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INTER-SOCIETY COLOR COUNCIL

NEWS LETTER NO. 60

JULY, 1945

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NEW DELEGATES AND MEMBERS

We take pleasure in welcoming as Council delegates for the S. M. P. E.: M. R. Bayer of the Photo Products Department of E. I. duPont de Nemours & Co., Parlin, N. J.; and A. M. Gundelfinger, Burbank, Cal. We are also glad to welcome the following new individual members:

Lee R. Dice, director of the Library of Vertebrate Biology, University of Michigan, whose interest is in biological color in work dealing with research with animals, including man. Dr. Dice states that as a biologist it appears that he will be very lonesome among our members, but thinks (as do we) that biology should be represented in the Council. He is a member of the American Society of Mammologists, the American Ornithologists Union, the Ecological Society of America, and the American Society of Herpetologists and Ichthyologists (-- these sound like logical prospects for Council membership.!) Problems of particular interest are methods of measuring colors of animals, classification of animal colors, heredity of color types of animals, including color of skin, hair and eyes of man; and heredity of color blindness.

Fogg Museum Library (Harvard University), E. Louise Lucas, Librarian. This membership is on the request of Professor Arthur Pope, so that the Library may have available not only the News Letters but all other reports distributed through the Council.

Harry Flowers, of New York City, whose interest in color is chemical and photographic, his work dealing with photo-engraving, roto-gravure and lithography. Mr. Flowers is a member of the American Photo-engravers Association and the Lithographic Society. Problems of particular interest are photographic color separation and composition as applied to printing and lithography, also to textile printing.

Betty Gustafson, artist and designer, of St. Paul, Minn., owner of Advertising Art Studios, interested in chemical, psychological and creative work with color. Since 1940, Miss Gustafson, a former pupil of Individual Member Foster Kienholtz, who has recommended her, has given talks to professional groups and to art and fashion classes.

James A. Russell, of Sylvania Electrical Products, New York City, whose interest in color is chiefly psychological and whose work deals principally with fluorescent light (phosphors).

Kenneth S. Campbell, of the Southern Regional Laboratory of the U.S. Department of Agriculture, New Orleans. Mr. Campbell is in the Cotton Chemical Finishing Division and is interested in both the chemistry and the physics of color, especially in connection with the dyeing of textiles.

C. Villalobos Dominguez, of Buenos Aires, professor (retired) of the Faculty of Sciences of the University of Buenos Aires, who taught drawing applied to the natural sciences, and painting and drawing, and who first became interested in color in 1925 and has since published in Anales de la Sociedad Cientifica Argentina, CXI, Jan. 1931, and in Nosotros Review, 252, May 1930. In his letter of application, Professor Villalobos Dominguez comments that he was much pleased to note that the recommended value scale, page 416 of the July, 1943, J. Opt. Soc. Amer. (Newhall sub-committee) report was surprisingly coincident with one that he had found by trial and error years ago by means of painted disks, but never published. He was not satisfied with the Fechner scale adopted by Ostwald, and did not know the Munsell work. His function extends from the correlates of black printing ink to those of barium white and is practically the same as that recommended in the Newhall subcommittee report. It is so close in most cases as to constitute a remarkable verification of the Munsell Research Laboratory results which, it is not generally remembered, were obtained by two very different but well-agreeing methods. In noting below the comparative reflectances for the even steps, it should also be remembered that the "recommended" reflectances are not absolute but relative to magnesium oxide; instead of the former maximum at value 10/, which was 100.0 percent, it is now expressed as 102.56. This was adopted to facilitate direct conversions of the "Y" determinations with a MgO standard to Munsell values.

Step No.	10	9	8	7	6	5	4	3	2	1
C.V.D. Scale	100.0	77.2	58.1	42.3	29.5	19.7	12.3	7.0	3.7	1.4
Recommended Munsell Scale	100.56	78.7	59.1	43.1	30.1	19.8	12.0	6.55	3.1	1.2

COLOR TRANSFORMATION

The following poem was delivered by Mr. Tafler, following Sir Richard Paget's address "Sign Language as a Form of Speech," according to Nature 137, 388 (March 7, 1936):

Were I in future blind, yet would I always have,
A rainbow in my life, since you love me.
My red would be your lips, yellow your golden hair -
Your fragrance violet, and green scented leaves;
My blue would be your eyes, your arms would light my heart.
Your absence be my gloom, your soul - my sun!

SELLING WITH COLOR

Selling with Color. Faber Birren. Pp. 244 VII; Figs. 20. McGraw-Hill, 1945. Price $2.50. The purpose of this book is "to assure the effective development of consumer products, merchandising, advertising, packages, displays ... Color in industry today may be engineered with remarkable certainty, once the methods are known and applied with intelligence and care ... It is evident that when you pick the right colors you sell a lot of merchandise or influence a lot of people; when you

pick the wrong colors you pile up unsold inventories and see the public turn its back .... American business knows the value of color. Yet it also is aware of certain hazards and risks. If color is to build profits, if those who use it are to find success in their efforts, a more accurate knowledge of the public heart and mind must be achieved." These excerpts from the preface indicate the author's idea of what the book accomplishes, and it must be admitted that to a considerable degree the book succeeds. The reader will finish the book with the feeling that he has been in extended conference with a successful color consultant speaking frankly about some of his problems and the methods of their solution.

Birren has found it's possible to reduce the solutions to a surprisingly few maxims. They bring order to what would otherwise be a very disconnected discussion. They thread through the whole book, appearing often and unexpectedly, yet with plausibility, in connection with each new aspect of the question how to sell with color. Some of these aspects are suggested by the chapter headings: Public Taste - What is it? These are the Colors that People Prefer; These are the Things that People Buy; Giving the Public What it Wants; Practical Research Techniques; Glorifying Human Desires; More Power to Advertising; Packages, Displays, Interiors; The Art of Color Conditioning; The Psychology of Color; The Romance of Color.

The chief principles by which Birren makes the road to color success seem almost unbelievably direct are as follows: (1) Think of the buying public as composed of the high-fashion market on the one hand and the mass market on the other. (2) The high-fashion market undergoes rapid changes, hard to predict, because high fashion must be different. (3) The mass market changes slowly and shifts chiefly in its demand for one variation or another of relatively few colors: red, blue, green, white (or cream), intermediate hues being usually avoided. (4) Follow these changes by thorough statistical studies and choose colors accordingly. (5) When in doubt use blue. By these principles, otherwise contradictory sales records come to make sense, the pitfalls of color design to please the few rather than the many are avoided, and merchandising is relieved of the waste of unsold inventories.

This book will also serve the busy executive as a stream-lined introduction to the heretofore largely inaccessible facts of the human eye and color vision (The Human Nature of Vision, Science Offers and Answer). In his previous books Birren has seemed to this reviewer outstanding in his ability to discern the connection between scientific discoveries and practical color problems, though he has sometimes adopted interpretations open to scientific criticism. In this book, however, extended use is made of the device of actual quotation of pertinent passages from such scientists as Guilford, Walls, Goldstein, Kravkov, Parsons, Maxwell, Southall and many others. There can thus be little question of inaccurate summarization. The chapters of background facts are quite appropriate to this kind of book, and, considering how condensed the treatment is, remarkably informative.

In his chapter, The Specification of Color, there are brief, factual summaries of the Maerz and Paul Dictionary of Color, The Munsell System, The Ostwald System, the ISCC-NBS method of color designations, and the ICI system. Controversial claims for and objections to the Munsell and Ostwald systems are happily omitted; and the non-technical reader is given a quick sketch of what he will find should he care to search for methods of specifying color. The use of color systems as an aid to creation of color harmonies (Glorifying Human Desires) is likewise skillfully treated. Birren recommends against reliance upon color systems for this purpose. He pays tribute, however, to Godlove's work in color harmony, to Guilford's work in color preference, and shows how the classical laws of color harmony as stated for

example by Moon and Spencer can be applied to designs in red, green and blue and thus glorify these hues which seem to fulfill a primal need of the average purchaser.

The chapter, Color Enterprise - Plain and Fancy, will immediately dispel any views entertained by a languid reader that remunerative color ideas have all been exploited long ago. This chapter of various color inventions and bright ideas also reveals the extent of the author's reading of diverse and seldom summarized sources of color information, just as the check list of color standards comprising Appendix B and the annotated bibliography of about 50 titles attest to his familiarity with more orthodox sources.

Anyone with an ounce of originality having read this book will itch to become a color consultant, himself; it seems fairly easy and very interesting to go on from where Birren has left off, and one wonders why so many of what are obviously valuable trade secrets are thus generously revealed for a paltry two dollars and a half. The principles, the pitfalls, the methods of analysis, the tools of the trade are all given; there is even (in Appendix A) a review and analysis of sales records according to color gathered under the author's supervision.

Perhaps Birren feels that he has more color consulting than he can do anyhow, but more likely he has discovered that even by taking great pains it is nearly impossible to present as complicated a subject as color so that many readers can readily understand it and will recognize the truth when they read it. We give Birren credit for a skillful and sincere attempt, and congratulate him for the easily read result. If the reader does not get a valuable degree of insight into selling with color by reading this book, it is his own fault.

D. B. J.

RECENT HILAIRE HILER BOOK

A recent announcement card indicates that we must add to the list of Mr. Hiler's books, given in the May 1945 News Letter (No. 59) on page 11, the new book, "Why Abstract," by Hilaire Hiler, with Comments by William Saroyan and Henry Miller. Here, by request, the "artist explains himself." The price of an autographed copy, which may be obtained at 1260 Canyon Road, Santa Fe, New Mexico, is $2.75.

