

ROBERT RIDGWAY

COLOR STANDARDS
AND
COLOR NOMENCLATURE

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COLOR STANDARDS AND COLOR NOMENCLATURE

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National Museum.

With Fifty-three Colored Plates
and
Eleven Hundred and Fifteen Named Colors.

WASHINGTON, D. C.
1912.

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by
Robert Ridgway

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A. HOEN & COMPANY
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TO
Señor Don JOSÉ C. ZELEDÓN
OF
SAN JOSÉ, COSTA RICA

True and steadfast friend for more than two-score years; host, guide, and companion on excursions among the glorious forests, magnificent mountains, and lovely plains of his native land; whose encouragement made possible the completion of a seemingly hopeless task, this book is affectionately and gratefully dedicated.

PREFACE

THE motive of this work is THE STANDARDIZATION OF
COLORS AND COLOR NAMES.

The terminology of Science, the Arts, and various Industries has been a most important factor in the development of their present high efficiency. Measurements, weights, mathematical and chemical formulæ, and terms which clearly designate practically every variation of form and structure have long been standardized; but the nomenclature of colors remains vague and, for practical purposes, meaningless, thereby seriously impeding progress in almost every branch of industry and research.

Many works on the subject of color have been published, but most of them are purely technical, and pertain to the physics of color, the painter's needs, or to some particular art or industry alone, or in other ways are unsuited for the use of the zoologist, the botanist, the pathologist, or the mineralogist; and the comparatively few works on color intended specially for naturalists have all failed to meet the requirements, either because of an insufficient number of color samples, lack of names or other means of easy identification or designation, or faulty selection and classification of the colors chosen for illustration. More than twenty years ago the author of the present work attempted to supply the deficiency by the publication of a book* containing 186 samples of named

*A | Nomenclature of Colors | for Naturalists, | and | Compendium of Useful Knowledge | for Ornithologists. | By | Robert Ridgway, | Curator, Department of Birds, United States National Museum. | With ten colored plates and seven plates | of outline illustrations. | Boston : | Little, Brown, and Company. | 1886. | (12mo., pp. 129, pls. 17.)

The subject of color and color nomenclature discussed on pages 15-58. Plates i-x, inclusive, represent 186 named colors, hand-painted (stencilled).

colors, but the effort was successful only to the extent that it was an improvement on its predecessors; and, although still the standard of color nomenclature among zoologists and many other naturalists, it nevertheless is seriously defective in the altogether inadequate number of colors represented, and in their unscientific arrangement. Fully realizing his failure, the author, some two or three years later, began to devise plans, gather materials, and acquire special knowledge of the subject, in the hope that he might some day be able to prepare a new work which would fully meet the needs of all who have use for it. Unfortunately, his time has been so fully occupied with other matters that progress has necessarily been slow; but after more than twenty years of sporadic effort it has at last been completed.

Acknowledgments are due to so many friends for helpful suggestions that it is hardly possible to name them all, or to specify the extent or kind of help which each has rendered; but special mention should be made of Mr. LEWIS E. JEWELL, of Johns Hopkins University; Dr. R. M. STRONG, of the University of Chicago; Prof. W. J. SPILLMAN, of the U. S. Department of Agriculture; Mr. WILLIAMS WELCH, of the U. S. Signal Service; Mr. MILTON BRADLEY, of Springfield, Mass.; Dr. P. G. NUTTING, of the U. S. Bureau of Standards; Mr. P. L. RICKER, of the Bureau of Plant Industry, U. S. Department of Agriculture; and Mr. J. L. RIDGWAY, of the U. S. Geological Survey. The late Professor S. P. LANGLEY, then Secretary of the Smithsonian Institution, was good enough to take a kindly interest in this undertaking and gave the author assistance for which he is glad to make acknowledgment. More than to all others, however, is the author deeply indebted to Mr. JOHN E. THAYER, of Lancaster, Mass., and Señor Don JOSÉ C. ZELEDÓN, of San José, Costa Rica, for aid so indispensable that without it the work could not have been completed.

To Dr. G. GRÜBLER & Co., of Leipzig, Germany, the author is under obligations for the gift of a nearly complete set of their celebrated coal-tar dyes, which have proven quite necessary to the work, especially in the coloring of the Maxwell disks on which the color scheme is based.

The reproduction of the plates has been a difficult matter, involving not only expensive experimentation, but more than three

years of unremitting labor. Vastly different from the ordinary lines of commercial color work, the correct copying of each one of the 1115 colors of the original plates developed many perplexing and often discouraging problems, which were finally solved through Mr. A. B. HOEN's expert knowledge of chemistry and pigments; the skill, industry, and patience of the firm's head colorist, Mr. FRANK PORTUGAL, and the personal interest of both these gentlemen. It is, therefore, with the greatest pleasure that the author's grateful acknowledgment is made to the firm of A. HOEN & COMPANY for the satisfactory manner in which they have fulfilled their contract.

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PROLOGUE

As stated in the Preface, the purpose of this work is the standardization of colors and color nomenclature, so that naturalists or others who may have occasion to write or speak of colors may do so with the certainty that there need be no question as to what particular tint, shade, or degree of grayness, of any color or hue is meant. Therefore, it is unnecessary to treat of the subject from any other point of view; it will be sufficient to say that this work is based on a thorough study of the subject from every standpoint, and that practically all authoritative works on the subject of color have been carefully consulted.*

PLAN.—The scientific arrangement of colors in this work is based essentially on the suggestions of Professor J. H. Pillsbury for a scheme of color standards,† which have also been the basis of several other efforts toward the same end, as the plates in Milton Bradley's "Elementary Color" and educational colored papers, Prang's charts of standard colors, Klinkseick and Valette's "Code des Couleurs," etc.; but while all these present a scientifically arranged color-scheme and more or less adequate

*Titles of several books on the subject which are especially recommended to the lay student of chromatology are given at the end of this text.

†See *Science*, June 9, 1893, and *Nature*, Vol. LII, No. 1347, Aug. 22, 1895, pp. 390-392.

number of colors they all fail to supply a ready or convenient means of identifying and designating the colors—the principal utility of a work of this kind. It is in the latter respect that the present work is believed to meet, more nearly than any other at least, this essential requirement, and in this consists whatever originality may be claimed for it.

The “key” to the classification or arrangement herewith presented is, of course, the solar spectrum, with its six fundamental colors and intermediate hues, augmented by the series of hues connecting violet with red, which the spectrum fails to show. If, with the red-violets and violet-reds thus added to the spectrum hues, the band forming this scale be joined end to end a circle is formed in which there is continuously a gradual change of hue, step by step, from red through orange-red and red-orange to orange; orange through yellow-orange and orange-yellow to yellow; yellow through green-yellow and yellow-green to green; green through blue-green and green-blue to blue; blue through violet-blue and blue-violet to violet; and violet through red-violet and violet-red to red—the starting-point—with intermediate connecting hues. In the solar spectrum, both prismatic and grating, but especially the former, the spaces between the adjoining distinct colors are very unequal; therefore for the present purpose an ideal scale must be constructed, so that an approximately equal number of equally distinct connecting hues shall be shown. Distinctions of hue appreciable to the normal eye are so very numerous* that the criterion of convenience or practicability must determine the number of segments into which the ideal chromatic scale or circle may be divided in order to best serve the purpose in view. Careful experiment seems to have

*According to Aubert more than 1000 hues are distinguishable in the spectrum, though among them all the hues between violet and red are wanting.

demonstrated that thirty-six is the practicable limit, and accordingly that number has been adopted.* If the number of intermediate hues were equal in all cases there would, in this scheme, be five between each two adjacent fundamental colors of the spectrum; but a greater number of recognizably distinct hues is obviously necessary in some cases than in others; for example, spectrum orange is decidedly nearer in hue to red than to yellow, and therefore the number of intermediates required on each side of the orange is different, being in the proportion of four for the red-orange series to five for the orange-yellow, and similarly six are required for the violet-red series, while four suffice for the blue-violet hues.

There is no known means by which we can measure the proportion of two or more *pigments* in any given mixture, "because color-effect cannot be measured by the pint of mixed paint or the ounce of dry pigment;"† but, fortunately, we have a very exact method, in the color-wheel and Maxwell disks, by which the relative proportions of two or more *colors* in any mixture may be precisely measured. This method has been used in the painting of every one of the 1115 colors of the present work, by means of one disk to represent each one of the thirty-six colors (both pure and "broken"), together with a black, a white, and a neutral gray disk, the last being a match in color to the gray resulting from the mixture of red, green and violet on the color-wheel;‡ the neutral gray disk, however, being used only for the making of disks for the broken series of colors (' , " , "" , "" , and "") and for the scale of neutral grays (Plate

*That is to say, the practical limit for pictorial representation of the colors in their various modifications.

†Milton Bradley: *Elementary Color*, p. 18.

‡See colored figure on frontispiece.

LIII.) These colored disks are slit on one side from center to circumference, and therefore by interlocking two or more they may be adjusted so that either occupies any desired percentage of the whole area, which may be very precisely determined by a scale of 100 segments shown on the outer edge of a larger disk on which the colored disks are superimposed. When connected with the color-wheel and adjusted as may be desired, and then rapidly revolved, the two or more distinct colors resolve themselves into a single uniform composite color, whose elements are shown, in their relative proportion, by the scale surrounding the disks.*

The scales (both horizontal and vertical) of the present work are all prepared directly from definite color-wheel formulæ, based on carefully calculated curves; the thirty-six pure spectrum hues, represented

*See the colored figure on the frontispiece of this work, which clearly illustrates this method of color measurement. Larger disks of spectrum red, green, and violet are interlocked and adjusted so that they present, respectively, 32, 42, and 26 per cent. of the circumference; superimposed on these is a single smaller disk of neutral gray, and on this two still smaller disks of black and white, the former occupying 79, the latter 21, per cent. of the area. The result of this combination of colors, when the disks are rapidly revolved, is that the entire surface becomes a uniform neutral gray precisely like the middle disk, which blends so completely with the color inside and outside its limits that no trace of division can be detected. Hence, neutral gray equals a combination of red 32, green 42, and violet 26 per cent., and also equals a combination of black 79 and white 21 per cent. As further illustrating the point, it may be mentioned that not only does the above-mentioned combination of the three primary colors equal neutral gray but so also does the combination of any color ("secondary" or "tertiary" as well as primary) with its complementary, though the darkness or lightness of the gray varies somewhat, as the following table shows:

| SPECTRUM COLOR. | | COMPLEMENTARY COLOR. | | EQUIVALENT GRAY. | |
|-----------------|-----------|----------------------|--------------------------|------------------|--------|
| Name. | Per Cent. | Per Cent. | Composition. | Black. | White. |
| Red | 44 | 56 | Blue 41 + Green 59. | 72.5 | 27.5 |
| Orange..... | 28.5 | 71.5 | Blue 51.5 + Green 48.5. | 69 | 31 |
| Yellow | 33 | 67 | Blue 60.5 + Violet 39.5. | 64 | 36 |
| Green | 51 | 49 | Red 57.5 + Violet 42.5. | 73 | 27 |
| Blue | 64 | 36 | Yellow 82 + Orange 18. | 62 | 37 |
| Violet..... | 62.5 | 37.5 | Yellow 69 + Green 31. | 61.5 | 38.5 |

by the middle horizontal line of color-squares on Plates I-XII (together with an equal number of intermediates represented by blank spaces), requiring a separate curve and consequently different relative proportions of the two component colors for each series of hues—that is, the series from red to orange, orange to yellow, yellow to green, green to blue, blue to violet, and violet to red, respectively; but the progressive increments of white in the scales of tints, black in those of shades, and neutral gray in the several series of broken colors are exactly the same in every case. The first series of Plates (I-XII) shows the pure, full spectrum colors and intermediate hues (middle horizontal line, nos. 1-72),* each with its vertical scale of tints (upward, *a-g*) and shades (downward, *h-n*), the increments of white for the tints being 9.5, 22.5, and 45 per cent., respectively, those of black in the shades being 45, 70.5, and 87.5 per cent. The remaining Plates show these same thirty-six colors or hues in exactly the same order and similarly modified (vertically) by precisely the same progressive increments of white (upward) and black (downward), but all the colors are dulled by admixture of neutral gray; the first series (1'-72', Plates XIII-XXVI) containing 32 per cent. of neutral gray, the second (1''-72'', Plates XXVII-XXXVIII) 58 per cent., the third (1'''-72''', Plates XXXIX-XLIV) 77 per cent., and the fourth (1''''-72'''', Plates XLV-L) 90 per cent. The last three Plates (LI-LIII) show the six spectrum colors† (also purple, the intermediate between violet and red) still further dulled by admixture of 95.5 per cent. of neutral

*The number is doubled so that every other one represents an intermediate hue not shown in color.

†Owing to the circumstance that spectrum orange does not, at least when mixed with gray, fairly represent a medium hue between red and orange, being much nearer the former, a hue much near to yellow (yellow-orange, No. 15) has been selected.

gray, these being in reality colored grays; to which are added a scale of neutral gray and one of carbon gray, the former being the gray resulting from mixture of the three primary colors (red 32, green 42, violet 26 per cent., which in relative darkness equals black 79.5, white 20.5 per cent.); the latter being the gray produced by mixture of lamp black and Chinese white, and the scale a reproduction of that in the author's first "Nomenclature of Colors" (1886, Plate II, nos. 2-10). It should be emphasized that in all cases except the scale of carbon grays, only the disks representing the middle horizontal series of colors (both pure and broken) have been used, in combination with a black and a white disk, respectively, to make the colors of the vertical scales of tints and shades.

The coloring of a satisfactory set of disks to represent the thirty-six pure spectrum colors and hues was a matter of extreme difficulty, many hundreds having been painted and discarded before the desired result was achieved. Several serious problems were involved, the matter of change of hue through chemical reaction of the combined pigments or dyes* (especially the latter) being almost as troublesome as that of securing the proper degree of difference between each adjoining pair of hues. The method by which satisfactory results were finally secured was as follows: First, six disks were colored to represent each of the fundamental spectrum colors,

*For satisfactory color-wheel work it is necessary to discard practically all the so-called artists' colors, as being much too dull to even approximately represent the colors of the spectrum, and to substitute carefully selected aniline or coal-tar dyes, of which, fortunately, there is a very large number of remarkable purity of hue. Indeed, the work of most color-physicists is vitiated by their use of such crude colors as vermillion, carmine, scarlet-lake, chrome yellow, emerald green, Prussian blue, etc. (For a list of dyes and pigments used in preparing the Maxwell disks representing the thirty-six colors of the chromatic scale, see pages 26, 27.)

according to the author's conception of them.* These six disks were then placed against a suitable background (a neutral gray), in spectrum sequence, with wide intervals for the accommodation of connecting series of disks, which were then colored so as to represent an apparently even transition from one to the other. When this very difficult task had been done as well as the eye alone could judge, each intermediate was then measured on the color-wheel and the relative proportions (in percentages) of its two component colors recorded. After this had been done for all the intermediate hues each series (the red-orange; orange-yellow, yellow-green, green-blue, blue-violet, and violet-red) was taken separately and a curve constructed on cross-section paper from the recorded ratios. These curves were found to be in all cases more or less irregular or unsymmetrical, but nevertheless were sufficiently near correct to serve as a basis for a symmetrical curve; and after the points out of

*In fixing the exact position or wave-length of the spectrum colors considerable latitude is allowable, the element of "personal equation"—that is, difference in the conception of different persons as to just where the reddest red, greenest green, etc., are located, accounting for the considerable disagreement among chromatologists as to the wave-lengths. The following table, showing the average, mean, and extreme wave-length of each of the spectrum colors as given by nine or more authorities together with those of the present work (as determined by Dr. P. G. Nutting, Associate Physicist of the U. S. Bureau of Standards) is of interest in this connection:

| | This work. | Average of 9-12 authorities. | Extremes of 9-12 authorities. | Mean of 9-12 authorities. |
|--------------|--------------|------------------------------------|-------------------------------------|---------------------------------|
| Red | 644 | 6770 | 6440-7028 | 6734 (10) |
| Orange | 598 \pm 2 | 6074 | 5892-6300 | 6096 (9) |
| Yellow | 577 \pm 1 | 5786 | 5640-5850 | 5745 (10) |
| Green | 520 \pm 10 | 5235 | 5050-5335 | 5193 (11) |
| Blue | 473 \pm 3 | 4738 | 4520-4861 | 4680 (12) |
| Violet | 410 | 4176 | 4050-4330 | 4190 (10) |

From this table it will be seen that the red of this work is appreciably more orange than that of others, the orange slightly more yellowish, and the violet a little less bluish than the average; but the author is assured by Dr. Nutting that these standards are exceptionally accurate.

proper line were suitably relocated the two component colors were correspondingly readjusted on the color-wheel and each faulty disk corrected (or a new one painted) until it exactly matched the required combination. The scales representing the tints and shades of each color, and also the gray or broken colors were similarly determined by corrected curves.*

By the method adopted of running each of the thirty-six spectrum hues through a scale of tints and shades, and repeating the combination through several series modified by increasing increments of neutral gray, practically the entire possible range of color variation is covered,† rendering it an easy matter to locate in the plates, either among the colors actually shown or in an intermediate space, any color which it is desired to match; and where short distinctive names have not been found (their place being, tentatively, supplied by compound names), as, necessarily, must often be the case, any color or intermediate between any two colors, either as to hue, tint, or shade, may be readily designated by the very simple system of symbols (numerals and letters) employed.‡

In order to designate any color for which a satisfactory name cannot be found, or one not represented on the plates, it is only necessary to proceed as follows: Suppose the color in question is nearest 1 on Plate I; say, for example, is intermediate in hue between 1 (spectrum red) and 3 (scarlet-red), or in other words if represented in color its position would be in the uncol-

*The percentages are given in tables on pages 23 and 25.

†That is to say, theoretically. Unfortunately it seems to be beyond the colorists' skill to reproduce true shades of the pure colors, all showing a more or less decided admixture of gray, resulting in a series of broken or dull shades. (See pages 23 and 24.)

‡Although only 1115 different colors are actually shown on the plates the system is really equivalent to the presentation of considerably more than 4000 distinguishable and designatable colors.

ored space designated as no. 2; and in tone between the full color (middle horizontal line) and tint *b*. Its designation, therefore, is *2a*. Exactly the same method applies to any of the other blank spaces, as well as to the colors themselves, except that in case of the broken colors the "primes" (', ", '", "''", or "''''") are to be affixed to the hue number. First locate the *hue*, designated by number, then the *tone*, designated by lower case letter, the full, pure colors of the middle horizontal row being designated by number alone.

COLOR NAMES.—While it is true that the naming of colors as usually employed has so little to do with the purely technical aspects of chromatology or color-physics that, as Von Bezold remarks* "we are in reality dealing with the peculiarities of language," it is equally true that a collection of color standards designed expressly for the purpose of identifying and designating particular colors can best attain this object by the use of a carefully selected nomenclature. In other words, the prime necessity is to standardize both colors and color names, by elimination of the element of "personal equation" in the matter. In no other way can agreement be reached as to the distinction between "violet" and "purple," two color names quite generally used interchangeably or synonymously but in reality belonging to quite distinct hues, or that any other color name can be definitely fixed. Various methods of handling the matter of color in zoological and botanical descriptions, etc., by the avoidance of color names and substitution therefor of symbols, numerals, or mechanical contrivances (as color-wheel and spectrum analyses, color-spheres, etc.) have been devised but all have been found impracticable or unsatisfactory: The author has taken the trouble to get an expression of opinion in this matter from many

*The Theory of Color (American edition, 1876), p. 99.

naturalists and others, and the preference for color-names very greatly predominates; consequently, whenever it has been possible to find a name which seems suitable for any color in this work it has been done, leaving as few as possible unnamed, and for these some other means must be devised for their designation. (See page 8). The selection of appropriate names for the colors depicted on the Plates has been in some cases a matter of considerable difficulty. With regard to certain ones it may appear that the names adopted are not entirely satisfactory; but, to forestall such criticism, it may be explained that the purpose of these Plates is not to show the color of the particular objects or substances which the names suggest, but to provide appropriate, or at least approximately appropriate, names for the colors which it has seemed desirable to represent. In other words, certain colors are selected for illustration, for which names must be provided; and when names that are exclusively pertinent or otherwise entirely satisfactory are not at hand, they must be looked up or invented. It should also be borne in mind that almost any object or substance varies more or less in color; and that therefore if the "orange," "lemon," "chestnut" or "lilac" of the Plates does not exactly match in color the particular orange, lemon, chestnut or lilac which one may compare it with, it may (in fact does) correspond with other specimens. Without standardization, even if arbitrary, color nomenclature must, necessarily, remain in its present condition of absolute chaos. Even the standard pigments are not constant in color, practically every one of them being subject to more or less variation in hue or tone, different samples from the same manufacturer sometimes varying to the extent of several tones or hues of the present work; indeed, in every case where two or more samples of the same color have been com-

pared it has been found that no two are exactly alike, the difference often being very great. For example: Of five samples of "vandyke brown" only two are approximately similar, each of the other three being widely different, not only from one another but from the other two, one being a blackish brown, another reddish brown, the third a yellowish orange-brown. Of eleven samples of "olive" no two are closely similar, the color ranging from a shade of dull (grayish) blue-green to orange-brown, dark brownish gray, and light yellowish olive; and the same or nearly the same degree of variation is seen in absolutely every color examined, showing very clearly the utter worthlessness of color names unless fixed or standardized.

