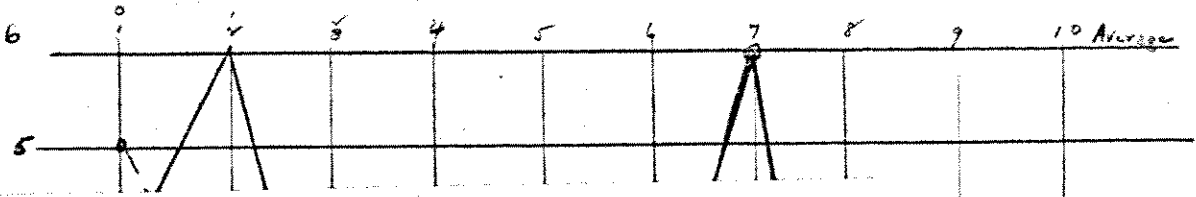


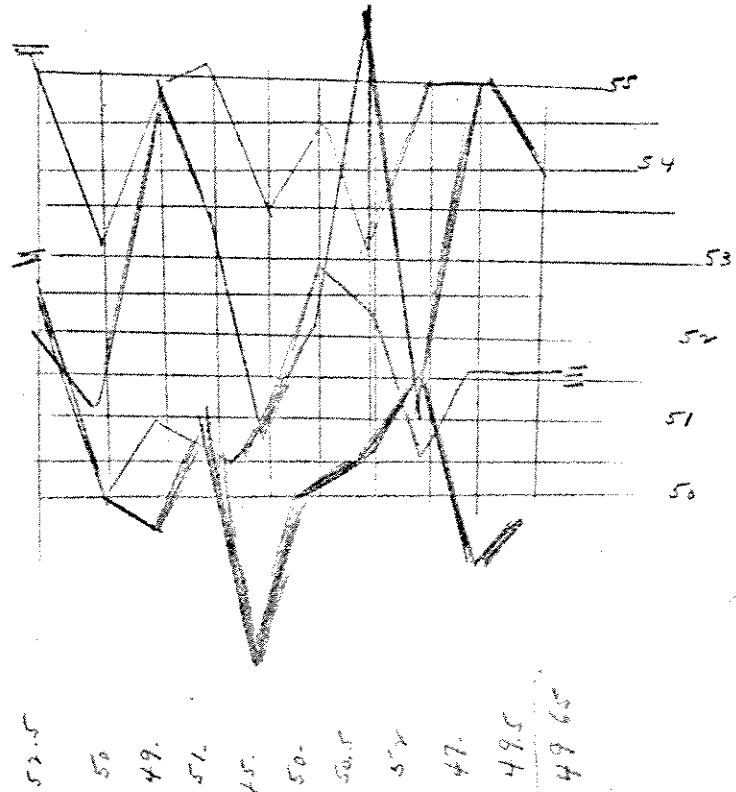
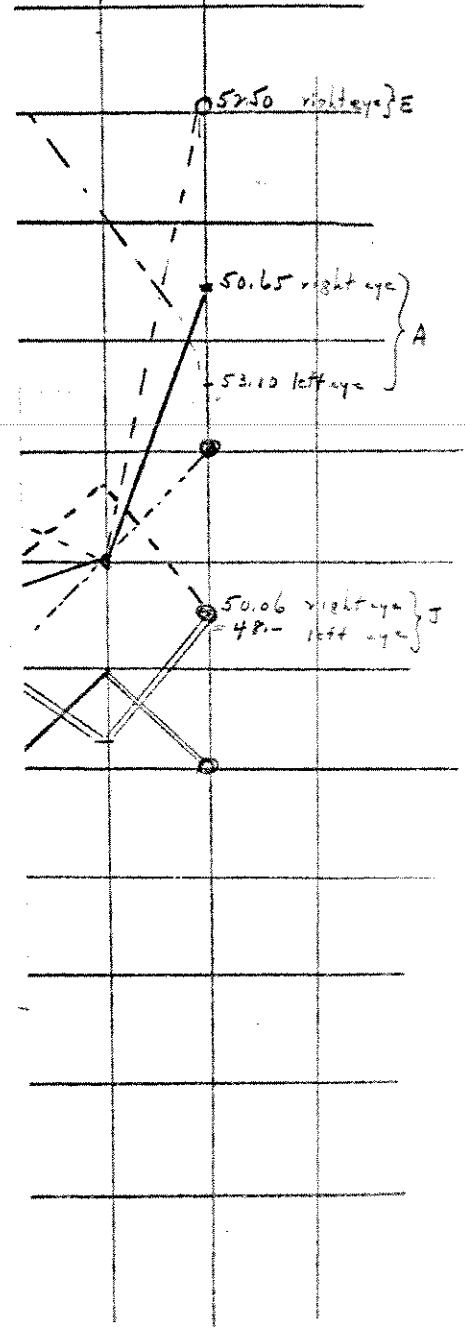
No. of Readings.

(172)



(172)

	E.	J.
56	56	54
	58	52
57	48	53
	55	57
57	43	54
	43	56
	49.5	52
	49.5	47
		58
		52
		53.5
		54.5
		53.
		55.
		55.5
		55.5
		53.5
		54.5
		53.
		55.
		55.5
		51.5
		51.5
		51.35



52
51
55
53.5
50.5
52
56
51
50.5
54
53.5

52.5
50
49.
51.
45.
50.
50.5
52
47.
49.5
49.65

more excited
thrust

Dec. 21 Photometric readings of a grey sample by
22 three persons.

17.

Ector-6 yrs.

A. H. M. 13 yrs

J. E. M. 36 yrs.

54 +0.5
56 +3.5
52 -0.5
52 -0.5
52 -0.5
53 +0.5
56 +3.5
50 -2.5
50 -2.5
50 -2.5

52.5

E ± 1.5

52.5 +1.95
54.5 -3.9
50.5 -2.05
51.5 -0.95
49.5 -1.05
50 -0.55
50 -0.55
48 -2.35
49 -1.55
50 -0.55

50.45
35

52 + 1.15
53 + 2.15
50.5 - 0.35
51.5 + 2.05
49.5 - 1.35
49 - 1.65
51.5 + 0.65
49.5 - 1.35
49 - 1.85
53 - 2.15

50.85

A

49.5 +0.5
54 +4.55
51 +1.55
51 +1.55
49 -0.45
50.5 +1.05
47.5 +1.95
47 -2.45
48 -1.45
47 -2.45

49.35
4

51 +0.55
52 +1.55
51 +2.55
51 +0.95
50 -0.95
49.5 +1.15
50 -0.45
49.5 +1.15
50.5 -2.25
50 -0.45

50.55
7

49 -1.60
51 +0.70
52 +1.70
50.5 +1.2
51 -0.70
49 -1.30
50.5 +0.20
50 -0.30
51 -0.70
49 -1.30

50.30 = av. 50.06

J

55 +2.15
53 +0.15
54 -1.15
53 +0.15
52.5 -0.35
52 -0.85
53 +0.15
53.5 0.65
52 -0.15
50.5 -2.35

53.10
2.05

50 +2.50
48 +0.50
45 -2.50
49 +1.50
45 -2.50
47 -0.50
49 +1.50
46 -1.50
49 +1.50
47 -0.50
47 -0.50

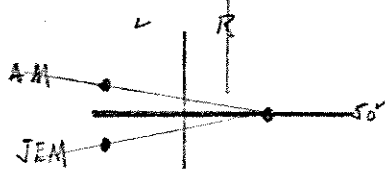
47.5

43 -1.40
47 -0.40
45 -2.40
46 -1.40
49.5 +1.10
49 ± 0.60
49.5 +2.10
48 +0.60
47 -0.40
50 +2.00

47.4

47 -2.10
50 +0.40
47 -2.10
52 -2.70
50 +0.10
50 +0.10
49 -0.10
50 -0.10
47 -0.10
49 -0.10

49.10 = av. 48



Dec 24 12-1:30 At Dr. Bowditch's office - Har. Med. School. 18.

