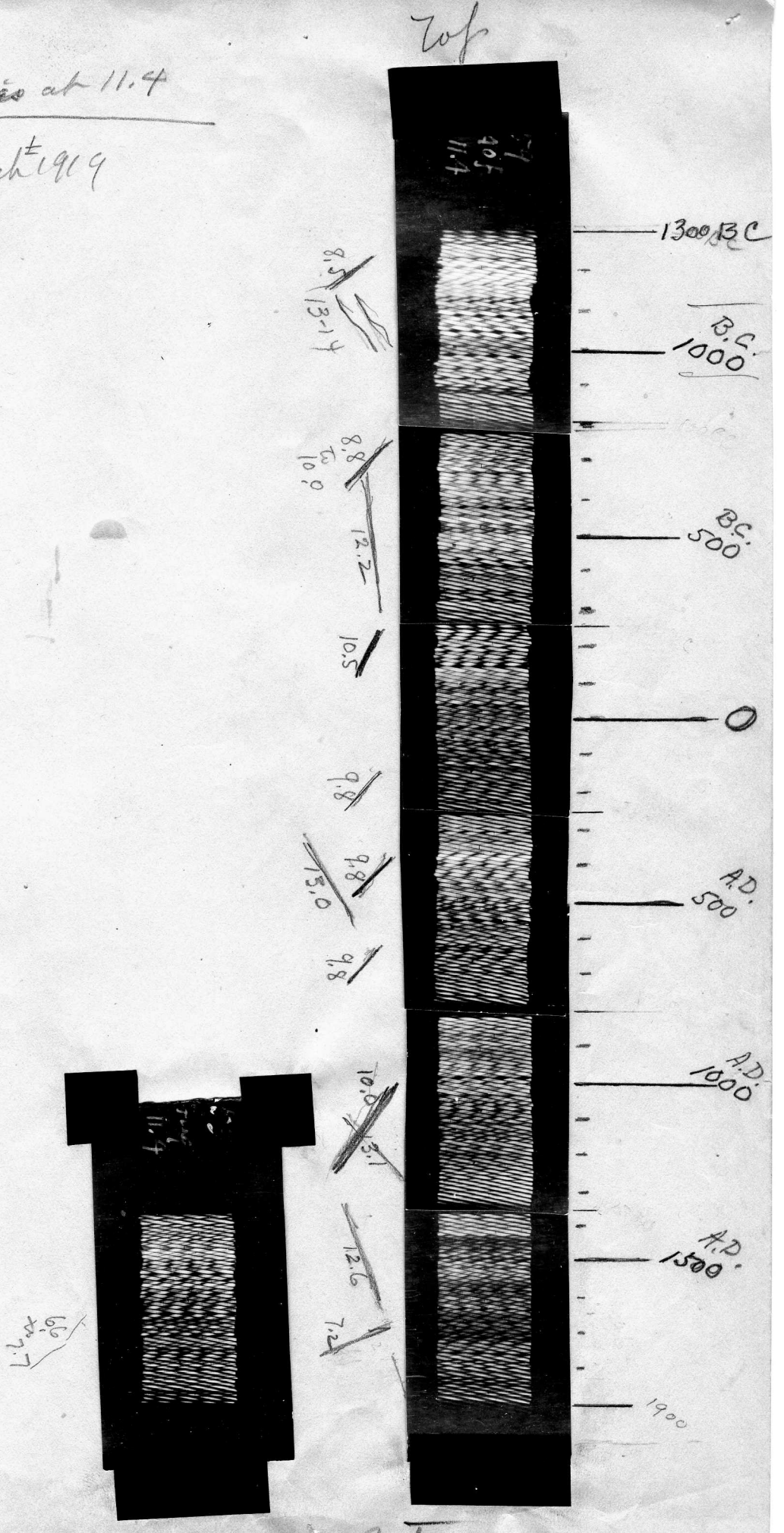
Analysis at 11.4

March ± 1919



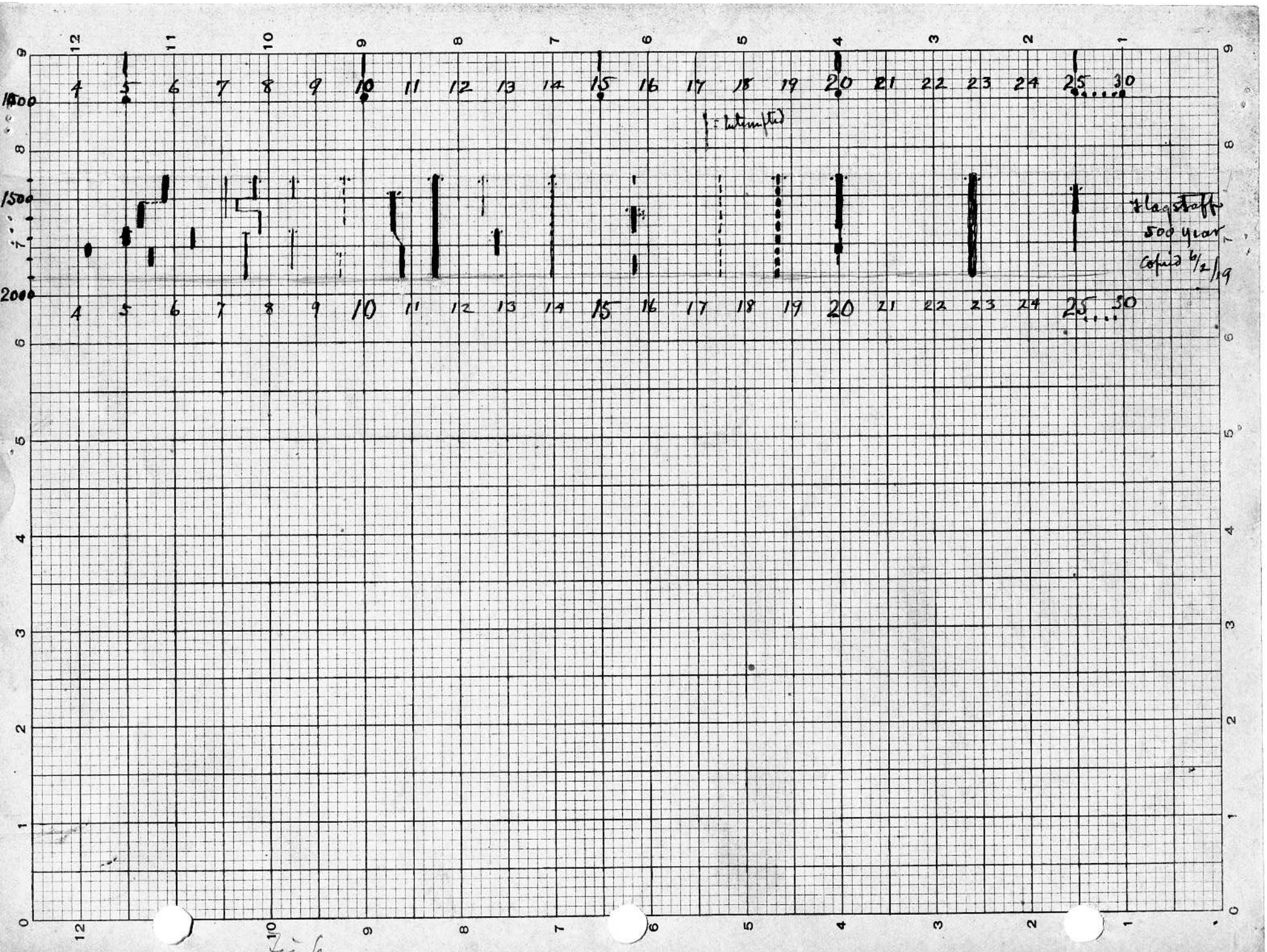