In order to obtain as many color names as possible for standardization it has been necessary to draw from all available sources. Several thousand samples of named colors have therefore been collected, and for convenience of reference and comparison gummed to card catalogue cards, with the name, source, and other data thereon. These include the colors from many standard works, among them Werner's "Nomenclature of Colours" (Syme's edition, 1821), Hay's "Nomenclature of Colours" (1846), Ridgway's "Nomenclature of Colors" (1886), Saccardo's "Chromataxia" (1891), Mathews' "Chart of Correct Colors of Flowers" (American Florist, 1891), Willson and Calkins' "Familiar Colors," Oberthur and Dauthenay's "Repertoire des Couleurs" (1905), Leidel's "Hints on Tints" (1893), "Lefèvre's Matieres Colorantes Artificiales" (1896), the Standard Dictionary chart of "typical colors," the educational colored papers of Milton Bradley and Prang, and many others; and besides these practically all of the artists' oil, water, and dry colors, manufactured by Winsor and Newton, F. Schoenfeld and Co., Charles Roberson and Co.,

George Rowney and Co., Madderton and Co., R. Ackermann and Co., Bourgeois, Binant, Chenal, Le Franc, Devoe, Raynolds, Osborne, Bradley, Hatfield and others; also the coal-tar or aniline dyes of Dr. G. Grüber & Co., Continental Color and Chemical Co., and Henry Heil Chemical Co., and the well known Diamond Dyes; chromo-lithographic inks, embroidery silks, etc., etc.

The material from which to select suitable color names was greatly augmented, almost at the last moment, from two sources, as follows: (1) A very large collection of color-samples (unfortunately mostly unnamed) collected and mounted on cards by Mr. Frederick A. Wampole, a talented young artist, to whom was delegated, by a Committee of the American Mycological Society, the task of preparing a nomenclature of colors based upon spectroscopic determinations, but which, unfortunately, the untimely death of Mr. Wampole prevented from progressing beyond the accumulation of this collection. For the use of this material I am indebted to the courtesy of Dr. Frederick V. Coville, Botanist of the U. S. Department of Agriculture, and Mr. P. L. Ricker, Assistant Botanist, Bureau of Plant Industry, in the same Department. (2) A splendid collection of colored Japanese silks, taffetas, velvets, and other dress goods, kindly sent me by Mr. C. H. Hospital, of the silk department of the firm of Woodward and Lothrop, Washington, D. C. The very large number of colors represented in this collection are all named and have afforded a considerable number of the names adopted in the present work.

For obvious reasons it has, of course, been necessary to ignore many trade names, through which the popular nomenclature of colors has become involved in really chaotic confusion rendered more confounded by the continual coinage of new names, many of them synonymous

and most of them vague and variable in their application. Most of them are invented, apparently without care or judgment, by the dyer or manufacturer of fabrics, and are as capricious in their meaning as in their origin; for example: Such fanciful names as "zulu," "serpent green," "baby blue," "new old rose," "London smoke," etc., and such nonsensical names as "ashes of roses" and "elephant's breath." An inspection of the sample books of manufacturers of fancy goods (such as embroidery silks and crewels, ribbons, velvets, and other dress- and upholstery-goods) is sufficient not only to illustrate the above observations, but to show also the absolute want of system or classification and the general unavailability of these trade names for adoption in a practical color nomenclature. This is very unfortunate, since many of these trade names have the merit of brevity and euphony and lack only the quality of stability.

It has been difficult for the author to decide whether the standards of his original "Nomenclature of Colors" (1886) should be retained in the present work. Some of them are admittedly wrong (indeed, certain ones are not as they were intended to be); besides, owing to the method of reproducing the originals (hand stenciling) there is considerable variation in different copies of the book, one or more reprints, necessitating new mixtures of pigments, adding to this lack of uniformity.* Many persons, however, have urged the retention of the old standards, on the ground that they have been used by so many zoologists and botanists in their writings during the last twenty-five years that they have become estab-

*In the present work the possibility of variation between different copies is wholly eliminated by a very different process of reproduction. Each color, for the entire edition, is painted uniformly on large sheets of paper from a single mixture of pigments, these sheets being then cut into the small squares which represent the colors on the plates.

lished through common usage. This very important consideration has induced the author to retain such of the old standards as can be matched in the present work, even though some of them do not agree strictly with either his own or the usual conception of the colors in question. An asterisk (*) preceding a color name indicates that the name in question is adopted from the older work, the variation between different copies of the work requiring the selection, in the new one, of a color representing as nearly as possible an average of the former.

In any systematically arranged scheme, unless the number of colors shown is practically unlimited, it will, necessarily, be impossible to find represented thereon a certain proportion of colors comprised among even a very limited number selected at random, or only roughly classified. Hence many (thirty-six, or more than five per cent.) of the colors shown in the old "Nomenclature of Colors" fall into the blank intervals of the present work, being intermediate either in hue or tone, or chroma, sometimes all. It is necessary of course to provide some means for the correlation of these with the present scheme, which is done by the list on page 41, where the position of each is shown.

The question of giving representations of metallic colors in this work was at one time considered; but the idea was abandoned for the reason that these are in reality only ordinary colors reflected from a metallic or burnished surface, or appearing as if so reflected; the actual hue is precisely the same, though often changeable according to angle of impact of the light rays, and relative position of the eye, this changeableness being sometimes due to interference.* Colors again vary, without actual difference of hue, in regard to quality of texture or surface; that is to say, the color may be quite

*See Rood, *Modern Chromatics*, pages 50-52.

lustreless, appearing on a dull, sometimes velvety surface, while again it may be more or less glossy, even to the degree of appearing as if varnished. To deal with these variations, however, requires simply the use of suitable adjectives. For example: To indicate a color which has no lustre or brightness, the adjective *matt* (or *mat*) may be used, in preference to *dull*, which implies reduction in purity or chroma; other adjectives, appropriate in special cases, being *velvety*, *glossy*, *burnished metallic*, *matt-metallic*, etc.

COLOR TERMS.—No other person has presented so forcibly the urgent need for reform in popular nomenclature nor stated so clearly and concisely its shortcomings and the simple remedy, as Mr. Milton Bradley, from one of whose educational pamphlets on the subject* the following is quoted: "The list of words now employed to express qualities or degrees of color is very small, in fact a half dozen comprise the more common terms, and these are pressed into service on all occasions, and in such varied relations that they not only fail to express anything definite but constantly contradict themselves . . . Tint, Hue and Shade are employed so loosely by the public generally, even by those people who claim to use English correctly, that neither word has a very definite meaning, although each is capable of being as accurately used as any other word in our every day vocabulary" . . .

Certainly one would expect that men of learning, at least, would employ the broader color terms correctly; but some of the highest authorities on color-physics habitually use them interchangeably, as if they were quite synonymous; and even the dictionaries, with few exceptions, give incorrect or "hazy" definitions of these

*Some criticisms of Popular Color Definitions and Suggestions for a better Color Nomenclature. Milton Bradley Co., Springfield, Mass. (Small pamphlet of 15 pages).

terms. It is not strictly correct to say a "dark tint" or "light shade" of any color, because a *tint* implies a color *paler* than the full color, while a shade means exactly the opposite; and to say an "orange shade (or tint) of red," a "greenish shade (or tint) of blue," a "bluish shade (or tint) of violet," etc., is an absurdity, for the term *hue*, which specifically and alone refers to relative position in the spectrum scale, without reference to lightness or darkness, is the only one which can correctly be used in such cases.

Indeed the standardization of color terms is almost if not quite as important, in the interest of educational progress, as that of the colors themselves and their names; therefore, to make easy a clear understanding of the specific meaning of each, the following definitions are given:—

Color.—The term of widest application, being the only one which can be used to cover the entire range of chromatic manifestation; that is to say, the spectrum colors (together with those between violet and red, not shown in the spectrum) with all their innumerable variations of luminosity, mixture, etc. In a more restricted sense, applied to the six distinct spectrum colors (red, orange, yellow, green, blue, and violet), which are sometimes distinguished as *fundamental colors* or *spectrum colors*.

Hue.—While often used interchangeably or synonymously with color, the term *hue* is more properly restricted by special application to those lying between any contiguous pair of spectrum colors (also between violet and purple and between purple and red); as an orange *hue* (not shade or tint, as so often incorrectly said) of red; a yellow *hue* of orange; a greenish *hue* of yellow, a bluish *hue* of green; a violet *hue* of blue, etc.

Tint.—Any color (pure or broken) weakened by high illumination or (in the case of pigments) by ad-

mixture of white, or (in the case of dyes or washes) by excess of aqueous or other liquid medium; as, a deep, medium, light, pale or delicate (pallid) *tint* of red. The term cannot correctly be used in any other sense.

Shade.—Any color (pure or broken) darkened by shadow or (in the case of pigments) by admixture of black; exactly the opposite of *tint*; as a medium, dark, or very dark (dusky) *shade* of red.

Tone.—"Each step in a color scale is a tone of that color."* The term tone cannot, however, be properly applied to a step in the spectrum scale, in which each contiguous pair of the six distinct spectrum or "fundamental" colors are connected by *hues*. Hence *tone*† is exclusively applicable to the steps in a scale of a single color or hue, comprising the full color (in the center) and graduated tints and shades leading off therefrom in opposite directions; or of neutral gray similarly graduated in tone from the darkest shade to the palest tint. Each one of the colored blocks in the vertical scales of the plates in this work represents a separate tone of that color.

Scale.—A linear series of colors showing a gradual transition from one to another, or a similar series of tones of one color. The first is a *chromatic scale*‡ (or scale of colors and hues) and in the plates of this work is represented by each horizontal series; the second is a

*Milton Bradley: Elementary Color, p. 25.

†Exception has been taken in a recent work ("A Color Notation," by A. H. Munsell) to the use of the term tone in this connection, on the ground that its proper use belongs to music, and the term *value* is substituted. The same line of reasoning would, however, certainly require the discarding of *chromatic scale* as a term of music nomenclature, since its derivation is clearly from color (chroma). Furthermore, the word "value" is even more elastic in its application than tone, and, all things considered, the present writer, at least, fails to see that any improvement is made by the proposed change.

‡The term *chromatic scale* has unfortunately been appropriated for a very different use (in music); nevertheless it is strictly correct in the present sense while in the other it is not, though firmly established by long usage. The term *spectrum scale* is not adequate, as a substitute, because the spectrum series of colors is incomplete through absence of the hues connecting violet with red, which are necessary to show the full scale of pure colors and hues.

tone scale, on the plates running vertically, growing from the full color, in the center, to a pale tint (at the top) and a dark shade (at the bottom). For clearer comprehension of these two distinct scales, each plate of this work may be compared to a sheet of woven fabric; the chromatic scale (horizontal) representing the warp, the luminosity or tone scale (vertical) the woof. A third kind of color scale is represented by adding progressive increments of neutral gray to any color. This is shown by the several series of Plates, of which the first (Plates I-XII, with colors numbered 1-71) represents each step in the spectrum scale unmixed with gray, followed by five other series in which the same colors* are shown dulled by gradually increasing increments of neutral gray, the first (Plates XIII-XXVI, colors 1'-71') containing 32 per cent., the second (Plates XXVII-XXXVIII, colors 1''-71'') 58 per cent., the third (Plates XXXIX-XLIV, colors 1'''-69''') 77 per cent., the fourth (Plates XLV-L, colors 1''''-69''') 90 per cent., and the fifth (Plates LI-LIII, colors 1''''' , 15''''' , 23''''' , 35''''' , 49''''' , 59''''' and 67''''') 95.5 per cent. of gray, the last being in reality colored grays. Finally scales are shown (on Plate LIII) of neutral gray (in which all trace of color is wanting), and of carbon gray, a simple mixture of lamp-black and chinese white. It is not easy to find a suitable name for these scales of reduced or "broken" colors, but they may, for present convenience, be termed *reduced* or *broken scales*.

Full Color.—A color corresponding in intensity with its manifestation in the solar spectrum.

*The distinctions of color or hue diminishing in proportion to the increased admixture of gray, each alternate color or hue, with its scale (vertical) of tones, is omitted from the third and fourth series; while in the fifth the color differentiation is so greatly reduced that only the six spectrum colors (dulled by admixture of 95.5 per cent. of neutral gray), together with purple (the intermediate between violet and red) are given; a yellow orange hue being substituted for spectrum orange because it is more exactly intermediate in hue between red and yellow.

Pure Color.—A color corresponding in purity with (or, in the case of material colors, closely approximating to) one of the spectrum colors.

Broken Color.—Any one of the spectrum colors or hues dulled or reduced in purity by admixture (in any proportion) of neutral gray, or varying relative proportions of both black and white; also produced by admixture of certain spectrum colors, as red with green, orange with blue, yellow with violet, etc. These broken colors are far more numerous in Nature than the pure spectrum colors, and include the almost infinite variations of brown, russet, citrine, olive, drab, etc. They are often called dull or neutral colors.

Fundamental Colors.—The six psychologically distinct colors of the solar spectrum; Red, Orange, Yellow, Green, Blue and Violet.

Primary Colors.—Theoretically, any of the spectrum colors which cannot be made by mixture of two other colors. According to the generally accepted Young-Helmholtz theory, the primary colors are red, green, and violet; orange and yellow resulting from a mixture of red and green, and blue from a mixture of green and violet. There is considerable difference of opinion, however, as to this question, and further investigation of the subject seems to be required; at any rate, authorities fail to explain why red may be exactly reproduced (except as to the degree of luminosity) by a mixture of orange and violet, exactly as yellow results from mixture of red and green or blue from green or violet, green being, in fact, the only spectrum color that cannot be made by mixture of other colors.*

*J. J. Müller found that a mixture of the orange and violet rays of the spectrum produced a whitish red (Rood, "Modern Chromatics," p. 129). The author of the present work, without being at the time aware of this, produced an absolutely pure red (but of reduced intensity) by mixture of either orange and violet (orange 63.5, violet 36.5 per cent. = red 85+white 15 per cent.), or from orange and the violet-red which is complementary to green (violet-red 51, orange 49 per cent.), the latter equaling red 89+white 11 per cent; the mixtures being made on a color wheel with Maxwell disks representing the pure colors of the present work. The red resulting from either of these mixtures on the color-wheel is far purer than the blue resulting from mixture of green and violet, and incomparably more so than the yellow resulting from mixture of either red and green or orange and green. Consequently, if the same results would come from mixing orange and violet light, it is difficult to understand how red can be a primary color according to the accepted definition.

Chroma.—Degree of freedom from white light; purity, intensity or fullness of color.

Luminosity.—Degree of brightness or clearness. The relative luminosity of the spectrum colors is as follows: [Yellow (brightest)?], orange yellow; orange; greenish-yellow, yellow-green, and green; orange-red; red and blue (equal); violet-blue, blue-violet, violet.*

Warm Colors.—The colors nearer the red end of the spectrum or those of longer wave-lengths (red, orange, and yellow, and connecting hues) "and combinations in which they predominate."†

Cool, or Cold, Colors.—The colors nearer the violet end of the spectrum or those of shorter wave-length, especially blue and green-blue. "But it is, perhaps, questionable whether green and violet may be termed either warm or cool."

Complementary Color.—"As white light is the sum of all color, if we take from white light a given color the remaining color is the complement of the given color." When any two colors or hues which when combined in proper proportion on the color-wheel produce, by rotation, neutral gray, these two colors each represent the complementary of the other.

Constants of Color.—The constants of color are numbers which measure (1) the wave-length, (2) the chroma, and (3) the luminosity.

In addition to the terms defined above there are many others, for which the reader is referred to the chapter on "Color Definitions" on pages 23-30 of Milton Bradley's excellent and most useful book "Elementary Color."

*Rood: Modern Chromatics, p. 34.

With the single exception of Vanderpoel (Color Problems, p. 28, plates 3, 4, where yellow is given first in order of luminosity) all authorities on color-physics that I have been able to consult very singularly ignore yellow entirely in their treatment of the subject of luminosity.

†All quotations here are from Milton Bradley's "Elementary Color," except where otherwise noted.

TABLE OF PERCENTAGES OF COMPONENT COLORS IN THE CONNECTING HUES OF THE CHROMATIC SCALE.

The following table shows the relative percentages, in color-wheel measurement, of the two components in each of the hues connecting adjacent pairs of the six spectrum colors as represented on the original Plates of this work; together with an equal number of exact intermediates (not shown on the Plates), the latter in lower-case type and not indicated by symbols.

| Num-ber. | Color. | Red. | Orange. | Yellow. | Green. | Blue. | Violet. | Wave-length. ¹ |
|----------|--------|------|---------|---------|--------|-------|---------|---------------------------|
| 1 | Red | 100 | | | | | | 644 |
| 2 | | 90 | 10 | | | | | |
| 3 | O-R | 80 | 20 | | | | | |
| 4 | | 70 | 30 | | | | | |
| 5 | OO-R | 60 | 40 | | | | | |
| 6 | | 50 | 50 | | | | | |
| 7 | R-O | 40 | 60 | | | | | |
| 8 | | 30 | 70 | | | | | |
| 9 | OR-O | 20 | 80 | | | | | |
| 10 | | 10 | 90 | | | | | |
| 11 | Orange | | 100 | | | | | 598 |
| 12 | | | 96 | 4 | | | | |
| 13 | OY-O | | 91 | 9 | | | | |
| 14 | | | 86 | 14 | | | | |
| 15 | Y-O | | 80 | 20 | | | | |
| 16 | | | 73.5 | 26.5 | | | | |
| 17 | O-Y | | 65 | 35 | | | | |
| 18 | | | 56.5 | 43.5 | | | | |
| 19 | YO-Y | | 47 | 53 | | | | |
| 20 | | | 36.5 | 63.5 | | | | |
| 21 | O-YY | | 25 | 75 | | | | 577 |
| 22 | | | 13.5 | 86.5 | | | | |
| 23 | Yellow | | | 100 | | | | |
| 24 | | | | 87 | 13 | | | |
| 25 | YG-Y | | | 75 | 25 | | | |
| 26 | | | | 64 | 36 | | | |
| 27 | G-Y | | | 55 | 45 | | | |
| 28 | | | | 46 | 54 | | | |
| 29 | GG-Y | | | 39 | 61 | | | |
| 30 | | | | 31 | 69 | | | |

¹ As determined by Dr. P. G. Nutting, Associate Physicist, U. S. Bureau of Standards.

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TABLE OF PERCENTAGES—Continued.

| Number | Color. | Red. | Orange. | Yellow. | Green. | Blue. | Violet. | Wave-length. ¹ |
|--------|--------|-------|---------|---------|--------|-------|---------|---------------------------|
| 31 | Y-G | | | 24 | 76 | | | 520 |
| 32 | ..... | ..... | ..... | 17 | 83 | ..... | ..... |  |
| 33 | GY-G | ..... | ..... | 11 | 89 | ..... | ..... |  |
| 34 | ..... | ..... | ..... | 6 | 94 | ..... | ..... |  |
| 35 | Green | ..... | ..... | ..... | 100 | ..... | ..... |  |
| 36 | ..... | ..... | ..... | ..... | 96.5 | 3.5 | ..... |  |
| 37 | GB-G | ..... | ..... | ..... | 93 | 7 | ..... |  |
| 38 | ..... | ..... | ..... | ..... | 90 | 10 | ..... |  |
| 39 | B-G | ..... | ..... | ..... | 85 | 15 | ..... |  |
| 40 | ..... | ..... | ..... | ..... | 81 | 19 | ..... |  |
| 41 | BB-G | ..... | ..... | ..... | 75 | 25 | ..... |  |
| 42 | ..... | ..... | ..... | ..... | 69 | 31 | ..... |  |
| 43 | G-B | ..... | ..... | ..... | 61 | 39 | ..... |  |
| 44 | ..... | ..... | ..... | ..... | 54 | 46 | ..... |  |
| 45 | BG-B | | | | 45 | 55 | | 473 |
| 46 | ..... | ..... | ..... | ..... | 36 | 64 | ..... |  |
| 47 | G-BB | ..... | ..... | ..... | 25 | 75 | ..... |  |
| 48 | ..... | ..... | ..... | ..... | 13 | 87 | ..... |  |
| 49 | Blue | ..... | ..... | ..... | ..... | 100 | ..... |  |
| 50 | ..... | ..... | ..... | ..... | ..... | 84 | 16 | |
| 51 | BV-B | ..... | ..... | ..... | ..... | 72 | 28 | |
| 52 | ..... | ..... | ..... | ..... | ..... | 64 | 36 | |
| 53 | V-B | ..... | ..... | ..... | ..... | 54 | 46 | |
| 54 | ..... | ..... | ..... | ..... | ..... | 47 | 53 | |
| 55 | B-V | ..... | ..... | ..... | ..... | 40 | 60 | |
| 56 | ..... | ..... | ..... | ..... | ..... | 32 | 68 | |
| 57 | VB-V | ..... | ..... | ..... | ..... | 22 | 78 | |
| 58 | | | | | | 12 | 88 | 410 |
| 59 | Violet | ..... | ..... | ..... | ..... | ..... | 100 | |
| 60 | ..... | 3 | ..... | ..... | ..... | ..... | 97 | |
| 61 | VR-V | 7 | ..... | ..... | ..... | ..... | 93 | |
| 62 | ..... | 11 | ..... | ..... | ..... | ..... | 89 | |
| 63 | R-V | 18 | ..... | ..... | ..... | ..... | 82 | |
| 64 | ..... | 24 | ..... | ..... | ..... | ..... | 76 | |
| 65 | RR-V | 33 | ..... | ..... | ..... | ..... | 67 | |
| 66 | ..... | 41 | ..... | ..... | ..... | ..... | 59 | |
| 67 | V-R | 52 | ..... | ..... | ..... | ..... | 48 | |
| 68 | ..... | 64 | ..... | ..... | ..... | ..... | 36 | |
| 69 | RV-R | 74 | ..... | ..... | ..... | ..... | 26 | |
| 70 | ..... | 83 | ..... | ..... | ..... | ..... | 17 | |
| 71 | V-RR | 90 | ..... | ..... | ..... | ..... | 10 | |
| 72 | ..... | 95.5 | ..... | ..... | ..... | ..... | 4.5 | |

¹ As determined by Dr. P. G. Nutting, Associate Physicist, U. S. Bureau of Standards.

TABLE SHOWING PERCENTAGE OF WHITE AND BLACK,
RESPECTIVELY, IN EACH TONE OF THE
TONE OR LUMINOSITY SCALES.