(Wishes Dr. Porter could have seen model of photometer.)

Would retain square opening of cat's eye shutter -

(calibration and ease of verification) - but sees

no reason why circle is not right for diaphragm.

Suggests eye-piece blackened like microscope -

I suggest increase of distance from mirror to sample -

so as to shorten eye-piece - Approves of this change.

Suggests that sample holder will be much handled -

and should be strong -

Approves of my first arrangement --- turning

clamp - Suggests metal clip to hold

sample firmly - Top one fixed - lower

ones to rotate into place.

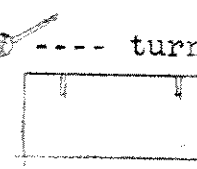
Septum may be received in slanting wood - and mirror

cut in halves to go either side of septum - to

exclude light. Approves of the blackened tin septum

and angle of mirror.

Expresses great interest in my scale of chroma. -

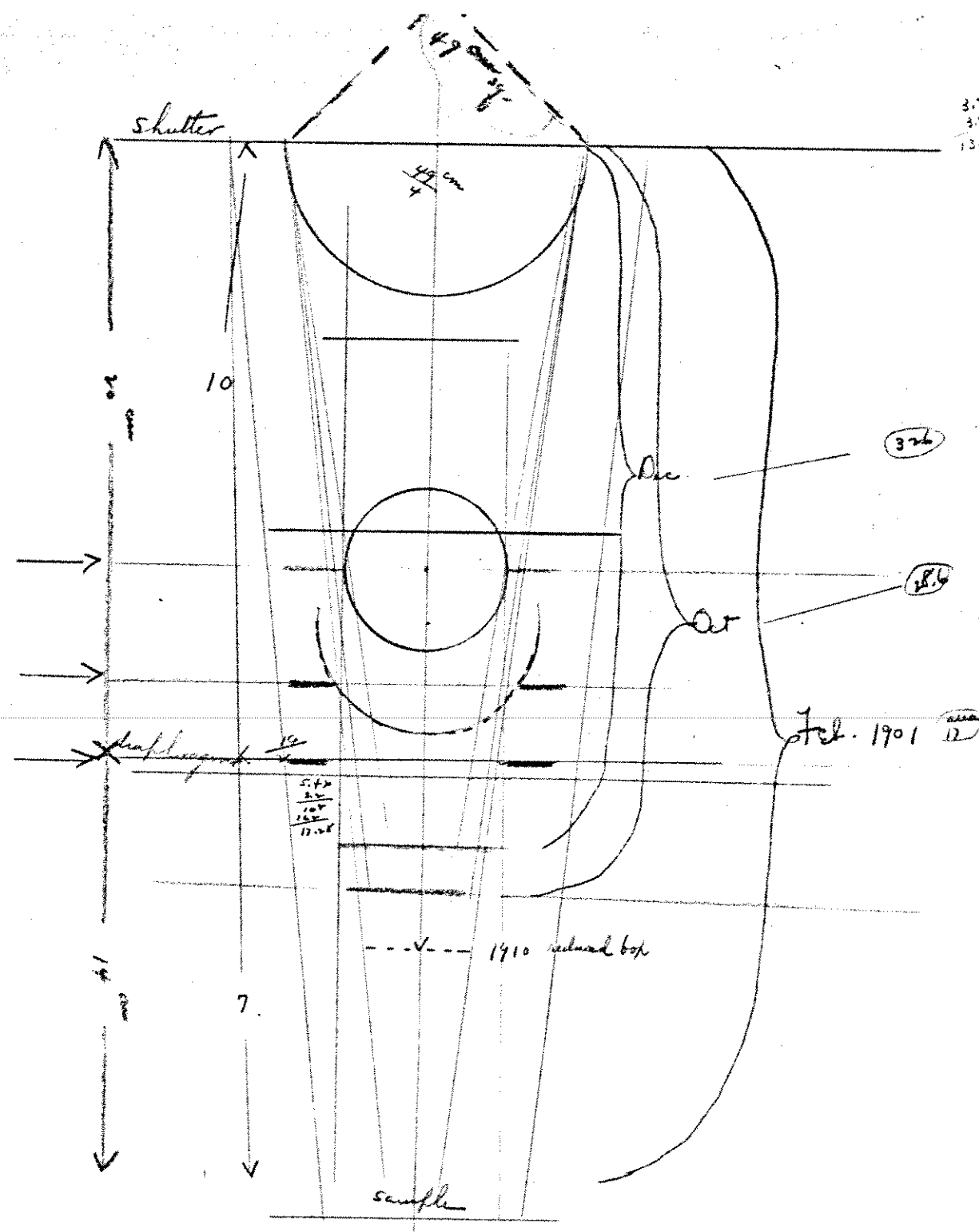


715

3.7
3.7
13.69

(180)

14.6
98
95



Feb. '01 - $\frac{\text{diag. of aper.}}{4''}$; $\frac{\text{dist. of camera}}{13.5''}$
 1.5

and in possibility that the photometer may give a quantitative measure of color blindness. "So as to say that a certain individual has only such a percent of normal sensibility to a given color." Would like to present the instrument and these questions before a physiological congress. Asks what p. will cost and I say maker advises \$50 - 1/3 off. Says he wants one - and will then show it to others interested - such as Prof. Münsterberg - Prof. Scripture. Says scientists talk of decrease of saturation by adding white light- but my notion of loss of chroma without change of value or hue is a new one to him and very interesting. Would like to see my manuscript when it is ready - I leave him copy of my address - (Art Education June 1900)

Tell him of attempt to decide greatest number of discriminations in each dimension 11" - 24" - 76" or p.-dia- and cir. of sphere - Thinks this very interesting.- Wishes measurements by artists and others to get at a

19.

Quantitative Measure of Color-Blindness

"to say that one individual has only a certain percent of normal sensibility to a given color." Quotes Rood's flickometer but says it made him out free from color-blindness while he knows himself partially blind in the field of red - (and blue-green) -!

Recalls that his readings at my studio were from 4-6% higher than mine - approaching as they become darker.