TCCA CONTINUES VERY ACTIVE

It was recently announced by Margaret Hayden Rorke, managing director of the Textile Color Card Association of the U. S., Inc., that the regular editions of the 1945 Fall Woolen and Rayon Cards, described in News Letter No. 59, are now available to the trade. These cards feature the themes already discussed and also portray important basic colors in groups of "tone-on-tones." In early July the Association issued to members the 1946 Spring Colors for Men's Felt Hat Bodies, which plays up the racing theme as a timely merchandising feature. These spring colors, shown in large swatches of fur felt, are Pimlico Grey, Turf Willow and Paddock Brown. The limitation to three colors is in accordance with the Association's wartime conservation policy. Another recent announcement concerns the United States Army Color Card of Standard Shades for Slide Fastener Tapes - 1945 - Supplement to U. S. Army Specification No. 100-31, which was issued at the request of the Quartermaster General of the United States Army. Among the 16 colors shown in the official tapes in this card are Light Brown, Medium Brown, Dark Brown, Maroon, Light Blue, Olive Drab 3 and Olive Drab 7.

The Textile Color Card Association has also recently issued to its members the

Confidential Advance 1945 Fall Hosiery Card. Here three new colors are announced and described as follows: Sunblonde, a "glowing autumn sun tone," Magic Beige, a "flattering medium beige," and Brown Brandy, an "exciting burnished shade." Mrs. Rorke in the announcement called attention to the smart blending or contrasting attributes of each new color with the important costume and shoe colors for the coming season. The announcement gives, for each of the three colors, the colors with which it harmonizes by analogy or by contrast and lists also the special uses for the colors in different types of wearing apparel.

COMMERCIAL STANDARDS FOR COLOR MATERIALS FOR ART EDUCATION IN SCHOOLS

The National Bureau of Standards last month issued a recommended Commercial Standard for Color Materials for Art Education in Schools. This standard was proposed by the Crayon, Water Color and Craft Institute and has been revised in accord with suggestions from art teachers, testing laboratories, manufacturers, and purchasing organizations such as the Association of School Business Officials. The primary object of the standard is to provide minimum requirements for products that are suitable for serious art education in schools. Color materials known to the trade as "toy" materials are not expected to conform to all of these requirements. The recommended standard covers 17 materials (crayons, water colors, tempera, blackboard crayons, and so on) and specifies for most of these materials the workmanship, the ingredients, working qualities, toxicity, packaging, color names and minimum chroma. The ISCC-NBS color names for the chroma standards are included. A copy of the standard is inclosed with this issue. We suggest that anyone interested in these materials study the recommended standard carefully. If the proposal strikes you as constructive and worthy of support, you can help it along by filling out and sending in to the National Bureau of Standards the acceptance form provided with each copy. If you discover reasons why the recommended standard should be changed before adoption, write a letter to our Editor. Our voting delegates will soon have to decide whether the Council should go on record as approving this standard in principle and they will appreciate your comments.

CORRESPONDENCE WITH INDIVIDUAL MEMBERS

A recent (May 16) letter from C. R. Conquergood to the Secretary included copy of a very interesting talk, "Color Makes the World Go Buy," which he gave early in May before the Paint and Oil Production Club of Toronto, Canada. Although not a teacher, Mr. Conquergood has for many years, as he puts it, tried as far as possible to create in quite a large number of people the desire to know and understand more about the use of color. And as most of us know who have been acquainted with Mr. Conquergood for a good many years, he has been quite successful in doing that. We would like to give you in the News Letter, as a typical example, his most recent paper, in complete form. Lacking the space, we cannot do that; but we quote the last paragraph of his letter, so that it may be shared by all ISCC delegates and members. He writes:

> I want to assure you that I very greatly appreciate my membership in the Inter-Society Color Council and must express my thanks as an Individual Member to those of you who devote so much time and energy unselfishly in the promotion of this work. I am of the opinion that the influence of your leadership goes far afield to many places where you have little knowledge and to a great many people like myself who have been mute in the expression of their appreciation.

From Foster Kienholz, president of Mills College of Arts and Advertising in St. Paul,

Minnesota, individual member of the Council since 1939, we also have a letter (dated May 29):

> Perhaps an obscure member like me, out here in the sticks, ought to write occasionally to tell you how interesting and helpful the News Letter and other material is. You may already have this information but during the past year or so a great many retail firms, newspapers and printers, manufacturers, around the Twin Cities have manifested a lively interest in color. The Inter-Society Color Council has spread its influence but I am sure that people will never give credit where it is due.
>
> For almost two years this school has had a new name, MILLS COLLEGE OF ARTS AND ADVERTISING. It has been approved as such by the Minnesota Department of Education. If you care to change my listing, I shall appreciate your kindness.

Congratulations, Mr. Kienholz; and we thank you also, for recommending for membership your former pupil, Miss Betty Gustafson, who for more than three years has been operating her own business with great success.

Still another letter came to us from "Mine Detail 21, c/o Acorn 30, F. P. O., San Francisco, Cal." It was dated May 31 and was from Jack Hanlon, at Mohawk Carpet before the war, later at the Philadelphia Navy Yard. He wrote that after a couple of months hectic work "out here," he is finally getting time to write a few letters, "out here" being a small island in the Philippines. He wrote:

> When I got to the Philippines I was lucky enough to be put in charge of Mine Detail 21. I have another j.g. as executive officer a grand crew of enlisted men. We are in a very active zone and are working our heads off. But best of all we are getting results - consequently we work late at night and all day Sunday and no one grumbles at the extra work.
>
> Conditions aren't too bad here; we live in Quonset huts and have pretty good mess facilities. We have an out-of-door movie and a fairly good library. The big drawbacks are the heat and the rain. The rain bothers us most because it frequently puts many of our instruments out of commission. The resulting mud is very discouraging to work in and makes it difficult to operate rolling stock. The rainy season has set in again and we get rain about three times a day. You can probably imagine how glad I shall be to get back to normal life.
>
> It has occurred to me that I must owe some dues and I would appreciate it if you would send me the bill....

Needless to say, to men as interested as this who indicate that they wish to keep in touch with Council activities even during overseas duty, we have for some time been mailing the News Letters first class. Several of our men have written to comment on the News Letter from overseas stations; for example, Lt. Colman from Italy and Cpl. Harry Scheid from Versailles, France, in the European theater, and now Lt. Hanlon from the Asiatic. The News Letter does get around!

ART-GALLERY LIGHTING — The report having this title sent to Council members with the last issue of the News Letter was provided by courtesy of the Illuminating Engineering Society. It seemed such an excellent

report and on a subject in which so many of our members have either a direct or an indirect interest, that the secretary asked Mr. Logan, I.E.S. delegate to the ISCC and a member of the I.E.S. committee which prepared the report, if copies could not be made available to the Council. Not long after this Mr. Hinckly, executive secretary of the I.E.S., wrote that arrangements had been made to provide 200 copies for distribution to interested members of the Council. Since this number nearly covers our mailing list, it was possible to send copies of the report to all but I.E.S. members, to whom it would be otherwise available. We thank the I.E.S. and recommend the report to your attention.

EARLY PAINTING

Colors, too, to paint his body
Place within his hand,
That he glisten, bright and ruddy
In the Spirit-Land.

From Schiller's "Nadowessier's Todtenlied."

FIATELLE'S "THE STORY OF COLOR"

From Mr. Joseph P. Gaugler of Fiatelle, Inc., Empire State Bldg., New York 1, N. Y. (color research, packaging, and production design), we received a letter, dated June 28, indicating that we have overlooked Fiatelle's pamphlet "The Story of Color." Chapter I of this pamphlet (4 pp. with 3 figures) is on "The Teaching of Color in Schools," by Arthur B. Allen. Mr. Allen is the author of "Color Harmony; its Theory and Practice" (F. Warne & Co., London and New York; 1937) and is not to be confused with the late Arthur S. Allen, popularizer of the Munsell Color System and organizer of the Allcolor Company. The author distinguishes three theories of color: that of the artist's pigment primaries, well executed with crimson lake, gamboge and Prussian blue; that of the physicist's "light primaries," red, green and blue-violet; and that of the psychologist with four primary colors, red, yellow, (sea) green and blue and "secondaries," orange, leaf green, turquoise and purple. It is explained that the first theory utilizes the subtractive method of mixing; the second utilizes the additive mixture of lights; and the third the "medial" method of mixing which uses the spinning color wheel. (We were a bit confused here, since "medial" suggested something intermediate between additive and subtractive mixing.) The last section, entitled "Where we stand today," indicates the disadvantages of the artist's or Brewster theory, states that the physicist's theory is "altogether useless" for the child in school, the practicing artist and the craftsman; and states that the psychologist's or Ostwald theory is the only one that affords a rational basis for the attainment of perfect color harmonies.

The confusions of additive and subtractive mixing, of pigment (colorant) mixture and color-stimulus mixture as well as the relations to the psychologists unique hues, have been treated by a number of authors. In the pages of the News Letter, we may refer you to the November, 1941, issue (No. 38), where in reviewing Martin Fischer's "The Permanent Palette," we wrote: "Musical terminology is much less confusing; a musician never confuses his violin string with sound, although he vibrates the violin string to produce sounds in much the same manner that an artist in oil paints applies a colorant to canvas in order to produce a given color effect. Perhaps if paints, pigments, dyes, etc., could be thought of as colorants instead of color, it might help." In commenting on this statement by the Council Secretary, Mr. Milton E. Bond, of the Rochester Athenaeum, wrote in part as follows (see pp. 6-7 of the same issue): "If you get mercuric sulfide (vermilion) in your eye, it is uncomfortable and dangerous; if you get vermilion red in your eye, it may be pleasing and thrilling! You (the artists) say you use paint only -- be awfully careful! -- I'd rather receive the light from your paint."