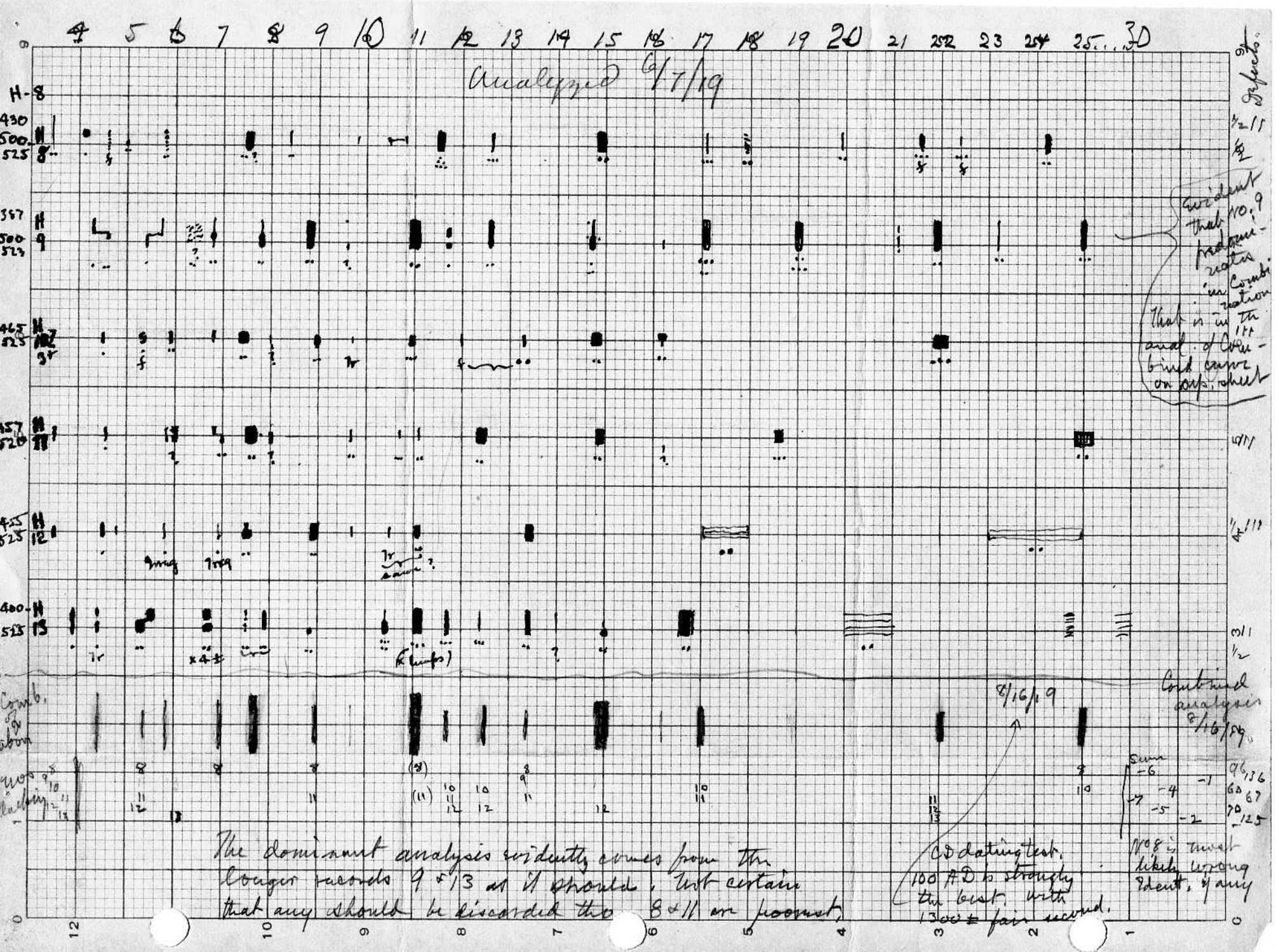
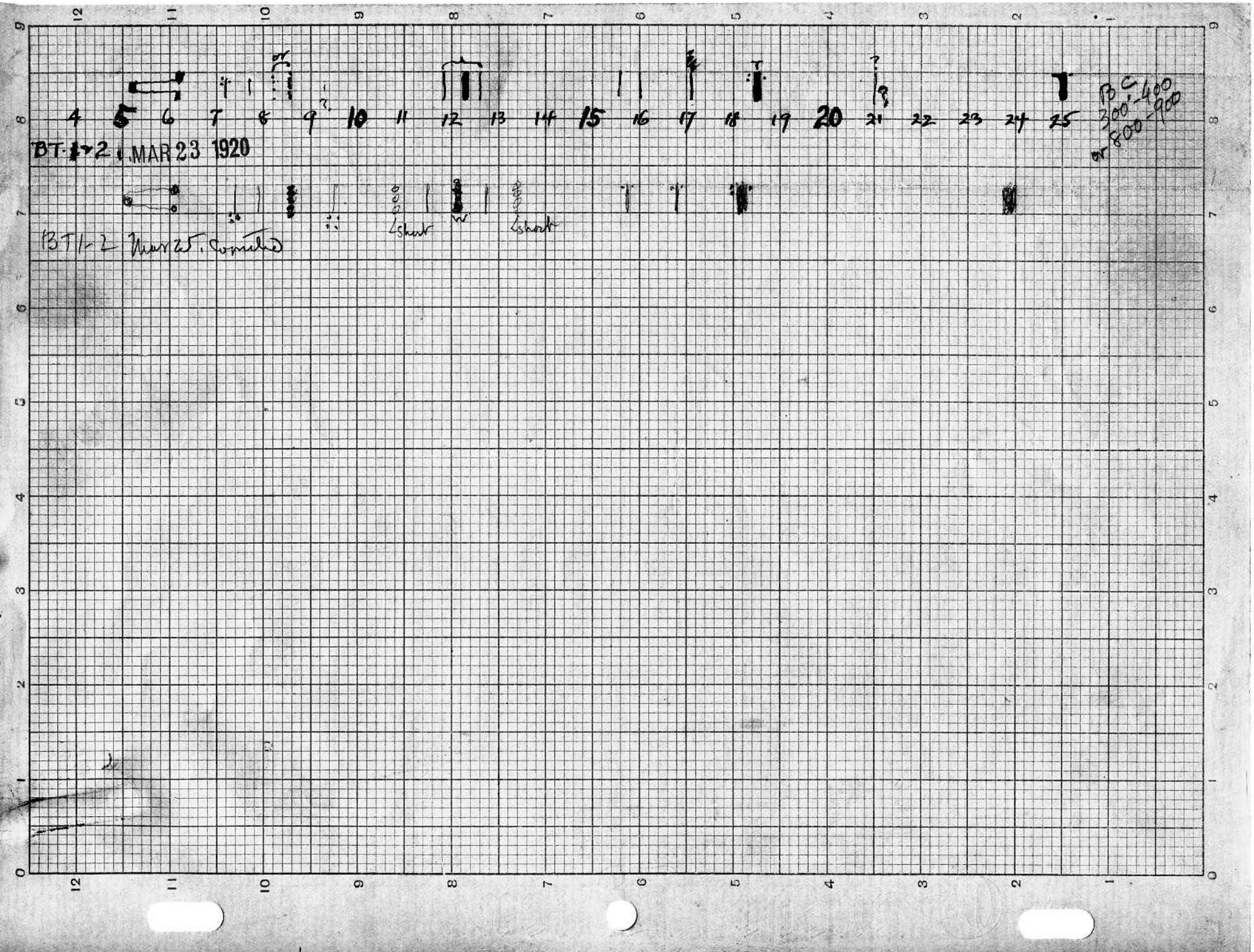
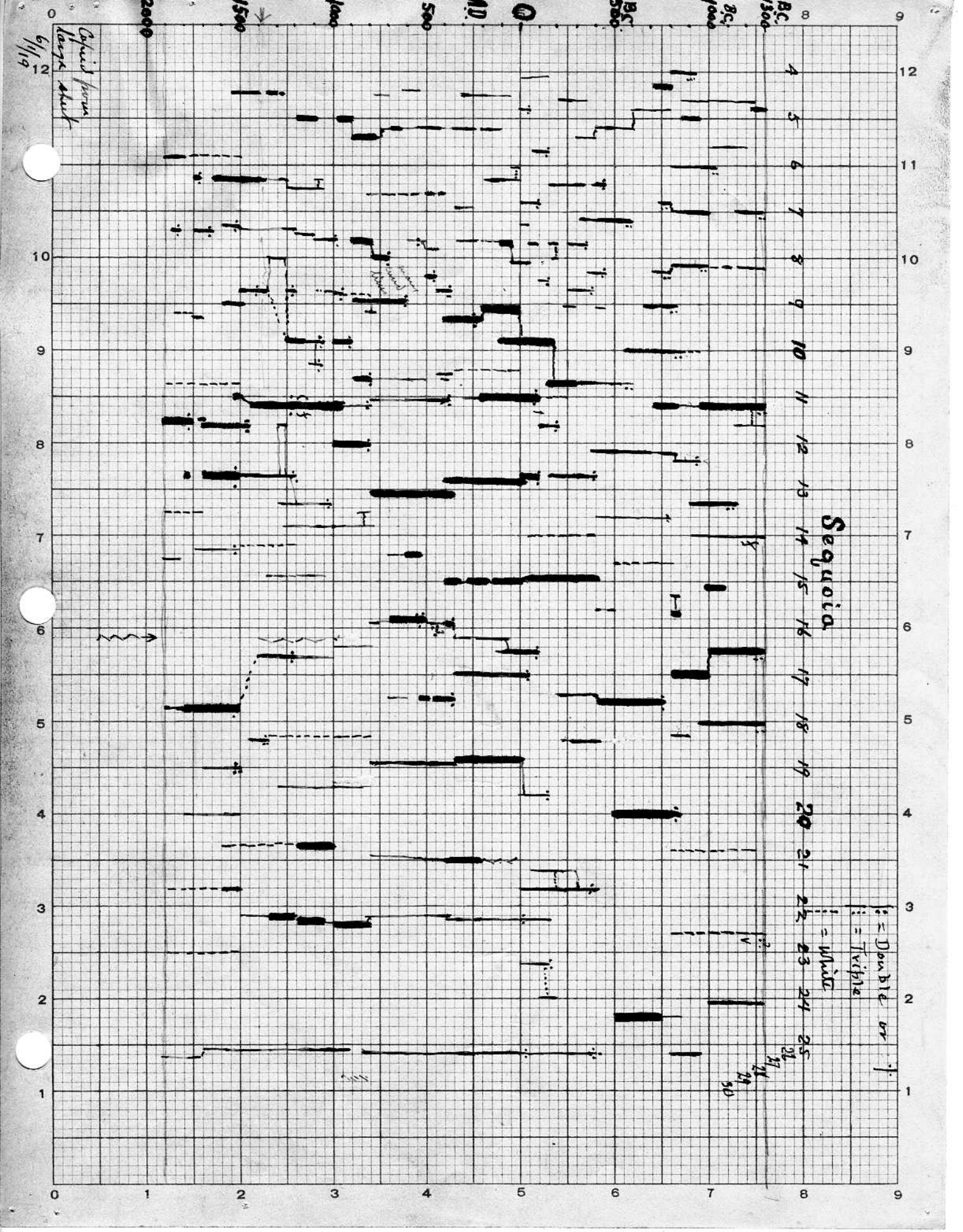

