A. H. MUNSELL DIARY

VOLUME A

1899 through May 1908

(From typed copy of A.H.Munsell's diary relating to his color studies.)

1879 Studied Rood's Modern Chromatics. 2,
Made twirling model of two triangular pyramids - fastened base to base - while studying descriptive geometry in class C (N. A. S.) and placed red, green and violet at angles.
(vermillion - emerald green- ult. blue)

1887 Reviewed Chevreul - at Beaux-Arts Library - and visited Gobelins - to see scale of yarns -

1889 Gave N. A. S. students sketch of various diagrams and models to illustrate color-balance - complementary colors - enhance and excite neighboring colors - harmonize and quiet - contrast colors - after images- schemes for arranging still-life. -

Pages 1 & 3 missing

--------at my request - talk to students by Denman Ross at N. A. S. -

Art the expression of personal feeling. Thought artist must express himself-

Fine experiences - fine feelings - fine utterances.

Omit the insignificant and trivial.

Not truth - but expression is art.

To define and relate the shapes of light and color felt through vision - Impressionism.

1890 (Met Mr. Ross at J. Linden Smith's studio - Trinity Court - April 1890.
He asks if I can get him a room at the Shoals -
1891 and comes in August, 1891.
We go out sketching before sunrise, and I tell him of my "Chloris Calls" shown at the Boston Art Club in 1885, when I arranged a spectrum circuit on the rim of a circle,- balancing yellow and blue, against red and purple.

1892 Both in Palazzo Gritti. (della Swift) on Grand Canal, Venice - June 1892 - went sketching together - visited Rosario, Ducal Palace Frari, Jesuati, San Roseo? and Academy.
Talk over the impression its "division of tone" - vs. Tintoret -Veronese.
Talk over a systematic color scheme for painters, so as to determine mentally on some sequence before laying the palette.
Show him my spirals for "War Cloud" - painted
1898 at Smutty nose and then a sphere of colors-

He objects to my complements. 4.

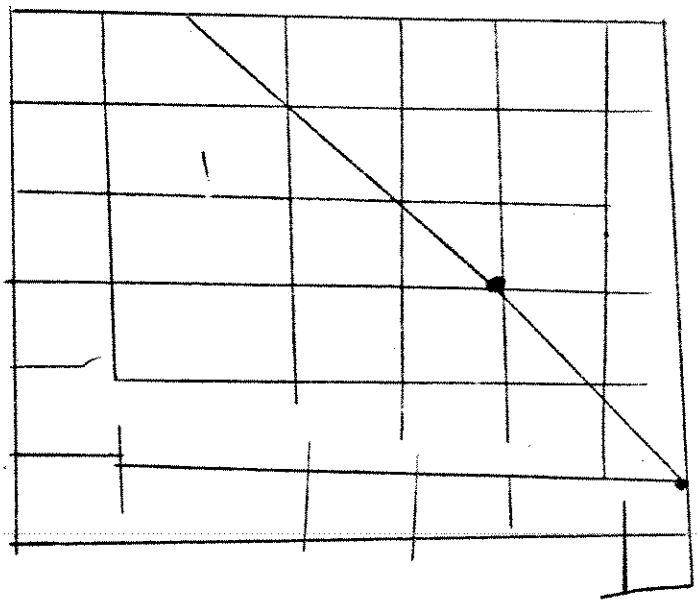
1900 Thinks my photometer will be very useful, but doubts value of the sphere -

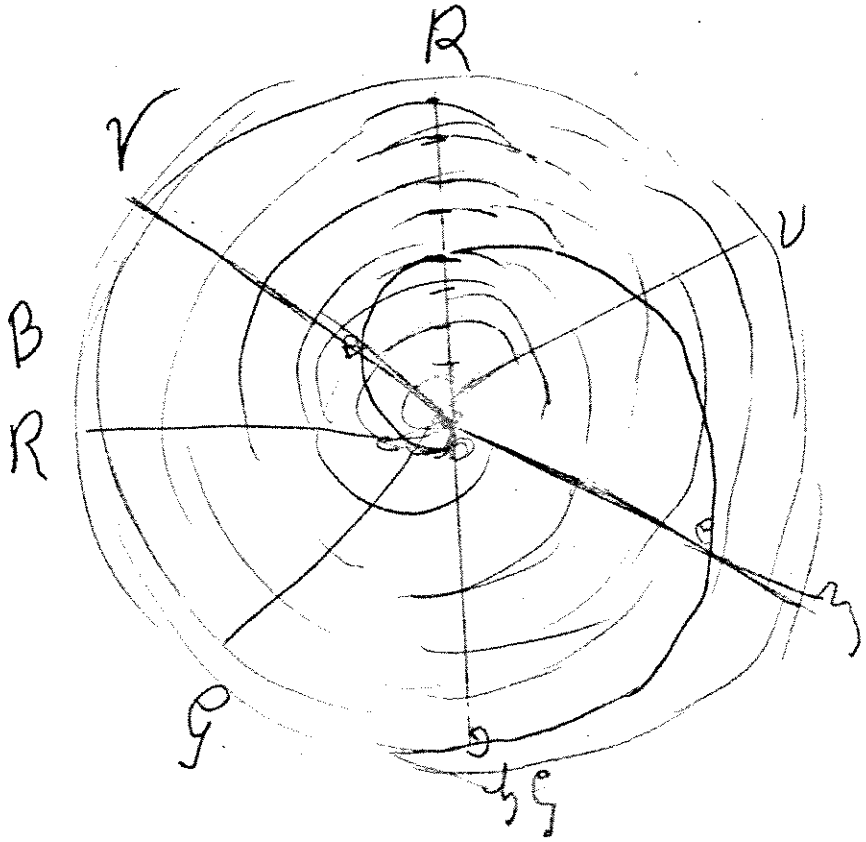
It is also necessary in this study to be 7a.
able to contrast any color or sequence
of colors with neutral grey. For this
purpose not only is color displayed upon
the surface of the sphere but each color
penetrates and diminishes inward until
it disappears in the neutral axis from
white to black.

The sphere may be constructed of two
hemispheres. These being separated,
expose an equatorial section with a
spectrum circuit of middle value upon
its circumference and each color dimin-
ishing inward until it merges in a
neutral grey at the centre. If each
hemisphere be subdivided, the sections
so exposed will exhibit diminishing se-
quences from their colored rim to their
neutral grey centres.

The neutral axis presents a regular gra-
dation from white to black, and any sec-
tion of the color sphere at right angles

V R U Y YG G BR





My dear Mr. Ross:-

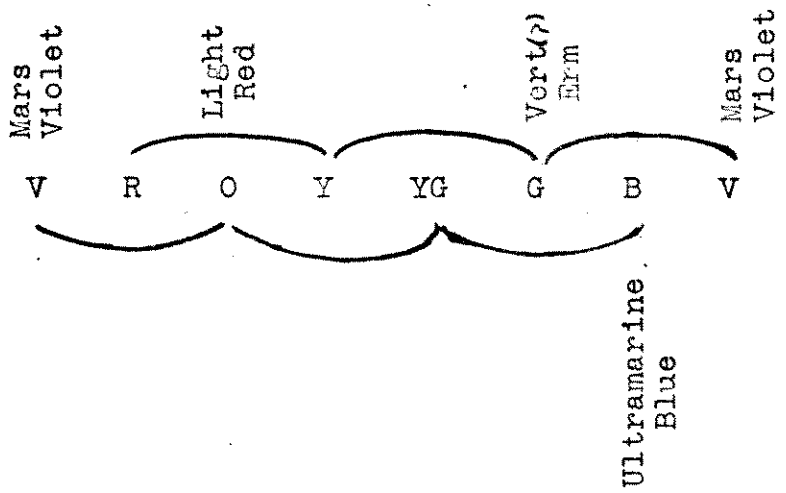
A spiral diagram which you made at my studio several years ago when I was trying to analyse a color scheme, led me to try some reversed spirals and later suggested the color sphere.

Now that I am trying to describe the development of this system, that diagram will serve as a significant illustration of one of the steps which finally brought me to the use of a rotating model, and unless you wish otherwise, I should be glad to have it appear among the drawings.