All of the vertical scales in the original Plates of this work (the scale of carbon grays alone excepted) contain the following percentages by color-wheel measurement :

| TONE. | PERCENTAGES. | | |
|--------------|--------------|--------|--------|
| | White. | Color. | Black. |
| (White) | 100 | | |
| (g) | 70 | 30 | |
| f | 45 | 55 | |
| (e) | 32 | 68 | |
| d | 22.5 | 77.5 | |
| (c) | 15 | 85 | |
| b | 9.5 | 90.5 | |
| (a) | 5 | 95 | |
| (Full Color) | | 100 | |
| (h) | | 64 | 26 |
| i | | 55 | 45 |
| (j) | | 41 | 59 |
| k | | 29.5 | 70.5 |
| (l) | | 20 | 80 |
| m | | 12.5 | 87.5 |
| (n) | | 6 | 94 |
| (Black) | | | 100 |

One of the most serious difficulties encountered in the preparation of the Plates of this work was the apparent impracticability of reproducing satisfactory shades of pure colors. This originated in the fact that there seems to be no substance (pigment, dye, or fabric) which represents a true black, all reflecting more or less of white light, and consequently producing shades which are dull

or broken. The difficulty is increased by the additional fact that any black pigment mixed with almost any color falls short of, even the color-wheel mixture in purity of hue in the resulting shades, owing to the very considerable amount of gray in all black pigments. Chromolithography can be made to produce clearer and better shades of the pure colors, but is distinctly objectionable for the purpose of a work of this kind owing to eventual oxidation of the oil or varnish with which the pigments are combined in lithographic inks, causing a change of hue; reds becoming more orange, blues more greenish, etc., in course of time.

While the absence (in large part) of pure chromatic shades is much to be regretted, the defect is not so serious, *from the standpoint of utility*, as might appear at first sight; for while saturated or darkened pure colors are not uncommon in the animal, vegetable, and mineral kingdoms, more or less broken dark colors are infinitely more so; and since the latter are greatly increased in number by the defect mentioned the actual result is rather an advantage than otherwise.

It will doubtless be noticed that there is a conspicuous difference in relative darkness between shades of yellow and contiguous hues on the one hand and corresponding ones of violet and adjacent hues on the other, as if the percentage of black in each were very different. This, however, is entirely the result of difference of luminosity of the two sets of colors, that of yellow being between 7000 and 8000 while that of violet is only about 13;* for the percentage of black in corresponding tones of the vertical scales is precisely the same for each color throughout the chromatic scale of this work.

*See Rood, *Modern Chromatics*, pages 34, 35.

TABLE SHOWING PERCENTAGES OF NEUTRAL GRAY
IN THE BROKEN COLOR SCALES.

Every Plate in each series of broken colors (' to ''''') contains exactly the same percentage of neutral gray in each color, the relative amount increasing progressively in the several series, as shown in the following table. The percentages of white in the tints and of black in the shades of the tone scales are in all cases exactly the same as in the tone scales of pure colors.

| SERIES. | PERCENTAGES. | |
|--------------|--------------|---------------|
| | Color. | Neutral Gray. |
| Pure Colors | 100 | ..... |
| (') | 68 | 32 |
| ('') | 42 | 58 |
| ('''') | 23 | 77 |
| ('''') | 10 | 90 |
| ('''') | 4.5 | 95.5 |
| Neutral Gray | ..... | 100 |

TABLE OF PERCENTAGE OF BLACK AND WHITE IN THE
DIFFERENT TONES OF CARBON GRAY.

| TONE NUMBER. | PERCENTAGES. | |
|--------------|--------------|--------|
| | Black. | White. |
| 1 | 100 | ..... |
| 2 | 98 | 2 |
| 3 | 94.5 | 5.5 |
| 4 | 89.5 | 10.5 |
| 5 | 83 | 17 |
| 6 | 75 | 25 |
| 7 | 67.5 | 32.5 |
| 8 | 58.5 | 41.5 |
| 9 | 47 | 53 |
| 10 | 30 | 70 |

Note.—The percentages given in the preceding tables may not in all cases be precisely those actually contained in the colors on the Plates, since absolute precision in reproduction is hardly possible. All that can be claimed is a reasonably close approximation to the ideal.

DYES AND PIGMENTS USED IN THE PREPARATION OF THE
MAXWELL DISKS, REPRESENTING THE THIRTY-
SIX COLORS OF THE PURE SPECTRUM SCALE,
FORMING THE BASIS OF THE COLOR-
SCHEME OF THIS WORK.*

Red.—Devøe's *geranium lake* (dry), its orange hue neutralized by a wash of *rhodamin b.* (*Crocein scarlet b.* washed with *rhodamin b.* produces practically the same fine red.)

Hues between red and orange.—*Crocein scarlet b.* with *gold orange*.

Orange.—*Gold orange* with *orange g.*

Hues between orange and yellow.—*Orange g.* with *auramin*.

Yellow.—*Auramin*, rather dilute. (The best substitute among pigments is a fine quality of *zinc yellow*, as Hatfield's.)

Hues between yellow and green.—*Auramin* washed with *light green*.

Green.—*Auramin* (very dilute) washed with *light green*. (The auramin should be applied first, because it "sets" or becomes fast quickly, while the light green does not, but is largely removed by overwashes of the yellow, thus rendering it very difficult to get the desired hue.)

Hues between green and blue.—*Methyl green*; the same washed with *light blue* (Diamond Dye); for the hues nearer blue, *light blue* washed with Winsor and Newton's *permanent blue* or *new blue* (the least violet-hued of the artificial ultramarines).

Blue.—*Light blue* washed with *permanent blue* or *new blue*. (Although the color is nearer that of the artificial ultramarines named, it is useless to apply the latter first,

*The aniline or coal-tar dyes named are all of the manufacture of Dr. G. Grübler and Co., Leipzig, Germany, unless otherwise stated. (See Preface, page ii.)

for overwashes of the light blue merely sink through and darken the color without improving the hue. A moderately saturated solution of the light blue should be applied first, and when this is dry covered with one or more rather thin washes of the permanent blue or new blue).

Hues between blue and violet.—Winsor and Newton's *permanent blue* and some of the more violet-hued artificial ultramarines, the hues nearer violet washed with *crystal violet* or *gentian violet*.

Violet.—*Crystal violet*.

Hues between violet and red.—*Methyl violet 1b.* washed with *rhodamin b.*; for hues nearer red, *rhodamin b.* with Devoe's *geranium red* (dry) or *crocein scarlet b.*

While more or less similar in hue to rhodamin b., several other aniline dyes, as *acid fuchsin*, *rubin s.*, *rosein*, *magenta*, etc., do not combine satisfactorily with the violets, the mixture soon becoming dark or dull and none of them are quite as pure a purple or red-violet.

It is most important to remember that disks thus colored must be carefully protected from light when not in actual use and *never* exposed to direct sunlight. The artificial ultramarines are, of course, permanent, and so, practically, are crocein scarlet, gold orange, orange g., and auramin—that is to say, are not materially affected by the action of light except after very prolonged exposure, though the last named undergoes a change of hue; but the green and violet aniline dyes are all very evanescent, rapidly fading and eventually disappearing; light blue and rhodamin, while sensitive to light, are far less so than the greens and violets.

ALPHABETICAL LIST OF COLORS REPRESENTED ON PLATES OF THIS WORK

| COLOR NAME. | Plate. | Color or hue Number. | Tone. | COLOR NAME. | Plate. | Color or hue Number. | Tone. |
|------------------------|--------|----------------------|-------|-------------------------------|--------|----------------------|-------|
| Absinthe Green..... | XXXI | 29'' | — | Benzo Brown..... | XLVI | 13''' | i |
| Acajou Red..... | XIII | 1' | i | Benzol Green..... | VII | 41 | — |
| Acetin Blue..... | XXXV | 49'' | k | *Berlin Blue..... | VIII | 47 | m |
| Ackermann's Green..... | XVII | 35' | k | Beryl Blue..... | VIII | 43 | f |
| Aconite Violet..... | XXXVII | 63'' | — | *Beryl Green..... | XIX | 41' | b |
| Ageratum Violet..... | XXXVII | 63'' | b | *Bice Green..... | XVII | 29' | k |
| Alice Blue..... | XXXIV | 45'' | b | Biscay Green..... | XXXI | 27'' | i |
| Alizarine Blue..... | XXI | 51' | m | Bishop's Purple..... | XXXVII | 65'' | — |
| Alizarine Pink..... | XIII | 1' | — | *Bister..... | XXIX | 15'' | m |
| Amaranth Pink..... | XII | 69 | d | Bittersweet Orange..... | II | 9 | b |
| Amaranth Purple..... | XII | 69 | i | Bittersweet Pink..... | II | 9 | d |
| Amber Brown..... | III | 13 | k | *Black..... | LIII | — | (I) |
| Amber Yellow..... | XVI | 21' | b | Blackish Brown (1)..... | XLV | 1''' | m |
| American Green..... | XLI | 33''' | i | Blackish Brown (2)..... | XLV | 5''' | m |
| Amethyst Violet..... | XI | 61 | — | Blackish Brown (3)..... | XLV | 9''' | m |
| Amparo Blue..... | IX | 51 | b | Blackish Green-Blue..... | VIII | 43 | m |
| Amparo Purple..... | XI | 63 | b | Blackish Green-Gray..... | LII | 35''' | m |
| Andover Green..... | XLVII | 25''' | i | Blackish Mouse Gray..... | LI | 15''' | m |
| Aniline Black..... | L | 69''' | — | Blackish Plumbeous..... | LII | 49''' | k |
| Aniline Lilac..... | XXXV | 53'' | d | Blackish Purple..... | XI | 65 | m |
| Aniline Yellow..... | IV | 19 | i | Blackish Red-Purple..... | XII | 67 | m |
| Anthracene Green..... | VII | 39 | m | *Blackish Slate..... | LIII | — | m(i) |
| Anthracene Purple..... | XLIV | 69''' | k | Blackish Violet..... | X | 59 | m |
| Anthracene Violet..... | XXV | 61' | k | Blackish Violet-Gray..... | LII | 59''' | m |
| Antimony Yellow..... | XV | 17' | b | Blanc's Blue..... | XX | 47' | k |
| Antique Brown..... | III | 17 | k | Blanc's Violet..... | XXIII | 59' | k |
| Antique Green..... | VI | 33 | m | Blue-Violet..... | X | 55 | — |
| *Antwerp Blue..... | VIII | 45 | k | Blue-Violet Black..... | XLIX | 57''' | m |
| *Apple Green..... | XVII | 29' | — | Bluish Black..... | XLIX | 49''' | m |
| Apricot Buff..... | XIV | 11' | b | Bluish Glaucous..... | XLII | 37''' | f |
| Apricot Orange..... | XIV | 11' | — | Bluish Gray-Green..... | XLII | 41''' | — |
| Apricot Yellow..... | IV | 19 | b | Bluish Lavender..... | XXXVI | 57'' | d |
| Argus Brown..... | III | 13 | m | Bluish Slate-Black..... | XLVIII | 45''' | m |
| Argyle Purple..... | XXXVII | 65'' | b | Bluish Violet..... | X | 57 | — |
| Army Brown..... | XL | 13''' | i | Bone Brown..... | XL | 13''' | m |
| Artemisia Green..... | XLVII | 33''' | — | Bordeaux..... | XII | 71 | k |
| Asphodel Green..... | XLI | 29''' | — | *Bottle Green..... | XIX | 37' | m |
| *Aster Purple..... | XII | 67 | i | Bradley's Blue..... | IX | 51 | — |
| Auburn..... | II | 11 | m | Bradley's Violet..... | XXIII | 59' | — |
| *Auricula Purple..... | XXVI | 69' | k | Brazil Red..... | I | 5 | i |
| Avellaneous..... | XL | 17''' | b | Bremen Blue..... | XX | 43' | b |
| Azurite Blue..... | IX | 53 | m | *Brick Red..... | XIII | 5' | k |
| Barium Yellow..... | XVI | 23' | d | Bright Chalcedony Yellow..... | XVII | 25' | — |
| Baryta Yellow..... | IV | 21 | f | Bright Green-Yellow..... | V | 9 | — |
| *Bay..... | II | 7 | m | Brownish Drab..... | XLV | 9''' | — |
| Begonia Rose..... | I | 1 | b | Brownish Olive..... | XXX | 19'' | m |

| COLOR NAME. | Plate. | Color or hue Number. | Tone. | COLOR NAME. | Plate. | Color or hue Number. | Tone. |
|-------------------------|--------|----------------------|----------|------------------------------|---------|----------------------|----------|
| Brownish Vinaceous..... | XXXIX | 5''' | <i>b</i> | *China Blue..... | XX | 45' | <i>i</i> |
| Brussels Brown..... | III | 15 | <i>m</i> | Chinese Violet..... | XXV | 65' | <i>b</i> |
| Buckthorn Brown..... | XV | 17' | <i>i</i> | *Chocolate..... | XXVIII | 7''' | <i>m</i> |
| *Buff-Pink..... | XXVIII | 11''' | <i>d</i> | *Chromium Green..... | XXXII | 31''' | <i>i</i> |
| Buffy Brown..... | XL | 17''' | <i>i</i> | Chrysolite Green..... | XXXI | 27''' | <i>b</i> |
| Buffy Citrine..... | XVI | 19' | <i>k</i> | Chrysoprase Green..... | VII | 37 | <i>b</i> |
| Buffy Olive..... | XXX | 21''' | <i>k</i> | *Cinereous..... | LII | 45''''' | <i>d</i> |
| *Buff-Yellow..... | IV | 21 | <i>d</i> | *Cinnamon..... | XXXI | 15''' | — |
| Burn Blue..... | XXXIV | 47''' | <i>f</i> | Cinnamon-Brown..... | XV | 15' | <i>k</i> |
| Burnt Lake..... | XII | 71 | <i>m</i> | Cinnamon-Buff..... | XXIX | 15''' | <i>d</i> |
| *Burnt Sienna..... | II | 9 | <i>k</i> | Cinnamon-Drab..... | XLVI | 13''''' | — |
| *Burnt Umber..... | XXVIII | 9''' | <i>m</i> | *Cinnamon-Rufous..... | XIV | 11' | <i>i</i> |
| Cacao Brown..... | XXVIII | 9''' | <i>i</i> | Citrine..... | IV | 21 | <i>k</i> |
| Cadet Blue..... | XXI | 49' | <i>i</i> | Citrine-Drab..... | XL | 19''' | <i>i</i> |
| Cadet Gray..... | XLII | 45''''' | <i>b</i> | Citron Green..... | XXXI | 25''' | <i>b</i> |
| *Cadmium Orange..... | III | 13 | — | *Citron Yellow..... | XVI | 25' | <i>b</i> |
| *Cadmium Yellow..... | III | 17 | — | Civette Green..... | XVII | 31' | <i>k</i> |
| Calamine Blue..... | VIII | 43 | <i>d</i> | *Claret Brown..... | I | 5 | <i>m</i> |
| Calla Green..... | V | 25 | <i>m</i> | *Clay Color..... | XXIX | 17''' | — |
| Calliste Green..... | VI | 31 | <i>i</i> | Clear Cadet Blue..... | XXI | 49' | — |
| Cameo Brown..... | XXVIII | 7''' | <i>k</i> | Clear Dull Green Yellow..... | XVI | 25' | <i>b</i> |
| Cameo Pink..... | XXVI | 71' | <i>f</i> | Clear Fluorite Green..... | XXXII | 33''' | <i>b</i> |
| *Campanula Blue..... | XXIV | 57 | <i>b</i> | Clear Blue-Green Gray..... | XLVIII | 45''''' | <i>d</i> |
| Capri Blue..... | XX | 43' | <i>i</i> | Clear Payne's Gray..... | XLIX | 49''''' | <i>b</i> |
| Capucine Buff..... | III | 13 | <i>f</i> | Clear Windsor Blue..... | XXXV | 49''' | — |
| Capucine Orange..... | III | 13 | <i>d</i> | Clear Yellow-Green..... | VI | 31 | <i>b</i> |
| Capucine Yellow..... | III | 15 | <i>b</i> | *Clove Brown..... | XL | 17''' | <i>m</i> |
| *Carmine..... | I | 1 | <i>i</i> | Cobalt Green..... | XIX | 37' | <i>b</i> |
| Carnelian Red..... | XIV | 7' | — | Colonial Buff..... | XXX | 21''' | <i>d</i> |
| Carob Brown..... | XIV | 9' | <i>m</i> | Columbia Blue..... | XXXIV | 47''' | <i>b</i> |
| Carrot Red..... | XIV | 7' | <i>b</i> | Commelina Blue..... | XXI | 51' | — |
| Cartridge Buff..... | XXX | 19''' | <i>f</i> | Congo Pink..... | XXVIII | 7''' | <i>b</i> |
| Castor Gray..... | LII | 35''''' | <i>i</i> | Coral Pink..... | XIII | 5' | <i>d</i> |
| Cedar Green..... | VI | 31 | <i>m</i> | *Coral Red..... | XIII | 5' | — |
| Celandine Green..... | XLVII | 33''''' | <i>b</i> | Corinthian Pink..... | XXVII | 3''' | <i>d</i> |
| Cendre Blue..... | VIII | 43 | <i>b</i> | Corinthian Purple..... | XXXVIII | 69''' | <i>k</i> |
| Cendre Green..... | VI | 35 | <i>b</i> | Corinthian Red..... | XXVII | 3''' | — |
| Cerro Green..... | V | 27 | <i>m</i> | Cornflower Blue..... | XXI | 53' | <i>i</i> |
| *Cerulean Blue..... | VIII | 45 | — | Corydalis Green..... | XLI | 29''' | <i>d</i> |
| Chaetura Black..... | XLVI | 17''''' | <i>m</i> | Cossack Green..... | VI | 33 | <i>m</i> |
| Chaetura Drab..... | XLVI | 17''''' | <i>k</i> | Cosse Green..... | V | 29 | <i>i</i> |
| Chalcedony Yellow..... | XVII | 25' | — | Cotinga Purple..... | XI | 63 | <i>k</i> |
| Chamois..... | XXX | 19''' | <i>b</i> | Courge Green..... | XVII | 25' | <i>i</i> |
| Chapman's Blue..... | XXII | 49* | <i>i</i> | Court Gray..... | XLVII | 29''''' | <i>f</i> |
| Chartreuse Yellow..... | XXXI | 25''' | <i>d</i> | *Cream-Buff..... | XXX | 19''' | <i>d</i> |
| Chatenay Pink..... | XIII | 3' | <i>f</i> | *Cream Color..... | XVI | 19' | <i>f</i> |
| Chessylite Blue..... | XX | 45' | <i>k</i> | Cress Green..... | XXXI | 29''' | <i>k</i> |
| *Chestnut..... | II | 9 | <i>m</i> | *Cyanine Blue..... | IX | 51 | <i>m</i> |
| Chestnut-Brown..... | XIV | 11' | <i>m</i> | Dahlia Carmine..... | XXVI | 71' | <i>k</i> |
| Chicory Blue..... | XXIV | 59* | <i>d</i> | *Dahlia Purple..... | XII | 67 | <i>k</i> |

| COLOR NAME. | Plate. | Color or hue Number. | Tone. | COLOR NAME. | Plate | Color or hue Number. | Tone. |
|------------------------------|---------|----------------------|-------|-----------------------------|---------|----------------------|-------|
| Danube Green..... | XXXII | 35" | m | Dark Mouse Gray..... | LI | 15"" | k |
| Daphne Pink..... | XXXVIII | 69" | b | Dark Naphthalene Violet.. | XXXVII | 61" | m |
| Daphne Red..... | XXXVIII | 69" | — | Dark Neutral Gray..... | LIII | — | k |
| Dark American Green..... | XLI | 29" | k | Dark Nigrosin Violet..... | XXV | 65" | m |
| Dark Aniline Blue..... | X | 55 | m | Dark Olive..... | XL | 21" | m |
| Dark Anthracene Violet.... | XXV | 61" | m | Dark Olive-Buff..... | XL | 21" | — |
| Dark Bluish Glauous..... | XLII | 37" | b | Dark Olive-Gray..... | LI | 23"" | i |
| Dark Bluish Gray-Green.... | XLII | 41" | k | Dark Orient Blue..... | XXXIV | 45" | k |
| Dark Bluish Violet..... | X | 57 | m | Dark Payne's Gray..... | XLIX | 49"" | k |
| Dark Cadet Blue..... | XXI | 49" | m | Dark Perilla Purple..... | XXXVII | 65" | m |
| Dark Chessylite Blue..... | XX | 45" | m | Dark Plumbago Blue..... | XLIII | 53" | b |
| Dark Cinnabar Green..... | XIX | 39" | k | Dark Plumbago Gray..... | L | 61" | — |
| Dark Citrine..... | IV | 21 | m | Dark Plumbago Slate..... | L | 61"" | k |
| Dark Corinthian Purple.... | XXXIX | 69" | m | Dark Plumbeous..... | LII | 49"" | i |
| Dark Cress Green..... | XXXI | 29" | m | Dark Porcelain Green..... | XXXIII | 39" | k |
| Dark Delft Blue..... | XLII | 45" | m | Dark Purple-Drab..... | XLV | 1"" | f |
| Dark Diva Blue..... | XXI | 51 | k | Dark Purplish Gray..... | LIII | 67"" | k |
| Dark Dull Blue-Violet..... | XXXVI | 55" | k | Dark Quaker Drab..... | LI | 1"" | k |
| Dark Dull Bluish Violet (1). | XXIV | 57* | k | Dark Russian Green..... | XLII | 37" | k |
| Dark Dull Bluish Violet (2). | XXXV | 51" | k | Dark Slate-Purple..... | XLIV | 65" | k |
| Dark Dull Bluish Violet (3). | XXXVI | 57" | k | Dark Slate-Violet (1)..... | XLIII | 57" | k |
| Dark Dull Violet-Blue..... | XXIV | 53* | k | Dark Slate-Violet (2)..... | XLIV | 61" | k |
| Dark Dull Yellow-Green..... | XXXII | 31" | m | Dark Soft Blue-Violet..... | XXIII | 55" | k |
| Dark Glauous-Gray..... | XLVIII | 37"" | b | Dark Soft Bluish Violet.... | XXIII | 57" | k |
| Dark Gobelin Blue..... | XXXIV | 43" | k | Dark Sulphate Green..... | XIX | 39" | i |
| Dark Grayish Blue-Green.... | XLVIII | 37"" | k | Dark Terre Verte..... | XXXIII | 41" | k |
| Dark Grayish Blue-Violet.. | XXIV | 55* | k | Dark Tyrian Blue..... | XXXIV | 47" | k |
| Dark Grayish Brown..... | XLV | 5"" | k | Dark Varley's Gray..... | XLIX | 57"" | k |
| Dark Grayish Lavender.... | XLIII | 57"" | b | Dark Vinaceous..... | XXVII | 1" | — |
| Dark Grayish Olive..... | XLVI | 21"" | k | Dark Vinaceous-Brown..... | XXXIX | 5"" | k |
| Dark Green..... | XVIII | 35" | m | Dark Vinaceous-Drab..... | XLV | 5"" | i |
| Dark Green-Blue Gray..... | XLVIII | 45"" | — | Dark Vinaceous-Gray..... | L | 69"" | — |
| Dark Green-Blue Slate.... | XLVIII | 45"" | k | Dark Vinaceous-Purple.... | XXXVIII | 67" | k |
| Dark Greenish Glauous.... | XLJ | 29"" | b | Dark Violet..... | X | 59 | k |
| Dark Greenish Olive..... | XXX | 23" | m | Dark Violet-Gray..... | LII | 59"" | k |
| Dark Gull Gray..... | LIII | — | (h) | Dark Violet-Slate..... | XLIX | 53"" | k |
| Dark Heliotrope Gray..... | L | 65"" | — | Dark Viridian Green..... | VII | 37 | k |
| Dark Heliotrope Slate..... | L | 65"" | k | Dark Yellowish Green..... | XVIII | 33" | m |
| Dark Hyssop Violet..... | XXXVI | 59" | k | Dark Yvette Violet..... | XXXVI | 55" | m |
| Dark Indian Red..... | XXVII | 3" | m | Dark Zinc Green..... | XIX | 37" | k |
| Dark Ivy Green..... | XLVI | 25"" | k | Dauphin's Violet..... | XXIII | 59" | i |
| Dark Lavender..... | XLIV | 61" | b | Dawn Gray..... | LII | 35"" | d |
| Dark Livid Brown..... | XXXIX | 1"" | k | Deep Aniline Lilac..... | XXXV | 53" | k |
| Dark Livid Purple..... | XXXVII | 63" | m | Deep Blue-Violet..... | X | 55 | i |
| Dark Livid Red..... | XXXIX | 1" | k | Deep Bluish Glauous..... | XLII | 37"" | d |
| Dark Madder Blue..... | XLIII | 53"" | k | Deep Bluish Gray-Green.... | XLII | 41"" | i |
| Dark Madder Violet..... | XXV | 63" | m | Deep Brownish Drab..... | XLV | 9"" | i |
| Dark Maroon Purple..... | XXVI | 71" | m | Deep Brownish Vinaceous.. | XXXIX | 5" | — |
| Dark Medici Blue..... | XLVIII | 41"" | i | Deep Cadet Blue..... | XXI | 49" | k |
| Dark Mineral Red..... | XXVII | 1" | m | Deep Chicory Blue..... | XXIV | 57* | b |

