INTER-SOCIETY COLOR COUNCIL

NEWS LETTER

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PHYSICAL SOCIETY COLOUR GROUP

The scientific meeting of the Colour Group was held at 3:30 p.m. on Wednesday October 14, 1959, in the Small Physics Lecture Theatre, Imperial College, Imperial Institute Road, London, S.W.7.

Program:

3:30 p.m. Professor W. D. Wright (Imperial College) presented an account of the meetings of the Commission Internationale de L'Eclairage which took place in Brussels earlier this year.

4:15 p.m. (approx.) Dr. B. H. Crawford (National Physical Laboratory) presented a report of the meeting of the "Journées Internationale de la Couleur" which took place in Brussels after those of the C.I.E.

Another scientific meeting was held at 3:30 p.m. on Wednesday, November 11th, 1959, in the Institute of Ophthalmology. A discussion of the recent work of Dr. Land in America was opened by Mr. M. H. Wilson.

The Physical Society Parsons Memorial Lecture was delivered by C. R. Burch, C.B.E., Ph.D., F.R.S. who spoke on Aspheric Imaging Systems on October 22, 1959. The lecture described the work of Bristol University's Optical Group during twenty years, touching on advances in Testing Methods, Aspheric Reflecting Microscope Design and Manufacture, Meniscus-Schmidt Camera Design and Manufacture, Astrographic Camera Design, the Method of the Plate Diagram, and cytological studies involving spectromicrography and cell refractometry.

The Illuminating Society (London) "Golden Jubilee Lectures" took place on the 15th, 19th, and 27th of October. The speakers were Sir Lawrence Bragg, Dr. L. J. Davies, Dr. W. H. Glanville, and Dr. A. N. Irens. Details can be obtained from Mr. S. F. Cole, Secretary, The Illuminating Engineering Society, 32 Victoria Street, London, S.W.1.

The lectures are entitled:

"The Nature of Light"
"The Generation of Light"
"Light and Road Safety"
"Light and Productivity"

A. W. S. Tarrant

TROISIEMES JOURNÉES INTERNATIONALES DE LA COULEUR

(Brussels, 25-27 June 1959) The French "Centre d'Information de la Couleur" organizes each year meetings called "Journées Internationales de la Couleur" where scientific and technical aspects of color problems are discussed. The first meeting was held in Amiens (France) in 1957, the second in Toulouse (France) in 1958, the third in Brussels (Belgium) in collaboration with the Belgium Association for Color, named "ATIPIC". About three hundred delegates of various countries met in a new building in UCCLE, which is in the periphery of Brussels, near a beautiful park. The days of the meeting (25-27 June) were chosen just after the end of the Congress of the CIE (International Commission on Illumination) which was also held in Brussels, in order that delegates from USA, Canada, Australia, may assist to both reunions.

The first day was devoted to problems of measurement of color; thirteen papers were presented and discussed (Reported by Dr. Judd in News Letter No. 142, July 1959.)

In the second day problems of color psychology and esthetics were discussed; some of these problems had practical applications, for example color photography (Mouchel, Kowaliski, France) or the protection of artistic documents against the light of the sun (Escher-Desrivières, France).

The morning of the third day dealt with problems of color education and teaching; the situation in Belgium was reviewed by Dr. Peters, in Great Britain by Prof. Wright, in Germany by Prof. Richter, in France by Saffre, Gillod, and others. At the end, Dr. Judd (USA) gave some results of the CIE Congress about color. The afternoon was devoted to conclusions and resolutions of this Congress, which appears to have aroused great interest amongst all participants.

Prof. Yves Le Grand
President of the
"Centre d'Information de la Couleur"

IVth JOURNÉES INTERNATIONALES DE LA COULEUR

The French Centre d'Information de la Couleur has announced the 4th International Conference to be held in Rouen, April 28-29-30, 1960. The program will include:

Section 1. -- Colorimétrie et rendu des couleurs.

Section 2. -- Psychologie et esthétique de la lumiere et de la couleur.

Section 3. -- Applications.

Sous-Sections : -- Sécurité, ambiance, hygiène du travail;
-- Photographie et cinéma;
-- Protection des oeuvres d'art
-- Industries graphiques.

Section 4. -- Enseignement de la Couleur.

Information about these meetings may be obtained from: C.I.C. headquarters 23, rue N.D. des-Victoires, Paris 2, France.

COLOR IN ARCHITECTURE

The American Institute of Architects held a North Central States Regional Conference in Milwaukee September 22-23, 1959. Several ISCC members conducted panels around the theme "Color in Architecture".

"Color Fundamentals for Architects"
Isay Balinkin

"Psychological Use of Color in Building Materials"
Howard Ketchum

"Color and Design in Architecture"
Walter Granville

"We Have Color - Now What?"
Charles Bridgman
Miss Julia Feron
Walter Granville
Charles Haeuser
Leonard Payne
Richard Wodehouse, Jr.

"Color As Selected"
Julian Garnsey

"Color in Interior Design"
Dan Kolka

ANNUAL AID PUBLIC EXPOSITION

AID President Dorothy Paul announced the American Institute of Decorator's Annual Exposition. The show will be held at the Hollywood Palladium May 6-18, 1960. Exhibits will be confined to residential and commercial room settings designed by AID members.

The 29th Annual National Convention will take place in Los Angeles at the same time.

CORRECTION FOR ANNUAL MEETING ISSUE

In the report of the Annual Meeting, Helen Taylor's name was inadvertently omitted from the reference to problem 23 Subcommittee, Expression of Historical Color Usage. The report should have read, E. R. Call and Helen Taylor, Co-chairmen.

THE COLOR COUNCIL OF CANADA

Our friends up North have been busily preparing a program for 1959-60. ISCC members are playing an important part in this activity. Charles R. Conquergood is the honorary president and Gene W. Butt the presiding president. Our Canadians look forward to the following program this year:

"Color in Modern Architecture"
"A Report on an International Meeting on Illumination"
"Color Coding in Canadian Pharmacy"
"A Psychiatrist's View on Color Psychology"
"Color in Ceramics"
"Artists Pigments and Related Inks for Better Reproduction"
"The Land Theory of Two-Color Reproduction"

They also hope to have a member of the Canada Council address the annual May meeting. There will be some interesting field trips to Canada Printing Ink's new plant, a trip to Bell Telephone Company, a trip through Cosmetic Color Research Lab, the Canadian National Institute for the Blind, and a historic sight in Toronto. It looks like an interesting year for the C.C.C.

THORNE SHIPLEY RETURNS TO MIAMI

In the New Members section May issue of the News Letter, the address listed for Thorne Shipley was Imperial College of Science and Technology. Mr. Shipley informed the News Letter that this was his temporary address through the courtesy of a Public Health Grant. His permanent address is:

Department of Ophthalmology
University of Miami School of Medicine
Miami, Florida

ELSCHEN HOOD VACATIONS AT SORBONNE

She spent her vacation taking a lecture course at the Sorbonne. When mornings were free she browsed in the galleries to her heart's content..."realizing as always that there is nothing 'new' in color. Every fresh color series that we place for fashion promotions or home fashions has been done again and again by the masters through the centuries whether in canvas, tapestry or frescoe. But to have time for forays into color, lends a new inspiration to the job."