Cordially yours

P. S. I ought to explain that this typewriting habit was brought about by a threatened attack of writer's cramp, which seems completely cured, but makes it wise to use the machine as much as possible.

221 Columbus Ave.
Boston, Jan. 30, 1902.

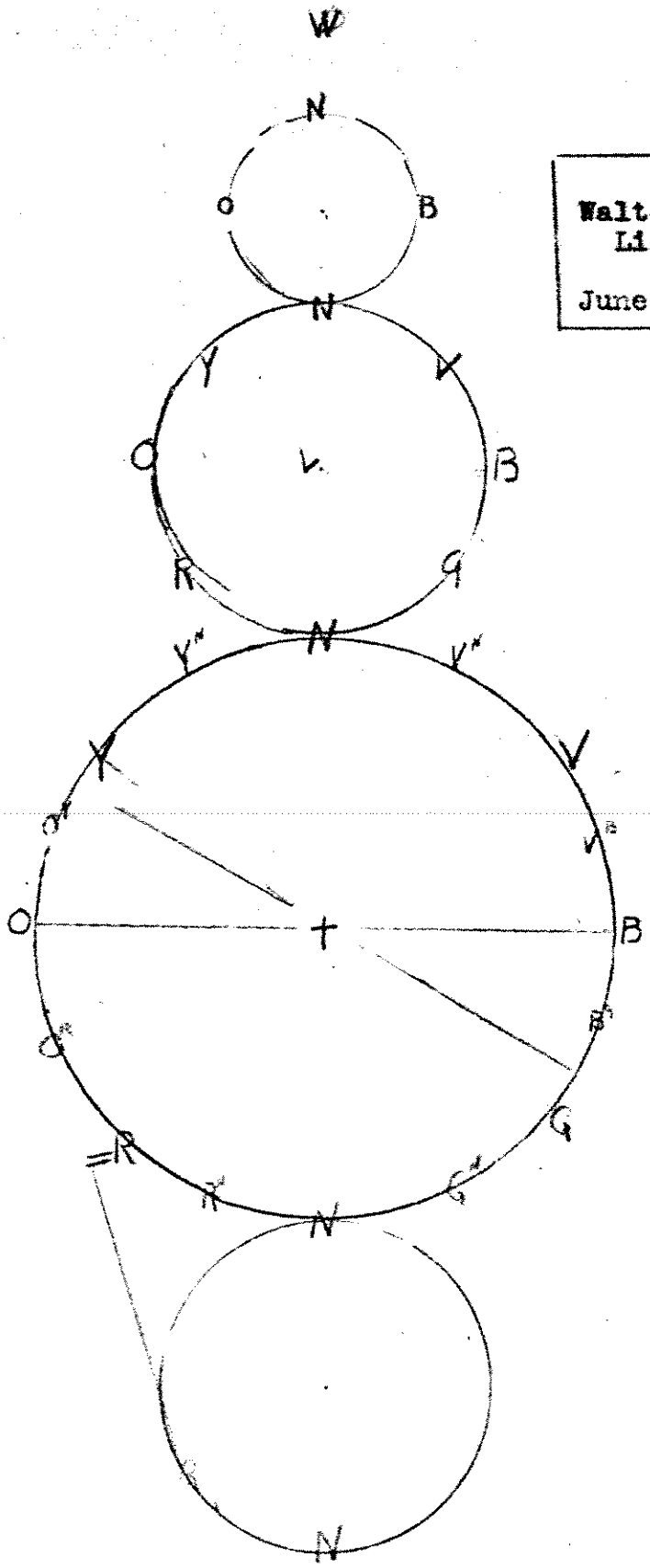


Permanent Yellow - Ult.Marine - (red)

by Denman Ross

Y	V
O	B
R	G

Walter Sargent,
Littleton, Mass.
Fitchburg.
June 8-1900.



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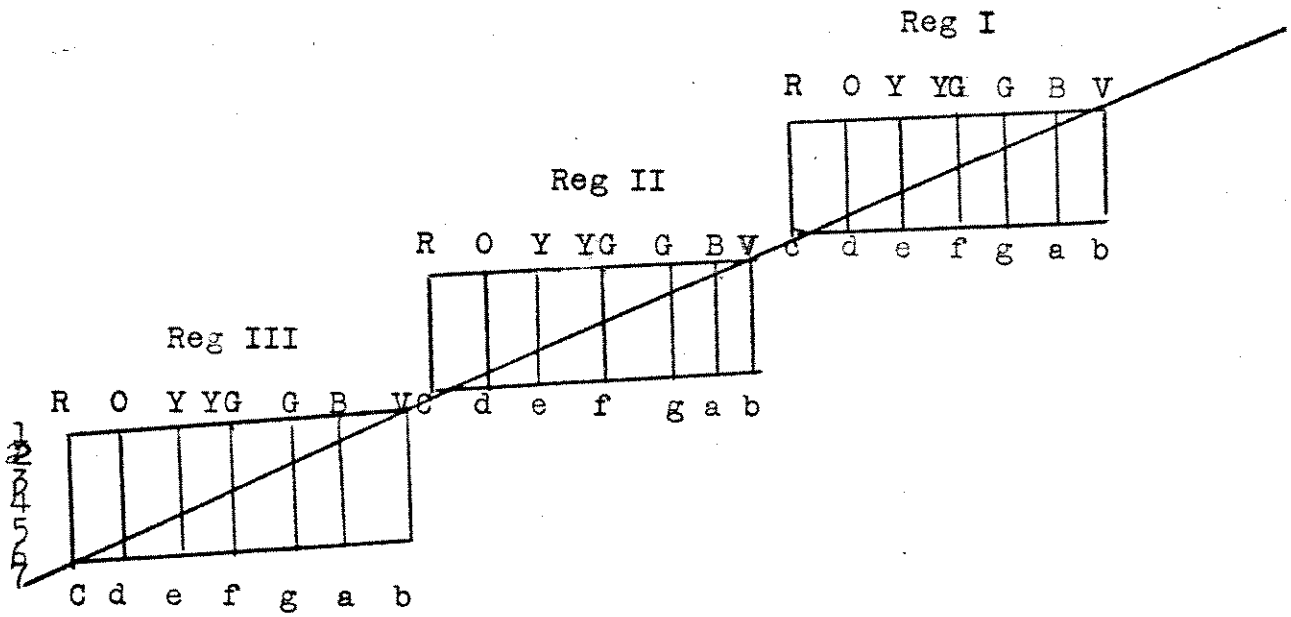
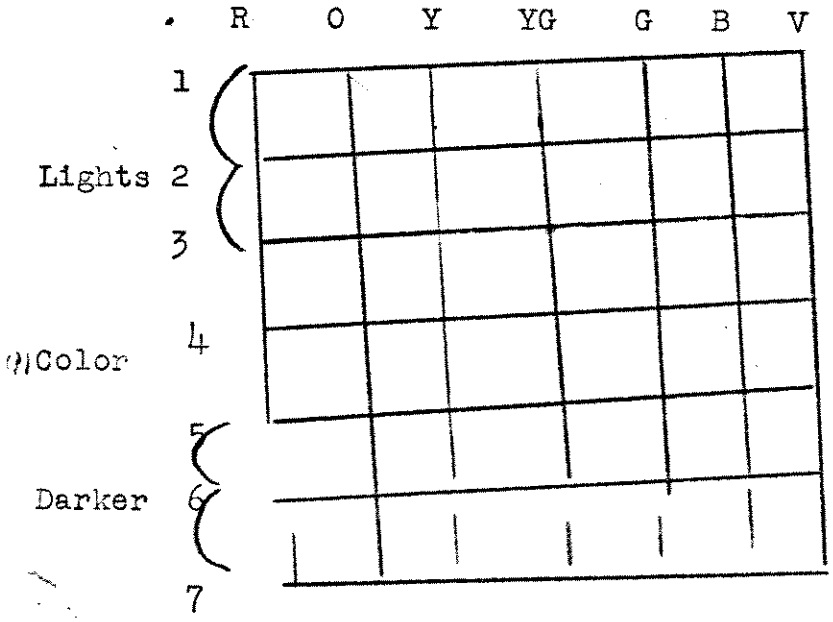


Ca.



by Denman Ross
at Studio 1898

to this axis, exhibits traces of color which increase regularly in intensity toward the circumference while preserving the same value as the point at which the section crosses the neutral axis. For instance, such a color section at the middle of the neutral axis will be of middle value throughout. 7a.

