

### Mechanical Spiral.

Moves one unit of latitude for every two of longitude.

Crosses equator at 26 - )  
 Merges with axis at 89 - ) increased angle as it  
 goes toward pole.

Chemical  
Scale

Abney's co-efficients

50°

63.2°

68.5°

Intensity →

P6.9 - Purple (Ab p. 190)

Chromogel (Ab p. 190)

Orange (Ab p. 190)

520 (Ab p. 190)

470 (Ab p. 190)

370 Orange

350

300

250

200

150

100

50

0

Luminosity →

4

6

8 1/2

10 1/2

13

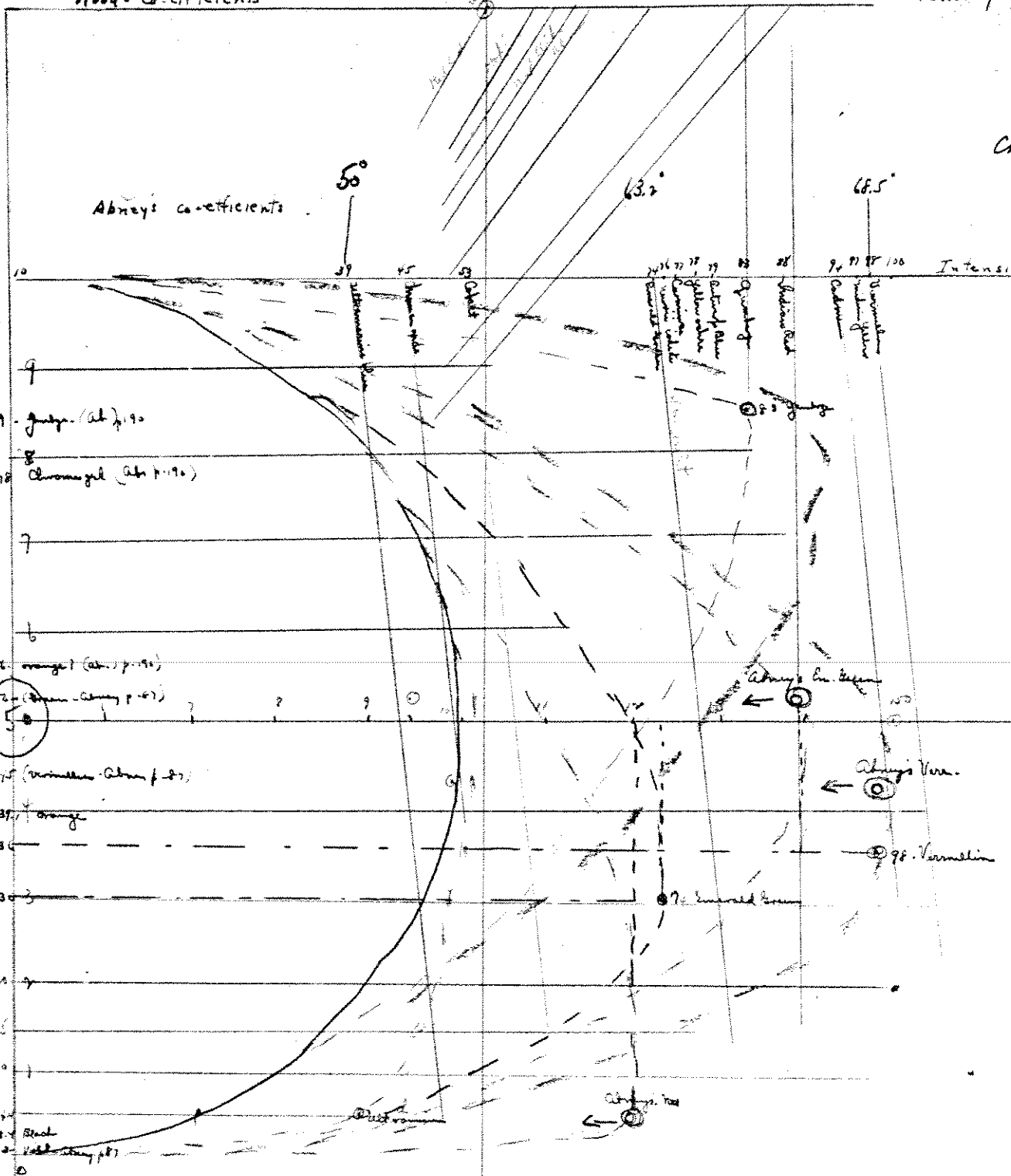
15 1/2

17 1/2

20

22

25



10  
9  
8  
7  
6  
5  
4  
3  
2  
1  
0

0 10 20 30 40 50 60 70 80 90 100

50°  
63.2°  
68.5°

Purple (Ab p. 190)  
Chromogel (Ab p. 190)  
Orange (Ab p. 190)  
520 (Ab p. 190)  
470 (Ab p. 190)  
370 Orange  
350  
300  
250  
200  
150  
100  
50  
0

0 10 20 30 40 50 60 70 80 90 100

Abney's Coefficient  
Abney's Ver.