COLORED THREADS TO MEASURE LIGHT INTENSITY

Dear Warren: We are intrigued by a project that is being carried on by the State of California, Department of Public Health in a study of the activities of mosquitoes. This is under the direction of Mr. Richard F. Peters, Chief, Bureau of Vector Control. For a quick, approximate and inexpensive determination of light intensities in the evening, they have borrowed a system worked out by Dr. Erik Tetens Nielsen and Mr. James S. Haeger of the Florida State Board of Health. This system was published in the journal "Ecology" July, 1955, Volume 36, No. 3, pp. 525-6. Mr. A. Ralph Barr, Supervisor of Vector Research at the California Department of Health writes us that Dr. Nielsen's system works well at extremely low light intensities which are difficult to measure by other methods.

We enclose a copy of the article from the July, 1955 "Ecology" with Tables I and II giving the results of measurements under morning, afternoon and specified evening conditions. We know that you will find this article of great interest.

Cordially yours,

COATS & CLARK INC.
Elschen Hood, Coordinator
Color Research

A Simple Method of Estimating Low Light Intensities
(From July, 1955, journal "Ecology")

It is never easy to find the correct way to measure light intensities in connection with ethological problems. For studies on Crepuscular and Nocturnal animals, this factor is of special importance and at the same time the difficulties of measurement are still greater than in the daytime.

During our current study of flight habits in mosquitoes, it became necessary at one time for us to improvise, on short notice, a method for obtaining at least a rough estimate of the light intensity during a considerable part of the night. Exposure meters, such as are used in photography, are usually not able to measure the illumination later than 10 - 15 minutes after sunset, or about half of the duration of civil twilight which in Florida lasts 23 - 26 minutes. The following inexpensive and easily provided method of estimating low light intensities may, as a temporary expedient, be useful for other biologists in a similar situation.

The principle is a very old one, indeed. Moslems, during the month of Ramadan, fast during the daytime; and the beginning of the day is determined according to the Quran: "Eat and drink until the white and black threads at dawn become distinguishable to you." Still older is the direction in the Talmud that the Shewa Prayer shall begin when it is possible to distinguish between purple and white.

Since we needed indications of more than one light intensity, we used a number of 2-color combinations. We tried many combinations on different backgrounds and found the ones tabulated below to be the most useful. We used no. 50 cotton threads of the following colors: (Mfr.: J. & P Coats Co.) black, white, dark green, blue 4-B, red, orange 36-C, and (Mfr.: American Thread Co.) yellow 529.5. Two pieces of thread about 30 cm. long were cut of two different colors and twisted together to form an irregular ball a couple of centimeters in diameter. The several balls were then glued to a white-painted board. In use the board was placed where the illumination was to be measured and the moment of merging recorded, i.e. the moment when the two colors in a ball can no longer be distinguished. In order to eliminate the individual differences in visual sensitivity, the same person should always make the observations. The manner of taking the observations should be standardized as much as possible. The observer must make sure his eyes are fully adapted and he should avoid looking at any bright light during the period of observation.

To calibrate this device, the observer stationed himself with the board in the usual position in a dark room with a door open to a room lighted by daylight. Variations in illumination were established by changing the opening of the door. A photocell was placed as close as possible to the thread-ball merging at the illumination in question. In preliminary tests a barrier-layer photocell connected to a Lange galvanometer was used; in the final test we used the "search unit" of a Photovolt electronic photometer, Model 514-M.

In some of the early tests incandescent lights were used in calibration and the results did not differ significantly from calibrations by daylight. The error introduced in calibrating by mid-day light a device for measuring Crepuscular light (with its preponderance of longwave light) is therefore presumed to be negligible.

The results from two series of measurements made on different days, one in the morning and the other in the afternoon, are given in Table I. A series of actual observations is given in Table II. These data will indicate the range of adaptability for the method.

TABLE I

Illuminations determined for the merging points of colored thread combinations.

Thread Combinations	Lux at moment of merging	
	Exp. 1	Exp. 2
Green - blue	2.15	2.30
Green - black	1.51	1.35
Red - blue	0.64	0.41
Orange - green	0.32	0.30
Red - yellow	0.19	0.22
Blue - white or red - white	0.06	0.09
Green - white	0.02	0.06
Black - white	0.01	0.03

TABLE II

Merging moments for colored thread combinations and corresponding light measurements on a moonless evening Sunset at 18 h 41'; civil twilight ending at 19 h 05'.

Thread Combinations	Time of Merging	Lux
Green - black	19 h 00'	1.4
Orange - green	19 h 20'	0.3
Red - yellow	19 h 26'	0.2
Red - white	19 h 35'	0.08
Blue - white	19 h 40'	0.08
Green - white	19 h 41'	0.04
Black - white	19 h 46'	0.02

For authenticating the origins of this millenium-old method, we should like to express our sincere gratitude to Prof. Dr. Pedersen, Copenhagen, and Dr. Mahomed Bey Hussein, Dokki, Egypt.

REFERENCES

El Quran Sura 2 vers 184
Talmud Mishna Berchoth 1.2.

Bureau of Entomology
Florida State Board of Health
Vero Beach, Florida

Erik Tetens Nielsen
James S. Haeger

NOW HEAR THIS

The Navy wife has now for the first time, colors for quarters selected by an interior designer.

Our people have become so conscious of color in their cars, their clothes, and their homes, that the Bureau of Yards and Docks of our Navy has seen fit to make a survey of all the shore stations to get the reaction of the public works officers from their experiences with the use of color at their stations.

Color has become important both psychologically and as a vital part of the happiness of our people.

New Color Selections for Use in Navy Shore Stations

For the Naval shore stations, color has always been a problem, what with yearly changes of personnel, with quarters for both officers and enlisted men's families. The selection of colors for quarters is more a decision which must be made by the public works officer and the Navy wife. The Navy wife is important because 10 to 1, women have better color vision than men.

The services of an interior designer is not part of the set up of the shore stations, though they should be and in the future will be. With seven million colors that the eye can see, professional advice is needed.

The application of color to shore establishments as published by the U. S. Navy Department, Bureau of Yards and Docks is soon to be revised to comply with recent findings and recommendations of H. W. Grieve, immediate past president of the American Institute of Decorators and an officer in the U. S. Naval Reserve.

H. W. Grieve

TRADE WINDS OF COLOR

"Trade Winds" are listed by Webster as "certain winds (in the Torrid Zone) which blow steadily from the same direction, periodically." These winds will have a more potent significance if we observe that the original word was spelled "Tread" and that its meaning was direction -- for it is the direction in which color moves which is a major concern for all of the Fashion Industry.

From prehistoric days until the 17th century the major trade of the world was sea-born and colorants moved on favoring winds.

Prehistorically efforts at dyeing fabrics and objects were greatly hampered because very few dyes formed "fast" combinations with materials. This was finally overcome by the discovery of mordants which caused dyes to adhere firmly. Sometime before 2000 B. C. dyeing began to make some progress and traders began moving the precious materials by land and sea.

In the ancient world colorants were used as money and wars were fought for their possession. Many colors are part and parcel of the history of the country of their origin.

Indigo was one of the earliest colors and a garment was found in a tomb in Thebes that is as far back as 3000 B. C.