1000
1500
2000
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 30
Interruption
Flagstaff
500 year
Cofaid 6/2/19

Fig 6.


Analyzed 6/7/19
H-8
430 500 525
387 500 523
465 525
457 520
455 525
400 525
Defects
Evident that No. 9 predominates in combination
That is in the anal. of combined curve on sep. sheet
Combined analysis 8/16/19
8/16/19
Comb. of above
Nos. lacking
Sum
CD dating test. 100 AD is strongly the best, with 1300± fair second.
No 8 is most likely wrong Ident. if any
The dominant analysis evidently comes from the longer records 9 & 13 as it should. Not certain that any should be discarded tho 8 & 11 are poorest.


BT-1-2 MAR 23 1920
BC 300'-400 or 800-900
BT1-2 Mar 25. Corrected
short
short


Sequoia
= Double or
= Triple
= White
Copied from large sheet
6/1/19

800-900 B.C.
MAR 23 1920

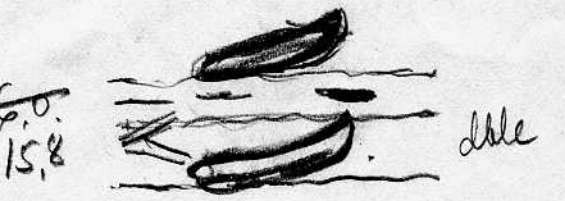
3/23/20

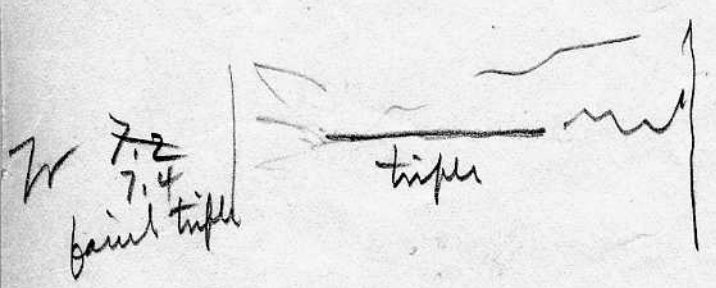
B. T. Analyses

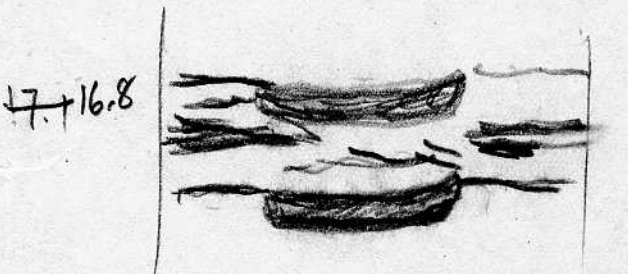
13.4 many short duration cycles scattered here & there

not accurate - non focussing

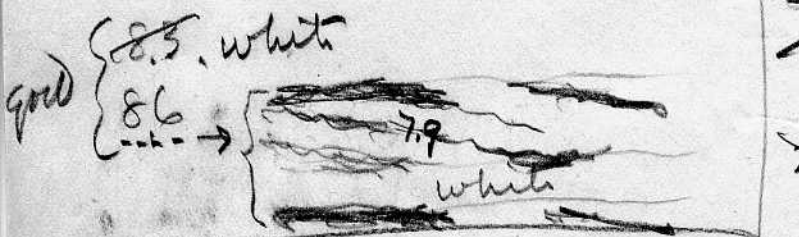
~~15.6~~

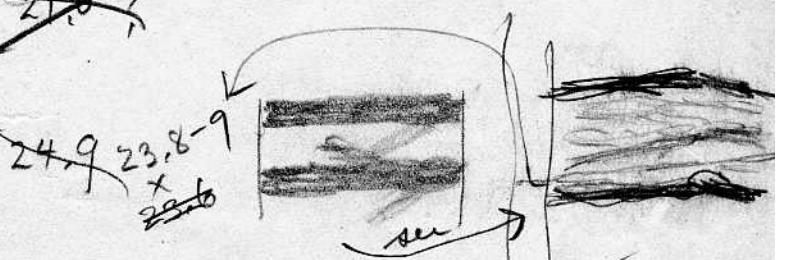






~~21.0~~ ?



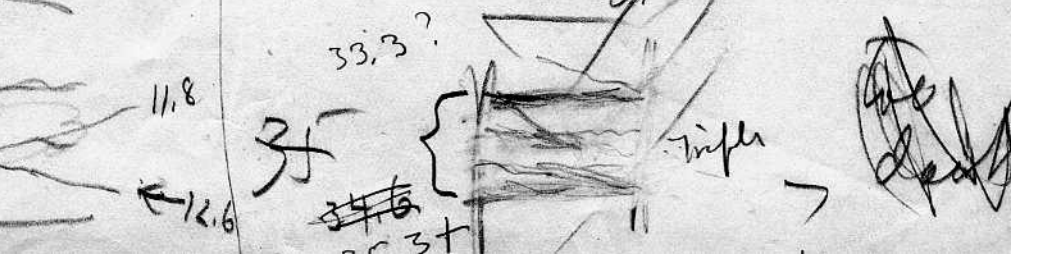


~~27.4~~ 27.7

29.7 · quadruple poor

~~31~~ ~~30.4~~

33.3?



MAR 23 1920 New Flag. 500.