Suggests reading of two color samples supposed to be equal in value - as red—blue-green
yellow—blue

Dec 28 Dr. Crowell calls - Show him color-atlas and Photometer 20.

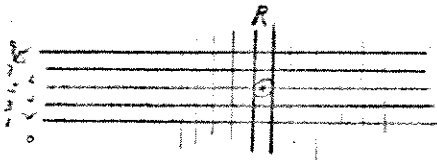
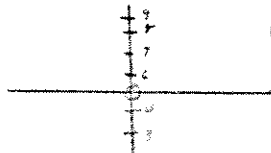
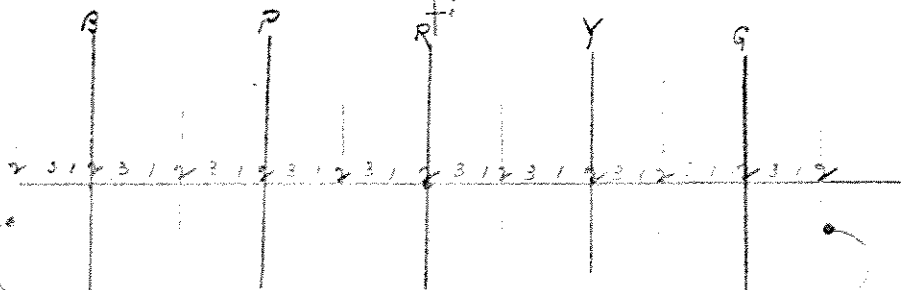


Diagram of color-notation with exponent to give 3d dimension (chroma)



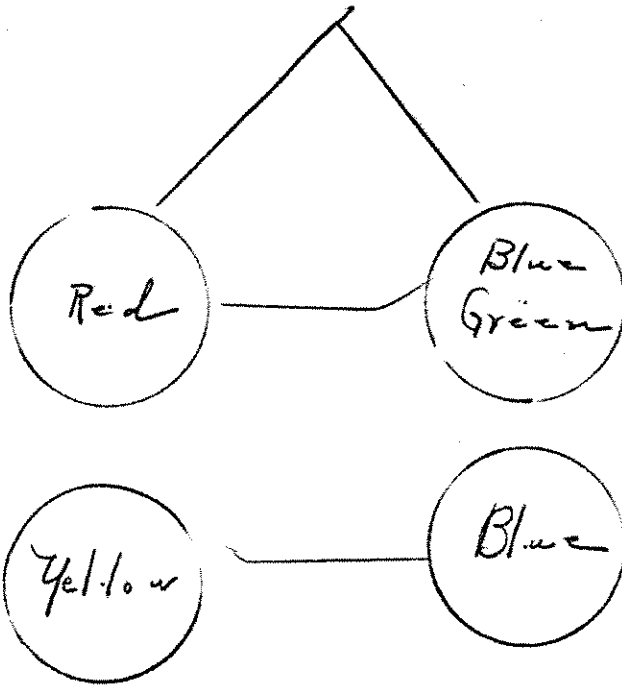
middle red as starting point- 5 values above and 5 below give 10 values



fifteen steps to right and left to make circuit of 30 hues.

Exponent to give 5 chromas

1900



Int-log

H. E. C. Jan - 1902

Fechner's Law

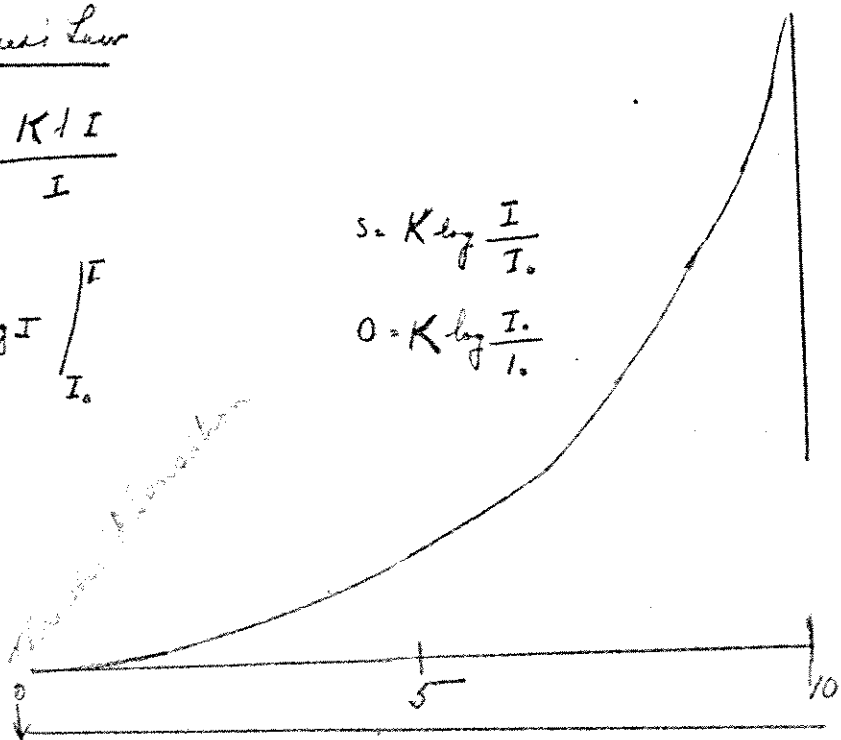
$$dS = \frac{K \cdot I}{I}$$

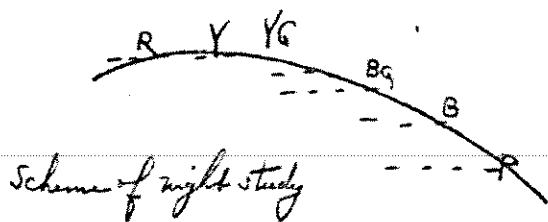
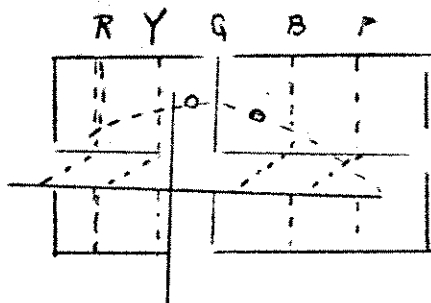
$$S \Big|_{S_0}^S = K \log \frac{I}{I_0}$$

$$S = K \log \frac{I}{I_0}$$

$$0 = K \log \frac{I_0}{I_0}$$

Intensity of sensation





Dec. 30-01

Stages

a	b	c	d	e
70.25	526	42.5	16.25	5.5
71.25	50.	36	19	7.75
65.3	47.8	26	18.5	
57.8	46.9	36.25		
64.6	51.6	37.6		
58.3	48.6	31.2		