The Biblical scarlet was from the insect Kermes found on trees as early as 2000 B.C. The military cloaks of the Greek and Roman Emperors were rich with this color, and it was so highly valued that part of the tribute of conquered nations was paid with it.

The purple of Tyre was a color sensation produced by a mixture of red and blue, and was notable for its richness and durable qualities. This was "Royal Purple" and its cost was fabulous.

The Egyptians obtained Saffron from the flowers of the common yellow crocus and yellow tans and golds from the barks.

The skills and colorants of Egypt, India, China and Persia were carried to Europe by the Phoenicians and Alexandrians.

In the early history of Japan there are no records of color until they were brought over the Silk Road from China and across the sea from Korea. In their 250 years of complete isolation no lightest zephyr of new color touched their islands. Their color customs differ from ours - white is worn for mourning -- all old people wear dark, muted colors - men love and wear wisteria and purple -- and the religious orders are resplendent in scarlet and gold garments. Japan is newly come to the ways of Western color and eager to ride our winds.

Madder root was used early in the Near East for the Turkey Red and was later carried to the Europeans. Madder (Rubia Tinctorium) was called the dyers root, and was also used to produce browns and purples and a variety of reds. It was cultivated on a large scale in Holland in the 15th century and widely exported.

In Italy before 1429 the great dyer Federigo inspired the first book on dyes, and this spread the coloring knowledge to Germany and the rest of Europe and centered in Holland and in Belgium.

The discovery of the new world and the opening of the Cape route to the East brought new dyes. Cochineal was discovered in Mexico and imported to Spain in the 16th century.

In Holland in the 17th century the Dutch Scientist Drebble made a brilliant scarlet with tin salts and cochineal.

From the beginning of recorded history until 1856 all colorants were natural products of the land or sea.

Then in that year in England, the chemist Sir William Henry Perkin accidently produced the first synthetic dye stuff while attempting quinine from coal tar. This color was "mauve" and all present-day synthetic dyes grew from this ur· foreseen result. From this springboard have come a wealth of hues to blow their beauties into every nook and cranny of our modern world.

The Mauve Decade winged on gentle winds, in muted, quiet colors. As the new experiments progressed the European chemical manufacturers developed a virtual monopoly of the dye stuff industry.

Prior to 1914 only 10% of our dyes were made here and these were only combinations of imported intermediates with other raw materials.

In 1914 all of our foreign supplies were cut off and over 80 American companies began making dyes in a limited range of colors. They had very little experience in this complicated chemical field; the cost was high, and progress slow. But, today we are no longer dependent on foreign supplies -- we can make every color but we do not always take the time to make the material, or the object, as beautiful as can the dyers of other countries who are older in this art.

Many of our colors ride in on swift winds from every quarter of the world, for now our world is small in time and distance. Many Americans have seen many foreign lands and many different patterns of color and culture, and therefore are interested in and ready to appreciate new color movements.

Color is a powerful motivation in moving merchandise, and in the world of Fashion there is nothing as potent as a color whose time has come. A color trend builds up slowly, gathering momentum from more than one source and one direction. Of equal importance is the charting of a color as it dies down.

WHERE DOES A COLOR COME FROM?

What Trade Wind brings it to us?

In the several hundred years before World War I, our Fashion Colors rode the trade winds from France. Only small puffs of other winds blew across our markets until after World War II.

Then, each day the color winds blew stronger from Southern Europe and from the Far East.

From Italy her age old arts and skills launched colors appealingly beautiful. Leathers and fabrics came with an irresistible combination of texture and off beat hue.

The olives were part and parcel of her land -- and I knew the birth of a color trend when a young officer, also an artist and a designer, wrote from the battle line "we were pinned down on a hill by heavy gun-fire and watching through my glasses for the hoped for reinforcements, I saw a line of green moving along a distant road -- as it grew closer, I could see it was a column of heavy tanks covered with olive branches. It was the most beautiful color in the world."

From the depths of her desperate poverty, Italy marshalled her arts and skills and produced colors that were wonderfully coordinated - as intrinsically good as her fabulous works of art...colors that were and are familiar to all artists and most designers. Her colors were air-born in competition with France and were rich in inspiration for the Fashion designer.

At the Olympic Games at Cortina, Italy was unwittingly the first push in a color trend.

When the Swiss team marched on the field in their bright blue uniforms the color impact was terrific - the brilliant sunshine spotlighted the colors and the blues were off to start a new trend.

The trade winds of color blow strong from both France and Italy.

From the days of our swift clipper ships, token color influences have come from the Orient, and in the last ten years, the winds of color have mounted.

Across the seas from India there come the darkly muted Madras colors.

Siam's silks are fabulous with blazing colors, shining like stars in our Fashion galaxy.

The new Japan has risen like the Phoenix from her ashes and her wings grow stronger every day. Her traditional colors and her silks are as beautiful as any in the world and they ride the trade winds of all Asia.

Trade winds of color are generally slow and periodic, and therefore, timing is their most important element.

When a color has run its course, from its pristine beauty at Top Fashion to its sad ending at the lowest price, it is generally as much as fifteen years before it will be reborn. Then, in new beauty and new material it will appear sparingly in high Fashion and move more widely each season until it reaches saturation, and begins its fade-out.

There is no competition between High Fashion and Volume markets, because the buyer in the volume market needs several seasons of conditioning before she accepts a new color.

The winds of color are strongest when they reach this market and from here on they diminish and must be replaced --- for here new color is the prime factor in moving merchandise.

For everyone in the Fashion Industry, there is one word that is the key to success - AWARENESS - a sensitivity to everything that happens in the world, for today the Trade Winds of color blow from every quarter.

Helen D. Taylor

Presented at the Fabric Meeting of the Fashion Group October 2, 1959.

NEW BOOK ON PARTIAL COLOR BLINDNESS

Hérédité et Fréquence des Anomalies Congénitales du Sens Chromatique (dyschromatopsies), Vigot Freres, Paris (1959) 109 pages.

This concise work on partial color blindness is a joint effort of two authorities, viz., the Parisian geneticist R. Kherumian and the Glasgow psychologist R. W. Pickford. It should be of interest and value to all concerned with human color vision.

The first of the two main parts of the study is about the nature and correlates of color blindness. The early history of discovery is summarized and the classical nomenclature of types is reviewed. The authors themselves, like Farnsworth, use the collective term protane to include the protanopes and protanomalous, and deutane to include the deuteranopes and deuteranomalous. The several informative chapters on the inheritance of partial color blindness include arresting ramifications regarding twins and hermaphrodites. The color sense in animals is very briefly discussed, but with due consideration for the unsettled status of color vision theory. There is also a good summary of the characteristics of acquired color blindness. This first part of the study is effectively substantiated throughout with references and data. The two searching case studies of twins are especially noteworthy.

The second part of the book is almost entirely empirical; it provides the most exhaustive tabulations available on the incidence of partial color blindness in men and women. First there is a report of the frequencies of color weakness among 18,096 Paris students. The data are fractionated not only with respect to sex but also in the basis of French département or other region of origin. Also, the extensive regional data of Vernon and Straker for Great Britain are quoted in detail. Then there is a more comprehensive table, compiled from selected sources, showing frequencies of color blindness throughout the world. The authors carefully explain that neither the relative frequencies in this table nor the preceding tables are necessarily valid indices of real ethnic or regional incidence.

