

552
TRANSIT BOOK

79+35

DIRECTIONS FOR USE OF TABLES

TABLE No. 1.

Distance of slope stake from side or shoulder stake for any width roadway slope $1\frac{1}{2}$ to 1. If ground is nearly level the cut or fill at side

IMPROVED TABLES
AND
INFORMATION

To find Tangent and External for curve of any other degree divide by degree of curve and add correction found in column of corrections. Degree of curve with a given L may be found by dividing tangent (or external), opposite L by given tangent (or external).
The distance from a point on the tangent to the curve is very nearly the radius of the tangent length divided by twice the radius.

DIRECTIONS FOR USE OF TABLES

TABLE No. 1.

Distance of slope stake from side or shoulder stake for any width roadway, slope $1\frac{1}{2}$ to 1. If ground is nearly level, the cut or fill at side stake is located by the double entry method in left column and top row. The number in body of table in same row and column gives distance from side stake to slope stake. If ground is not level estimate the difference in elevation between the side stake and slope stake, lower target by this amount if cut, elevate if fill. Add this amount to cut or fill and find distance in table. Set up rod at this point, and line of sight should cut target. If it does not make the slight adjustment necessary.

TABLE No. 9.

To find Tangent and External for curve of any other degree, divide by degree of curve and add correction found in column of corrections. Degree of curve with a given I may be found by dividing tangent, (or external), opposite I by given tangent, (or external).

The distance from a point on the tangent to the curve is very nearly the square of the tangent length divided by twice the radius.

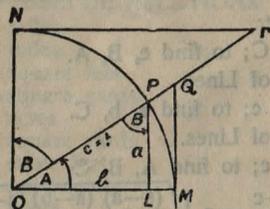


TABLE II
TRIGONOMETRIC FORMULÆ.

$$\angle A = \angle MOP \quad \angle B = \angle PON = \angle OPL$$

$$R = OB = c = 1$$

$$\sin A = \frac{a}{c} = \frac{a}{1} = a = \cos B = LP$$

$$\cos A = \frac{b}{c} = \frac{b}{1} = b = \sin B = OL$$

$$\tan A = \frac{a}{b} = \frac{MQ}{OM} = \frac{MQ}{1} = MQ = \cot B = MQ$$

$$\cot A = \frac{NT}{ON} = \frac{NT}{1} = NT = \tan B = NT$$

$$\sec A = \frac{OQ}{OM} = \frac{OQ}{1} = OQ = \csc B = OQ$$

$$\csc A = \frac{OT}{ON} = \frac{OT}{1} = OT = \sec B = OT$$

$$\text{vers } A = \frac{LM}{OP} = LM = \text{covers } B = \neq$$

$$\text{covers } A = \frac{OP-LP}{OP} = OP-LP = \text{vers } B$$

$$\text{exsec } A = PQ = \text{coexsec } B$$

$$\text{coexsec } A = PT = \text{exsec } B$$

$$\sin \frac{1}{2} A = \sqrt{\frac{1 - \cos A}{2}} \quad \cos \frac{1}{2} A = \sqrt{\frac{1 + \cos A}{2}}$$

$$\sin 2 A = 2 \sin A \cos A \quad \cos 2 A = \cos^2 A - \sin^2 A$$

$$\text{Law of Lines} \quad \frac{\sin A}{a} = \frac{\sin B}{B} = \frac{\sin C}{C}$$

$$\text{Law of Cosines} \quad c^2 = a^2 + b^2 - 2 ab \cos C$$

$$\text{Law of Tangents} \quad \frac{a+b}{a-b} = \frac{\tan \frac{1}{2} (A+B)}{\tan \frac{1}{2} (A-B)}$$

TABLE II — Continued
TRIGONOMETRIC FORMULÆ (continued)

In any triangle:

Given a, b, C; to find c, B, A.

Use Law of Lines.

Given A, B, c; to find a, b, C.

Use Law of Lines.

Given a, b, c; to find A, B, C.

$$\text{Let } \frac{a+b+c}{2} = s, \sqrt{\frac{(s-a)(s-b)(s-c)}{s}} = r$$

$$\cos \frac{1}{2} A = \sqrt{\frac{s(s-a)}{bc}}$$

$$\tan \frac{1}{2} A = \frac{r}{s-a}$$

$$\tan \frac{1}{2} B = \frac{r}{s-b}$$

$$\tan \frac{1}{2} C = \frac{r}{s-c}$$

Area of a triangle:

$$\text{Area} = \frac{1}{2} ab \sin C$$

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

PRISMOIDAL FORMULA.

$$\text{Vol.} = \frac{h}{6} (B+b+4M)$$

h = altitude; b, B = bases; M = midsection

TABLE III

INCHES AND FRACTIONS OF AN INCH IN DECIMALS OF A FOOT

	0	1	2	3	4	5	6	7	8	9	10	11	
¹ / ₁₆	.0052	.0885	.1719	.2552	.3385	.4219	.5052	.5885	.6719	.7552	.8385	.9219	¹ / ₁₆
¹ / ₈	.0104	.0938	.1771	.2604	.3438	.4271	.5104	.5938	.6771	.7604	.8438	.9271	¹ / ₈
³ / ₁₆	.0156	.0990	.1823	.2656	.3490	.4323	.5156	.5990	.6823	.7656	.8490	.9323	³ / ₁₆
¹ / ₄	.0208	.1042	.1875	.2708	.3542	.4375	.5208	.6042	.6875	.7708	.8542	.9375	¹ / ₄
⁵ / ₁₆	.0260	.1094	.1927	.2760	.3594	.4427	.5260	.6094	.6927	.7760	.8594	.9427	⁵ / ₁₆
³ / ₈	.0313	.1146	.1979	.2813	.3646	.4479	.5313	.6146	.6979	.7813	.8646	.9479	³ / ₈
⁷ / ₁₆	.0365	.1198	.2031	.2865	.3698	.4531	.5365	.6198	.7031	.7865	.8698	.9531	⁷ / ₁₆
¹ / ₂	.0417	.1250	.2083	.2917	.3750	.4583	.5417	.6250	.7083	.7917	.8750	.9583	¹ / ₂
⁹ / ₁₆	.0469	.1302	.2135	.2969	.3803	.4635	.5469	.6302	.7135	.7969	.8802	.9635	⁹ / ₁₆
⁵ / ₈	.0521	.1354	.2188	.3021	.3854	.4688	.5521	.6354	.7188	.8021	.8854	.9688	⁵ / ₈
¹¹ / ₁₆	.0573	.1406	.2240	.3073	.3906	.4740	.5573	.6406	.7240	.8073	.8906	.9740	¹¹ / ₁₆
³ / ₄	.0625	.1458	.2292	.3125	.3958	.4792	.5625	.6458	.7292	.8125	.8958	.9792	³ / ₄
¹³ / ₁₆	.0677	.1510	.2344	.3177	.4010	.4844	.5677	.6510	.7344	.8177	.9010	.9844	¹³ / ₁₆
⁷ / ₈	.0729	.1563	.2396	.3229	.4063	.4896	.5729	.6563	.7396	.8229	.9063	.9896	⁷ / ₈
¹⁵ / ₁₆	.0781	.1615	.2448	.3281	.4115	.4948	.5781	.6615	.7448	.8281	.9115	.9948	¹⁵ / ₁₆
1	.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167	1.000	1
	0	1	2	3	4	5	6	7	8	9	10	11	

TABLE IV. USEFUL RELATIONS.

Lineal feet	×	.00019	=	miles
Lineal yards	×	.0006	=	miles
Square inches	×	.007	=	square feet
Square feet	×	.111	=	square yards
Square yards	×	.0002067	=	acres
Acres	×	4840	=	square yards
Cubic inches	×	.00058	=	cubic feet
Cubic feet	×	.03704	=	cubic yards
Links	×	.22	=	yards
Links	×	.66	=	feet
Feet	×	1.5	=	links

$$360^\circ = 21600' = 1296000''$$

$$\text{Radius} = \text{arc of } 57.2957790''$$

$$\text{Arc of } 1^\circ (\text{radius} = 1) = .017453292$$

$$\text{Arc of } 1' (\text{radius} = 1) = .000290888$$

$$\text{Arc of } 1'' (\text{radius} = 1) = .000004848$$

$$\pi = 3.141592654$$

$$\sqrt{\frac{1}{4}} = 0.564190$$

$$\frac{\pi}{4} = 0.785398163$$

$$\sqrt[3]{\frac{6}{\pi}} = 1.240700982$$

$$\frac{\pi}{6} = 0.523598776$$

$$\pi^2 = 9.869604401$$

$$\sqrt{\frac{4}{\pi}} = 1.128379167$$

$$\frac{1}{\pi^2} = 0.101321184$$

$$\frac{\pi}{6} = 0.523598776$$

$$\sqrt{\pi} = 1.772453851$$

$$\frac{4\pi}{3} = 4.188790205$$

$$\frac{1}{\pi} = 0.3183099$$

Curvature of Earth's surface = about 0.7 feet in 1 mile

Curvature in feet = 0.667 (Dist. in miles)²

Difference between arc and chord length, 0.05 feet in 11 1/2 miles

$$\text{Probable error of a single observation} = 0.6754 \sqrt{\frac{\sum v^2}{n-1}}$$

Error in chaining of 0.01 feet in 100 feet:

Due to—

1. Length of tape error of 0.01 feet
2. Alignment. One end 1.4 feet out of line
3. Sag of tape at centre of 0.61 feet
4. Temperature difference of 15'
5. Difference of pull of 15 lbs.

STADIA REDUCTION FORMULÆ.