It is also necessary in this study to be able to contrast any color or sequence of colors with neutral grey. 3a.

(For) this purpose color is not only displayed upon the surface of the sphere but each color penetrates the interior. It may be constructed of two hemispheres, which being separated, expose an equatorial section having a spectrum circuit of middle value upon its circumference, and each color diminishes in intensity toward the centre until it disappears in neutral grey. Each hemisphere may be subdivided and the sections exposed, showing the surface colors diminishing inward to the neutral axis.

The neutral axis is a regularly graded sequence from white to black. Any sec-

tion of the color-sphere at right angles to this neutral axis exhibits traces of colors increasing in intensity toward the circumference and all of the same value as the point where such section crosses the neutral axis: for instance, such a section at the centre of the neutral axis will be throughout of middle value; - successive parallel sections above will be of lighter and lighter value as they approach the white pole, - and similar sections below the equator will be of darker and darker values throughout, down to the black pole.

The sphere is therefore conceived as built up of an infinite number of parallel superposed color-circles, each and all perpendicular to the neutral axis, and each having a uniform value corresponding to the point where the circle is pierced by said axis.

Color sequences may therefore be traced through the substance of the sphere by means of sections, segments, sectors, spherical triangles, chords, radii or other elements of the sphere - as well as by lines

or figures described upon its surface.

CLAIMS

Amend Claim I.

by adding "and with sectors, segments or other portions however formed of said color-sphere as herein described with all charts or other developments of said sphere or any of its parts.

Insert above at proper place in Claim II.

Amend Claim III.

by inserting after the word "revolved"- "by means of the hand or by electrical, mechanical or other attachments necessary for its revolution."

These successive parallel sections above the middle or equatorial section, present lighter and lighter color-circles, with lighter and lighter grey centres until they reach the white pole - Similar sections below the equator present darker and darker values throughout until they reach (in) the black pole. (and) We conceive the color-sphere as built up of an infinite number of superposed color circles, all

perpendicular to the neutral axis, and each of a fixed value established by that point of the axis where the circle intersects.

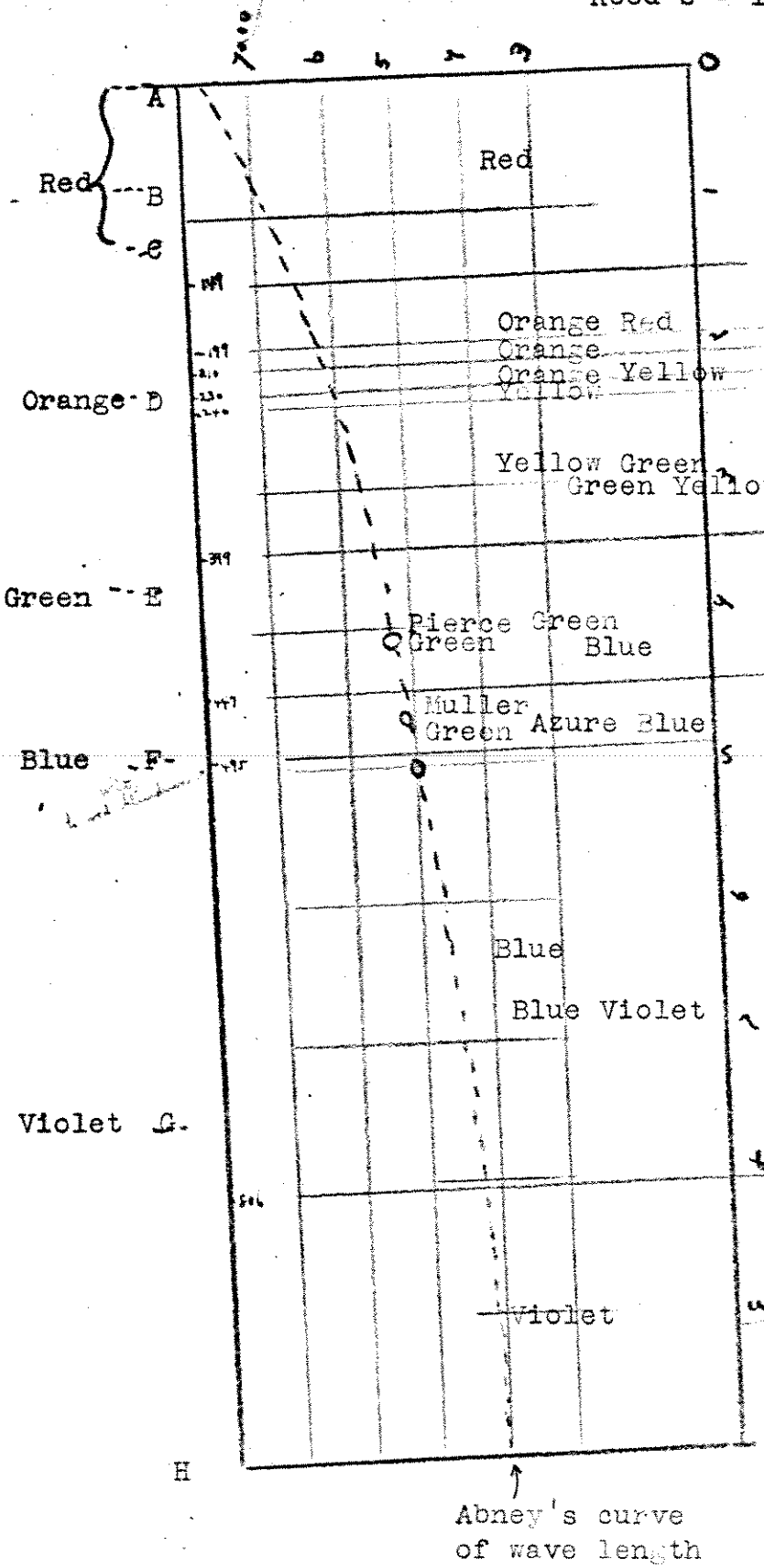
Color sequences may thus be traced through the substance of the sphere - by means of sections, segments, sectors, spherical triangles, chords, radii or other elements of the sphere - as well as by lines or figures described upon its surface.

lla follows here.

Chevreul	Hue	Value	Chroma
		Gamme des tous	

"Such (broken) colors do not exert the fatiguing effect of successive contrast; but they call forth more than any others, the insinuating effect of simultaneous contrast, which is prolific of illusions. An artist who works with full, unbroken colors, therefore deprives himself of one of the most potent means for producing illusions by the aid of simultaneous contrast. The paintings of such an artist will never produce the impression of rich-

Rood's - 1000 - scale of spectrum.



THE BRADLEY COLORS. (printed folder)

Under the title on the foregoing page the publishers offer a folding Cardboard tablet 22x28 inches, which contains five very useful color charts made from the well known Standard Colored Papers originated and manufactured only by them.

These five charts are designated as PURE SPECTRUM STANDARDS, PURE SPECTRUM SCALES COMPLEMENTARY COLORS, BROKEN SPECTRUM SCALES, and GRAYS comprising Neutral, Warm, Cool and Green, two tones of each.

This well known line of educational colored papers comprises more than one hundred and fifty colors definitely named in terms of the Solar Spectrum Standards Red, Orange, Yellow, Green, Blue and Violet of the Bradley system of color education and nomenclature.

CHART OF SPECTRUM STANDARDS.

This chart comprises samples of the six pigmentary standard spectrum colors, Red, Orange, Yellow, Green, Blue and Violet, made in the closest possible imitation of the solar spectrum standards which were selected as the foundation for this system of color education, and which furnish the first permanent color standards ever applied to the establishment of a popular and scientific nomenclature of color.

CHART OF PURE SPECTRUM SCALES.

This comprises ninety samples of colored papers which are classified into eighteen series of five tones each, called scales of Color. Each of these scales comprises a full spectrum color with two tints and two shades of that color.