Since Professor Pickford visited us last year we have been impressed with the care taken in the assembly of the data and the attention given to questions of testing technique and sample selection. Interestingly enough, our modest contribution (488 cases) to the comprehensive table shows an unexciting male incidence of 7.4%, but a female incidence of 2.2%. The latter happens to be the highest female figure in the entire table. The next highest is 1.7% for 1132 Chinese, and the next 1.6% for another group of 487 white women. At the other extreme, there were nine female samples with zero index and most diverse nationalities; but all the sample sizes were small (64 to 415). By way of comparison, the several lowest male indices were: 0.82% for 608 Fijis, 1.1% for 535 Navajo Indians, 1.3% for 232 hybrid Indians, and 1.7% for 929 Belgian Congo Negroes. The four highest male indices were: 11.2% for 125 Canadians, 10.7% for 103 Polynesians, 10.5% for 565 Czechoslovakians, and 10.1% for 2005 Norwegians. Among the authors' general conclusions is the statement that the white race has the highest incidence of color blindness in the world.

Sidney Newhall

DEAN FARNSWORTH
LECTURES TO A.P.T.

The following lecture, reprinted from Printing Technology, was presented by Dean Farnsworth at a joint meeting of the Association of Printing Technologists and the Oil and Colour Chemists Association, November 4, 1958 in London.

Colour Vision and the Printer

Dean Farnsworth

This is a discussion of some of the perceptual problems in vision that are encountered in various stages of printing from copy-to-customer. The study of perceptual problems is included in the science of "psychophysics"--the immediate results of exposure to physical stimuli. The stimuli which concerns the printer are paper, inks and lights. These are interpreted by the eyes of the printer and the buyer. I won't say anything about the physics of inks, paper or light--where this lies in the province of colorimetry it is ably covered in Judd's "Color in Business, Science and Industry."[1] Nor am I speaking of what is commonly called the "psychology of colour"--why people prefer well-printed magazines, why they buy the fresh-looking packages, why they insist on a consistent colour for their products, why a book illustration must be a reasonable replica of the original painting, why an advertisement in one colour scheme sells better than another--all this is the province of psychological research, styling, consumer reactions, public relations applications and so on.

But I do want to single out certain of the psycho-physical problems which are printers' principal headaches. Fortunately, these constitute only a small fraction of known visual phenomena--or printers would go stark, raving mad, instead of only crazy.

To clear the decks for action we must first discuss four different but interconnected subjects. These are (1) colour-blindness, (2) colour discrimination, (3) colour description and (4) metamerism.

Colour-blindness

Colour deficiency is a fascinating study but its importance is sometimes overemphasized. You must simply recognise that about one out of 10 men in the English public are more or less colour defective, and one out of 200 women. About one out of 20 men are moderately to completely colour deficient. If you could look at the world first with your normal eyes and then with the eyes of a "red-green confuser" you would notice that darks and lights and details remained about the same. You would note that the reds and greens were replaced by various tones of yellows and blues and that the yellows and blues were the same to both eyes.

That's how much appearances are changed for the relatively few severely colour defective people in the world. A printer need not be much concerned unless one of them happens to be a paying customer! But of course you don't want a severe case in your own organisation--not anywhere, from stock clerk to pressman. But they are easily eliminated: a session with a book of Ishihara's pseudo-isochromatic plates, or, preferably, the American Optical Company's new H-R-R plates will suffice to eliminate the moderately and severely colour defective (making sure the test is given under light of daylight quality, of course).

	PROTAN "red blind"	DEUTAN "green blind"	TRITAN "blue blind"	
MILD				
MODERATE	(protan-omalous)	(deuteran-omalous)	(tritan-omalous)	Anomalous trichromacy
SEVERE	(protanope)	(deuteranope)	(tritanope)	dichromat

"red-green confusers"

Fig. 1
Classification system for congenital colour deficiency.

Figure 1 represents a simple and scientifically accurate classification for colour deficicicency. Only the six words in caps need be used; the names in lower case parentheses are drawn from the literature and are shown for comparison. There are no definite divisions between "mild", "moderate" and "severe" but the classes are descriptively useful. Protans and deutans are the common types; tritans are rare.

It is necessary to differentiate sharply between colour deficiency and colour discrimination. Colour deficiency cannot be cured or remedied in any way; it is congenital. Colour discrimination varies not only with inherited factors but with age and with training; a mildly colour-defective person may develop a better colour sense than many normals.

Colour Discrimination

The prime visual requisite for the printer is colour discrimination. This is the ability to tell small colour differences apart. It is best understood by analogy. Some ballistics experts can tell minute differences between weights of bullets by hefting--others can't. After musical training some people acquire "absolute pitch" but others never will. And so on. Discrimination is a combination of "native" ability to distinguish small differences plus training and/or experience. Most people improve with practice, but some never improve much; some start lower and never reach the level that others start at; some improve more rapidly than others. Mildly defective colour vision is an initial handicap, but almost every large printing firm can report at least one skilled colour discriminator who fails some of the Ishihara plates!

So what the printing trade most needs is a good test of colour discrimination: first, for selecting the most likely applicants for apprentice training; second, for placing the best of a plant's staff in colour control positions; and third, to have a test which trade unions will accept as a criterion for transfer or promotion. In the United States both unions and management in many plants have settled with a sigh of mutual relief on the F-M 100 Hue Test.[2] More recently the Inter-Society Color Council has issued the Colour Aptitude Test, a test which has higher sensitivity but lower reliability.

Colour Description

Every trade has its own names for colour differences, but they are usually descriptive of the behavior of their particular materials when processed or combined. In order to discuss colour as seen by the eye we must have a reference system which is organised according to psychological attributes. Many of you are familiar with the Munsell system of colour notation which has been established for half a century and has round-the-world acceptance. All colours can be organised in terms of their HUE--red, yellow, green, blue and purple; of their lightness or darkness, called VALUE; and of their saturation or difference from grey, called CHROMA. With these three scales all conceivable pigment colours can be designated accurately.

A new book of Munsell standards[2] has just been issued in high-gloss surface which is particularly applicable to the printing trades. There are over 1,200 samples, removable and individually coded. Production is controlled to a rigid tolerance which corresponds to about one NBS unit. Their use permits the specification of a printing ink by a number notation to a closeness of colour match which is acceptable for all normal commercial usage.

Metamerism

What are metamers? They are colorants of similar appearance but different spectral composition. Their colour differences are particularly susceptible to change under different illuminants and to differences between individual observers. When a colour sample is furnished, your ink match must almost always be a combination of pigments with different spectral characteristics. Let us say that B is a satisfactory match to A for most of you under your shop light. B is a green ink mixed with some black; (unknown to you) A was mixed with blue and yellow inks. If they are matched under a given light it is certain that they will differ under another light--say daylight, or tungsten or a fluorescent. What is worse, they will appear different to different observers, and that is where the argument with the customer starts. It may be an honest difference of opinion because what is a match for you really may not be a match to him! The Sidney Blumenthal Rug Co. in America was driven to the expedient of manufacturing a device known as the "Glenn Color Rule" to prove to customers that two metameric colours may be identical under a given light for one person but cannot be identical under all lights for any person, nor identical for all people under any light.