Horizontal Distance = R - R sin² a + C cos a

Vertical Distance = R 1/2 sin 2 a + C sin a

distance from Object glass to cross hairs

R = Reading × $\frac{\text{distance between cross hairs}}{\text{distance from Object glass to center of instrument.}}$

C = distance from Object glass to cross hairs + distance from Object glass to center of instrument.

a = angle of elevation for mid Reading

TABLE VI (continued)
SINES, COSINES, TANGENTS, COTANGENTS (continued)

deg.	sin 0'	tan 0'	sin 10'	tan 10'	sin 20'	tan 20'	sin 30'	tan 30'	sin 40'	tan 40'	sin 50'	tan 50'	deg.
46	7193	1.0355	7214	1.0416	7234	1.0477	7254	1.0533	7274	1.0599	7294	1.0661	43
47	314	.0724	333	.0786	353	.0850	373	.0913	392	.0977	412	.1041	42
48	431	.1106	451	.1171	470	.1237	490	.1303	509	.1369	528	.1436	41
49	547	.1504	566	.1571	585	.1640	604	.1708	623	.1778	642	.1847	40
50	660	1.1918	7679	1.1988	7698	1.2059	7716	1.2131	7735	1.2203	7753	1.2276	39
51	771	.2349	790	.2423	808	.2497	826	.2572	844	.2647	862	.2723	38
52	880	.2799	898	.2876	916	.2954	934	.3032	951	.3111	969	.3190	37
53	986	.3270	8004	.3351	8021	.3432	8039	.3514	8056	.3597	8073	.3680	36
54	8090	.3764	107	.3848	124	.3934	141	.4019	158	.4106	175	.4193	35
55	192	.4281	208	.4370	225	.4460	241	.4550	258	.4641	274	.4733	34
56	290	.4826	307	.4919	323	.5013	339	.5108	355	.5204	371	.5301	33
57	387	.5399	403	.5497	418	.5597	434	.5697	450	.5798	465	.5900	32
58	480	.6003	496	.6107	511	.6212	526	.6319	542	.6426	557	.6534	31
59	572	.6643	587	.6753	601	.6864	616	.6977	631	.7090	646	.7205	30
60	660	1.7321	8675	1.7437	8689	1.7556	8704	1.7675	8718	1.7797	8732	1.7917	29
61	746	.8040	760	.8165	774	.8291	788	.8418	802	.8546	816	.8676	28
62	829	.8807	843	.8940	857	.9074	870	.9210	884	.9347	897	.9486	27
63	910	.9626	923	.9768	936	.9912	949	2.0057	962	2.0204	975	2.0353	26
64	988	2.0503	9001	2.0655	9013	2.0809	9026	.0965	9038	.1123	9051	.1283	25
65	9063	.1445	075	.1609	088	.1775	100	.1943	112	.2113	124	.2286	24
66	135	.2460	147	.2637	159	.2817	171	.2998	182	.3183	194	.3369	23
67	205	.3559	216	.3750	228	.3945	239	.4142	250	.4342	261	.4545	22
68	272	.4751	283	.4960	293	.5172	304	.5386	315	.5605	325	.5826	21
69	336	.6051	346	.6279	356	.6511	367	.6746	377	.6985	387	.7228	20
70	397	2.7475	9407	2.7725	9417	2.7980	9426	2.8239	9436	2.8502	9446	2.8770	19
71	455	.9042	465	.9319	474	.9600	483	.9887	492	3.0178	502	3.0475	18
72	511	3.0777	520	3.1084	528	3.1397	537	3.1716	546	.2041	555	.2371	17
73	563	.2709	572	.3052	580	.3402	588	.3759	596	.4124	605	.4495	16
74	613	.4874	621	.5261	628	.5656	636	.6059	644	.6470	652	.6891	15
75	659	.7321	667	.7760	674	.8208	681	.8657	689	.9136	696	.9617	14
76	703	4.0108	710	4.0611	717	4.1126	724	4.1653	730	4.2193	737	4.2747	13
77	744	.3315	750	.3897	757	.4494	763	.5107	769	.5736	775	.6382	12
78	781	.7046	787	.7729	793	.8430	799	.9152	805	.9894	811	5.0658	11
79	816	.1446	822	5.2257	827	5.3093	833	5.3955	838	5.4845	843	.5764	10
80	9848	5.6713	9853	5.7694	9858	5.8708	9863	5.9758	9868	6.0844	9872	6.1970	9
81	877	6.3138	881	6.4348	886	6.5606	890	6.6912	894	.8269	899	.9682	8
82	903	7.1154	907	7.2687	911	7.4287	914	7.5958	918	7.7704	932	7.9530	7
83	925	8.1443	929	8.3450	932	8.5555	936	8.7769	939	9.0098	942	9.2553	6
84	945	9.5144	948	9.7882	951	10.0788	954	10.3855	957	10.7111	959	11.0595	5
85	962	11.4300	964	11.8226	967	12.2500	969	12.7067	971	13.1977	974	13.7274	4
86	976	14.3000	978	14.9224	980	15.6058	981	16.3500	983	17.1698	985	18.0753	3
87	986	19.081	988	20.2026	989	21.4700	990	22.9032	992	24.542	993	26.432	2
88	994	28.636	995	30.246	996	34.368	997	38.189	997	42.964	998	49.104	1
89	9998	57.290	9999	68.750	9999	85.940	9999	114.58	1.000	171.88	1.000	343.77	0
deg.	60 cos	60 cot	50 cos	50 cot	40 cos	40 cot	30 cos	30 cot	20 cos	20 cot	10 cos	10 cot	deg.

TABLE V.—RADII, ORDINATES AND DEFLECTIONS

Deg.	Radius	Mid. Ord.	Tan. Offset	Def. for 1 Foot	Deg.	Radius	Mid. Ord.	Tan. Offset	Def. for 1 Foot	
0°	10	34377.5	.036	.145	0.05'	7°	819.02	1.528	6.105	2.10'
	20	17188.8	.073	.291	0.10	20'	781.84	1.600	6.395	2.20
	30	11459.2	.109	.436	0.15	30	764.49	1.637	6.540	2.25
	40	8594.42	.145	.582	0.20	40	747.89	1.673	6.685	2.30
	50	6875.55	.182	.727	0.25					
1		5729.65	.218	.873	0.30	8	716.78	1.746	6.976	2.40
	10	4911.15	.255	1.018	0.35	20	688.16	1.819	7.266	2.50
	20	4297.28	.291	1.164	0.40	30	674.69	1.855	7.411	2.55
	30	3819.83	.327	1.309	0.45	40	661.74	1.892	7.556	2.60
	40	3437.87	.364	1.454	0.50	9	637.28	1.965	7.846	2.70
	50	3125.36	.400	1.600	0.55	20	614.56	2.037	8.136	2.80
2		2864.93	.436	1.745	0.60	30	603.80	2.074	8.281	2.85
	10	2644.58	.473	1.891	0.65	40	593.42	2.110	8.426	2.90
	20	2455.70	.509	2.036	0.70	10	573.69	2.183	8.716	3.00
	30	2292.01	.545	2.181	0.75	30	546.44	2.292	9.150	3.15
	40	2148.79	.582	2.327	0.80	11	521.67	2.402	9.585	3.30
	50	2022.41	.618	2.472	0.85	30	499.06	2.511	10.02	3.45
3		1910.08	.655	2.618	0.90	12	478.34	2.620	10.45	3.60
	10	1809.57	.691	2.763	0.95	30	459.28	2.730	10.89	3.75
	20	1719.12	.727	2.908	1.00	13	441.68	2.839	11.32	3.90
	30	1637.28	.764	3.054	1.05	30	425.40	2.949	11.75	4.05
	40	1562.88	.800	3.199	1.10	14	410.28	3.058	12.18	4.20
	50	1494.95	.836	3.345	1.15	30	396.20	3.168	12.62	4.35
4		1432.69	.873	3.490	1.20	15	383.07	3.277	13.05	4.50
	10	1375.40	.909	3.635	1.25	30	370.78	3.387	13.49	4.65
	20	1322.53	.945	3.718	1.30	16	359.27	3.496	13.92	4.80
	30	1273.57	.982	3.926	1.35	30	348.45	3.606	14.35	4.95
	40	1228.11	1.018	4.071	1.40	17	338.27	3.716	14.78	5.10
	50	1185.78	1.055	4.217	1.45	18	319.62	3.935	15.64	5.40
5		1146.28	1.091	4.362	1.50	19	302.94	4.155	16.51	5.70
	10	1109.33	1.127	4.507	1.55	20	287.94	4.374	17.37	6.00
	20	1074.68	1.164	4.653	1.60	21	274.37	4.594	18.22	6.30
	30	1042.14	1.200	4.798	1.65	22	262.04	4.814	19.08	6.60
	40	1011.51	1.237	4.943	1.70	23	250.79	5.035	19.94	6.90
	50	982.64	1.273	5.088	1.75	24	240.49	5.255	20.79	7.20
6		955.37	1.309	5.234	1.80	25	231.01	5.476	21.64	7.50
	10	929.57	1.346	5.379	1.85	26	222.27	5.697	22.50	7.80
	20	905.13	1.382	5.524	1.90	27	214.18	5.918	23.35	8.10
	30	881.95	1.418	5.669	1.95	28	206.68	6.139	24.19	8.40
	40	859.92	1.455	5.814	2.00	29	199.70	6.360	25.04	8.70
						30	193.18	6.583	25.88	9.00

Note. Chord Deflection = 2 times tangent deflection.

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE.