| COLOR NAME. | Plate. | Color or hue Number. | Tone. | COLOR NAME. | Plate. | Color or hue Number. | Tone. |
|----------------------------------|---------|----------------------|-------|------------------------------|--------|----------------------|-------|
| *Deep Chrome..... | III | 17 | b | Deep Slate-Green..... | XLVII | 33'''' | k |
| Deep Chrysolite Green..... | XXXI | 27'' | — | Deep Slate-Olive..... | XLVI | 29'''' | k |
| Deep Colonial Buff..... | XXX | 21'' | b | Deep Slate-Violet..... | XLIV | 61'''' | i |
| Deep Corinthian Red..... | XXVII | 3'' | t | Deep Slaty Brown..... | L | 69'''' | k |
| Deep Delft Blue..... | XLII | 45'''' | k | Deep Soft Blue-Violet..... | XXIII | 55'' | i |
| Deep Dull Bluish Violet (1)..... | XXIV | 57* | i | Deep Soft Bluish Violet..... | XXIII | 57'' | i |
| Deep Dull Bluish Violet (2)..... | XXXV | 51'' | i | Deep Turtle Green..... | XXXII | 31'' | — |
| Deep Dull Bluish Violet (3)..... | XXXVI | 57'' | i | Deep Varley's Gray..... | XLIX | 57'''' | i |
| Deep Dull Lavender..... | XLIV | 61'''' | d | Deep Vinaceous..... | XXVII | 1'' | b |
| Deep Dull Violaceous Blue..... | XXII | 51* | k | Deep Vinaceous-Gray..... | L | 69'''' | b |
| Deep Dull Violet-Blue..... | XXXV | 53'' | i | Deep Vinaceous-Lavender..... | XLIV | 65'''' | d |
| Deep Dull Yellow-Green (1)..... | XXXII | 31'' | k | Deep Violet-Gray..... | LII | 59'''' | i |
| Deep Dull Yellow-Green (2)..... | XXXII | 33'' | k | Deep Violet-Plumbeous..... | XLIX | 53'''' | — |
| Deep Dutch Blue..... | XLIII | 49'' | — | Deep Wedgewood Blue..... | XXI | 51'' | d |
| Deep Glaucous-Gray..... | XLVIII | 37'''' | d | Delft Blue..... | XLII | 45'''' | i |
| Deep Glaucous-Green..... | XXII | 39'' | b | Diamin-Azo Blue..... | XXXV | 51'' | m |
| Deep Grape Green..... | XLI | 25'''' | i | Diamine Brown..... | XIII | 3'' | m |
| Deep Grayish Blue-Green..... | XLVIII | 37'''' | i | Diamine Green..... | VII | 37'' | m |
| Deep Grayish Lavender..... | XLIII | 57'''' | d | Diva Blue..... | XXI | 51'' | i |
| Deep Grayish Olive..... | XLVI | 21'''' | i | *Drab..... | XLVI | 17'''' | — |
| Deep Green-Blue Gray..... | XLVIII | 45'''' | b | *Drab-Gray..... | XLVI | 17'''' | d |
| Deep Greenish Glaucous..... | XLI | 29'''' | d | *Dragons-blood Red..... | XIII | 5'' | i |
| Deep Guil Gray..... | LIII | — | b(?) | Dresden Brown..... | XV | 17'' | k |
| Deep Heliotrope Gray..... | L | 65'''' | b | Duck Green..... | XIX | 39'' | m |
| Deep Hellebore Red..... | XXXVIII | 71'' | i | Dull Blackish Green..... | XLI | 29'''' | m |
| Deep Hyssop Violet..... | XXXVI | 59'' | i | Dull Blue-Green Black..... | XLVIII | 41'''' | m |
| Deep Lavender..... | XXXVI | 59'' | d | Dull Blue-Violet (1)..... | XXIV | 55* | — |
| Deep Lavender-Blue..... | XXI | 53'' | b | Dull Blue-Violet (2)..... | XXXVI | 55'' | i |
| Deep Lichen Green..... | XXXIII | 37'' | d | Dull Bluish Violet (1)..... | XXIV | 57* | — |
| Deep Livid Brown..... | XXXIX | 1'' | i | Dull Bluish Violet (2)..... | XXXV | 51'' | — |
| Deep Livid Purple..... | XXXVII | 63'' | k | Dull Bluish Violet (3)..... | XXXVI | 57'' | — |
| Deep Madder Blue..... | XLIII | 53'''' | i | Dull Citrine..... | XVI | 21'' | k |
| Deep Malachite Green..... | XXXII | 35'' | — | Dull Dark Purple..... | XXVI | 67'' | m |
| Deep Medici Blue..... | XLVIII | 41'''' | — | Dull Dusky Purple..... | XXVI | 67'' | m |
| Deep Mouse Gray..... | LI | 15'''' | i | Dull Greenish Black (1)..... | XLVII | 29'''' | m |
| Deep Neutral Gray..... | LIII | — | i | Dull Greenish Black (2)..... | XLVII | 33'''' | m |
| Deep Olive..... | XL | 21'''' | k | Dull Green-Yellow..... | XLII | 27'' | — |
| Deep Olive-Buff..... | XL | 21'''' | b | Dull Indian Purple..... | XLIV | 69'''' | i |
| Deep Olive-Gray..... | LI | 23'''' | — | Dull Lavender..... | XLIV | 61'''' | f |
| Deep Orient Blue..... | XXXIV | 45'' | i | Dull Magenta Purple..... | XXVI | 67'' | i |
| Deep Payne's Gray..... | XLIX | 49'''' | i | Dull Opaline Green..... | XIX | 37'' | f |
| Deep Plumbago Blue..... | XLIII | 53'''' | d | Dull Purplish Black..... | L | 65'''' | m |
| Deep Plumbeous Gray..... | L | 61'''' | b | Dull Slate-Violet..... | XLIII | 57'''' | i |
| Deep Plumbeous..... | LII | 49'''' | — | Dull Violet-Black (1)..... | XLIV | 61'' | m |
| Deep Purplish Gray..... | LIII | 67'''' | i | Dull Violet-Black (2)..... | XLIX | 53'''' | m |
| Deep Purplish Vinaceous..... | XLIV | 69'' | — | Dull Violet-Black (3)..... | L | 61'''' | m |
| Deep Quaker Drab..... | LI | 1'''' | i | Dull Violaceous Blue..... | XXII | 51* | — |
| Deep Rose-Pink..... | XII | 71'' | d | Dull Violet-Blue..... | XXXV | 53'' | — |
| Deep Seafoam Green..... | XXXI | 27'' | d | Dusky Auricula Purple..... | XXVI | 69'' | m |
| Deep Slate-Blue..... | XLIII | 49'''' | k | Dusky Blue..... | XXII | 49* | m |

| COLOR NAME. | Plate. | Color or hue Number. | Tone. | COLOR NAME. | Plate | Color or hue Number. | Tone. |
|-----------------------------|---------|----------------------|----------|----------------------------|--------|----------------------|--------------|
| Dusky Blue-Green..... | XXXIII | 39'' | <i>m</i> | Fluorite Violet..... | XI | 61 | <i>m</i> |
| Dusky Bluish Green..... | XXXIII | 41'' | <i>m</i> | Forest Green..... | XVII | 29' | <i>m</i> |
| Dusky Blue-Violet (1)..... | XXIII | 57' | <i>m</i> | Forget-me-not Blue..... | XXII | 51* | <i>b</i> |
| Dusky Blue-Violet (2)..... | XXIV | 55* | <i>m</i> | *French Gray..... | LII | 49'''' | <i>f</i> |
| Dusky Brown..... | XLV | 1'''' | <i>k</i> | *French Green..... | XXXII | 35'' | <i>k</i> |
| Dusky Drab..... | XLV | 9'''' | <i>k</i> | Fuscou..... | XLVI | 13'''' | <i>i</i> |
| Dusky Dull Bluish Green.. | XLII | 41'' | <i>m</i> | Fuscou-Black..... | XLVI | 13'''' | <i>m</i> |
| Dusky Dull Green..... | XLII | 37'' | <i>m</i> | Garnet Brown..... | I | 3 | <i>k</i> |
| Dusky Dull Violet (1)..... | XXXVI | 57'' | <i>m</i> | Gendarme Blue..... | XXII | 47* | <i>k</i> |
| Dusky Dull Violet (2)..... | XXXVI | 59'' | <i>m</i> | Gentian Blue..... | XXI | 53' | <i>i</i> |
| Dusky Dull Violet-Blue..... | XXXV | 53'' | <i>m</i> | *Geranium Pink..... | I | 3 | <i>d</i> |
| Dusky Green..... | XXXIII | 37'' | <i>m</i> | Glass Green..... | XXXI | 29'' | <i>d</i> |
| Dusky Green-Blue (1)..... | XX | 43'' | <i>m</i> | Glaucous..... | XLI | 29'' | <i>f</i> |
| Dusky Green-Blue (2)..... | XXXIV | 43'' | <i>m</i> | *Glaucous-Blue..... | XXXIV | 43'' | <i>b</i> |
| Dusky Green-Gray..... | LII | 35'''' | <i>k</i> | Glaucous-Gray..... | XLVIII | 37'' | <i>f</i> |
| Dusky Greenish Blue..... | XL | 47'' | <i>m</i> | *Glaucous-Green..... | XXXII | 39'' | <i>d</i> |
| Dusky Neutral Gray..... | LIII | — | <i>m</i> | Gnaphalium Green..... | XLVII | 29'' | <i>d</i> |
| Dusky Olive-Green..... | XLI | 25'' | <i>m</i> | Gobelin Blue..... | XXXIV | 43'' | <i>i</i> |
| Dusky Orient Blue..... | XXXIV | 45'' | <i>m</i> | Grape Green..... | XLI | 25'' | — |
| Dusky Purplish Gray..... | LIII | 67'''' | <i>m</i> | *Grass Green..... | VI | 33 | <i>k</i> |
| Dusky Slate-Blue..... | XLIII | 49'' | <i>m</i> | Grayish Blue-Green..... | XLVIII | 37'' | — |
| Dusky Slate-Violet..... | XLIII | 57'' | <i>m</i> | Grayish Blue-Violet (1)... | XXIV | 55* | <i>i</i> |
| Dusky Violet..... | XXIII | 59'' | <i>m</i> | Grayish Blue-Violet (2)... | XXXV | 51'' | <i>b</i> |
| Dusky Violet-Blue (1)..... | XXII | 55'' | <i>m</i> | Grayish Lavender..... | XLIII | 57'' | <i>f</i> |
| Dusky Violet-Blue (2)..... | XLIII | 53'' | <i>m</i> | Grayish Olive..... | XLVI | 21'' | — |
| Dusky Yellowish Green..... | XLI | 27'' | <i>m</i> | Grayish Violaceous Blue... | XXII | 51* | <i>i</i> |
| Dutch Blue..... | XLIII | 49'' | <i>b</i> | Grayish Violet-Blue..... | XXIV | 53* | <i>i</i> |
| *Ecrú-Drab..... | XLVI | 13'''' | <i>d</i> | Green-Blue Slate..... | XLVIII | 45'' | <i>i</i> |
| Ecrú-Olive..... | XXX | 21'' | <i>i</i> | Green-Yellow..... | V | 27 | <i>b</i> |
| Elm Green..... | XVII | 27'' | <i>m</i> | Greenish Glaucous..... | XLI | 33'' | <i>f</i> |
| *Emerald Green..... | VI | 35 | — | Greenish Glaucous-Blue... | XLII | 41'' | <i>b</i> |
| Empire Green..... | XXXII | 33'' | <i>m</i> | Greenish Slate-Black..... | XLVIII | 37'' | <i>m</i> |
| Empire Yellow..... | IV | 21 | <i>b</i> | Greenish Yellow..... | V | 25 | — |
| Endive Blue..... | XLIII | 49'' | <i>d</i> | Grenadine..... | II | 7 | <i>b</i> |
| English Red..... | II | 7 | <i>i</i> | Grenadine Pink..... | II | 7 | <i>d</i> |
| Eosine Pink..... | I | 1 | <i>d</i> | Grenadine Red..... | II | 7 | <i>d</i> |
| Etain Blue..... | XX | 43' | <i>f</i> | Guinea Green..... | VII | 39 | <i>i</i> |
| Ethyl Green..... | VII | 41 | <i>i</i> | Gull Gray..... | LIII | — | <i>d</i> (8) |
| Eton Blue..... | XXII | 49* | <i>k</i> | Haematite Red..... | XXXVI | 5'' | <i>m</i> |
| Etruscan Red..... | XXVII | 5'' | — | Haematoxylin Violet..... | XXV | 61' | <i>i</i> |
| Eugenia Red..... | XIII | 1' | — | *Hair Brown..... | XLVI | 17'' | <i>b</i> |
| Eupatorium Purple..... | XXXVIII | 67'' | — | Hathi Gray..... | LII | 35'''' | <i>b</i> |
| *Fawn Color..... | XL | 13'' | — | Hay's Blue..... | IX | 53 | <i>k</i> |
| *Ferruginous..... | XIV | 9' | <i>i</i> | Hay's Brown..... | XXXIX | 9'' | <i>k</i> |
| *Flame Scarlet..... | II | 9 | — | Hay's Green..... | XVIII | 33' | <i>k</i> |
| *Flax-flower Blue..... | XXI | 51' | <i>b</i> | Hay's Lilac..... | XXXVII | 63'' | <i>d</i> |
| *Flesh Color..... | XIV | 7' | <i>d</i> | Hay's Maroon..... | XIII | 1' | <i>m</i> |
| Flesh Ocher..... | XIV | 9' | <i>b</i> | Hay's Russet..... | XIV | 7' | <i>k</i> |
| Flesh Pink..... | XIII | 5' | <i>f</i> | *Hazel..... | XIV | 11' | <i>k</i> |
| Fluorite Green..... | XXXII | 33'' | — | Heliotrope-Gray..... | L | 65'' | <i>d</i> |

| COLOR NAME. | Plate. | Color or hue Number. | Tone. | COLOR NAME. | Plate. | Color or hue Number. | Tone. |
|-----------------------|---------|----------------------|----------|------------------------------|--------|----------------------|----------|
| Heliotrope-Slate..... | L | 65''' | <i>i</i> | Light Alice Blue..... | XXXIV | 45'' | <i>d</i> |
| Hellebore Green..... | XVII | 25' | <i>m</i> | Light Amparo Blue..... | IX | 51 | <i>d</i> |
| Hellebore Red..... | XXXVIII | 71'' | — | Light Amparo Purple..... | XI | 63 | <i>d</i> |
| Helvetia Blue..... | IX | 51 | <i>k</i> | Light Bice Green..... | XVII | 29' | <i>i</i> |
| Hermosa Pink..... | I | 1 | <i>f</i> | Light Blue-Green..... | VII | 39 | <i>d</i> |
| Hessian Brown..... | XIII | 5' | <i>m</i> | Light Blue-Violet..... | X | 55 | <i>b</i> |
| Honey Yellow..... | XXX | 19'' | — | Light Bluish Violet..... | X | 57 | <i>b</i> |
| Hortense Blue..... | XXII | 47* | <i>m</i> | Light Brownish Drab..... | XLV | 9''' | <i>b</i> |
| Hortense Violet..... | XI | 61 | <i>b</i> | Light Brownish Olive..... | XXX | 19'' | <i>k</i> |
| *Hyacinth Blue..... | X | 55 | <i>k</i> | Light Brownish Vinaceous.. | XXXIX | 5''' | <i>d</i> |
| Hyacinth Violet..... | XI | 61 | <i>i</i> | Light Buff..... | XV | 17' | <i>f</i> |
| Hydrangea Pink..... | XXVII | 5'' | <i>f</i> | Light Cadet Blue..... | XXI | 49' | <i>b</i> |
| Hydrangea Red..... | XXVII | 1'' | — | Light Cadmium..... | IV | 19 | — |
| Hyssop Violet..... | XXXVI | 59'' | — | Light Campanula Blue..... | XXIV | 55* | <i>d</i> |
| Indian Lake..... | XXVI | 71' | <i>t</i> | Light Celandine Green..... | XLVII | 33''' | <i>d</i> |
| *Indian Purple..... | XXXVIII | 67'' | <i>m</i> | Light Cendre Green..... | VI | 35 | <i>d</i> |
| Indian Red..... | XXVII | 3'' | <i>k</i> | Light Cerulean Blue..... | VIII | 45 | <i>b</i> |
| *Indigo Blue..... | XXXIV | 47'' | <i>m</i> | Light Chalcedony Yellow.... | XXII | 25' | <i>d</i> |
| Indulin Blue..... | XXII | 51* | <i>m</i> | Light Chicory Blue..... | XXX | 57* | <i>f</i> |
| Invisible Green..... | XIX | 41' | <i>m</i> | Light Cinnamon-Drab..... | XLVI | 13''' | <i>b</i> |
| Iron Gray..... | LI | 23''' | <i>k</i> | Light Columbia Blue..... | XXXIV | 47'' | <i>d</i> |
| *Isabella Color..... | XXX | 19'' | <i>t</i> | Light Congo Pink..... | XXXVII | 7'' | <i>d</i> |
| Italian Blue..... | VIII | 43 | — | Light Coral Red..... | XIII | 5' | <i>b</i> |
| Ivory Yellow..... | XXX | 21'' | <i>f</i> | Light Corinthian Red..... | XXVII | 3'' | <i>b</i> |
| Ivy Green..... | XXXI | 25'' | <i>m</i> | Light Cress Green..... | XXXI | 29'' | <i>i</i> |
| Jade Green..... | XXXI | 27'' | <i>k</i> | Light Danube Green..... | XXXII | 35'' | <i>b</i> |
| Japan Rose..... | XXVIII | 9'' | <i>b</i> | Light Drab..... | XLVI | 17''' | <i>k</i> |
| Jasper Green..... | XXXIII | 37'' | <i>t</i> | Light Dull Bluish Violet... | XXXVI | 57'' | <i>b</i> |
| Jasper Pink..... | XIII | 3' | <i>d</i> | Light Dull Green-Yellow.... | XVII | 27' | <i>d</i> |
| Jasper Red..... | XIII | 3' | — | Light Elm Green..... | XVII | 27' | <i>i</i> |
| Javel Green..... | V | 27 | <i>t</i> | Light Fluorite Green..... | XXXII | 33'' | <i>d</i> |
| Jay Blue..... | XXII | 47* | <i>i</i> | Light Forget-me-not Blue... | XXII | 51* | <i>d</i> |
| Jovence Blue..... | XX | 43' | <i>k</i> | Light Glaucous-Blue..... | XXXIV | 43'' | <i>d</i> |
| Kaiser Brown..... | XIV | 9' | <i>k</i> | Light Dull Glaucous-Blue... | XLII | 41''' | <i>d</i> |
| Kildara Green..... | XXXI | 29'' | <i>b</i> | Light Grape Green..... | XLI | 25''' | <i>b</i> |
| Kiltarne Green..... | XVIII | 35' | <i>t</i> | Light Grayish Blue-Violet.. | XXXV | 51'' | <i>d</i> |
| King's Blue..... | XXII | 47* | <i>b</i> | Light Grayish Olive..... | XLVI | 21''' | <i>b</i> |
| Kronberg's Green..... | XXXI | 25'' | <i>k</i> | Light Grayish Vinaceous... | XXXIX | 9'' | <i>d</i> |
| Laelia Pink..... | XXXVIII | 67'' | <i>d</i> | Light Grayish Violet-Blue... | XXIV | 53* | <i>b</i> |
| La France Pink..... | I | 3 | <i>f</i> | Light Greenish Yellow..... | V | 25 | <i>b</i> |
| *Lavender..... | XXXVI | 59'' | <i>f</i> | Light Green-Yellow..... | V | 27 | <i>d</i> |
| Lavender-Blue..... | XXI | 53' | <i>d</i> | Light Gull Gray..... | LIII | <i>f</i> (9) | |
| *Lavender-Gray..... | XLIII | 49''' | <i>f</i> | Light Heliotrope-Gray..... | L | 65''' | <i>f</i> |
| Lavender-Violet..... | XXV | 61' | <i>b</i> | Light Hellebore Green..... | XVII | 25' | <i>k</i> |
| Leaf Green..... | XLI | 29''' | <i>k</i> | Light Hortense Violet..... | XI | 61 | <i>d</i> |
| Leitch's Blue..... | VIII | 47 | <i>t</i> | Light Hyssop Violet..... | XXXVI | 59'' | <i>b</i> |
| Lemon Chrome..... | IV | 21 | — | Light Jasper Red..... | XIII | 3' | <i>b</i> |
| *Lemon Yellow..... | IV | 23 | — | Light King's Blue..... | XXII | 47* | <i>d</i> |
| Lettuce Green..... | V | 29 | <i>k</i> | Light Lavender-Blue..... | XXI | 53' | <i>f</i> |
| Lichen Green..... | XXXIII | 37'' | <i>f</i> | Light Lavender-Violet..... | XXV | 61' | <i>d</i> |

ALPHABETICAL LIST OF COLORS.