As this subject is one of considerable interest, we take the liberty of referring our readers to two other discussions of the relations between pigment mixing, color-stimulus mixing, pigment primaries, light-stimulus primaries and the introspectively "primary" colors. These are given in the references: Lieut. Dean Farnsworth, ISCC News Letter No. 41 (May 1942), pp. 2-3, latitude and longitude of color; and D. R. Dohner and C. E. Foss, J. Opt. Soc. Amer. 32, 702-8 (1942), color-mixing systems: Color vs. colorant mixing. Perhaps here it may be well to point out also that, although the artists most commonly use red, yellow and blue as their primary colorants, this is not necessarily the "best" choice. At least in the "process" or three-color printing and photographic industries, the tendency is to go toward yellow, red-purple (magenta) and blue-green (cyan) as the most useful triad. In this connection, one might do well to study the conclusions of F. F. Rupert, J. Opt. Soc. Amer. 20, 182-3 (1930), a study of pigment primaries and mixtures, D. MacAdam's work, same journal, 28, 466-80 (1938), subtractive color mixture and color reproduction, as well as the spectrophotometric reflectance curves of various artists' pigments obtained by N. F. Barnes, J. Opt. Soc. Amer. 29, 208-14 (1939); also Tech. Stud. Field Fine Arts, publ. for Fogg Art Museum, Harvard Univ. 7, No. 3 (Jan. 1939).

To return now to the pamphlet, "The Story of Color," we find that Chapter II describes the "Color Helm," first built by Mr. Gaugler in 1932. This is the Fiatelle "Guide to Correct Color," comprising a neat and conveniently arranged scheme of printed colors and masks for the selection of harmonious color combinations. The main feature is a circle of hues based upon Ostwald's. The primary hues are red, yellow, green and blue; the secondary ones are orange, leaf green, turquoise and purple. In each range are shown three hues, making 24 in all; and each hue is shown in three colors, "tints," "pures," and "darks." The composition of these is exactly stated, in the Ostwald manner, in percentages of "white," "black," and "pure color" content. Sections of the chapter, pp. 7 to 12 of the pamphlet, state how the various combinations and contrasts may be obtained. They are: "8 1/3 % adjoining contrasts," "16 2/3 % alternates," "41 2/3 % intermediates," "66 2/3 % triads," and "100 % complementaries." Other sections deal with "split complementaries" and "full complementaries," helpful suggestions, the science of color (summary of Chap. 1), three ways to identify color (hue, value and chroma), color behavior (cool or receding vs. warm or advancing colors), and color control (relative areas, etc.); and it is stated that 13,824 color combinations are possible with the Color Helm.

Chapter III, "The Story of Blue," by Mr. Gaugler, shows how the Color Helm is used when blue is the predominant hue selected for an interior, a painting, a layout or a package. Chapter IV is a price list and list of references on color; and Chapter V, gives "Applause" for the Color Helm received by Fiatelle. In this connection we may recall a letter from a user of the Color Helm reproduced in News Letter No. 57 (Jan. 1945), pp. 4-5.

MEETING OF EXECUTIVE COMMITTEE

At the suggestion of Chairman Zigler, the ISCC Executive Committee met in Boston, at Hotel Fensgate, on June 29. As usual, the chairmen of active committees and one or two persons working on Council problems met with the Executive Committee. On that day the committee were the guests of Professor Arthur Pope, Acting Director of the Fogg Museum of Art, Harvard University, at an informal luncheon at the Faculty Club; and on the following day members of the Color Aptitude Test Committee were the guests at Wellesley, Mass., of Mrs. Michael J. Zigler, wife of the Council chairman, who is Professor of Psychology at Wellesley College.

The business session of the Executive Committee (passing upon membership applications, reports of committees, including the nominating committee, etc.) was rather routine in nature and was disposed of quickly. The meeting was made memorable, however, by an informal visit to the Fogg Museum of Art, Harvard University, where Acting Director Arthur Pope and members of the staff of the Museum gave an informal talk and exhibition of the methods of color organization and teaching, with applications to pictorial and abstract art, as used at the Museum. There was considerable free and informal discussion, and a meeting of the minds; and the occasion was made memorable and utterly delightful by Professor Pope's able and lucid presentation and the rational and plausible way in which the ideas developed. Very interesting too was the presentation and exhibition of abstract designs based upon a scientific approach to color by Morton C. Bradley, Jr. We hope to report on Mr. Bradley's work in the next issue of the News Letter.

Professor Pope's fundamental postulate, in his approach to harmonious or pleasing combinations of color and to esthetic significance, was expressed centuries ago by Xenophon in the aphorism: "All things without exception, because of symmetry, will appear more beautiful when placed in order." This is the principle used much later by Munsell and Ostwald. If the principle is valid, color arrangements will be most pleasant and significant if they are based ultimately upon the most rational possible organization of colors generally. In his work and teaching Arthur Pope utilizes the Munsell color system, with modifications toward a "working color solid" suggested by his own experiments and observations. Regular or orderly paths in this modified color solid are examined with particular attention to the contrasts between the colors represented in the paths. Some of the paths are found to be particularly significant. Though starting from a theoretical principle -- Leonardo said that an artist without a theory is like a mariner without a compass -- Pope checks the results of the theory at every point by reference to experiment and to the accumulated experience generally bearing upon esthetic significance.

In correspondence with the Editor-in-chief, Pope wrote that he is suspicious of the matter of preferences or pleasantness, for esthetic value transcends mere agreeableness; the principal difficulty is that preferences for colors or their combinations involve so many factors of association, temperament, etc., that they form an uncertain basis. In a letter dated April 26, 1845, he wrote: "What we want to know is how many different ways we can achieve orderly relationships which are visible appreciably, and then how each kind of orderly relationship may be made esthetically significant." With these ideas we can readily agree. We disagree in a direction we shall mention; but we continue to quote the same letter. "Of course there is nothing new about the idea of order and diversity. The Greeks certainly thought that out first. Only it is I believe not a matter of a mean between two opposites (italics ours- Ed.), for this would imply that you can have too much order. (Note that he did not say that you cannot have too much diversity. - Ed.) My idea is that diversity is a means to make order emotionally appreciable -- you cannot have too much order."

In a 1934-5 series of articles on harmony, the Editor expressed similar ideas. Variety (diversity) was said to be the "spice" of life in design; but the sense of unity, order and congruity is its "food." The spice makes the food "emotionally appreciable," to use Pope's phrase, but it can be overdone. Food cannot be overdone; that is, except in the grossest sense, and of course even order carried to the limit becomes monotony. We found ourselves going along with Pope, too, in our early writing and later as an experimental conclusion, in the validity of a principle which may be called a substitution of amounts of contrast of different kinds, one

for another. When the hue contrast [15] are small, there should be larger value and chroma contrasts; when the hue contrasts are great, the other contrasts may be smaller.

We differ with Pope only in the belief that experiments on the pleasantness of simple color combinations may yield results which may serve as a point of departure or vantage point from which the subleties or complexities, mentioned by Pope, may be attacked. Nor is this any real difference, for we have seen no evidence that Pope has been so appalled by the complexities as to wish to ban from consideration facts observable in simple experiments, as has been the case with some too entangled in the elaboration of their theories.

In his informal presentation Pope dealt with the importance or esthetic significance of what Ostwald called the "shadow series," and with the importance of a composite parameter in the color solid which he sometimes called "saturation 2" because it is different from Munsell chroma or saturation as used by others. In the shadow series saturation 2 is constant; and Pope believes it is significant. We have asked Dr. Judd to discuss these particular points in the next News Letter.

Our available space does not permit further discussion of Pope's ideas. But we shall close this note by recalling our pleasure in hearing an interesting but difficult subject logically and lucidly presented in a delightful way by a master of his subject.

I. H. G.

THE MAGIC OF COLOR — Under this title was a nearly full-page article in the St. Louis Globe-Democrat of (about) May 22. It dealt with the work, and showed a picture of, Mr. George D. Gaw, Director of the Color Research Institute of America, and his associate Dr. Louis Cheskin. These Chicago color specialists say that color is the key to comfort, convenience, appearance, safety and even health. Many familiar as well as original ideas are reported in the article. There were advocated brightly colored bases for electric stop signals and boulevard stop signs, instead of "camouflage" (diagonal black and white stripes); blue-green walls on bedrooms, which are also to have pink sheets; adjoining rooms painted with "split complements," the full complementary contrast being too strong and dangerous; tablecloths and napkins in complementaries, so that white napkins will not disappear into white tablecloths; blue slaughter houses and kitchen-door screens to dispel flies; red to repel mosquitoes; black roofs and white ceilings for doghouses, to make the dog more comfortable in winter; black auto driveways to decrease the winter ice; white tarpaulins for ice wagons; avoidance of bright yellowish green (chartreuse) drapes to prevent nausea at work; orange in the danger areas of machines; bright red stripes on washroom floors "to lift the loafer right up and out;" orange vertical faces of stairs to impel the lifting of the feet; green walls in operating rooms and green costumes for surgeons and nurses to avoid troublesome afterimages; but the use of complementary afterimages by women wanting to know color schemes for their dress ensembles. We found this article interesting reading.