10 20 a.m. Can trace 7.0 (checked by Mult. standard thru 500 gr flag + in nearly all it is divisible by 3, making 2.30 - 2.33 a fundamental. This is the average 2yr zigzag as found in St. (+ may be composed of alternating 2 1-2 & 2 8-30 mos)

MAR 16 1920

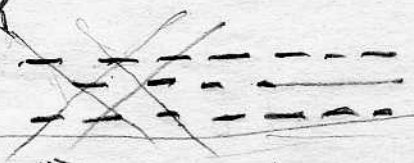
New Flag 500

5.5 { [redacted] poss dble

7.2 prob

8.6 white line
nearly all –

9.4 poss – short

11.0  2(5.5)

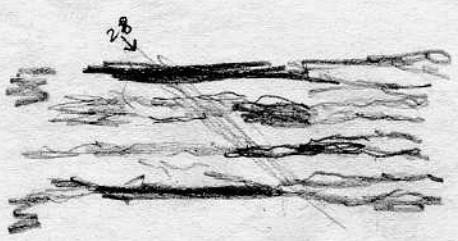
13.8 2(6.6) 2(7.4)

16.4 3(5.5)

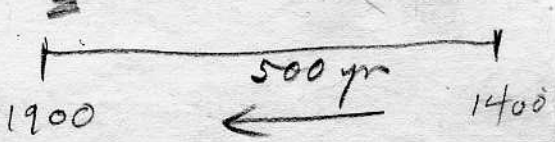
18.9 ?

22.0 – 22 2(11) 4 × (5.5)

28.1 4(7.) or ~~2 (14)~~ 5(5.5)



33.3 3(11) 6(5.5)



by scale lamp light
carriage Dr mgt
to small st
25m Exp

Sub-harmonics of the SS cycle

MAR 15 1920

~~7.22~~ ~~3.14~~

3 | 22
7.3

3 | 22.2
7.4

	11.1 Obsd pds in yrs	x 2.83 years of planet in circular orbit
3 x 11.1	33.3	94.2 — Uranus
	28.0	79.2
2 x 11.1	22.2	62.3
3 x 5.5	16.7	47.3
	14.0	39.6
1 x 11.1	11.1	31.4 Saturn only possible correspondence
$\frac{3}{4}$ x 11.1	8.3	23.5
$\frac{2}{3}$. 11.1 =	7.1 7.4	20.1
$\frac{1}{2}$. 11.1 =	5.5	15.6 — Jupiter
	1.85	5.24
	.92	2.58 — Mars
Extra 10.4 mo	.86	2.44 2.02 ±

Tracing idea of planetary groups of meteors

NG.

11.1 x 1

8.32 (25) = $\frac{3}{4}$ of 11.1 (11.0)		3/4
8.55 = " " 11.4		
8.70 = " " 11.6		
6.67 = $\frac{3}{5}$ of 11.1		3/5
6.84 = " " 11.4		
6.96 = " " 11.6		
7.40 = $\frac{2}{3}$ of 11.1		2/3
7.60 = " " 11.4		
7.73 = " " 11.6		
8.88 = 4/5 of 11.1		4/5
9.12 = " " 11.4		
9.28 = " " 11.6		
5.55 = 1/2 of 11.1		1/2
5.70 = " " 11.4		
5.80 = " " 11.6		

Fundamental 11.1

$$\frac{D^3}{\cancel{T^2}} = T^2$$

$$\left(\frac{1}{2}\right)^3 = \frac{1}{8} = T^2$$

$$T = \frac{1}{2.83} = .354$$

$$(1.6)^3 =$$

H & K 7/31/20

7.1 traces all along
8.1 Some 8.6 White)
9.3 " "
9.8-9.9 good 9
11.0 traces → 11.8 traces
12.9 10 : 10
14.6 poss.
16.3 dble 7
19.3 dble 9 : Fine dble
23.6 Fair : poss triple ✓
25.3 Some : White ✓
27.5 ± Composite
29.1 dark line

7.8 to 8.1 } really thin } 8.1 16.2 7.9 3 23.7

9.8-.9 9.9 2 19.8

12.8
16.4
19.8

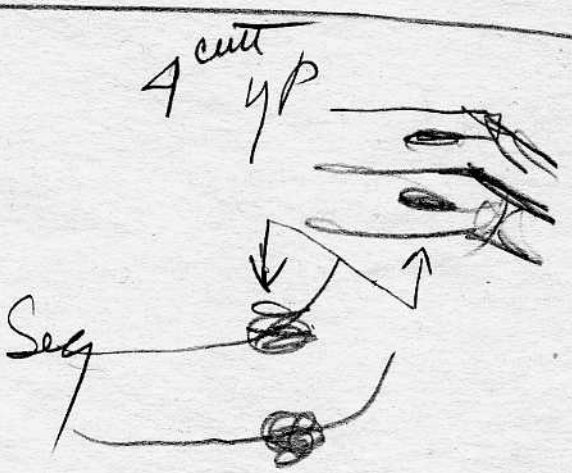
Cutting off bottoms
14.9 plain

8/3/20 Test of columnar plot versus point-top plot shows no difference

8/3/20 This curve from 19 beams changes little from the old "CD" (Cliff Dwelling) curve except losing 11.1 & getting a trace of 11.8±
8.1 (8.6) 9.8-.9 (11.1?) (11.8 Tr) 12.8 . 16.3 19.8