35

| COLOR NAME. | Plate. | Color or hue Number. | Tone. | COLOR NAME. | Plate | Color or hue Number. | Tone. |
|-----------------------------|--------|----------------------|----------|----------------------------|---------|----------------------|----------|
| Light Lobelia Violet..... | XXXVII | 61'' | <i>d</i> | Light Viridine Green..... | VI | 33 | <i>f</i> |
| Light Lumiere Green..... | XVII | 29' | <i>d</i> | Light Viridine Yellow..... | V | 29 | <i>d</i> |
| Light Mallow Purple..... | XII | 67 | <i>d</i> | Light Windsor Blue..... | XXXV | 49'' | <i>b</i> |
| Light Mauve..... | XXV | 63' | <i>d</i> | Light Wistaria Blue..... | XXIII | 57' | <i>d</i> |
| Light Medici Blue..... | XLVIII | 41'''' | <i>d</i> | Light Wistaria Violet..... | XXIII | 59' | <i>d</i> |
| Light Methyl Blue..... | VIII | 47 | <i>b</i> | Light Yellow-Green..... | VI | 31 | <i>d</i> |
| Light Mineral Gray..... | XLVII | 25'''' | <i>f</i> | Light Yellowish Olive..... | XXX | 23'' | <i>i</i> |
| Light Mouse Gray..... | LI | 15'''' | <i>b</i> | *Lilac..... | XXV | 65' | <i>d</i> |
| Light Neropolin Blue..... | XXII | 49* | <i>d</i> | *Lilac-Gray..... | LII | 59'''' | <i>f</i> |
| Light Neutral Gray..... | LIII | — | <i>b</i> | Lily Green..... | XLVII | 33'''' | <i>b</i> |
| Light Niagara Green..... | XXXIII | 41'' | <i>d</i> | Lime Green..... | XXXI | 25'' | — |
| Light Ochraceous-Buff..... | XV | 15' | <i>d</i> | Lincoln Green..... | XLI | 25'' | <i>b</i> |
| Light Ochraceous-Salmon.. | XV | 13' | <i>d</i> | Liseran Purple..... | XXVI | 67' | <i>k</i> |
| Light Olive-Gray..... | LI | 23'''' | <i>d</i> | Litho Purple..... | XXV | 63' | <i>i</i> |
| Light Orange-Yellow..... | III | 17 | <i>d</i> | *Liver Brown..... | XIV | 7' | — |
| Light Oriental Green..... | XVIII | 33' | <i>b</i> | Livid Brown..... | XXXIX | 1'' | <i>f</i> |
| Light Paris Green..... | XVIII | 35' | <i>d</i> | Livid Pink..... | XXVII | 3'' | <i>f</i> |
| Light Payne's Gray..... | XLIX | 49'''' | <i>d</i> | Livid Purple..... | XXXVII | 63'' | <i>i</i> |
| Light Perilla Purple..... | XXXVII | 65'' | <i>i</i> | Livid Violet..... | XXXVII | 61'' | <i>i</i> |
| Light Phlox Purple..... | XI | 65 | <i>d</i> | Lobelia Violet..... | XXXVII | 61'' | <i>b</i> |
| Light Pinkish Cinnamon... | XXIX | 15'' | <i>d</i> | Lumiere Blue..... | XX | 43' | <i>d</i> |
| Light Pinkish Lilac..... | XXXVII | 65'' | <i>f</i> | Lumiere Green..... | XVII | 29' | <i>b</i> |
| Light Plumbago Gray..... | L | 61'''' | <i>f</i> | Lyons Blue..... | IX | 51 | <i>i</i> |
| Light Porcelain Green..... | XXXIII | 39'' | — | Madder Blue..... | XLIII | 53'' | — |
| Light Purple-Drab..... | XLV | 1'''' | <i>b</i> | *Madder Brown..... | XIII | 3' | <i>k</i> |
| Light Purplish Gray..... | LIII | 67'''' | <i>b</i> | Madder Violet..... | XXV | 63' | <i>k</i> |
| Light Purplish Vinaceous.. | XXXIX | 1'' | <i>d</i> | *Magenta..... | XXVI | 67' | — |
| Light Quaker Drab..... | LI | 1'''' | <i>b</i> | Mahogany Red..... | II | 7 | <i>k</i> |
| Light Rosolane Purple..... | XXVI | 69' | <i>b</i> | *Maize Yellow..... | III | 19 | <i>f</i> |
| Light Russet-Vinaceous.. | XXXIX | 9'' | <i>b</i> | *Malachite Green..... | XXXII | 35'' | <i>b</i> |
| Light Salmon-Orange..... | II | 11 | <i>d</i> | Mallow Pink..... | XII | 67 | <i>f</i> |
| Light Seal Brown..... | XXXIX | 9'' | <i>m</i> | Mallow Purple..... | XII | 67 | <i>b</i> |
| Light Sky Blue..... | XX | 47' | <i>f</i> | Manganese Violet..... | XXV | 63' | — |
| Light Soft Blue-Violet..... | XXIII | 55' | <i>b</i> | Marguerite Yellow..... | XXX | 23'' | <i>f</i> |
| Light Squill Blue..... | XX | 45' | <i>d</i> | *Marine Blue..... | VIII | 45 | <i>m</i> |
| Light Sulphate Green..... | XIX | 39' | <i>b</i> | *Maroon..... | I | 3 | <i>m</i> |
| Light Terre Verte..... | XXXIII | 41'' | — | *Mars Brown..... | XV | 13' | <i>m</i> |
| Light Turtle Green..... | XXXII | 31'' | <i>d</i> | Mars Orange..... | II | 9 | |
| Light Tyrian Blue..... | XXXIV | 47'' | — | Mars Violet..... | XXXVIII | 71'' | <i>m</i> |
| Light Varley's Gray..... | XLIX | 57'''' | <i>b</i> | Mars Yellow..... | III | 15 | <i>i</i> |
| Light Vinaceous-Cinnamon | XXIX | 13'' | <i>d</i> | Martius Yellow..... | III | 23 | <i>f</i> |
| Light Vinaceous-Drab..... | XLV | 5'''' | <i>b</i> | Massicot Yellow..... | XVI | 21' | <i>f</i> |
| Light Vinaceous-Fawn..... | XL | 13'' | <i>d</i> | Mathews' Blue..... | XX | 45' | — |
| Light Vinaceous-Gray..... | L | 69'''' | <i>f</i> | Mathews' Purple..... | XXV | 65' | — |
| Light Vinaceous-Lilac..... | XLIV | 69'' | <i>b</i> | *Mauve..... | XXV | 63' | <i>b</i> |
| Light Vinaceous-Purple... | XLIV | 65'' | <i>b</i> | Mauvette..... | XXV | 65' | <i>f</i> |
| Light Violet..... | X | 59 | <i>b</i> | Mazarine Blue..... | IX | 49 | <i>d</i> |
| Light Violet-Blue..... | IX | 53 | <i>b</i> | Meadow Green..... | VI | 35 | <i>k</i> |
| Light Violet-Gray..... | LII | 59'''' | <i>b</i> | Medal Bronze..... | III | 19 | <i>m</i> |
| Light Violet-Plumbeous... | XLIX | 53'''' | <i>d</i> | Medici Blue..... | XLVIII | 41'''' | <i>b</i> |

| COLOR NAME. | Plate. | Color or hue Number. | Tone. | COLOR NAME. | Plate. | Color or hue Number. | Tone. |
|---------------------------|---------|----------------------|----------|------------------------------|--------|----------------------|----------|
| Methyl Blue..... | VIII | 47 | — | *Olive- Buff..... | XL | 21''' | <i>d</i> |
| Methyl Green..... | XIX | 41' | — | Olive-Citrine..... | XVI | 21' | <i>m</i> |
| Microcline Green..... | XIX | 39' | <i>f</i> | *Olive-Gray..... | LI | 23''''' | <i>b</i> |
| Mignonette Green..... | XXXI | 25'' | <i>i</i> | *Olive-Green..... | IV | 23 | <i>m</i> |
| Mikado Brown..... | XXIX | 13'' | <i>i</i> | Olive Lake..... | XVI | 21' | <i>i</i> |
| Mikado Orange..... | III | 13 | <i>b</i> | Olive-Ocher..... | XXX | 21'' | — |
| Mineral Gray..... | XLVII | 25''''' | <i>d</i> | *Olive-Yellow..... | XXX | 23'' | — |
| Mineral Green..... | XVIII | 31' | — | Olivine..... | XXXII | 35'' | <i>d</i> |
| Mineral Red..... | XXVII | 1'' | <i>k</i> | Olympic Blue..... | XX | 47'' | — |
| Montpellier Green..... | XXXIII | 37'' | — | Onion-skin Pink..... | XXVIII | 11'' | <i>b</i> |
| Morocco Red..... | I | 5 | <i>k</i> | Ontario Violet..... | XXVII | 55'' | <i>b</i> |
| Motmot Blue..... | XX | 43' | — | Opaline Green..... | VII | 37 | <i>f</i> |
| Motmot Green..... | XLVII | 35' | — | *Orange..... | II | 15 | — |
| *Mouse Gray..... | LI | 15''''' | — | *Orange- Buff..... | III | 15 | <i>d</i> |
| *Mummy Brown..... | XV | 17' | <i>m</i> | *Orange Chrome..... | II | 11 | — |
| Mulberry Purple..... | XI | 61 | <i>k</i> | Orange-Cinnamon..... | XXXIX | 13'' | — |
| Mustard Yellow..... | XVI | 19' | <i>b</i> | Orange-Citrine..... | IV | 19 | <i>k</i> |
| Mytho Green..... | XLI | 29'' | <i>b</i> | Orange-Pink..... | II | 11 | <i>f</i> |
| *Myrtle Green..... | VII | 41 | <i>m</i> | *Orange-Rufous..... | II | 11 | <i>i</i> |
| Naphthalene Violet..... | XXXVII | 61'' | <i>k</i> | Orange-Vinaceous..... | XXVIII | 5'' | <i>d</i> |
| Naphthalene Yellow..... | XVI | 23' | <i>f</i> | Oriental Green..... | XXVII | 33' | — |
| *Naples Yellow..... | XVI | 19' | <i>d</i> | Orient Blue..... | XXXIV | 45'' | — |
| Natal Brown..... | XL | 13'' | <i>k</i> | Orient Pink..... | II | 9 | <i>f</i> |
| Navy Blue..... | XXI | 53' | <i>m</i> | Oural Green..... | XXVIII | 35' | <i>i</i> |
| Neropolin Blue..... | XXII | 49* | <i>b</i> | Ox-blood Red..... | I | 1 | <i>k</i> |
| Neutral Gray..... | LIII | — | — | Oxide Blue..... | VIII | 45 | <i>i</i> |
| Neutral Red..... | XXXVIII | 71'' | <i>k</i> | Pale Amaranth Pink..... | XII | 69 | <i>f</i> |
| Neuvider Green..... | VII | 37 | <i>d</i> | Pale Amparo Blue..... | IX | 51 | <i>f</i> |
| Neva Green..... | V | 29 | — | Pale Amparo Purple..... | XI | 63 | <i>f</i> |
| Niagara Green..... | XXXIII | 41'' | <i>b</i> | Pale Aniline Lilac..... | XXXV | 53'' | <i>f</i> |
| Nickel Green..... | XXXIII | 37'' | <i>k</i> | *Pale Blue (Ethyl Blue) ... | VIII | 45 | <i>f</i> |
| Night Green..... | VI | 33 | — | Pale Blue-Green..... | VII | 39 | <i>f</i> |
| Nigrosin Blue..... | XXXV | 49'' | <i>m</i> | Pale Blue-Violet..... | X | 55 | <i>d</i> |
| Nigrosin Violet..... | XXV | 65' | <i>k</i> | Pale Bluish Lavender..... | XXXVI | 57'' | <i>f</i> |
| *Nile Blue..... | XIX | 41' | <i>d</i> | Pale Bluish Violet..... | X | 57 | <i>d</i> |
| Nopal Red..... | I | 3 | <i>i</i> | Pale Brownish Drab..... | XLV | 5''''' | <i>d</i> |
| *Ochraceous- Buff..... | XV | 15' | <i>b</i> | Pale Brownish Vinaceous..... | XXXIX | 3'' | <i>f</i> |
| Ochraceous-Orange..... | XV | 15' | — | Pale Cadet Blue..... | XXI | 49' | <i>d</i> |
| Ochraceous-Salmon..... | XV | 13' | <i>b</i> | Pale Campanula Blue..... | XXIV | 57* | <i>d</i> |
| Ochraceous-Tawny..... | XV | 15' | <i>i</i> | Pale Cendre Green..... | VI | 35 | <i>f</i> |
| Ocher Red..... | XXVII | 5'' | <i>b</i> | Pale Cerulean Blue..... | VIII | 45 | <i>d</i> |
| *Oil Green..... | V | 27 | <i>k</i> | Pale Chalcedony Yellow... .. | XVII | 25' | <i>f</i> |
| Oil Yellow..... | V | 25 | <i>i</i> | Pale Cinnamon-Pink..... | XXIX | 13'' | <i>f</i> |
| Old Gold..... | XVI | 19' | <i>i</i> | Pale Congo Pink..... | XXVIII | 7'' | <i>f</i> |
| Old Rose..... | XIII | 1' | <i>b</i> | Pale Drab-Gray..... | XLVI | 17''''' | <i>f</i> |
| Olivaceous Black (1)..... | XLVI | 21''''' | <i>m</i> | Pale Dull Glaucous-Blue..... | XLII | 43'' | <i>f</i> |
| Olivaceous Black (2)..... | XLVII | 25''''' | <i>m</i> | Pale Dull Green-Yellow... .. | XVII | 27'' | <i>f</i> |
| Olivaceous Black (3)..... | LI | 23''''' | <i>m</i> | Pale Ecrú-Drab..... | XLVI | 13''''' | <i>f</i> |
| *Olive..... | XXX | 21'' | <i>m</i> | Pale Flesh Color..... | XIV | 7'' | <i>f</i> |
| Olive-Brown..... | XL | 17''''' | <i>m</i> | Pale Fluorite Green..... | XXXII | 33'' | <i>f</i> |

| COLOR NAME. | Plate. | Color or hue Number. | Tone. | COLOR NAME. | Plate. | Color or hue Number. | Tone. |
|-------------------------------|---------|----------------------|-------|---------------------------------|--------|----------------------|-------|
| Pale Forget-me-not Blue... | XXII | 51* | f | Pale Sulphate Green..... | XIX | 39' | d |
| Pale Glass Green..... | XXXI | 29'' | f | Pale Tiber Green..... | XVIII | 33' | f |
| Pale Glaucous-Blue..... | XXXIV | 43'' | f | Pale Turquoise Green..... | VII | 41 | f |
| Pale Glaucous-Green..... | XXXIII | 39'' | f | Pale Turtle Green..... | XXXII | 31'' | f |
| Pale Grayish Blue..... | XXI | 49' | f | Pale Varley's Gray..... | XLIX | 57'''' | d |
| Pale Grayish Blue-Violet..... | XXXV | 51'' | f | Pale Verbena Violet..... | XXXVI | 55'' | f |
| Pale Grayish Vinaceous..... | XXXIX | 5''' | f | Pale Veronese Green..... | XVIII | 31' | f |
| Pale Grayish Violet-Blue..... | XXIV | 53* | d | Pale Vinaceous..... | XXVII | 1'' | f |
| Pale Greenish Yellow..... | V | 25 | d | Pale Vinaceous-Drab..... | XLV | 3''' | d |
| Pale Green-Blue Gray..... | XLVIII | 43'''' | f | Pale Vinaceous-Fawn..... | XL | 13''' | f |
| Pale Green-Yellow..... | V | 27 | f | Pale Vinaceous-Lilac..... | XLIV | 69'' | — |
| Pale Gull Gray..... | LIII | — | (10) | Pale Vinaceous-Pink..... | XXVIII | 9'' | f |
| Pale Hortense Violet..... | XI | 61 | f | Pale Violet..... | X | 59 | d |
| Pale King's Blue..... | XXII | 47* | f | Pale Violet-Blue..... | IX | 53 | d |
| Pale Laelia Pink..... | XXXVIII | 67'' | f | Pale Violet-Gray..... | LII | 59'''' | d |
| Pale Lavender-Violet..... | XXV | 61' | f | Pale Violet-Plumbeous..... | XLIX | 53'' | f |
| Pale Lemon Yellow..... | IV | 23 | b | Pale Viridine Yellow..... | V | 29 | f |
| Pale Lilac..... | XXXVII | 63'' | f | Pale Windsor Blue..... | XXXV | 49'' | d |
| Pale Lobelia Violet..... | XXXVII | 61'' | f | Pale Wistaria Blue..... | XXIII | 57' | f |
| Pale Lumiere Green..... | XXVI | 29' | f | Pale Wistaria Violet..... | XXIII | 59' | f |
| Pale Mauve..... | XXV | 63' | f | Pale Yellow-Green..... | VI | 31 | f |
| Pale Mazarine Blue..... | IX | 49 | f | Pale Yellow-Orange..... | III | 15 | f |
| Pale Medici Blue..... | XLVIII | 41'''' | f | Pallid Blue-Violet..... | X | 55 | f |
| Pale Methyl Blue..... | VIII | 47 | d | Pallid Bluish Violet..... | X | 57 | f |
| Pale Mouse Gray..... | LI | 15'''' | d | Pallid Brownish Drab..... | XLV | 5'''' | f |
| Pale Neropaline Blue..... | XXII | 49* | f | Pallid Grayish Violet-Blue..... | XXIV | 53* | f |
| Pale Neutral Gray..... | LIII | — | d | Pallid Methyl Blue..... | VIII | 47 | f |
| Pale Niagara Green..... | XXXIII | 41'' | f | Pallid Mouse Gray..... | LI | 15'''' | f |
| Pale Nile Blue..... | XIX | 41' | f | Pallid Neutral Gray..... | LIII | — | f |
| Pale Ochraceous-Buff..... | XV | 15' | f | Pallid Purple-Drab..... | XLV | 1'''' | f |
| Pale Ochraceous-Salmon..... | XV | 13' | f | Pallid Purplish Gray..... | LIII | 67'''' | f |
| Pale Olive-Buff..... | XL | 21''' | f | Pallid Quaker Drab..... | LI | 1'''' | f |
| Pale Olive-Gray..... | LI | 23'''' | d | Pallid Soft Blue-Violet..... | XXIII | 55' | f |
| Pale Olivine..... | XXXII | 35'' | f | Pallid Vinaceous-Drab..... | XLV | 3''' | f |
| Pale Orange-Yellow..... | III | 17 | f | Pallid Violet..... | X | 59 | f |
| Pale Payne's Gray..... | XLIX | 49'''' | f | Pallid Violet-Blue..... | IX | 53 | f |
| Pale Persian Lilac..... | XXXVIII | 69'' | f | *Pansy Purple..... | XII | 69 | k |
| Pale Pinkish Buff..... | XXIX | 17'' | f | Pansy Violet..... | XI | 63 | i |
| Pale Pinkish Cinnamon..... | XXIX | 15'' | f | *Paris Blue..... | VIII | 47 | k |
| Pale Purple-Drab..... | XLV | 1'''' | d | *Paris Green..... | XVIII | 35' | b |
| Pale Purplish Gray..... | LIII | 67'''' | d | *Parrot Green..... | VI | 31 | k |
| Pale Purplish Vinaceous..... | XXXIX | 1''' | f | Parula Blue..... | XLII | 43''' | — |
| Pale Quaker Drab..... | LI | 1'''' | d | Patent Blue..... | VIII | 43 | k |
| Pale Rhodone Pink..... | XXXVIII | 71'' | f | Payne's Gray..... | XLIX | 49 | — |
| Pale Rose-Purple..... | XXVI | 67'' | f | Peach Red..... | I | 5 | b |
| Pale Rosolane Purple..... | XXVI | 69' | d | Peacock Blue..... | VIII | 43 | i |
| Pale Russian Blue..... | XLII | 43'''' | f | Peacock Green..... | VI | 35 | i |
| Pale Salmon Color..... | XIV | 9' | f | *Pea Green..... | XLVII | 29'''' | b |
| Pale Smoke Gray..... | XLVI | 21'''' | f | *Pearl Blue..... | XXXV | 49'' | f |
| Pale Soft Blue-Violet..... | XXIII | 55' | d | *Pearl Gray..... | LI | 35'''' | f |