It is less well recognized that the ordinary three- and four-colour reproduction process is the grossest example of metameric matching. You start with three colours with which all other hues must be matched. Therefore screen process printing is the most sensitive of reproduction methods and is the most demanding of rigid controls of all environment conditions at all stages of the reproduction process.

Conditions that Affect Colour Judgment

So metamerism--an inescapable hazard--leads us into the heart of the printer's perceptual problems. By way of solution let us ask, "What are the conditions that most affect colour perception or colour judgments, so that we may stabilise them?" These are the most controlling: (1) Lighting, (2) Area of Colour, (3) Induced contrasts--simultaneous, successive--and effects of surround.

Lighting

Two factors have to be considered in lighting: quantity and quality. As for quantity, we are all aware of the mistakes that can be made in the darker recesses of the shop or the errors which the pressman misses under high speed and insufficient lighting. Colour judgments cannot be made with any assurance under less than 100 footcandles of illumination, and thereafter discrimination increases up to several hundred footcandles, perhaps a thousand. These levels are not economically practicable or obtainable for overall shop illumination, and yet these are the levels at which the product may be viewed at sales-point. So a compromise must be made in terms of the requirements of your customer, matching the more critical places of inspection with the higher lighting installations. How long since you've had an illumination survey made in your plant?

If your printing involves colour at all, the quality of illumination cannot be over-emphasised. Under no circumstances should working lights be of lower colour temperature than that of 150-watt lamps in clean, white reflectors (and not with opalescent diffusers). Accurate colour matching positively requires higher colour temperatures. Illuminant B, 4800° or 5000° K is the minimum tolerable. Preferred colour temperatures for colour shading are on the order of 6700° K (Illuminant C), and some experiments have shown that even finer discrimination can be obtained at higher colour temperatures, as in cotton grading. Again, an analysis of the requirements of your particular products and customers will indicate your requirements in colour matching equipment. A pair of metameric colour samples will be a constant reminder to you of the potential danger of uncontrolled illumination and a disappointment with a single order will show how costly it can be.

Area of Colour

Since printers must work so extensively with metameric matches, let us again call on a metameric pair of colours to demonstrate the effect of size of test patch. Take two matching greys of different spectral composition; let the areas be large and viewed up close. Now snip a corner from each and see if one does not appear more pinkish, the other a cooler, grey. The same result will occur if the larger areas are seen at a considerable distance. Therefore, the final matches should be viewed at the visual angle which the printed copy--hoarding sheet or magazine ad.--will most likely subtend to the final customer.

A more dramatic effect can be demonstrated with two small spots of colour, one a vivid yellow, the other an equally strong blue. At sufficient distance these may be seen as merely dark grey and light grey, at an intermediate distance a pale yellow and dull blue. Neither will evoke anything like the full colour of a draw-down subtending 10 degrees visual angle or more. On the other hand, the same experiment with reds and greens show that those colours do not lose their vividness to the same extent as yellows and blues.

This has several applications: (1) When making yellow or blue mixes, the samples should be of generous size; (2) small masks tend to desaturate as well as distort colour; (3) when a painting or other coloured copy must be considerably reduced, it may be necessary to over-emphasise the size or intensity of small yellow and blue areas in the design if they are to maintain the relative strength intended in the original; (4) areas of a picture can be toned effectively towards warmth or coolness but small accents of yellow or blue are impossible; accents must be reserved for reds and greens.

The above demonstrations are calculated proofs of the effects of visual angle; the effects are no less when less immediately provable. Colour imbalance and lack of emphasis, highlighting and "snap" may result from disregard of the effect of sizes of the colour areas.

Induced Contrasts

Induced contrast may be simultaneous or successive. I am sure you are aware that two tints when placed side by side tend to enhance the apparent chroma of each as well as change the apparent hues of the other. The effect is most pronounced on the weakest colour in a series. And we are all familiar with the successive contrasts induced by changing the direction of attention from one colour to the next. For example, a colour consultant of my acquaintance recently sent down a proposed colour for the new car line to the Board of Directors. It was rejected as being too dull and too dark. So he prepared another sample slightly duller and slightly darker than the original. This he presented at the next meeting and agreed wholeheartedly that it was too dull and too dark. Then he produced the original sample, which by contrast appeared lighter and brighter, and they unanimously agreed that this was what they were looking for.

The effect of the immediate surround of an ink or of a composition is too little regarded. The surround need not even be coloured in order to produce considerable effects upon the apparent colour of the inks. The usual black masking technique has the effect of desaturating the colours viewed and in most cases of changing their hue. You can easily prove this by dropping a spot of chartreuse upon a black background on which it will appear lemon yellow and upon a white background upon which it will appear olive, to prove the point. Dozens of other colours will misbehave in the same way, the more tricky being certain blue-greens, blue-purples and violets.

When the manufacturers of Lucky Strike cigarettes dropped the green border from around the red central disc and replaced it with a white ring, it was necessary to lighten the red in order to make it appear the same red as before. Then when over-printed with black lettering it again appeared too dark and had to be lightened another step. Half-tone colour must frequently be falsified by re-etching in order to account for the influence of adjacent colours.

Other conditions will suggest whether a full colour reproduction will appear best if printed with normal white page margins, surrounded with a dark frame or bleed-off. Many an otherwise excellent half-tone reproduction has lost its luminous quality because of the contrast with the white borders. On the other hand, a white surround may intensify the density of the darks when this is the predominantly required effect. For the same reason the use of grey masks is indicated when examining colour proofs in order to avoid the faulty distortions induced by black and white.

It is unnecessary and it would be impossible to discuss all the colour illusions which are encountered in the printing arts. The important thing is to become aware of them and be able to identify them so that they can be avoided or turned to your advantage.

EYE, FILM AND CAMERA

Ralph M. Evans' new book, Eye, Film and Camera in Color Photography has just been published by John Wiley and Sons, Inc. (1959, 410 p.). The Newsletter has arranged to have the book reviewed in a later issue.

The book contains many interesting illustrations, but the sixteen-page color insert is dramatic by comparison with the black and white reproductions. These striking photographs by Jeannette Klute make the reader wish that all illustrations could have been reproduced in color.

ASTM METHOD FOR SPECIFYING COLOR BY THE MUNSELL SYSTEM

The American Society for Testing Materials has recently issued Tentative Method for Specifying Color by the Munsell System, D 1535-58T. The method is under the jurisdiction of ASTM Committee D-1 on Paint, Varnish, Lacquer and Related Products. Subcommittee X, Optical Properties, of Committee D-1 voted on March 1, 1956 to establish a group to develop a procedure for expressing colors in the Munsell System. Mr. W. J. Kiernan, presently a director of the Inter-Society Color Council, became chairman of the task group, which has now successfully completed its mission.

ASTM Tentative Method D 1535-58T, Method for Specifying Color by the Munsell System

The Munsell Color System had received increasing acceptance throughout the paint industry, but no specification was available that detailed the many visual and instrumental aspects of the System. American Standard Specification Z58, Specification and Description of Color, describes the Munsell Color System as an acceptable alternate to the C. I. E. system of specifying color but does not instruct the reader of the specification in its use. Published information on the Munsell Color System was widely scattered and, in fact, in some cases out of print. The members of Subcommittee X when organizing the task group felt that not only would a published ASTM method fill a great need but would also help to increase the use of the color system.