Between two adjacent standard scales when arranged in spectrum order there are two intermediate spectrum scales. For illustration. Between the Orange Scale and the Yellow Scale there are the Yellow Orange and the Orange Yellow Scales.

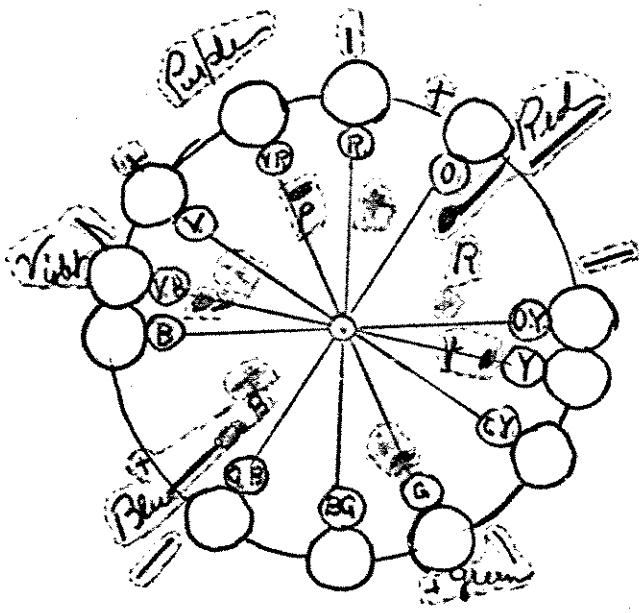
Thus there are in the spectrum colors sixteen scales and between the red and the violet when arranged in a circle there are violet-red and red-violet, colors not found in the spectrum but common in nature and the arts, thus forming eighteen scales in all, but only sixteen are strictly spectrum scales.

Each of the six standard colors with its tints and shades forms a standard spectrum scale.

A CHART OF COMPLEMENTARY COLORS.

This consists of twelve disks of paper arranged in a circle. Six of these are the Standard Colors shown in the first chart. Diametrically opposite each standard is

Mr. Munsell's notations enclosed in dotted lines.



its complementary color, thus constantly calling this important series of color facts to mind without mental effort.

CHART OF BROKEN SPECTRUM SCALES.

The fourth chart shows a series of twelve broken scales of three tones each. These thirty-six colors comprise the only definite attempt ever made to show this most beautiful class of colors in their true relation to the pure colors, and to thus demonstrate the radical difference between pure and broken colors. The fact of this distinct difference between pure colors with their tints and shades, and broken colors in their various tones is shown in no other than the Bradley system with its special line of colored papers, based on color truths.

THE GRAYS.

In the last chart the grays are illustrated in four groups of two each comprising neutral, warm, cool and green grays. The neutral gray may be called a pure gray i. e. a gray without spectrum color of any kind and is practically a STANDARD GRAY because determined by the disk combination of white and black, a quality which cannot be guaranteed in any other way.

The Warm Gray is neutral gray with a mixture of red, orange or yellow.

The Cool Gray is a neutral with blue or violet.

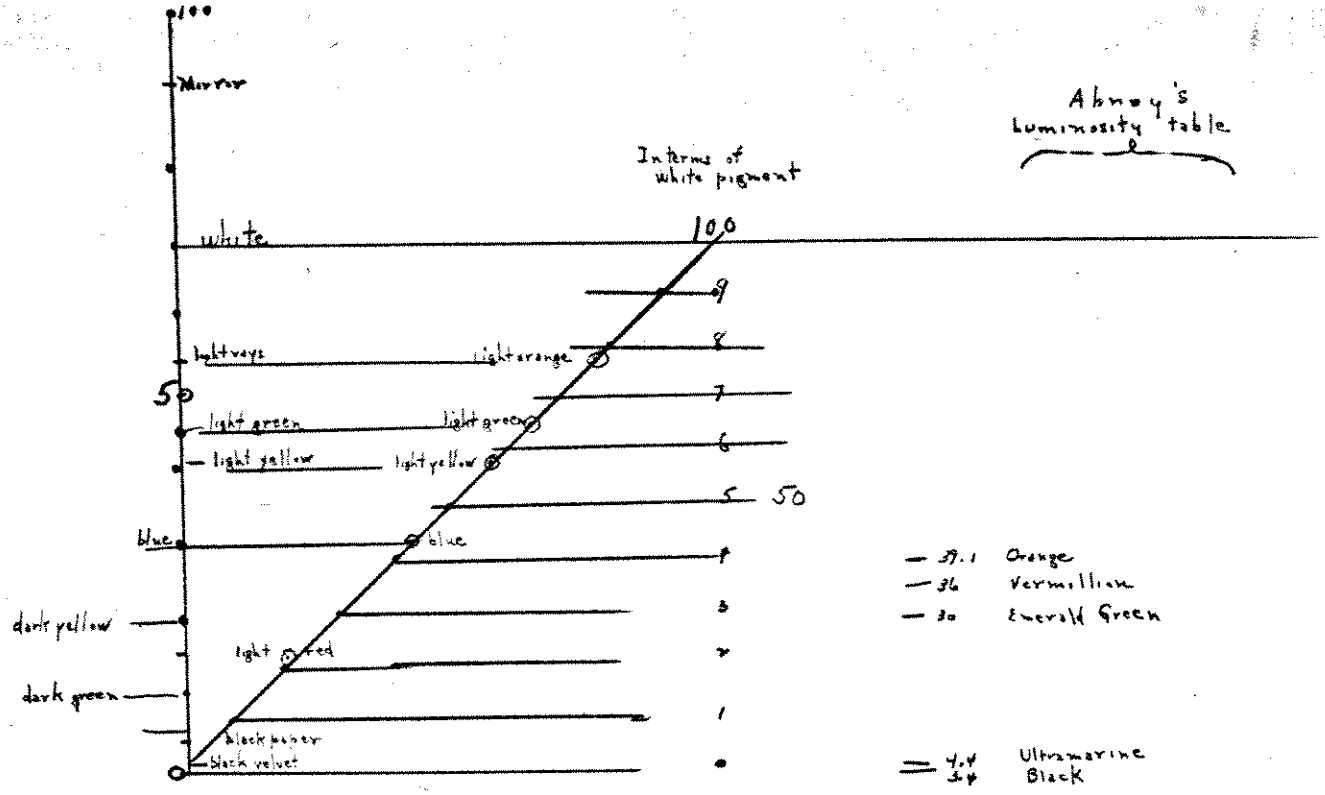
The fourth is described by its name having a combination of neutral gray and green.

ness of color, in spite of the lavish outlay of pigment. They will always look gaudy, poor and hard."

Von Bezold - p.158

"All the great colorists have actually made extended use of it, (small color differences), - while bunglers who are led by the trivial idea that "much helps much", will always endeavor to reach their aim by strong contrasts."

Ibid - p.169



(clipping)

Evidently wrong!!

"The lighting of a room," says the Pharmaceutical Era, "depends, to a large extent, upon the color and the material of the walls; in other words, upon the percentage of light reflected by them. Recent experiments have shown the proportion of light reflected to be in percentages as follows: Black velvet, 0.4; black cloth, 1.2; black paper, 4.5; dark blue, 6.5; dark green, 10.1; light red, 16.2; dark yellow, 20; blue, 30; light yellow, 40; light green, 46.5; light orange, 54.8; white, 70; mirror, 92.3."

