated by Professor H. Frankfort that the earliest known fragment of clear glass was found at Tell Asmar (the ancient Eshnunna in Mesopotamia, dating 2600 B.C. This was of a pale blue-green color. Glass beads were found in a cemetery of the Third Dynasty of Ur (2070-1960 on Albright's "minimal" chronology). Glazes having compositions rather similar to glass, but commonly applied to the surfaces of ceramics, steatite or similar materials, were produced quite early, in Egypt from Badarian times (perhaps from 4400 B.C.) onward; and in Mesopotamia from the start of the third millenium B.C. The former are older than glazed faience, which dates, however, from Predynastic times

(in the fourth millenium). Glazed seals were found in the Indus culture at Mohenjo-Daro and Harappa, and in Mesopotamia at Kish and Ur. Two specimens of black glaze, one on the beautiful Tell Halaf pottery from Arpachiyah in northern Mesopotamia, the other on al. 'Ubaid ware from Ninevah, contained magnetic oxide of iron (Fe_3O_4) as pigment.

The Canaanites, later called Phoenicians, excelled in textile production, dyeing woolen cloth bright red and blue with Murex and other dyes. As is well known, the Phoenicians are also generally credited with the invention of the alphabet. The Canaanites of the Late Bronze Age (after 1550 B.C.) wrote their language at different times in four or five systems of writing: (1) Accadian or Mesopotamian cuneiform; (2) Egyptian hieroglyphic; (3) the linear "Phoenician" alphabet from which our own ultimately descended through the Greek; (4) the cuneiform alphabet of Ras Shamrah (Ugarit); and (5) the syllabic script of Byblos. The so-called "Proto-Sinaitic" inscriptions, found less than fifty miles from the traditional site of Mt. Sinai and dating in the 15th century B.C., are of the last-named type and form the oldest body of documents in our own ancestral alphabet, though three very short ones from Palestine are older. They were made by captives or slave miners in the copper or turquoise mines of Sinai, and are in the Canaanite linear script. It was recognized in 1906 that there must be a genetic relationship between the Sinaitic script and the Hebrew-Greek alphabet, though separated in time by nearly a thousand years. In 1924 were found inscriptions from the tomb of Hiram, king of Byblos (1000 B.C.) and friend of Solomon. The oldest dated text previously known was 250 years later; but between 1930 and 1936 earlier alphabetical inscriptions were found in Palestine and Byblos (back to 1800). The Egyptian conquest of Palestine near 1550 B.C. ushered in the Late Bronze Age. During this period writing, with its acceleration of the tempo of civilization, came more and more into use. Since the names of the Greek letters, which are meaningless in Greek, are nearly all obviously derived from meaningful Hebrew-Phoenician names, and the letters follow the same order, it is evident that the Greeks borrowed their alphabet from the Phoenicians. But in spite of these relations and increasing knowledge, translation and clear understanding of early inscriptions has not been too good until recent years.

Returning now to glazes, since we have mentioned one chemical component (magnetic iron oxide) and the color it imparts, we may mention a few more, usually stated as oxides: ferric iron (for yellow, red, brown and black); copper (green, blue-green and red); manganese (violet, "cream," brown, and black); chromium (green, red; with tin, pink; with zinc, brown); nickel (brown, violet); uranium (yellow); tin (white); cobalt (blue; with chromium, bluish green); colloidal gold (red, purple); selenium (red). Perhaps one of the glass experts among our ISCC members, such as Dr. H. P. Gage or Dr. N. Kreidl, will be kind enough to correct this list written by an amateur. Finally, remaining with glazes while returning to language, it may be repeated that the Hebrew word for glaze has only recently been correctly understood. The Authorized Version of the Bible (Proverbs XXVI, 23) translated as "Burning lips and a wicked heart are like a potsherd covered with silver dross," what is now translatable as "Like glaze crusted over pottery are smooth lips and an evil heart."

PROFESSOR VILLALOBOS-DOMINGUEZ Professor C. Villalobos-Dominguez has called our attention to the fact that an error appeared in the copy of his letter published in ISCC News Letter No. 85 (November 1949). We regret that at the start of line 11 of the third paragraph of page 9 "rectangular compromise" was inserted in place of "triangular compromise."

Professor Villalobos was also kind enough to send us a brief but interesting

discussion of "A New Type of Color Mixtures"; and we hope to reproduce this in the next issue.

UREA We recently received an eleven-page pamphlet on "Colors for Molded
PLASTICS Urea Plastics," which is Commercial Standard CS147-47 issued by the
U. S. Department of Commerce (a recorded voluntary trade standard).

