

HIGHWAY #9

LEVEL BOOK
370

9



KEUFFEL & ESSER CO.

DRAWING MATERIALS

AND

SURVEYING INSTRUMENTS.

NEW YORK.

SAN FRANCISCO.

ST LOUIS.

CHICAGO.

TABLES FOR EXCAVATIONS AND EMBANKMENTS.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 18 FEET WIDE. SIDE SLOPES 1 TO 1.

FOR SINGLE TRACK EXCAVATION.

"Copyright, 1895, by Keuffel & Esser Co."

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	0
1	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	1
2	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	2
3	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	3
4	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	4
5	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	5
6	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	6
7	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	7
8	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	8
9	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	9
10	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	10
11	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	11
12	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	12
13	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	13
14	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	14
15	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	15
16	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	16
17	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	17
18	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	18
19	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	19
20	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	20
21	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	21
22	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	22
23	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	23
24	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	24
25	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	25
26	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	26
27	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	27
28	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	28
29	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	29
30	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	30
31	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	31
32	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	32
33	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	33
34	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	34
35	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	35
36	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.

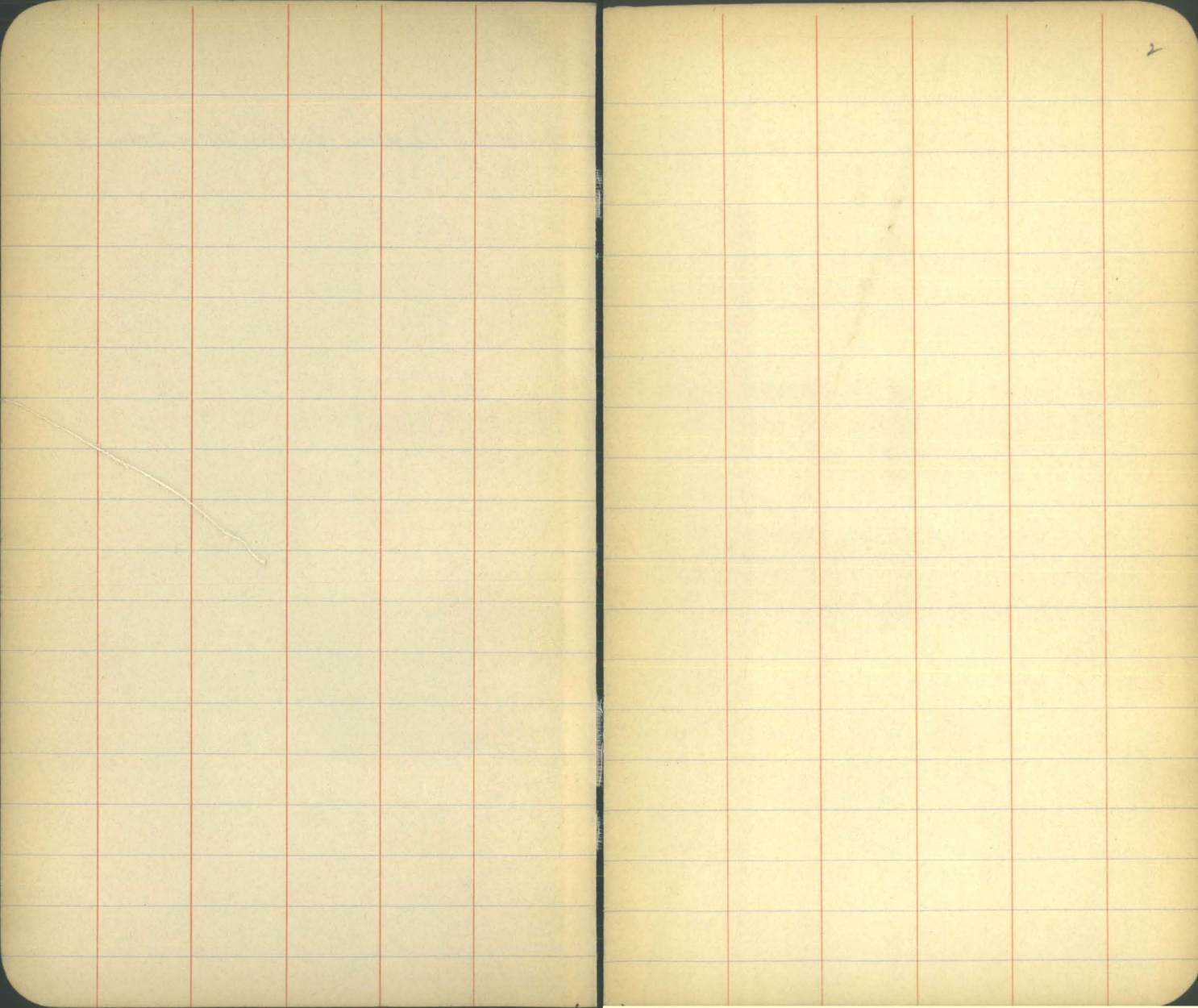
Highway #9

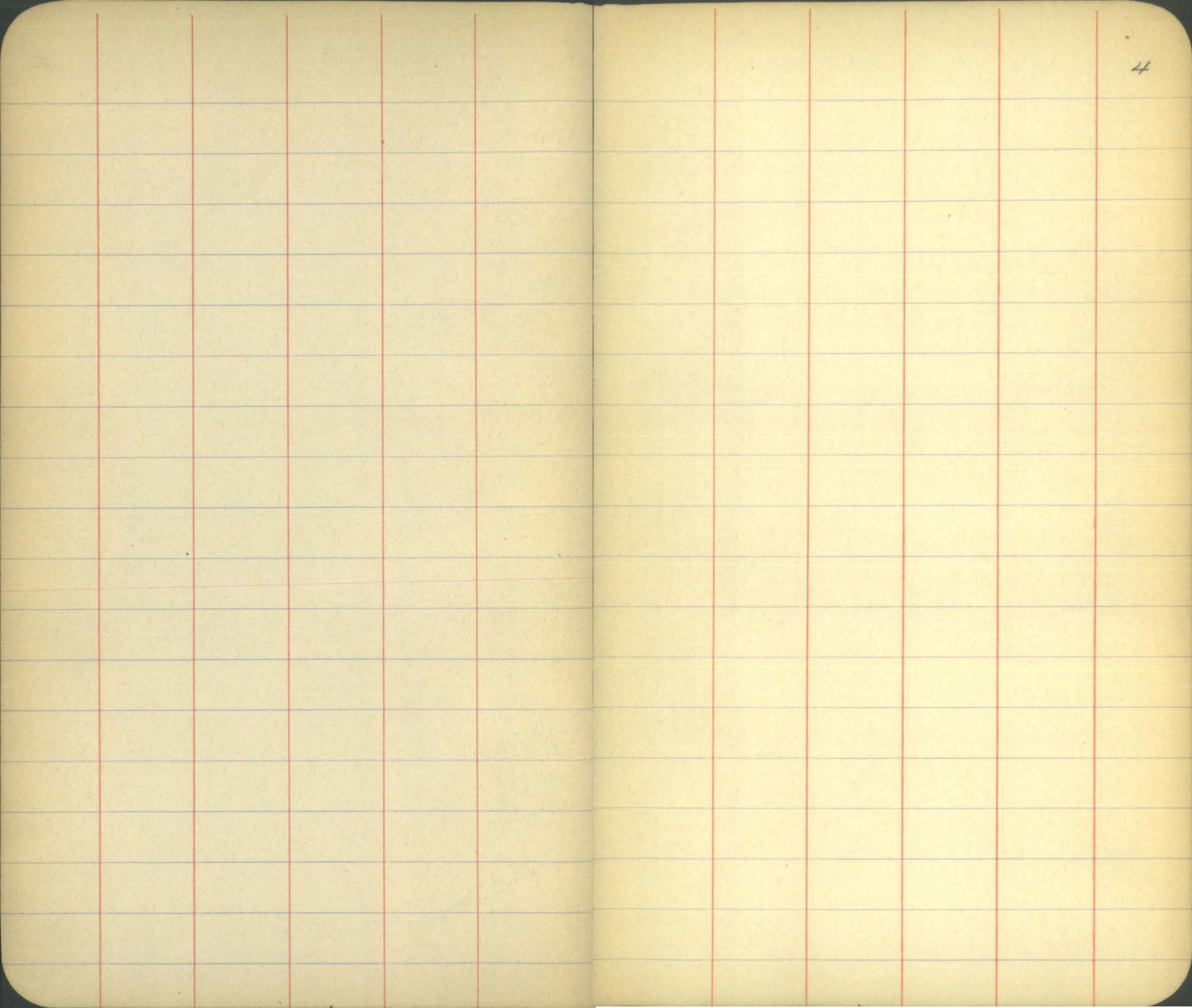
Entered 1922 C.P.H.

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Page

NEW WATERLOO + CEDAR FALLS ROAD CROSS SECTION STATIONS 5 TO 22





X section Whitney Road

4/5/13

B.M. 3.40 110.38 107.98

4.85 5.03 105.35

1.77 111.94 110.17

6.19 105.75

4.85 5.06 111.81 5.19 106.75

R

C

5- 21 6.20 105.6 16 5.80 106.00 5.00

B.M. 3.46 108.35

6- 12 5.50 106.30 5.00 106.80 4.90

7- 18 6.60 105.20 5.90 105.90 5.80

8- 14 6.20 105.60 5.30 106.50 5.10

9- 10 6.80 105.00 5.60 106.20 5.50

10 17 6.30 105.50 5.10 106.70 5.00

11 15 6.10 105.70 5.20 106.60 5.30

T.P. 6.04 112.81 5.04 106.77

12 10 6.60 106.20 5.90 106.90 6.00

Spike Elec pole 2nd W C.R.I. + P.

Rail C.R.I. + P.

C.R.I. + P Rail on S road

Stone at limit line

Rail C.R.I. + P

	11		16	
106.80	5.00	106.80	5.60	106.20

Spike Elec pole 2nd W C.R.I. + P.

106.90	4.80	107.00	5.20	106.60
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106.00	6.40	105.40	6.20	105.60
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106.70	5.25	106.50	5.50	106.30
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106.30	5.40	106.40	5.80	106.00
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106.80	4.90	106.90	5.20	106.60
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106.50	5.30	106.50	5.70	106.10
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	12		11	
106.80	5.90	106.90	6.30	106.50

112.81

5

12

C

h

13	$\frac{13}{7.00}$	105.80	$\frac{7}{5.80}$	107.00	5.80
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107.00	$\frac{15}{5.80}$	107.00	$\frac{17}{6.40}$	106.40
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14	$\frac{13}{5.90}$	106.90	$\frac{9}{5.40}$	107.40	5.20
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107.60	$\frac{16}{5.30}$	107.50	$\frac{18}{5.50}$	107.30
--------	-------------------	--------	-------------------	--------

+90			3.46	109.35	109.57
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Rail WLF&N

15	$\frac{20}{6.10}$	106.7	$\frac{17}{4.50}$	108.3	4.40
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108.4	$\frac{12}{4.50}$	108.3	$\frac{18}{5.40}$	107.4
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16	$\frac{16}{8.10}$	104.7	$\frac{17}{6.60}$	106.2	6.60
----	-------------------	-------	-------------------	-------	------

106.2	$\frac{17}{6.70}$	106.1	$\frac{22}{7.10}$	105.7
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T.P.	7.24	116.33	3.77	109.04	
------	------	--------	------	--------	--

End Concrete bridge

17	$\frac{13}{10.5}$	106.3		10.00	
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106.3	$\frac{2}{10.00}$	106.3	$\frac{10.5}{10.80}$	106.0 on bridge
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18	$\frac{12}{9.40}$	106.9	$\frac{2}{9.10}$	107.2	9.10
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107.2	$\frac{14}{9.60}$	106.7	$\frac{16}{9.90}$	106.4
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19	$\frac{14}{5.20}$	111.1	$\frac{13}{5.00}$	111.3	5.00
----	-------------------	-------	-------------------	-------	------

111.3	$\frac{7}{5.50}$	110.8	$\frac{12}{6.20}$	110.1
-------	------------------	-------	-------------------	-------

20	$\frac{19}{1.90}$	114.4	$\frac{13}{1.40}$	114.9	1.60
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114.7	$\frac{6}{1.60}$	114.7	$\frac{9}{2.80}$	113.5
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T.P.	9.95	125.92	0.36	115.97	
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21	$\frac{15}{7.80}$	118.10	$\frac{12}{7.30}$	118.60	7.40
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118.50	$\frac{8}{7.70}$	118.2	$\frac{13}{9.00}$	116.9
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22	$\frac{12}{4.40}$	121.5	$\frac{8}{3.70}$	122.2	3.70
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122.2	$\frac{2}{4.20}$	121.7	$\frac{12}{4.80}$	121.1
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23	$\frac{13}{1.00}$	124.9	$\frac{2}{0.30}$	125.6	0.10
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125.80	$\frac{8}{0.45}$	125.4	$\frac{14}{1.40}$	124.5
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T.P.	11.76	136.97	0.71	125.21	
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24	$\frac{2}{5.70}$	131.3	$\frac{5}{4.90}$	132.1	4.90
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132.1	$\frac{9}{5.10}$	131.9	$\frac{13}{5.30}$	131.7
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+66	$\frac{8}{0.50}$	136.5	$\frac{6}{0.60}$	136.9	0.00
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137.0	$\frac{13}{0.00}$	137.0	$\frac{12}{0.20}$	136.8
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R 136.97

C

L

T.P. 12.87 145.87 3.97 133.00

End Culvert pipe at Houses mail box

T.P. 12.42 157.83 0.46 145.44

$$\begin{array}{r} 10 \\ 26788 \quad 9.90 \end{array}$$

$$\begin{array}{r} 5 \\ 9.70 \end{array}$$

9.80

$$\begin{array}{r} 10 \\ 148.0 \quad 10.20 \end{array}$$

$$\begin{array}{r} 18 \\ 10.80 \end{array}$$

$$\begin{array}{r} 10 \\ 27 \quad 9.50 \end{array}$$

148.30

$$\begin{array}{r} 6 \\ 9.20 \end{array}$$

148.60

9.40

$$\begin{array}{r} 10 \\ 148.40 \quad 10.60 \end{array}$$

147.84

$$\begin{array}{r} 13 \\ 10.30 \end{array}$$

147.50

$$\begin{array}{r} 10 \\ 28 \quad 6.00 \end{array}$$

151.80

$$\begin{array}{r} 7 \\ 5.70 \end{array}$$

152.10

5.50

$$\begin{array}{r} 10 \\ 152.30 \quad 6.20 \end{array}$$

$$\begin{array}{r} 12 \\ 6.50 \end{array}$$

151.30

$$\begin{array}{r} 18 \\ 29 \quad 3.80 \end{array}$$

$$\begin{array}{r} 2 \\ 3.30 \end{array}$$

2.70

$$\begin{array}{r} 4 \\ 154.90 \quad 3.60 \end{array}$$

$$\begin{array}{r} 12 \\ 4.20 \end{array}$$

153.80

$$\begin{array}{r} 12 \\ +28 \quad 3.20 \end{array}$$

$$\begin{array}{r} 6 \\ 2.70 \end{array}$$

2.10

$$\begin{array}{r} 10 \\ 155.70 \quad 2.60 \end{array}$$

$$\begin{array}{r} 14 \\ 3.20 \end{array}$$

B.M. 8.00 149.80

149.59

Bass road on left

T.P. 5.43 161.35 1.91 155.92

$$\begin{array}{r} 12 \\ 34788 \quad 5.10 \end{array}$$

$$\begin{array}{r} 8 \\ 4.70 \end{array}$$

4.20

$$\begin{array}{r} 2 \\ 157.2 \quad 4.30 \end{array}$$

$$\begin{array}{r} 12 \\ 4.30 \end{array}$$

38	$\frac{12}{4.90}$	$\frac{17}{161.35}$	$\frac{8}{4.70}$	156.6✓	4.30	157.00	$\frac{10}{4.60}$	156.8✓	$\frac{L}{12}$ $\frac{12}{4.70}$	156.6✓
39	$\frac{11}{7.80}$	153.50	$\frac{6}{6.90}$	154.5✓	6.40	154.90	$\frac{10}{6.30}$	155.0✓	$\frac{12}{6.50}$	154.9✓
34	$\frac{12}{9.90}$	151.90	$\frac{5}{8.80}$	152.50✓	8.30	153.00	$\frac{8}{8.70}$	153.20✓	$\frac{12}{8.50}$	152.80✓
35	$\frac{12}{12.50}$	148.9✓	$\frac{6}{11.00}$	150.4✓	10.50	150.80	$\frac{12}{10.90}$	150.5	$\frac{15}{12.50}$	148.9✓ 10.4✓
36	$\frac{12}{10.10}$	150.3	$\frac{6}{9.50}$	151.9	9.10	152.20	$\frac{10}{8.80}$	152.6	$\frac{14}{9.20}$	152.2
T.P.	$\frac{10.69}{9}$	$\frac{162.20}{9}$	$\frac{9.84}{6}$	151.51						
+25	9.90		9.30		9.00	153.2	$\frac{12}{8.70}$		$\frac{10}{8.60}$	
T.P.	4.25	165.81	0.64	161.56						
			3.34	162.47	162.34					
T.P.	0.20	153.50	12.51	153.30						
T.P.	4.18	149.53	8.15	145.55						

Foundation of K. for School (Castle Hill)

	R 149.53			C		2644.00			
46+44	$\frac{14}{5.90}$	143.6✓	$\frac{12}{5.90}$	143.6✓	5.20	144.30	$\frac{10}{4.70}$	144.8✓	$\frac{15}{4.00}$ 145.5✓
47	$\frac{60}{8.60}$	140.9	$\frac{12}{8.50}$	141.0	8.20	141.30	$\frac{8}{7.50}$	142.0	$\frac{12}{7.80}$ 141.7
470	$\frac{15}{13.00}$	136.50✓	$\frac{7}{9.00}$	140.5	9.00	140.50	$\frac{8}{9.60}$	139.9	$\frac{12}{11.30}$ 138.2
48	$\frac{13}{10.00}$	139.50✓	$\frac{8}{8.50}$	141.20✓	8.40	141.10	$\frac{8}{8.60}$	140.9	$\frac{13}{10.90}$ 138.6
460	$\frac{12}{6.20}$	143.3	$\frac{8}{5.60}$	143.9	5.40	144.10	$\frac{8}{4.70}$	144.8	$\frac{12}{6.10}$ 143.4
T.P.	1.27	151.20	0.60	148.93					
51+75	$\frac{12}{9.30}$	141.80✓	$\frac{10}{8.90}$	142.30✓	9.10	142.10	$\frac{7}{9.10}$	142.20✓	$\frac{12}{9.30}$ 141.9
52	$\frac{15}{10.30}$	140.90✓	$\frac{9}{10.10}$	141.10✓	9.90	141.30	$\frac{11}{10.00}$	141.20✓	$\frac{14}{10.50}$ 140.70✓
T.P.	1.53	139.89	12.84	138.36					