(newspaper clipping)

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violet - yellow - comp
"redder yellow"

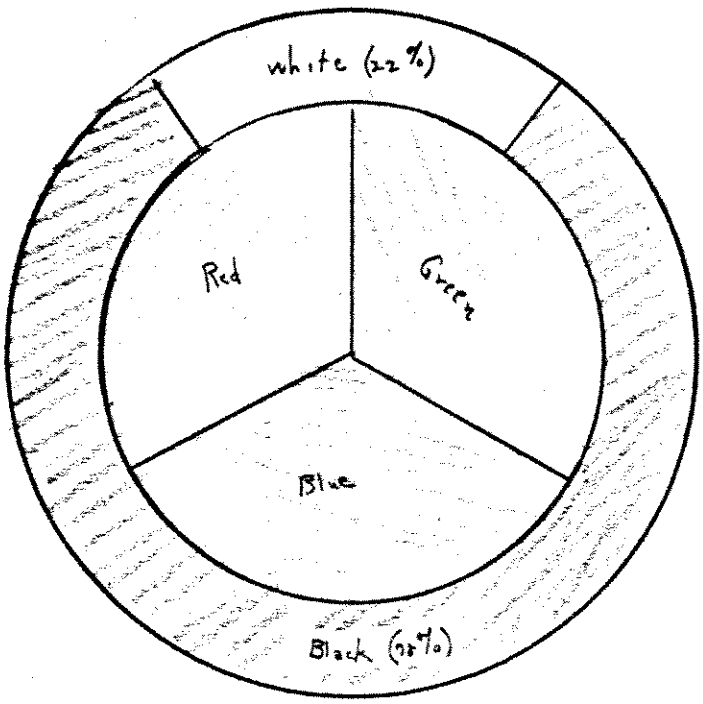
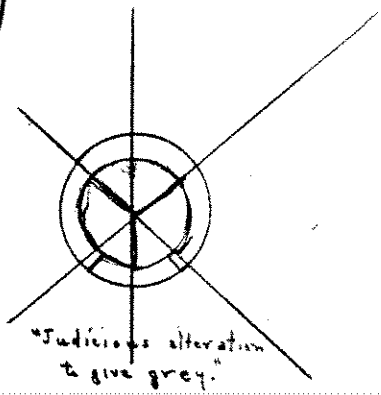
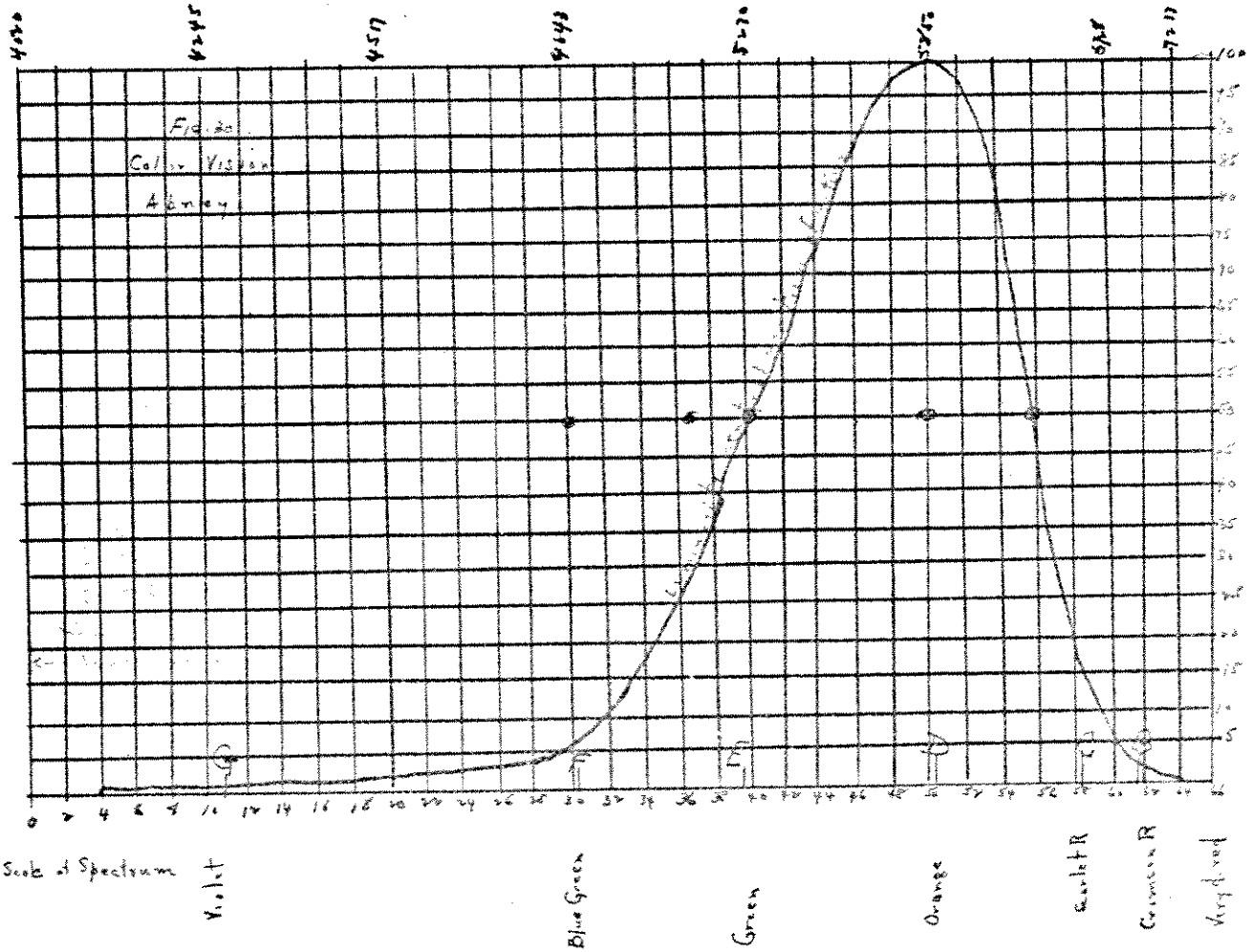


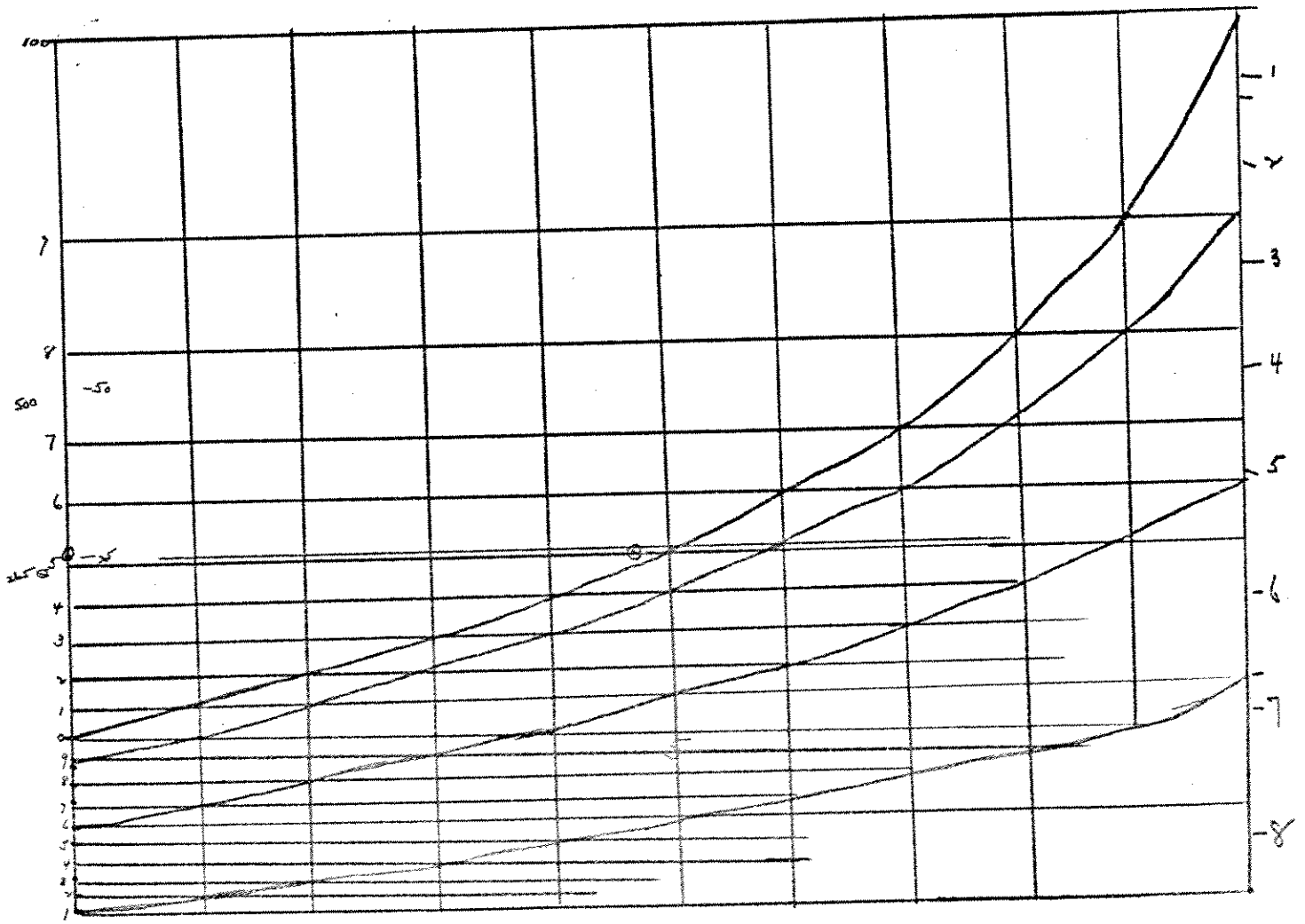
Fig. 9.
(percents by AM.)