In Table I the 17 colors are specified by means of their chromaticity coordinates (x, y) and daylight reflectance (Y); by ISCC-NBS color names and by Munsell notations; and by the closest color matches in the 9th edition of the Textile Color Card Association's standards and in the Container Corporation of America's "Color Harmony Manual." On pages 4 and 5 the NBS Unit of Color-Difference, the tolerance used along with the specifications, is explained in detail.

The samples may be obtained for \$2.50 from the Plastic Materials Manufacturers Association, Tower Building, 14th and K Streets, N.W., Washington 5, D.C.; and the pamphlet may be obtained for five cents from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

LEGRAND'S Yves LeGrand, "Optique Physiologique II: Lumiere et Couleurs";
BOOK Paris 1949, Editions de la Revue d'Optique; 490 pp. This new book
by Professor LeGrand is the second volume of a proposed three-volume work on physiological optics. The first volume of this work was addressed to ophthalmologists and dealt with the eye as an optical instrument. The present volume deals with the eye as a receiver of radiant energy and is addressed particularly to physicists. The reviewer wishes to state at once that in his opinion it is one of the most clearly written and logical books that he has ever seen, besides being one of the most erudite. Professor LeGrand has read everything on the subject. American readers will be interested in the fact that the Journal of the Optical Society of America is represented in no less than 38 of his 129 references to publications.

The book begins with a very clear discussion of the concept of radiant energy and quickly develops into a short but eminently logical text on photometry. There is then a chapter on sources of energy and another on the eye considered as a receiver. It would take too long to detail the contents of the twenty chapters but it should be stated that the reader is led gradually and with the utmost ease through the general theory of colorimetry into the theories of color vision. These last are dealt with in a masterly way. The various theories are compared critically and the author seems to favour the ideas of Fick on the fundamental sensations.

It is interesting to compare this book with two other recent books on color; those of Evans and Bouma. The present work is obviously addressed to a much more serious-minded audience than Evans' but probably to much the same audience for which Bouma's book was designed. One gets the impression that Professor LeGrand has realized that the subject will be difficult even for many physicists and has gone into a good deal of detail to explain unfamiliar concepts without dodging any of the difficulties with which physicists ought to be able to deal.

American physicists will be interested in the remarks on page 78 regarding the names of units. Professor LeGrand fears that there may be a confusion between "luminance" and "illuminance," a fear which is shared by the reviewer. On page 231 he feels that the French will avoid the term "Illuminance."

We may sum up by saying that American color workers will have much to learn from

this book and will find themselves in a congenial atmosphere. There is very little on visual colorimetry, the emphasis on which has spoiled several European books from the standpoint of workers on this continent. On the other hand the book is definitely physics and physiology and not technique. It can be recommended to those who wish to learn how the eye works rather than to those who wish ready-made formulas for solving industrial problems.

One minor complaint. Apart from the 33 references to books and the 129 to periodicals, there are hundreds of other references in the text, giving dates, but not documented in the bibliography. We are tantalized by a reference to "LeBlon, 1722" who tried color printing; but how can we look him up? When another edition is required it is to be hoped that Professor LeGrand will give us a very much more extensive selection of his obviously immense set of index cards.

Finally it should be remarked that the book is provided with an excellent index, and it is to be hoped that this is the sign of a trend in French scientific books.

W. E. K. M.

OBJECTIVE & SUBJECTIVE The following six paragraphs on the recent meeting, dated March 8, 1950, were written by Mr. A. E. O. Munsell and communicated to the editor. The full title was: Theory & Practise. - Objective & Subjective. - Logic & Emotion. They have been passed along to you as an alternative statement of the editor's summary found elsewhere in this issue.

This afternoon's most interesting program makes clear the relation between objective and subjective, theory and practise, logic and emotion. They are two phases of living energy, each dependent on each other for their very existence.

Take the cave man, for instance. To him the subjective side of life meant survival. At first he had to meet the challenges of nature all around him, almost in a hair-trigger fashion. But with the discovery of fire and a resulting quicker digestion-time, he began to have little snatches of leisure, which is the soil which the objective side of life must have in order to grow. In this leisure time he reviewed what he had done, and drew conclusions - very simple, crude ones - which he tried out when next he came up against the same problem.