17 139.89

C

L

53 $\frac{14}{3.80}$ 136.10 $\frac{8}{2.30}$ 137.60 1.90

138.00 $\frac{10}{2.20}$ 137.70 $\frac{15}{3.40}$ 136.80

54 $\frac{14}{6.00}$ 133.90 $\frac{7}{4.10}$ 135.80 3.70

136.20 $\frac{10}{3.80}$ 136.10 $\frac{15}{4.50}$ 135.40

55 $\frac{15}{7.30}$ 132.60 $\frac{7}{5.30}$ 134.60 5.00

134.90 $\frac{7}{5.20}$ 134.70 $\frac{14}{5.60}$ 134.30

56 $\frac{14}{7.90}$ 132.00 $\frac{6}{6.20}$ 133.70 6.10

133.80 $\frac{10}{5.90}$ 134.00 $\frac{13}{6.20}$ 133.70

57 $\frac{15}{7.50}$ 132.40 $\frac{7}{6.70}$ 133.20 6.50

133.40 $\frac{8}{5.90}$ 134.0 $\frac{12}{6.20}$ 133.7

450 $\frac{14}{7.60}$ 132.3 $\frac{7}{6.90}$ 133.0 6.40

133.50 $\frac{8}{6.20}$ 133.70 $\frac{15}{6.40}$ 133.50

T.P 1.82 135.10 6.61 133.28

59+75 $\frac{14}{11.00}$ 124.1 $\frac{10}{11.00}$ 124.1 10.60

124.50 $\frac{10}{10.40}$ 124.7 $\frac{12}{11.1}$ 124.0

T.P 0.89 125.06 10.93 124.17

R 125.06

C

L

60	$\frac{17}{2.70}$	122.30 ✓	$\frac{15}{2.40}$	122.60 ✓	1.80
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123.20	$\frac{15}{1.90}$	123.10 ✓	$\frac{17}{3.20}$	121.80 ✓
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61	$\frac{9}{6.00}$	119.06 ✓	$\frac{7}{5.50}$	119.50 ✓	5.00
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120.00	$\frac{11}{5.20}$	119.80 ✓	5.70	119.30 ✓
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62	$\frac{12}{8.40}$	116.60 ✓	$\frac{7}{8.10}$	116.90 ✓	7.60
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117.40	$\frac{10}{7.50}$	117.50 ✓	$\frac{12}{7.50}$	117.50 ✓
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63	$\frac{10}{9.90}$	115.10 ✓	$\frac{5}{9.40}$	115.60 ✓	9.00
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116.00	$\frac{10}{8.80}$	116.20 ✓	$\frac{14}{8.60}$	116.40 ✓
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64	$\frac{15}{8.00}$	117.00 ✓		7.80
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117.20		$\frac{13}{8.40}$	116.60 ✓ on bridge
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T.P.	6.32	<u>124.45</u>	6.93	118.13
65	$\frac{12}{6.60}$	117.80 ✓	$\frac{8}{6.00}$	118.4 ✓
				5.80

End bridge right side

118.60	$\frac{8}{6.20}$	118.20 ✓	$\frac{12}{7.00}$	117.40 ✓
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66	$\frac{12}{4.10}$	120.30 ✓	$\frac{7}{3.70}$	120.70 ✓	3.50
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120.90	$\frac{7}{3.80}$	120.60 ✓	$\frac{12}{4.60}$	119.8 ✓
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67	$\frac{12}{1.90}$	122.50 ✓	$\frac{8}{1.90}$	122.50 ✓	1.90
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122.50	$\frac{8}{2.20}$	122.1 ✓	$\frac{12}{2.70}$	121.7 ✓
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4/17/13

R

B.M.	10.00	<u>128.13</u>		118.13	
	<u>14</u>		<u>10</u>		
66	4.10	124.0	3.70	124.4	3.20
			4.52	123.61	

	7.98	<u>126.11</u>		118.13	
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T.P.	12.80	<u>138.41</u>	0.50	125.61	
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72+25	<u>17</u>		<u>10</u>		
	4.10	134.3	3.60	134.8	3.60

73	<u>14</u>		<u>9</u>		
	2.90	135.5	2.70	135.7	2.50

74	<u>15</u>		<u>9</u>		
	1.40	137.0	1.10	137.2	1.00

T.P.	12.81	<u>150.27</u>	0.65	137.76	
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75	<u>15</u>		<u>9</u>		
	11.60	138.7	10.90	139.4	10.40

78	<u>16</u>		<u>9</u>		
	2.90	147.4	2.50	147.8	2.60

L

E end bridge right side Sta 64

	<u>13</u>		<u>15</u>		
124.80	3.60	124.5	4.40	123.7	

Non E end bridge R side at Sta 64

	<u>10</u>		<u>16</u>		
134.8 ✓	3.80	134.6	5.60	132.8	

	<u>8</u>		<u>18</u>		
135.90 ✓	2.70	135.7	4.70	133.7	

	<u>7</u>		<u>14</u>		
137.40 ✓	1.10	137.2	2.70	135.7	

	<u>7</u>		<u>14</u>		
139.90 ✓	10.90	139.4	12.10	138.2	

	<u>7</u>		<u>13</u>		
147.70 ✓	3.00	147.3	4.40	145.9	

R

150.27

T.P. 12.76 162.74 0.29 149.9879 $\frac{12}{12.20}$ 150.5 $\frac{9}{12.20}$ 150.5 12.00775 $\frac{16}{7.80}$ 154.9 $\frac{10}{7.50}$ 155.2 7.20T.P. 12.71 174.39 10.6 161.6882+12 $\frac{11}{9.80}$ 164.6 9.8083 $\frac{12}{9.80}$ 164.6 10.0084 $\frac{12}{5.60}$ 168.8 6.00+40 $\frac{17}{3.70}$ 170.7 $\frac{15}{3.20}$ 171.2 3.7085425 $\frac{17}{0.50}$ 173.9 $\frac{7}{1.50}$ 172.9 1.70

L

150.70 $\frac{9}{12.20}$ 150.5 $\frac{16}{13.00}$ 149.7155.50 $\frac{12}{7.90}$ 154.8 $\frac{16}{8.70}$ 154.0164.6 $\frac{11}{10.50}$ 163.9164.4 $\frac{9}{10.50}$ 163.9 $\frac{14}{11.10}$ 163.3168.4 $\frac{9}{6.50}$ 167.9 $\frac{15}{6.50}$ 167.9170.7 $\frac{6}{3.80}$ 170.6 $\frac{9}{4.30}$ 170.1172.7 $\frac{11}{2.30}$ 172.1 $\frac{19}{4.00}$ 170.4

R 17439

C

h

86	$\frac{10}{3.10}$	171.3	3.20
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171.2 [✓]	$\frac{10}{3.80}$	170.6	$\frac{15}{4.70}$	169.7
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87	$\frac{16}{2.60}$	171.8	$\frac{9}{2.40}$	172.0	2.70
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171.7 [✓]	$\frac{11}{2.90}$	171.5	$\frac{14}{3.70}$	170.7
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T.P.	12.62	<u>186.44</u>	0.57	173.82
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88	$\frac{16}{11.50}$	174.9	$\frac{9}{11.50}$	174.9	11.50
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174.9 [✓]	$\frac{8}{11.60}$	174.8	$\frac{15}{11.50}$	174.9
--------------------	-------------------	-------	--------------------	-------

89	$\frac{15}{5.30}$	181.2	$\frac{13}{4.80}$	181.6	4.70
----	-------------------	-------	-------------------	-------	------

181.7 [✓]	$\frac{10}{4.70}$	181.7
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T.P.	7.82	<u>193.45</u>	0.81	185.63
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91+35	$\frac{10}{6.00}$	187.4	$\frac{8}{5.60}$	187.8	5.40
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188.0 [✓]	$\frac{7}{5.80}$	187.6	$\frac{9}{6.10}$	187.4
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92	$\frac{11}{9.40}$	184.0	9.30
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184.1 [✓]	$\frac{8}{9.50}$	184.0
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93	$\frac{15}{11.20}$	182.2	$\frac{13}{10.80}$	182.6	10.53
----	--------------------	-------	--------------------	-------	-------

182.9 [✓]	$\frac{8}{11.20}$	182.2	$\frac{15}{12.10}$	181.4
--------------------	-------------------	-------	--------------------	-------

IP 193.45

C

L

94 $\frac{14}{7.60}$ 185.80 7.60 185.8 7.50

186.0

$\frac{12}{7.70}$ 185.7

+50 $\frac{12}{4.10}$ 189.3 $\frac{7}{4.00}$ 189.4 3.80

189.6

$\frac{12}{4.10}$ 189.4

T.P 6.77 197.60 2.62 190.83

97 $\frac{12}{6.20}$ 191.4 6.40

191.20

$\frac{10}{6.10}$ 190.7

98 $\frac{12}{9.90}$ 187.7 9.80

187.80

$\frac{11}{10.40}$ 187.2

99 $\frac{14}{11.00}$ 186.6 11.20

186.40 $\frac{8}{11.40}$ 186.2

$\frac{15}{12.20}$ 185.3

100 $\frac{15}{10.10}$ 187.5 $\frac{12}{9.80}$ 187.8 9.80

187.80 $\frac{10}{10.40}$ 187.2

$\frac{10}{10.40}$ 187.2

101 $\frac{13}{6.60}$ 191.0 5.50

192.10

$\frac{10}{6.50}$ 191.1

T.P 11.03 ⁴⁵203.57 ⁴²5.18 192.48

	R				C	
	203.45					
102	$\frac{10}{9.60}$	193.8	$\frac{17}{9.20}$	194.2	9.00	194.50 [✓]
103	$\frac{11}{7.90}$	195.5			7.60	195.90 [✓]
104	$\frac{13}{6.70}$	196.7			6.10	197.40 [✓]
105	$\frac{13}{4.60}$	198.8			3.90	199.60 [✓]

		L	
	$\frac{10}{7.90}$	193.5	
	$\frac{10}{8.50}$	195.0	
	$\frac{13}{7.00}$	196.5	
	$\frac{10}{4.60}$	196.8	

			201.63 NBB		
		3.65	199.86		
107+50	$\frac{13}{2.70}$	200.7		1.60	
T.P.	3.35	204.85	1.95	201.50	
108	$\frac{13}{4.50}$	200.40 [✓]		3.40	201.50 [✓]
109	$\frac{13}{4.60}$	200.30 [✓]		4.20	200.7 [✓]

		Burr Oak height 104+70	
	$\frac{13}{2.80}$	201.8	
	$\frac{13}{3.50}$	201.4	
	$\frac{13}{3.80}$	201.0	

R 204.85

C

h

$$\begin{array}{r} 13 \\ 110 \quad 4.60 \end{array} \quad 200.30$$

3.80

201.10[✓]

4.10 200.8

$$\begin{array}{r} 13 \\ 111 \quad 5.30 \end{array} \quad 199.60$$

4.50

200.40[✓]

$$\begin{array}{r} 13 \\ 4.80 \end{array} \quad 200.1$$

$$\begin{array}{r} 13 \\ 112 \quad 6.40 \end{array} \quad 198.50$$

5.70

199.20[✓]

$$\begin{array}{r} 13 \\ 5.90 \end{array} \quad 199.0$$

$$\begin{array}{r} 13 \\ 113 \quad 6.80 \end{array} \quad 198.11$$

6.00

198.90[✓]

$$\begin{array}{r} 13 \\ 6.20 \end{array} \quad 198.7$$

$$\begin{array}{r} 13 \\ 114 \quad 6.20 \end{array} \quad 198.7$$

5.60

199.30[✓]

$$\begin{array}{r} 13 \\ 5.70 \end{array} \quad 199.2$$

$$\begin{array}{r} 13 \\ 115 \quad 4.80 \end{array} \quad 200.1$$

4.40

200.50[✓]

$$\begin{array}{r} 13 \\ 4.40 \end{array} \quad 200.5$$

T.P. 9.08 209.70 4.23 200.62

$$\begin{array}{r} 13 \\ 116 \quad 8.80 \end{array} \quad 200.90$$

8.20

201.50[✓]

$$\begin{array}{r} 13 \\ 9.00 \end{array} \quad 200.7$$

$$\begin{array}{r} 13 \\ 117 \quad 8.40 \end{array} \quad 201.30$$

8.20

201.50[✓]

$$\begin{array}{r} 13 \\ 8.90 \end{array} \quad 200.8$$

	TP	$\frac{13}{209.76}$		C			$\frac{L}{200.90}$
118	$\frac{13}{8.00}$	201.76		8.00	201.70		8.80
119	$\frac{13}{7.00}$	202.7		7.20	202.50		$\frac{13}{8.00}$
+75	$\frac{10}{6.20}$	203.50		5.80	203.90		$\frac{12}{6.80}$
123+10	$\frac{12}{5.90}$	203.8		5.70	204.6		$\frac{12}{5.10}$
124	$\frac{11}{8.90}$	200.8		7.80	201.9		$\frac{8}{8.10}$
TP	1.38	$\frac{202.56}{198.00}$	8.52	201.18			$\frac{11}{4.20}$
125	$\frac{10}{4.60}$	198.00		3.60	199.00		198.40
126	$\frac{15}{7.70}$	194.9	$\frac{8}{7.70}$	194.9	7.10	195.5	$\frac{13}{7.10}$
126+25		7.91	194.65	Stone			

R 202.56

C

127	$\frac{8}{11.50}$	191.1	$\frac{8}{11.50}$	191.1	10.90	191.70 [✓]	$\frac{13}{11.00}$	191.6	$\frac{17}{11.80}$	190.8
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T.P	5.28	195.47	12.37	190.19						
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128	$\frac{13}{8.10}$	187.40 [✓]	$\frac{9}{7.70}$	187.80 [✓]	7.50	188.00 [✓]	$\frac{9}{7.60}$	187.90 [✓]	$\frac{13}{8.00}$	187.5
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129	$\frac{17}{9.80}$	185.70 [✓]	$\frac{13}{8.80}$	186.70 [✓]	8.70	186.80 [✓]			$\frac{13}{9.60}$	185.90 [✓]
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130	$\frac{13}{7.90}$	187.60 [✓]			8.00	187.50 [✓]			$\frac{13}{9.30}$	186.20 [✓]
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+75	$\frac{13}{6.10}$	189.40 [✓]			5.10	189.70 [✓]			$\frac{12}{7.10}$	188.4 [✓]
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132+55	$\frac{11}{4.80}$	190.7			4.10	191.0 [✓]			$\frac{13}{5.40}$	190.10 [✓]
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133	$\frac{13}{5.70}$	189.8			5.20	189.70 [✓]	$\frac{9}{6.20}$	189.2	$\frac{13}{7.20}$	188.3
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134	$\frac{13}{6.00}$	189.5			5.60	189.90 [✓]	$\frac{10}{6.20}$	189.3	$\frac{14}{7.00}$	188.5
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	R			C
	$\frac{13}{134+75}$	195.49 3.60 191.90		3.80
T.P.	3.20	198.12	0.55	194.96
138	$\frac{13}{6.50}$	191.60		6.10
139	$\frac{13}{9.80}$	188.30		9.80
140	$\frac{14}{12.20}$	186.00	$\frac{10}{11.60}$	186.50 11.40
+91			12.07	186.05
141	$\frac{12}{11.90}$	186.2		12.20
142	$\frac{13}{13.00}$	185.1		13.00
+25	$\frac{12}{13.00}$	185.1		13.00
T.P.	0.92	186.79	12.25	185.87

			141+60 49+50 20 157+50 10/60+50	
	$\frac{13}{4.60}$	191.70	190.9	
	$\frac{13}{7.20}$	192.0	190.9	
	$\frac{13}{10.40}$	188.3	187.7	
	$\frac{8}{11.60}$	186.7	186.5	185.7
		Stone on Sec line		
	$\frac{13}{12.60}$	185.9	185.5	
	$\frac{12}{13.40}$	185.1	184.3	183.9
	$\frac{13}{13.60}$	185.1	184.5	183.7

	$\overline{R}$		$\overline{C}$	
144+60	$\frac{13}{3.60}$	$\frac{186.79}{183.2}$		3.40
145	$\frac{13}{3.90}$	182.9	4.00	
146	$\frac{13}{4.70}$	182.1	4.90	
147	$\frac{13}{4.90}$	181.9	5.10	
148	$\frac{13}{4.60}$	182.2	5.30	
149	$\frac{13}{4.80}$	182.0	5.00	
+50	$\frac{13}{5.00}$	181.8	$\frac{11}{4.40}$	182.4 4.80
T.P	4.79	186.37	5.21	181.58
T.P	0.55	178.36	8.62	177.75

183.4 ^v	$\frac{12}{4.10}$	182.7	$\frac{13}{4.50}$	182.3
182.8 ^v			$\frac{13}{4.80}$	182.0
181.9 ^v			$\frac{13}{5.40}$	181.4
181.7 ^v			$\frac{13}{5.70}$	181.1
181.5 ^v			$\frac{13}{5.40}$	181.4
181.8 ^v			$\frac{13}{5.30}$	181.5
182.0 ^v	$\frac{10}{4.90}$	181.9	$\frac{13}{6.00}$	180.8