I	T	E	I=100	I	T	E	I=200	I	T	E	I=300
1°	50.00	.218		11°	551.70	26.500		21°	1061.9	97.577	
10'	58.34	.297		10'	560.11	27.313		10'	1070.6	99.155	
20'	66.67	.388		20'	568.53	28.137		20'	1079.2	100.775	
30'	75.01	.491		30'	576.95	28.974		30'	1087.8	102.35	
40'	83.34	.606		40'	585.36	29.824		40'	1096.4	103.97	
50'	91.68	.733		50'	593.79	30.686		50'	1105.1	105.60	
2°	100.01	.873		12°	602.21	31.561		22°	1113.7	107.24	
10'	108.35	1.024		10'	610.64	32.447		10'	1122.4	108.90	
20'	116.68	1.188		20'	619.07	33.347		20'	1131.0	110.57	
30'	125.02	1.364		30'	627.50	34.259		30'	1139.7	112.25	
40'	133.36	1.552		40'	635.93	35.183		40'	1148.4	113.95	
50'	141.70	1.752		50'	644.37	36.120		50'	1157.0	115.66	
3°	150.04	1.964		18°	652.81	37.070		23°	1165.7	117.38	
10'	158.38	2.188		10'	661.25	38.031		10'	1174.4	119.12	
20'	166.72	2.425		20'	669.70	39.006		20'	1183.1	120.87	
30'	175.06	2.674		30'	678.15	39.993		30'	1191.8	122.63	
40'	183.40	2.934		40'	686.60	40.992		40'	1200.5	124.41	
50'	191.74	3.207		50'	695.06	42.004		50'	1209.2	126.20	
4°	200.08	3.492		14°	703.51	43.029		24°	1217.9	128.00	
10'	208.43	3.790		10'	711.97	44.066		10'	1226.6	129.82	
20'	216.77	4.099		20'	720.44	45.116		20'	1235.3	131.65	
30'	225.12	4.421		30'	728.90	46.178		30'	1244.0	133.50	
40'	233.47	4.755		40'	737.37	47.253		40'	1252.8	135.35	
50'	241.81	5.100		50'	745.85	48.341		50'	1261.5	137.23	
5°	250.16	5.459		15°	754.32	49.441		25°	1270.2	139.11	
10'	258.51	5.829		10'	762.80	50.554		10'	1279.0	141.01	
20'	266.86	6.211		20'	771.29	51.679		20'	1287.7	142.93	
30'	275.21	6.606		30'	779.77	52.818		30'	1296.5	144.85	
40'	283.57	7.013		40'	788.26	53.969		40'	1305.3	146.79	
50'	291.92	7.432		50'	796.75	55.132		50'	1314.0	148.75	
6°	300.28	7.863		16°	805.25	56.309		26°	1322.8	150.71	
10'	308.64	8.307		10'	813.75	57.498		10'	1331.6	152.69	
20'	316.99	8.762		20'	822.25	58.699		20'	1340.4	154.69	
30'	325.35	9.230		30'	830.76	59.914		30'	1349.2	156.70	
40'	333.71	9.710		40'	839.27	61.141		40'	1358.0	158.72	
50'	342.08	10.202		50'	847.78	62.381		50'	1366.8	160.76	
7°	350.44	10.707		17°	856.30	63.634		27°	1375.6	162.81	
10'	358.81	11.224		10'	864.82	64.900		10'	1384.4	164.86	
20'	367.17	11.753		20'	873.35	66.178		20'	1393.2	166.95	
30'	375.54	12.294		30'	881.88	67.470		30'	1402.0	169.04	
40'	383.91	12.847		40'	890.41	68.774		40'	1410.9	171.15	
50'	392.28	13.413		50'	898.95	70.091		50'	1419.7	173.27	
8°	400.66	13.991		18°	907.49	71.421		28°	1428.6	175.41	
10'	409.03	14.582		10'	916.03	72.764		10'	1437.4	177.55	
20'	417.41	15.184		20'	924.58	74.119		20'	1446.3	179.72	
30'	425.79	15.799		30'	933.13	75.488		30'	1455.1	181.89	
40'	434.17	16.426		40'	941.69	76.869		40'	1464.0	184.08	
50'	442.55	17.065		50'	950.25	78.264		50'	1472.9	186.29	
9°	450.93	17.717		19°	958.81	79.671		29°	1481.8	188.51	
10'	459.32	18.381		10'	967.38	81.092		10'	1490.7	190.74	
20'	467.71	19.058		20'	975.96	82.525		20'	1499.6	192.99	
30'	476.10	19.746		30'	984.53	83.972		30'	1508.5	195.25	
40'	484.49	20.447		40'	993.12	85.431		40'	1517.4	197.53	
50'	492.88	21.161		50'	1001.7	86.904		50'	1526.3	199.82	
10°	501.28	21.887		20°	1010.3	88.389		30°	1535.3	202.12	
10'	509.68	22.624		10'	1018.9	89.888		10'	1544.2	204.44	
20'	518.08	23.375		20'	1027.5	91.399		20'	1553.1	206.77	
30'	526.48	24.138		30'	1036.1	92.924		30'	1562.1	209.12	
40'	534.89	24.913		40'	1044.7	94.462		40'	1571.0	211.48	
50'	543.29	25.700		50'	1053.3	96.013		50'	1580.0	213.86	

T = R tan 1/2 I

E = R exsec 1/2 I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=400	I	T	E	I=500	I	T	E	I=600
31°	1589.0	216.3		41°	2142.2	387.4		51°	2732.9	618.4	
10'	1598.0	218.7		10'	2151.7	390.7		10'	2743.1	622.8	
20'	1606.9	221.1		20'	2161.2	394.1		20'	2753.4	627.2	
30'	1615.9	223.5		30'	2170.8	397.4		30'	2763.7	631.7	
40'	1624.9	226.0		40'	2180.3	400.8		40'	2773.9	636.2	
50'	1633.9	228.4		50'	2189.9	404.2		50'	2784.2	640.7	
32°	1643.0	230.9		42°	2199.4	407.6		52°	2794.5	645.2	
10'	1652.0	233.4		10'	2209.0	411.1		10'	2804.9	649.7	
20'	1661.0	235.9		20'	2218.6	414.5		20'	2815.2	654.3	
30'	1670.0	238.4		30'	2228.1	418.0		30'	2825.6	658.8	
40'	1679.1	241.0		40'	2237.7	421.4		40'	2835.9	663.4	
50'	1688.1	243.5		50'	2247.3	425.0		50'	2846.3	668.0	
33°	1697.2	246.1		43°	2257.0	428.5		53°	2856.7	672.7	
10'	1706.3	248.7		10'	2266.6	432.0		10'	2867.1	677.3	
20'	1715.3	251.3		20'	2276.2	435.6		20'	2877.5	682.0	
30'	1724.4	253.9		30'	2285.9	439.2		30'	2888.0	686.7	
40'	1733.5	256.5		40'	2295.6	442.8		40'	2898.4	691.4	
50'	1742.6	259.1		50'	2305.2	446.4		50'	2908.9	696.1	
34°	1751.7	261.8		44°	2314.9	450.0		54°	2919.4	700.9	
10'	1760.8	264.5		10'	2324.6	453.6		10'	2929.9	705.7	
20'	1770.0	267.2		20'	2334.3	457.3		20'	2940.4	710.5	
30'	1779.1	269.9		30'	2344.1	461.0		30'	2951.0	715.3	
40'	1788.2	272.6		40'	2353.8	464.6		40'	2961.5	720.1	
50'	1797.4	275.3		50'	2363.5	468.4		50'	2972.1	725.0	
35°	1806.6	278.1		45°	2373.3	472.1		55°	2982.7	729.9	
10'	1815.7	280.8		10'	2383.1	475.8		10'	2993.3	734.8	
20'	1824.9	283.6		20'	2392.8	479.6		20'	3003.9	739.7	
30'	1834.1	286.4		30'	2402.6	483.4		30'	3014.5	744.6	
40'	1843.3	289.2		40'	2412.4	487.2		40'	3025.2	749.6	
50'	1852.5	292.0		50'	2422.3	491.0		50'	3035.8	754.6	
36°	1861.7	294.9		46°	2432.1	494.8		56°	3046.5	759.6	
10'	1870.9	297.7		10'	2441.9	498.7		10'	3057.2	764.6	
20'	1880.1	300.6		20'	2451.8	502.5		20'	3067.9	769.7	
30'	1889.4	303.5		30'	2461.7	506.4		30'	3078.7	774.7	
40'	1898.6	306.4		40'	2471.5	510.3		40'	3089.4	779.8	
50'	1907.9	305.3		50'	2481.4	514.3		50'	3100.2	784.9	
37°	1917.1	312.2		47°	2491.3	518.2		57°	3110.9	790.1	
10'	1926.4	315.2		10'	2501.2	522.2		10'	3121.7	795.2	
20'	1935.7	318.1		20'	2511.2	526.1		20'	3132.6	800.4	
30'	1945.0	321.1		30'	2521.1	530.1		30'	3143.4	805.6	
40'	1954.3	324.1		40'	2531.1	534.2		40'	3154.2	810.9	
50'	1963.6	327.1		50'	2541.0	538.2		50'	3165.1	816.1	
38°	1972.9	330.2		48°	2551.0	542.2		58°	3176.0	821.4	
10'	1982.2	333.2		10'	2561.0	546.3		10'	3186.9	826.7	
20'	1991.5	336.3		20'	2571.0	550.4		20'	3197.8	832.0	
30'	2000.9	339.3		30'	2581.0	554.5		30'	3208.8	837.3	
40'	2010.2	342.4		40'	2591.0	558.6		40'	3219.7	842.7	
50'	2019.6	345.5		50'	2601.1	562.8		50'	3230.7	848.1	

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE.