1950  
May 2

Ginn & Co  
9 Tremont Pl. 24.  
Called on Mr. C. R. Perkins  
Advised waiting until book was written before

deciding on title and copyright needed.

Said another publisher than Bradley might be wise, as he was already a worker in the same line, and had a pet idea -

Suggested Ginn & Co. 9 Tremont Pl., or Youth's Companion Co.

See p 314  
May 3<sup>d</sup>

10 a.m. Appointment to meet Prof. Cross at Institute of Technology.

He accepts the visual estimate of "middle value" and on my scale chooses 60 - 70 black as "

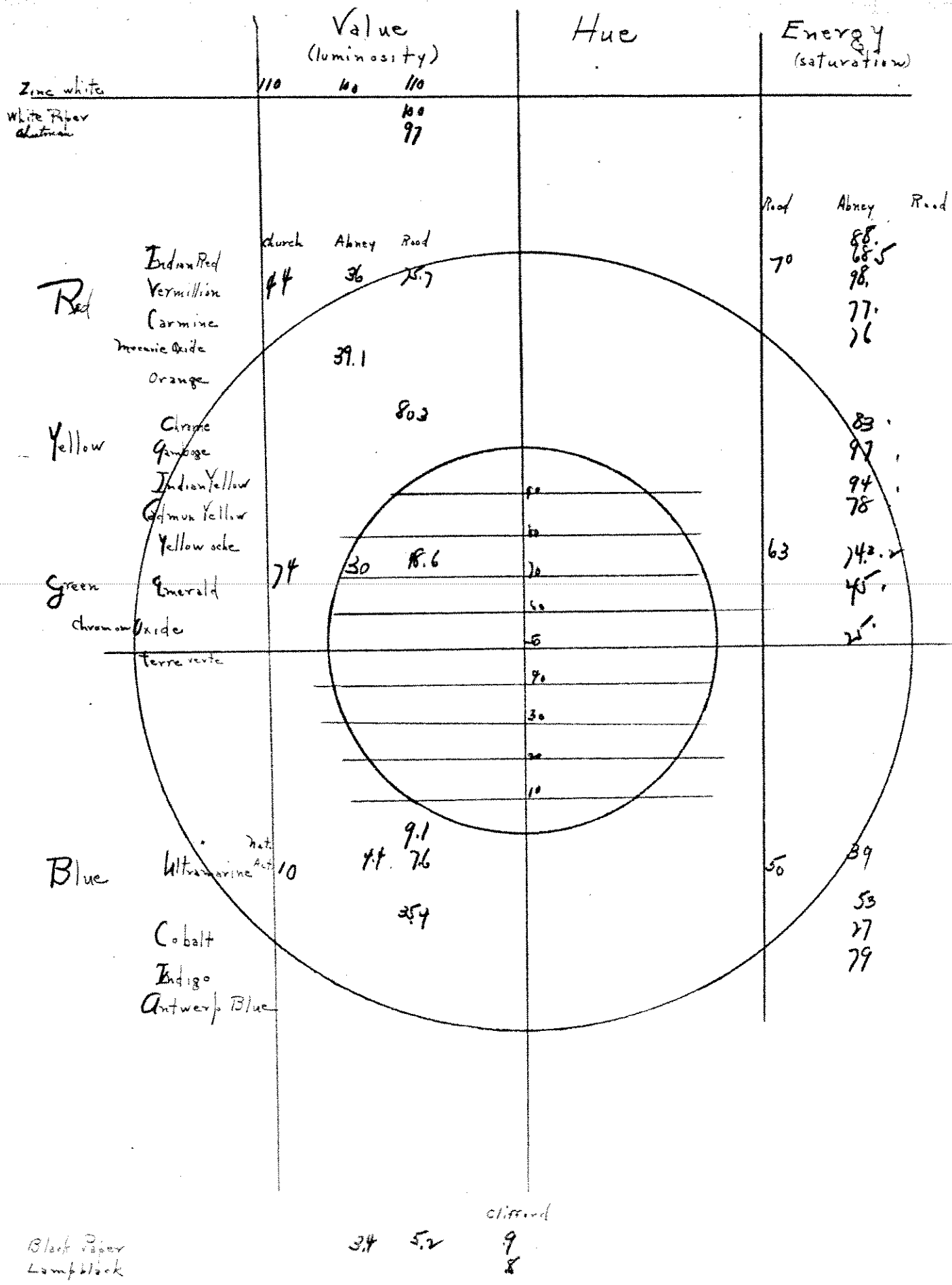
Said "You have obtained a very beautiful result"

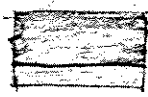
Approved of decimal notation.