R

178.30

C

L

22

157+50 $\frac{13}{2.00}$ 176.3

1.50 176.8^v

$\frac{13}{2.70}$ 175.6

158 2.50 175.8

2.40 175.9^v

$\frac{8}{3.50}$ 174.8

159 $\frac{13}{4.45}$ 173.8

4.50 173.8^v

$\frac{13}{5.20}$ 173.1

160 $\frac{13}{6.80}$ 171.5

6.70 171.6^v

$\frac{13}{7.40}$ 170.9

+50 $\frac{13}{8.20}$ 170.1

7.90 170.4^v

$\frac{13}{8.40}$ 169.9

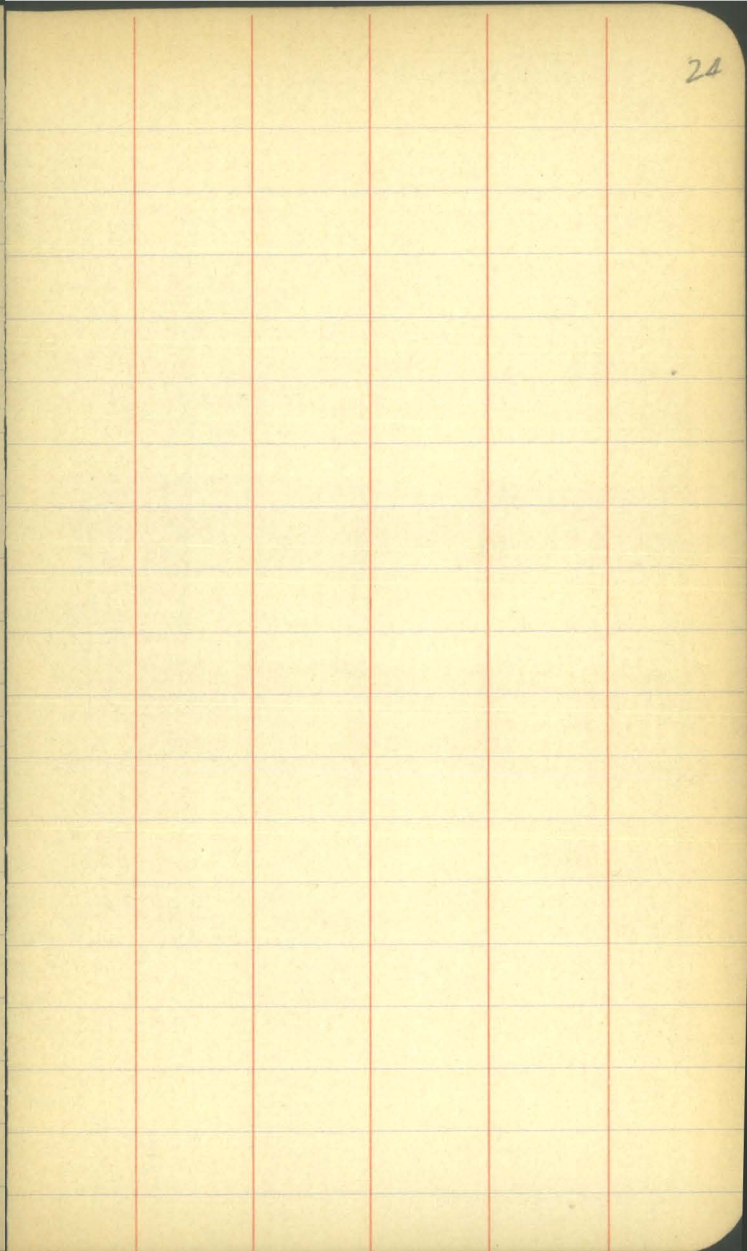
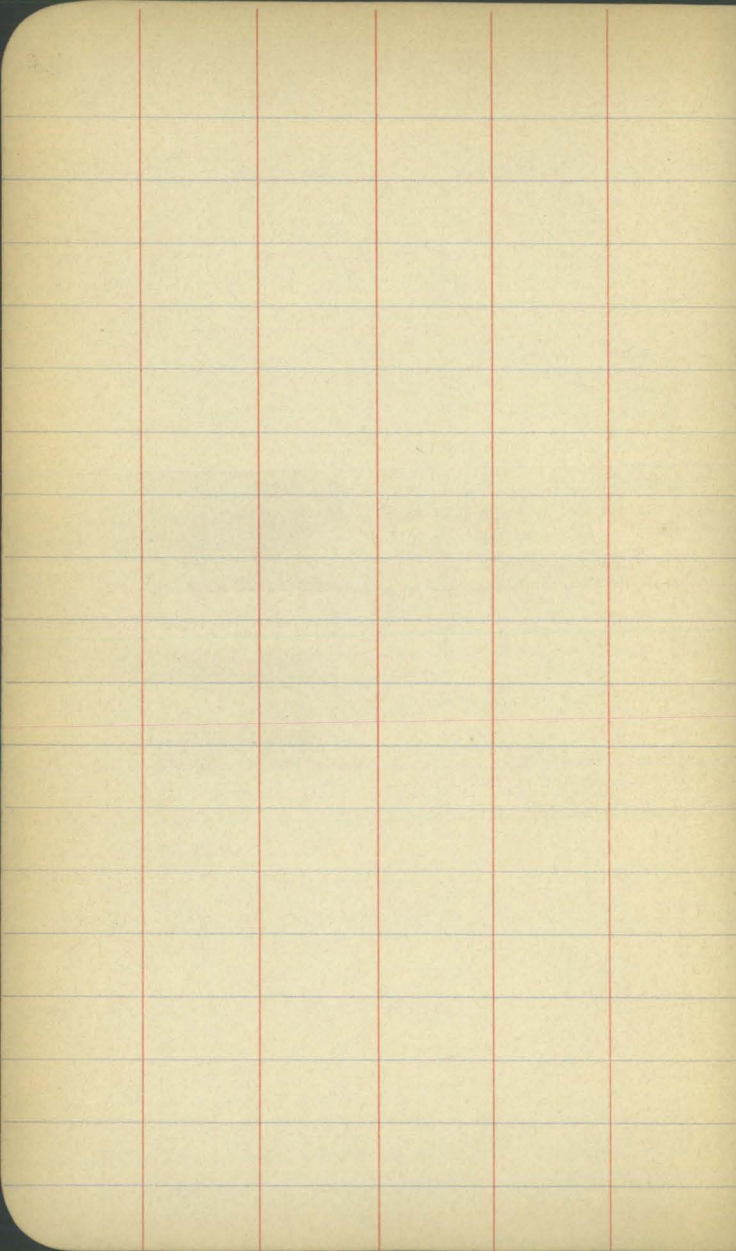
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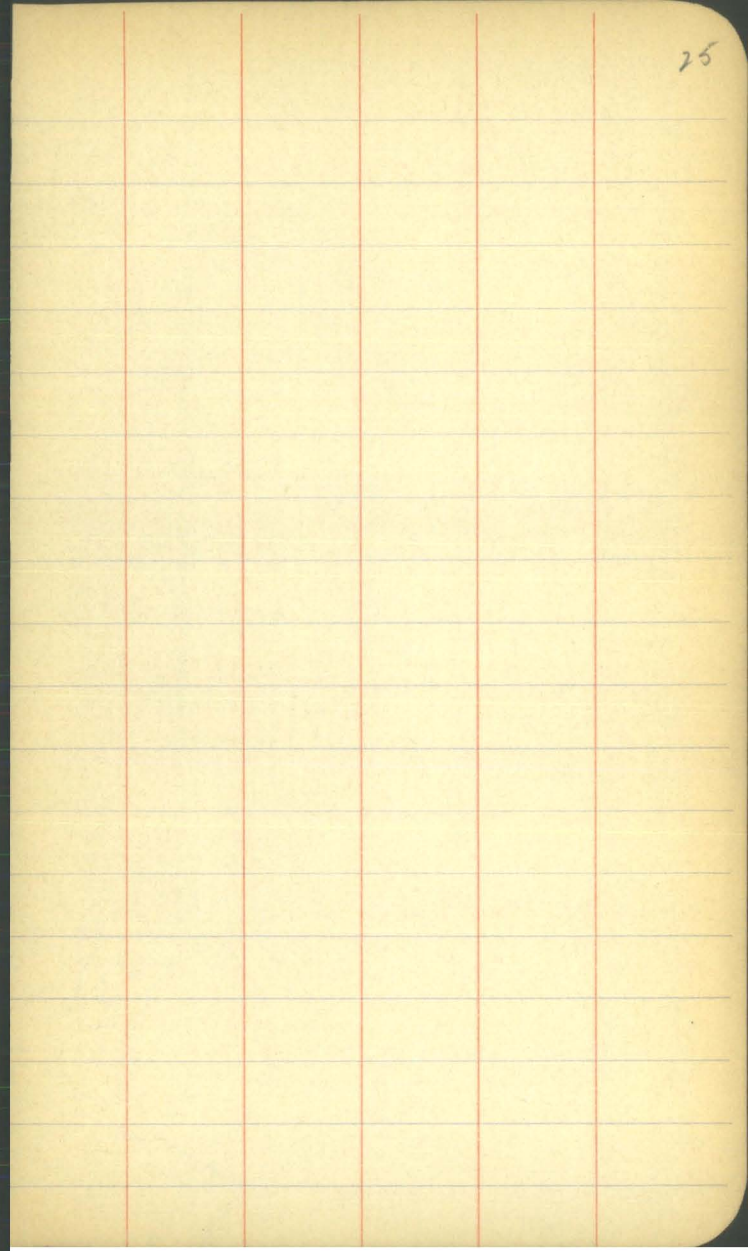
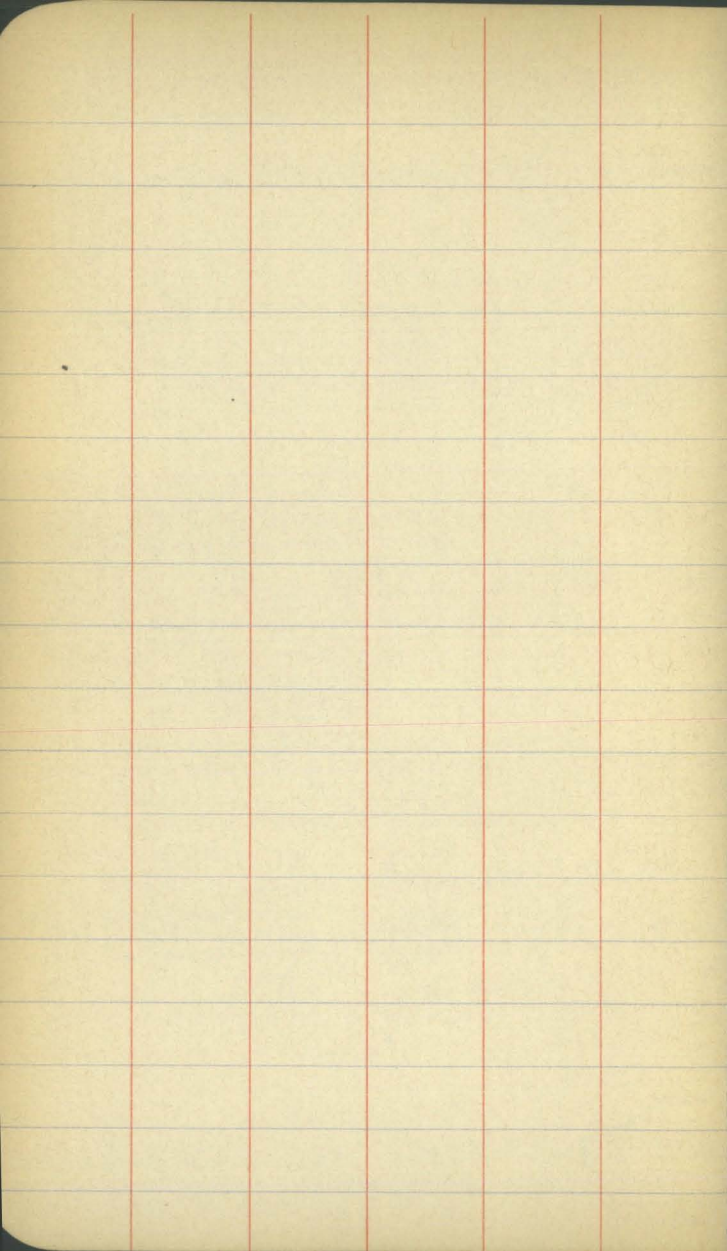
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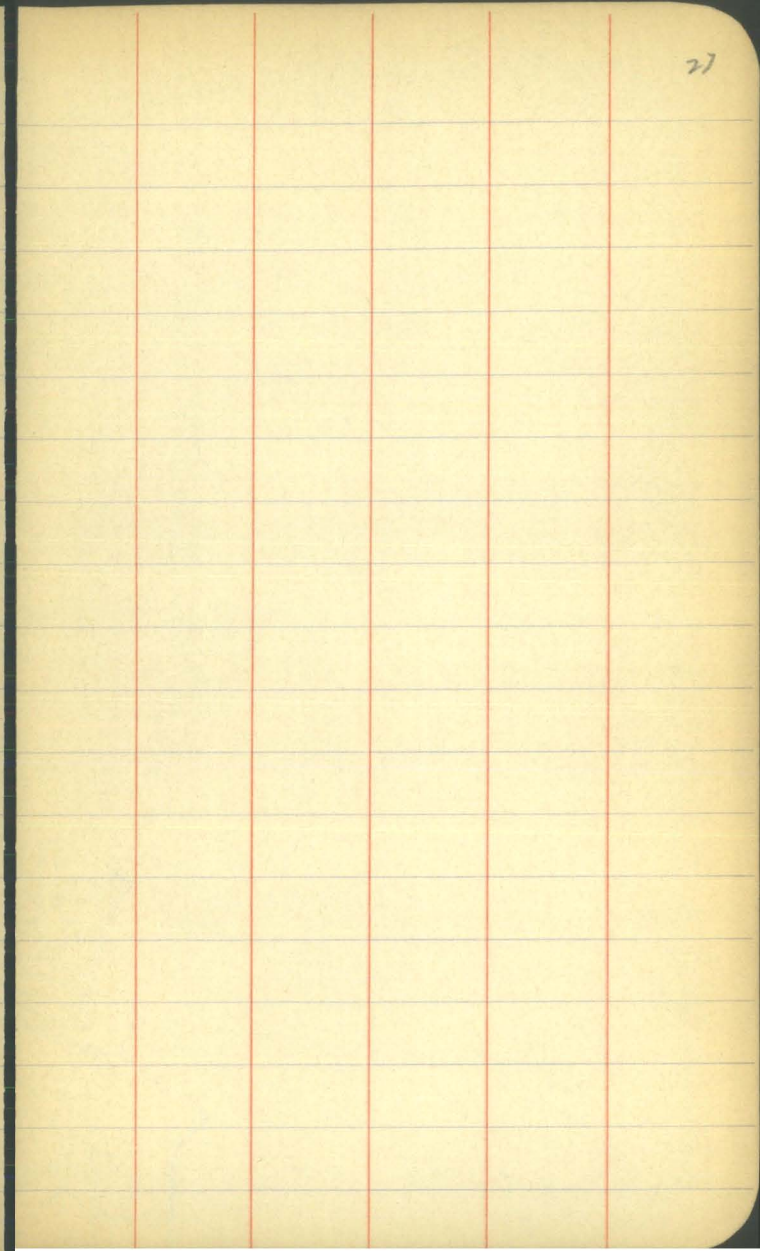
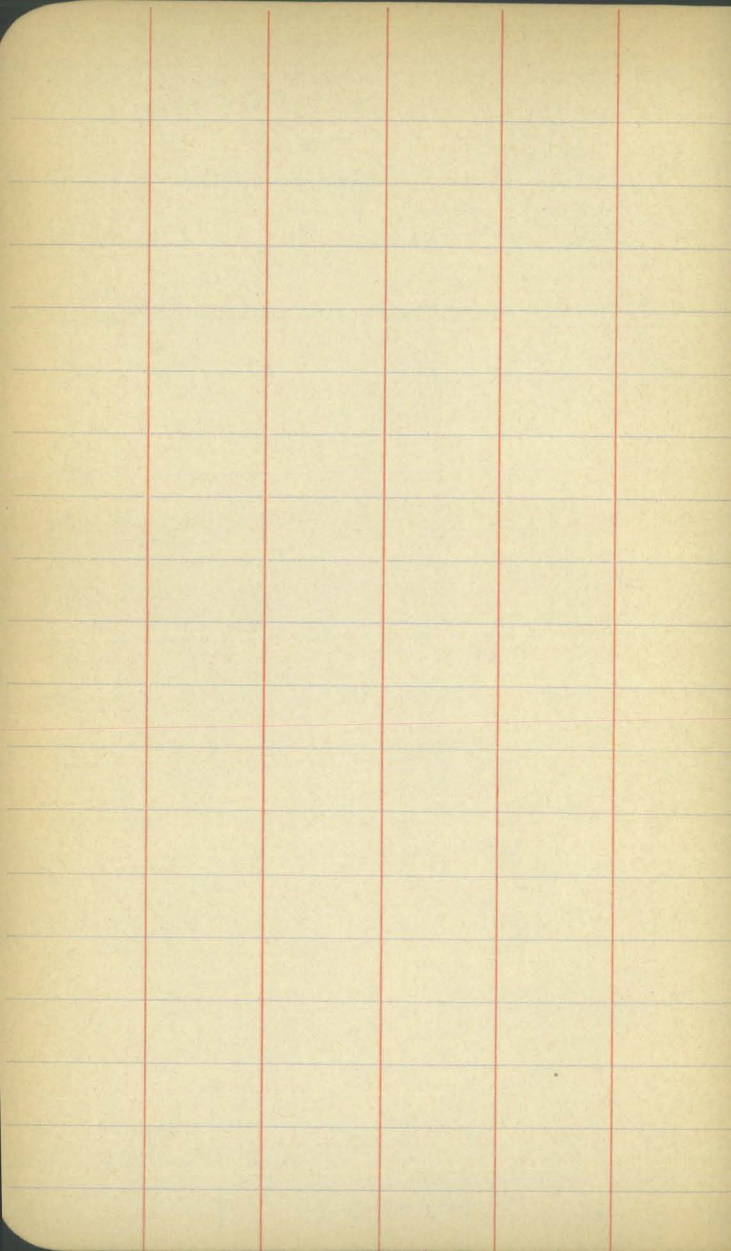
10.63 143.79

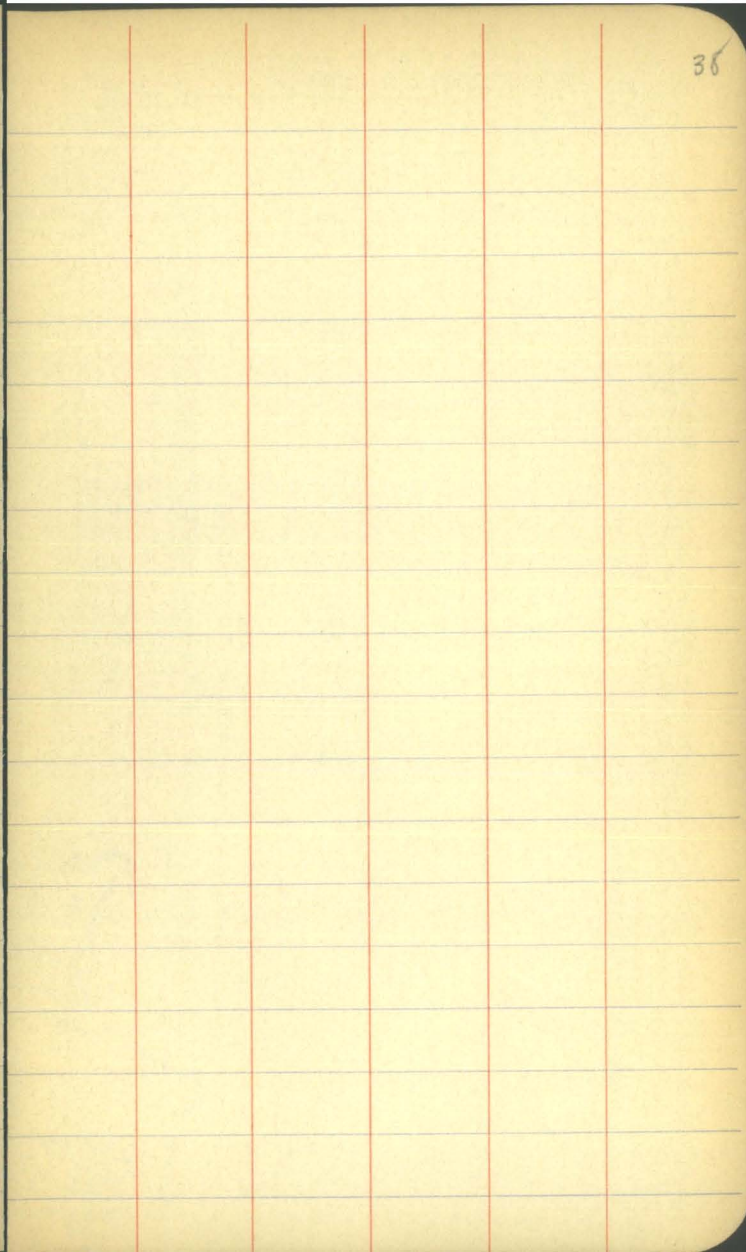
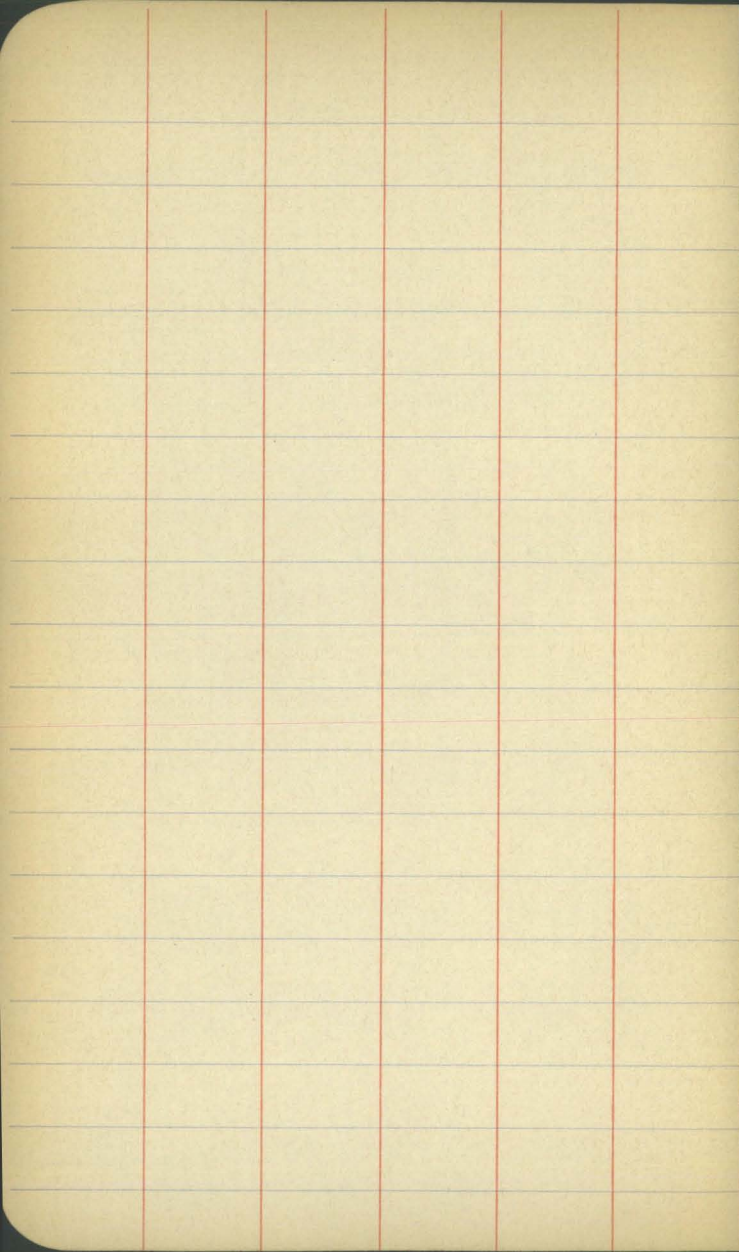
Tel pole at intersection of roads (Sarms)