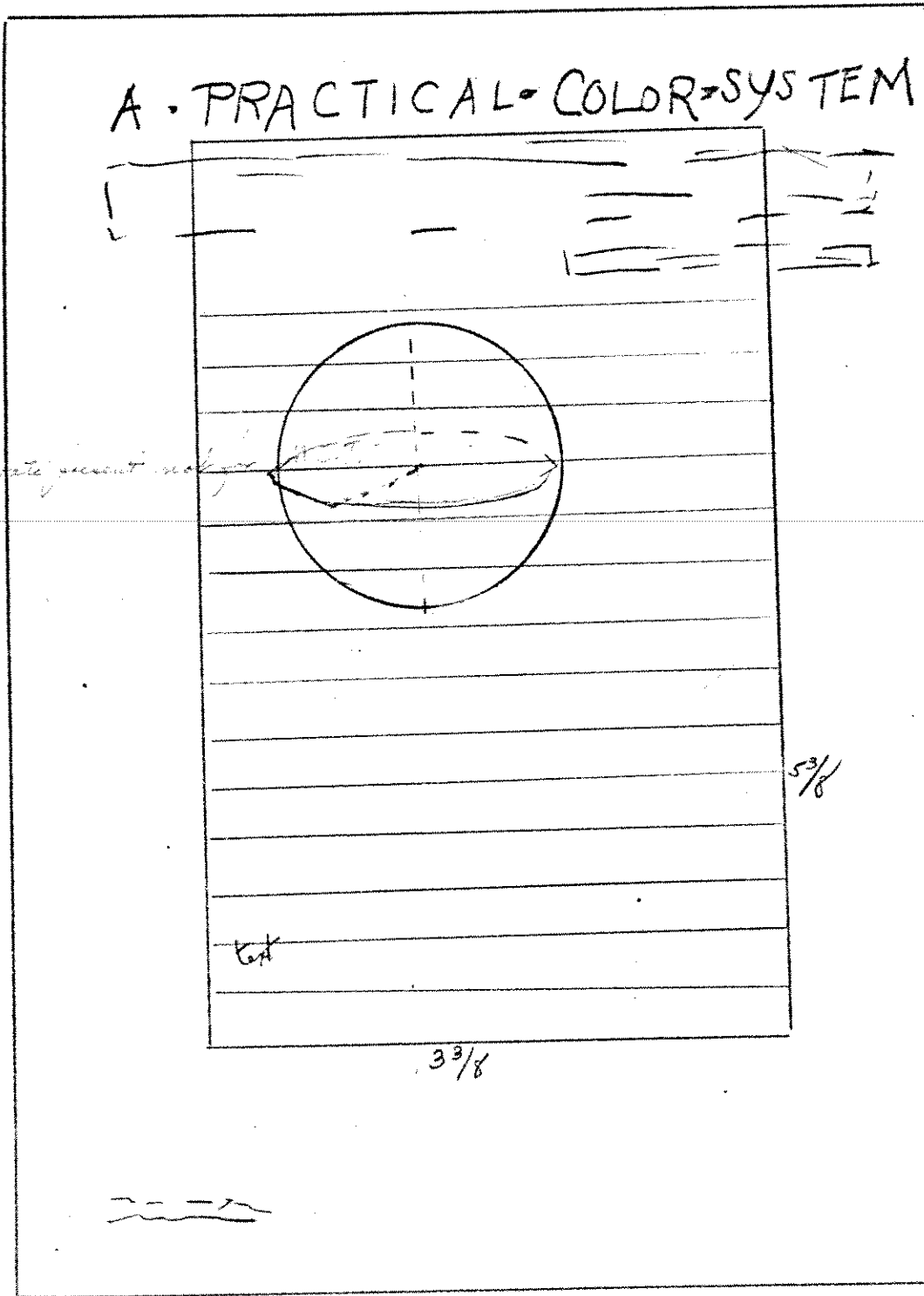
Colors

P	R	WY	WY	G	B
	37	92	54.25	65.25	36
46	40	80.5	43	61	30
41.5	40	77.5	47.5	57	29.3
	27				
	28.5				
	25				

FJ Flammagan 1/20-01
 W J Kauler 1/4-02
 FH Tompkins 1/4-02
 Prof Carby 1/10-02
 Miss Kroyder "
 Herbert George "

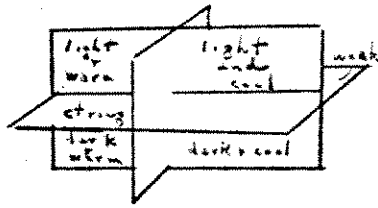
Design for Cover

1902.



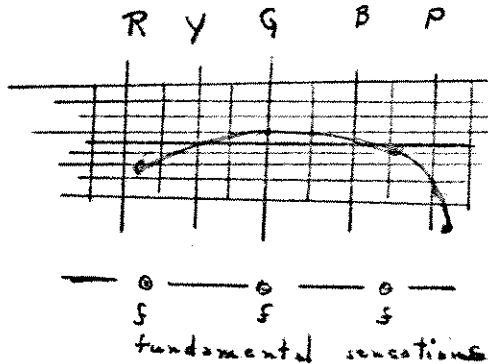
19 lines 120 words

Jan-29



(vertical parallel)intersecting
 Three planes (" perpendicular) in
 (horizontal)middle green

Three qualities (light and dark
 (hot and cold
 (weak and strong)



Eight (8) fields (light warm- strong
 separated by (" " weak
 Three (3) planes (dark " strong
 intersecting (" " weak
 in (light cool strong
middle green (" " weak
 (dark " strong
 (" " weak

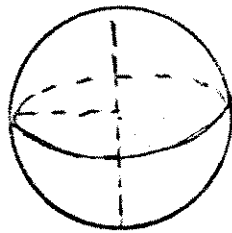
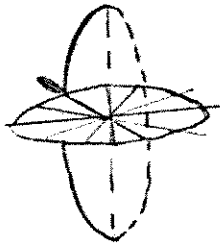
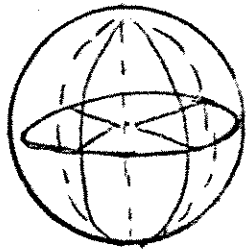
Jan 1st 1902 Pd. L. A. Lyon for assistance in charts \$10.50 21.

Jan 2 Prof. Clifford at studio. Tests photometer. Thinks adjustment will be needed for extremes of light: - moving farther away - or interposing media to keep a medium illumination. Prefers a two eye-piece to single eye-piece to allow readings by right eye and then left eye: then by both to see if they strike an average. (Brochuerp a very fatiguing instrument.) Reads middle grey at 49 (Red Blue)

Compares (daylight 36' 50'
 (electric
 (bulb 42' 44'

Advises screening dial - to prevent consciousness of the pointer. Thinks deeper sample case an advantage. Would not attempt to rig up for rotating elec. bulbs - Let those who need that attachment, - make it. Thinks it will be useful in determinations of candle power. Name will be important - (as in patent medicine) in exciting attention.

-----X-----
 Sees illustrations of color-atlas and hears description of Notation: would like to see it tested. Thinks it well to publish now - without waiting to further developments. Advises very clear well-spaced type - and excellent color pages on linen to fold in.