Thus as improved techniques have made more leisure time available, there has been more soil for more objective activity, creating thereby still better techniques, to make more leisure time etc. Together with this there has been a wider and wider gap between subjective and objective, creating a constantly growing potential (like an electrical potential) between the two which could be a dynamic force or a paralyzing strain, depending on how it was handled, both by the leaders and by those they lead.

So this afternoon's program proves how intertwined are the objective and subjective sides of life, for our color theories would be useless without persons to apply them and the public to demand what both the theoreticians and appliers can furnish to them. How far we have come since the formation of the ISCC! Our society has effectively utilized the high differences of potential, between the practical needs of the appliers of theory and the constantly growing theoretical insight of the theoreticians. This "potential" can lead - in our case - either to confusion or to enlightenment. Confusion comes from the under-evaluation of either group by the other. Enlightenment comes from mutual understanding, and coordinated action to serve the public.

So "objective" may include all that is done in leisure time to increase the probability that next time an activity will be performed more efficiently, while "subjective" may include all that we actually do when we "are on the spot" (as we might say) in grappling with some actual practical problem, backed up by mass demand. It is clear that the "subjective" came first in human history, but that it was very poor and meager at first. It is clear that it is the "objective" which has enriched the subjective, with the result that both have grown and developed by their interaction. Just as the heart beats and then rests, so subjective activity must be followed (taking life on its broadest basis) by rest and objective study, before the next pulse of subjective action can take place.

The ISCC is on the right road in coordinating these two phases of life. Let us learn more about the built-up potential between the two, and learn, both in such meetings and in our analyses of them, to further coordinate the two towards further mutual understanding and cooperation.

THE COLORED THREADS OF REVOLT

The colored thread presented at ISCC Operation Rainbow on March 8 with the compliments of the Color Research Bureau, The Spool Cotton Company, New York City, reminded us of a story reported in the literature. Back in 1792 the Indians of Peru organized a secret revolt against their Spanish conquerors. It was learned later that the revolt had been organized through messengers carrying a piece of wood in which were enclosed threads the ends of which formed red, black, blue and white fringes. The black thread had four knots which signified that the messenger had started from Valdura, the residence of the chief of the conspiracy, four days after full moon. The white thread had ten knots, which signified that the revolt would break out ten days after the arrival of the messenger. The person to whom the keeper was sent had in his turn to make a knot in the red thread if he agreed to join the confederates; in the red and blue threads if he refused. It was by means of these quipus that the Inca transmitted their instructions; on all roads starting from the capital, at distances rarely exceeding five miles, rose tambos, or stations for the couriers who went from one post to another. The orders of the Inca were disseminated with great rapidity; those which emanated directly from him were marked with a red thread of the royal llantu and nothing could equal the respect with which these messages were received.

DISTRIBUTION OF MATERIAL

During 1949, as usual in the past few years, there were six News Letters approximately equally-spaced, throughout the year totalling 83 pages. The approximate distribution of material was as follows:

Strictly current news	45%
Reviews	24
Bibliography	15
Feature articles, and historical notes	10
Color notes in light vein, verses, etc.	3
Title heading	2

These figures show that the News Letter still justifies its title. No immediate changes in this distribution or policy have been planned by the News Letter Committee; but the committee earnestly welcomes any suggestions from ISCC members.

One point perhaps needs clarification in connection with the two largest items, "strictly news" and reviews. Quite naturally, the editors tend to discuss items

sent to them for consideration by the members. The apparent and inadvertent result may be to favor the more active contributors, while more modest persons or organizations may have material of more interest to our readers. Of course the editors actively seek information on current matters of live interest; - and our Secretary in particular always has her fingers on the pulse of current color activities. But we would again like to remind you that a News Letter can only be as good as its contributors make it; and we suggest that you forget considerations of modesty in sending us reprints and news of your doings in the color field.

TRIBUTE
COLORS

One of our favorite stories we can properly relay here because of the colors of the objects mentioned. The Spaniards required great amounts of tribute from the conquered Aztecs. Part of the tribute at one time was twenty sacks of crimson cochineal, and necklaces of green emeralds, yellow gold and reddish yellow magical amber (magical because it exhibited its peculiar properties when merely rubbed). Those Aztecs too poor to contribute rare gems or other rich items were required to contribute a certain number of living creatures, as serpents or scorpions. Two companions of Cortez, the first to enter the royal palace of Mexico, noticed some carefully piled-up sacks. They hastened to possess them, expecting rich booty. This tribute from one province consisted of bags filled with lice. How is this last connected with color? The answer is indicated by the chain: tribute, lice, bite, itch, scratch, red skin!

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