EYESIGHT BULLETIN — From Dr. D. B. Armstrong of the Metropolitan Life Insurance Company we have recently received a 70-page Industrial Health Series Bulletin (No. 4): Methods of Testing and Protecting Eyesight in Industry. The bulletin includes sections on the purpose and scope of industrial eye examinations, visual testing in industry, functions of the eyes and techniques for their measurement (including color-vision tests), special arrangements for eye protection in fine work, basic principles of industrial illumination, industrial

lighting standards and industrial lighting systems. The bulletin is well illustrated and should serve as an excellent introduction to work in this field. Among others, the assistance of the ISCC through our Secretary, and of Dr. Gertrude Rand, in the preparation of this booklet, is acknowledged. Any one interested in seeing a copy might write to Dr. Armstrong at One Madison Avenue, New York 10, N. Y.

FLUORESCENT LIGHTING — In the pages of Illuminating Engineering in recent months, discussion has been going on concerning fluorescent lighting and complaints of workers in industrial plants. In the May 1945 issue appears the most recent of the series, an article by D. D. Morgan of Seattle, Washington, entitled "There is Something Wrong with our Fluorescent Lighting Applications." Persons interested in this subject are referred to this article and to the discussion by Luckiesh and by LeGrand Hardy, which follows the article. This discussion seems to present a sensible view of the subject. Dr. Hardy is skeptical concerning the ariboflavinosis (vitamin B_2 deficiency) hypothesis that has been proposed regarding the action of fluorescent light on the eyes, and believes that at present the chief difficulties referable to fluorescent lighting installations arise from high intrinsic brightness and inadequate control of glare.

SYNCHRONIZED MEN — This was the title of an editorial in the Washington Post on April 5. It states that under the auspices of the Men's Fashion Guild of New York there began in retail stores that week a campaign to educate men to harmonize more effectively the colors of their suits, shirts, hats, socks, neckties, handkerchiefs, garters, suspenders and cuff links. About 100 articles of men's wear were shown in two color themes, blue and gold. This was the first coordinated color combination to be attempted in the men's wear industry. Commenting that men have been less style conscious, more color blind, more restrained and less given to panic or luxury buying, than women, the editorial goes on to picture the troubles men face. "They will find it no simple matter to get synchronized with, say, a cocoa-brown suit that requires a strato-beige shirt striped in turf tan, a Fort Knox gold necktie with rust polka dots, coffee-colored socks with gold clocks, burnt-caramel suspenders, tobacco leaf handkerchief with a Fort Knox gold stripe (to accent the tie) and topaz cuff links." The editor exercised his fancy further in speaking of the problems of rotation of dominant hues and the difficulty of trying to beat other men to the tie of the week or the handkerchief of the day.

OUTLINE HISTORY OF COLOR (CONT.)

1577 In Saxony, the use of indigo was prohibited as a "pernicious, deceitful and corrosive dye" (and smelly when vatted)

1653 C. Huygens (1629-95) began work on his "Dioptrica"

17th cent. William Briggs of Norwich, England, discovered the optic papilla; Leeuwenhoeck first employed the microscope on the tissues of the eye, and discovered the layer of rods in the retina; also the fibers of the cornea and lens; Daca de Valdes, of Spain, mentioned the use of convex lenses after the cataract operation, which was still done by the method of "depression"

1656 A. van Leeuwenhoeck; see News Letter No. 49

1659 A. Kircher (1601-80) first observed micro-organisms with the microscope; C. Huygens discovered a ring about Saturn

1663 J. Gregory; see News Letter No. 49. R. Boyle (1627-91) observed the propagation of light through a vacuum; collected the ideas of his predecessors on color and made some experiments of his own; studied fluorescent phenomenon mentioned by Kircher (1671), but did not recognize its true nature

1664-5 R. Hooke; see News Letter Nos. 49 and 50; F. M. Grimaldi, see News Letter No. 49

1165-7 I. Newton; see News Letter No. 49; (worked on infinitesmal and fluxional calculus, infinite series and the binomial theorem; fundamental principle of gravitation.)

1666-9 French Academy, E. Mariotte. E. Bartholinus and I. Barrow; see News Letters Nos. 49 and 50; (N. Steno laid the foundations of crystallography.)

1669-71 I. Newton, J. Gregory, R. Boyle and the painter Hobbema; see News Letters Nos. 49 and 50

1671 A. Kircher first described the "magic lantern" and studied fluorescence; found an infusion of Lignum nephriticum to be transparent to transmitted light but a bright green by scattered light

1672 R. Hooke, I. Newton, Colbert and d'Albo; see News Letters Nos. 49 and 50; W. Salmon published his "Polygraphice" and R. Boyle his "On the Light of Fish;" (O. von Guericke invented the first static electrical machine)

1674 I. Newton studied the fluorescent phenomenon mentioned (1671) by Kircher, but did not recognize its true nature. I. Barrow published a lens formula in his "Lectiones Opticae"

1675 I. Newton and O. Römer; see News Letter No. 50; (G. W. von Leibnitz invented calculus; publ. 1684)

1677-80 R. Descartes and J. Brenner; see News Letter No. 50; (R. Boyle, 1678, introduced the modern concept of a chemical element)

1682 C. P. Ango quoted Perdis (both Jesuits) on a wave theory of light, mentioned by Huygens; (E. Halley correctly predicted the return of Halley's comet); about this time Huygens discovered the achromatic (Huygens) eyepiece for a telescope

1684-6 D. Tuberville and A. Cassius; see News Letter No. 50; (1685-6, Newton stated his three laws of motion)

1687 (A. v. Leeuwenhoeck discovered bacteria; Newton published his "Principie")

1689-91 R. Waller and C. Huygens; see News Letter No. 50 (correct the spelling of the latter's name)

1690 J. Locke (1632-1704) in a famous essay distinguished "primary" qualities, as extensity and motion, from "secondary" ones, as color and hardness, the latter being properties of "consciousness"

1692 I. Newton; see News Letter No. 50; W. Molyneux published "Dioptrica nova," which contained an abscissa formula for thin lenses

1693 E. Halley published the lens formula in its present form

1695 D. Gregory (1661-1708) first suggested the possibility of the achromatic lenses

c. 1700 Joh. Bernoulli published his minimum principle for the path persued by a ray of light

1703 C. Huygens published the "Dioptrica" (begun in 1652); explained some phenomena of halos and parhelia

1704-10 J. Méry, I. Newton, R. Hooke, Bishop Berkeley, M. Brisseau and the painter Watteau; see News Letter No. 50

(1713 Jac. Bernoulli published his classic work on probability)

1715 B. Taylor (1685-1731) first determined the differential equation for the path of a light ray in a homogeneous medium (and in 1719 wrote on perspective; first general statement of the principle of vanishing points)

1717 I. Newton, in an edition of his Opticks, explained polarization (discussed but not explained by Huygens in 1690)

1720-22 Lancret, Nattier (and Stradivarius, Handel, Bach, Voltaire, Marlborough and Peter the Great); see News Letter No. 50

1722 R. Cotes (1682-1716) in a posthumous work made the first attempt to frame a theory of errors of observation; attempted to extend the laws of single lenses to systems of lenses

1727 J. Bradley; see News Letter No. 50; Schultze observed the chemical action of light on silver salts, and the color change

1729-30 P. Bouguer, Le Blond, Gautier, Tiepolo, Chardin and Pater; see News Letter No. 50

1735-8 Celsius, Dufay, R. Smith and J. Hoofnail; see News Letter No. 50; add that Smith's optics gave R. Cotes' theorems for the "apparent distance" of an object viewed through any number of thin lenses; (also that, 1735, C. Linnaeus published his botany "Systema Naturae," and L. Euler founded analytical mechanics in 1736)

1740-43 Barth, Comte de Buffon, Boucjer, Canaletto and Guardi; see News Letter No. 50

1745 Daviel removed (not by suction) from a living subject through the anterior chamber a cataract broken up by accident (St. Yves had merely removed an unbroken lens already dislodged into the anterior chamber)

1745 Tobias Meyer, mathematician of Göttingen, produced three "fundamental colors" yellow, red, and blue, all the admixtures from two of these and then from three of these, graded in steps of one-half to get all possible colors within these limitations. All were put in a triangle with the three fundamental colors at the corners, binary mixtures on the sides and tertiary ones within. Besides

this he made a number of other triangles with black and white. The work was edited by Lichtenberg after Meyer's death. According to Ostwald, Meyer had the idea of the three-fold nature of mixtures, which was retained by Lambert, Runge and Chevreul. Meyer thought of black and white as independent; Runge but not Lambert or Chevreul agreed.

1752 De la Faye was the first to suggest discarding the lance and scissors of Daviel in the cataract operation; and in 1743 Sharp of London did so, making a cut with the knife

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ACCEPTANCE OF RECOMMENDED COMMERCIAL STANDARD

This sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this recommended commercial standard.

Date . . . . . .

Division of Trade Standards,
National Bureau of Standards,
Washington 25, D.C.

Gentlemen:

We believe that the Recommended Commercial Standard, TS-3961, constitutes a useful standard of practice, and we individually plan to utilize it as far as practicable in the

production 1/ distribution 1/ purchase 1/ testing 1/

of Color Materials for Art Education in Schools beginning January 1, 1946. We reserve the right to depart from it as we deem advisable.

We understand, of course, that only those articles which actually comply with the standard in all respects can be identified or labeled as conforming thereto.

Please advise us when this standard is promulgated and send us a printed copy when available.

Signature of
authorized officer _____
(in ink)

(Kindly typewrite or print the following lines)

Name and title
of above officer. . . . . .

Organization . . . . . .
(Fill in exactly as it should be listed in pamphlet)
If acceptance represents an individual only, indicate your organization in parentheses.

Street address. . . . . .

City, Zone, and State . . . . . .