| COLOR NAME. | Plate. | Color or hue Number. | Tone. | COLOR NAME. | Plate | Color or hue Number. | Tone. |
|--------------------------|---------|----------------------|----------|--------------------------|---------|----------------------|----------|
| Pecan Brown..... | XXVIII | 11" | <i>i</i> | Rhodonite Pink..... | XXXVIII | 71" | <i>d</i> |
| Perilla Purple..... | XXXVII | 65" | <i>k</i> | Rinnemann's Green..... | XVIII | 31' | <i>i</i> |
| Persian Blue..... | XX | 45' | <i>f</i> | Rivage Green..... | XVIII | 31' | <i>b</i> |
| Persian Lilac..... | XXXVIII | 69" | <i>d</i> | Rocellin Purple..... | XXXVIII | 71" | <i>b</i> |
| Petunia Violet..... | XXV | 65' | <i>i</i> | Roman Green..... | XVI | 23' | <i>m</i> |
| Phenyl Blue..... | IX | 53 | — | Rood's Blue..... | IX | 49 | <i>k</i> |
| Phlox Pink..... | XI | 65 | <i>f</i> | Rood's Brown..... | XXVIII | 11" | <i>k</i> |
| *Phlox Purple..... | XI | 65 | <i>b</i> | Rood's Lavender..... | XLIX | 57" | <i>f</i> |
| Picric Yellow..... | IV | 23 | <i>d</i> | Rood's Violet..... | XI | 65 | <i>i</i> |
| Pinard Yellow..... | IV | 21 | <i>d</i> | Rose Color..... | XII | 71 | <i>b</i> |
| *Pinkish Buff..... | XXIX | 17" | <i>d</i> | Rose Doree..... | I | 3 | <i>b</i> |
| Pinkish Cinnamon..... | XXIX | 15" | <i>b</i> | *Rose Pink..... | XII | 71 | <i>f</i> |
| *Pinkish Vinaceous..... | XXVII | 5" | <i>d</i> | *Rose-Purple..... | XXVI | 67" | <i>d</i> |
| Pistachio Green..... | XLI | 33" | — | *Rose Red..... | XII | 71 | — |
| Pleroma Violet..... | XXV | 61" | — | Rosolane Pink..... | XXVI | 69' | <i>f</i> |
| Plumbago Blue..... | XLIII | 53" | <i>f</i> | Rosolane Purple..... | XXVI | 69' | — |
| Plumbago Gray..... | L | 61" | <i>d</i> | Roslyn Blue..... | X | 57 | <i>k</i> |
| Plumbago Slate..... | L | 61" | <i>i</i> | *Royal Purple..... | X | 59 | <i>i</i> |
| *Plumbeous..... | LII | 49" | <i>b</i> | *Rufous..... | XIV | 9' | — |
| Plumbeous-Black..... | LII | 49" | <i>m</i> | *Russet..... | XV | 13' | <i>k</i> |
| *Plum Purple..... | XXIV | 57" | <i>m</i> | Russet-Vinaceous..... | XXXIX | 9" | — |
| *Pols Green..... | XLI | 29" | <i>i</i> | Russian Blue..... | XLII | 45" | <i>d</i> |
| *Pomegranate Purple..... | XII | 71 | <i>i</i> | Russian Green..... | XLII | 37" | <i>i</i> |
| Porcelain Blue..... | XXXIV | 43' | — | Saccardo's Olive..... | XVI | 19' | <i>m</i> |
| Porcelain Green..... | XXXIII | 39' | <i>i</i> | Saccardo's Slate..... | XLVIII | 41" | <i>k</i> |
| Pompeian Red..... | XIII | 3' | <i>i</i> | Saccardo's Umber..... | XXIX | 17" | <i>k</i> |
| *Primrose Yellow..... | XXX | 23" | <i>d</i> | Saccardo's Violet..... | XXXVII | 61" | — |
| Primulina Yellow..... | XVI | 19' | — | Safrano Pink..... | II | 7 | <i>f</i> |
| *Prout's Brown..... | XV | 15' | <i>m</i> | *Sage Green..... | XLVII | 29" | — |
| *Prune Purple..... | XI | 63 | <i>m</i> | Sailor Blue..... | XXI | 53' | <i>k</i> |
| Prussian Blue..... | IX | 49 | <i>m</i> | *Salmon-Buff..... | XIV | 11' | <i>d</i> |
| Prussian Green..... | XIX | 41' | <i>k</i> | *Salmon Color..... | XIV | 9' | <i>d</i> |
| Prussian Red..... | XXVII | 5" | <i>k</i> | Salmon-Orange..... | II | 11 | <i>b</i> |
| Puritan Gray..... | XLVII | 33" | <i>f</i> | Salvia Blue..... | IX | 49 | <i>b</i> |
| Purple (true)..... | XI | 65 | — | Sanford's Brown..... | II | 11 | <i>k</i> |
| Purple-Drab..... | XLV | 1" | — | Sayal Brown..... | XXXIX | 15" | — |
| Purplish Gray..... | LIII | 67" | — | *Scarlet..... | I | 5 | — |
| Purplish Lilac..... | XXXVII | 65" | <i>d</i> | Scarlet-Red..... | I | 3 | — |
| Purplish Vinaceous..... | XXXIX | 1" | <i>b</i> | Scheele's Green..... | VI | 33 | <i>i</i> |
| Pyrite Yellow..... | IV | 23 | <i>i</i> | Schoenfeld's Purple..... | XXVI | 69' | <i>i</i> |
| Quaker Drab..... | *LI | 1" | — | Seafoam Green..... | XXXI | 27" | <i>f</i> |
| Rainette Green..... | XXXI | 27" | <i>f</i> | Seafoam Yellow..... | XXXI | 25" | <i>f</i> |
| Ramier Blue..... | XLIII | 57" | — | *Sea Green..... | XIX | 41' | <i>f</i> |
| Raisin Black..... | XLIV | 65" | <i>m</i> | *Seal Brown..... | XXXIX | 5" | <i>m</i> |
| Raisin Purple..... | XI | 65 | <i>k</i> | Seashell Pink..... | XIV | 11' | <i>k</i> |
| *Raw Sienna..... | III | 17 | <i>i</i> | *Sepia..... | XXIX | 17" | <i>m</i> |
| *Raw Umber..... | III | 17 | <i>m</i> | Serpentine Green..... | XVI | 23' | <i>k</i> |
| Reed Yellow..... | XXX | 23" | <i>b</i> | Shamrock Green..... | XXXII | 33" | <i>i</i> |
| Rejane Green..... | XXXIII | 37" | <i>b</i> | Shell Pink..... | XXVIII | 11" | <i>f</i> |
| Rhodamine Purple..... | XII | 67 | — | Shrimp Pink..... | I | 5 | <i>f</i> |

| COLOR NAME. | Plate. | Color or hue Number. | Tone. | COLOR NAME. | Plate. | Color or hue Number. | Tone. |
|-------------------------|---------|----------------------|--------------|----------------------------|---------|----------------------|----------|
| Skobeloff Green..... | VII | 39 | — | Tyrian Rose..... | XII | 69 | — |
| Sky Blue..... | XX | 47' | <i>d</i> | Tyrolite Green..... | VII | 39 | <i>b</i> |
| Sky Gray..... | XXXIV | 45" | <i>f</i> | Ultramarine Ash..... | XXII | 49* | — |
| *Slate-Black..... | LIII | — | (2) | *Ultramarine Blue..... | IX | 49 | <i>t</i> |
| Slate-Blue..... | XLIII | 49''' | <i>t</i> | Urania Blue..... | XXIV | 53* | <i>m</i> |
| *Slate Color..... | LIII | — | <i>k</i> (4) | Vanderpoel's Blue..... | XX | 47' | <i>b</i> |
| *Slate-Gray..... | LIII | — | <i>t</i> (5) | Vanderpoel's Green..... | VI | 33 | <i>b</i> |
| Slate-Olive..... | XLVII | 29''' | <i>t</i> | Vanderpoel's Violet..... | XXXVI | 55" | — |
| Slate-Purple..... | XLIV | 65''' | <i>i</i> | *Vandyke Brown..... | XXVIII | 11" | <i>m</i> |
| Slate-Violet (1)..... | XLIII | 57''' | <i>i</i> | Vandyke Red..... | XIII | 1' | <i>f</i> |
| Slate-Violet (2)..... | XLIV | 61''' | — | Variscite Green..... | XIX | 37' | <i>d</i> |
| *Smalt Blue..... | IX | 53 | <i>i</i> | Varley's Gray..... | XLIX | 57''' | — |
| *Smoke Gray..... | XLVI | 21''' | <i>d</i> | Varley's Green..... | XVIII | 31' | <i>m</i> |
| Snuff Brown..... | XXIX | 15" | <i>k</i> | Venetian Blue..... | XXII | 47* | — |
| Soft Blue-Violet..... | XXIII | 55' | <i>k</i> | Venetian Pink..... | XIII | 1' | <i>f</i> |
| Soft Bluish Violet..... | XXIII | 57' | — | Venice Green..... | VII | 41 | <i>b</i> |
| Sooty Black..... | LI | 1''' | <i>m</i> | Verbena Violet..... | XXXVI | 55" | <i>d</i> |
| Sorghum Brown..... | XXXIX | 9''' | <i>i</i> | *Verdigris Green..... | XIX | 37' | — |
| Sorrento Green..... | VII | 41 | <i>k</i> | Vernonia Purple..... | XXVIII | 69" | <i>t</i> |
| Spectrum Blue..... | IX | 49 | — | Verona Brown..... | XXIX | 13" | <i>k</i> |
| Spectrum Red..... | I | 1 | — | Veronese Green..... | XVIII | 31' | <i>d</i> |
| Spectrum Violet..... | X | 59 | — | Vetiver Green..... | XLVII | 25''' | — |
| Spinach Green..... | V | 29 | <i>m</i> | Victoria Lake..... | I | 1 | <i>m</i> |
| Spinel Pink..... | XXVI | 71' | <i>b</i> | *Vineaceous..... | XXVII | 1" | <i>d</i> |
| Spinel Red..... | XXVI | 71' | — | Vineaceous-Brown..... | XXXIX | 5''' | <i>i</i> |
| Squill Blue..... | XX | 45' | <i>b</i> | *Vineaceous-Buff..... | XL | 17''' | <i>d</i> |
| Stone Green..... | XLII | 37''' | — | *Vineaceous-Cinnamon..... | XXIX | 13" | <i>b</i> |
| Storm Gray..... | LII | 35''' | — | Vineaceous-Drab..... | XLV | 5''' | — |
| Strawberry Pink..... | I | 5 | <i>d</i> | Vineaceous-Fawn..... | XL | 13''' | <i>b</i> |
| *Straw Yellow..... | XVI | 21' | <i>d</i> | Vineaceous-Gray..... | L | 69''' | <i>d</i> |
| Strontian Yellow..... | XVI | 23' | — | Vineaceous-Lavender..... | XLIV | 65''' | <i>f</i> |
| Sudan Brown..... | III | 15 | <i>k</i> | Vineaceous-Lilac..... | XLIV | 69''' | <i>b</i> |
| Sulphate Green..... | XIX | 39' | — | *Vineaceous-Pink..... | XXVIII | 9" | <i>d</i> |
| Sulphin Yellow..... | IV | 21 | <i>i</i> | Vineaceous-Purple (1)..... | XXXVIII | 67" | <i>i</i> |
| *Sulphur Yellow..... | V | 25 | <i>f</i> | Vineaceous-Purple (2)..... | XLIV | 65''' | — |
| Taupe Brown..... | XLIV | 69''' | <i>m</i> | *Vineaceous-Rufous..... | XIV | 7' | <i>i</i> |
| *Tawny..... | XV | 13' | <i>i</i> | Vineaceous-Russet..... | XXVIII | 7" | — |
| *Tawny-Olive..... | XXXIX | 17" | <i>i</i> | Vineaceous-Slate..... | L | 69''' | <i>i</i> |
| Tea Green..... | XLVII | 25''' | <i>b</i> | Vineaceous-Tawny..... | XXVIII | 11" | — |
| Terra Cotta..... | XXVIII | 7" | — | Violet Carmine..... | XII | 69 | <i>m</i> |
| *Terre Verte..... | XXXIII | 41" | <i>i</i> | Violet-Gray..... | LII | 59''' | — |
| Testaceous..... | XXVIII | 9" | — | Violet-Plumbeous..... | XLIX | 53''' | <i>b</i> |
| Thulite Pink..... | XXVI | 71' | <i>d</i> | Violet-Purple..... | XI | 63 | — |
| Tiber Green..... | XVIII | 33' | <i>d</i> | Violet-Slate..... | XLIX | 53''' | <i>i</i> |
| Tilleul Buff..... | XL | 17''' | <i>f</i> | Violet Ultramarine..... | X | 57 | <i>i</i> |
| Tourmaline Pink..... | XXXVIII | 67" | <i>b</i> | *Viridian Green..... | VII | 37 | <i>i</i> |
| Turquoise Green..... | VII | 41 | <i>d</i> | Viridine Green..... | VI | 33 | <i>d</i> |
| Turtle Green..... | XXXII | 31" | <i>b</i> | Viridine Yellow..... | V | 29 | <i>b</i> |
| Tyrian Blue..... | XXXIV | 47" | <i>i</i> | Vivid Green..... | VII | 37 | — |
| Tyrian Pink..... | XII | 69 | <i>b</i> | Wall Green..... | VII | 39 | <i>k</i> |

| COLOR NAME. | Plate. | Color or hue Number. | Tone. | COLOR NAME. | Plate. | Color or hue Number. | Tone. |
|--------------------------|--------|----------------------|----------|--------------------------|--------|----------------------|----------|
| *Walnut Brown..... | XXVIII | 9" | <i>k</i> | *Wood Brown..... | XL | 17''' | — |
| Warbler Green..... | IV | 23 | <i>k</i> | Xanthine Orange..... | III | 13 | <i>i</i> |
| Warm Blackish Brown..... | XXXIX | 1''' | <i>m</i> | Yale Blue..... | XX | 47' | <i>b</i> |
| Warm Buff..... | XV | 17' | <i>d</i> | Yellow-Green..... | VI | 31 | — |
| Warm Sepia..... | XXIX | 13" | <i>m</i> | Yellowish Citrine..... | XVI | 23' | <i>i</i> |
| Water Green..... | XLI | 25''' | <i>d</i> | Yellowish Glaucaous..... | XLI | 25''' | <i>f</i> |
| *Wax Yellow..... | XVI | 21' | — | Yellowish Oil Green..... | V | 25 | <i>k</i> |
| Wedgewood Blue..... | XXI | 51' | <i>f</i> | Yellowish Olive..... | XXX | 23'' | <i>k</i> |
| White..... | LIII‡ | — | — | Yellow Ocher..... | XV | 17' | — |
| Windsor Blue..... | XXXV | 49'' | <i>i</i> | Yew Green..... | XXXI | 27'' | <i>m</i> |
| Winter Green..... | XVIII | 33' | <i>i</i> | Yvette Violet..... | XXXVI | 55'' | <i>k</i> |
| Wistaria Blue..... | XXIII | 57' | <i>b</i> | Zinc Green..... | XIX | 37' | <i>i</i> |
| Wistaria Violet..... | XXIII | 59' | <i>b</i> | Zinc Orange..... | XV | 13' | — |

‡ Also the top horizontal row on all the other plates.

THE FOLLOWING COLORS REPRESENTED IN THE OLD "NOMENCLATURE OF COLORS" (1886) CANNOT BE MATCHED BY COLORS IN THE PRESENT WORK. THEY ARE INTERMEDIATES, EITHER AS TO HUE OR TONE (SOMETIMES BOTH), AND WOULD FALL IN UNCOLORED SPACES, AS INDICATED BY THE NUMERALS AND LETTERS APPENDED TO EACH:—

- Azure Blue*—48 *a* (see Plates VIII and IX).
Broccoli Brown: Between 17''' *k* and 17''' *i* (see Plates XL and XLVI).
Buff—18'' *d* (see Plates III and IV).
Burnt Carmine—71 *i* (Plate XII).
Canary Yellow: Between 23 *b* and 21' *h* (see Plates IV and XVI).
Chinese Orange—12 *h* (see Plates II and III).
Chrome Yellow—20 *a* (Plate IV).
Cobalt Blue—48 slightly dull (see Plates VIII and IX).
Crimson—1 *j* (Plate I).
French Blue—52 *h* (Plate IX).
Gallstone Yellow—19' *h* (Plate XVI).
Gamboge Yellow—20, slightly dull, or 21, slightly dull (Plate IV).
Geranium Red—3 *a* (Plate I).
Heliotrope Purple: Between 65''' *b* and 65''' *b* (see Plates XLIV and L).
Indian Yellow—18 *h* or 18 slightly dull (Plate III). This color and Saffron Yellow are practically identical in many copies of the old "Nomenclature."
Lake Red—72 *h* (Plate XII).
Maroon Purple—72' *i* (Plate XXVI).
Ochraceous—16' *h* (Plate XV).
Ochraceous-Rufous—12' *h* (see Plates XIV and XV).
Ochre Yellow—18' (see Plates XV and XVI).
Orange-Ochraceous—16 *h* (Plate III).
Orange Vermilion—4, dull (Plate I).
Orpiment Orange—11 *h* (Plate II).
Peach-blossom Pink—1 *e* (Plate I).
Poppy Red: between 3 and 5 *h* (Plate I).
Saffron Yellow—18 (see Plates III and IV).
Saturn Red—11 *a* (Plate II).
Scarlet Vermilion—4, dull (Plate I).
Sèvres Blue—46 *h* (Plate VIII).
Solferino—67 *h* (Plate XII).
Tawny-Ochraceous—14' *h* (Plate XV).
Turquoise Blue—44 *h* (Plate XX).
Verditer Blue: Between 43' and 43'' *b* (see Plates XX and XXXIV).
Vermilion: Between 3 and 3' (see Plates I and XIII).
Violet—61 *h* (Plate XI).
Wine Purple—70 *h* (Plate XXVI).

A FEW OF THE MODERN BOOKS ON THE SUBJECT
OF COLOR WHICH THE AUTHOR OF THIS
WORK HAS FOUND MOST USEFUL

Bradley, Milton, author of "Color in the Schoolroom" and "Color in the Kindergarten." — *Elementary Color*. With an Introduction by Henry Lafavour, Ph. D., Professor of Physics, Williams College. Milton Bradley and Co., Springfield, Mass. [1895]. Small 8vo., pp. [i]-iv, [1]-128; colored frontispiece ("miniature color charts made from the Bradley educational colored papers," showing 126 unnamed colors) and numerous figures in text.

The present writer frankly and gratefully acknowledges that he has learned more, and learned it more easily, from this little book, which is a model of conciseness and perspicuity, than from careful study of more elaborate and authoritative works on the subject. It is therefore most heartily recommended to the student as a preliminary, at least, to the study of more technical works on color.

Bradley, Milton. — *The Evolution of a Practical System of Color Education based on Spectrum Standards*. Milton Bradley Co., Springfield, Mass. Pamphlet, 8vo., pp. 8.

Bradley, Milton. — *A Few Practical Suggestions relating to Color Standards and the Present Status of Elementary Color Instruction in the United States*. Milton Bradley Co., Springfield, Mass. Pamphlet, small 8vo., pp. 16.

Bradley, Milton. — *Some Criticisms of Popular Color Definitions, and Suggestions for a Better Color Nomenclature*. Milton Bradley Co., Springfield, Mass., 1898. Pamphlet, 12mo., pp. 15.

Bradley, Milton. — *The Bradley Color Scheme, with Suggestions to Teachers*. Milton Bradley Co., Springfield, Mass. Pamphlet, 12mo., pp. 45.

Church, A. H., F. R. S., etc., Professor of Chemistry in the Royal Academy of Arts in London. — *The Chemistry of Paints and Painting*. Third edition, revised and enlarged. London: Seeley and Co. Small 8vo., pp. [i-vii] viii-xx, 1-355. An invaluable work which should be consulted by every painter.

Hurst, George H., F. C. S., etc. — *Colour: A Handbook of the Theory of Colour*. With ten coloured plates and seventy-two illustrations. London: Scott, Greenwood & Co., 1900., 8vo., 160 pp.

Rood, Ogden N.—Students' Text-book of Color; or Modern Chromatics, with applications to Art and Industry. New York: D. Appleton and Company, 1903. Small 8vo., pp. [i-v] vi-viii, [9] 10-329; 1 colored plate (frontispiece) and 130 original illustrations.

(One of the best technical works on the physics of color.)

Vanderpoel, Emily Noyes.—Color Problems. A Practical Manual for the Lay Student of Color. With one hundred and seventeen colored plates. Longmans, Green and Co., New York London and Bombay. 1903. Small 8vo., pp., [i-vi] vii-xv, [1-3] 3-137.

The colored plates of this excellent work illustrate the physics and psychology of color, color harmonies, and kindred subjects but have no relation to color nomenclature.

Jorgensen, Charles Julius.—The Mastery of Color. A simple and perfect color system, based upon the spectral colors, for educational and practical use in the Arts and Crafts. Published by the Author. Milwaukee, 1906. 8vo., 2 vols., one of text, the other of 22 loose colored plates contained in double box.

An exceedingly useful work for artists and decorators, but not adapted to the needs of science. The technical execution of the plates is exquisite and the colors very fine.

CAUTION!!!

DO NOT EXPOSE THESE PLATES TO THE LIGHT FOR A
LONGER TIME THAN IS NECESSARY.

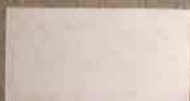
THE pigments used in the preparation of these Plates are the most durable known, those which have been proven unstable having been, as far as possible, discarded. The latter include carmine and other cochineal lakes, colors of vegetable origin (as gamboge, violet carmine, indigo, etc.), and most of the aniline or coal tar dyes, though among the last are a considerable number which are really more permanent than several colors habitually used by artists. Certain colors in this work could not, however, possibly be reproduced except by the employment of pigments which are more or less sensitive to *prolonged exposure* to light, and hence this caution not to expose the plates unnecessarily.