1			432	Fechner's Law
2	30.103		860	
3	47.712	17604	1284	$\Delta S = K\frac{\Delta_1}{I}$
4	60.206	12494	1703	
5	69.897	9691	2119	$S = K \log I$
6	77.815	7918	2531	
7	84.510	6695		Sensation = K proportion
8	90.309	5799		into intensity of illumi-
9	95.424	5113		nation.
10	1.	4576		
11	1.04 139	4139		

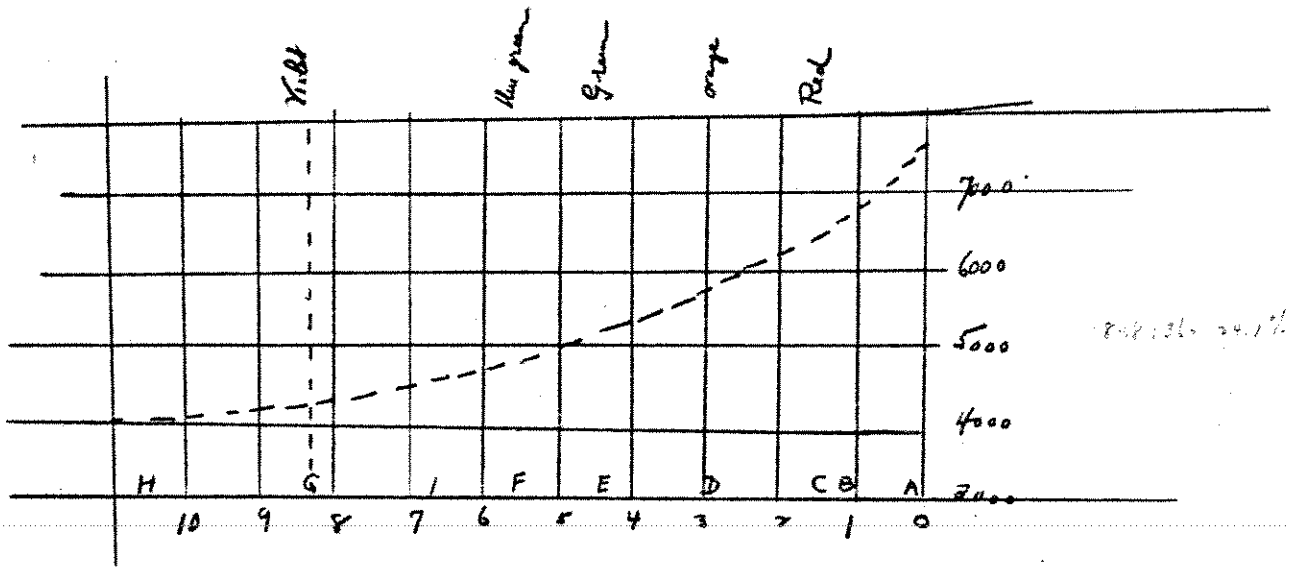
Middle C - on tuning-fork gives 528 vibrations per second



Abney "Color Vision"-

p.137 - " I believe --(some of the characteristics of the deficiency in colour sensation) -- seem to indicate the existence of a special part of the brain endowed with the functions for perceiving colour."

16a.



Color measurement
Fig. 3 p.28

Curve for converting the prismatic spectrum into wave lengths.

"A certain percentage of colored light can be hidden in white without being perceived"

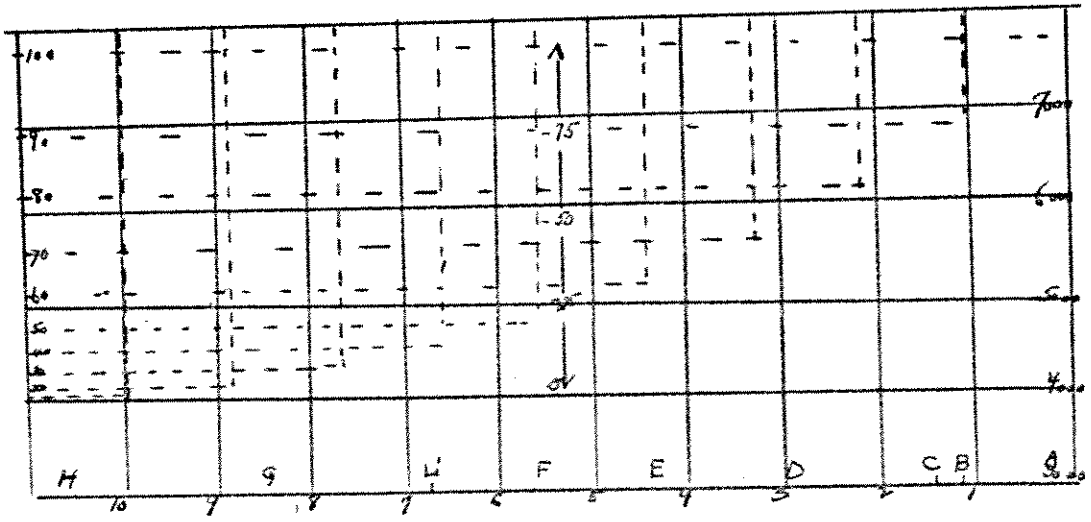
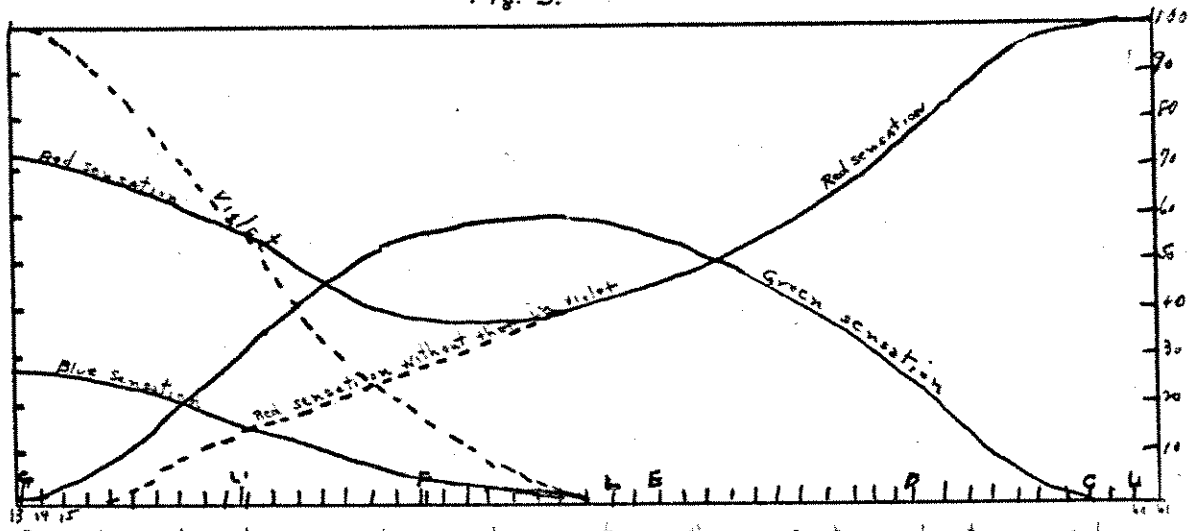