I	T	E	I=70°	I	T	E	I=80°	I	T	E	I=90°
61°	3375.0	920.2		71°	4086.9	1308.2		81°	4893.6	1805.3	
10'	3386.3	925.9		10'	4099.5	1315.6		10'	4908.0	1814.7	
20'	3397.5	931.6		20'	4112.1	1322.9		20'	4922.5	1824.1	
30'	3408.8	937.3		30'	4124.8	1330.3		30'	4937.0	1833.6	
40'	3420.1	943.1		40'	4137.4	1337.7		40'	4951.5	1843.1	
50'	3431.4	948.9		50'	4150.1	1345.1		50'	4966.1	1852.6	
62°	3442.7	954.8		72°	4162.8	1352.6		82°	4980.7	1862.2	
10'	3454.1	960.6		10'	4175.6	1360.1		10'	4995.4	1871.8	
20'	3465.4	966.5		20'	4188.5	1367.6		20'	5010.0	1881.5	
30'	3476.8	972.4		30'	4201.2	1375.2		30'	5024.8	1891.2	
40'	3488.3	978.3		40'	4214.0	1382.8		40'	5039.5	1900.9	
50'	3499.7	984.3		50'	4226.8	1390.4		50'	5054.3	1910.7	
63°	3511.1	990.2		73°	4239.7	1398.0		83°	5069.2	1920.5	
10'	3522.6	996.2		10'	4252.6	1405.7		10'	5084.0	1930.4	
20'	3534.1	1002.3		20'	4265.6	1413.5		20'	5099.0	1940.3	
30'	3545.6	1008.3		30'	4278.5	1421.2		30'	5113.9	1950.3	
40'	3557.2	1014.4		40'	4291.5	1429.0		40'	5128.9	1960.2	
50'	3568.7	1020.5		50'	4304.6	1436.8		50'	5143.9	1970.3	
64°	3580.3	1026.6		74°	4317.6	1444.6		84°	5159.0	1980.4	
10'	3591.9	1032.8		10'	4330.7	1452.5		10'	5174.1	1990.5	
20'	3603.5	1039.0		20'	4343.8	1460.4		20'	5189.3	2000.6	
30'	3615.1	1045.2		30'	4356.9	1468.4		30'	5204.4	2010.8	
40'	3626.8	1051.4		40'	4370.1	1476.4		40'	5219.7	2021.1	
50'	3638.5	1057.7		50'	4383.3	1484.4		50'	5234.9	2031.4	
65°	3650.2	1063.9		75°	4396.5	1492.4		85°	5250.3	2041.7	
10'	3661.9	1070.2		10'	4409.8	1500.5		10'	5265.6	2052.1	
20'	3673.7	1076.6		20'	4423.1	1508.6		20'	5281.0	2062.5	
30'	3685.4	1082.9		30'	4436.4	1516.7		30'	5296.4	2073.0	
40'	3697.2	1089.3		40'	4449.7	1524.9		40'	5311.9	2083.5	
50'	3709.0	1095.7		50'	4463.1	1533.1		50'	5327.4	2094.1	
66°	3720.9	1102.2		76°	4476.5	1541.4		86°	5343.0	2104.7	
10'	3732.7	1108.6		10'	4489.9	1549.7		10'	5358.6	2115.3	
20'	3744.6	1115.1		20'	4503.4	1558.0		20'	5374.2	2126.0	
30'	3756.5	1121.7		30'	4516.9	1566.3		30'	5389.9	2136.7	
40'	3768.5	1128.2		40'	4530.4	1574.7		40'	5405.6	2147.5	
50'	3780.4	1134.8		50'	4544.0	1583.1		50'	5421.4	2158.4	
67°	3792.4	1141.4		77°	4557.6	1591.6		87°	5437.2	2169.2	
10'	3804.4	1148.0		10'	4571.2	1600.1		10'	5453.1	2180.2	
20'	3816.4	1154.7		20'	4584.8	1608.6		20'	5469.0	2191.1	
30'	3828.4	1161.3		30'	4598.5	1617.1		30'	5484.9	2202.2	
40'	3840.5	1168.1		40'	4612.2	1625.7		40'	5500.9	2213.2	
50'	3852.6	1174.8		50'	4626.0	1634.4		50'	5517.0	2224.3	
68°	3864.7	1181.6		78°	4639.8	1643.0		88°	5533.1	2235.5	
10'	3876.8	1188.4		10'	4653.6	1651.7		10'	5549.2	2246.7	
20'	3889.0	1195.2		20'	4667.4	1660.5		20'	5565.4	2258.0	
30'	3901.2	1202.0		30'	4681.3	1669.2		30'	5581.6	2269.3	
40'	3913.4	1208.9		40'	4695.2	1678.1		40'	5597.8	2280.6	
50'	3925.6	1215.8		50'	4709.2	1686.9		50'	5614.2	2292.0	
69°	3937.9	1222.7		79°	4723.2	1695.8		89°	5630.5	2303.5	
10'	3950.2	1229.7		10'	4737.2	1704.7		10'	5646.9	2315.0	
20'	3962.5	1236.7		20'	4751.2	1713.7		20'	5663.4	2326.6	
30'	3974.8	1243.7		30'	4765.3	1722.7		30'	5679.9	2338.2	
40'	3987.2	1250.8		40'	4779.4	1731.7		40'	5696.4	2349.8	
50'	3999.5	1257.9		50'	4793.6	1740.8		50'	5713.0	2361.5	
70°	4011.9	1265.0		80°	4807.7	1749.9		90°	5729.7	2373.3	
10'	4024.4	1272.1		10'	4822.0	1759.0		10'	5746.3	2385.1	
20'	4036.8	1279.3		20'	4836.2	1768.2		20'	5763.1	2397.0	
30'	4049.3	1286.5		30'	4850.5	1777.4		30'	5779.9	2408.9	
40'	4061.8	1293.6		40'	4864.8	1786.7		40'	5796.7	2420.9	
50'	4074.4	1300.9		50'	4879.2	1796.0		50'	5813.6	2432.9	

E = R tan 1/2 I

E = R exsec 1/2 I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=100°	I	T	E	I=110°	I	T	E	I=120°
91°	5830.5	2444.9		101°	6950.6	3278.1		111°	8336.7	4386.1	
10'	5847.5	2457.1		10'	6971.3	3294.1		10'	8362.7	4407.6	
20'	5864.6	2469.3		20'	6992.0	3310.1		20'	8388.9	4429.2	
30'	5881.7	2481.5		30'	7012.7	3326.1		30'	8415.1	4450.9	
40'	5898.8	2493.8		40'	7033.6	3342.3		40'	8441.5	4472.7	
50'	5916.0	2506.1		50'	7054.5	3358.5		50'	8468.0	4494.6	
92°	5933.2	2518.5		102°	7075.5	3374.9		112°	8494.6	4516.6	
10'	5950.5	2531.0		10'	7096.6	3391.2		10'	8521.3	4538.8	
20'	5967.9	2543.5		20'	7117.8	3407.7		20'	8548.1	4561.1	
30'	5985.3	2556.0		30'	7139.0	3424.3		30'	8575.0	4583.4	
40'	6002.7	2568.6		40'	7160.3	3440.9		40'	8602.1	4606.0	
50'	6020.2	2581.3		50'	7181.7	3457.6		50'	8629.3	4628.6	
93°	6037.8	2594.0		103°	7203.2	3474.4		113°	8656.6	4651.3	
10'	6055.4	2606.8		10'	7224.7	3491.3		10'	8684.0	4674.2	
20'	6073.1	2619.7		20'	7246.3	3508.2		20'	8711.5	4697.2	
30'	6090.8	2632.6		30'	7268.0	3525.2		30'	8739.2	4720.3	
40'	6108.6	2645.5		40'	7289.8	3542.4		40'	8767.0	4743.6	
50'	6126.4	2658.5		50'	7311.7	3559.6		50'	8794.9	4766.9	
94°	6144.3	2671.6		104°	7333.6	3576.8		114°	8822.9	4790.4	
10'	6162.2	2684.7		10'	7355.6	3594.2		10'	8851.0	4814.1	
20'	6180.2	2697.9		20'	7377.8	3611.7		20'	8879.3	4837.8	
30'	6198.3	2711.2		30'	7399.9	3629.2		30'	8907.7	4861.7	
40'	6216.4	2724.5		40'	7422.2	3646.8		40'	8936.3	4885.7	
50'	6234.6	2737.9		50'	7444.6	3664.5		50'	8965.0	4909.9	
95°	6252.8	2751.3		105°	7467.0	3682.3		115°	8993.8	4934.1	
10'	6271.1	2764.8		10'	7489.6	3700.2		10'	9022.7	4958.6	
20'	6289.4	2778.3		20'	7512.2	3718.2		20'	9051.7	4983.1	
30'	6307.9	2792.0		30'	7534.9	3736.2		30'	9080.9	5007.8	
40'	6326.3	2805.6		40'	7557.7	3754.4		40'	9110.3	5032.6	
50'	6344.8	2819.4		50'	7580.5	3772.6		50'	9139.8	5057.6	
96°	6363.4	2833.2		106°	7603.5	3791.0		116°	9169.4	5082.7	
10'	6382.1	2847.0		10'	7626.6	3809.4		10'	9199.1	5107.9	
20'	6400.8	2861.0		20'	7649.7	3827.9		20'	9229.0	5133.3	
30'	6419.5	2875.0		30'	7672.9	3846.5		30'	9259.0	5158.8	
40'	6438.4	2889.0		40'	7696.3	3865.2		40'	9289.2	5184.5	
50'	6457.3	2903.1		50'	7719.7	3884.0		50'	9319.5	5210.3	
97°	6476.2	2917.3		107°	7743.2	3902.9		117°	9349.9	5236.2	
10'	6495.2	2931.6		10'	7766.8	3921.9		10'	9380.5	5262.3	
20'	6514.3	2945.9		20'	7790.5	3940.9		20'	9411.3	5288.6	
30'	6533.4	2960.3		30'	7814.3	3960.1		30'	9442.2	5315.0	
40'	6552.6	2974.7		40'	7838.1	3979.4		40'	9473.2	5341.5	
50'	6571.9	2989.2		50'	7862.1	3998.7		50'	9504.4	5368.2	
98°	6591.2	3003.8		108°	7886.2	4018.2		118°	9535.7	5395.1	
10'	6610.6	3018.4		10'	7910.4	4037.8		10'	9567.2	5422.1	
20'	6630.1	3033.1		20'	7934.6	4057.4		20'	9598.9	5449.2	
30'	6649.6	3047.9		30'	7959.0	4077.2		30'	9630.7	5476.5	
40'	6669.2	3062.8		40'	7983.5	4097.1		40'	9662.6	5504.0	
50'	6688.8	3077.7		50'	8008.0	4117.0		50'	9694.7	5531.7	
99°	6708.6	3092.7		109°	8032.7	4137.1		119°	9727.0	5559.4	
10'	6728.4	3107.7		10'	8057.4	4157.3		10'	9759.4	5587.4	
20'	6748.2	3122.9		20'	8082.3	4177.5		20'	9792.0	5	

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.

	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

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

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

Deflections for Sub Chords for Short Radius Curves.