Said he should defer to Prof. Rood more than to any other scientist in the subject. Referred to his flick-ometer. Also mentioned Capt. Abney.

Discussed colored photographs (McDonough) and their standard colors. Doubted its ability in the more delicate colors - especially in blues and violets.

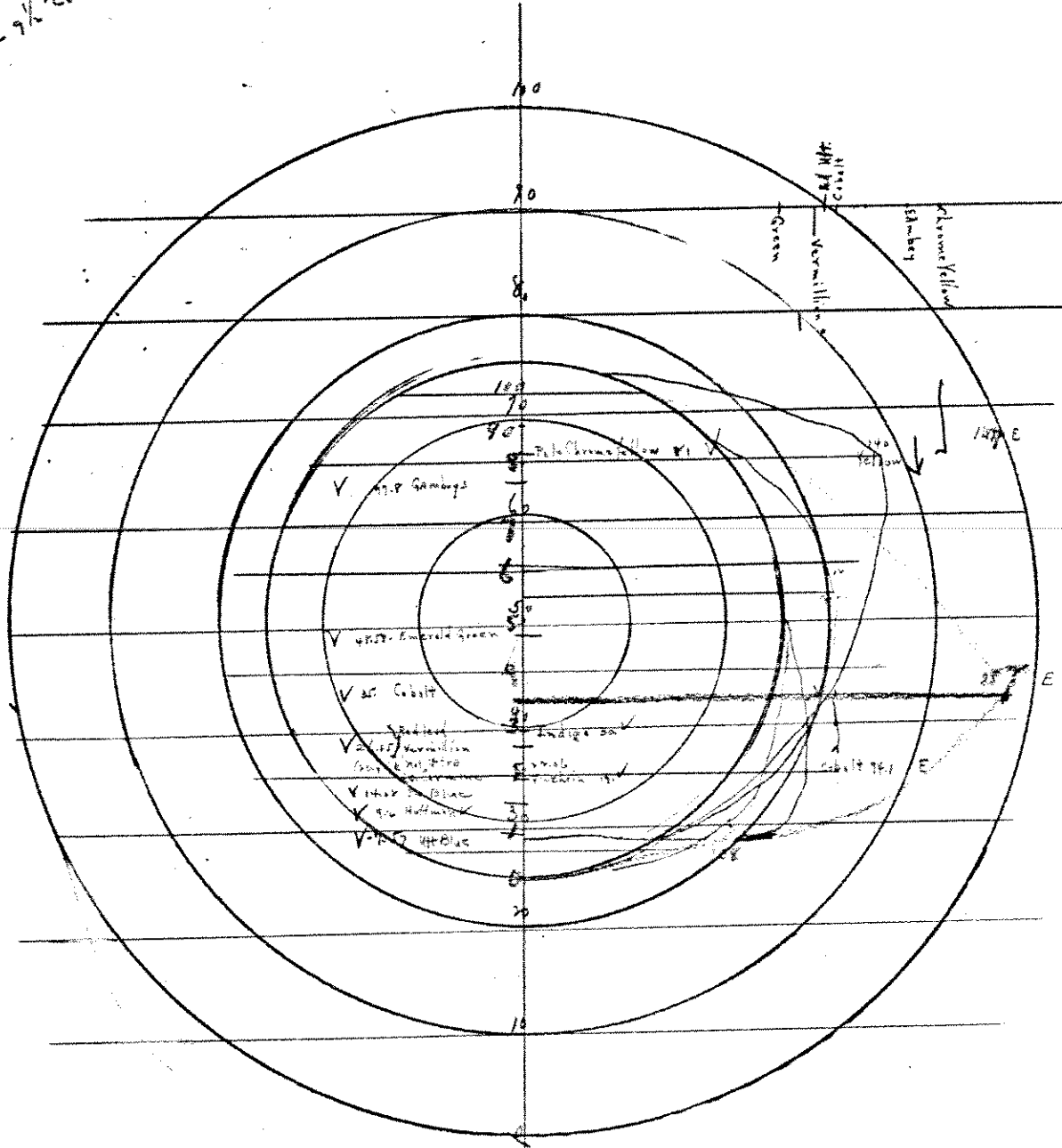
----- Referred to Aniline colors as superposed shells to this sphere. Thought this sphere would be of great use in teaching color. Thanked me for bringing it to his attention and said he would be glad to know of further developments. Prof. Clifford also came in and admired it, but could not stay because of lecture.





Black sky & blacker line beneath with glitter.

3 sphere - 9/16 circle



May 4th.

Titles.

26.

The Color-Sphere

presenting a standard of measurement  
for the (three) color-constants:

with charts.

presenting a unit for the simultaneous  
measure of hue, value, and energy.