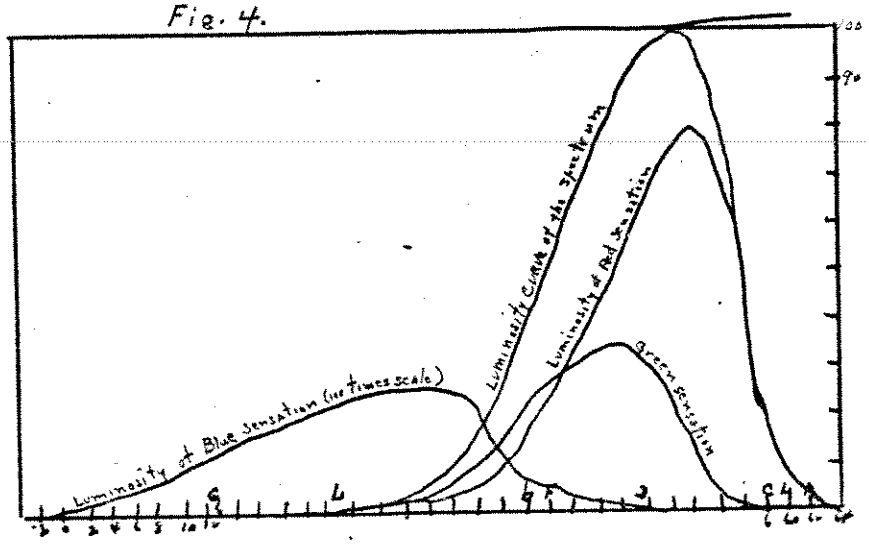
Fig 3. - Curve for Converting the Prismatic Spectrum into Wave-lengths.

Fig. 3.



Percentage of color-sensations as luminosity in the prismatic spectrum colors.

Fig. 4.



RS	GS	V	W
66.55	31.96	1.69	100
67.42	31.90	1.68	"
66.20	32.28	1.52	"

Sensation luminosities in the spectrum of the light of the crater of the Positive pole of the arc light as seen with the centre of the retina.

Possible uses of a revolving spherical Color-Chart.

Educational - to present facts and relations of color.

Record - to preserve and reproduce any color group or effect.

Apparatus - for mergence and predominance of hues in any sequence.

Key-board - or instrument for color arrangements.

Variants suggested in chart.

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1. Colors and values merged imperceptibly.
2. Three or more colors spaced regularly in circuit.
   Two " " values " " from (white / to / black)
3. Keyed to a dominant light (midday / night / artificial light)
4. Simplified for children (kind

A. H. Munsell.

June 2d 1899.

1900. March 29. At Fayerwether Bldg. - Columbia. 18.
4-6 P. M. Interview with Prof. Rood.

Showed Revolution Machine - up to 3,000 per minute

4 spheres (6") 4 centrals - and 8 centrals
3 " " 6 "

Disks corresponding to above spheres.

Prof. Rood pronounced them "very successful".

He said "You have put an artistic idea (sequences) into scientific form."

Suggests these descriptions

1. for artist friends and adult mind "top to bottom"
2. " 16 years of age (main points)
3. " 8-10 " " " simplest statement

Suggests 5% gelatine solution for plaster balls (Dr. Roosevelt)
Incision of spirals on interior of mould

pivot for high speed - 360 per sec.
60
21600 " min.

Braided silk for bands.- as on Holtz machine -

Chooses the division by four as most satisfactory.

Gives me permisssion to refer this to him im pamphlet. & will look over proofs.

March 31d, 1900.- Springfield - at Mr. Milton Bradley's house 3:30 - 5. Hall comes to fetch me.

"Send us what you want to do and we will see how it can best be published.

5% to 10% on sales.

Discuss "Values".-

Monday, April 2. Trinity Court - Bailey brings his Ross' scales-

Debate need of a single word for "Yellow green".

I suggest "lettuce".

Thinks Ross and I may come together on a system of color.

Acknowledges the 4 division gives best orange and purple.

18a.

"Nature loves the number five. (Emerson)

"You have put an artistic idea into Scientific form." (Rood)

"What atomic weightshave done for chemistry, this will do for color." (Worthington Ford) p42

"It may be of use in the Observatory in making the color of Mars." (Prof. W. H. Pickering)

"You have obtained a very beautiful result." (Prof.C.R.Cross)

"I think it is sound in principle." (Prof. Clifford)

"You arrive at a higher degree of accuracy and convenience than any methods hither devised. I should like to make it the basis of a lecture and have one in my class-room." (Prof. Dolbeare)

"It is a system in which color and value are composed in equal intervals of equal contrasts in all directions. - in which one can think infinite things in tone, and convey these thoughts to others in accurate terms." (Denman Ross) p33

"I am under obligation to you for a new view of color. It is a necessity in education." (M. T. Pritchard)

"I should say that your scale is one to be trusted." (Capt. W. deW. Abney)

"Cannot fail to introduce definiteness into the conceptions of artists, which has heretofore been lacking." Dr.H. P. Bowditch.

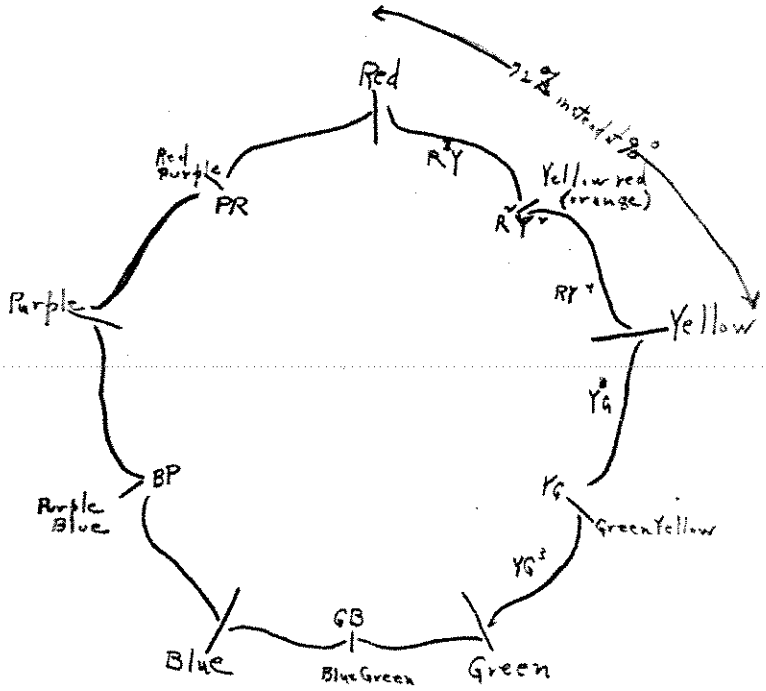
April 3 Write Librarian of Congress for provisional copyright on charts. (black and white until color prints are ready.)

Also make 5-piece mold of plaster sphere with spiral joints.

April 4 Write Cross about tin stand for sphere - and ask advice as to royalty.