Degree of Curve	Radius 50 sin. def. ang.	$\frac{1}{2}$ sub chord = sin of def. angle R				Length of arc for 100 ft.
		12.5 Ft.	15 Ft.	20 Ft.	25 Ft.	
30°	193.18	1° 51'	2° 17'	2° 58'	3° 43'	101.15
32°	181.39	1° 59'	2° 25'	3° 10'	3° 58'	101.33
34°	171.01	2° 06'	2° 33'	3° 21'	4° 12'	101.48
36°	161.80	2° 13'	2° 41'	3° 33'	4° 26'	101.66
38°	153.58	2° 20'	2° 49'	3° 44'	4° 40'	101.85
40°	146.19	2° 27'	2° 57'	3° 55'	4° 54'	102.06
42°	139.52	2° 34'	3° 05'	4° 07'	5° 08'	102.29
44°	133.47	2° 41'	3° 13'	4° 18'	5° 22'	102.53
46°	127.97	2° 48'	3° 21'	4° 29'	5° 36'	102.76
48°	122.92	2° 55'	3° 29'	4° 40'	5° 50'	103.00
50°	118.31	3° 02'	3° 38'	4° 51'	6° 04'	103.24
52°	114.06	3° 09'	3° 46'	5° 02'	6° 17'	103.54
54°	110.11	3° 16'	3° 54'	5° 13'	6° 31'	103.84
56°	106.50	3° 22'	4° 02'	5° 23'	6° 44'	104.14
58°	103.14	3° 29'	4° 10'	5° 34'	6° 57'	104.43
60°	100.00	3° 35'	4° 18'	5° 44'	7° 11'	104.72

TABLE XIII.
MINUTES IN DECIMALS OF A DEGREE.

0'30''	.00833	10'30''	.17500	20'30''	.34167	30'30''	.50833	40'30''	.67500	50'30''	.84167
1 00	.01667	11 00	.18333	21 00	.35000	31 00	.51667	41 00	.68333	51 00	.85000
30	.02500	30	.19167	30	.35833	30	.52500	30	.69167	30	.85833
2 00	.03333	12 00	.20000	22 00	.36667	32 00	.53333	42 00	.70000	52 00	.86667
30	.04167	30	.20833	30	.37500	30	.54167	30	.70833	30	.87500
3 00	.05000	13 00	.21667	23 00	.38333	33 00	.55000	43 00	.71667	53 00	.88333
30	.05833	30	.22500	30	.39167	30	.55833	30	.72500	30	.89167
4 00	.06667	14 00	.23333	24 00	.40000	34 00	.56667	44 00	.73333	54 00	.90000
30	.07500	30	.24167	30	.40833	30	.57500	30	.74167	30	.90833
5 00	.08333	15 00	.25000	25 00	.41667	35 00	.58333	45 00	.75000	55 00	.91667
30	.09167	30	.25833	30	.42500	30	.59167	30	.75833	30	.92500
6 00	.10000	16 00	.26667	26 00	.43333	36 00	.60000	46 00	.76667	56 00	.93333
30	.10833	30	.27500	30	.44167	30	.60833	30	.77500	30	.94167
7 00	.11667	17 00	.28333	27 00	.45000	37 00	.61667	47 00	.78333	57 00	.95000
30	.12500	30	.29167	30	.45833	30	.62500	30	.79167	30	.95833
8 00	.13333	18 00	.30000	28 00	.46667	38 00	.63333	48 00	.80000	58 00	.96667
30	.14167	30	.30833	30	.47500	30	.64167	30	.80833	30	.97500
9 00	.15000	19 00	.31667	29 00	.48333	39 00	.65000	49 00	.81667	59 00	.98333
30	.15833	30	.32500	30	.49167	30	.65833	30	.82500	30	.99167
10 00	.16667	20 00	.33333	30 00	.50000	40 00	.66667	50 00	.83333	60 00	1.00000

#209
Hoover Rd Drainage 1969 Pg. 2

#226
LIDALL ROAD & DATA Pg. 6

#5
AQUILLA ROAD X. SEC. Pg. 10

#9
CHAGRIN ROAD Topo Pg. 20

X SEC. Pg. 32

Culvert
Dr. Profiles Pg. 44

#170 #35
Ceder St. & Franklin Profile Pg. 48

10

1

Bob Kasie
Bob Dadrach
5/25/69

Hover Rd

DRAINAGE PROBLEM E. OF

S.R. 700 STA 0+0 = E SR 700

17+0

14+0

15+0

14+31

14+0

13+50

13+0

24" Conc. culvt.

IN Swamp

B.M. 100.00 Nail in Pole 2
N. Side 13+24

N. Ditch

S. Ditch

100.8
4.50

102.1
3.20

100.5
4.75

99.1
6.20

101.3
4.01

99.9
5.35

98.1
7.20

100.2
4.90

98.5
6.80

97.5
7.75 Fl. line

97.9
7.40 Fl. line

99.0
6.30

100.2
4.90

98.8
6.50

98.7
6.55

99.8
5.45

100.9
4.40

98.1
7.15

BM 3pk S. SIDE
CEI POLE STA. 13+0

H.I. 105.31

21+20

12" C.M.P. End

21+10

12" C.M.P. Begin

21+0

20+0

19+0

18+0

17+85

12" C.M.P. End

17+75

12" C.M.P. Begin

~~18+0~~

N

S

103.86

4.34

103.73

4.47

102.79

5.41

105.18

3.02

103.74

4.46

102.56

5.64

103.95

4.25

101.38

6.82

101.74

6.46

103.16

5.09

101.20

7.00

101.7

6.48

102.8

5.44

101.6

6.57

101.5

6.70

101.4

6.80

H.I. 108.20

N.

S.

27+75

~~B~~ End 6" Tile

110.38
4.90

27+0

110.60 111.84 111.68
4.68 3.44 3.60

26+0

111.41 111.53 111.14
4.87 3.75 4.14

25+0

109.06 110.46 108.56
6.22 4.82 6.72

24+90

Begin 6" Tile

108.24 109.50 108.48
7.04 5.78 7.83

24+0

106.84 108.44 106.72
8.44 6.84 8.55

23+0

105.61 106.83 106.63
9.67 8.45 8.65

22+0

H.I. 115.28

31+92

Top Pond

31+92

31+0

30+40

End 12" G.M.P.

30+30

Begin 12" G.M.P.

30+0

~~30+0~~

29+70

Low spot 25' S.

29+50

Low spot 30' N.

29+0

28+0

N.

S.
111.04
7.78112.27
#1 line 12" G.M.P.
6.60 ←116.32
2.55111.98
Fl. Line 12" G.M.P.
6.89 ←114.01
4.86114.35
4.52112.63
6.24112.32
6.65111.67
7.20111.47
7.40112.77
6.10111.31
7.56~~6.00~~No Culvert
110.03
8.84110.57
8.30

111.02

7.85

112.15

6.72

111.05

7.82

110.77

8.10

111.85

7.02

112.16

6.76

H.I. 118.87

8-20-27
 H. Patterson
 R. Baker
 S. Baker
 O+O

LIDALL ROAD

D-95 Road
 Record
 1846 = 60'

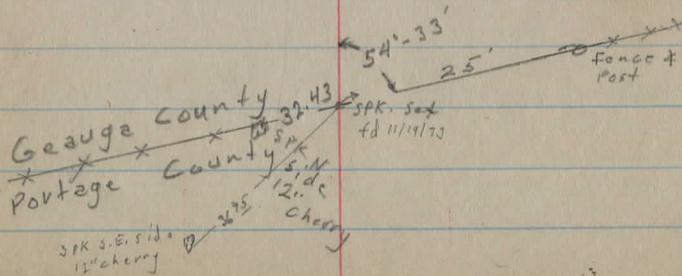
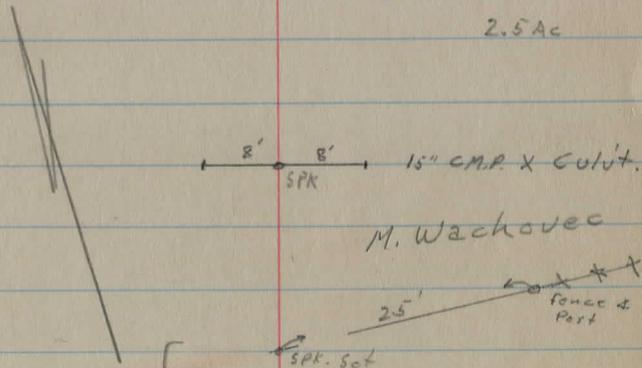
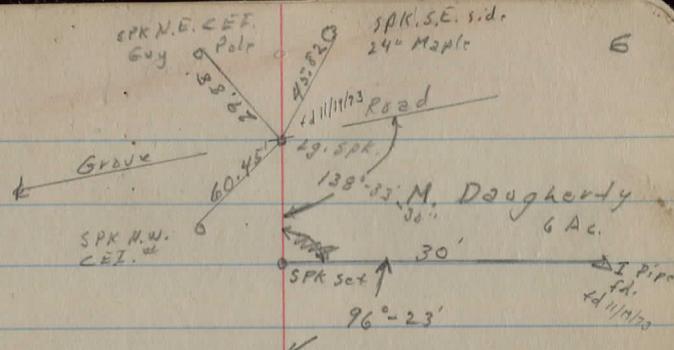
6+34.52