Hand-book of the Color-Sphere.

establishing an accurate standard of Color-Values  
with charts and Decimal Notation to record

Color-Schemes.

A Standard of Color  
with Charts & Decimal  
Notation  
to record Color-Schemes.

A reproducible standard-  
with charts and decimal  
notations to record  
color-schemes -

Charts of the Color-Sphere:  
displaying a logical system  
of surface colors, gradations  
both within and without the  
sphere: and a decimal notation  
defining each degree of color  
by the three measures of  
hue, value and energy.

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A. H. Munsell

1900

"Hand-book of the Color-sphere with charts  
which display a logical system of surface-colors  
with their regular gradation, both within and without the sphere"

see p 314

Red a bright warm color - resembling blood  
or the highest part of the primary rainbow  
" " lowest part " " spectrum.

Yellow-red is scarlet

Purple " " crimson

Yellow the color of gold, butter .581 micron  
midway between scarlet and emerald green  
Em. Green  
Y  
(Scarlet

Violet blue

Green The color of ordinary foliage  
.511 - .543 "

Blue the color of the clear sky  
or ultramarine .460 - .487 "

Purple A color formed by the mixture of blue and red -  
including the violet of the spectrum (.417 micron)  
which is a violet blue  
and extending to, but not including crimson.  
Originally, applied to the surging sea.

Porphyry.

May 5. Mr. George suggests a shell with guadiant  
slip to fit over the sphere -

27.

I hold a slit  $180^\circ$  is necessary.

Hall at studio - We discuss rythms.

May 7. Write Prof. Rood asking what may be claimed  
for the sphere.

" 10. Write again asking for scientific authority.

" 14. Meet Prof. Cross.

Who says he can see its value in teaching -  
Establishes an idea of color based on something  
fixed.

A matter of psychology - rather than physics -  
Remembers Mr. Andrews speaking of an arrangement  
which he did not see - being away at the time  
(but shown to Prof. Clifford:)

(Prof. Clifford says Mr. A's ideas  
about color were rudimentary, and  
showed little acquaintance with the  
subject. A's assumption at a  
later interview vexed Prof. Cross-)

" 11

Red	—	Vermillion (French)	
		Raw Sienna (terre d'Italie)	
Yellow	—	Cadmun	
Green	—	Emerald Green	*
Blue	—	Cobalt	
Purple	—	Vermillion	(discarded vte. em. and Rouge d. Venise)

28.



Revolved 6 div. sphere in new machine - on  
various axes.

28.

Seems to produce middle grey on equator,  
and leave color unchanged at poles -

i. e. describes an axis through the  
centre of sphere - between any chosen  
color poles.

*See p 314*

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Oscillation of hues {Greatest between Or. & purple 30a.  
(Least " green and blue  
noon  
&  
night

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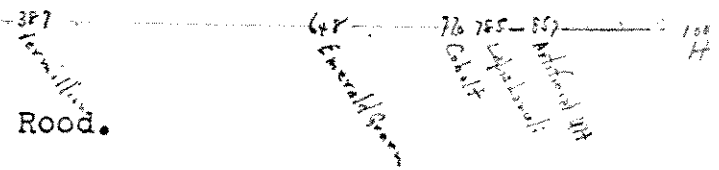
Church. p. 130 "It should be added that if we  
were in possession of three pigments all of equal  
brightness or luminosity - but having the exact  
hues of vermillion, emerald green, and artificial  
ultramarine - we should have to use very different  
proportions of them to acheive a neutral grey, namely