(See Church: "The Chemistry of Paints and Painting," third edition, pages 257-263.)

1. RED

3. O-R.

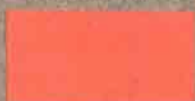
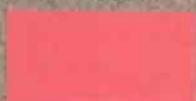
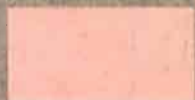
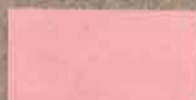
5. OO-R.



Hermosa Pink

La France Pink

Shrimp Pink



Eosine Pink

*Geranium Pink

Strawberry Pink



Begonia Rose

Rose Doree

Peach Red



Spectrum Red

Scarlet-Red

*Scarlet



*Carmine

Nopal Red

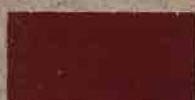
Brazil Red



Ox-blood Red

Garnet Brown

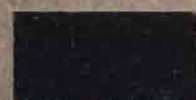
Morocco Red



Victoria Lake

*Maroon

*Claret Brown



7. R-O.

9. OR-O.

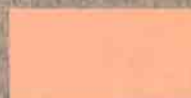
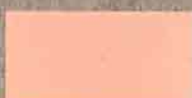
11. ORANGE



Safrano Pink

Orient Pink

Orange-Pink



Grenadine Pink

Bittersweet Pink

Light Salmon-Orange



Grenadine

Bittersweet Orange

Salmon-Orange



Grenadine-Red

*Flame Scarlet

*Orange Chrome



English Red

Mars Orange

*Orange Rufous



Mahogany-Red

*Burnt Sienna

Sanford's Brown



*Bay

*Chestnut

Auburn

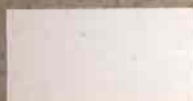


13. OY-O.

15. Y-O.

17. O-Y.

f

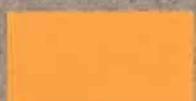


Capucine Buff

Pale Yellow-Orange

Pale Orange-Yellow

d



Capucine Orange

*Orange-Buff

Light Orange-Yellow

b



Mikado Orange

Capucine Yellow

*Deep Chrome



*Cadmium Orange

*Orange

*Cadmium Yellow

i



Xanthine Orange

Mars Yellow

*Raw Sienna

k



Amber Brown

Sudan Brown

Antique Brown

272



Argus Brown

Brussels Brown

*Raw Umber



19. YO-Y.

21. O-YY.

23. YELLOW

f

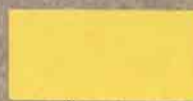


*Maize Yellow

Baryta Yellow

Martius Yellow

d

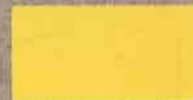


*Buff-Yellow

Pinard Yellow

Picric Yellow

b



Apricot Yellow

Empire Yellow

Pale Lemon Yellow

i

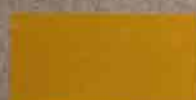


Light Cadmium

Lemon Chrome

*Lemon Yellow

k



Aniline Yellow

Sulphine Yellow

Pyrite Yellow

m



Orange-Citrine

Citrine

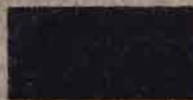
Warbler Green



Medal Bronze

Dark Citrine

*Olive-Green



25. YG-Y.

27. G-Y.

29. GG-Y.

f

*Sulphur Yellow

Pale Green-Yellow

Pale Viridine Yellow

d

Pale Greenish Yellow

Light Green-Yellow

Light Viridine Yellow

b

Light Greenish Yellow

Green-Yellow

Viridine Yellow

Greenish Yellow

Bright Green-Yellow

Neva Green

i

Oil Yellow

Javel Green

Cosse Green

k

Yellowish Oil Green

*Oil Green

Lettuce Green

m

Calla Green

Cerro Green

Spinach Green

31. Y-G.

33. GY-G.

35. GREEN

f

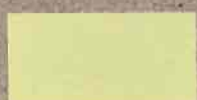
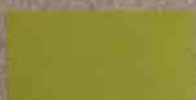
d

b

i

k

m



Pale Yellow-Green

Light Viridine Green

Pale Cendre Green

Light Yellow-Green

Viridine Green

Light Cendre Green

Clear Yellow-Green

Vanderpoel's Green

Cendre Green

Yellow-Green

Night Green

*Emerald Green

Calliste Green

Scheele's Green

Peacock Green

*Parrot Green

Grass Green

Meadow Green

Cedar Green

Cossack Green

Antique Green

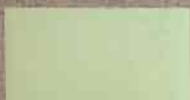
37. GB-G.

39. B-G.

41. BB-G.



t



Opaline Green

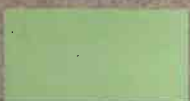


Pale Blue-Green



Pale Turquoise Green

a



Neuvider Green



Light Blue-Green

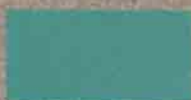


Turquoise Green

b



Chrysoprase Green



Tyrolite Green



Venice Green



Vivid Green



Skobeloff Green

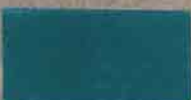


Benzol Green

i



*Viridian Green



Guinea Green



Ethyl Green

λ



Dark Viridian Green



Wall Green



Sorrento Green

712



Diamine Green



Anthracene Green



*Myrtle Green



43. G-B.



45. BG-B.



47. G-BB.



Beryl Blue



*Pale Blue. (Ethyl Blue)



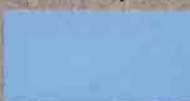
Pallid Methyl Blue



Calamine Blue



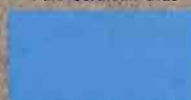
Pale Cerulean Blue



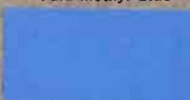
Pale Methyl Blue



Cendre Blue



Light Cerulean Blue



Light Methyl Blue



Italian Blue



*Cerulean Blue



Methyl Blue



Peacock Blue



Oxide Blue



Leitch's Blue



Patent Blue



*Antwerp Blue



*Paris Blue



Blackish Green-Blue



*Marine Blue



*Berlin Blue



49. BLUE

51. BV-B.

53. V-B.



f

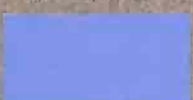


Pale Mazarine Blue

Pale Amparo Blue

Pallid Violet-Blue

d



Mazarine Blue

Light Amparo Blue

Pale Violet-Blue

b



Salvia Blue

Amparo Blue

Light Violet-Blue

i



Spectrum Blue

Bradley's Blue

Phenyl Blue

k



*Ultramarine Blue

Lyons Blue

*Smaill Blue

m



Rood's Blue

Helvetia Blue

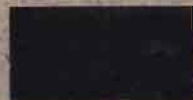
Hay's Blue



Prussian Blue

*Cyanine Blue

Azurite Blue



55. B-V.

57. VB-V.

59. VIOLET

f



Pallid Blue-Violet

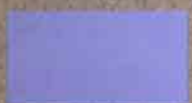


Pallid Bluish Violet



Pallid Violet

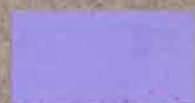
d



Pale Blue-Violet



Pale Bluish Violet

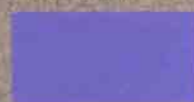


Pale Violet

b



Light Blue-Violet



Light Bluish Violet



Light Violet

z



Blue-Violet



Bluish Violet



Spectrum Violet

k



*Hyacinth Blue



Roslyn Blue



Dark Violet

m



Dark Aniline Blue



Dark Bluish Violet



Blackish Violet



61. VR-V.

63. R-V.

65. RR-V.

f

Pale Hortense Violet

Pale Amparo Purple

Phlox Pink

d

Light Hortense Violet

Light Amparo Purple

Light Phlox Purple

b

Hortense Violet

Amparo Purple

*Phlox Purple

Amethyst Violet

Violet-Purple

Purple, (True)

i

Hyacinth Violet

Pansy Violet

Rood's Violet

k

Mulberry Purple

Cotinga Purple

*Kaiser Purple

nl

Fluorite Violet

*Prune Purple

Blackish Purple

67. V-R.

69. RV-R.

71. V-RR.



Mallow Pink

Pale Amaranth Pink

*Rose Pink



Light Mallow Purple

Amaranth Pink

Deep Rose Pink



Mallow Purple

Tyrian Pink

Rose Color



Rhodamine Purple

Tyrian Rose

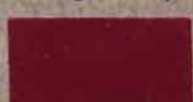
*Rose Red



*Aster Purple

Amaranth Purple

*Pomegranate Purple



*Dahlia Purple

*Pansy Purple

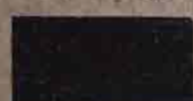
Bordeaux



Blackish Red-Purple

Violet Carmine

Burnt Lake



| | 1. RED | 3. O-R. | 5. OO-R. |
|----------|---|---|---|
| |  |  |  |
| <i>f</i> |  |  |  |
| | Venetian Pink | Chatenay Pink | Flesh-Pink |
| <i>a</i> |  |  |  |
| | Alizarine Pink | Jasper Pink | Coral Pink |
| <i>b</i> |  |  |  |
| | Old Rose | Light Jasper Red | Light Coral Red |
| |  |  |  |
| | Eugenia Red | Jasper Red | *Coral Red |
| <i>z</i> |  |  |  |
| | Acajou Red | Pompeian Red | *Dragon's-blood Red |
| <i>k</i> |  |  |  |
| | Vandyke Red | *Madder Brown | *Brick Red |
| <i>m</i> |  |  |  |
| | Hay's Maroon | Diamine Brown | Hessian Brown |
| |  |  |  |

| | 7'. R-O. | 9'. OR-O. | 11'. ORANGE |
|----------|---|---|---|
| |  |  |  |
| <i>f</i> |  |  |  |
| | Pale Flesh Color | Pale Salmon Color | Seashell Pink |
| <i>d</i> |  |  |  |
| | *Flesh Color | *Salmon Color | *Salmon-Buff |
| <i>b</i> |  |  |  |
| | Carrot Red | Flesh-Ocher | Apricot Buff |
| |  |  |  |
| | Carnelian Red | *Rufous | Apricot Orange |
| <i>i</i> |  |  |  |
| | *Vinaceous-Rufous | *Ferruginous | *Cinnamon-Rufous |
| <i>k</i> |  |  |  |
| | Hay's Russet | Kaiser Brown | *Hazel |
| <i>m</i> |  |  |  |
| | *Liver Brown | Carob Brown | Chestnut-Brown |
| |  |  |  |

13'. OY-O

15'. Y-O.

17'. O-Y.

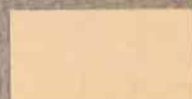
t



Pale Ochraceous-Salmon



Pale Ochraceous-Buff



Light Buff

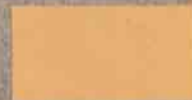
d



Light Ochraceous-Salmon



Light Ochraceous-Buff



Warm Buff

b



Ochraceous-Salmon



*Ochraceous-Buff



Antimony Yellow



Zinc Orange



Ochraceous-Orange



Yellow Ocher

z



*Tawny



Ochraceous-Tawny



Buckthorn Brown

k



*Russet



Cinnamon-Brown



Dresden Brown

m



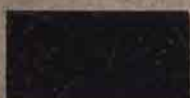
*Mars Brown



*Prout's Brown



*Mummy Brown



19'. Y0-Y.



21'. 0-YV.



23'. YELLOW



f



*Cream Color



Massicot Yellow



Naphthalene Yellow

d



*Naples Yellow

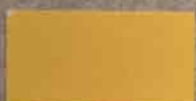


*Straw Yellow

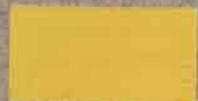


Barium Yellow

b



Mustard Yellow



Amber Yellow



*Citron Yellow



Primuline Yellow

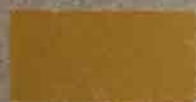


*Wax Yellow



Strontian Yellow

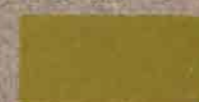
i



Old Gold



Olive Lake



Yellowish Citrine

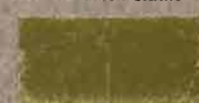
k



Buffy Citrine



Dull Citrine



Serpentine Green

m



Saccardo's Olive



Olive Citrine



Roman Green

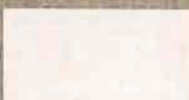


25'. YG-Y.

27'. G-Y.

29'. GG-Y.

f

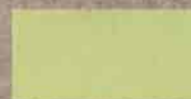
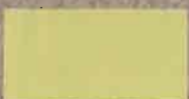


Pale Chalcedony Yellow

Pale Dull Green-Yellow

Pale Lumiere Green

d

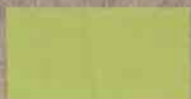
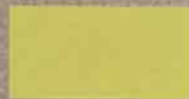
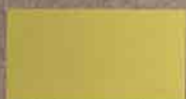


Light Chalcedony Yellow

Light Dull Green-Yellow

Light Lumiere Green

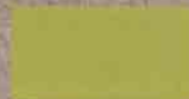
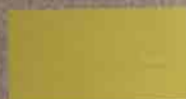
b



Chalcedony Yellow

Clear Dull Green-Yellow

Lumiere Green



Bright Chalcedony Yellow

Dull Green-Yellow

*Apple Green

i



Courge Green

Biscay Green

Light Bice Green

k



Light Hellebore Green

Light Elm Green

*Bice Green

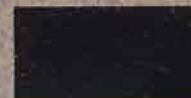
m



Hellebore Green

Elm Green

Forest Green



31'. Y-G.

33'. GY-G.

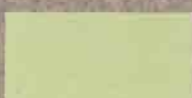
35'. GREEN



f



Pale Veronese Green



Pale Tiber Green



Oural Green

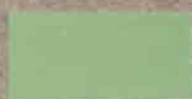
d



Veronese Green

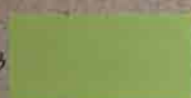


Tiber Green



Light Paris Green

b



Rivaige Green



Light Oriental Green



*Paris Green



Mineral Green



Oriental Green



Motmot Green

z



Rinneemann's Green



Winter Green



Killarney Green

k



Civette Green



Hay's Green



Ackermann's Green

m



Varley's Green



Dark Yellowish Green



Dark Green



37'. GB-G.

39'. B-G.

41'. BB-G.



Dull Opaline Green



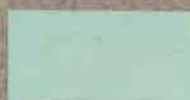
Microcline Green



Pale Nile Blue



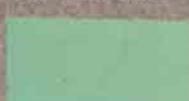
Variscite Green



Pale Sulphate Green



*Nile Blue



Cobalt Green



Light Sulphate Green



*Beryl Green



*Verdigris Green



Sulphate Green



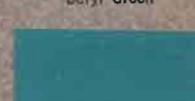
Methyl Green



Zinc Green



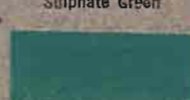
Dark Sulphate Green



*Sea Green



Dark Zinc Green



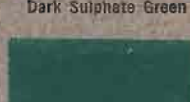
Dark Cinnabar Green



Prussian Green



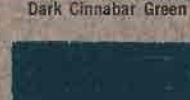
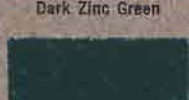
*Bottle Green



Duck Green



Invisible Green



43'. G-B.

45'. BG-B.

47'. G-BB.

f



Etain Blue

Persian Blue

Light Sky Blue

d



Lumiere Blue

Light Squill Blue

Sky Blue

b



Bremen Blue

Squill Blue

Yale Blue

i



Motmot Blue

Mathews Blue

Olympic Blue

k



Capri Blue

*China Blue

Vanderpoel's Blue

m



Jouvence Blue

Chessylite Blue

Blanc's Blue



Dusky Green-Blue (1)

Dark Chessylite Blue

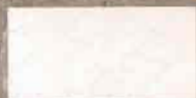
Dusky Greenish Blue



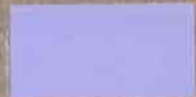
49'. BLUE

51'. BV-B.

53'. V-B.



f



Pale Grayish Blue

Wedgewood Blue

Light Lavender-Blue

d

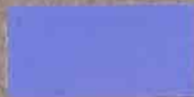


Pale Cadet Blue

Deep Wedgewood Blue

Lavender-Blue

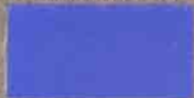
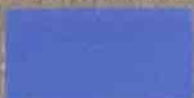
b



Light Cadet Blue

*Flax-flower Blue

Deep Lavender-Blue



Clear Cadet Blue

Commelina Blue

Cornflower Blue

i



Cadet Blue

Diva Blue

Gentian Blue

k



Deep Cadet Blue

Dark Diva Blue

Sailor Blue

m



Dark Cadet Blue

Alizarine Blue

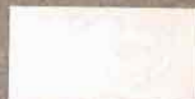
Navy Blue



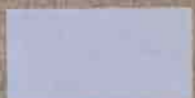
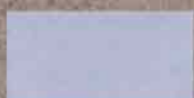
47*. G-BB.

49*. BLUE

51*. BV-B.



f

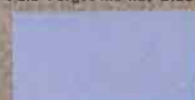


Pale King's Blue

Pale Neropaline Blue

Pale Forget-me-not Blue

d

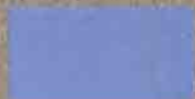


Light King's Blue

Light Neropaline Blue

Light Forget-me-not Blue

b



King's Blue

Neropaline Blue

Forget-me-not Blue



Venetian Blue

Ultramarine Ash

Dull Violaceous Blue

i



Jay Blue

Chapman's Blue

Grayish Violaceous Blue

k



Gendarme Blue

Eton Blue

Deep Dull Violaceous Blue

m



Hortense Blue

Dusky Blue

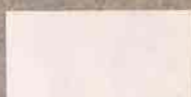
Indulin Blue



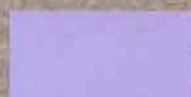
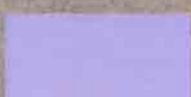
55'. B-V.

57'. VB-V.

59'. VIOLET



f



Pallid Soft Blue-Violet

Pale Wistaria Blue

Pale Wistaria Violet

d



Pale Soft Blue-Violet

Light Wistaria Blue

Light Wistaria Violet

b



Light Soft Blue-Violet

Wistaria Blue

Wistaria Violet



Soft Blue-Violet

Soft Bluish Violet

Bradley's Violet

i



Deep Soft Blue-Violet

Deep Soft Bluish Violet

Dauphin's Violet

h

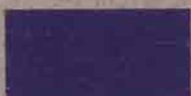


Dark Soft Blue-Violet

Dark Soft Bluish Violet

Blane's Violet

m



Dusky Violet-Blue (1)

Dusky Blue-Violet (1)

Dusky Violet



53*. V-B.

55*. B-V.

57*. VB-V.

f



Pallid Grayish Violet-Blue



Pale Campanula Blue



Light Chicory Blue

d



Pale Grayish Violet-Blue



Light Campanula Blue



Chicory Blue

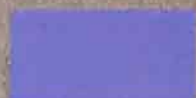
b



Light Grayish Violet-Blue



*Campanula Blue



Deep Chicory Blue



Dull Violet-Blue



Dull Blue-Violet (1)



Dull Bluish Violet (1)

i



Grayish Violet-Blue



Grayish Blue-Violet (1)



Deep Dull Bluish Violet (1)

k



Dark Dull Violet-Blue



Dark Grayish Blue-Violet



Dark Dull Bluish Violet (1)

m



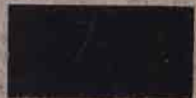
Urania Blue



Dusky Blue-Violet (2)



*Plum Purple



61'. VR-V.

63'. R-V

65'. RR-V.

f



Pale Lavender-Violet

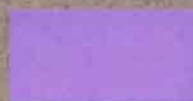


Pale Mauve



Mauvette

d



Light Lavender-Violet



Light Mauve

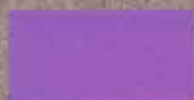


*Lilac

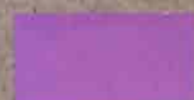
b



Lavender-Violet



*Mauve



Chinese Violet

i



Pleroma Violet



Manganese Violet



Mathews' Purple

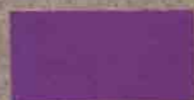
k



Heematoxylin Violet



Litho Purple



Petunia Violet

m



Anthracene Violet



Madder Violet



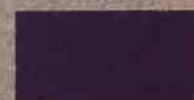
Nigrosin Violet



Dark Anthracene Violet



Dark Madder Violet



Dark Nigrosin Violet



67'. V-R.

69'. RV-R.

71'. V-RR.

f

Pale Rose-Purple

Rosolane Pink

Cameo Pink

d

*Rose-Purple

Pale Rosolane Purple

Thulite Pink

δ

Liseran Purple

Light Rosolane Purple

Spinel Pink

*Magenta

Rosolane Purple

Spinel Red

i

Dull Magenta Purple

Schoenfeld's Purple

Indian Lake

λ

Dull Dark Purple

*Auricula Purple

Dahlia Carmine

m

Dull Dusky Purple

Dusky Auricula Purple

Dark Maroon-Purple

1" RED

3" O-R.

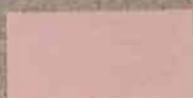
5" O-R.



Pale Vinaceous



Livid Pink



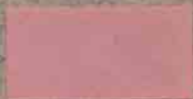
Hydrangea Pink



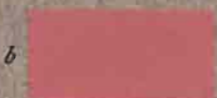
*Vinaceous



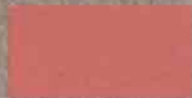
Corinthian Pink



Pinkish Vinaceous



Deep Vinaceous



Light Corinthian Red



Orange-Vinaceous



Dark Vinaceous



Corinthian Red



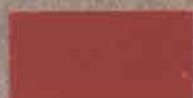
Etruscan Red



Hydrangea Red



Deep Corinthian Red



Ocher Red



Mineral Red



Indian Red



Prussian Red



Dark Mineral Red



Dark Indian Red



Haematite Red



7". R-O.

9". OR-O.