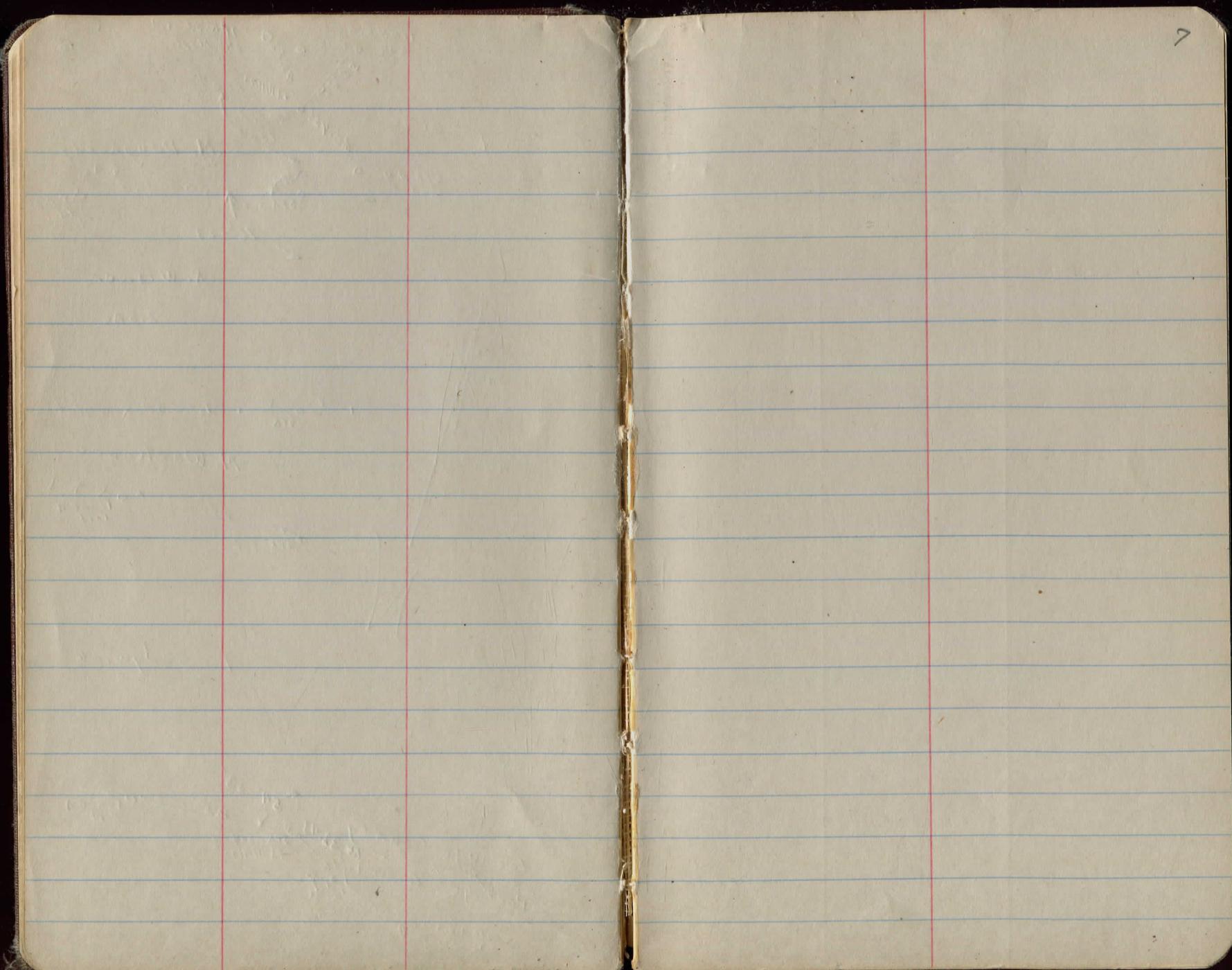
12+54.97

16+39.68

All side stakes set 100' at + 30' off R. w. side

18+08.60 = ± Co. line





B.S.

F.S.

B.M.	7.96	1164.74		1156.78
TP1	9.03	1173.51	0.26	1164.48
TP2	3.94	1177.12	0.33	1173.18
TP3	6.68	1179.18	4.62	1172.50
TP4	1.09	1169.08	11.19	1167.99
TP5	5.75	1164.89	9.94	1159.14
TP6	10.89	1175.49	0.29	1164.60
TP7	8.54	1181.98	2.05	1173.44
TP8	8.62	1190.47	0.13	1181.85
TP9	6.79	1193.03	4.23	1186.24
TP10	10.05	1202.09	0.99	1192.04
TP11	8.21	1209.38	0.92	1201.17
TP12	10.41	1219.44	0.35	1209.03
TP13	10.21	1228.40	1.25	1218.19
TP14	10.78	1238.64	0.54	1227.86
TP15	7.61	1245.37	0.88	1237.76
TP16	8.80	1252.41	1.76	1243.61
TP17	3.38	1253.43	2.36	1250.05

D. Lewis
H. Patterson
G. Sziklo65° Worn
4-23-70

10

N. end Culvert Hdwall

NE Corner Intersection

	+	1253.43	-	Elev.
TP 18	3.60	1252.52	4.51	1248.92
TP 19	5.62	1252.57	5.57	1246.95
TP 20	5.02	1253.70	3.89	1248.68
TP 21	5.63	1255.43	3.90	1249.80
TP 22	6.30	1258.38	3.35	1252.08
TP 23	0.72	1256.73	2.37	1256.01
TP 24	1.70	1248.60	9.83	1246.90
BM			6.32	1242.28

	+			
BM	6.35	1256.15		1249.80

85+0

WEST	E		EAST					
6.10	7.54	7.34	5.72	5.42	6.00	7.88	7.14	7.61
30	17.5	13	9		13.5	17.5	26	38
	DITCH		EP		EP	DITCH		

86+0

6.15	7.40	7.39	5.30	4.88	5.60	7.41	7.28	7.30	
30	19	14.5	10		13.5	16.5	19.50	30	
	DITCH		EP		EP	DITCH			

87+0

5.05	6.22	7.39	7.28	4.70	4.70	4.33	5.19	6.75	6.70	6.30
30	20	17.5	15.5	11.5	10		13	14	18	30
	DITCH		NEP				EP	DITCH		

Hd. WALL

① SPIKE IN O.B.T. CEF #821190 [Donald Boyan 11589 Aquilla Rd]
B.M. POLE # 13X073

② B.M. SPIKE IN POLE # CEF 44495

+

1256.99

-

94+0

95+0

96+0

TP 3

1.78

1247.51

11.26

1245.73

97+0

98+0

99+0

WEST

EAST

1252.59
 5.38 4.40 4.85 6.65 5.50 4.51 5.20 3.98
 30.0 0 9.0 15.0 19.0 45.0 48.0 60.0

♀

1245.25

8.10 8.01 9.55 8.74 7.44 7.00 8.12 7.22 6.91
 30.0 9.0 3.0 0 2.0 25.0 29.0 33.0 40.0

♀

1247.84

10.20 11.20 9.80 9.15 9.45 10.34 9.22
 30.0 12.0 8.5 0 16.5 20.0 30.0

♀

1247.11

1.40 2.62 1.10 0.40 0.87 2.01 0.45
 30.0 11.0 11.0 0 19.0 17.5 30.0

♀

1245.91

3.58 2.90 4.59 2.37 1.60 2.35 3.95 3.10 2.71
 30.0 18.0 14.5 11.0 0 13.5 17.0 21.0 30.0

♀

1243.21

5.20 4.30 4.55 5.53 4.45 4.60
 30.0 0 13.5 16.0 20.0 30.0
 NO DITCH ♀

+ 1247.51 -

100+0

101+0

B.M.

5.28 1242.23

WEST

±

EAST

1240.29

6.91	6.86	7.61	6.85	6.22	5.00
30	15.5	14.0	11.0	0	30.0
				±	NO. 0.724

8.25	9.98	10.47	8.84	8.36	8.55	7.0
30.0	18.0	14.0	11.0	0	16.0	30.0
				±		

CEI

B.M. # 2 POLE # 44495

T O P O

+33	Pavement	8' 10"	
+26	Brush	18' 33"	
88726	30" Maple	32.5'	
+85	24" Maple	32.5'	
+27			13' Curve Sign
+49	30" Maple	32.5'	
+31	C.E.T.	29.5'	
+27		19.5'	O.B.T.
+11	30" Maple	32.5'	
+06	width of Pavement	8' 10"	
82780	Brush	17' 33"	
+73	24" Maple	32.5'	
+37	30" Maple	32.5'	
86703	20" Maple	31.5'	
+83	C.E.T.	28.5'	
+68	24" Maple	32'	
+61		19.5'	O.B.T.
+32	20" Maple	32.5'	
+0	20" Maple	31.5'	
8574	Brush	17' 33"	