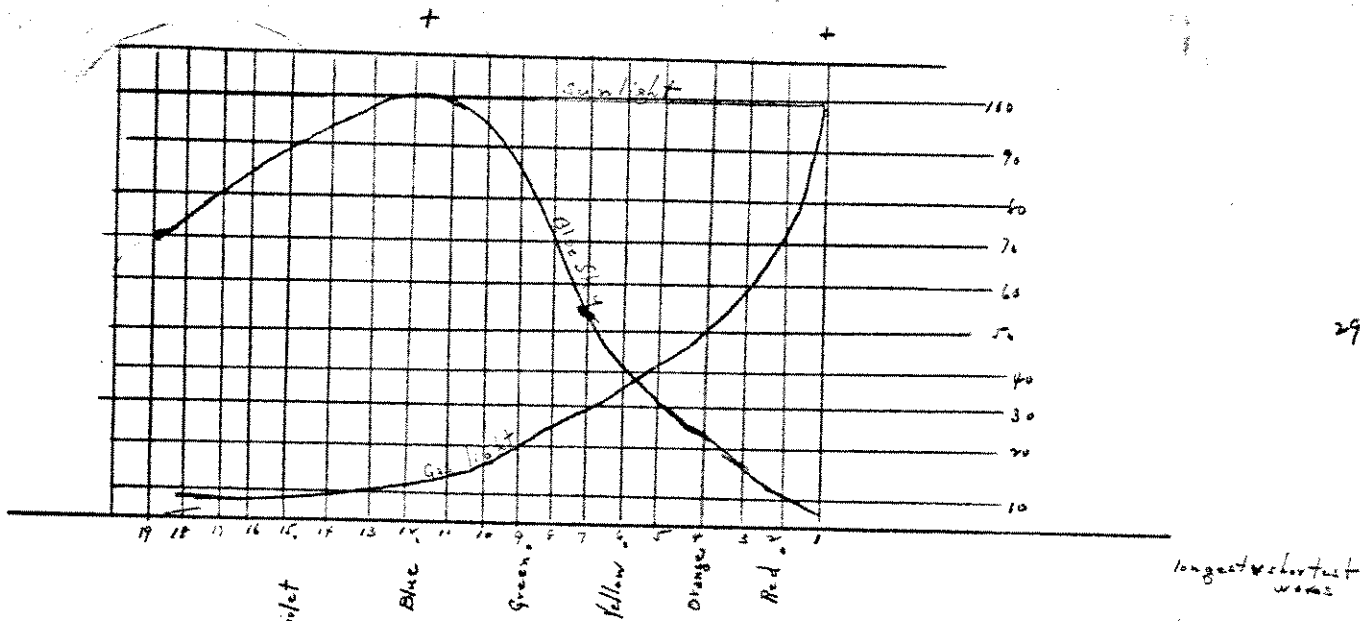
red  $\frac{11}{4}$  ) for the luminosity of emerald green is  
green  $\frac{7}{4}$  ) much higher, and of ultramarine very  
blue 10 ) much lower than that of vermillion.

p. 145 "In pictorial art - color is a means  
and not as in decorative art- the end |||

p. 57 :

Church's quotation of Rood.





Abney - Color M.M. - p. 110 - Fig 28. Spectrum intensities of Sunlight - Gaslight - Blue Sky.

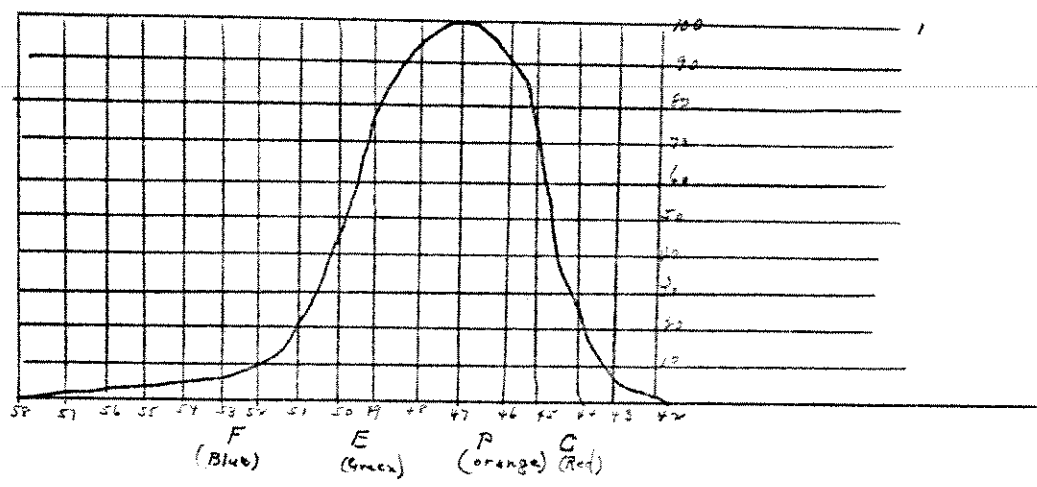


Fig. 18. Light from metallic Surfaces -  $V$  - luminosity of white light

While we can hear about eleven octaves )  
 " " see but one " ) Church p. 25.

The Gradations of blue.

31a.

- A a White - pure white
- b Silver white - silvery - pearly
- c Milk " - milky color
- B a Blue white - bluish
- b Pearl color - mother of pearl
- c Water color
- C Blue being born
- D " dying (pale)
- E Mignon blue - azure
- F Celestial blue - sky color (sapphire)
- G a Azur " - ultramarine
- b Complete "
- c Fine blue - green blue
- H Covert blue - turquoise
- I King blue - deep
- J Light brown blue - indigo
- K a Persian blue Wood flower
- b Forge blue (steel)
- c Livid blue
- L a Blackish blue
- b Hell blue
- c Blue black
- M a Black-blue - charcoal
- b Black - velvety
- c Jet-black

25 kinds of blue  
from  
white to black  
by  
Ignaz Schiffer-Müller  
Vienna 1772

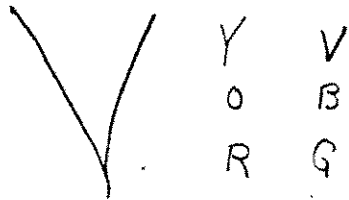
- 
- May 19 Prof. Cross lends me three books on color.  
       Otto Runge Hamberg 1810 Color-sphere  
       Ignaz Schiffer Müller Search for a  
                                 Vienna 1772 color-system  
       I. H. Lambert Berlin 1772 Color-pyramid
- 

32.