2202

KROMATOMETER

or

COLOR-SPHERE

=

KROMATOGRAPHY

LUMINOMETER
SENSOMETER

KROMOMETER
LIGHT-METER

KROMASCOPE
SENSISCOPE

LUMINOSCOPE
LUMENOMETER
LUMINOMETER

LUMENSURA

LIGHT-SCALE

COLOR-

STRENGTH
MIXTURE

MENSURA LUX

METROLUX

see Vol. I-

Dec-27-1900

1243

Transcript Jan. 3-1902. *clipping*

If the present system of turning out flowers of every hue is much further developed we shall have to add to our knowledge of colors. Although we have got now where we can speak of a green pink with a straight face the accomplishment must be acquired all over again to fit the "pink violet" case. For the flower has arrived, it is said, and soon beds of them, for they are to be hardy, will show themselves in all the "commuters" gardens.

22.

Jan 4 Mr. Hall at studio and dinner - then to Symphony. Show him photometer, Notation and last chapter on "Hues". "Bailey says Ross is coasting all around your sphere - but hates to accept it because it is not flat." But B. thinks you are right, and that others will come to it soon. He has been up to see Bradley once or twice about it, but latter is waiting until these schemes crystallize for he sees Ross is always changing. I tell Hall of Bradley's foreknowledge of Bailey's state report on color - and letter as a result. He speaks of the extreme simplicity needed in talking with teachers. They will go wrong if there is the slightest loophole for mistake. Thinks the object necessary in order to help the description of a color-sphere. If spindle shape is logical should present it so - If middle colors are fundamental, - show them first. Is impressed with the great progress of my work, and appreciates what a mass of material has been necessary in reaching results. Says Ross' last diagram has lateral curves to express intensity of a color - I show him my contours of intensity made over a year ago.

Jan 6 Anson K. Cross at studio 3:30 - 5. Advised careful specifications before making photometers.- \$100. an instrument would not repay me financially. Thought the two patches unequal - R - more red than L and lighter. Thought diffuser to blame and bright metal. Advised a tight fitting mask - and blackened brass shutter. "It does not pay to be much in advance of your time." Just now, Art Education is not to represent nature, but to evolve works of art - even in the school" (J. S. Clark)

23.

Ginn and Amer. Book Co. - the giants and rivals want pupils' books, not teachers' manuals.

Jan 9 Mr. Pritchard to lunch - Ell's letter about Gen. Elec. Laboratory.

Jan 10 Prof. Crosby - Vesper George and Miss Woodie
(faculty of the Lowell Textile School)
Show apparatus and read from manuscript - to
explain entire system - Show charts -
Prof. C. makes from 65 -70 steps of color
difference -
(Thinks only a few more possible 72"
(Accepts the sample of nine chromas as complete 10^c
(Would add three to Chevreul's gray scale 24^v)

Wishes me to know Prof. of Wesleyan-
psychologist.

Jan 20 Made spindle shaped models (Mr. Jepson at school)
to exhibit "central" colors in their relation
to scales of chroma and value. Color pins to
be inserted to describe stronger chromas beyond
the spindle and art to spherical surface.

Jan 31 Wrote Mr. Ross asking permission to use one of his diagrams. 24.

Delivered manuscript of "Practical Color System"
(Mr. Gilman
to (" Pritchard

Feb 4 Received MMS. and criticism from Mr. Gilman -
"Whole thing very much improved in every way"
"Analogies between sound and color are valid and
useful - which is quite a novelty."

33 Lumenometer should be fully described - and
use of Rotating Discs-

36 Chromatic tuning fork " " and
finding place of a Pigment

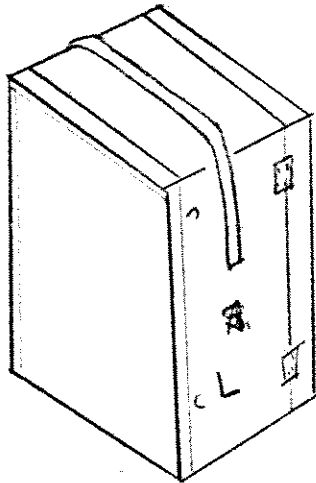
42 Revolution of sphere on all axes - fully
described and use of co-efficients .37

44 Charts as completed and fully described
A color meridian- 52

Lumenometer - an extremely simple, compact, and
accurate photometer - size 8x11x14

Measures natural or artificial illumination
" luminosity of colored materials and pigments.
" transparency of colored glass
" relative sensitiveness of each eye - to
each color

The luminosity of any color sample or any gray
from white to black is brought to a per cent of
standard white (100) by measuring the amount of
light which should be shut off from the standard
in order to match the sample.

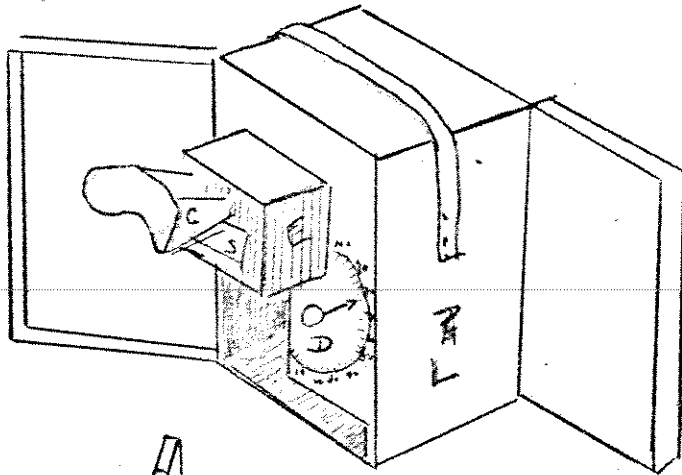


L Lumenometer - closed
(light box)

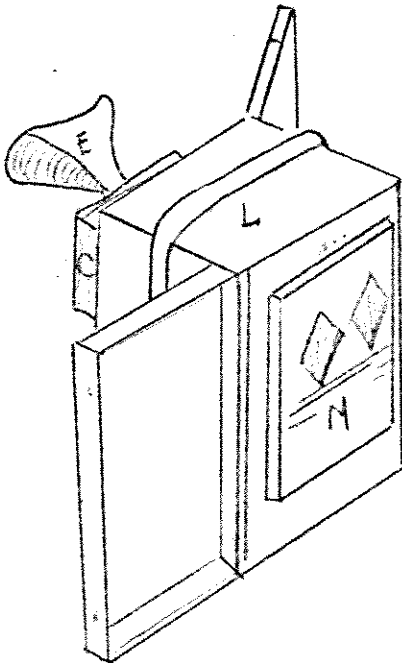
C Cabinet - to juxtapose sample
& standard

D Dial - to read % of illumination

E Eye-piece or hood
to shut out extraneous light



M Mask - to carry diffuser
& hold glass



S Sample Screen - to prevent
any color for measurement.

Feb.-4-1902

Can be read separately by each eye.
Available for any sort of illumination: . natural
or artificial.