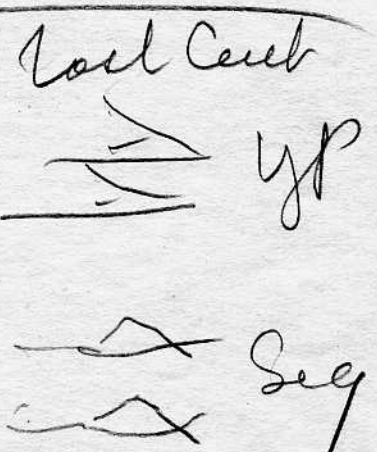
18.8

Rest fair



15.3

Center 2 cuts, very good

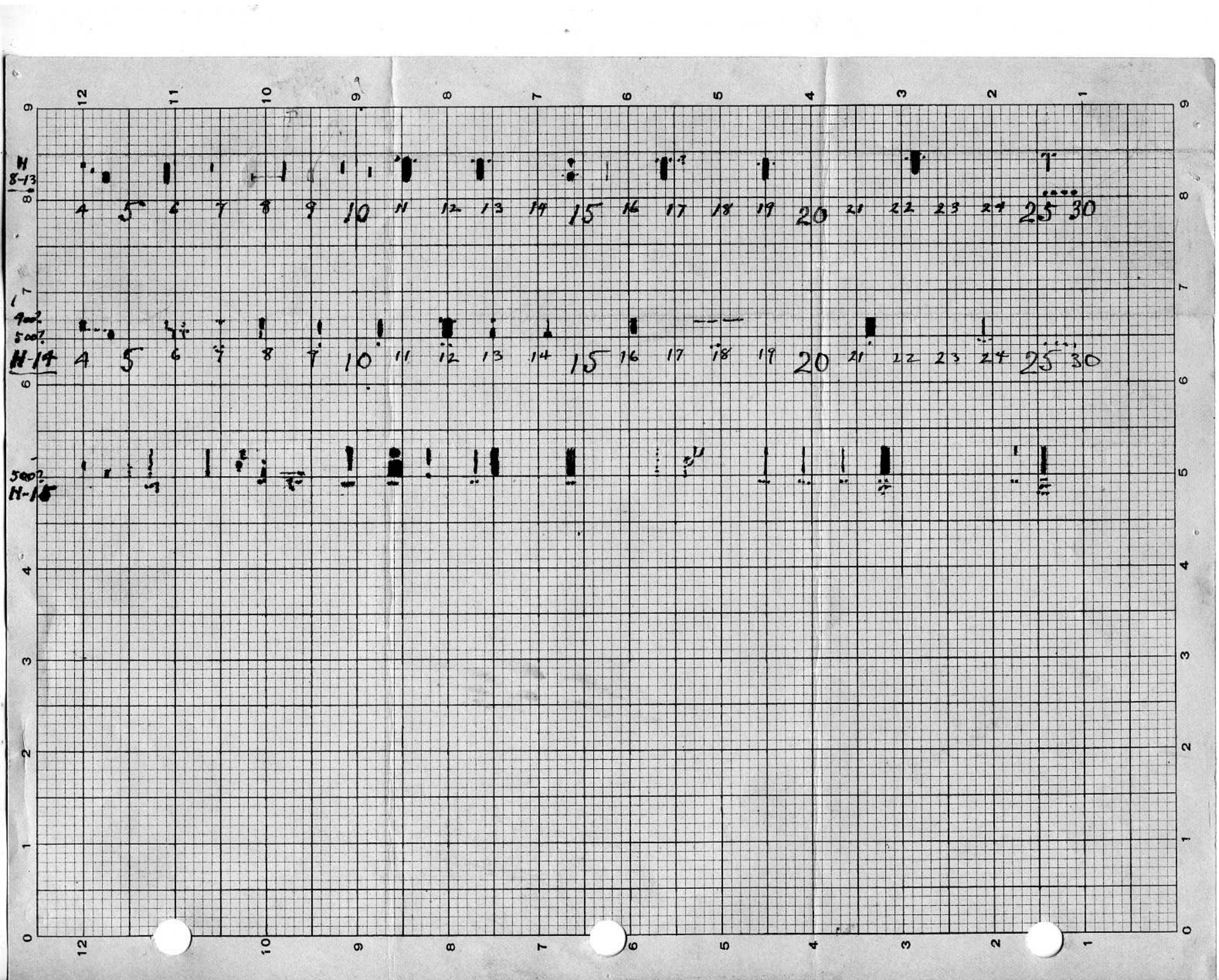


19.0

AUG 8 - 1920

To make YP (Flag 500 - old arm) resemble the Seq old

7.1	app Right 1/4 good	turn 7.5 Arm to 6.2 alternatives	turn 6.2 into 7.5 predominating	6.8 & 7.6 turn to 6.8 & 7.4 good
8.2	all good except at 7/8		YP Seq	
9.05	fine	fine	YP Seq	very good
9.2	good white liner complete YP " " & dark " " Seq			
10.1	middle very good in each			
10.6			dble - last 200 yrs YP not in Seq	
11.15	500 yrs YP no inversion, slight defect Central 80 YP Fair in Seq - less good in 1st & 2nd Century			


H
8-13
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 30
1
4m2
500?
H-14
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 30
500?
H-15

AUG 6 - 1920

10 a.m. Mod. H's 17-26 - analyze OK with 7-500 yr Y. P. of Flag.
SS is not strong in either

7-500 yr Flag } Agree pretty well but 11.5 in Old 500 Fl
Old 500 yr Flag } is much reduced in 7-500 yr (queries: are old trees less sensitive to SS variat^ns?)
NB the Old 500 yr has too ~~short~~ close ~~variable~~ a mat & removes many 20 yr ± variations.

Modern H { Col Plot } Agree fairly well.
Old Seq. Curve { Angle plot }

Mod. H. } Fine agreement! N.B.
Old Seq. at 1900 = 1300 }

1. Moved Seq - backward 300 yrs at a time { 100-200 no good resemblance
535 Seq (= 530 RD on the HK Curve)

2. Had to move it forward { 1210
1305 }
1320 } Prob. best
1312 }

3. To moved it backward { 1080
805 ?
715 ?
605 ?
530
410 ?
BC 20 ?
Set at 17 yr Pd.

Best result 1312 ± 7
To notices good apparent
Xid bet. 19 HK & Old Seq

4. To moved it forward 300
660-705
1040
1305 or +

Cwd of 19HKal Aug. 7, 20

~~AD~~ 1285
to
1120 good at 17.6 fair not
1315 better at less feds & OK at big feds

635 fair

525 very good - not to 1315

245 very good - as best

30BC fair

245
very good

525
very good -
Cutrol parts better
Ends worse

1315
no better
than the
other 2

AUG 8 - 1920

Tried again. Dating 19 HK (selected)
in terms of old sequoia curve
1315 - good

525 - somewhat better

245 - same as last

AUG 8 - 1920

BT 11 & Seq

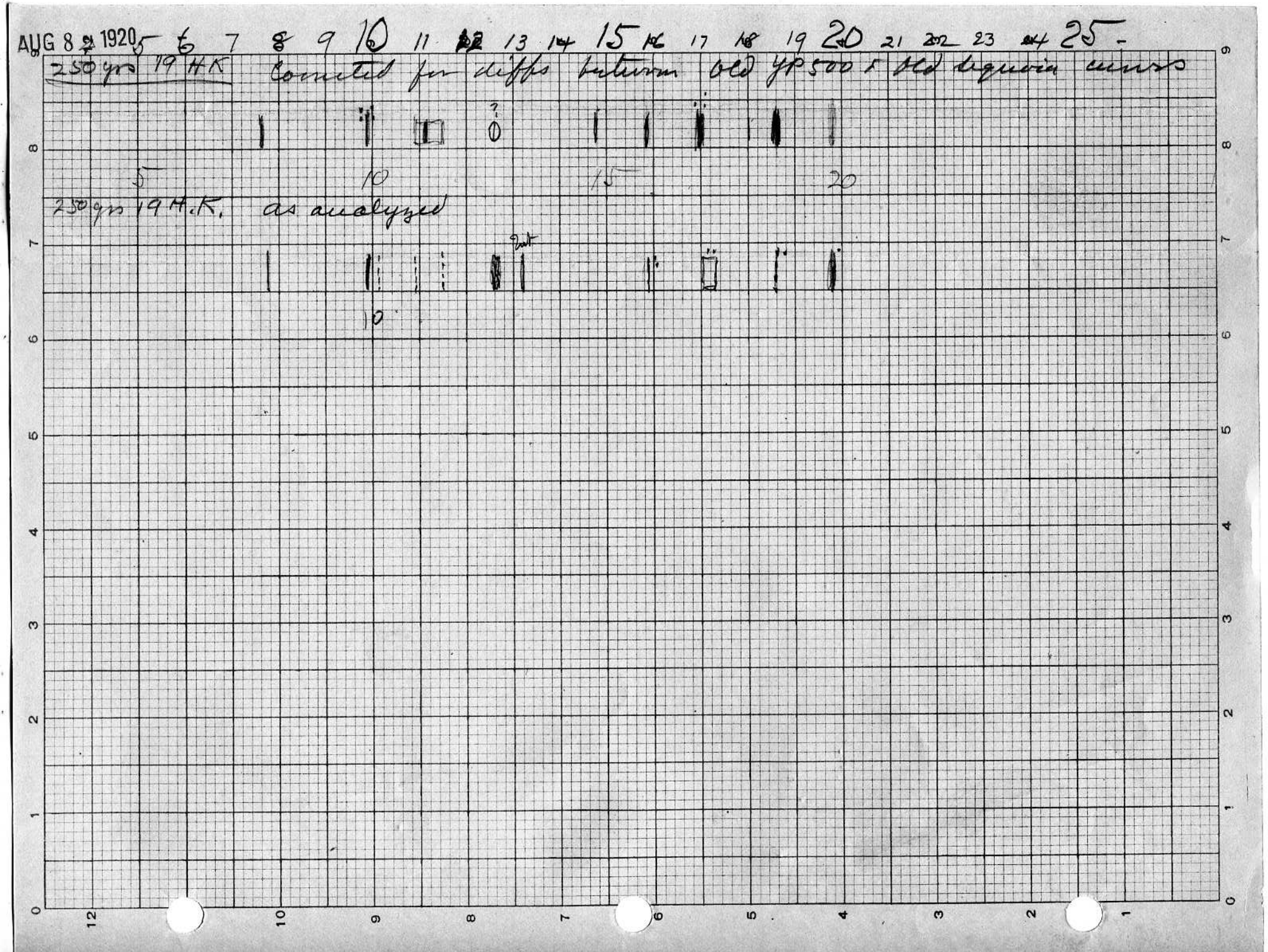
245 - very good

790 fair

1260 fine

1315 NG

1250 fine


AUG 8 1920
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
250 grs 19 HK Corrected for diffs between old YP 500 & old sequoia curves
5
10
15
20
250 grs 19 H.K. as analyzed
10

OCT 12 1920

Flag 7-500 yr trees

5.7 } 8.7 faint

10.4 } 11.00 Dble

11.0 ± 3

11.5 }

13.8 ± .1 14.0 after 4 single

16.64 16.55 composite 4 or 5 frags all 19

21.9 ± .2) 21.7 Dble

27.~~6~~7 Dble oc 4

32.~~6~~8 Tple. oc 6

often composed of less pds in short length

OCT 13 1920

9.0 in 3s . 4s = 1.75 yrs

2.3 yrs

5.5-7

10.4

11.0 ~~are~~ dble much made up of fragments of 9.3

11.5 in part

13.8-14.0 single? - fragments of 12.2

16.64 = 1½ × 11.0 = 3 × 5.5

~~21.9~~ from 11.0

~~27.7~~ from 13.8

~~32.8~~ from 11.0 + 5.5

19 HK

AUG 8 - 1920

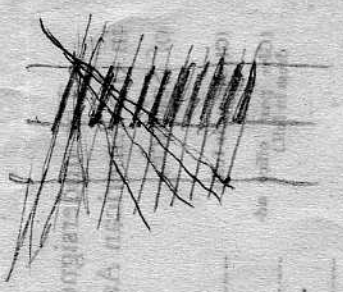
	In sig
19.8 strong dark single	Int. 14.8
18.6 white line Single	mostly 18.6 oc. like 19.8
17.3 thin black - dble 17.0 " " " other branch	all goes to 17.0 (prob triple)
15.86 thin black double	dble or triple goes to Single
13.2 Intermit black - Single or dble	strong black dble becomes Intermitt spots - traces spots of 14.7 - 18.0
12.6 Coarse composite single	none, see last
11.5 white single (?)	no 11.5 but 11.15 shows 10.9 in 1st 200 yrs 10.0 in middle Cent + 1½ 11.5 in last 150 yrs
10.9 ? white	11.0 white goes to 11.5 dble
10.1 white	
9.9 white & dark, strong single or triple?	10.1 white black becomes 9.9 dble & Quadruple
7.75 " " fairly good	7.75 becomes 7.65.