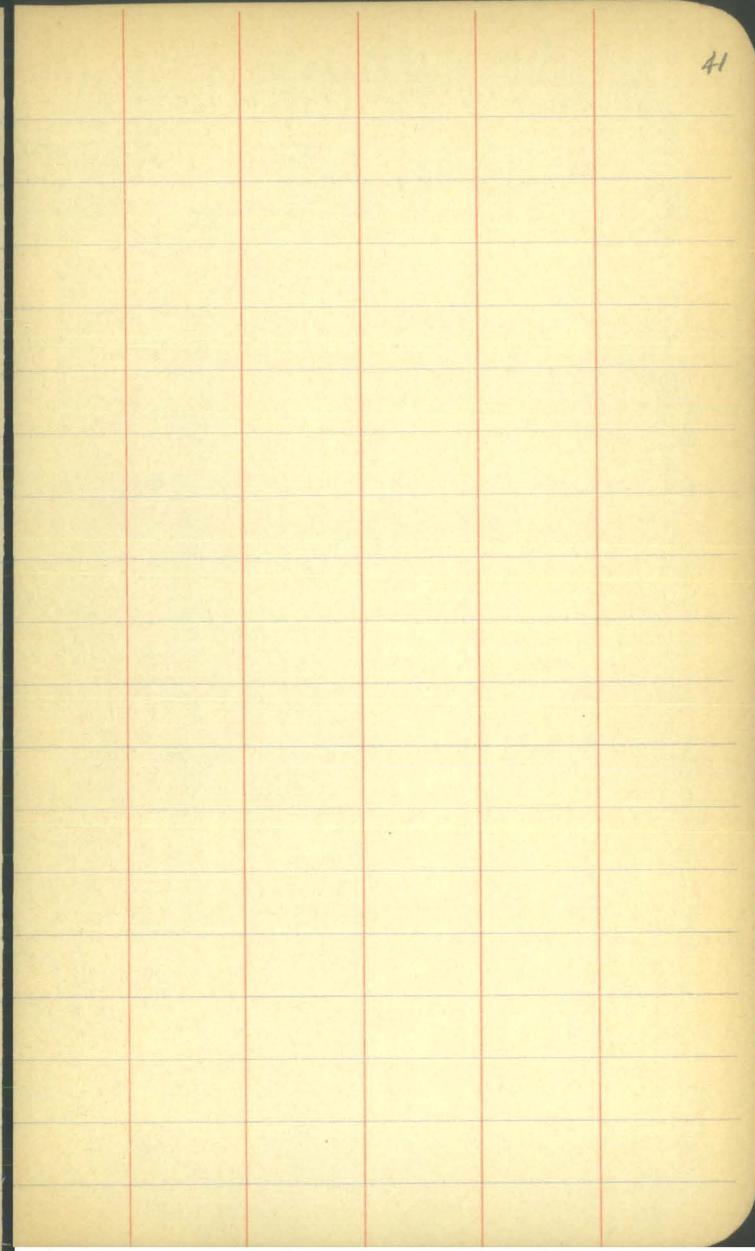
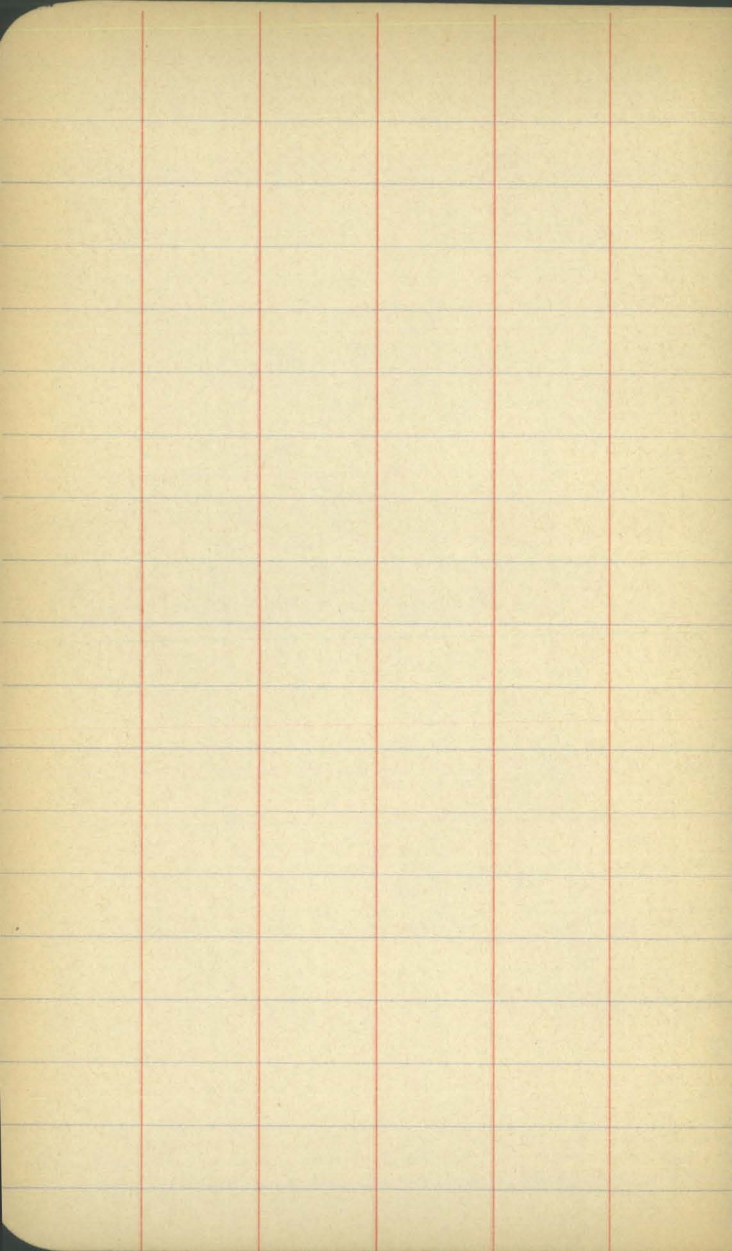
Index
to
Herc.

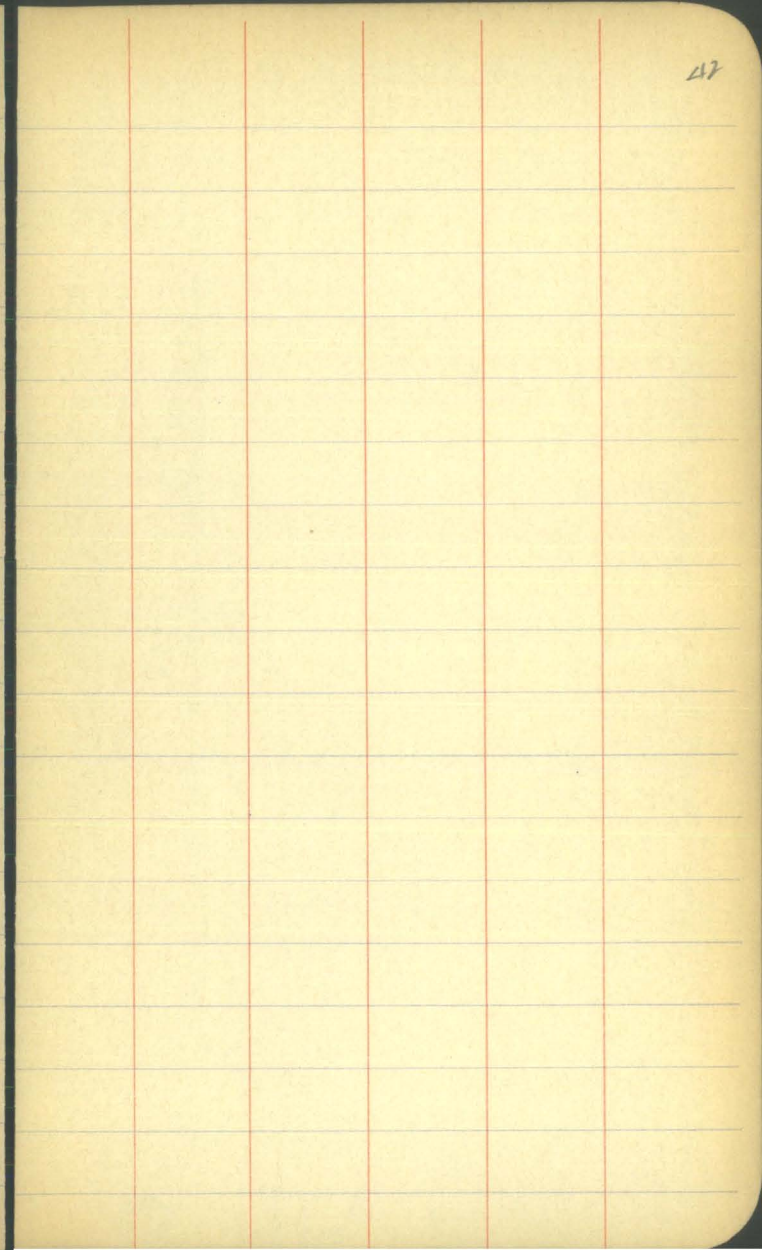
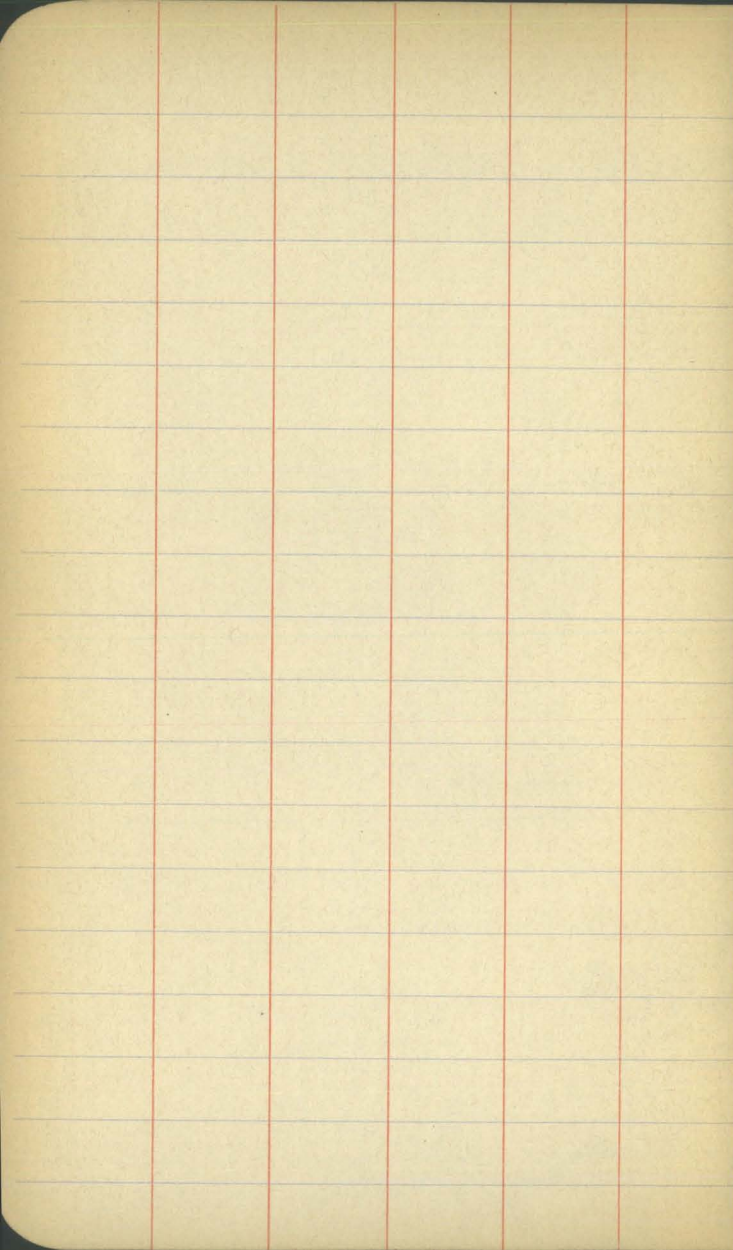


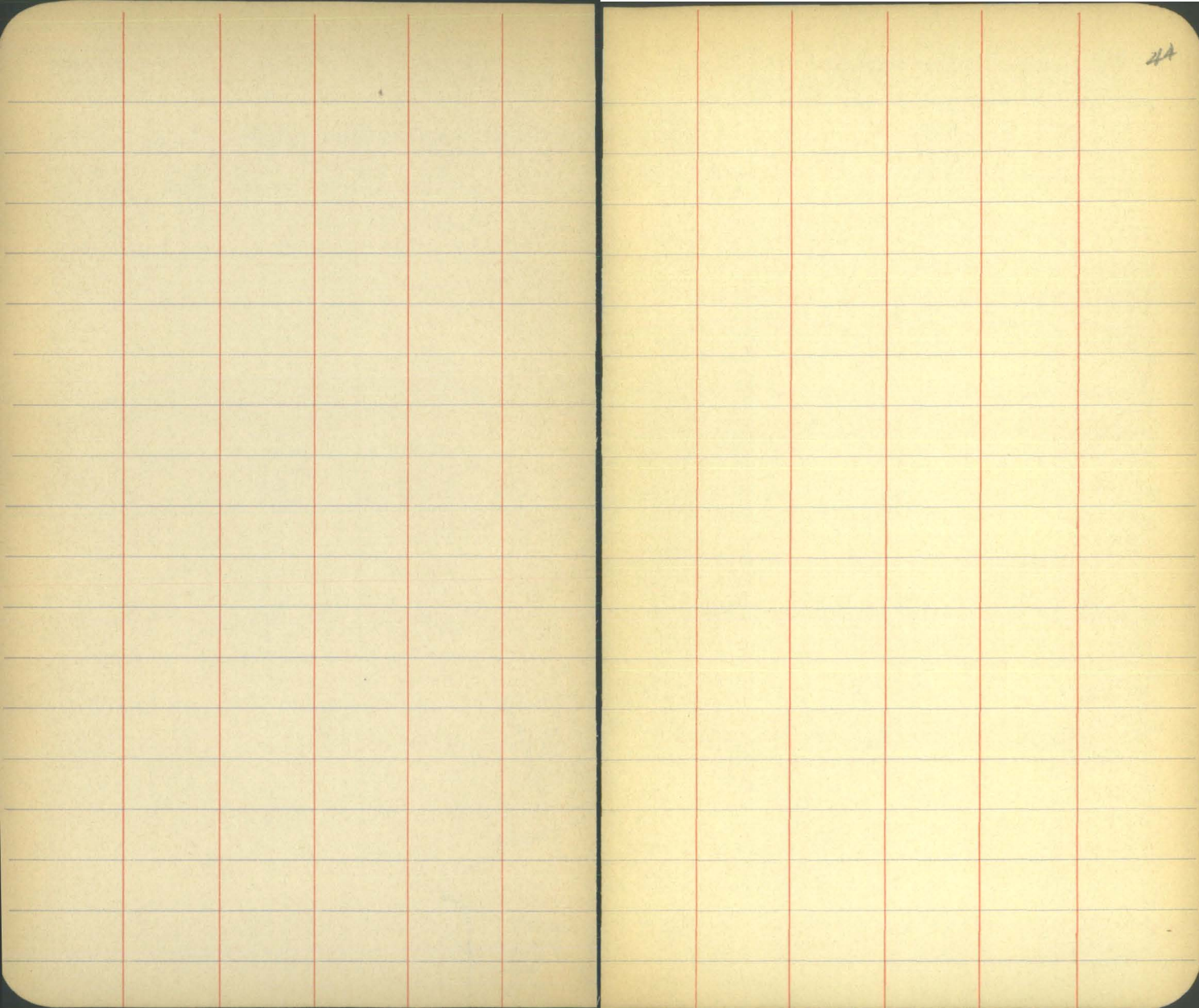


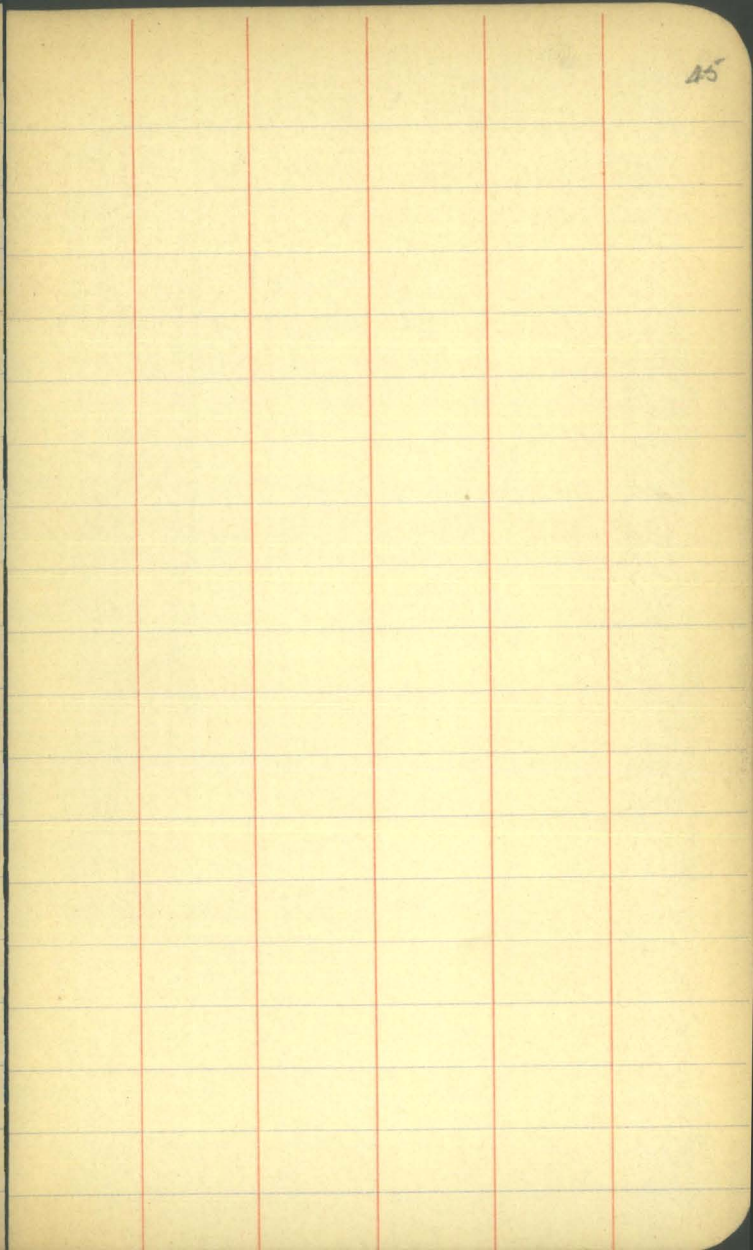
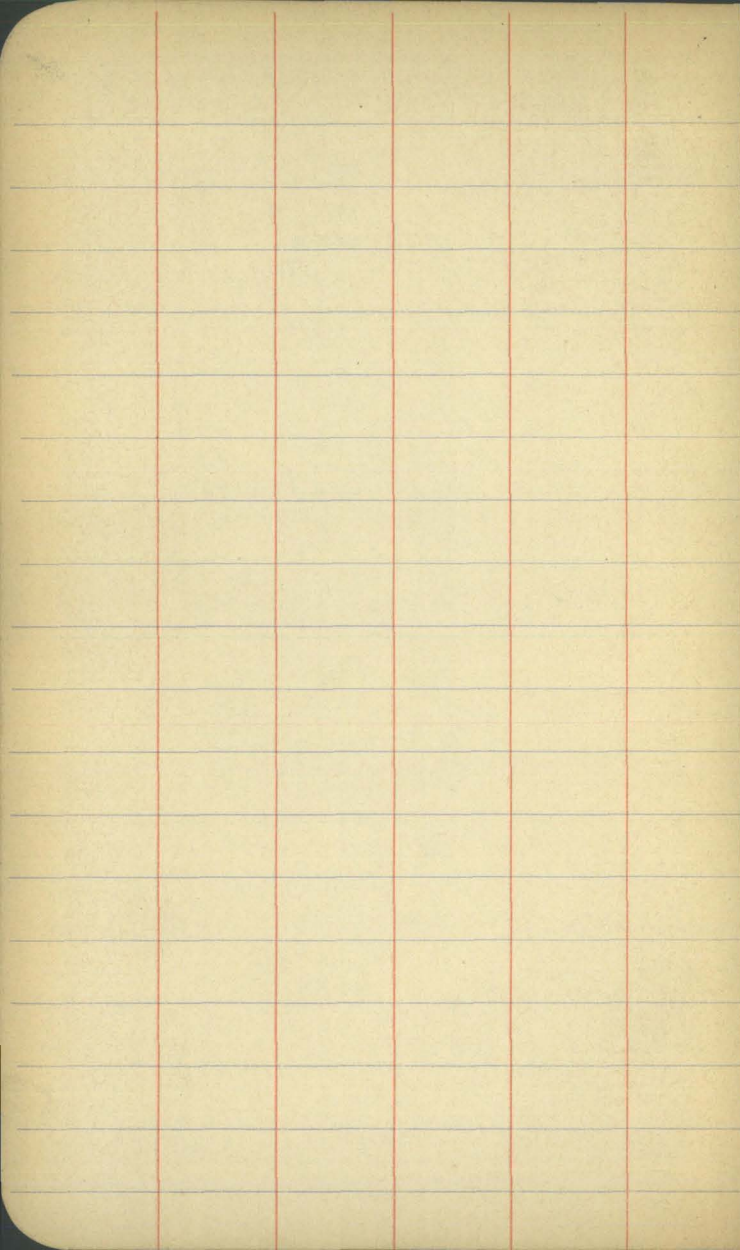