- Feb 9 Spent Sunday at Wampum - with Mr. Gilman - 25.
Read added pages describing "Lumenometer -
Chromatic Tuning Fork
Maxwell discs
Co-efficients
Revolution proofs on all axes
Place of a pigment
Says busy men will not go back to re-read a
sentence several times - if in doubt as to its
meaning. Typewritten copy should therefore be
about perfect:- (Has re-written six page account
of Michael Angelo eight times). Mentions
Carnegie Institute as now very much in the public
eye, and desiring original investigation of this
sort - Thinks this might be presented by some
independent personality.
Discusses the Charts - and five standard enamels-
Have they all been made - Can they all be made?
~~The large atlas is a later and very expensive~~
performance but the present account of the system-
with very full illustration and skeleton charts
is ready for publication. Clearness creates
its own style.
- Feb 11 Visit Lowell Textile School and Capet Mill.
Prof. Crosby shows work of school - and discusses
a color standard - (arc light spectrum)
Meet Profs. Aney, Barker - George (Mr. Kendall
and Mr. Philbrick) Mr. Wright (color blind)
Mr. Lyon at Capet Mills - and see dying process.
- Feb 13 See photometer nearly complete at Ziegler Co. 26.
Think inside would reflect less if rough finished.
" Holder - better come out freely (no hinges)
with rim of felt to avoid leak.
Dial very close to cabinet - (not quite true-
1% too long). Advise change of clamps so as not
to be visible in mirror - Weight, 10 lbs.
- Feb. 14 Denman Ross at studio -
Hears sketch of development of the color-sphere
and consents to description and diagram of his
spiral in text. Sees rotation test of color-
sphere - and Photometer - Believes latter will
be of varied and great helpfulness, and furnish
students an absolute standard of values - Is not
so clear as to use of sphere-
Sees ten charts - index and gray scale - discuss
their reproduction by three color process -
accepts their v. and c. - but would leave out
the Red purple. I ask how the color-sphere is

to be balanced without the complement of green - (answere that YG is at the centre of the normal spectrum, and has no visible complement therein - but says when he makes a neutral black - by slight addition of bt.siena & raises it to level of intense red - the mixture of these two -red and gray - gives a strong red-violet.)

I suggest that purple-red exists in nature and in the mind - e.g. any system must be incomplete which leaves it out. - answers that perhaps he may have to include it again.

- Feb 19 Saw Mr. Pritchard - at Everett School and on train- 27.
(El). Says "I admire it (manuscript) and proud to think you can do such original work - believe it is very satisfactory to the adult and specialist- Feel as if I had seen it born."
It is all knit together, and builds up strongly-
but -
For your pupils - or a general reader not up in color - it is too technical, too dry, too condensed.
When I joked and called it an "Ugly Duckling" - he laughed and said it has a good frame, is well articulated - had "guts" - but needed flesh and feathers.
Would show it to Dr. Bowditch, but think of a more ample and easily understood presentation later.
- Feb 20 Received two Lumenometers from Ziegler Elec. Co.
Found dial inverted and too pale- (Main 3320.
Tripod nut - not standard thread -
Opening into cabinet could be much smaller
but by adjusting height of cabinet- volume of light can be fitted to different intensities.
- Feb 21 Take Lumenometer No. 3 over to Dr. Bowditch's 27
office. Meet Dr. Warren.
Dr. B. dislikes double eye-piece - it makes a wide interval between images. Prefers a single eye-piece for himself. Is disappointed with width of septum. Leave MSS of color system with him.

In experimenting again at studio - find 2 mirrors not in same plane and notify Mr. Hall.
- Feb.25 Mr. Jepson brings Mr. Rawsome (dye-chemist(-ex-supt. of woollen mill) - Show color-sphere - charts - and photometer - find that Mr. J's rate is 4% higher than Mr. R's- Red sample goes up 25% under electric light - Blue sample goes down 9% under electric light - Read middle grey at 51 and 55 (mine is 52) - Back of same at 24 and 25 (mine is 26).
Mr. R. describes uncertainties of dyeing and mixing colors.

- Mar 1 Rec. from Ziegler - No.21 and sent back No. 8 to be refitted - recommending complete piece of felt - and smooth tube against face -
- 2 Found leak where septum joins plate - top and bottom.
- 4 Visit Ziegler's - recommend velvet instead of felt - and agree to \$1.80 extra for brass plates on large box - and \$3.00 extra for single tube eye-piece.
- Mar 7 Mr. Hall sends up No. 15 and asks if the instruments can be now sent up to studio - to be packed later as desired. I answer that the new brass diaphragm is not in place and is so rough with black paint (instead of acid) that I cannot enter the cabinet and test its accuracy. Think best to defer sending other instruments until the sample is perfect. 29.
- 10 Received Lumenometers 2-7-8-11 (all marred in transit)

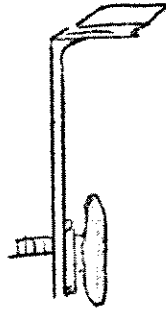
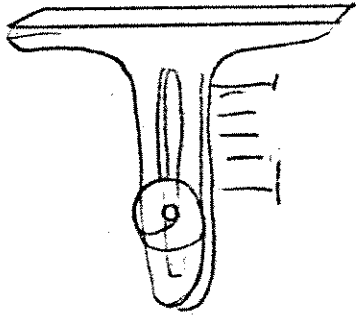
		New diaphragm	
1		-	
*2			
3	Dr. Bowditch - Feb. 21	exch. for #5	3/11 - at Ziegler's
-4			
5	Harvard Med. School	Del'd Mar 12	Pd. Mar 31. Dr. Bowditch
6			
*7			
*8	Rec. Feb. 26	-Ret. Mar. 1	
9			
10			
*11			
12	Studio	March 1	

*Scarred in transit
 *Return to Ziegler for repair 3/18/02

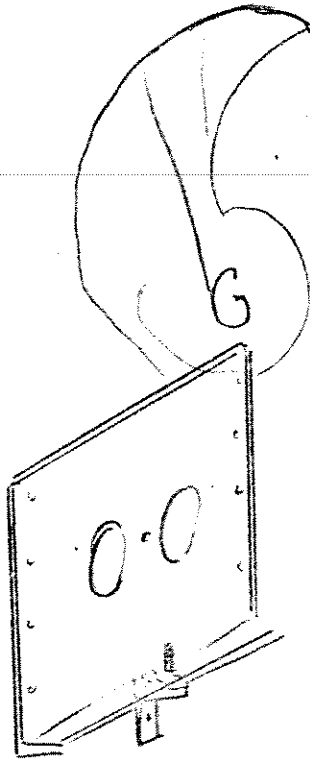
Find area of varnished septum affects readings -
 More " more light reflected -
 higher reading!

- Mar 12 Mr. Walter Russell calls - bringing Mr. Quinby (publisher) and Mr. Pevear - Show Lumenometer - charts - sphere - and explain system. 30.

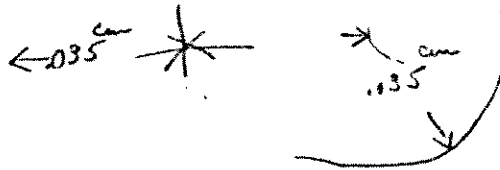
Carried No. 5 over to Dr. Bowditch - and brought back No. 3



30 a.