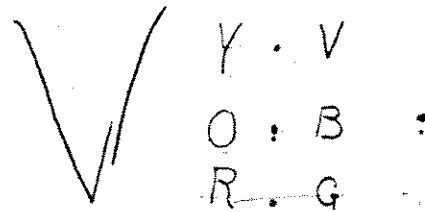
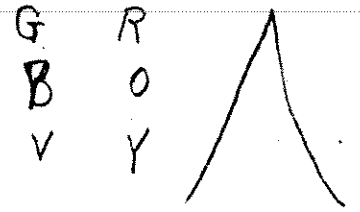
- May 20 Denman Ross at studio - Admired the revolution  
 on different axes. Objects to accuracy of  
 some values - Prefers a more purple red - Finds  
 the yellow-green too dark - suggests the melon  
 spots would perhaps be better  
 Says it is "a system in which color and values  
 are composed in equal intervals of equal contrasts  
 in all direction." --In which one can think in-  
 finite things in tone and convey those thoughts  
 to others in accurate terms!"  
 Questions if it can be used to describe master-  
 pieces of painting - altho very valuable for  
 decorative schemes.

A system in which color and values are composed in equal intervals of equal contrasts in all directions.

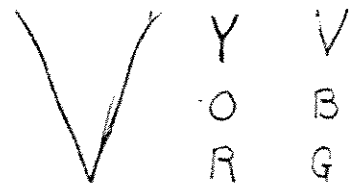
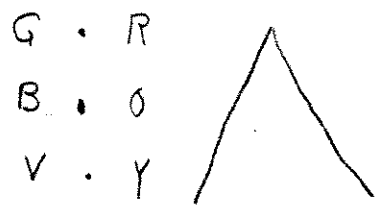
In which one can think infinite things in tone and convey those things to others in accurate terms.



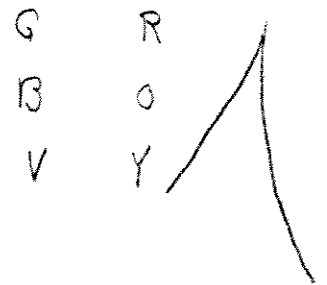
Half light



Neutral Half Tone



Half Dark



by Ross.

1st -catch class -

Must arouse interest before it can be held -  
growing like a snow ball - where should lesson  
begin. - purely instructive - all their  
own finding out.

1900  
May 28

Vesper George takes layer and kindergarten 33.  
spheres to show Mr. Morrill - Mr. Morrill  
takes discs to find enamels.

June 4

Mr. Pritchard - Prin - Everett Grammar School, Boston-  
advises for a

Book that teachers can use - Kindergarten to  
High School - Pure text book - explain purpose  
of color-sphere - how to be used - carefully  
and deliberately explained

elementary as for a child -

assuming teacher is ignorant -

1 Hand-book with sphere - how to use it in all grades

(2 Treatise on color -  
can come later )

(Talk out lessons as if  
in a class-  
8-12-18-20

(Model lesson written out  
for teacher - preferably at  
end of book)

Says "it is interesting" -

"I am under obligation to you for a new view  
of color."

Believe it is a necessity in education.

- 1 Introduction - showing need of such a sphere
- 2 Description - how found - middle value
- 3 Tests & Proof of its accuracy
- 4 Complements - how shown and balanced
- 5 Sequences
- 6 Balance
- 7 Natural Examples
- 8 Influence of color on life
- 9 Order of presentation of color-notion
- 10 Model lessons

34a.

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Possible to train color sense, so that children may  
have not only names - but color values.

Uses intensity for darkest values.