The task group with the help of Dorothy Nickerson collected as much information as it could and finally prepared a tentative method based on the following prime sources.

1. ISCC-NBS Method of Designating Colors, NBS Circular 553. This method was used as a basis for the visual aspects of the ASTM Munsell Color System method.

2. The following published sources were used in the interconversion of Munsell and C. I. E. data.

   a. Final report of the OSA Subcommittee on the Spacing of the Munsell Colors, J. Opt. Soc. Am. 33, 385 (1943).

b. Tristimulus Specification of the Munsell Book of Color from Spectrophotometric Measurements, J. Opt. Soc. Am. 33, 355 (1943).

c. Trichromatic Specifications for Intermediate and Special Colors of the Munsell System, J. Opt. Soc. Am. 33, 376 (1943).

d. Colorimetric Specifications of Munsell Repaints, J. Opt. Soc. Am. 43, 163 (1953).

e. Extension of the Munsell Renotation System to Very Dark Colors, J. Opt. Soc. Am. 46, 281 (1956).

3. The Munsell Color Company published brochures were used as general references.

The proposed tentative method was reviewed by Council members Dorothy Nickerson, Deane B. Judd, Kenneth Kelly and Harry Hammond. The method as published describes the Munsell Color Notation of Hue, Value and Chroma, and the following procedures:

1. Munsell Book Notation by Visual Means
2. Munsell Book Notation from C. I. E. Data
3. Munsell Book Notation from Munsell Renotation
4. Determination of Munsell Renotation.

The published method is available from the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pennsylvania.

W. J. Kiernan

HIGH VISIBILITY FLUORESCENT FINISHES

The August 1959 (Volume 31, No. 415) issue of the Official Digest, organ of the Federation of Paint and Varnish Production Clubs, carried a supplement entitled "Fluorescent High Visibility Paints for Aircraft" which should be of particular interest to Newsletter readers. Many will recall the fascinating visibility experiments of Commander Dean Farnsworth which led to the adoption of improved air-sea rescue fluorescent colors nearly a decade ago. (Refer: Newsletter Issue No. 100 for May 1952).

The very short service life, the complex painting methods, the limited availability, and the high cost of fluorescent paint systems restrained for sometime the extension of their use to many obvious civilian applications. However, fluorescent high visibility paints have been recently highly publicized as one important means for minimizing mid-air collisions of aircraft. Increasing commercial availability, lower cost, and considerable improved quality of fluorescent finishes is now leading to their expanded use to meet many other safety and high visibility requirements. In spite of (possibly justifiable) aesthetic objections, the properties of these colors to brilliantly contrast against conventional backgrounds, particularly under conditions of low illumination and distant viewing, has led to their application in situations where identification and public awareness is desired. We may expect to see a growing array of carriers, vans, tank trucks, school buses, and road markers with appropriate fluorescent markings for safety and advertising applications dotting our highways and waterways as well as our airways.

In 1954 the U. S. Naval Research Laboratory, acting upon request of the Bureau of Aeronautics, began developmental research on fluorescent high visibility paints. The reference article, written by Jack S. Cowling and Frank M. Noonan of U. S. Naval Research Laboratory - Organic Coatings Section of the Chemistry Division, provides an excellent summary of NRL findings concerning the recent advances in fluorescent paint technology. More than this, however, it offers a concise review of the (1) color properties of fluorescent colors and principles of selection for high visibility, (2) methods for colorimetric specification and durability performance appraisal, (3) definitions for fluorescent color terminology, and (4) comparison of the spectral reflectance with nonfluorescent finishes. This constitutes an important contribution to the limited literature available on this subject.

Reprints are obtainable from the Federation of Paint and Varnish Production Clubs, 121 South Broad Street, Philadelphia 7, Pennsylvania. In quantities of less than 10 copies the price is $1.25.

WHY AND HOW WE SEE COLORS

"Pourquoi et Comment Nous Voyons Les Couleurs", by Victor Letouzey, a handsomely printed monograph published by Ecole Estienne (Editions Estienne, Paris, 1959) with nine color plates, treats the subject under the chapter headings: Physics of Color, Physiopsychology of Color, Various Phenomena of Color Vision, Color Measurement, Practical Applications, and Conclusion, and has a complete glossary and bibliography of 16 books on color. The second chapter contains a summary of the Sègal theory of color vision, and since this theory attracts great interest in France though little known here, this passage is translated:

"Though still very rudimentary, these few ideas of the constitution of the eye permit an approach to the general process of producing luminous sensation due to stimulation by radiant energy. The mechanism of this process is of such complexity that no complete and certain explanation has yet been found. Some attribute to three types of cones the functions of receptors of blue, of green, and of red, colors which, in appropriate proportions, yield all colors and white, while the rods have the function of luminosity. The three kinds of hypothetical cones so far cannot be identified.

"Others propose hypotheses more or less compatible with the observed realities of the functioning of the eye. As regards knowing exactly what goes on in the brain we are much further from being informed than we are about the eye. Therefore we confine ourselves to an explanation of the essential suggestions of Sègal, researcher of great competence, suggestions which have the merit of throwing new light on the question, and of demonstrating the need for new researches.

"Sègal suggests the existence of three types of identifiable receptors, one for violet, one for green, and one for slightly purplish red (dregs of wine).

"The feet of the cones form the receptor for violet. This explains the absence of violet vision in the fovea, and the macula which surrounds it, where the cones do not have any feet. Additional remark: the synapses (relays) of the cones and rods transmit the potentials coming from the external segments and from the receptors for violet; furthermore the rod is physiologically separated from its foot as soon as its potential produced by the absorption of a critical number (epsilon) of elementary quantities of energy attains a certain limit, the moment at which the synapse of the rod becomes a receptor for violet. But the synapse of the foot of the cone transmits the potentials of different qualities; regarding the time constants, it retards the transmission of potentials of violet relative to those of green and red. It follows that not only the sensation of violet is delayed in time, but also for other reasons reveals itself as relatively less luminous than the sensations green and red.

"The absorption spectrum of the receptor for violet is very close to that of the transitory orange, result of the transformation of retinal purple or rhodopsin by the action of radiant energy. One finds concentrations of this transitory orange in the feet of the cones where it arrives by diffusion of retinal purple from the external segments of the cones and rods. The regeneration of transitory orange to retinal purple is the more difficult the greater the distance of the external segments so that there exists in the synapses only slightly photosensitive transitory orange. As regards the fact of the slight relative luminosity of violet, this can be attributed, among other causes, to the fact that the crystaline lens absorbs short-wave radiant energy, and this the more as the individual advances in age.

"The cones form the receptors for green. It is at 506 mu where is produced the maximum absorption of retinal purple which encloses the cones. The wavelength 506 mu furthermore corresponds to the maximum purity of green.

"The receptors for red are the photosensitive points of microcrystals, oriented toward the incident energy, located at the extremity of the epithelial cells. A lesion in this region takes away the vision of red.