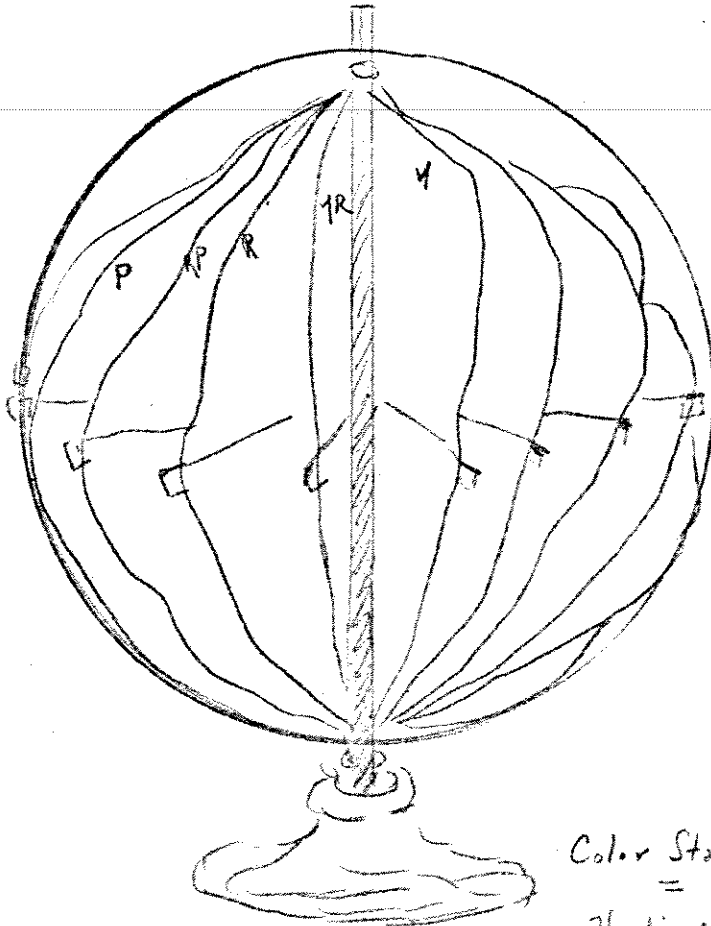
New diaphragm plate - with set screws to
adjust height of cabinet and
central height.



March 22nd

	C	H	V
Tropics	170	yellow red	80°
	95	red	35°
	90	yellow red	60°
		purple red	30°
	85	yellow red	70°
	60	red	70°
		green yellow	70°
green		50°	
purple		20°	

3/a.



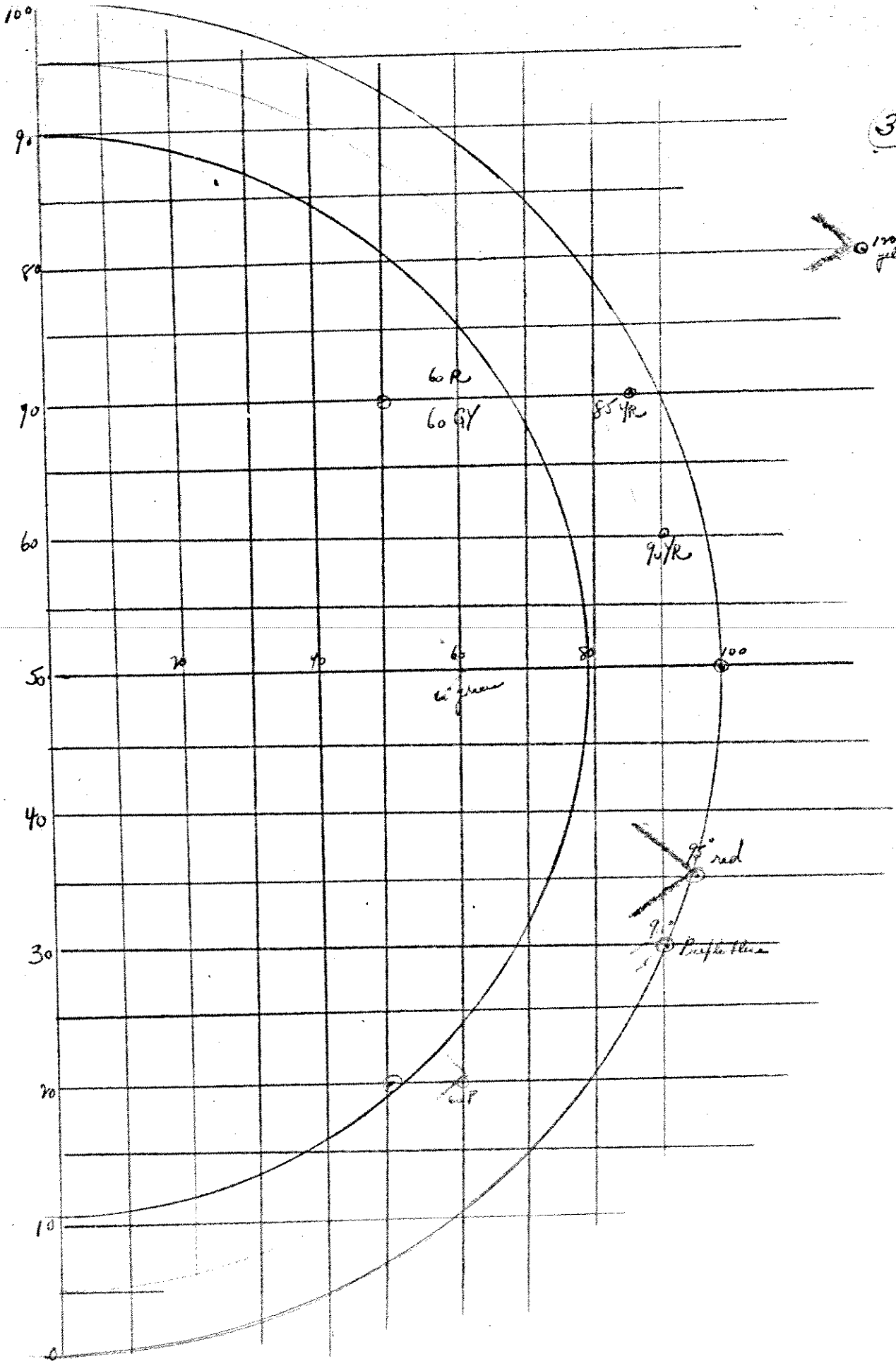
Color Standard

Vertical leaves
on gray axis

All values and chromas of
singles blue

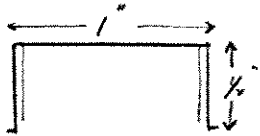
To fold as are colors

March 20-1902



Mar 13 Returned No. 3 for new tripod nut and furnished exact drawing of new diaphragm plate with bracket to carry set screw - (30-35 cents extra for each)

18 New diaphragm plate - does not fit old screw holes - allows side play to cabinet. Call at Prof. Cross' office - he will notify me when Prof. Clifford and he are ready to test new photometer.