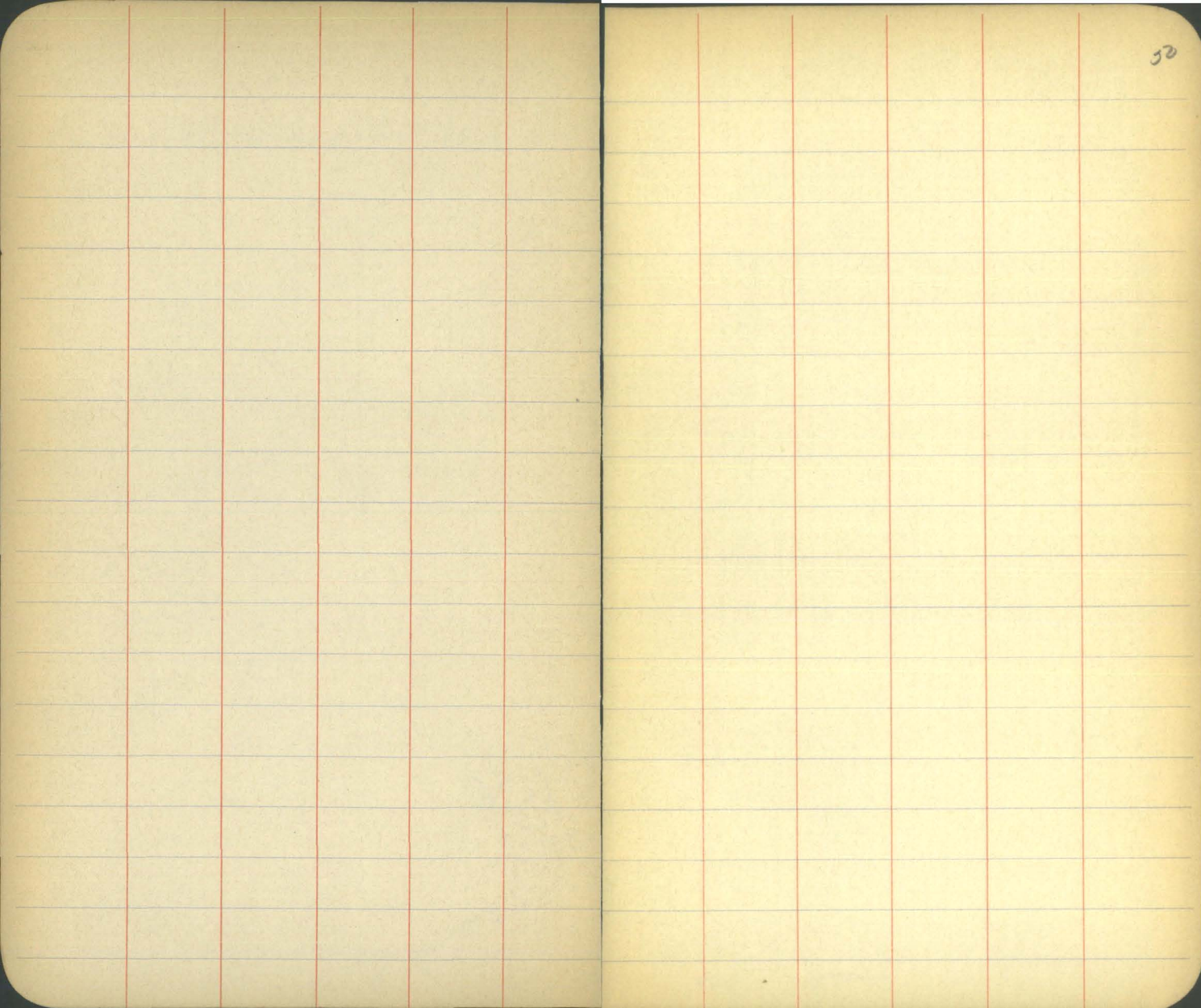


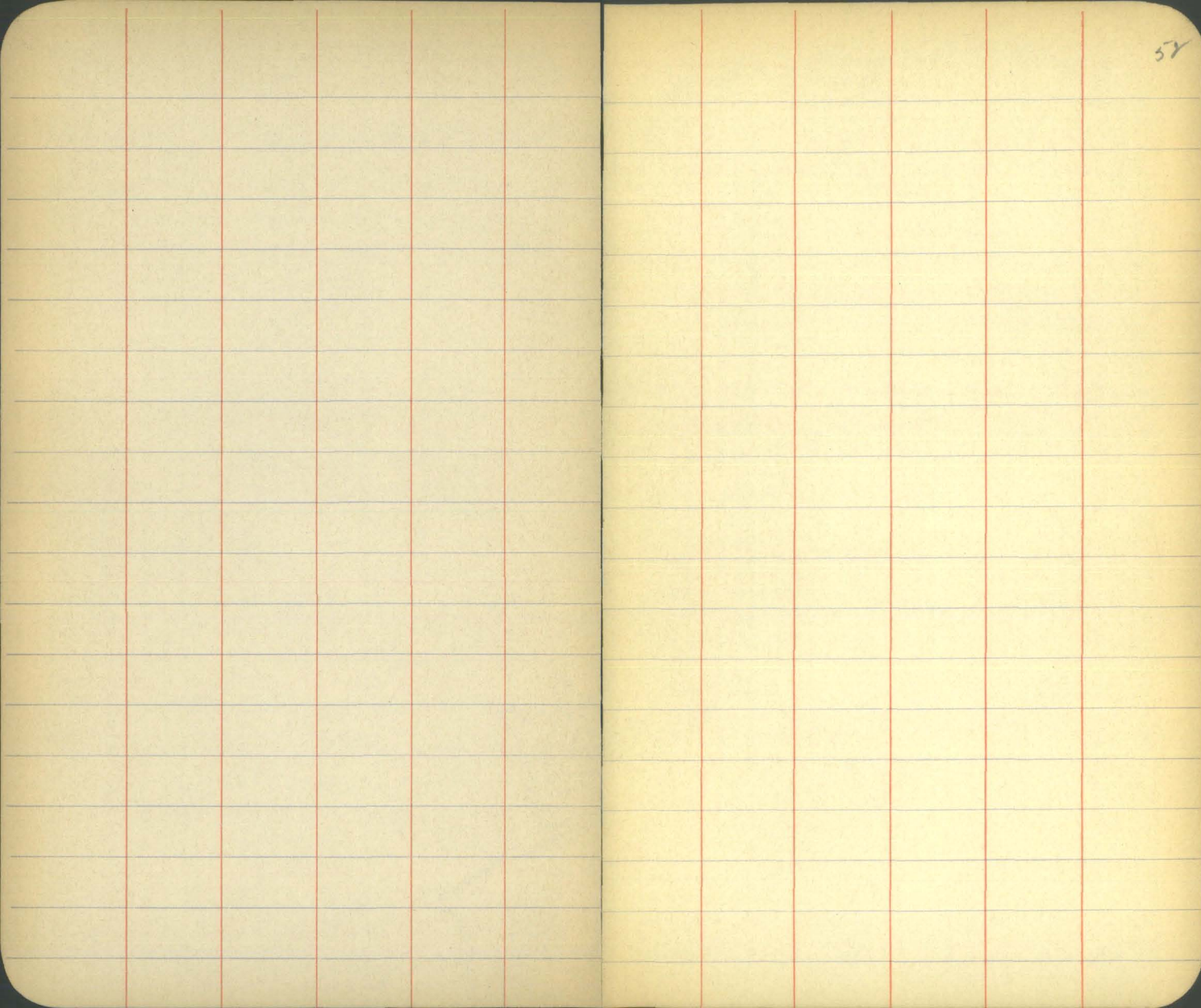


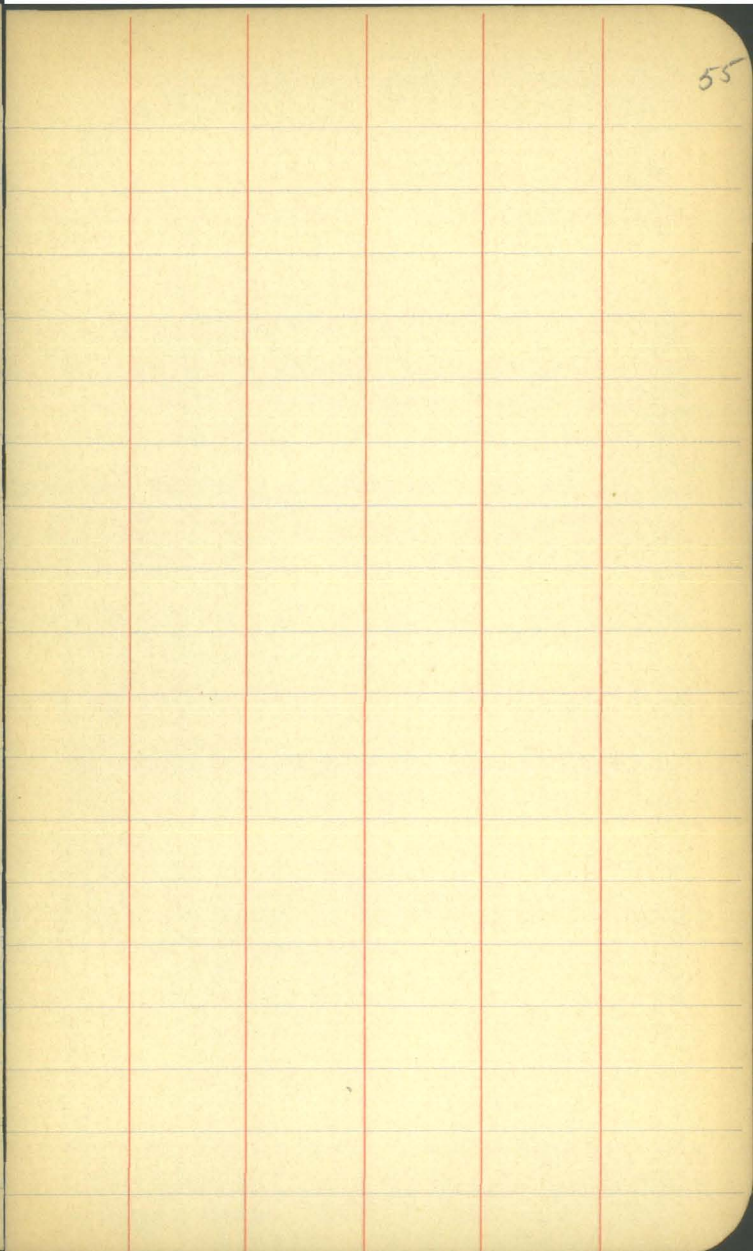
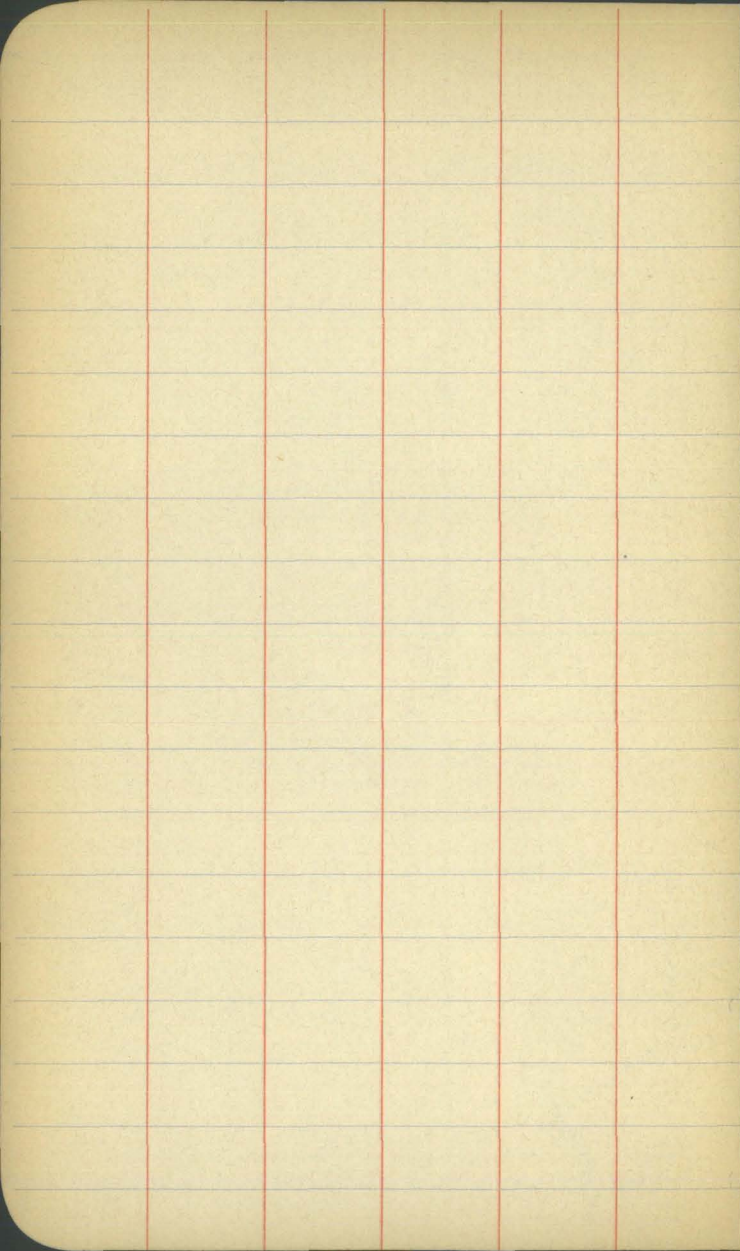


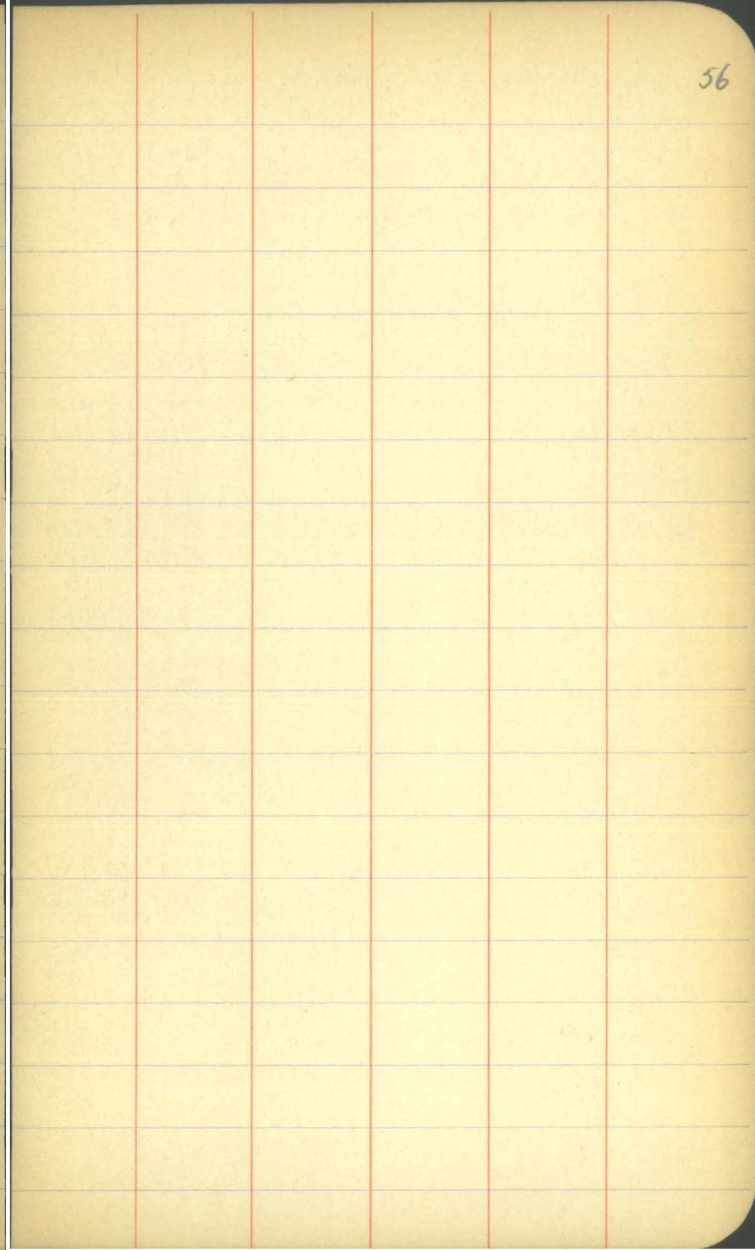
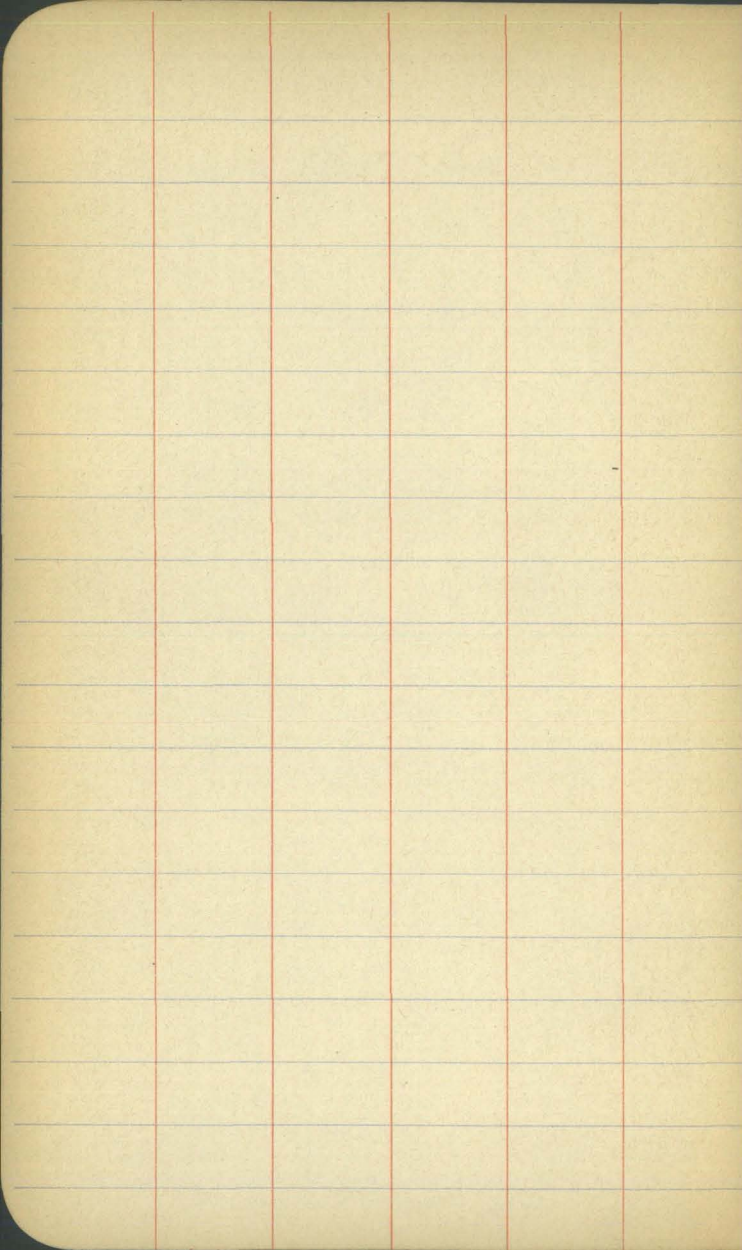