105.31

-3.34

101.97 elev

+6.23

H.I. 108.20

-1.37

elev. 106.83

+8.45

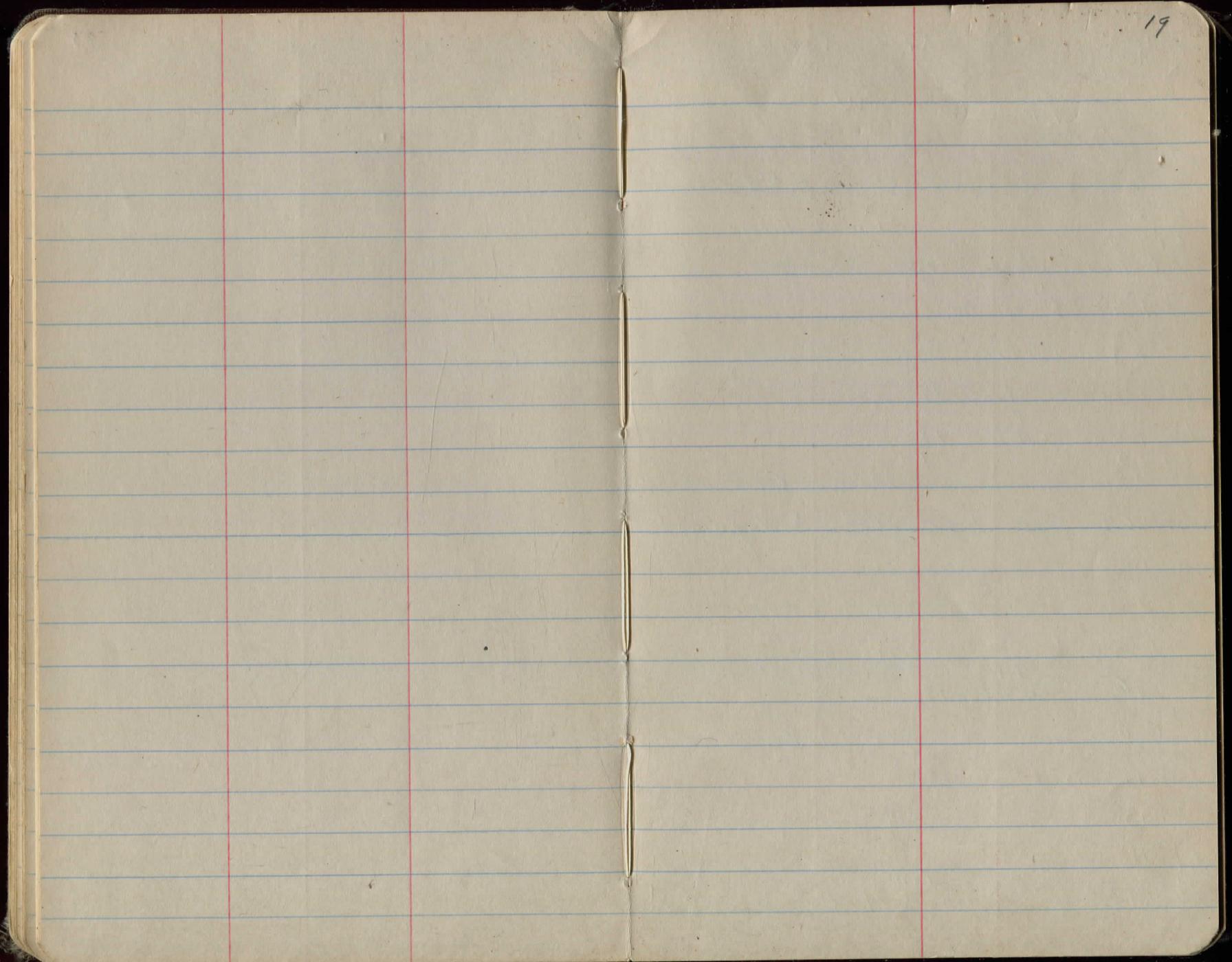
115.28

-3.43

111.85

+7.02

118.87



H. Patterson
 F. Barbis
 R. Meek
 6-22-70

CHAGRIN ROAD

CH # 9

E. W.

+47	CEI T.P.	18.5	
+47		22'	CEI
63+44		31'	2" Pine
63+0		7.5	10.5
+92	15" Maple	25.5	
+58	12" Grav. Dr.		
+50	12" Pine	34'	
+46	45" stump	34'	
62+46	CEI T.P.	18'	
62+0		7'	10'
+91		22'	CEI
+69		29.5'	5" Dogwood
+37		21'	end Bush
+27		21'	Bush
+24		21'	Steel Sign Post
+26	T.P. CEI	17'	
+20		27'	12" Pine
+12	10" Elm	28'	
+13		34'	4"X4" Wood Post
61+11		39'	12" Pine
61+0		7'	11" & Catsden Road
20+51		39	

17-26 CE

- TOPS

E. W.

20

+13	15" Locust	25'	
+09		35.5'	50" stump
65+02	15" Ash	25'	
65+0		7'	10'
+95	CEI T.P.	17'	
+87		27'	8" Blue Spruce
+85	shrub	21'	
+82	12" CMP	13'	
+73	& Grav. Dr.		
+68			& Grav. Dr.
+65	12" CMP	13'	
+62	shrub	21'	
+59		21'	4"X4" Wood Post
+55		27'	6" Blue Spruce
+46	15" Ash	32'	
+36	8" Elm	25'	
+26		33.5'	50" stump
+04	Berry? Bush	30'	
64+0	3'X3' Stone Culit,	12.5'	13.5' culit
64+0		7'	7.5'
+81		36'	12" Apple
+81	18" Locust	21'	
63+56	20" Maple	28'	

E. W.

+62 ± 18' Asp. Dr.

+49 17' 10" CMP. Dr.

+50 29' 8" Blue spruce

+46 15" STump 16'

+28 T.P. 18'

+08 3' dia. Bush 25.5'

66+02 10" CMP. 29'

66+0 7' 10"

10" CMP. Dr. Pip 21.5'

+74 ± Grad. Dr.

~~89~~ 3' dia. Bush 24.5'

+82 Bush 24.5'

+64 Beg 10" Vit. ss. 13'

+64 Quad 8" Ash 24'

+63 2'x2' Brick Pillar 25'

+60 29' 4" Pine

+44 36' Bush

+44 31' 1" Pine

+44 23' Bush

+41 19.5' CET.

⁶⁵+28 4" Locust 28' 24.5' 6" Blue spruce

E. W.

+50 ± 10' Asp. Dr. 155.

+35 10' dia. Bush 35'

+25 15" Maple 29'

+10 3' w. sidewalk 8'

69+00 6' 10'

+94 T.P. 17'

+93 15" Maple 29'

+48 22' CET.

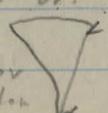
68+00 Punt. 6' 10'

+75 15'

+64 CET  17.5'

+56 Flower  15'

+50 ± 10' chip + seal Dr. 40' 6" Pine

+45 Flower Garden  17'

67+24 17'

67+00 6' 10'

+95 28.5' CET

+73 17' 10" CMP.

+72 35438 Peony Bush

66+72 25' 8" Blue spruce

		E	W
+52	T.P.	16.5	
+49		30'	12" Maple
+35		30'	15" Maple
+19		30'	15" Maple
+15	14" Maple	25'	
+10	Rd. width	6'	10.5"
71+0		30'	18" Maple
+80	12" Maple	25.5	
+68		23.5'	C.E.T.
+44		30'	4" Maple
+32	end 10" Vlt. S.S.	11'	
+23	T.P.	17.5	
+12		30'	18" Tulip
70+0	Rd. width	6'	10.3"
+81		30'	12" Maple
+67		36.5'	Crab Apple
+67		22'	C.E.T.
+59		31+40	15'x15" Brick Pillar <small>with concrete</small>
+52		34'	Pine Bush
69+50		25+40	shrub

	E	W	
+59		29' 30" Maple	
+41	30" Maple	24.5'	27' 20" Maple
+22		28'	8" Maple
+20	Dead Tree	24'	
+09	T.P.	17'	
+02		26'	10" Maple
73+0	30" Maple	26'	
+95		26'	15" Maple
+60		38'	10" Cherry
+50	15" Maple	26.5'	
+32	30" Maple	24'	
+25		23.5'	C.E.T.
+06	30" Maple	28'	
72+0	Rd. W.	6'	10'
+91			end 10" CMP. S.S.
+89	15" Maple	27'	
+79			4 Grav. On
+69		30'	15" Maple
71+62			4 Asp. Dr
+58	18" Maple	25'	

+02	24" Maple	25.5'	
7540		6	10.5'
+72		34	6" Maple
+76	Forsythia	29'	
+74		32'	
+72	Bush	29'	
+55	Bush	30'	
+43	15" Pine	30'	
+25	T.P.	17'	
+23		34	6" Maple
+22	8" Vit. Dr.	12'	
+17	Bush	15'	
+08	± Grav. Dr.		
74+0	Rd. W.	6'	10.5'
	6" W.		
74+0	Holly Bud	13'	
+97	8" Vit. Dr.	12'	
+96	36" Maple	28'	
+77		23.5'	C.E.I.
73+63	42" Maple	29'	

+02	36" Stump	22'	
77+00		6'	10.5'
+99			± Grav. Dr. ^{12'}
+94	6" Maple	30.5'	
+84		24.5'	C.E.I.
+80	T.P.	16'	
+70	18" Stump	22	34.5' 6" Maple
+52	20" Maple	28.5'	
+38	36" Stump	23'	
+22		34'	8" Maple
		<u>6-23-70</u>	
76+0	Rd. W.	6	10.5'
76+0	6" Maple	30	
+94		19'	4" Vit. sewer
+73		34'	8" Maple
+55	T.P.	17'	
+45	12" Maple	26'	
+34		23.5'	C.E.I.
+20	30" Maple	25.5'	34' 8" Maple

	E	W	
8040 R.D.	6.5'	10'	
+87 5" Maple	30'		
+72		34'	5" Maple
+49 T.P.	16.5'		20-24' end Brush
+37 4" Maple	30'		
+35			20-24' Bay Brush
+35 } 2Hx2W +26 } Stone Colvt.	10'	14.5'	*
+22		34'	6" Maple
7940 R.D. W.	7	9.5'	
+86 4" Maple	30'		
+73		34'	6" Maple
+52		24'	C.E.I.
+36 6" Maple	30.5'		
+24		34.5'	6" Maple
78414 T.P.	16'		
+86 6" Maple	30'		
+75		34.5'	4" Maple
+37 15" Maple	24'		
177+25		34.5'	6" Maple

8440 R.D. W.	2'	9.5'	
+86 3" Maple	30'		
+72 } +47 }			27-30' Bushes
+37 T.P.	17'		
+35 3" Maple	30'		
+34		24'	Dead Man
+14		24'	C.E.I.
8370 +84 3" Maple	7'	9.5'	
+38 4" Maple	30'		
+09 T.P.	16.5'		
8440 R.D.	7'	9.5'	
+86 2" Maple	30'		
+62		24'	C.E.I.
+27 5" Maple	30'		
8170	5'	9.5'	
+86 2" Maple	30'		
+79 T.P.	16.5'		
+35 5" Maple	30'		
+05		24'	C.E.I.

E. W.

+39	20" Maple	30'		+0	18" Maple	31	
+24	T.P.	11.5'		90+0		7'	9.5'
87+0	Rd. W.	7'	9.5'	+85	T.P.	17'	
+56	20" Maple	25'		+45	20" Maple	29'	
+55		26'	24" Maple	+17		20'	C.E.T.
+31	15" Maple	28'		+07	20" Maple	32'	
+26		24'	C.E.T.	87+0		7'	9.5'
+08	20" Maple	33'		+80		25'	20" Maple
+03		24'	15" Maple	+74	20" Maple	32'	
86+0	Rd. W.	7'	9.5'	+54	T.P.	17'	
+98	T.P.	16'		+42	20" Maple	32'	
+89	Wire & Rail fence	25'		+41		24.5'	15" Maple
+67		27'	15" Maple	+23	20" Maple	33'	
83+35	4" Maple	30'		+05		25'	20" Maple
85+0		7'	9.5'	88+0		7'	9.5'
+86	3" Maple	30'		+98	20" Maple	31'	
+68	T.P.	17'	34' C.E.T.	+73	36" stump	28'	
+35	3" Maple	30'		+65		23'	C.E.T.
84+30		24'	⁴⁰ Bay woods all under 8" other than noted	87+63	2" Dogwood clump	26'	

E. W.

+79	24" Sq. Brick Pillar	25'	16'	12" Conc. On Pipe	+75	36" AsL	24'	
+76		24'		end Rail fence	9370		8'	9'
+75	20" Maple	28'	22'	15" Maple	+96		22'	CET.
+70		22'		CET.		w/4x1 Conc. Hdwall		
+55	circle of Bushes	25-33			+87	10" Metal S.S.	15.5'	
+39	20" Maple	25'	24'	12" Maple	+86	woven wire Bey fence S+E.	25'	
+13	circle of Bushes	25+33			+85	Hodge row E.	27'	
+13	T.P.	17'			+80	circle of Bushes	24-31	
+11		25'		15" Maple	+74	20" Maple	24'	
9140	Rd. W.	7'	9.5'		+58	18" Maple	24'	25' 8" Apple
+99	20" Maple	26.5'			+43	circle of Bushes	22-24'	
+90	2 Bushes	27+30			+42	T.P.	17'	
+88	2 Bushes	27+30			+27	15" Maple	21.5'	
+83	15" Maple	27'			+15	circle of Bushes	20-30'	
+69	wire fence E. End rail fence	25'			+12		22.5'	8" Ash
+56	15" Maple	29'			+07		31'	8" Ash
+48		22'		CET.	+0	Rd. W.	8'	9'
+41	20" Maple	30'			9240		25'	Bey Woods
+25		21'		18" Maple	+95	24" Maple	25'	16' 12" conc. line
90+22		25'		40" Ash end woods Bey zig zag rail fence	+94	24" Sq. Brick Pillar	25'	
					91+85	grav. Pr.		Grav. Pr.