"The receptors for violet, green and red being located, we know that, stimulated or not by radiant energy, they are the seat of the basic potentials. These basic potentials, like those coming from stimulation, go to the brain by means of a network of extraordinary complexity and bring into play millions of cerebral elements. We also know that the stimulation is a function of the number (epsilon) of elementary quantities of energy absorbed, and when this number falls short of a certain threshold limit the transmission of the stimulation does not go past this level. One finds again in our other sensitive systems this arrangement which regularizes to a maximum and to a minimum the action potentials. An excess or a feebleness of sensibility indicates that the relay-valves which are the synapses do not fulfill their function normally. We can conceive that a multitude of simultaneous arrivals of potentials in the brain supplied by our diverse sensitive organs produces a hindrance little favorable to the quality of appreciation of stimulations from one or several of our senses.

"It is very hard to detail precisely what goes on in the brain proper. We know, however, that the cerebral cells, like the sensorial cells of the receptors, are the seat of an average basic potential which modifies itself on the arrival of action potentials from the receptors. It is also established that, from the receptors to the brain, the routing of the potentials is accomplished by three separate paths which bears on the assumption of the existence of three of receptors. Furthermore the upside-down image formed on the retina is rectified and the images of the two eyes are somehow combined. The cerebral image is not composed of three images superposed like in a tricolor photograph or color print. The three pathways for the potentials of violet, green, and red excitation converge to a common neuron and the three potentials produce a differential potential of the ensemble. But the three pathways differ by the caliber of their fibers as well as by the time constants and amplitudes of potential, the one ample and short, the other weak and long lasting. The interaction of these potentials furnishes a complex potential corresponding to a certain stimulation. This complex potential of stimulation intervenes in the cerebral potential, a kind of basic memory potential constituted by an ensemble of potentials due to stimulations more or less recent and more or less numerous. From this ensemble the sensation results. . .

"The stimulations of the receptors brought to the brain by about a million nerve fibers arrive at the pertinent cerebral cells, in number of the order of a million as regards the visual cerebral cells. Since the other cerebral cells number ten billion units, one may ask, noting the volume of the brain, what can be their mode of connection. Every stimulation provokes in the brain a considerable work, our luminous sensations becoming from early age perceptions or educated sensations. Each stimulation puts into play a memory system which, having registered a prodigious number of facts, determines the multiple muscular movements such as speaking, movement of the limbs, and so on.

"Researches will complete and modify the information of which the two first chapters give only a glimpse, succinct but sufficient to show that the science of color is not exactly simple and that it is well to show ourselves reserved in our appreciations of colors."

This brief excerpt, though losing elegance in translation, may serve to exemplify the style of treatment which is condensed and at the same time remarkably clear. Equally distinguished brief summaries are given of the Purkinje effect, the Broda-Sulzer effect, retinal zones, dark adaptation, blind spot, yellow spot, Bezold-Brücke effect, Stiles-Crawford effect, illuminance required for maximum saturation of the various hues, unitary colors, Abney effect, effect of field size, chromatic adaptation, negative after images, contrast effects, and metameric colors. These are considered in relation to the graphic arts, and the illustrations in color show to very good advantage what the graphic arts can do to explain color.

D. B. Judd

COLOR PREFERENCE AND SUBJECTIVE COLOR STRUCTURE

A reprint of the article "Color Preference and Subjective Color Structure" by Robert Hefner and Joseph Zinnes is included with this issue of the News Letter.

Part I of this article, a Paint Research Institute report was published in Official Digest, Volume 31, No. 415, August, 1959, by the Federation of Paint and Varnish Production Clubs.

HARRY HELSON AWARDED WARREN MEDAL

In April, 1959, Dr. Harry Helson was awarded the Howard Crosby Warren Medal for outstanding research in psychology. The Society of Experimental Psychologists made the award to Dr. Helson for his concept of adaptation level and his demonstration of its power to encompass many empirical findings, to reconcile conflicting results, and to point the way to new investigations.

The News Letter recently received word that Dr. Helson is on leave from the

University of Texas until next September. He is presently at the University of California at Berkeley.

COLOR REPORTS NOTED

The September number of DYESTUFFS, the quarterly publication of the National Aniline Division, of the Allied Chemical Corporation, of which the Harmon Color Works is now a part, has several interesting color articles. One is by Max Saltzman on color matching by way of pigment identification as practiced at Harmon, a laboratory method based on chemical classification of pigments (See Vesce & Ryan in PROTECTIVE AND DECORATIVE COATINGS, Vol. II, edited by Mattiello-Wiley, 1942) and use of spectrophotometric transmittance curves of pigment solutions in many solvents, as proposed by Shurcliff, Stearns and others.

Another article is by Faber Birren concerning the use and impact of color in the graphic arts. For the Whiteford Paper Company he had worked out a line of tinted papers with specially related color inks, and his article is printed with specially related color inks on four of these tinted papers and white, with a number of pages devoted to a demonstration of four-color process printing on the four tints and white. This paper is available in reprint form, and because it is such an interesting demonstration we enclose a copy with this number of the News Letter, through courtesy of Mr. P. L. Oertal of the National Aniline Division.

Still another article in this number of DYESTUFFS is one by J. F. Wright, relating how "Dyestuffs and Papermaking Grew Up Together."

MISCELLANY

Color in the News from Time magazine November 2 issue.

At 9:30 one morning last week the Associated Press got a request by long distance telephone from the Minneapolis Star: could A. P. take color pictures of General George C. Marshall's funeral, air-ship the developed film from Washington to Minneapolis that same night? The A. P. could and did. Next morning at 10:20 five big Star presses rolled. On page one: a five column, four-color picture showing the flag-draped casket and its uniformed pallbearers, the pearl-grey columns of Washington Cathedral, the green trees and the blue sky.

Color in daily journalism is not new. The Milwaukee Journal first used run-of-press color in 1891. But such color remained a prohibitively expensive rarity until after World War II, when technical improvements in the process brought costs down to a level that newspapers - and newspaper advertisers - could afford.

The increase in run-of-press color, i.e., in regular press runs as opposed to specially preprinted color, is a major development in U. S. journalism. Moving westward, its importance grows almost in geographical proportion: in the East, 52 per cent of newspaper readers get multicolor dailies; in the Midwest, 87%, and in the Far West, 96%.

It is interesting to note and speculate why that the only significant color holdout is New York City, which prints more big dailies than any other city in the U. S. Manhattan papers show little inclination to depart from the traditional black and white news package. The reasons they give for holding out is the poor quality and high cost of newspaper color and that their readers are indifferent to color.

But as the use of color continues to spread, even the relatively colorless New York papers may be forced to join in the parade. All, that is, but one. "We pride ourselves on the appearance of our paper and we don't want to detract from it," says a spokesman for the paper that will presumably remain the good, grey New York Times.

* * * * * *

Colors Signal Calorie Content on Cafeteria Counter

A cafeteria counter, with its tempting array of salads, appetizers, assorted breads and eye-filling desserts, makes it difficult to curb calories. Color will help all the diet conscious government workers in Washington. Dr. Roy P. Lindgren, who is with the Federal Employee Health Service, has devised an ingenious calorie indicator plan which is brand new and novel enough to spark a lively interest for calorie counters everywhere.