Tones

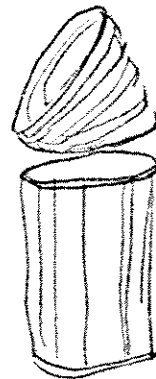
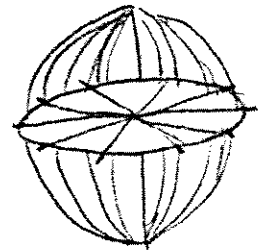
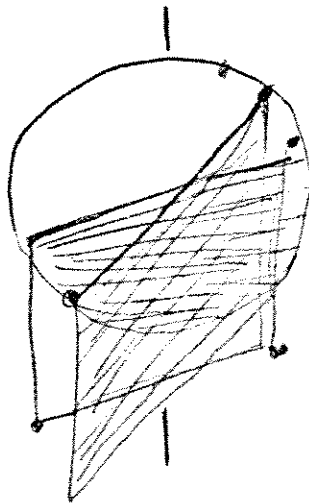
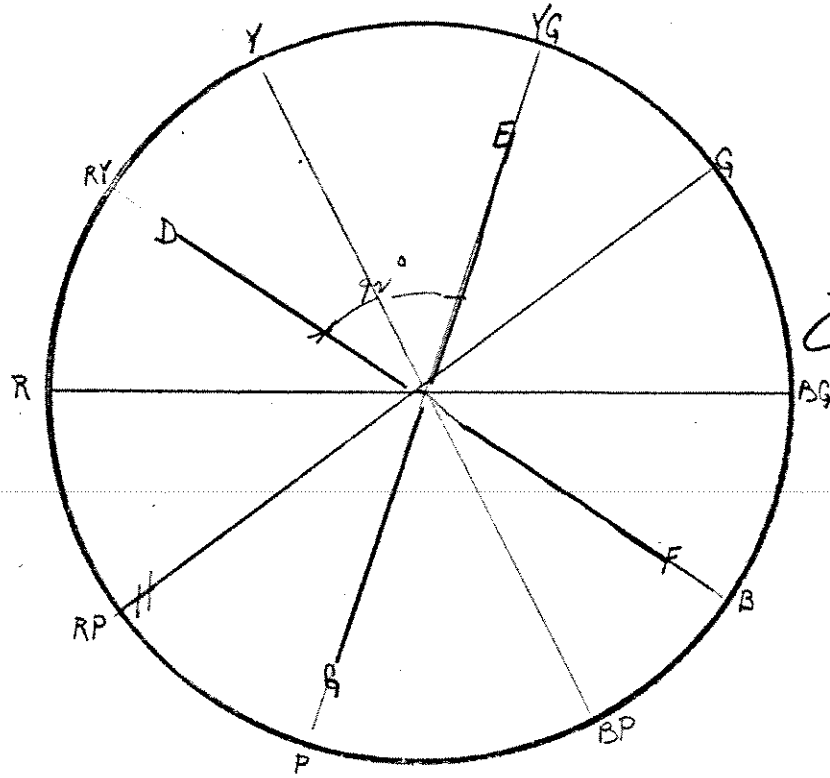
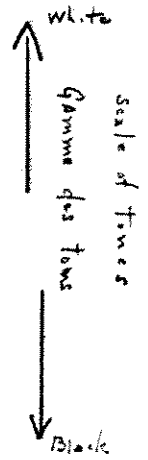
values.

Zones

ecliptic + steeper :-

CHEVREUL

34A.



Color-Sphere

for teaching accurate ideas of color value.

Introduction -

Showing necessity for such a standard -  
the defects of existing methods - and  
a sketch of its evolution.

- Chap. I Description of the Color-Sphere  
spectrum circuit - middle value -  
gradation to white and black
- II Its accuracy tested by revolution. (Its tuning)  
a. on white-black axis. b. on red-green  
axis. c. on any axis.
- III Complementary colors seen simultaneously.  
poles of any axis complementary - they  
merge through neutral grey or spectrum-  
power to enhance each other.
- IV Spherical Color-Chart & its proofs  
a complete and ideal field - every color  
related to white and black  
latitude ) ? to its  
spherical measures (longitude ) decimal neighbors  
radial distance) " grey &  
saturation
- V Sequences through a chosen color  
-of value, - of hue, - of energy - combinations.
- VI Balance of color: warm and cold - light and dark -  
grey and intense - equilibrium - preponderance
- VII Natural examples - sunsets, flowers, - reflecting  
surfaces  
Influence
- VIII Power of Color on the mind - dress, interiors -  
pageants, services  
Savage and child-taste - Hypercritical taste
- IX Order of presentation for color ideas  
Model
- X Specimen lesson.

A. H. M. June 4, 1900.



Oct.22

4:30 Mr. Pritchard - Mrs Evart & M-  
Hear 1st two chapters of manuscript -  
Says he will come to "talk business!"

35.

In eve. - Mr. L. F. Parsons goes over same  
chapter.

26 11:30 -1:30 in studio - Trinity Court

Prof. Clifford sees all experiments and hears  
parts of text

Says it is "sound"  
would not try to relate it to wave lengths

Will see if he can rig up apparatus like  
Capt. Abney's to measure a scale of values -  
from white to black

With regard to Mr. Andrew's idea - says they  
were very crude, and the notion of yellow as  
a primary and fundamental color seemed to  
show lack of familiarity with the subject.

Nov 2

4-6 P. M. Prof. Rood's study at Columbia  
says "with all the desire in the world, I  
have so far been <sup>un</sup>able to make a scientifically  
accurate color-system because of the varying  
and unmeasurable amount of white light entering  
into each pigment.

Therefore he suggests that I say "It practically  
represents a scientific arrangement of colors."