Strong single

JAN 27 1921 - 3

2/1 = 2
3/2 = 3
4/3 = 4
5/4 = 5
6/5 = 6
7/6 = 7
8/7 = 8
9/8 = 9
10/9 = 10
11/10 = 11
12/11 = 12

2 3 4 5 6 7 8 9 10 11 12



JAN 28 1921

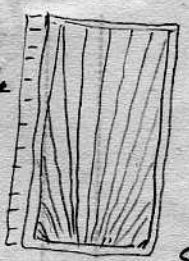
Think this is combin^n of 5.55 ± and 13.8 ±

5.55	7.2
11.10	14.4
16.65	
22.20	21.6
27.75	28.8
33.30	36.0
38.85	
44.40	43.2

Standards - ideas

JAN 28 1921

Scale



Moves up & down ~~across~~ window light & gives differently spaced dots of light into the pdgph -

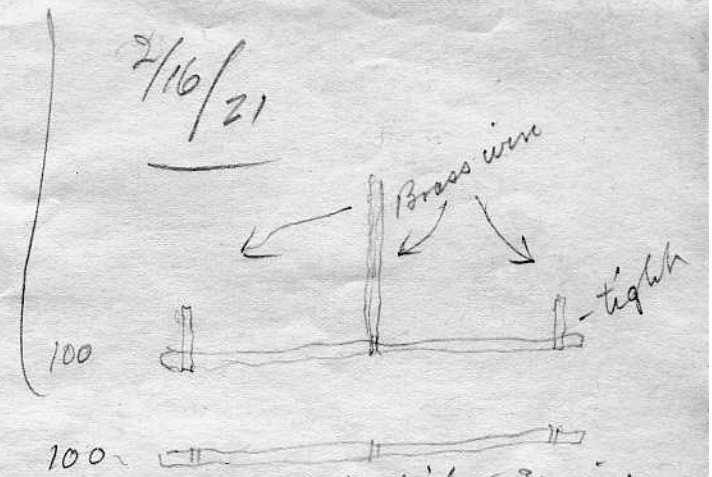
2 or more Rubber bands - holes regularly spaced

or

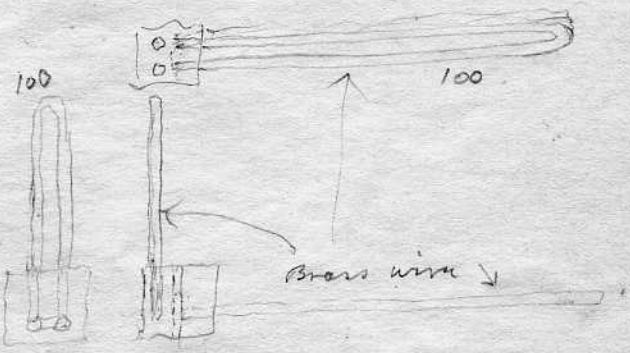
2 Extension "hat rack" affair. Each top carries a plate with hole in it. These are made to rotate as they approach each other to avoid covering holes -

2 or 3 of these would give several test periods at once -

2/16/21

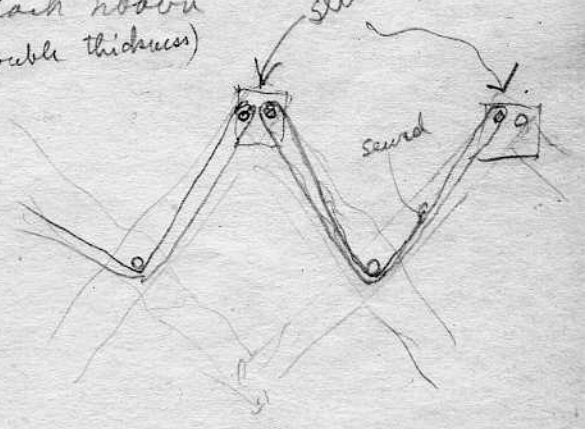


Al, 1/8 thick & 3/8 wide or Brass. Holes well spaced



100 - Brass blocks cut from 3/8" square rod

Black ribbon (double thickness)



2 sets, 50 each

1921 Periodograph Work

Pds found JAN 27 1921 — 1

5.6 in Early Cent^s

1.25 7.0

1.31 9.2 poor

1.21 11.1 — prob dble

1.25 13.9 — Sing?

1.19 16.5 poor dble/6 = 2.75

1.16 19.2 poor — single lazy

1.14 21.8 dble

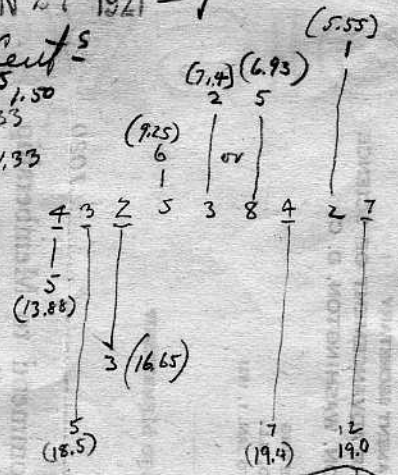
1.28 (22.5?)

27.6 } dble
28.4 }

1.19 33.2 triple

$\frac{1}{2} \cdot \frac{2}{3} \cdot \frac{3}{4} \cdot \frac{4}{5} \cdot \frac{5}{6}$

$\frac{2}{5} \cdot \frac{3}{5} \cdot \frac{1}{3} \cdot \frac{1}{4} \cdot \frac{1}{5} \cdot \frac{1}{6}$



also faint
24.6
30.5

1/2	5.55		
1/3	3.7	7.4	
1/4	2.78	8.34	
1/5	2.22	4.44	8.88
1/6	1.85		9.25

2.78 Flag JAN 27 1921 — 2

	Diffs		obsd
	2.78	2.75	
		5.50 ✓	
5.55			
1 — 1.50 = .1 1/2	2.78	8.17	
8.33			
1 — 1.33 = .1 1/3	2.77	10.89	11.05
11.1			
1 — 1.25 = .1 1/4	2.8	13.62	13.9
13.9			
1 — 1.20 = .1 1/5	2.8	16.35	16.5
16.7			
1 — 1.167 = .1 1/6	2.78	19.08	19.2
19.48			
I — 1.143 = .1 1/7	2.82	21.82	21.8 (?22.5)
22.3			
I — 1.125 = .1 1/8	2.8	24.56	24.6
25.1			
I — 1.111 = .1 1/9	2.8	27.30	28.0
27.9			
I — 1.100 = .1 1/10	2.8	30.03	30.5
30.7			
I — 1.091 = .1 1/11	2.8	32.75	33.2
33.5			
I — 1.083 = .1 1/12	2.8	35.50	38.22
36.3			