April 5

Attempted division by 5 in order to use decimal system 100° from any color to its complement -right or left-handed 100° from black to white

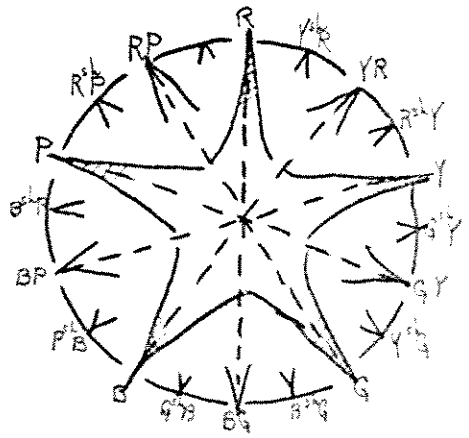


Centrals	Intermediates
1 word	2 words
Red	
	Purplish red
	Red purple
	Reddish purple
Purple	
	Bluish purple
	Purple Blue (violet)
	Purplish Blue
Blue	
	Greenish Blue
	Blue Green
	Bluish Green
Green	
	Yellowish Green
	Green Yellow
	Greenish Yellow
Yellow	
	Reddish Yellow
	Yellow Red (orange)
	Yellowish Red

A Color Compass of 20 points

(10 to right of red 10 to left of red)

Each 10% of Hue



April 6

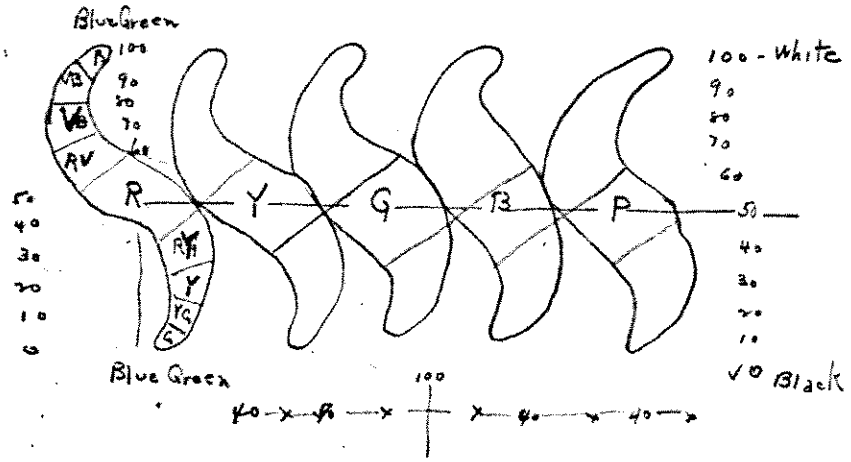
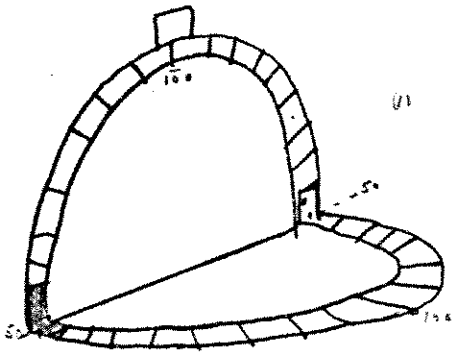


Chart of Color-Sphere showing color-sequences through five centres and scale of values (decimal).

April 9.- Sent diagram as above and description to Prof. Rood, substituting purple for violet.

" 10. Wrote Bradley about above - and asked for form of agreement.



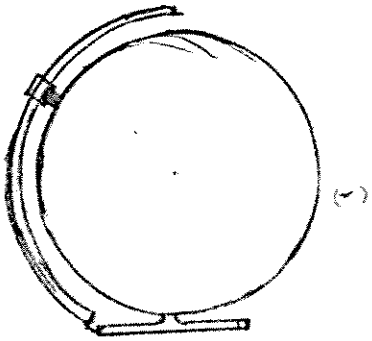
April 13.- Made folding circle to act as measure for vertical scale of Value, Horizontal scale of Hues, Radial scale of - - - Designed notation R - 90

(1)

Designed arc, pencil and wheel to draw spirals at any given rate from pole to pole - through any chosen point on the equator. -

(2)

-45° 55° pitch -



(3)

←5" wheel→

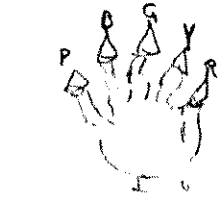
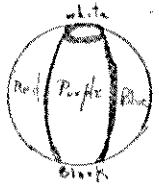
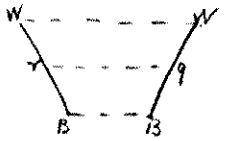
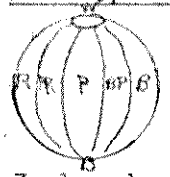
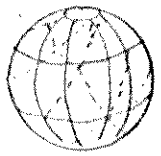
THOSE UP-TO-DATE MAGAZINES.

Mr. Boozer—I hev sheen 'em all, an' more, too, many a time. Where ish my old companion, th' variegated alligator?

Apr 16 Prof. Rood "fivefold idea seems to be a good one!"

16 APRIL, 1900. VOLUME ONE, NOTES OF A H MUNSELL, PAGE 21.

PROFESSOR ROOD REPLIES: "THE FIVE FOLD IDEA SEEMS TO BE A GOOD ONE."

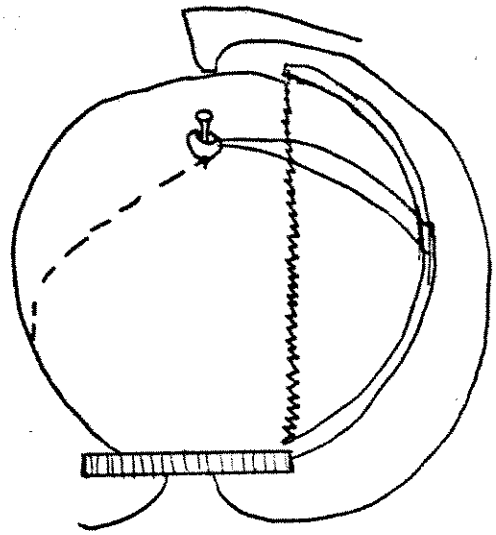
OBJECTIVE	SUBJECTIVE	NATURAL EXAMPLES	
Five colored balls	Idea of color	Rainbow	Circle of finger tips - caps of colored paper
1 (R) (Y) (G) (B) (P)	names, order		
2			
3 1st sphere 2½"	Groups of three colors	Flowers & leaves Japenese tops	
 5 colors & black & white			Bend colored papers.
5			
2nd sphere 3"	Intermediate colors	Rainbow & Spectrum	Arrangements of colored paper
6  10 colors	names & order 	Soap-bubble	1 In straight line 2 " circle 3 " oblique series 
	Groups of four colors 		
7 3rd sphere 3" 10 colors 3 values 	Sequences 1 of value 2 " hue 3 " both value & hue	Shading of prints Oriental Rugs	Rainbow in colored papers
8			
4th sphere 6" 10 colors in 10 values	Groups of five colors	Oil on water	

Interior sections

Exterior shells

Idea of Chroma - Greyness to saturation

APRIL 13, 1900

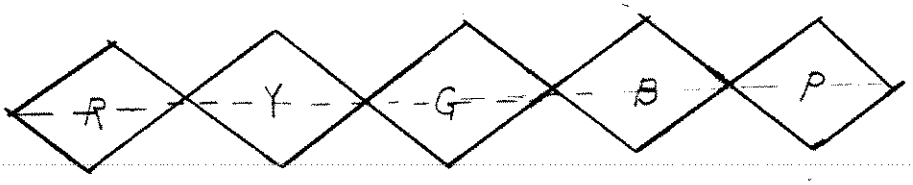


Designed spur and crown gear
to describe spirals -

Pitch 24 -(3 in 6 in)
          (72 144)

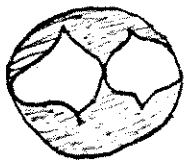
Crown wheel spins on $6\frac{1}{2}$" sphere

April 20 -

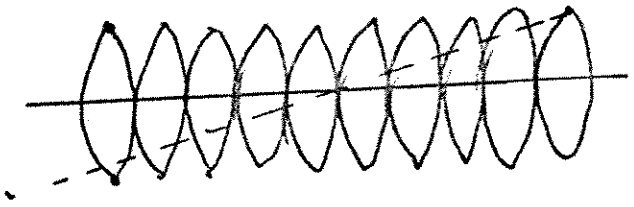


April 23,
1900.

Three standard papers to fit



1. North pole
2. South pole
3. The middle sequence
   or
   A melon arrangement of ten parts



with spiral line drawn in grey.

1. Three measures of a color (Hue / (Value or Luminosity (tint & / (Energy " Purity - shade) / Saturation
2. Exercises in change of Hue, without change of Value ———
3. " " " " Value " " " " Hue |
4. " " " " Energy " " " " Value —◯
5. " " " " " & Value " " " " Hue 
6. " " " " " " & Hue - Color cones
7. Arrangements of above - in straight lines
" a circle
" " spiral
on cones (apex on surface / " in N.S.axis / " (?) sphere
8. Arrangements through any given point.