1/ Underscore which one. Please see that separate acceptances are filed for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related interests trade associations, trade papers, etc.,desiring to record their general support, the words "General Support" should be added after the signature.

FWR:MLL

TS-3961
June 4, 1945

RECOMMENDED COMMERCIAL STANDARD
for
COLOR MATERIALS FOR ART EDUCATION IN SCHOOLS

(Proposed by The Crayon, Water Color and Craft Institute, and adjusted in cooperation with other interested organizations. Endorsed by the Association of School Business Officials).

PURPOSE

1. The purposes of this commercial standard are to provide a guide to school authorities in the purchase of color materials for art education in schools, as to satisfactory color, working properties and durability; to eliminate confusion in nomenclature; to promote fair competition among manufacturers by providing criteria for differentiation among materials of known satisfactory composition and others considered unsuitable for art education in schools, and thus to provide a basis for certification of quality.

2. This commercial standard covers minimum requirements for color materials of satisfactory color and working properties for art education. It is not intended that all color materials for art education meeting the requirements shall be identical, nor of uniform excellence in all respects. Variations in manufacture not controlled by the specification may cause some schools to prefer one brand over another, both of which are acceptable under this specification.

SCOPE

3. This commercial standard covers material and workmanship, working qualities, color, packing and quality guarantees of the following color materials for art education in schools:

DEFINITIONS

4. For the purpose of these standards the following definitions shall apply:

HUE - The hue of a color determines whether it is red, yellow, green, blue, purple or an intermediate. A color possessing hue is called a "chromatic" color, all others (white, black, silver and gray) are called "neutral" colors. This standard does not place definite restrictions on variations in hue.

VALUE - The value of a color is its lightness or darkness, expressed on a scale extending from black to white by perceptually uniform steps. This standard does not specify values.

CHROMA - The chroma of a color is the degree of its departure from the gray of the same value. If the color of the sample to be tested differs in hue and value from the standard to a degree which prevents judgment as to the relative chroma, the decision shall be based upon Munsell chroma. With respect to any one pigment used within the limitations customary for art materials, the chroma of a chromatic crayon or paint is a measure of the relative amount of pigment it contains. Excepting modeling clay and pastel crayons, this standard sets definite limitations below which the chromas of art materials conforming to this standard may not fall.

DETAIL REQUIREMENTS
WAX CRAYONS

5. Size. Drawing crayons shall be 3 5/8 ins. long and 5/16 in. in diameter.

Kindergarten crayons shall be 4 1/4 ins. long and 7/16 in. in diameter.

The shape may be either round or hexagonal. The measurement of the diameter of the hexagonal crayons shall be the distance between parallel flat sides.

6. Material and workmanship. Wax crayons shall be made of quality pigments, high quality waxes and other essential materials, thoroughly and uniformly molded. They shall be free from grit and other substances that will impair their working properties. The color distribution shall be uniform. They shall not contain in excess of .5 percent free dyestuff.

7. Waxes. The basic ingredients used in wax crayons shall be paraffin wax and stearic acid or equivalent. The paraffin content shall be not less than 40 percent; the stearic acid, or equivalent content shall be not less than 40 percent. The average melting point of the colored crayons shall be not less than 120.0°F (See par. 111).

8. Working qualities. Wax crayons shall have a marking texture which yields color freely without scratching, dragging or smudging. Under normal working conditions there shall be a minimum of flaking or piling. Colors shall blend readily. The crayons shall withstand normal temperature changes without bending.

9. Toxicity. Wax crayons shall not contain lead, arsenic or other toxic materials in excess of .05 percent.

10. Packaging. Each wax crayon shall be wrapped with a printed or colored label indicating the color of the crayon and shall be plainly marked with brand and/or company name. The crayons shall be packed as specified in Simplified Practice Recommendation R192-45, as issued by the National Bureau of Standards.

11. Chroma. The chroma of all chromatically colored wax crayons shall equal or exceed the Munsell chroma specified in table 1 when tested according to paragraphs 110 and 110a.

12. Color range. (Drawing crayons). The color range of wax drawing crayons shall be: black, blue (ultramarine), blue-green, blue-violet, brown (burnt umber), burnt sienna, carmine-red, dark blue (Prussian), dark green, dark red (Indian), gray, green, lavender, light blue, light red (pink), light yellow, magenta, middle blue-green, olive-green, orange, red, red-orange, red-violet, turquoise blue, violet, white, yellow, yellow-green, yellow-ochre (gold-ochre), yellow-orange.

13. Color range. (Kindergarten crayons) The color range of wax kindergarten crayons shall be: black, blue, blue-green, blue-violet, brown, burnt sienna, flesh, gray, green, magenta, orange, red, red-orange, red-violet, turquoise blue, violet, white, yellow, yellow-green, yellow-orange.

PRESSED CRAYONS

14. Size. Drawing crayons shall be 3 1/2 ins. long and 5/16 in. in diameter, or 3 ins. long by 1/4 in. in diameter.

Kindergarten crayons shall be 4 ins. long and 7/16 in. in diameter.

Pressed drawing crayons shall be either round or hexagonal; pressed kindergarten or enlarged drawing crayons shall be either round, hexagonal, or round with one flat side - each to contain an equivalent amount of material by volume, using round dimension as basic, with a tolerance of ± 5 percent by volume.

15. Materials and workmanship. Pressed crayons shall be made of quality pigments together with waxes and other essential materials, thoroughly and uniformly pressed into a homogeneous crayon. They shall be free from grit and other substances that will impair their working properties. The color distribution shall be uniform throughout. They shall not contain in excess of .5 percent free dyestuff.

16. Working qualities. Pressed crayons shall have a marking texture which yields color freely without scratching, dragging or smudging. Under normal working conditions there shall be a minimum of flaking or piling. Colors shall blend readily. They shall withstand normal temperature changes without bending.

17. Toxicity. Pressed crayons shall not contain lead, arsenic, or other toxic materials in excess of .05 percent.

18. Packaging. Each pressed crayon shall be wrapped with a printed or colored label indicating the color of the crayon, and shall be plainly marked with brand and/or company name. The crayons shall be packed in standard type containers as set forth in the Simplified Practice Recommendation R192-45, as issued by the National Bureau of Standards.

19. Chroma. The chroma of all chromatically colored pressed crayons shall equal or exceed the Munsell chroma specified in Table 1 when tested according to paragraphs 110 and 110a.

20. Color range. (Pressed drawing crayons) The color range of pressed drawing crayons shall be: black, blue, blue-green, blue-violet, brown, gray, green, magenta, orange, red, red-orange, red-violet, turquoise blue, violet, white, yellow, yellow-green, yellow-ochre, yellow-orange.

21. Color range. (Kindergarten) The color range of pressed kindergarten crayons shall be: black, blue, blue-green, blue-violet, brown, burnt sienna, flesh, gray, green, magenta, orange, red, red-orange, red-violet, turquoise blue, violet, white, yellow, yellow-green, yellow-orange.

SEMI-MOIST WATER COLORS

22. Size. Semi-moist water colors shall be put up in rectangular pans commonly known as "half-pans", size (inside dimensions) 3/4 in. long, 9/16 in. wide and 1/4 in.deep; "three-quarter pans", size 1 3/16 ins. long, 1/2 in. wide and 1/4 in. deep; and "Full pans", 1 1/4 ins. long, 3/4 in. wide and 1/4 in. deep; or in oval or round pans containing a volume of material equivalent to that held by the half pans.

23. Material and workmanship. Semi-moist water colors shall be manufactured from quality pigments and other essential materials. They shall be thoroughly ground and dispersed in a water-miscible vehicle. They shall be dried to a consistency such that, under normal climatic conditions, the material will not soften and run out of the pans. Semi-moist water colors shall be free from air holes and grit. The pans shall be so filled, that when received, the outer rim of the concave surface of the color material shall extend to the brim of the pan.

24. Working qualities. Semi-moist water colors shall have a smooth, uniform spread and shall dry without gloss. They shall mix satisfactorily with each other to produce intermediate shades, and shall lift readily from the pans when a wet brush is applied.

25. Toxicity. Semi-moist water colors shall not contain lead, arsenic or other toxic materials in excess of .05 percent.

26. Packaging. Semi-moist water colors shall be packed in a rolled-edge metal box 1/ of substantial construction with a hinged cover containing mixing divisions. Each box shall be equipped with a suitable tray which will hold removable water color pans, and the box shall include a suitable No.7 brush. All boxes shall have baked enamel finish on the inside and either lacquer or enamel on the outside. Each box shall bear a brand and/or company name. Semi-moist water color refills shall be packed in metal clips or boxes containing either 6 or 12 half pans.

27. Chroma. The chroma of all chromatically colored semi-moist water colors shall equal or exceed the Munsell chroma specified in table 1 when tested according to paragraphs 110 and 110b.

28. Color range. (Half pans) The color range of semi-moist water colors supplied in half pans shall be: alizarin crimson, black, blue (ultramarine), blue-green, blue-violet, brown (burnt umber), burnt sienna, dark blue (Prussian), gamboge, green, gold, magenta, peacock blue, orange, red (carmine), red-orange, red-violet, silver, turquoise blue, vermilion, violet, white, yellow, yellow-green, yellow-ochre, yellow-orange.

29. Color range. (Three-quarter and full pans) The color range of semi-moist water colors supplied in full pans and three-quarter pans shall be: black, blue, brown, green, magenta, orange, red, red-orange, turquoise blue, violet, white, yellow.

DRY CAKE WATER COLORS

30. Size. Dry cakes shall be 1 1/8 ins. long, 7/16 in. wide and 1/4 in. thick.

31. Material and workmanship. Dry cake water colors shall be manufactured from quality pigments together with other essential materials. The cakes must withstand normal climatic conditions.