JAN 28 1921 - 3

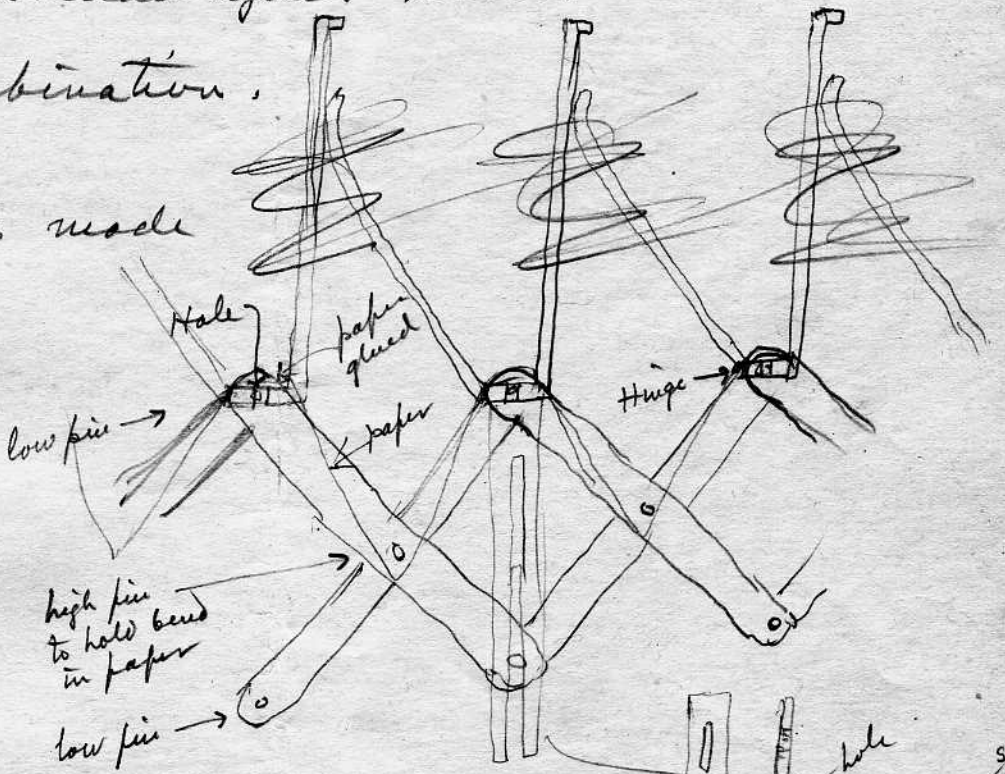
Tests on combining incommensurate cycles
(such as 5.55 and 7.0)

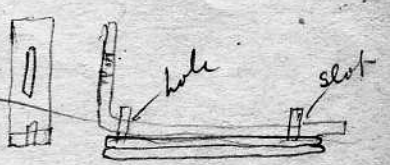
Plan is to put in window illumination, several cycles together, each variable over large range, and watch the pseudo-cycles which come out of this combination.

How several of these made

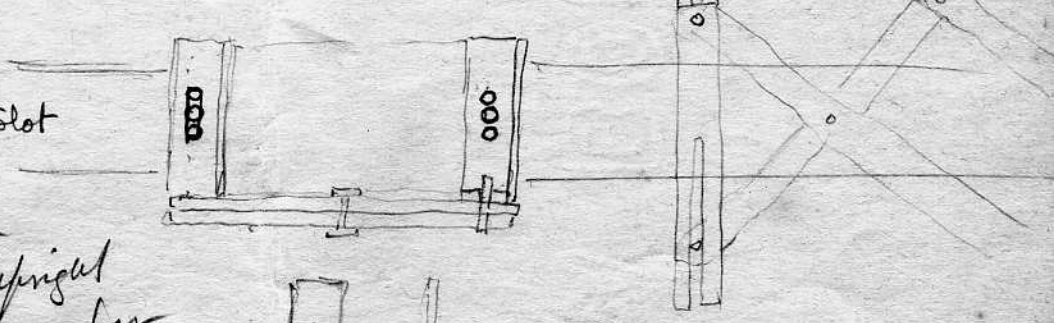
Plan

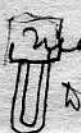
Extension "slat rack" about size shown
Extreme pins extend up 1/4"
Center pins high to catch fold of black paper

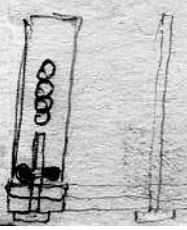




Elevation



The upright can be a square post ~~[illegible]~~ standing upright on pin: holes in holes thru for light & 2 holes near base for inserting wire  back as guide



FEB 6 - 1921

All T's diff from 1918 Analysis

| | | |

Pdgfsh Anal. Feb. 7, 1921

Sunspots by Month

~~1749-80~~ 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 23 26 29 32 35 30

1749-80

7.95 W 10.55 11.45 17.4 19.6 W f 21.4 D

7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 30

W 7.95 10.55 11.45 13.9 17.4 W 19.6 f 21.4 D 23.0 25.0 27.3 26.2

1770-1815

1780? 1794 19.0 strong black lines above white Badly mxd

9.5 8.6 T 11.0 f 12.5 13.2 13.6 W 14.1 90 17.4 f 18.3 21.1 22.9 25.7 T 27.9 f 29.9 30.8

1805-1850

Log 16.6 D strong black lines above 28.2 f 32.9 f 32.0 T

7.9 9.1 10.4 10.4 11.5 f W 11.2 f W 13.6 13.6 15.2 D 15.1 W Trace 18.4 19.2 19.4 Pwlng 20.2 1867½ 22.8 T 26.1 T 24.7 27.2 D

1840-1885

6.5 9.1 W 10.0? 11.6 11.9 (Trace 13.0) 13.6 17.1 W 18.4 W 20.1? 21.5 23.0 T 23.9 T 27.1 29.0 W 32.9

mostly late 25.5 W

1875-1916 agrees perfectly with former tests - others? 13.7 1906 W 95 15.1 16.2 D 17.0 D 18.0 18.8 19.9 W (thin black) D thin black 21.8 D (1892-1903 Read) 1900 27.3 D 26.1 T 29.7 ff 31.7 T W 34.7

6.2 6.7 7.6 8.4 10.0 f 10.7 12.4 83 D D? 24.5

7.8 9.2 10.3 11.4 13.7 mos 166 yrs Except 1780-1800 & 1850-65 15.1 17.3 19.4 21.4 - 22.9 25± 27.2

yrs 2.43 yrs 2.69 12.4 1770-95 & 1900-16 yrs 3.56 yrs 4.08 yrs 4.58 yrs 5.05 5.4 12 | 36.5 25 2 yrs 6.42

11.5 - all to 1880 15.1 3.044 1.22

10.5 yrs 2.93 yrs 3.24

Csb + mos 17.3 oc D nearly all except 1885-1900

Mars would give 7 mos

Jupiter 4.2 yrs = 50.4 mos

Saturn 10.6 yrs

Uranus 30 yrs

Neptune 65 yrs

Nerve 1 mo

Venus 2½ mos

Earth 4 mos

37.1 days

x .236 reduces to yr pd of planet

8.5 9.1 10-11.5 or 12.5 or 13.+ variable

7.9 6.5

Csb 18.4 19.2

pos var 1805-50

24-26.1 variable

23.0

21-23 variable

$\frac{1}{12} - \frac{1}{13.7} = \frac{1}{100} = 8.3$ yrs

.083 .073 .01 | .0838 .0578 .0255 | 12 | 17.3 = 39.3 mos 3.28 yrs

13.7 Csb

Aphelion Dist^s for obs^d periods

$2\sqrt[3]{\left(\frac{13.7}{12.0}\right)^2} = 2.18$

$2\sqrt[3]{\left(\frac{17.3}{12}\right)^2} = 2.54$

12 | 27.2 2.27

$2\left(\frac{11}{12}\right)^{2/3} = 1.88$

$2\left(\frac{12.5}{12}\right)^{2/3} = 2.05\frac{1}{2}$

$2\left(\frac{22}{12}\right)^{2/3}$ 3.00

$2\left(\frac{25}{12}\right)^{2/3} = 3.26$

Hale & Tubular Axis Test Feb. 21

236 7.7 1652 1652 236 1.8408 236 92 472 2124 17 232

24.5 26.1

27.2 D 6.5 17 | 20.7 1.22 mos

2/7 & 2/8/21 10 15 ~~20~~ 20 25 30 35

B.T. 11 9.0/3 11.7/4 13.1D 15.9D 18.5D 20.5/3 D of 117 & 13.1 from 30.8

BT 10 6.0 7.2/3 8.2? 9.2 10.8/4 11.2 13.2D 17.0/2 22.2 23.6-27 8 bles 33.2/3

9 6.2/2 or 3 7.1/3 8.3?/m 9.7/4 11.9 14.7/2 or m 17.4/2 20.4-22.0/2 24-5 30/3

1 & 2 6.2/2 7.2/3 8.2/D? 9.3 Harm 11.4 12.3 W 13.0/2 14.5 thin 15.8/2 17.0/2 or 3 18.6 D 2/8 24.4 W 27.4/T 30.4/6

3 6.0/3 or 2 7.4/3 8.6-8/m 9.7/4 11.5/2 & 4 15.2 W/6 & 17.8±/2 26.0±/3 30±2/3?