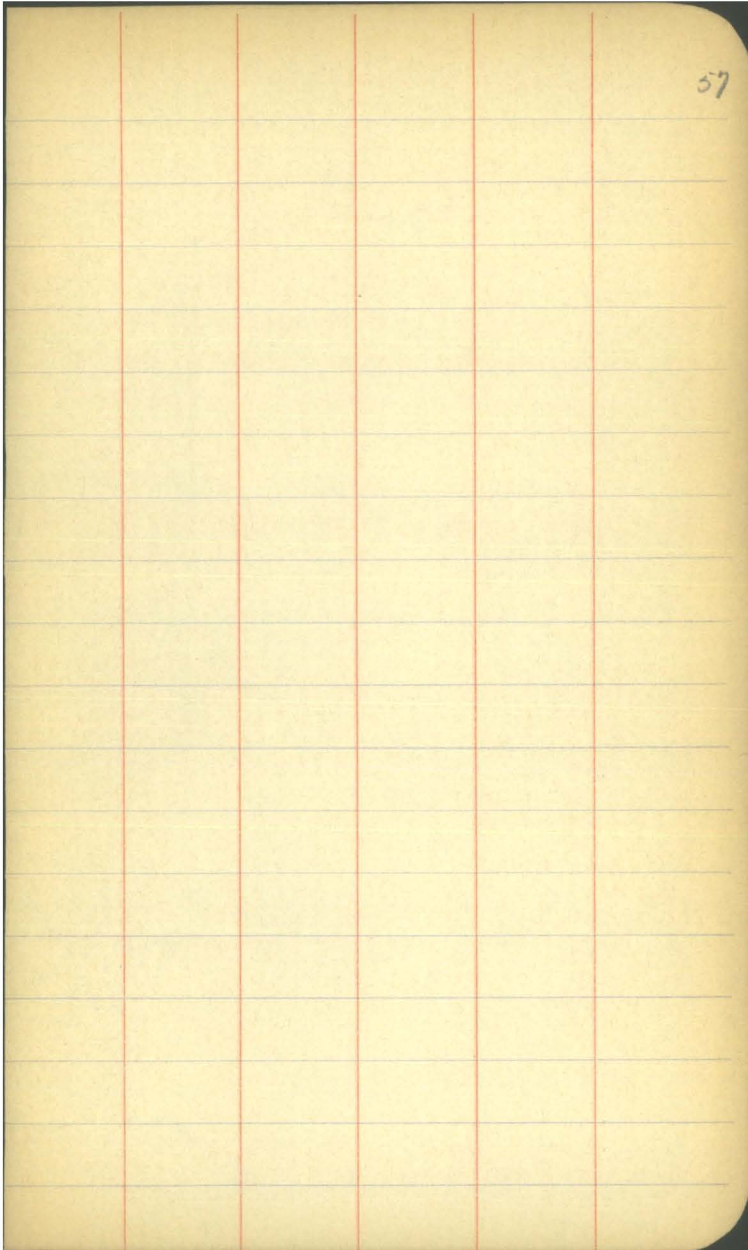
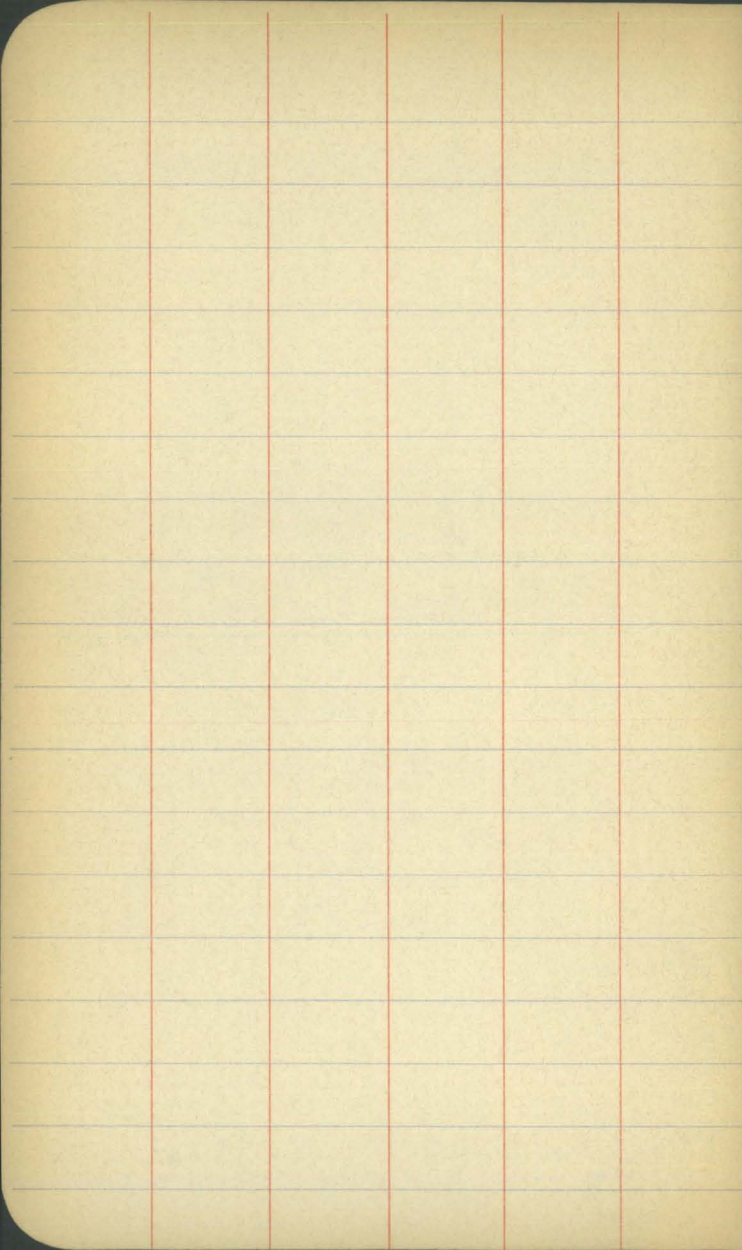


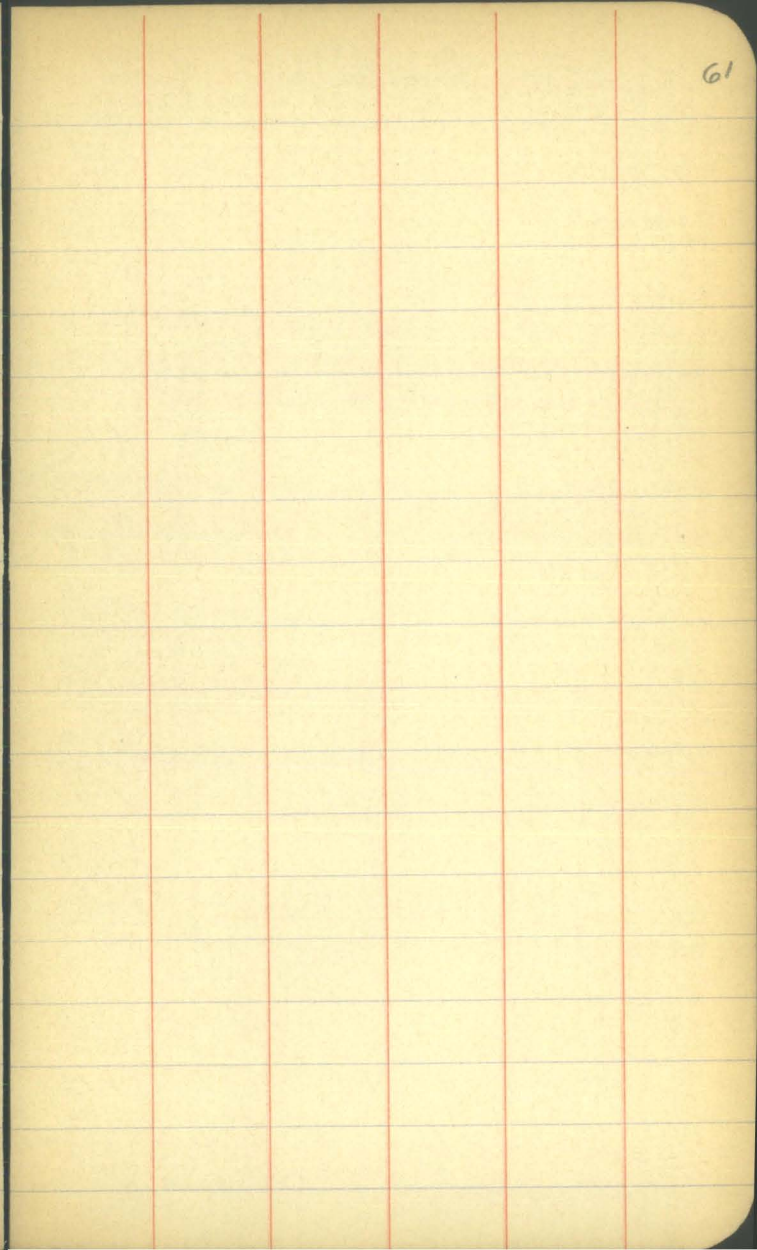
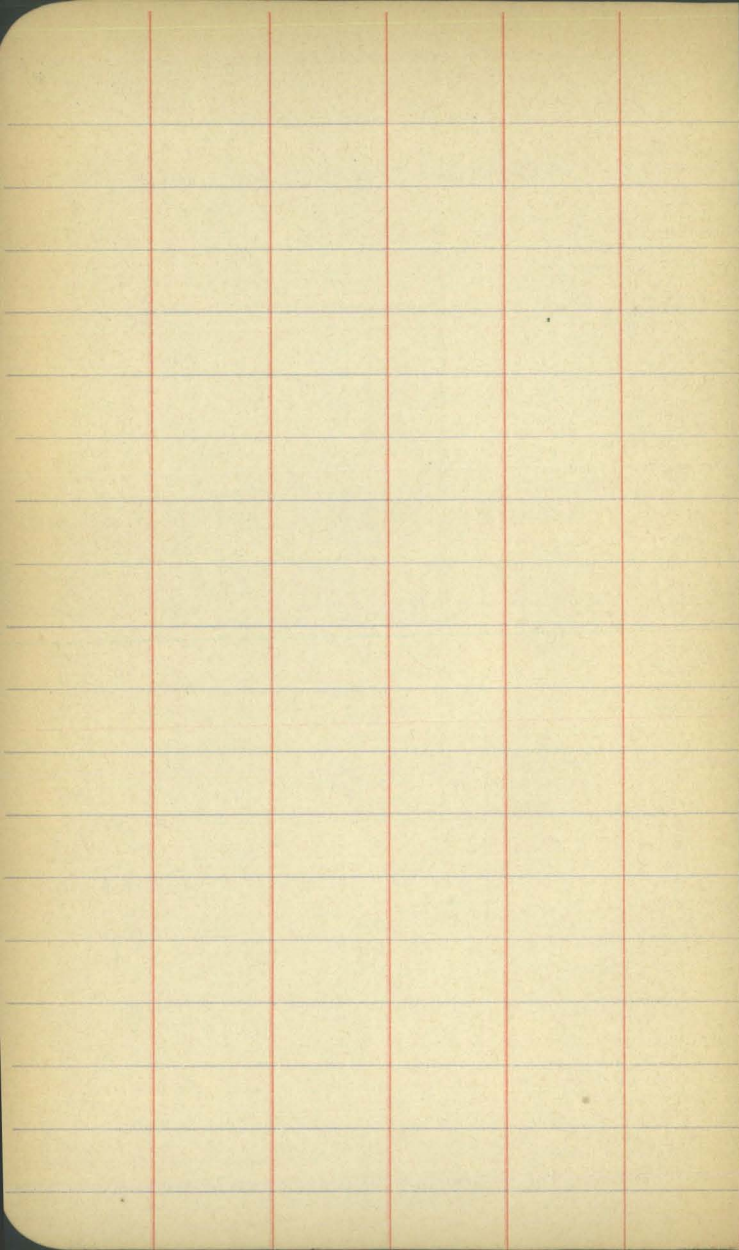


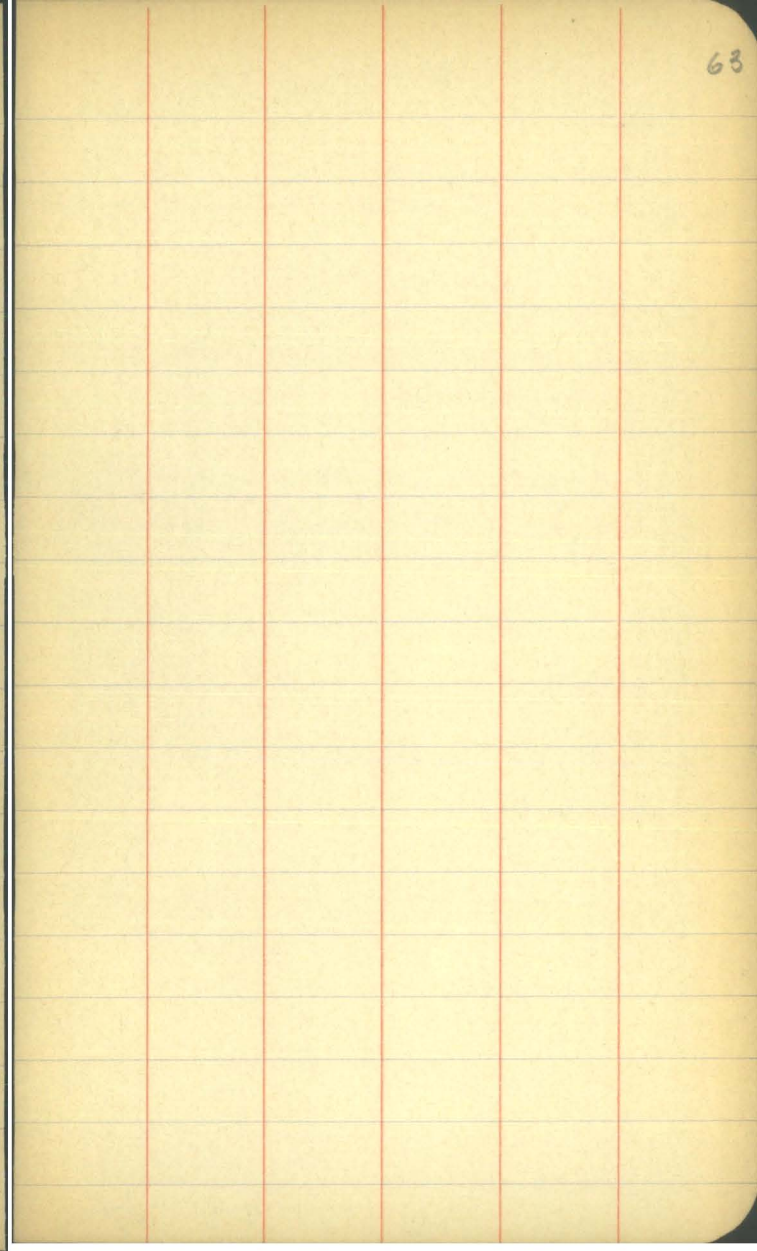
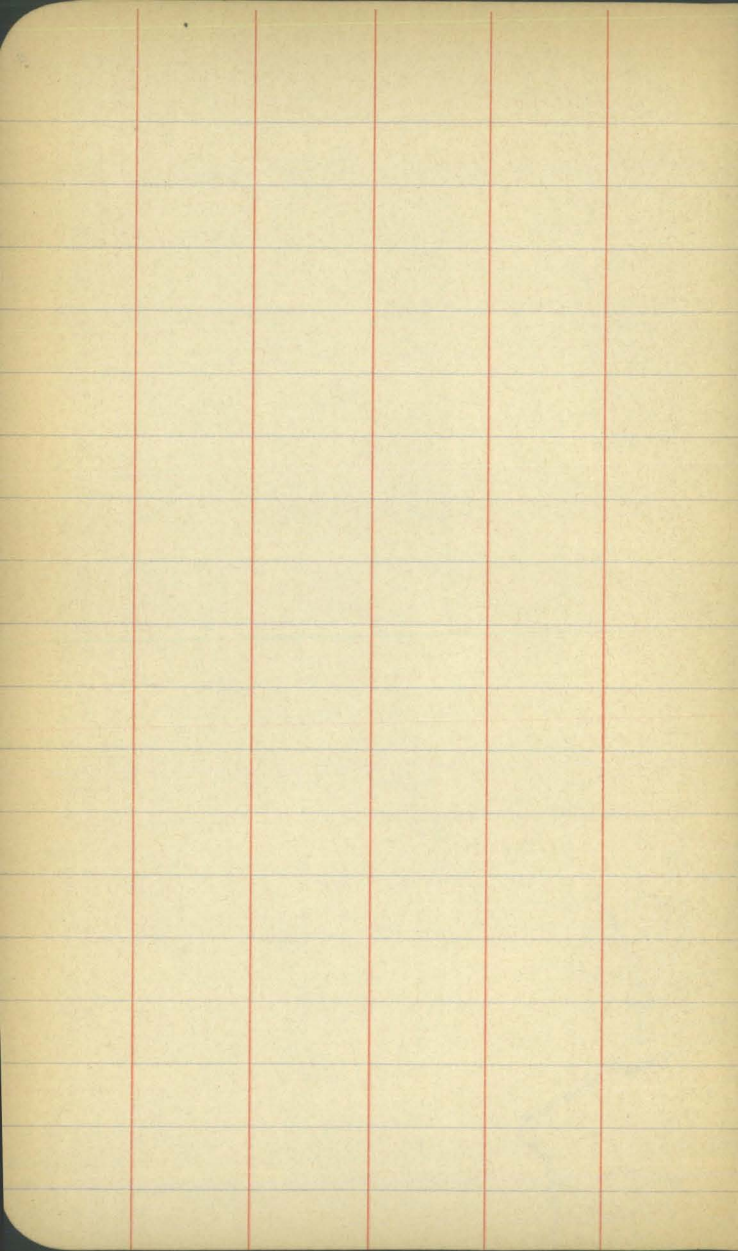