32. Working qualities. Dry cake water colors shall have a smooth, uniform spread when applied on water color paper and shall dry without gloss. They shall mix satisfactorily with each other to give clear intermediate tones. The color shall lift readily from the cake when a wet brush is applied.

33. Toxicity. Dry cake water colors shall not contain lead, arsenic, or other toxic materials in excess of .05 percent.

34. Packaging. Dry cake water colors shall be packed in suitable cardboard containers. Each cake shall bear brand and/or company name

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1/ Metal boxes are standard packaging, but due to war restrictions, cardboard boxes may be used until such time as restrictions on labor and metal are removed.

35. Chroma. The chroma of all chromatically colored dry cake water colors shall equal or exceed the Munsell chroma specified in table 1 when tested according to paragraphs 110 and 110c.

36. Color range. The color range of the dry cake water colors shall be: alizarin crimson, black, blue, brown, carmine-red, green, orange, turquoise blue, violet, white, yellow.

LIQUID TEMPERA

37. Material and workmanship. Liquid tempera shall be made from quality pigments and other essential materials, ground and dispersed in a suitable water-miscible vehicle, which when thoroughly stirred, will be ready for immediate use.

38. Working qualities. Liquid tempera colors shall have a smooth uniform spread. They shall brush easily and adhere evenly on illustration board without flaking or chipping. They shall dry to a clean velvety matt finish. They shall intermix readily, giving clear intermediate tones without streaking. They shall not bleed, chip or peel when one color is applied over a dried coat of another color.

39. Preservatives. Liquid tempera colors shall contain the necessary preservatives so that they will keep for at least one year without decomposition.

40. Toxicity. Liquid tempera colors shall not contain lead, arsenic or other toxic metals in excess of .05 percent.

41. Packaging. Liquid tempera colors shall be packed in glass jars. Each jar and container shall bear the name of color, brand and/or company name.

42. Chroma. The chroma of all chromatically colored liquid tempera shall equal or exceed the Munsell chroma specified in table 1 when tested according to paragraphs 110 and 110d.

43. Color range. The color range of liquid tempera shall be: black, blue (ultramarine), blue-green, blue-violet, brown (burnt umber), burnt sienna, dark blue (Prussian), dark green, dark red, emerald green, gold, gray, green, magenta, lavender, medium yellow, orange, red, red-orange, red-violet, silver, turquoise blue, vermilion, violet, white, yellow, yellow-green, yellow-ochre, yellow-orange.

POWDER TEMPERA

44. Materials and workmanship. Powder tempera shall be made of quality pigments, sizing, preservatives and other essential materials. They shall be intimately ground and mixed in such a manner as to insure a smooth uniform powder sufficiently fine, when wet, to pass through a 325 mesh screen. The powder shall flow freely from the canister.

45. Working qualities. Powder tempera shall be so compounded that, when mixed with water, it will produce liquid color readily. The colors shall have a smooth uniform spread. They shall brush easily and adhere evenly on drawing paper without flaking or chipping. The colors shall not bleed, chip or peel when one color is applied over a dried coat of another color.

46. Preservatives. Powder tempera shall contain the necessary preservatives so that when mixed with water, it will remain undecomposed for one month.

47. Toxicity. Powder tempera shall contain no lead, arsenic, or other toxic metals in excess of .05 percent.

48. Packaging. Powder tempera shall be packed in cardboard canisters having an average minimum content of 16 ozs.by weight and equipped with a sealed pouring opening. The canister shall bear a label containing printed instructions for use and shall be plainly marked with name of color, brand and/or company name.

49. Chroma. The chroma of all chromatically colored powder tempera shall equal or exceed the Munsell chroma specified in table 1 when tested according to paragraphs 110 and 110e.

50. Color range. The color range of powder tempera shall be: black, blue (ultramarine), blue-green, blue-violet, brown (burnt umber), burnt sienna, dark blue (Prussian), dark green, gold, gray, green, magenta, orange, red, red-violet, red-orange, silver, turquoise blue, violet, white, yellow, yellow-green, yellow-orange, extending white.

TYPE "A" WHITE DUSTLESS BLACKBOARD CRAYONS

51. Size. Crayons shall be 3 1/4 ins. long and 3/8 in. in diameter.

52. Material and workmanship. Type "A" dustless blackboard crayons shall be made of high quality levigated whiting and other essential materials. The whiting content shall be not less than 90 percent. The crayons shall be free from grease, grit and sandy abrasives. They shall register a highly visible and distinct mark that can be easily erased.

53. Transverse strength. The strength of Type "A" white dustless blackboard crayons shall be such that if a crayon is supported at points 2 1/2 ins. apart and a weight applied midway between the supports, the average transverse breaking strength shall be not less than four pounds.

54. Packaging. Type "A" white distless blackboard crayons shall be packed as specified in the Simplified Practice Recommendation R192-45 as issued by the National Bureau of Standards. Each package shall be properly identified with brand and/or company name.

TYPE "B" WHITE DUSTLESS BLACKBOARD CRAYONS

55. Size. Crayons shall be 3 1/4 ins. long and 3/8 in. in diameter.

56. Material and workmanship. Type "B" white dustless blackboard crayons shall be made of high quality levigated whiting and other essential materials. The whiting content shall be not less than 45 percent. The crayons shall be free from grease, grit and sandy abrasives. They shall register a highly visible and distinct mark that can be easily erased.

57. Transverse strength. The strength of Type "B" dustless blackboard crayons shall be such that if a crayon is supported at points 2 1/2 ins. apart and a weight applied midway between the supports, the average transverse breaking strength shall be not less than four pounds.

58. Packaging. Type "B" white dustless blackboard crayons shall be packed as specified in Simplified Practice Recommendation R192-45, as issued by the National Bureau of Standards. Each package shall be properly identified with brand and/or company name.

SIGHT SAVING DUSTLESS BLACKBOARD CRAYONS

59. Size. Crayons shall be 3 1/4 ins. long and 3/8 in. in diameter.

60. Materials and workmanship. Dustless sight saving blackboard crayons shall be made of high quality levigated whiting, organic coloring, and other essential materials. The whiting content shall be not less than 70 percent. The crayons shall be free from grease, grit, and sandy abrasives. They shall contain a very small amount of non-toxic, non-staining, organic coloring material so as to render a light yellow, distinct mark that can be easily erased and which under adequate illumination, may be read from all parts of the average classroom. They shall not contain in excess of .5 percent free dyestuff.

61. Transverse strength. The strength of sight saving dustless blackboard crayons shall be such that if a crayon is supported at two points 2 1/2 ins. apart and a weight applied midway between the supports, the average transverse breaking strength shall be not less than four pounds.

62. Toxicity. Sight saving dustless blackboard crayons shall not contain lead, arsenic or other toxic materials in excess of .05 percent.

63. Packaging. Sight saving dustless blackboard crayons shall be packed as specified in the Simplified Practice Recommendation R192-45, as issued by the National Bureau of Standards. Each package shall be properly identified with brand and/or company name.

64. Chroma. The chroma of sight saving dustless blackboard crayons shall not exceed 6.5 when tested according to paragraphs 110 and 110f.

COLORED DUSTLESS CRAYONS

65. Size. Colored dustless crayons shall be supplied in two sizes: (1) 3 1/4 ins. long and 3/8 in. in diameter, (2) 2 3/4 ins. long and 7/16 in. in diameter.

66. Material and workmanship. Colored dustless crayons shall be made of quality pigments, high quality levigated whiting and other essential materials. The crayons shall be free from grit, hard spots and sandy abrasives. They shall not contain in excess of .5 percent free dyestuff.

67. Working qualities. Colored dustless crayons shall be soft, velvety and pastel-like in texture. They shall have such firmness of stick as to be adaptable for various shcool uses without wasteful breakage or crumbling.

68. Toxicity. Colored dustless crayons shall not contain lead, arsenic, or other toxic materials in excess of .05 percent.

69. Packaging. Colored dustless crayons shall be packed as specified in the Simplified Practice Recommendation R192-45 as issued by the National Bureau of Standards. Each package to be properly identified with brand and/or company name.

70. Chroma. The chroma of all chromatically colored dustless crayons shall equal or exceed the Munsell chroma specified in table 1 when tested according to paragraphs 110 and 110f.

71. Color range. The color range of colored dustless crayons shall be: black, blue (ultramarine), blue-green, blue-violet, brown (burnt umber) burnt sienna, dark blue(Prussian), dark green, dark red, flesh, gray, green, light red (pink), magenta, olive-green, orange, red, red-orange, red-violet, turquoise blue, violet, white, yellow, yellow-green, yellow-ochre, yellow-orange.

MOLDED SIGHT SAVING BLACKBOARD CRAYONS

72. Size. Crayons shall be 3 3/16 ins. long and 7/16 in. in diameter at one end, tapering to 3/8 in. in diameter.

73. Material and workmanship. Molded sight saving blackboard crayons shall be made of not less than 90 percent calcium sulphate, and other essential materials. The crayons shall be free from grit, hard spots, sandy abrasives and air spaces. They shall contain a very small amount of non-toxic, non-staining, organic coloring material so as to render a light yellow, distinct mark that can be easily erased and which, under adequate illumination, may be read from all parts of the average classroom.

74. Packaging. Molded sight saving blackboard crayons shall be packed as specified in the Simplified Practice Recommendation R192-45, as issued by the National Bureau of Standards. Each package shall be properly identified with brand and/or company name.

75. Chroma. The chroma of molded sight saving blackboard crayons shall not exceed 6.5 when tested according to paragraphs 110 and 110f.