7 6.4/2 or 3 7.1/m 8.0/3 9.8/4 11.2/2 12.7/2? 14.0/2 15.7/4 (or 3) 17.5 Trace/2 or 4 19.4/6+ for 20.4? 22.4/2 25.1/3 27.8/2 31.0/2 34.0/3

" 8 6.1/3 7.1/3 8.3 part var 9.0? 11.0/2 & 4 & 5 12.3 W 13.6/2 17.3-19.2/m 19.0/2 21.6? 24.2? 27.3/2 & 3 34.2/m

9.54/4 11.3/2 & 4 13.2/2 17.2/2

6.15/2 or 3 7.18/3 8.26/3 or 2 2.38 12.3 W 14.4/2

2.05 3.07 2.39 4.1 or 2.75 5.6 2.8 6.6 7.2 2.5 3.9 5.2 8.6 9.3 9.5 3.2 13.6 9.0

2.0 2.39 2.38 2.5

3.1 2.75 2.8 & x2 3.2

4.1

5.2?

6.6

7.2/3?

8.6

B.T. 1-10, 2/8/21 9.5/4?

6.15 7.18/3 8.26 9.54/4 11.3/2 17.2/2 19.0/2 22.1/2 27.4/2 & 3

12.3 13.1 14.4/2 15.6

Feb. 8, 1921

grams with old tests		10							15					20		25		30	35
H	15	6.6/2	6.9/2	8.0/3	9.9/3	11.2	12.8	13.4	14.8/m?		16.4?	18.5/2?		21.6 w		27.5+/2			31+/3
H	14	Log 5.5 to	6.6/3	7.6/2-3		10.1 Log 11.1 to 12.2-13.1				15.6	17.4/3		20.2/2	22 ← 23.3/2		27.0 – 28.6/2			
H	9		6.7/2	8.3/2	9.0/2	9.8/2	11.0 – 11.6/2		13.2/3	14.6/2		16.2 – 17.7/3	19.5/2?	21.7/m	24.7	26.4/2	29*/2		31.3

Feb. 9, 1921 Reduction scheme: The BT's, the T's and the Monthly SSpots all give agreement in their respective groups: To correlate the various periods noted Plot them & analyze for intervals either differential or logarithmic. Plot thus: ~~cut a slit~~ lay off a scale, left to right to cover all periods in say 60 cm; then cut a slit at each period making its ordinate proportional to emphasis i.e. conspicuousness of period.

	Dist	Time (days)	T / 2.83 d	mos
Mercury	35.8	88.0	31.1	1.
Venus	66.8	224.7	79.2	2.6
Earth	92.5.	365.3	129.0	4.24.
Mars	141	687	243	= 8.0
Ast.		year	mos	yrs
Jupiter	484	11.86	50.4	= 4.2
Saturn	882	29.46	124.8	10.4
Uranus	1774	84.02		29.7
Neptune	2780	164.88		58.3

Distances for 55 Monthly Periods noted

mos.	yrs of Planet	mos.	days
7.8	1.84	= 22.08	= 672
9.2	2.17	26.04	= 792
10.3	2.43	29.16	
11.4	2.69		
13.7	3.24		
15.1	3.56		
17.3	4.08		
19.4	4.58		
21.4	5.05		
22.9	5.4		
25±	5.9		
27.2	6.42		

N.B. The mean difference bet. periods obtained today, $1.15^{\text{mos}} = 35.1$ days may be a revolution of some or a Mercury minor group whose period would be 31 days

$$\frac{35.1}{30.44} = 1.15^{\text{mo.}} \text{ of } \frac{1.15}{12} \times 2.83 = 3.25^{\text{mos}}$$

Feb. 10. 1921

T.s. 6.0 var to 5.4

10.5 var to 9.0 – 10.1 best = 1.01 yrs

14.3 fair – 1 is midway

$\frac{29.5}{3}$ + $\frac{20.0}{2}$

Analysis gives 1.00 yr increments

Periods are years

9.4 13.6 16.4 19.4 27.6

11.4 14.7 17.6 22.3

B.T. Small ones at $\frac{20.0}{2}$

Large at 19.2

$\frac{25.7}{3}$ Harmonic!

$\frac{29.6}{m}$

Periods are

6.15 years

$\frac{7.18}{3}$

8.26

$\frac{9.54}{4}$

$\frac{11.3}{2}$

12.3

13.1

$\frac{14.4}{2}$

15.6

$\frac{17.2}{2}$

$\frac{19.0}{2}$

22.1/2 to $\frac{27.4}{2+3}$

19.3 17.4 $\frac{31.4}{m}$

15.7

11.9

10.1 will take most

6.8 will take all but 4

$\frac{6.8}{2}$ will take all (with small ones a trace out of line

Multiples of 1 yr are the controlling factors

1.92 yrs enters also of = 23.04 mos

Mos = 1.88 yrs

SS by Mo. 1750–1916

mo. .73 forms good line

only 1 divides it in 2

11.5 (= 1.15 mo) best line

$\frac{14.45}{2+3}$ harmonic

$\frac{34.5}{3}$

$\frac{22.6}{2}$

19.7 somewhat scattered

12 | 365.25

30.44

1.15

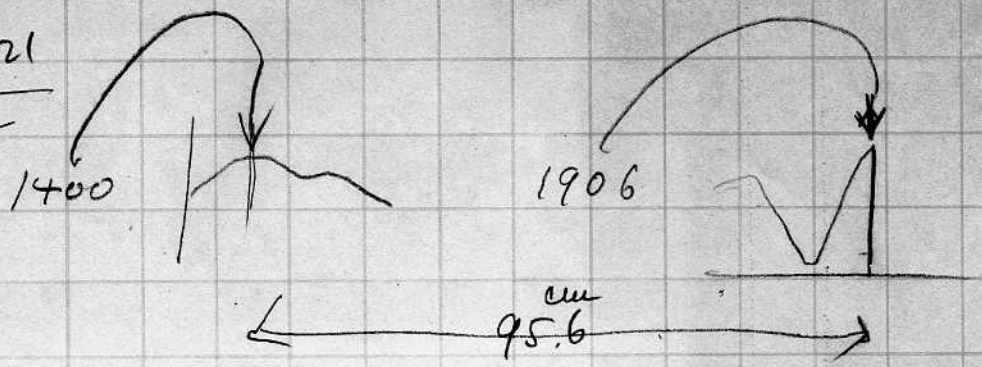
35.1 days

Is this a rotation of sunes core? ~~(or is it a mercury meteor swarm).~~

Periods are mos = 7.8, 9.2, 10.3, 11.4, 13.7, 15.1, 17.3, 19.4, 21.4–22.9, 25± 27.2

2/12/21

2



5.07

5yr Stand 2.2 mm short in 60 cm 500 yr long

L .6 20.1
R .5 19.9

Av. 25.05 L 25.25
R 24.95

Av 30.15 L 30.34
R 30.00

L 1/3 15.00
Av 15.06 R 1/3 "
Center 15.2

Av 10.1 L 1/3 10.08
R 10.09
Center 10.13

Av. 7.6

2/12/21

Old Vt Rain - small variations - now re-analyzd

single

10.0 * | 13.0/2 = 15.1/m | wf 16.5 | 19.0D | 19.8 Db | 23.4 25 25.0 or 23.4 or Bet. | D(vT) 26.8 | Tiffs 30.0 or 28.7 | vr 32.1 | poor 34.0 single line

Early .6 carries a well marked double at 10.8

7.0 latehalf changing to 6.7 in middle

5.2 to 5 (var in Early part)

= intermittent

10.0 = 2.00 cm × 1.241 yrs per cm = 2.48 yrs = 29.8 mos

10.8 = 2.16 "

2.68

1.34 = 16.1

Cover made 8/4/14

Shrinkage 4½ mm in 60 cm

Black strips 62.0 cm of fast

1835
1912
62 | 77 yrs
1.241

MWR June 1909

32.8 Min 1880.6

21.2 Min 1884.3

These check well on 1912 Curve
("Century Curve")

Negs 2/12/21

1 5.7 yr pd in Flag - sub

2 Views of White Pdgp

Analyses Exp 2m 22 yr Flag pd -
Exp 2m showing interference
Exp ½m Flag 7-500 at 7.1 (na