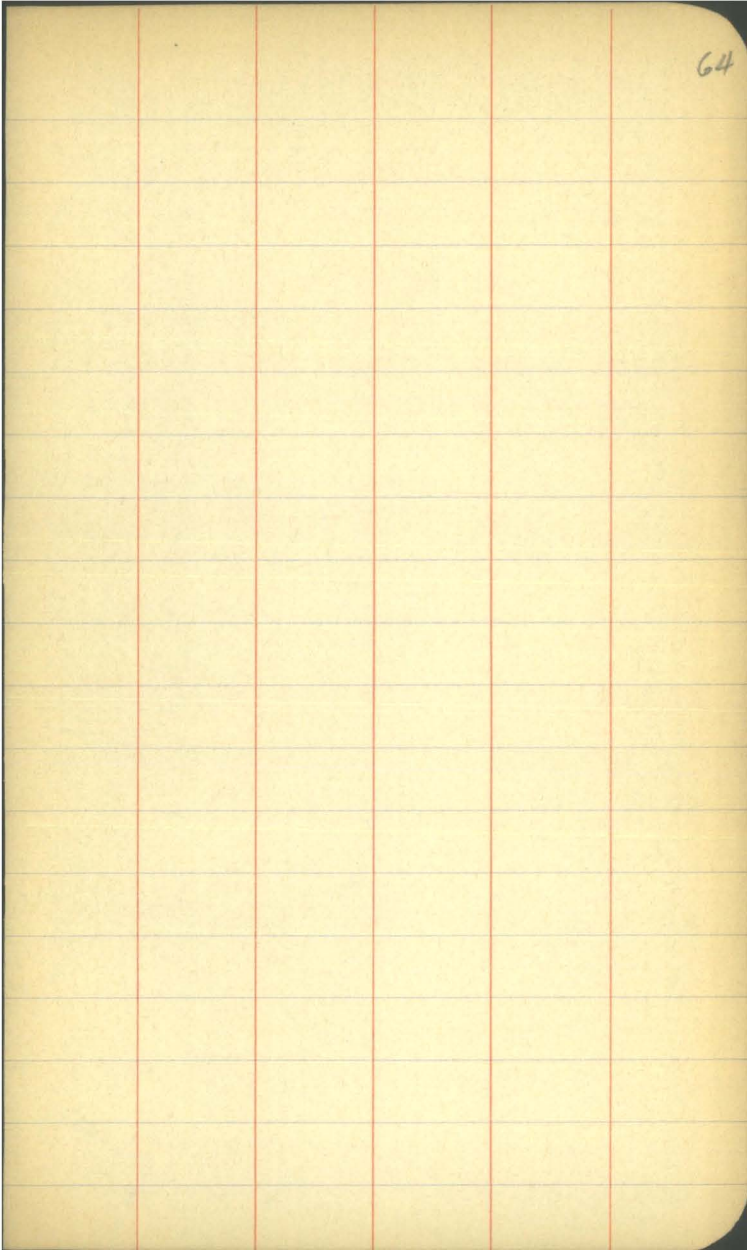
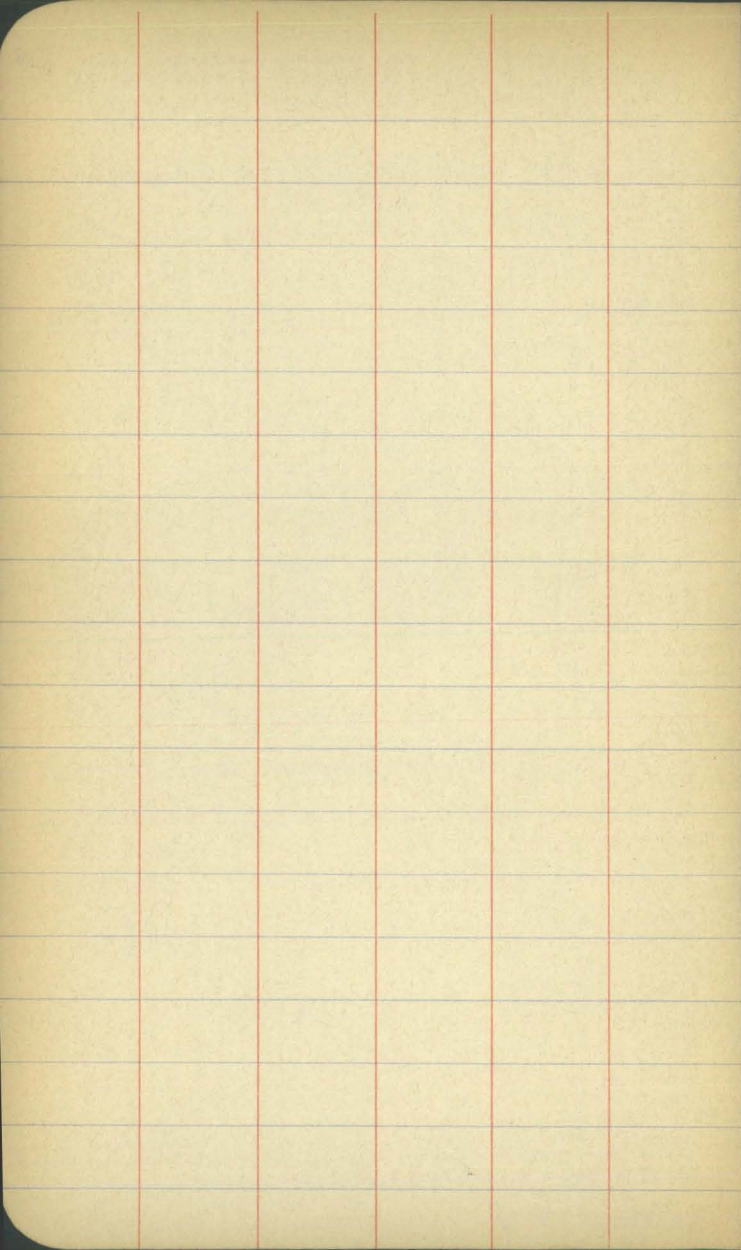


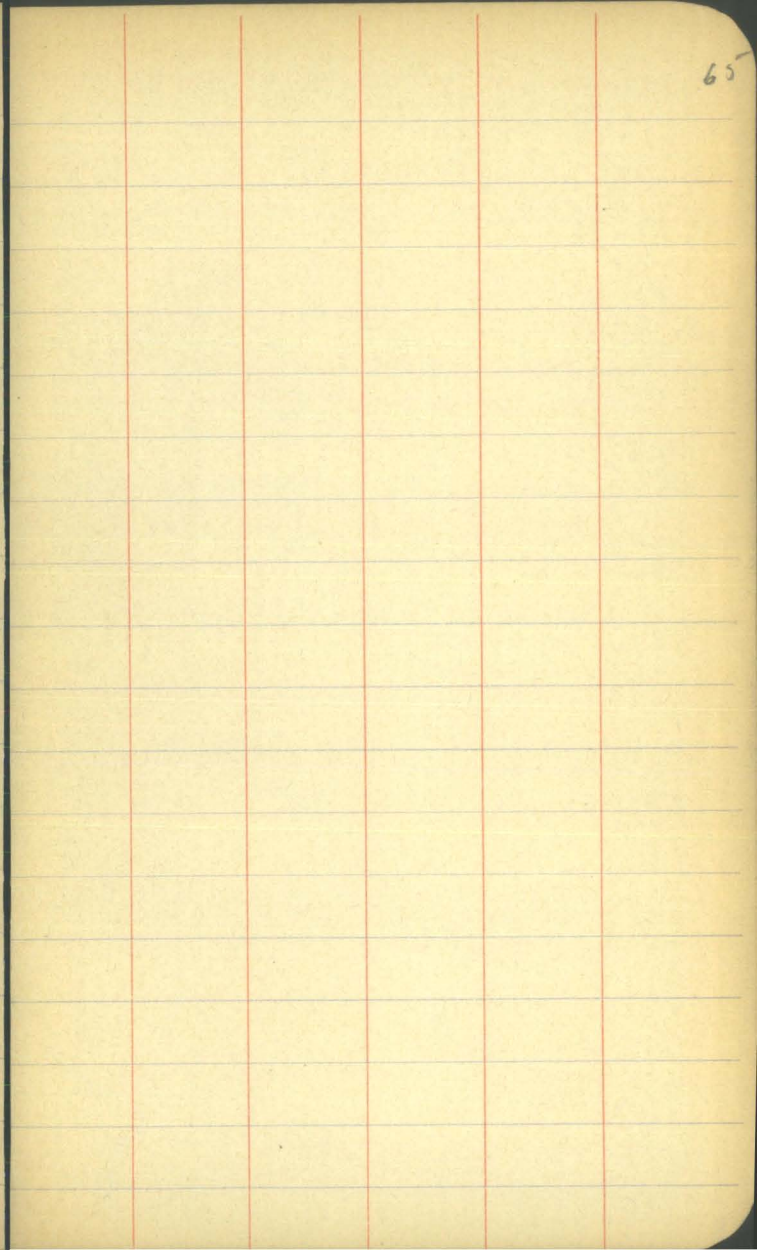
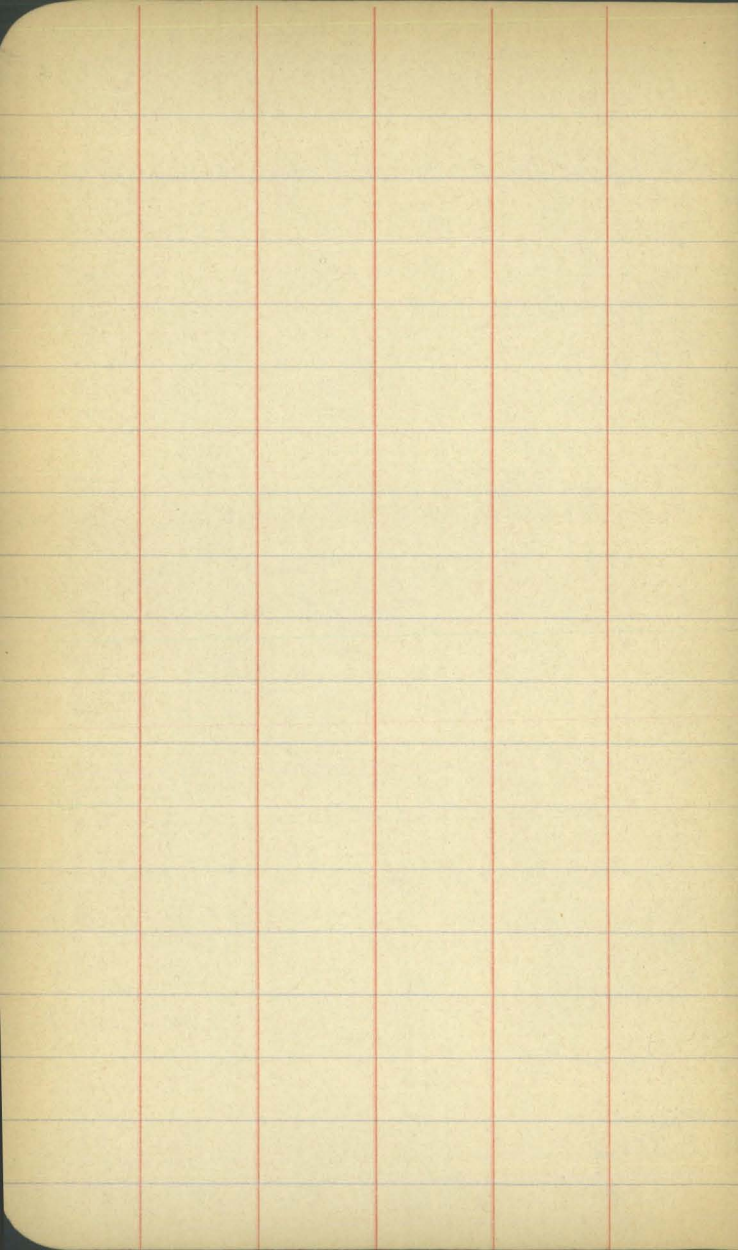


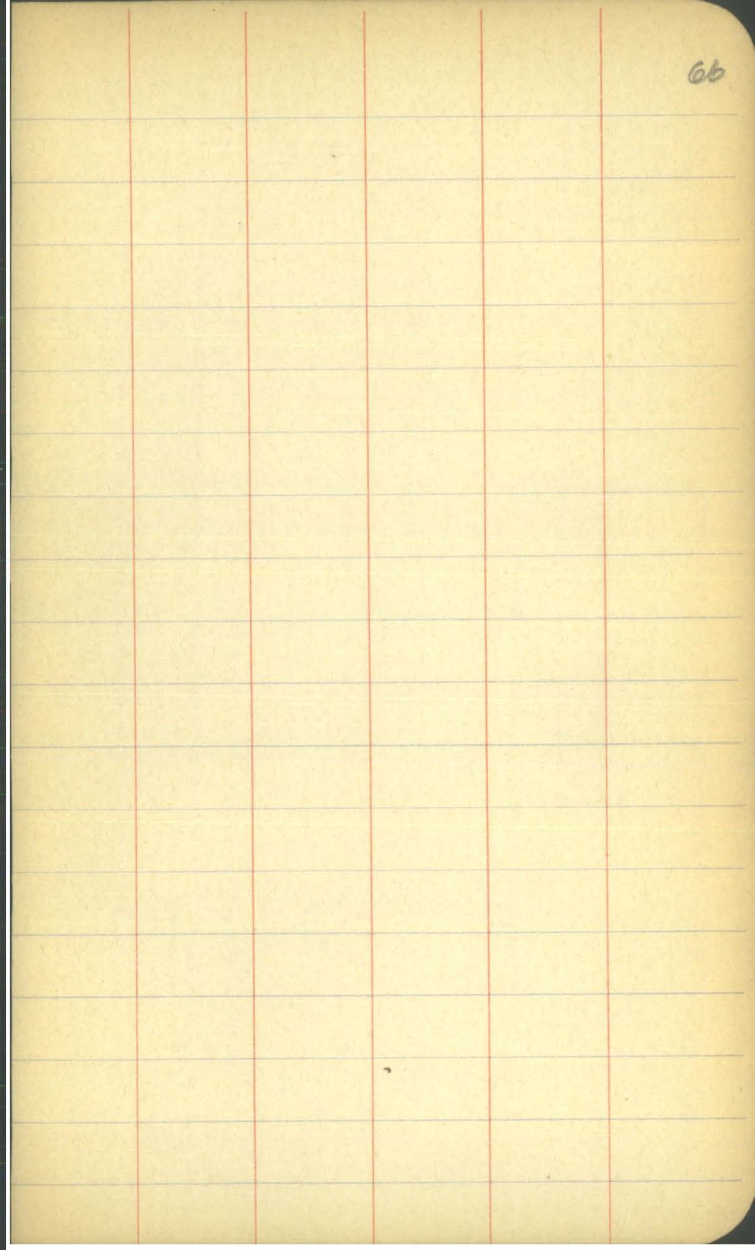
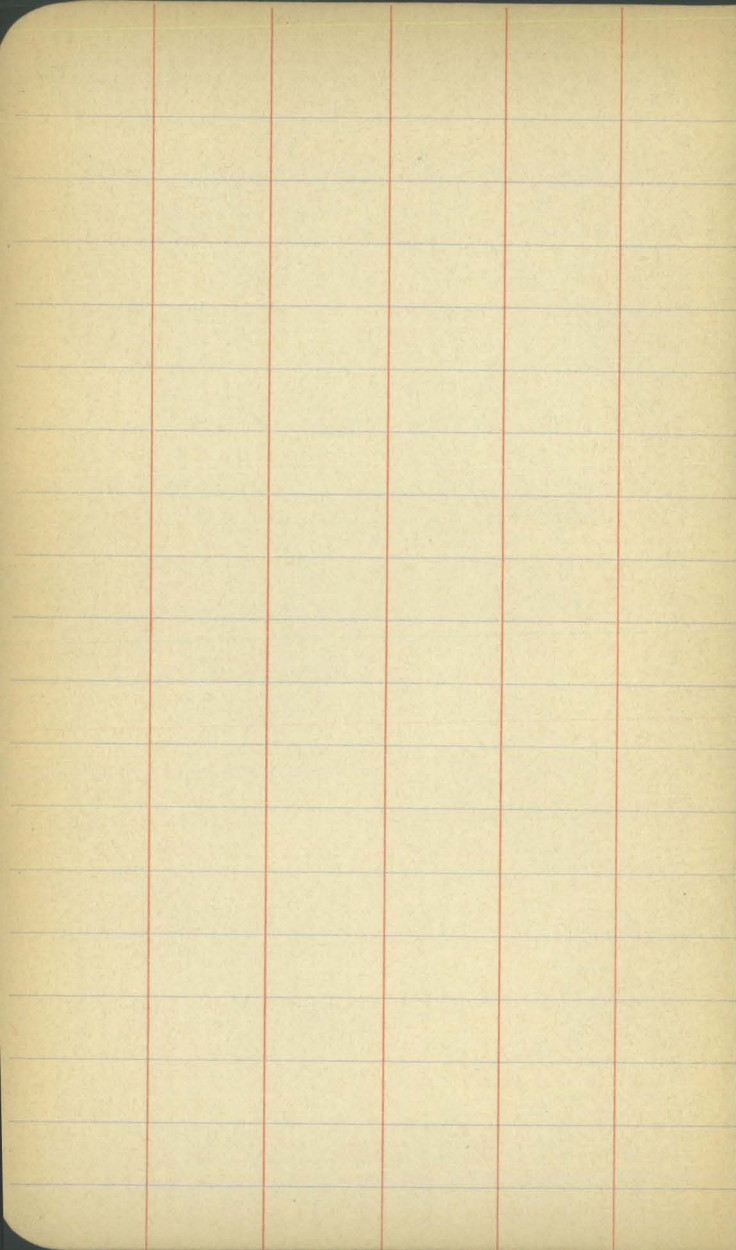


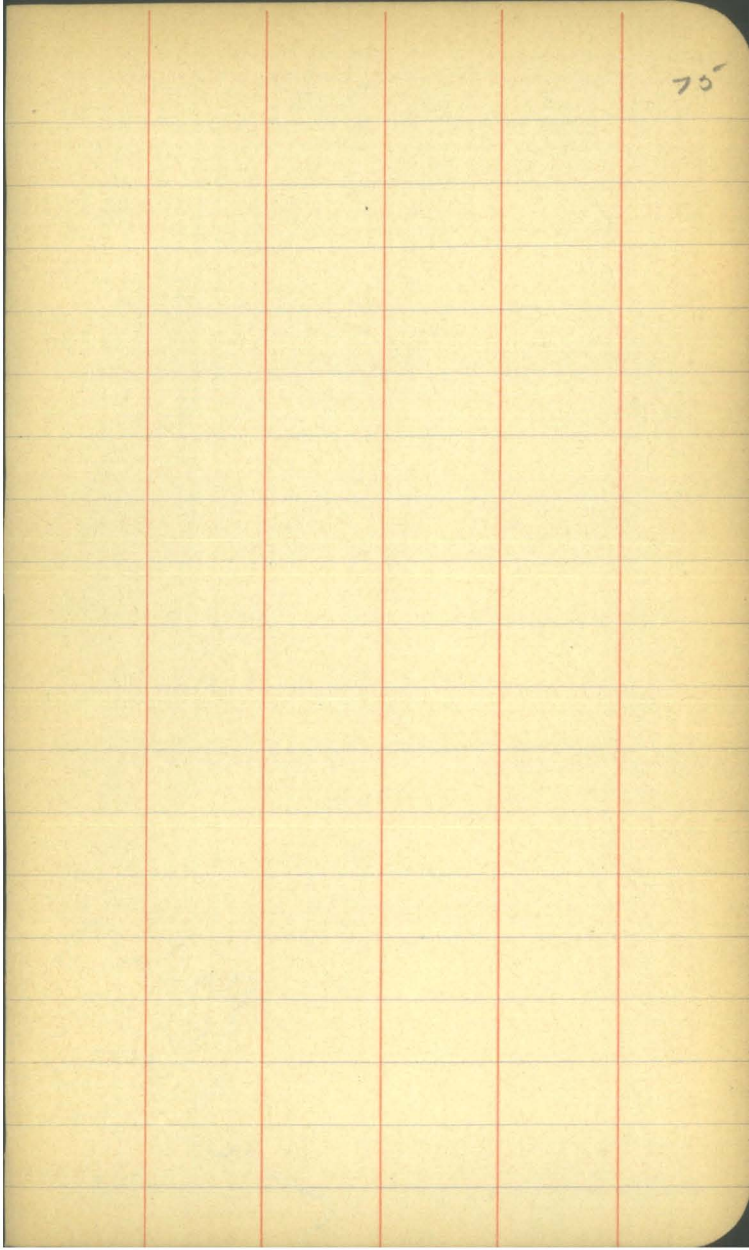
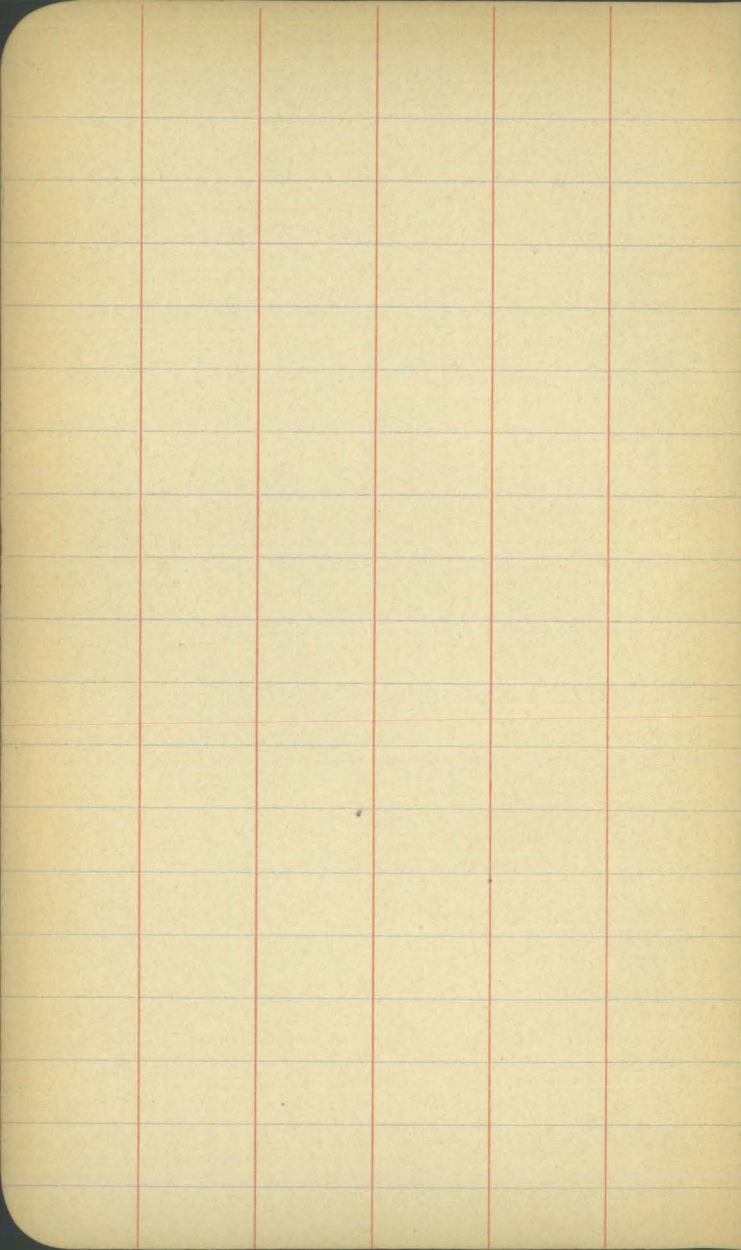