11". ORANGE

f

Pale Congo Pink

Pale Vinaceous-Pink

Shell Pink

d

Light Congo Pink

*Vinaceous-Pink

*Buff-Pink

b

Congo Pink

Japan Rose

Onion-skin Pink

i

Vinaceous-Russet

Cacao Brown

Pecan Brown

k

Cameo Brown

*Walnut Brown

Rood's Brown

m

*Chocolate

*Burnt Umber

*Vandyke Brown

13% OY-O.

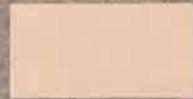
15% Y-O.

17% O-Y.

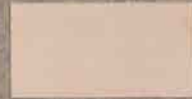
f



Pale Cinnamon-Pink



Pale Pinkish Cinnamon



Pale Pinkish Buff

d



Light Vinaceous-Cinnamon

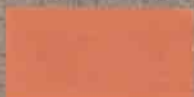


Light Pinkish Cinnamon



*Pinkish Buff

b



*Vinaceous-Cinnamon



Pinkish Cinnamon



Cinnamon-Buff



Orange-Cinnamon



*Cinnamon



*Clay Color

i



Mikado Brown



Sayal Brown



*Tawny-Olive

k



Verona Brown



Snuff Brown



Saccardo's Umber

m



Warm Sepia



*Biester



*Sepia



19". YO-Y.

21". O-YY.

23". YELLOW

f

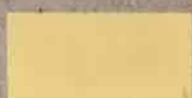


Cartridge Buff

Ivory Yellow

Marguerite Yellow

d

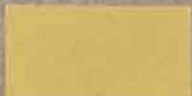
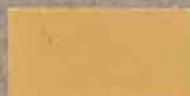


Cream-Buff

Colonial Buff

*Primrose Yellow

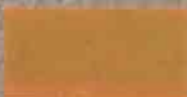
b



Chamois

Deep Colonial Buff

Reed Yellow



Honey Yellow

Olive-Ocher

*Olive-Yellow

z



Isabella Color

Ecu-Olive

Light Yellowish Olive

ē



Light Brownish Olive

Buffy Olive

Yellowish Olive

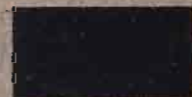
m



Brownish Olive

*Olive

Dark Greenish Olive



25". YG-Y.

27". G-Y.

29". GG-Y.

f



Sea-foam Yellow



Sea-foam Green

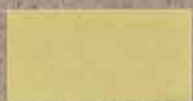


Pale Glass Green

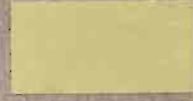
d



Chartreuse Yellow

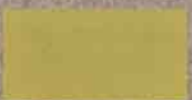


Deep Sea-foam Green



Glass Green

δ



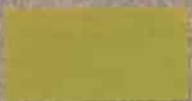
Citron Green



Chrysolite Green



Kildare Green



Lime Green



Deep Chrysolite Green

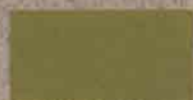


Absinthe Green

z



Mignonette Green



Rainette Green



Light Cress Green

k



Kronberg's Green

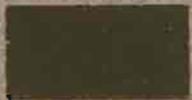


Jade Green



Cress Green

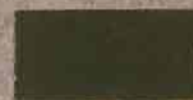
m



Ivy Green



Yew Green



Dark Cress Green



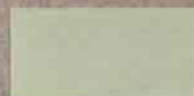
31". Y-G.

33". GY-G.

35". GREEN



f



Pale Turtle Green

Pale Fluorite Green

Pale Olivine

d

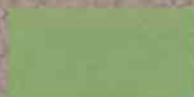
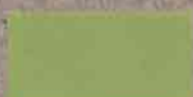


Light Turtle Green

Light Fluorite Green

Olivine

b



Turtle Green

Clear Fluorite Green

*Malachite Green

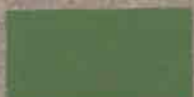


Deep Turtle Green

Fluorite Green

Deep Malachite Green

i



*Chromium Green

Shamrock Green

*French Green

k



Deep Dull Yellow-Green (1)

Deep Dull Yellow-Green (2)

Light Danube Green

m



Dark Dull Yellow-Green

Empire Green

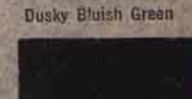
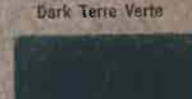
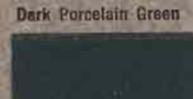
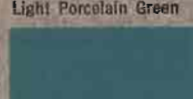
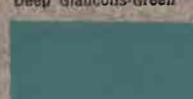
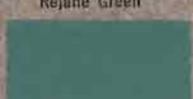
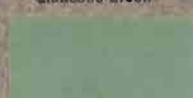
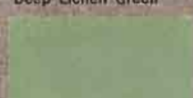
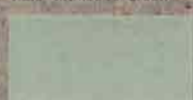
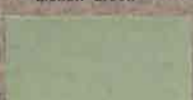
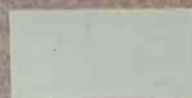
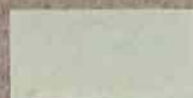
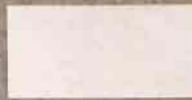
Danube Green



37". GB-G.

39". B-G.

41". BB-G.



Lichen Green

Pale Glaucous-Green

Pale Niagara Green

Deep Lichen Green

*Glaucous-Green

Light Niagara Green

Rejane Green

Deep Glaucous-Green

Niagara Green

Montpeller Green

Light Porcelain Green

Light Terre Verte

Jasper Green

Porcelain Green

*Terre Verte

Nickel Green

Dark Porcelain Green

Dark Terre Verte

Dusky Green

Dusky Blue-Green

Dusky Bluish Green

43". G-B.

45". BG-B.

47". G-BB.



Pale Glaucous-Blue



Sky Gray



Burn Blue

f



Light Glaucous-Blue



Light Alice Blue



Light Columbia Blue

a



*Glaucous-Blue

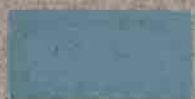


Alice Blue



Columbia Blue

b



Porcelain Blue



Orient Blue



Light Tyrian Blue

i



Gobelin Blue



Deep Orient Blue



Tyrian Blue

k



Dark Gobelin Blue



Dark Orient Blue



Dark Tyrian Blue

m



Dusky Green Blue (2)



Dusky Orient Blue



*Indigo Blue



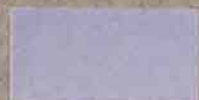
49". BLUE

51". BV-B.

53". V-B.



f



*Pearl Blue



Pale Grayish Blue-Violet



Pale Aniline Lilac

d



Pale Windsor Blue



Light Grayish Blue-Violet



Aniline Lilac

b



Light Windsor Blue



Grayish Blue-Violet (2)



Deep Aniline Lilac



Clear Windsor Blue



Dull Bluish Violet (2)



Dull Violet-Blue

f



Windsor Blue



Deep Dull Bluish Violet (2)



Deep Dull Violet-Blue

k



Acetini Blue



Dark Dull Bluish Violet (2)



Dark Dull Violet-Blue

m



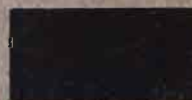
Nigrosin Blue



Diamin-Azo Blue



Dusky Dull Violet-Blue



55". B-V.

57". VB-V.

59". VIOLET

f

Pale Verbena Violet

Pale Bluish Lavender

"Lavender

d

Verbena Violet

Bluish Lavender

Deep Lavender

b

Ontario Violet

Light Dull Bluish Violet

Light Hyssop Violet

Vanderpool's Violet

Dull Bluish Violet (3)

Hyssop Violet

i

Dull Blue-Violet (2)

Deep Dull Bluish Violet (3)

Deep Hyssop Violet

k

Yvette Violet

Dark Dull Bluish Violet (3)

Dark Hyssop Violet

m

Dark Yvette Violet

Dusky Dull Violet (1)

Dusky Dull Violet (2)

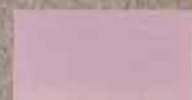
61". VR-V.

63". R-V.

65". RR-V.



f

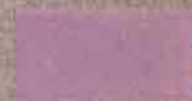
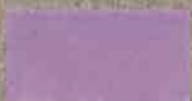


Pale Lobelia Violet

Pale Lilac

Light Pinkish Lilac

d

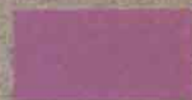
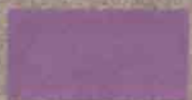
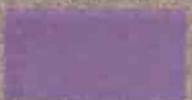


Light Lobelia Violet

Hay's Lilac

Purplish Lilac

b



Lobelia Violet

Ageratum Violet

Argyle Purple

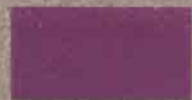
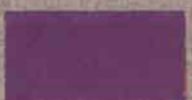


Saccardo's Violet

Aconite Violet

Bishop's Purple

z



Livid Violet

Livid Purple

Light Perilla Purple

ke



Naphthalene Violet

Deep Livid Purple

Perilla Purple

ms



Dark Naphthalene Violet

Dark Livid Purple

Dark Perilla Purple

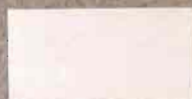
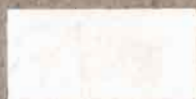


67%. V-R.

69%. RV-R.

71%. V-RR.

f

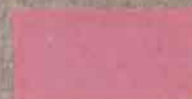
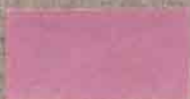


Pale Laelia Pink

Pale Persian Lilac

Pale Rhodonite Pink

d



Laelia Pink

Persian Lilac

Rhodonite Pink

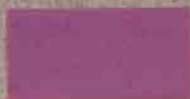
b



Tourmaline Pink

Daphne Pink

Rocellin Purple



Eupatorium Purple

Daphne Red

Hellebore Red

i



Vinaceous-Purple

Vernonia Purple

Deep Hellebore Red

k

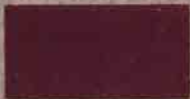


Dark Vinaceous-Purple

Corinthian Purple

Neutral Red

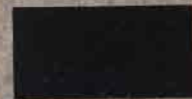
m



*Indian Purple

Dark Corinthian Purple

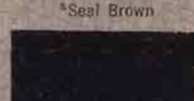
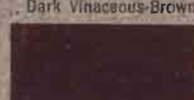
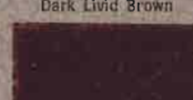
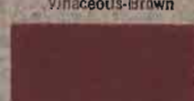
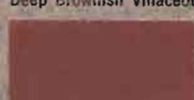
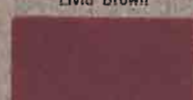
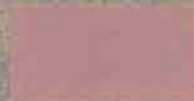
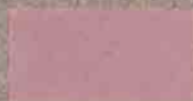
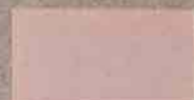
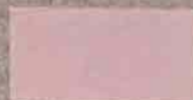
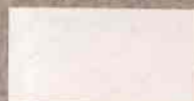
Mars Violet



100% RED

50% OR-R.

90% OR-O.



13^{'''}. OY-O.

17^{'''}. O-Y.

21^{'''}. O-YY.

f



Pale Vinaceous-Fawn



Tilleul-Beuf



Pale Olive-Beuf

d



Light Vinaceous-Fawn



*Vinaceous-Beuf



*Olive-Beuf

b



Vinaceous-Fawn



Avellaneous



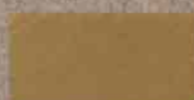
Deep Olive-Beuf



*Fawn Color



*Wood Brown



Dark Olive-Beuf

i



Army Brown



Buff Brown



Citrine-Drab

k



Natal Brown



Olive-Brown



Deep Olive

m



Bone Brown



*Clove Brown



Dark Olive



25". YG-Y.

29". GG-Y.

33". GY-G.

f

Yellowish Glauous

Glauous

Greenish Glauous

d

Water Green

Corydalis Green

Deep Greenish Glauous

b

Light Grape Green

Myths Green

Dark Greenish Glauous

Grape Green

Asphodel Green

Pistachio Green

i

Deep Grape Green

Pois Green

American Green

h

Lincoln Green

Leaf Green

Dark American Green

m

Dusky Olive-Green

Dusky Yellowish Green

Dull Blackish Green

37". GB-G.

41". BB-G.

45". BG-B.

f



Bluish Glaucous

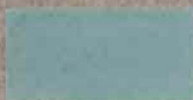


Pale Dull Glaucous-Blue



Pale Russian Blue

d



Deep Bluish Glaucous



Light Dull Glaucous-Blue



Russian Blue

b



Dark Bluish Glaucous



Greenish Glaucous-Blue

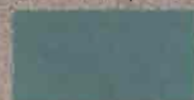


Cadet Gray

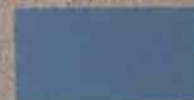
i



Stone Green



Bluish Gray-Green



Parula Blue

k



Russian Green



Deep Bluish Gray-Green

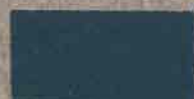


Delft Blue

m



Dark Russian Green



Dark Bluish Gray-Green



Deep Delft Blue



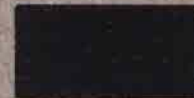
Dusky Dull Green



Dusky Dull Bluish Green



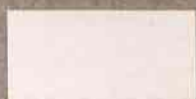
Dark Delft Blue



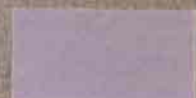
49''' BLUE

53''' V.B. -

57''' VB-V.



f



*Lavender Gray

Plumbago Blue

Grayish Lavender

d

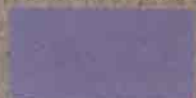
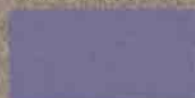


Endive Blue

Deep Plumbago Blue

Deep Grayish Lavender

b



Dutch Blue

Dark Plumbago Blue

Dark Grayish Lavender



Deep Dutch Blue

Madder Blue

Ramier Blue

i



Slate-Blue

Deep Madder Blue

Slate-Violet (1)

h



Deep Slate-Blue

Dark Madder Blue

Dark Slate-Violet (1)

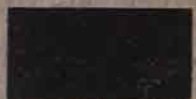
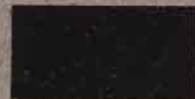
m



Dusky Slate-Blue

Dusky Violet-Blue (2)

Dusky Slate-Violet



61". VR-V.

65". RR-V.

69". RV.R.



Dull Lavender

Vinaceous-Lavender

Pale Vinaceous-Lilac



Deep Dull Lavender

Deep Vinaceous-Lavender

Light Vinaceous-Lilac



Dark Lavender

Light Vinaceous-Purple

Vinaceous-Lilac



Slate-Violet (2)

Vinaceous-Purple

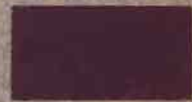
Deep Purplish Vinaceous



Deep Slate-Violet

Slate-Purple

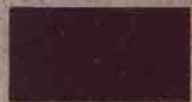
Dull Indian Purple



Dark Slate-Violet (2)

Dark Slate-Purple

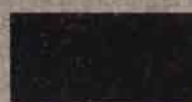
Anthracine Purple



Dull Violet-Black (1)

Raisin Black

Taupe Brown



1''' RED

5''' OO-R.

9''' OR-O.

f

Pallid Purple-Drab

Pallid Vinaceous-Drab

Pallid Brownish-Drab

d

Pale Purple-Drab

Pale Vinaceous-Drab

Pale Brownish-Drab

b

Light Purple-Drab

Light Vinaceous-Drab

Light Brownish-Drab

Purple-Drab

Vinaceous-Drab

Brownish-Drab

i

Dark Purple-Drab

Dark Vinaceous-Drab

Deep Brownish-Drab

k

Dusky Brown

Dark Grayish Brown

Dusky Drab

m

Blackish Brown (1)

Blackish Brown (2)

Blackish Brown (3)

13''' GY-O.

17''' G-Y.

21''' O-YY.

f

Pale Ecru-Drab

Pale Drab-Gray

Pale Smoke Gray

d

*Ecru-Drab

*Drab-Gray

*Smoke Gray

b

Light Cinnamon-Drab

Light Drab

Light Grayish Olive

Cinnamon-Drab

*Drab

Grayish Olive

i

Benzo Brown

*Hair Brown

Deep Grayish Olive

k

Fuscous

Chaetura Drab

Dark Grayish Olive

m

Fuscous-Black

Chaetura Black

Olivaceous Black (1)

25''' YG-Y.

29''' GG-Y.

33''' GY-G.



f



Light Mineral Gray



Court Gray



Puritan Gray

d



Mineral Gray



Gnaphalium Green



Light Celandine Green

b



Tea Green



*Pee Green



Celandine Green



Vetiver Green



*Sage Green



Artemisia Green

i



Andover Green



Slate-Olive



Lily Green

k



Dark Ivy Green



Deep Slate-Olive



Deep Slate-Green

m



Olivaceous Black (2)



Dull Greenish Black (1)



Dull Greenish Black (2)



37''' . GB-G.

41''' . BB-G.

45''' . BG-B.

f



Glaucous-Gray

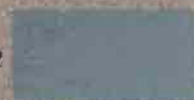


Pale Medici Blue



Pale Green-Blue Gray

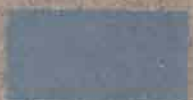
d



Deep Glaucous-Gray



Light Medici Blue

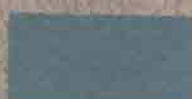


Clear Green-Blue Gray

b



Dark Glaucous-Gray



Medici Blue



Deep Green-Blue Gray



Grayish Blue-Green



Deep Medici Blue



Dark Green-Blue Gray

z



Deep Grayish Blue-Green



Dark Medici Blue



Green-Blue Slate

k



Dark Grayish Blue-Green



Saccardo's Slate



Dark Green-Blue Slate

m



Greenish Slate-Black



Dull Blue-Green Black



Bluish Slate-Black



49''' BLUE

53''' V-B.

57''' VB-V.

f



Pale Payne's Gray



Pale Violet-Plumbeous



Rood's Lavender

d



Light Payne's Gray



Light Violet-Plumbeous



Pale Varley's Gray

b



Clear Payne's Gray



Violet-Plumbeous



Light Varley's Gray



Payne's Gray



Deep Violet-Plumbeous



Varley's Gray

i



Deep Payne's Gray



Violet-Slate



Deep Varley's Gray

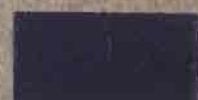
k



Dark Payne's Gray



Dark Violet-Slate



Dark Varley's Gray

m



Bluish-Black



Dull Violet-Black (2)



Blue-Violet-Black



61''' VR-V.

65''' RR-V.

69''' RV-R.



f



Light Plumbago Gray

Light Heliotrope Gray

Light Vinaceous-Gray

d



Plumbago Gray

Heliotrope Gray

Vinaceous-Gray

b



Deep Plumbago Gray

Deep Heliotrope Gray

Deep Vinaceous-Gray



Dark Plumbago Gray

Dark Heliotrope Gray

Dark Vinaceous-Gray

i



Plumbago-Slate

Heliotrope-Slate

Vinaceous-Slate

k



Dark Plumbago-Slate

Dark Heliotrope-Slate

Deep Slaty Brown

m



Dull Violet-Black

Dull Purplish Black

Aniline Black



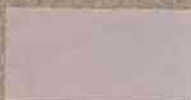
1"mm. RED

15"mm. Y.O.

23"mm. YELLOW



f



Pallid Quaker Drab

Pallid Mouse Gray

Pale Olive-Gray

d



Pale Quaker Drab

Pale Mouse Gray

Light Olive-Gray

b



Light Quaker Drab

Light Mouse Gray

*Olive-Gray



Quaker Drab

*Mouse Gray

Deep Olive-Gray

t



Deep Quaker Drab

Deep Mouse Gray

Dark Olive-Gray

k



Dark Quaker Drab

Dark Mouse Gray

Iron Gray

m



Sooty Black

Blackish Mouse Gray

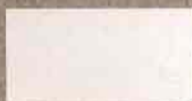
Olivaceous Black (3)



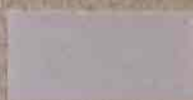
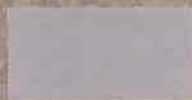
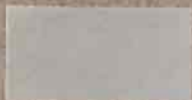
35''''', GREEN

49''''', BLUE

59''''', VIOLET



f



*Pearl Gray

*French Gray

*Lilac Gray

d



Dawn Gray

*Cinereous

Pale Violet-Gray

b



Hathi Gray

*Plumbeous

Light Violet-Gray



Storm Gray

Deep Plumbeous

Violet-Gray

i

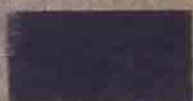
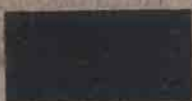


Castor Gray

Dark Plumbeous

Deep Violet-Gray

h

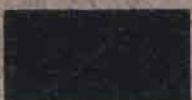


Dusky Green-Gray

Blackish Plumbeous

Dark Violet-Gray

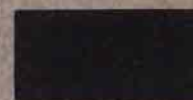
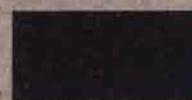
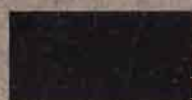
g



Blackish Green-Gray

Plumbeous-Black

Blackish Violet-Gray



| 67''''', V-R. | NEUTRAL GRAY | CARBON GRAY |
|---|---|---|
|  |  |  |
| White | White | *10. Gray. (Pale Gull Gray) |
| <i>f</i> |  |  |
| Pallid Purplish Gray | Pallid Neutral Gray | *9. Gray. (Light Gull Gray) |
| <i>d</i> |  |  |
| Pale Purplish Gray | Pale Neutral Gray | *8. Gray. (Gull Gray) |
| <i>b</i> |  |  |
| Light Purplish Gray | Light Neutral Gray | *7. Gray. (Deep Gull Gray) |
|  |  |  |
| Purplish Gray | Neutral Gray | *6. Gray. (Dark Gull Gray) |
| <i>t</i> |  |  |
| Deep Purplish Gray | Deep Neutral Gray | *5. Slate-Gray |
| <i>k</i> |  |  |
| Dark Purplish Gray | Dark Neutral Gray | *4. Slate Color |
| <i>m</i> |  |  |
| Dusky Purplish Gray | Dusky Neutral Gray | *3. Blackish Slate |
|  |  |  |
| Black | *1. Black | *2. Slate-Black |