MOLDED WHITE CHALK CRAYONS

76. Size. Crayons shall be 3 3/16 ins. long and 7/16 in. in diameter at one end, tapering to 3/8 in. in diameter.

77. Material and workmanship. Molded white chalk crayons shall be made of not less than 90 percent calcium sulphate, and other essential materials. The crayons shall be free from grit, hard spots, sandy abrasives and air spaces. They shall register a highly visible and distinct mark that can be easily erased and shall have such firmness of stick as to be adaptable to ordinary classroom use without wasteful breaking.

78. Enameled white chalk. Enameled white chalk shall have a satisfactory protective coating which shall not contain in excess of .05 percent toxic material.

79. Packaging. Molded white chalk crayons shall be packed as specified in Simplified Practice Recommendation R192-45, as issued by the National Bureau of Standards. Each package shall be properly identified with brand and/or company name.

MOLDED COLORED CHALK CRAYONS

80. Size. Crayons shall be 3 3/16 ins. long and 7/16 in. in diameter at one end, tapering to 3/8 in. in diameter.

81. Material and workmanship. Molded colored chalk crayons shall be made of quality pigments, calcium sulphate, and other essential materials. The crayons shall be free from grit, hard spots and sandy abrasives.

82. Working qualities. Molded colored chalk crayons shall be soft and velvety and pastel-like in texture. The crayons shall have such firmness of stick as to be adaptable for various art uses without wasteful breakage or crumbling.

83. Toxicity. Molded colored chalk crayons shall not contain lead, arsenic or other toxic materials in excess of .05 percent.

84. Packaging. Molded colored chalk crayons shall be packed as specified in the Simplified Practice Recommendation R192-45, as issued by the National Bureau of Standards. Each package shall be properly identified with brand and/or company name.

85. Chroma. The chroma of all chromatically colored molded chalk crayons shall equal or exceed the Munsell chroma specified in table 1 when tested according to paragraphs 110 and 110f.

86. Color range. The color range of molded colored chalk crayons shall be: black, blue (ultramarine), brown (burnt umber), burnt sienna, dark green, blue-green, blue-violet, dark blue (Prussian), dark red, flesh, gray, green, light red (pink), magenta, olive-green, orange, red, red-orange, red-violet, turquoise blue, violet, white, yellow, yellow-green, yellow-ochre, yellow-orange.

LECTURERS' COLORED CHALK CRAYONS

87. Size. Lecturers' colored chalk crayons shall be supplied in one size, 3 ins. long, 1/2 in. wide and 1/2 in. thick.

88. Materials and workmanship. Lecturers' colored chalk crayons shall be made of quality pigments, calcium sulphate and other essential materials. The crayons shall be free from grit, hard spots and sandy abrasives. They shall not contain in excess of .5 percent free dyestuff.

89. Working qualities. Lecturers' colored chalk crayons shall be soft, velvety and pastel-like in texture and shall have such firmness of stick as to be adaptable for various classroom uses without wasteful breakage or crumbling.

90. Toxicity. Lecturers' colored chalk crayons shall not contain lead, arsenic or other toxic materials in excess of .05 percent.

91. Packaging. Lecturers' colored chalk crayons shall be packed as specified in the Simplified Practice Recommendation R192-45, as issued by the National Bureau of Standards. Each package shall be properly identified with brand and/or company name.

92. Chroma. The chroma of all chromatically colored lecturers' chalk crayons shall equal or exceed the Munsell chroma specified in table 1 when tested according to paragraphs 110 and 110f.

93. Color range. The color range of lecturers' chalk crayons shall be: black, blue (ultramarine), blue-green, blue-violet, brown (burnt umber), burnt sienna, dark blue (Prussian), dark green, dark red, flesh, gray, green, light red (pink), magenta, olive-green, orange, red, red-orange, red-violet, turquoise blue, violet, white, yellow, yellow-green, yellow-ochre, yellow-orange.

LECTURERS' COLORED DUSTLESS CRAYONS

94. Size. Lecturers' colored dustless crayons shall be supplied in one size, 3 ins. long, 1/2 in. wide and 1/2 in. thick.

95. Material and workmanship. Lecturers' colored dustless crayons shall be made of quality pigments, high quality levigated whiting and other essential materials. The crayons shall be free from grit, hard spots and sandy abrasives. They shall not contain in excess of .5 percent free dyestuff.

96. Working qualities. Lecturers' colored dustless crayons shall be soft, velvety and pastel-like in texture. They shall have such firmness of stick as to be adaptable for various school uses without wasteful breakage or crumbling.

97. Toxicity. Lecturers' colored dustless crayons shall not contain lead, arsenic or other toxic materials in excess of .05 percent.

98. Packaging. Lecturers' colored dustless crayons shall be packed as specified in the Simplified Practice Recommendation R192-45, as issued by the National Bureau of Standards. Each package to be properly identified with brand and/or company name.

99. Chroma. The chroma of all chromatically colored lecturers' dustless crayons shall equal or exceed the Munsell chroma specified in table 1 when tested according to paragraphs 110 and 110f.

100. Color range. The color range of lecturers' dustless crayons shall be: black, blue (ultramarine), blue-green, blue-violet, brown (burnt umber), burnt sienna, dark blue (Prussian), dark green, dark red, flesh, gray, green, light red (pink), magenta, olive-green, orange, red, red-orange, red-violet, turquoise blue, violet, white, yellow, yellow-green, yellow-ochre, yellow-orange.

PASTEL CRAYONS

101. Size. Pastel crayons shall be supplied in the following size: 3 ins. long by 1/4 in. in diameter.

102. Material and workmanship. Pastel crayons shall be made of quality pigments, high quality levigated whiting and other essential materials. The crayons shall be free from grit, hard spots and sandy abrasives. They shall not contain in excess of .5 percent free dyestuff.

103. Working qualities. Pastel crayons shall have a soft, velvety texture. The colors shall be intense and cover perfectly; they shall blend readily when used on paper and shall erase easily from the blackboard.

104. Toxicity. Pastel crayons shall not contain lead, arsenic, or other toxic materials in excess of .05 percent.

105. Packaging. Pastel crayons shall be packed as specified in the Simplified Practice Recommendation R192-45 as issued by the National Bureau of Standards. Each package to be properly identified with brand and/or company name.

106. Color range. The color range of pastel crayons shall be: black, blue (ultramarine), blue green, blue violet, brown (burnt umber), burnt sienna, dark blue (Prussian), dark green, dark red, dark yellow, gray, green, light red (pink), magenta, orange, red,

red-orange, red-violet, turquoise blue, violet, white, yellow, yellow-green, yellow orange.

MODELING CLAY

107. Material and workmanship. Modeling clay shall consist essentially of a plastic clay and a grease-type binder, ready to use and of such a putty-like consistency that it can be easily worked and kneaded with the hands of a small child, yet of sufficient body to retain its shape when molded into various finished objects.

108. Working qualities. Modeling clay shall be sufficiently plastic so that a 1/2-inch cylinder can be either pulled apart without tearing or fashioned into small rings or spirals without cracking or breaking apart. It shall be harmless to use, non-staining, and shall maintain its satisfactory working qualities over a period of 18 months. It shall be responsive to either fashioning with the fingers or with ordinary modeling tools.

109. Packaging. Modeling clay shall be packed as specified in the Simplified Practice Recommendation R192-45 as issued by the National Bureau of Standards. Each package to be properly identified with brand and/or company name.

METHODS OF TEST

110. Chroma. The chroma of color materials shall be found by applying a sample of the crayon or paint to a specified ground, and then determining the chroma by reference to the Munsell Book of Color, (1929) Standard or Abridged Edition. Specified procedures for each material are described in paragraphs 110a to 110f inclusive Paints shall be allowed to dry to constant chroma before determination.

110a. Wax and pressed crayons. Make solid rub-out on white drawing paper.

110b. Semi-moist water colors. Prepare paint as follows:

5 parts semi-moist color (by weight)
10 parts water (by weight)
Mix thoroughly and brush paint on white drawing paper.

110c. Dry cake water colors. Prepare paint as follows:

5 parts dry cake water color (by weight)
10 parts water (by weight)
Mix thoroughly and brush paint on white drawing paper.

110d. Liquid tempera. Stir liquid tempera thoroughly. Brush paint on white illustration board.

110e. Powder tempera. Prepare the paint as follows:

20 parts powder tempera (by weight)
12 parts water (by weight)
Mix thoroughly and brush paint on white illustration board.

110f. Dustless and molded chalk crayons. Make solid rub-out on drawing paper.

111. Melting point of wax crayons. Melting point shall be determined according to ASTM Designation D87-42.

GUARANTEE

112. It is recommended that color materials for art education in shcools shall be guaranteed by including the following statement on labels, invoices, contracts, etc.:

"The (manufacturer) guarantees this (material) to conform with the requirements of Commercial Standard CS - , as issued by the National Bureau of Standards of the United States Department of Commerce."

113. On small labels, when space does not permit use of the full statement, the commercial standard number "CS - " may be used for identification, and when so used signifies that the contained material conforms to the applicable requirements of this standard.

APPENDIX

Colors of chroma standards. In table 2 are given the color designations of the chroma standards, according to the ISCC-NBS 2/ method 3/ The purpose of table 2 is to furnish an approximate indication of the colors to be expected under the various color material names, but the designations are not to be construed as requirements of the standard; it is intended that colors that are not close matches of the colors selected as chroma standards shall be obtainable under the standard. (See definitions of hue and value in paragraph 4.) It is to be noted, further, that the colors of several of the chroma standards lie at or near the boundary lines of the designations assigned, where a barely perceptible difference will place the colors in the adjacent areas, carrying different designations.