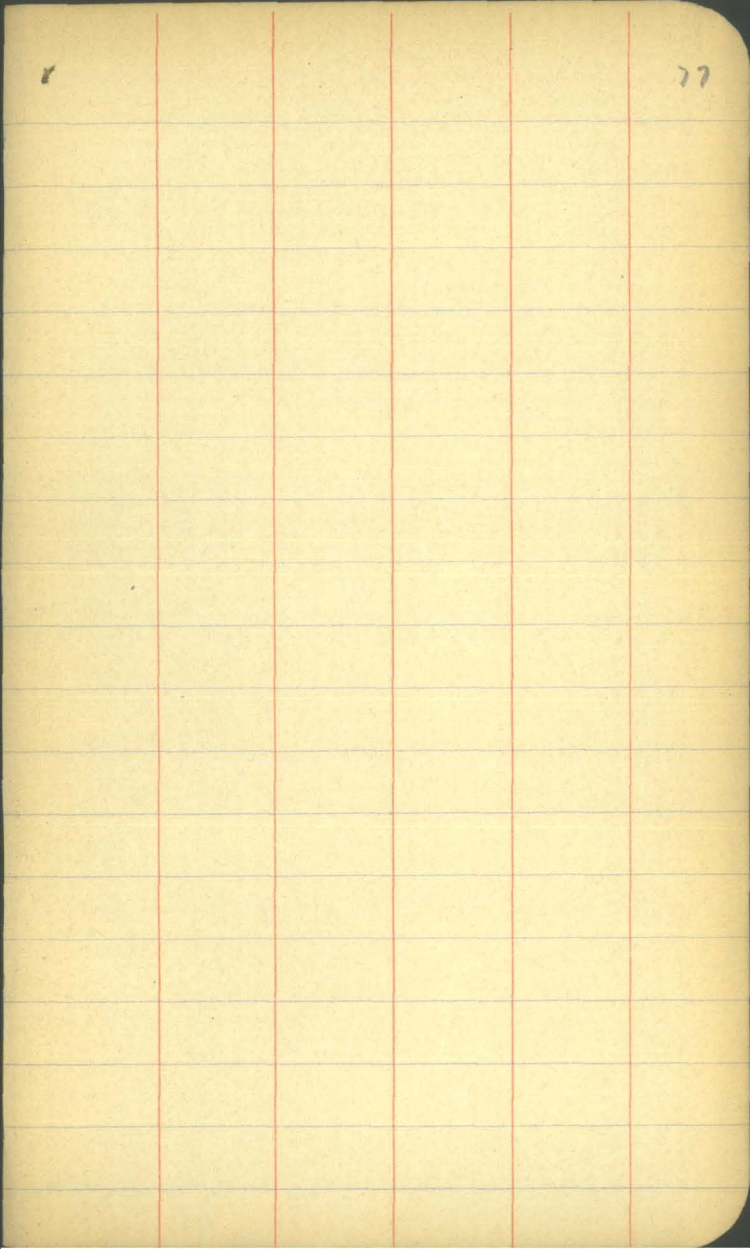
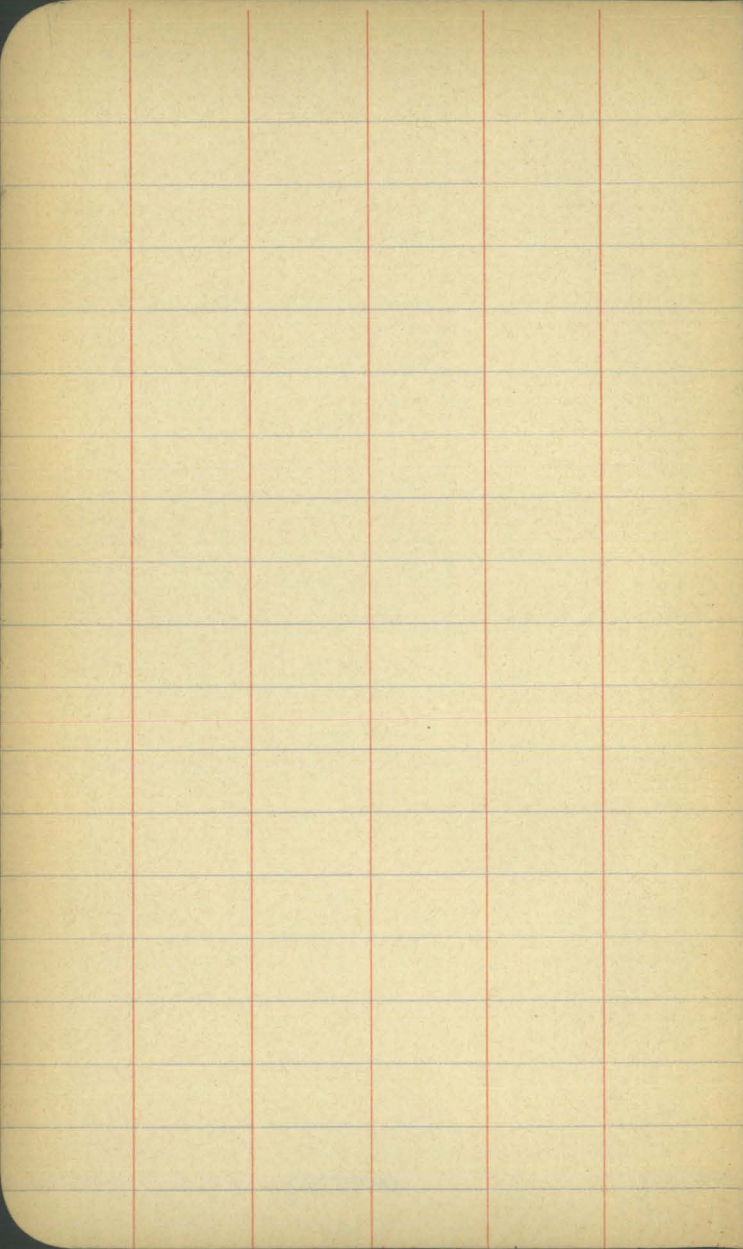


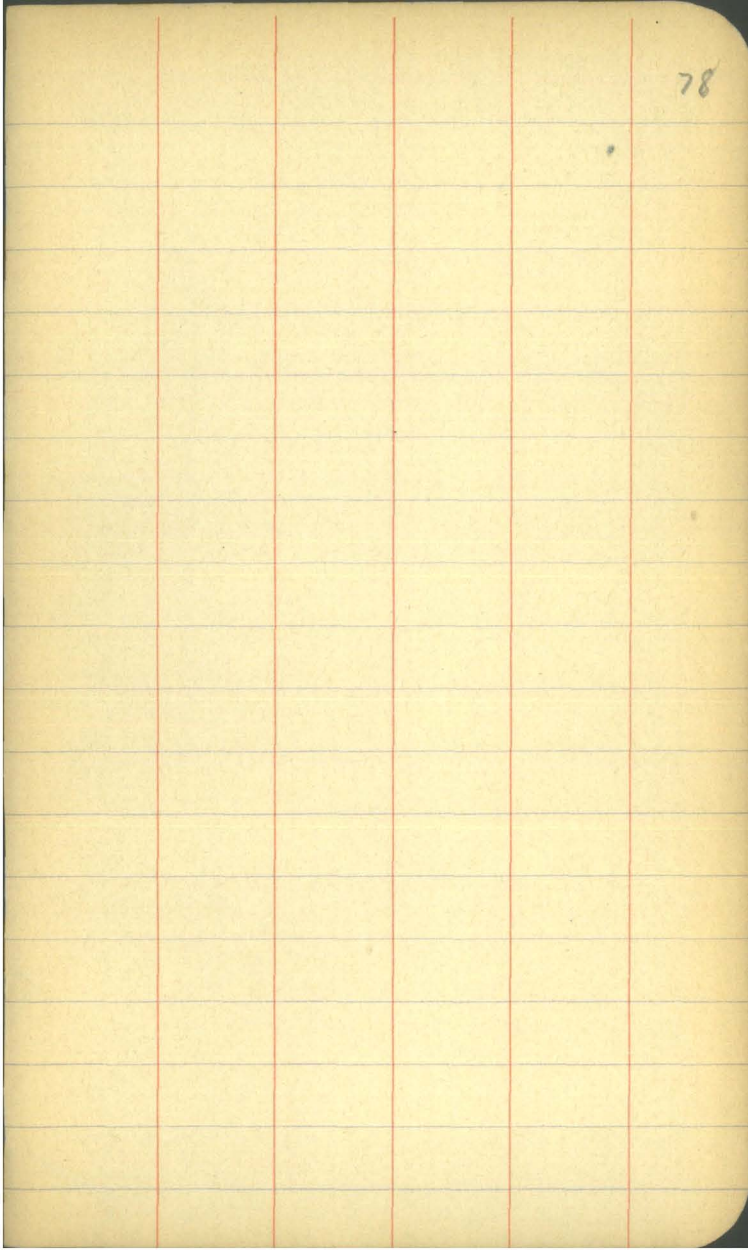
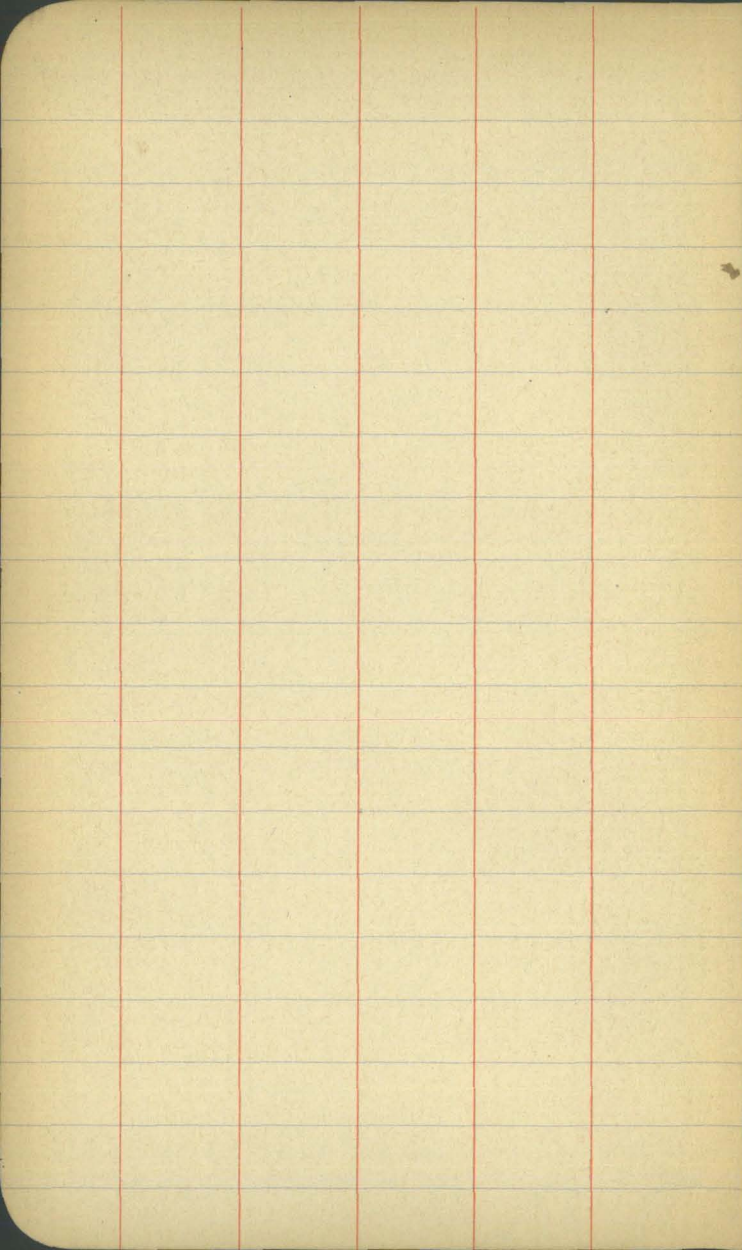


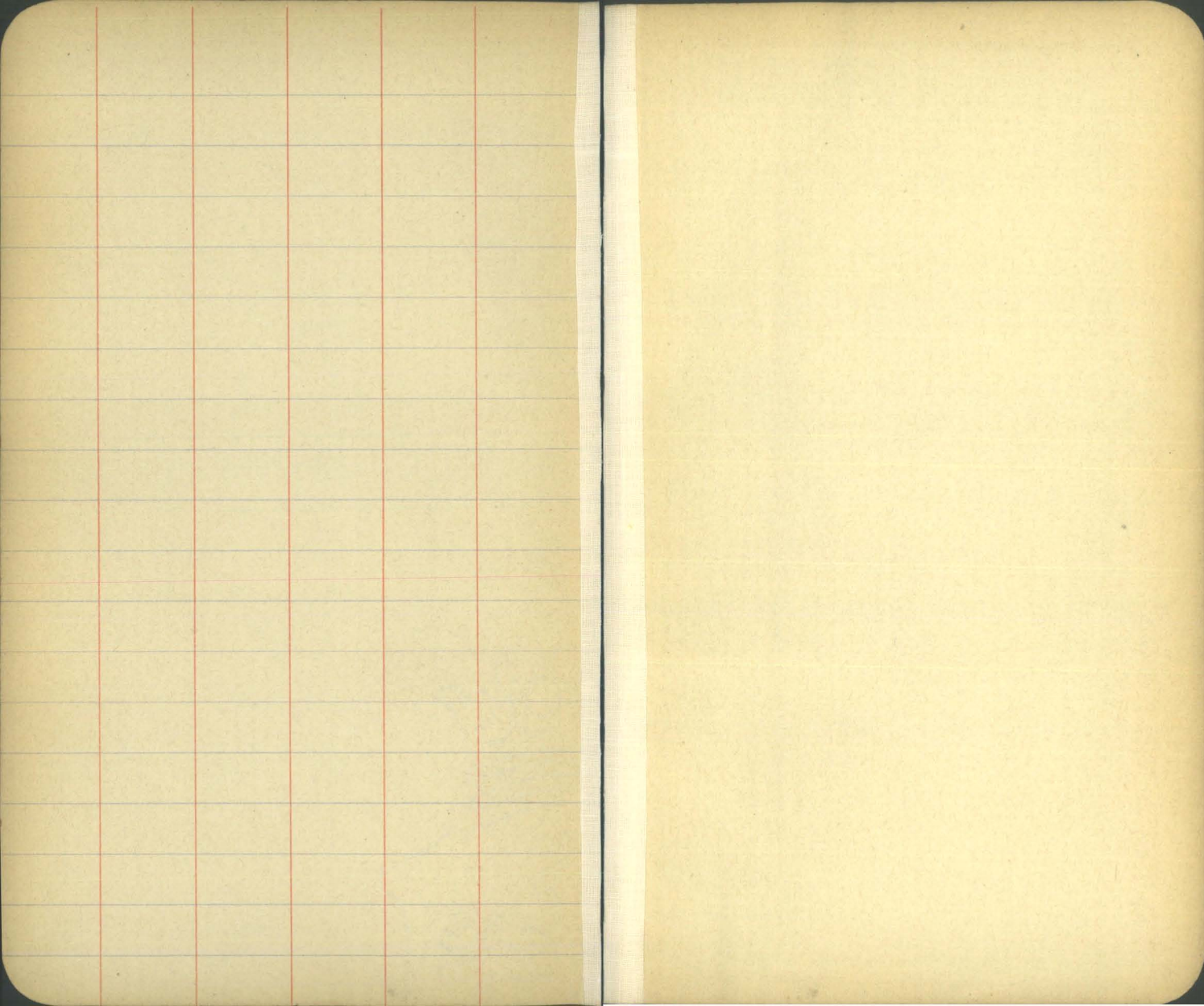












DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES $1\frac{1}{2}$ TO 1.

FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	0
1	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.6	9.7	9.9	1
2	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	2
3	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	3
4	13.0	13.2	13.3	13.5	13.6	13.8	13.9	14.1	14.2	14.4	4
5	14.5	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.7	15.9	5
6	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1	17.2	17.4	6
7	17.5	17.7	17.8	18.0	18.1	18.3	18.4	18.6	18.7	18.9	7
8	19.0	19.2	19.3	19.5	19.6	19.8	19.9	20.1	20.2	20.4	8
9	20.5	20.7	20.8	21.0	21.1	21.3	21.4	21.6	21.7	21.9	9
10	22.0	22.2	22.3	22.5	22.6	22.8	22.9	23.1	23.2	23.4	10
11	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6	24.7	24.9	11
12	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.2	26.4	12
13	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	13
14	28.0	28.2	28.3	28.5	28.6	28.8	28.9	29.1	29.2	29.4	14
15	29.5	29.7	29.8	30.0	30.1	30.3	30.4	30.6	30.7	30.9	15
16	31.0	31.2	31.3	31.5	31.6	31.8	31.9	32.1	32.2	32.4	16
17	32.5	32.7	32.8	33.0	33.1	33.3	33.4	33.6	33.7	33.9	17
18	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4	18
19	35.5	35.7	35.8	36.0	36.1	36.3	36.4	36.6	36.7	36.9	19
20	37.0	37.2	37.3	37.5	37.6	37.8	37.9	38.1	38.2	38.4	20
21	38.5	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	21
22	40.0	40.2	40.3	40.5	40.6	40.8	40.9	41.1	41.2	41.4	22
23	41.5	41.7	41.8	42.0	42.1	42.3	42.4	42.6	42.7	42.9	23
24	43.0	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44.2	44.4	24
25	44.5	44.7	44.8	45.0	45.1	45.3	45.4	45.6	45.7	45.9	25
26	46.0	46.2	46.3	46.5	46.6	46.8	46.9	47.1	47.2	47.4	26
27	47.5	47.7	47.8	48.0	48.1	48.3	48.4	48.6	48.7	48.9	27
28	49.0	49.2	49.3	49.5	49.6	49.8	49.9	50.1	50.2	50.4	28
29	50.5	50.7	50.8	51.0	51.1	51.3	51.4	51.6	51.7	51.9	29
30	52.0	52.2	52.3	52.5	52.6	52.8	52.9	53.1	53.2	53.4	30
31	53.5	53.7	53.8	54.0	54.1	54.3	54.4	54.6	54.7	54.9	31
32	55.0	55.2	55.3	55.5	55.6	55.8	55.9	56.1	56.2	56.4	32
33	56.5	56.7	56.8	57.0	57.1	57.3	57.4	57.6	57.7	57.9	33
34	58.0	58.2	58.3	58.5	58.6	58.8	58.9	59.1	59.2	59.4	34
35	59.5	59.7	59.8	60.0	60.1	60.3	60.4	60.6	60.7	60.9	35
36	61.0	61.2	61.3	61.5	61.6	61.8	61.9	62.1	62.2	62.4	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.

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