The plan is adapted from our traffic light system. The traffic light colors - red, yellow, and green - are used to designate the calorie rating of the various dishes in each food category. The red indicators are used on high calorie dishes, yellow stands for medium and green is the go signal, for the dishes marked with green indicators are low in calories. This is the way the system works: In the entrée selection, whether it's meat, fish, chicken, eggs or cheese, any dish that furnishes 350 calories or more is marked with a red indicator. Any dish in this section that is 250 calories or less has a green indicator. The yellow indicator is used for calories that lie between 250 and 350. The same calorie scoring plan is used to designate the comparative values in all the different food categories.

By following the green color, the dieter can choose a delicious lunch for as low as 300 calories, and for 450 calories a few trimmings can be included.

Many people are almost afraid to eat good meals. A calorie indicator system of this kind should add to the pleasure of eating. Color is making it easier to eat - to - beat- the-pounds.

* * * * * *

Doane Eaton of Skowhegan, Maine sent in this interesting article from the pages of the Bangor Daily News.

Storm Mystery: White Houses Turn Yellow.

Householders in several eastern Maine communities who retired in neat white homes Saturday night received quite a shock when they set out to survey possible storm damage Sunday (Oct. 25, 1959) morning.

Many of the neatly painted white houses had turned to a brilliant yellow.

Reports Sunday evening indicated property owners from Hancock County were hit by the unusual freak of the heavy southeaster but white houses also turned yellow in several other counties.

One property owner at Blue Hill reported the house retained its white color but the barn, painted with the same kind of paint, had turned yellow.

At Searsport several houses showed the bright yellow coloring but mostly on the southerly side of the buildings.

No official explanation of the freak condition was at hand but painters recalled that they had encountered the situation before in isolated instances where southeast winds from the coast had reacted on white house paint.

In many instances clearing weather will restore the original colors, painters said.

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The following letter was received by the News Letter:

Dear Mr. Rhodes,

The May NEWS LETTER refers (on page 8) to "The Munsell Color Company, Inc." Am I right in thinking it is now styled "The Munsell Foundation" or is this a separate entity?

I am presently engaged in doing fast color portraits at various County Fairs in California. These are done in pastel, water-color and pencil. (A combination used by J. J. Audubon.)

The papers are tinted in advance to a variety of complexicns. One sees fascinating mixtures of Japanese, Mexican, Negro, Indian and, of course, Celtic and Anglo-Saxon strains.

The public still thinks of portraits in terms of black and white photography, so the color approach is still something of a novelty.

This rapid portraiture would be far more difficult without the high standards of uniformity maintained by the manufacturers of artists materials.

The part played by the Inter-Society Color Council in the standardization of artists pigments should be a source of pride to its membership.

Sincerely,

Henderson Wolfe

* * * * * *

Everything seems to cost more these days and publishers of books find they are certainly no exception. Book publication costs more each year yet the public seems to demand more and more. Increasing pressure by the public for more color is felt in many areas but especially so when it comes to books for children. Many publishers when faced with the high cost of color simply eliminate or drastically reduce the number of color plates but here is a story of a multi-million press run with sprightly color on every page.

The Western Printing and Lithographing Co., one of the country's largest publishing and manufacturing operations, recently published Golden Book Encyclopedia.

This low cost, junior encyclopedia represents the most sizeable project ever to be undertaken by the company. Ordinarily, over 6,000 color illustrations and 375 full-color maps in addition to the more than half-million words for the text would command a high selling price, yet one may buy the encyclopedia for $.99 per volume in supermarkets throughout the country. The Golden Book Encyclopedia is truly an adventure in color.

* * * * * *

Gladys Miller, Editor of New Homes Guide and Home Modernizing Guide sent in an interesting article taken from the Lamp Journal.

If you are tired of that old white lamp shade then the Lamp & Shade Institute of America recommends that you just ask for a shade in "citrange"! Don't look up the word "citrange" in American College Dictionary, because you won't find it there. Nevertheless, citrange has become, almost overnight, a common word in the language of lamps.

Citrange is a coined word - a contraction of citrus and range, indicating a range of colors found in citrus fruits. Included in the family of citrange colors are lemon, lime, orange, and tangerine, but these are augmented by the deft use of related hues of persimmon, burnt orange, plum, browns, and beige.

* * * * * *

Police work is a colorful job in Rochester, New York. The Rochester Police Bureau, the Monroe County sheriff's department, and the district attorney's office have blossomed forth with full color identification badges.

These law enforcement groups are the first such departments in any city in the country to have full color photographs on individual identification cards. Appropriately enough, it is an all-Rochester production, from the subjects themselves right on down the line through every phase of the operation.

The only other police group having color identification cards, so far as is known, is the White House Guard.

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COMPREHENSION

You may think you know all about
  colours
With their beautiful dazzling hues
The reds and the yellows and greens
The oranges, purples and blues.

To the layman all colours are
  lovely
And every shade pleases the eyes
But Oh! to the Colour Council
They are herbs and earths and dyes.

There we learn how colour can help
  one
Feel bright and peppy or blue.
And how, if you're down in the dumps
You should make use of some other hue.

They explain how, when looking at
  colour
You may think you see a red tie.
But all other colours are swallowed
And only the red meets the eye.

And that, as you look around you
And think there are things that you see
Unless you can reach out and touch them
Light rays can fool you and me.

And colours are all only relevant
A blue may be yellow or green
If the colour scale slides up or down
Then shades are not what they seem.

And when it comes to psychology
Then to colours you must be acute
For you may lose your health or your reason
If your temper your pigments don't suit.

It is proved by intelligent lectures
That tints on films, fabrics or inks
In a manner astounding change colour
And never turn out as one thinks.

And while many sit and think fondly
Of the hues of the lovely rainbow,
You'll comprehend colours more clearly
If to the Colour Council meetings you go.

(Mrs.) Phyllis Pomeroy
The Colour Council of Canada

LIST OF ARTICLES ON COLOR RECEIVED BY NEWS LETTER

"The Age of Reason for Color," Faber Birren, Dyestuffs, 43, No. 3, (Insert) (Sept. 1959).

"Analysis of Phenols and Hydrocarbons by Gas-Liquid Chromatography," L. Sokol, 11 pp. (1959); Trans. of Chem(ické) Listy (Czechoslovakia), 52, pp. 1726-1734 (1958). Order from ATS $15.75 ATS-53L31C.

"An Anomaloscope," R. A. Weale, Die Farbe, 6, Nr. 1/2, pp. 1-4 (1957).

"The Chemical Basis of Modern Aerial Photography (Khimich e skaya baza sovremennoy aerofotografii)," V. Ya. Mikhaylov, Geodeziya i Kartografiya, No. 4, pp. 29-36 (1958). (USSR)

"Colorant Dispensers Popular at Show," Roland L. Meyer, Am. Paint & Wallpaper Dealer, 51, No. 5, pp. 40-41 (1958).

"Color Constancy in Shadows," S. M. Newhall, R. W. Burnham and R. M. Evans, J. Opt. Soc. Amer., 48, No. 12, pp. 976-984 (Dec. 1958).

"Colored Emulsion Paints for Exterior Use," A. D. Hibbert, Paint Tech., 23, No. 257, pp. 45-50 (1959).

"Color Forecast for 1959," Louise C. Mann, Am. Paint & Wallpaper Dealer, 51, No. 4, pp. 19-21 (1958).

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