2/ Inter-Society Color Council - National Bureau of Standards.

3/ Method of Designating Colors, by Judd and Kelly, National Bureau of Standards Research Paper RP1239. Obtainable from the Superintendent of Documents, Washington 25, D.C., for 10 cents per copy.

Table 1. MUNSELL CHROMA

Color name	Wax crayons	Pressed crayons	Water Colors	Tempera		Dust-less crayon	Molded chalk
				Liquid	Powder		
Alizarin crimson			11.5				
Blue(Ultramarine)	15.0	13.0	14.9	16.7	15.0	14.0	14.5
Blue-green	8.0	3.5	7.6	7.5	7.0	8.5	7.5
Blue-violet	15.0	8.0	12.5	8.8	12.5	12.5	11.5
Brown(burnt umber)	4.0	3.5	4.5	2.0	3.5	4.5	5.0
Burnt sienna	6.0		7.0	4.5	5.5	10.0	5.5
Carmine red	14.5		12.0				
Dark blue(Prussian)	4.5		5.0	7.2		11.5	12.0
Dark green	5.5			5.0	4.0	6.0	9.0
Dark red(Indian)	6.0			14.0		6.0	10.0
Emerald green				7.5			
Flesh						5.5	5.5
Gamboge			14.0				
Gold			4.5	5.5	4.5		
Green	10.0	8.0	9.5	8.0	9.5	4.5	5.0
Lavender	9.5			10.0			
Light blue	10.0						
Light red (pink)	13.5					13.3	
Light yellow	7.5						
Magenta	14.0	13.0	16.8	15.2	16.2	14.5	14.0
Medium yellow				11.5			
Middle blue-green	7.5						
Olive-green	6.0					3.5	
Orange	14.5	13.5	15.5	16.0	15.0	14.0	10.0
Red	15.0	12.0		14.5	13.0	13.5	12.5
Red-orange	14.0	12.0	15.0	16.0	13.5	12.0	12.0
Red-violet	12.5	10.0	13.0	12.5	14.5	10.0	12.0
Turquoise blue	10.0	9.0	10.5	11.5	9.4	7.5	8.0
Vermilion			14.0				
Violet	11.5	7.5	11.0	12.0	6.0	8.0	10.0
Yellow	9.5	10.0	12.5	13.0	13.5	9.0	9.0
Yellow-green	9.5	9.0	9.0	13.5	10.0	6.5	9.5
Yellow-ochre	8.5	7.5	8.0	8.5		5.5	
yellow-orange	15.0	9.0	12.5	16.0	11.5	14.0	9.5

Note: Chroma standards for a few colors of some materials have not yet been selected or determined; these will be added when practical.

Table 2. Chroma Standards - Color Designations

Color Material Name	Designation - (ISCC-NBS Method)						
	Wax crayons	Pressed crayons	Water colors	Liquid tempera	Powder tempera	Dustless crayon	Molded chalk
Alizarin crimson			Strong purplish red				
Blue (Ultramarine)	Vivid purplish blue	Vivid purplish blue	Vivid purplish blue	Vivid purplish blue	Vivid bluish purple	Vivid purplish blue	Vivid purplish blue
Blue-green	Strong greenish blue	Moderate blue-green	Strong blue-green	Strong greenish blue	Strong greenish blue	Strong greenish blue	Strong greenish blue
Blue-violet	Vivid Bluish purple	Moderate bluish purple	Strong bluish purple	Dark bluish purple	Strong bluish purple	Strong bluish purple	Strong bluish purple
Brown (burnt umber)	Weak reddish brown	Weak reddish brown	Light brown	Weak brown	Weak reddish brown	Moderate brown	Moderate brown
Burnt sienna	Moderate brown		Dark orange	Weak reddish brown	Moderate brown	Dark reddish orange	Moderate reddish brown
Carmine red	Vivid purplish red		Strong purplish red				
Dark blue (Prussian)	Dusky purplish blue		Dark purplish blue	Dark bluish purple		Strong purplish blue	Strong purplish blue
Dark green	Moderate green			Dark green	Dark green	Moderate green	Strong green
Dark red (Indian)	Moderate purplish red	Weak red		Vivid red		Moderate reddish brown	Dark reddish orange
Emerald green				Moderate yellowish green			
Flesh						Moderate pink	Moderate pink
Gamboge			Vivid yellow				
Green	Brilliant green	Brilliant green	Brilliant green	Strong green	Strong green	Weak yellowish green	Light green
Lavender	Strong bluish purple			Strong bluish purple			
Light blue	Brilliant purplish blue						
Light red (Pink)	Vivid red purple					Strong purplish pink	
Light yellow	Light greenish yellow						
Magenta	Vivid red purple	Vivid red purple	Vivid red purple	Vivid red purple	Vivid red purple	Vivid red purple	Vivid red purple
Medium yellow				Strong yellow			
Middle blue-green	Strong blue-green						
Olive-green	Dark greenish yellow					Light olive	
Orange	Strong orange	Strong orange	Vivid orange	Vivid orange	Vivid reddish orange	Strong orange	Moderate orange
Red	Vivid red	Strong purplish red		Vivid red	Deep reddish orange	Vivid purplish red	Brilliant purplish red
Red-orange	Strong reddish orange	Strong reddish orange	Vivid reddish orange	Vivid reddish orange	Strong reddish orange	Strong red	Strong red
Red-violet	Strong reddish purple	Strong reddish purple	Vivid reddish purple	Deep reddish purple	Vivid reddish purple	Strong reddish purple	Strong reddish purple
Turquoise blue-	Brilliant greenish blue	Brilliant greenish blue	Brilliant greenish blue	Strong blue	Strong blue	Brilliant greenish blue	Light blue
Vermilion			Strong reddish orange				
Violet	Strong bluish purple	Moderate bluish purple	Strong bluish purple	Strong bluish purple	Very dark purple	Moderate bluish purple	Strong bluish purple
Yellow	Strong greenish yellow	Brilliant greenish yellow	Strong yellow	Vivid yellow	Vivid yellow	Brilliant greenish yellow	Brilliant yellow
Yellow-green	Brilliant yellow green	Brilliant yellowish green	Brilliant yellow green	Vivid yellowish green	Brilliant yellowish green	Light yellow green	Brilliant yellowish green
Yellow-ochre	Moderate yellowish orange	Dark yellowish orange	Moderate yellowish orange	Dark yellowish orange		Weak yellowish orange	
Yellow-orange	Vivid orange	Moderate orange	Strong orange	Vivid orange	Strong orange	Strong yellowish orange	Moderate yellowish orange

ACCEPTANCE OF RECOMMENDED COMMERCIAL STANDARD

(Please retain this copy for your files)

Date . . . . . .

Division of Trade Standards,
National Bureau of Standards,
Washington 25, D.C.

Gentlemen:

We believe that the Recommended Commercial Standard, TS-3961, constitutes a useful standard of practice, and we individually plan to utilize it as far as practicable in the

production 1/ distribution 1/ purchase 1/ testing 1/

of Color Materials for Art Education in Schools beginning January 1, 1946. We reserve the right to depart from it as we deem advisable.

We understand, of course, that only those articles which actually comply with the standard in all respects can be identified or labeled as conforming thereto.

Please advise us when this standard is promulgated and send us a printed copy when available.

Signature of
authorized officer _____
(in ink)

(Kindly typewrite or print the following lines)

Name and title
of above officer. . . . . .

Organization. . . . . .
(Fill in exactly as it should be listed in pamphlet)
If the acceptance represents an individual only, indicate your organization in parentheses.

Street address . . . . . .

City, Zone, and State. . . . . .

1/ Underscore which one. Please see that separate acceptances are filed for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related interests, trade associations, trade papers, etc., desiring to record their general support, the words "General Support" should be added after the signature.

TO THE ACCEPTOR

The following statements answer the usual questions arising in connection with the acceptance and its significance:

1. Enforcement.--Commercial standards are commodity specifications voluntarily established by mutual consent of those concerned. They present a common basis of understanding between the producer, distributor, and consumer and should not be confused with any plan of governmental regulation or control. The United States Department of Commerce has no regulatory power in the enforcement of their provisions, but since they represent the will of the interested groups as a whole, their provisions through usage soon became established as trade customs, and are made effective through incorporation into sales contracts by means of labels, invoices and the like.

2. The acceptor's responsibility.--The purpose of commercial standards is to establish for specific commodities, nationally recognized grades or consumer criteria and the benefits therefrom will be measurable in direct proportion to their general recognition and actual use. Instances will occur when it may be necessary to deviate from the standard and the signing of an acceptance does not preclude such departures; however, such signature indicates an intention to follow the commercial standard where practicable, in the production, distribution, or consumption of the article in question.

3. The Department's responsibility.--The major function performed by the Department of Commerce in the voluntary establishment of commercial standards on a Nation-wide basis is fourfold; first, to act as an unbiased coordinator to bring all interested parties together for the mutually satisfactory adjustment of trade standards; second, to supply such assistance and advice as past experience with similar programs may suggest; third, to canvass and record the extent of acceptances and adherence to the standard on the part of producers, distributors, and users; and fourth, after acceptance, to publish and promulgate the standard for the information and guidance of buyers and sellers of the commodity.

4. Announcement and promulgation.--When the standard has been endorsed by a satisfactory majority of production or consumption in the absence of active, valid opposition, the success of the project is announced. If, however, in the opinion of the standing committee or the Department of Commerce, the support of any standard is inadequate, the right is reserved to withhold promulgation and publication.