Size of diaphragm in eye-piece -

20 Received 5 diaphragms and set screws-

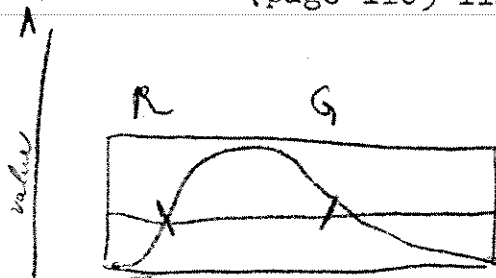
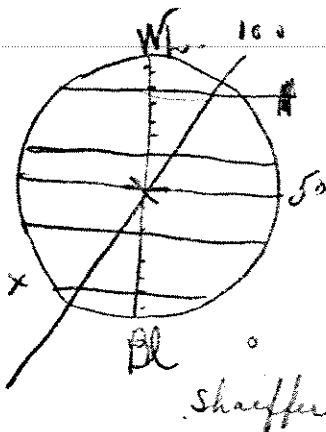
26 At Dr. Bowditch's office 9:30-12

32.

What public is intended.

Bowditch - Vision pp 776-

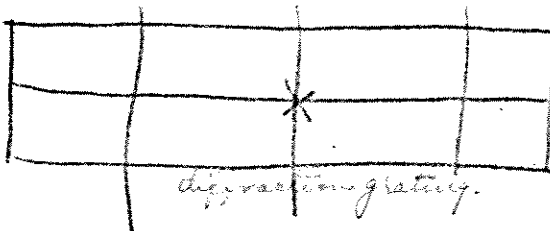
Shaeffer - Text-book of Physiology) to get scientific phrase-
(page 1105-1122)) ology



-page 9 -
middle values of f.

definition of "value" - "warm & cool" -
"weak & strong"

12



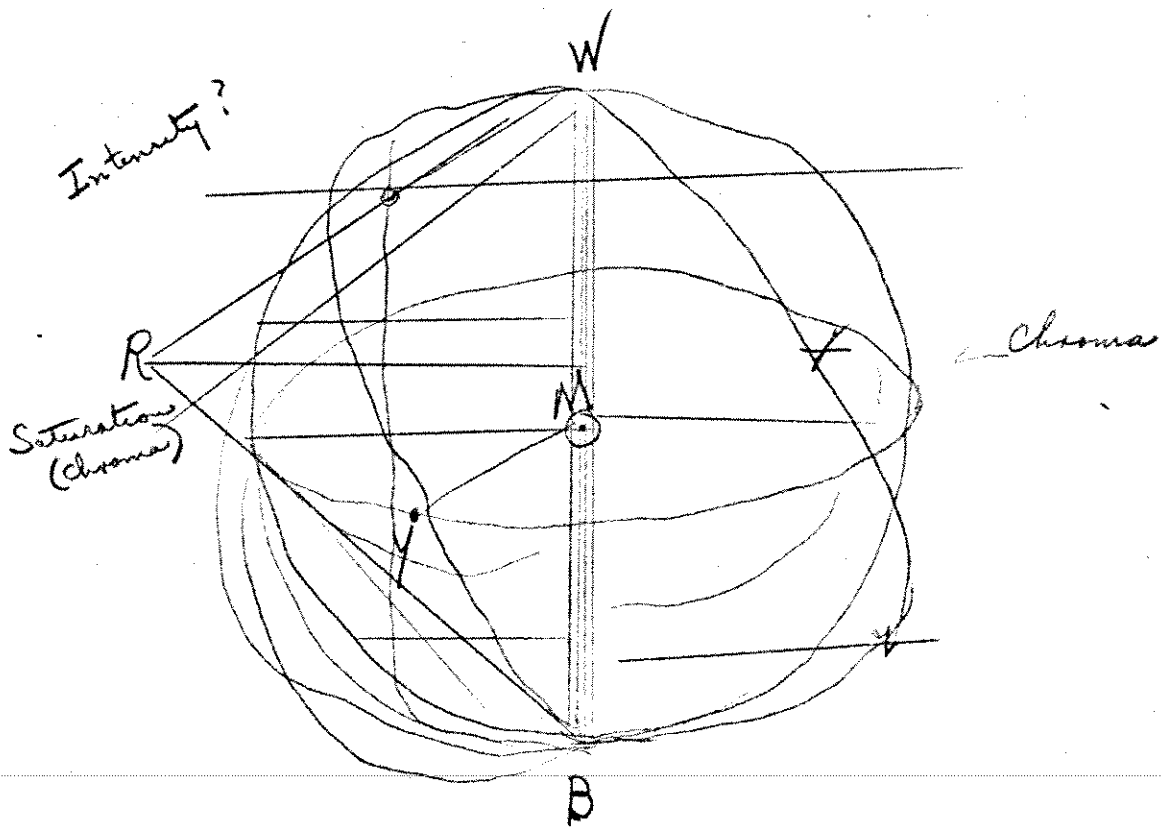
"distance along" spectrum

17

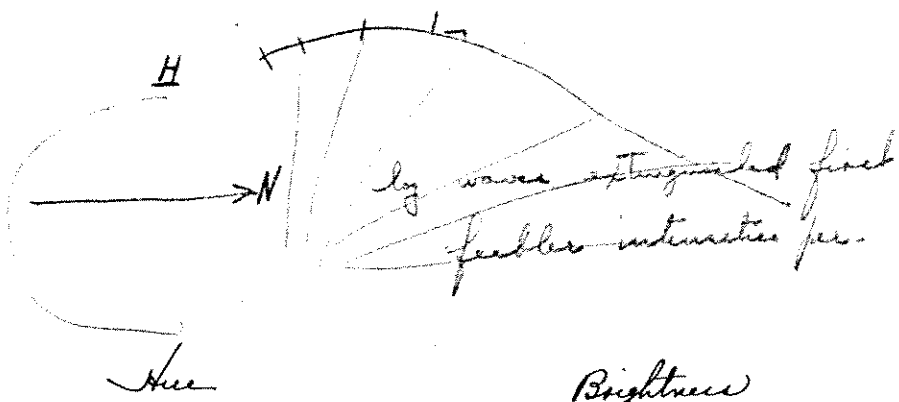
Spectral color becomes neutral as light is decreased.

What is Intensity? in this scheme - Do artists produce it?

30



31. a.



	<i>Purity</i>	<i>Brightness</i>
Abney	"is often called colour"	"Luminosity or brightness"
Church	"color for excellence"	"Brightness, often called luminosity"
Rood	wave length - refrangibility.	Luminosity or brightness

31.

Abney
Church
Rood

"freedom from white light"

(Intensities may be deduced from luminosity) *ie. intensity*

(If perfectly pure) a color is saturated

(Red as intense, ^{bright} saturated and brilliant as possible)

(saturation or intensity of a colored pigment is greatly reduced by "black")

p. 194 (intensity due to { strength of light + length of waves } "amplitude")

p. 200 "Saturated or intense"