"I have no doubt whatever of its value to the  
teacher and the artist."

Thinks five colors should be preserved in enamel  
(the circuit, or equator) in order to be able  
to reproduce exactly at a distance.

Suggests a plan for measuring the color balance  
of some well-known and admired painting.

Has heard of Denman Ross' theories, (not knowing  
his name) and asks how my plan differs. I explain  
the musical analogies he is attempting and its  
flat arrangement which omits continuity.- also  
its arbitrary and personal qualities.

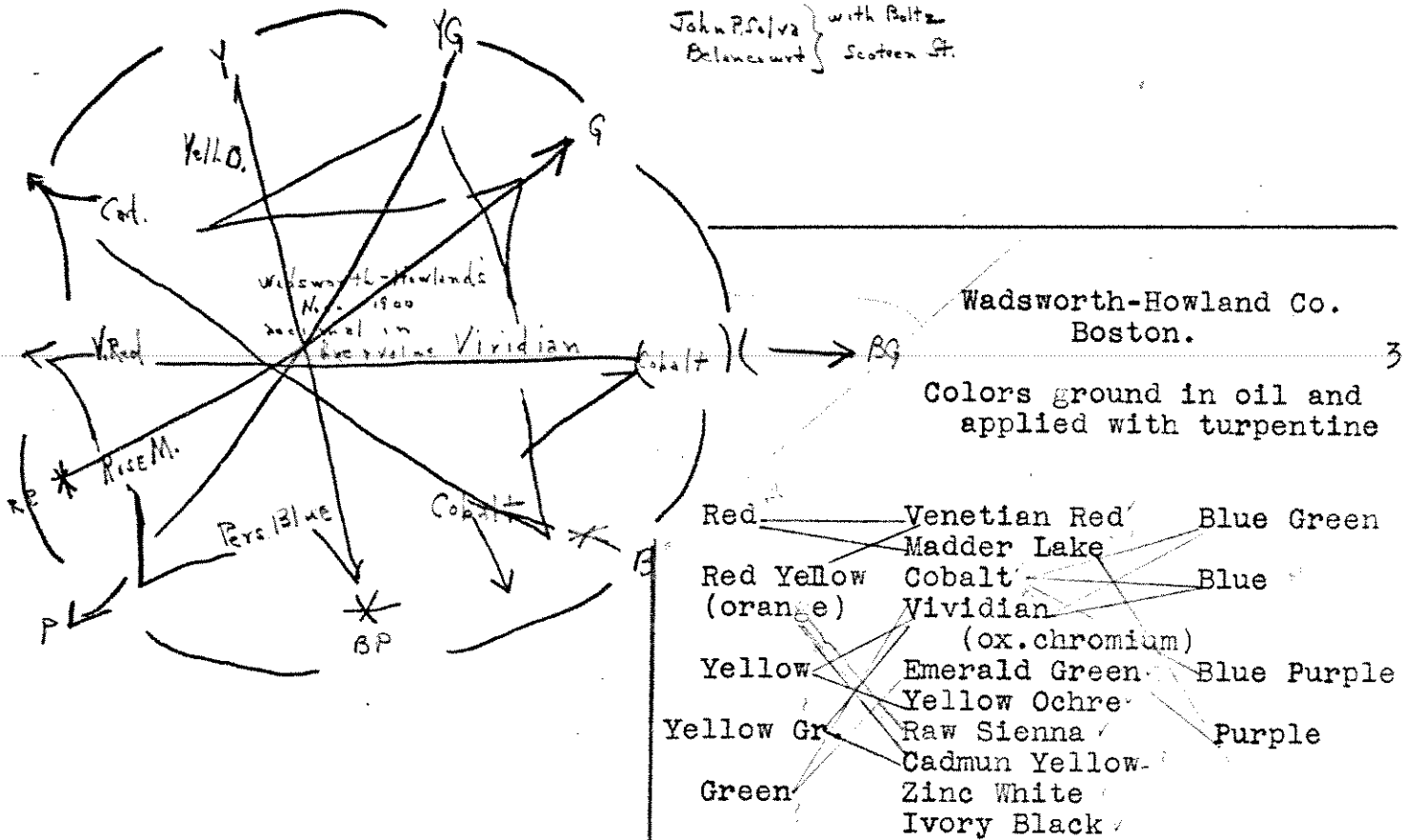
Described efforts to write music in colors - and

vice versa - said one could always get something interesting, and would probably let one fortuitous (very accidental) result stand - altho all the rest were ridiculous.

35a.

Has remarked that the blue of twilight grows more intense until about two hours after sundown - then decreases rapidly.

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My dear Prof. Gill:

These are the pigments of which I spoke yesterday at lunch wishing to learn if the mixtures indicated were likely to fade or suffer discoloration,

Yours very truly,

A. H. Munsell.

Trinity Court - Dec. 17, 1900.