+63	22	30" Maple	9510	9' 7.5'
+33	21.5	24" Maple	+94	37.5' 15" Maple
+21	24" Maple	26.5'	+70	38' 20" Maple
+26	T.P.	18'	+65	22' C.E.I.
9570	9' 8'		+32	38.5' 30" Maple
+99	12" Maple	24'	+29	15' 8" C.M.P.
+92	15" Maple	29'	+19	1/2 Grav. Dr.
+63	12" Maple	25' 21.5'	+08	14.5' 8" C.M.P. Dr.
+33	15" Maple	24'	97+00 (end wire fence C.M.P.)	28' 39' 20" Maple
+18	24'	End woods 15" Maple	+73	TP 18'
94100			+70	Bad Brush line 28'
+98	22'	18" Maple	+65	
+79	T.P.	18'	+45	20" Maple 26'
+76	20" Maple	24'	+43	25' 20" Maple
+70	24'	15" Maple	+33	22' C.E.I.
+56	15" Maple	26'	+15	23' 15" Maple
+37	23'	20" Maple	+0	9' 7.5'
+31	12" Maple	24'	96+0 wire fence	27.5'
93+20	19'	20" Maple	95+90	30" Maple 24'

	E.	W.	
+41		30'	Rail fence
+38	8" Maple	21'	
+33		10'	Gravel Dr.
+21		23' 35'	Circle of shrubs w/ ^{mito} post in center
+97		9' 25.5'	20" Maple
+69		30'	20" Maple
+48	T.P.	17.5'	
+29		14'	Vit. stand pipe
+24	E. Tree row	19' 21.5'	C&I
+09		28.5'	
99+0	R.L. W.	9' 7.5'	20" Maple
+89		28.5'	18" Maple
+72		25.5'	18" Maple
+63		15'	12" Vit. S.S.
+55		16'	4" Vit. Drain
+50	wire fence	20'	
+40		25'	15" Maple
+29	(Bey Row at 4" + 6" Trees in row 10' apart)	37'	30" Maple
98+13	T.P.	17'	

	E.	W.	
103+0		9' 8'	
+57		16'	shrub
+48		16-20-24)	3 Shrubs
+45		22'	C.E.T.
+35			4 Gravel Dr.
+23		26.5'	
+19	T.P.	18'	
102+0		9' 7.5'	
+90		30'	end fence
+87		32'	shrubs
+85		30'	Bey ^{rail} fence
+77			10' Asp. Dr.
+70		30'	end rail fence
+64		37'	2" Evergreen
+64		Circle of flowers 12#18'	
101+0		8.5' 8'	
+97		23'	C&I.
+85	T.P.	17.5'	
100+80		23'	24" Maple

	E.	W.
+33 T.P.	18'	
106+0 Brush	40925	
106+0	9' 8"	
+41	22'	C.E.T.
+18	30'	20" Maple 10' Vit.
+12	15'	end Dr. beg. SS
+11	19.5'	Steel Light Post
+0	9' 8"	
105+0		4 Grav. Dr.
+92 T.P.	18' 15'	10" L.M.P. Dr.
+91	15'	end SS Vit
+72	30'	Twin 10" Elm
+59		4 Grav. Dr.
+54	35'	Steel High Post
104+09	22'	C.E.T.
104+0	9' 8"	
+92	28'	30" Maple
+54 8" Maple	20'	
103+54 T.P.	18'	

	E.	W.
+18 ^{Savoy} 4 RD. E.	15.5	CET Light
109+0	9' 8"	
+95 end X RD. E. C.M.P.	50'	
+82		4 Asp. Dr.
+66 X RD. E. 12" C.M.P.	20'	
+59	17' 16"	18" Conc. X RD Culvert
+57	27'	15" Apple Vit.
+53	16'	end 10" S.S.
+48	32'	Dead Man
+47	22.5	CET.
108+0	9' 8"	4 Asp. Dr.
+98	30'	Bush
+88		
+87 T.P.	18' 22'	steel light Post
+74	19'	? Shrub
107+0 end fence	20'	
+98	20.5	8" w/cherry
+95	22	CET.
+80 24" Hickory	31'	
+50 end Brush	25'	
+47	27'	Apple Clony

E. W.

+86	T.P.	18'	
+80		38'	6" cherry
+76		22'	C.E.T.
+64		39	8" cherry
+49		14-15	(S.S.) 4" Vit. Drain
+41		34'	8" cherry
+31		37'	8" cherry
+25		37	8" cherry
111+0		9' 8'	
+92		32.5'	10" Cherry flowers
+79		23'	end Rail fence
+70		33	6" Cherry
+67		25+40'	Rail fence w/ flowers
+57	T.P.	18.5'	
+56			4 12" Grav. Dr.
+46		15.5'	12" CMP. Dr. ? S.S.
+25		25'	24" Maple
+05		22'	C.E.T.
110+0		9' 8'	
109+25	T.P.	18'	

+48			22' C.E.T.
+30			4 Country lane
+15	4	12'	15' end ss.
+12	T.P.	13'	13'
+08		18'	21' steel sign Post
113+0			
+89			Quo 16" Mulberry 24'
+88			6" Cherry 24'
+77			8" cherry 24' 34' 6" cherry
+66			35.5' 3" cherry
+42			35' 4" cherry
+30			6" cherry 28'
+22			4" cherry 28'
+15			6" Mulberry 26'
+15			37.5' 4" cherry
112+0			22' 5" cherry

H. Potterson
 F. Barbis
 R. Meek 6-24-70
 +

Chagrin Rd.
 X, Sec.
 HZ - Elev.

BM #5 3.95 1101.70 1097.75

61+0

+50

62+0

+50

63+0

+50

64+0

BM #5 6.23 1103.98 3.95 1097.75

6-25-70

64+0

+50

74100 Vert. spike 25 Maple 1113.6

32

Now a stump

Vert. spike W. side 24" Maple sta 61460 E
 BM #5 (from F.B. 82 Pg 60 8-22-58)

E. W.

$\frac{4.94}{40}$ $\frac{6.20}{21.5}$ $\frac{7.35}{17}$ $\frac{5.83}{11.5}$ 5.62 5.76 $\frac{7.05}{43}$

$\frac{4.58}{40}$ $\frac{4.98}{28}$ $\frac{6.53}{11.5}$ $\frac{5.81}{7}$ 5.59 5.73 $\frac{6.78}{16}$ $\frac{6.74}{40}$

$\frac{3.94}{40}$ $\frac{5.10}{16.5}$ $\frac{5.98}{12}$ $\frac{5.16}{7.5}$ 5.84 $\frac{5.46}{13.5}$ $\frac{6.54}{15.5}$ $\frac{6.00}{17}$ $\frac{6.08}{40}$

$\frac{4.14}{40}$ Dv. $\frac{4.76}{17}$ 4.72 $\frac{5.67}{13.5}$ $\frac{6.82}{16}$ $\frac{5.91}{12.5}$ $\frac{5.95}{40}$

$\frac{4.65}{40}$ $\frac{5.13}{22}$ $\frac{6.27}{12.5}$ $\frac{5.36}{9.5}$ 4.77 $\frac{5.56}{13.5}$ $\frac{6.74}{16}$ $\frac{6.11}{17}$ $\frac{7.06}{40}$

$\frac{5.50}{40}$ $\frac{6.12}{19.5}$ $\frac{6.72}{13}$ $\frac{5.18}{9}$ 4.69 4.92 $\frac{6.07}{14}$ $\frac{7.08}{16.5}$ $\frac{6.95}{17}$ $\frac{7.63}{40}$

$\frac{8.71}{40}$ creek $\frac{9.34}{12.5}$ $\frac{5.25}{9.5}$ 4.62 $\frac{5.02}{10.5}$ $\frac{9.50}{14}$

$\frac{12.64}{40}$

763 down $\frac{7.11}{15}$ $\frac{7.95}{13}$ $\frac{6.55}{9}$ 6.31 $\frac{6.69}{10}$ $\frac{7.89}{25}$ $\frac{8.68}{40}$

1102.95

65+0

6.30	Lawn	7.05	5.85	5.62	5.87	Lawn	7.08
<u>40</u>		<u>12.5</u>	<u>8.0</u>		<u>10.5</u>		<u>40</u>

+50

5.62	Lawn	5.45	6.86	5.19	5.02	5.36	6.42	6.08	5.80
<u>40</u>		<u>15</u>	<u>11.5</u>	<u>8.5</u>		<u>11</u>	<u>16.5</u>	<u>19</u>	<u>40</u>

66+0

4.88	Drive	4.51	4.15	4.58	5.67	4.85	4.68
<u>40</u>		<u>9</u>		<u>12.5</u>	<u>16.5</u>	<u>21.5</u>	<u>40</u>

+50

4.51	Lawn	4.41	3.76	3.46	3.20	Dr.	4.25
<u>40</u>		<u>12.5</u>	<u>10</u>		<u>15.5</u>		<u>40</u>

67+0

3.45	Lawn	3.63	3.07	2.91	3.30	4.12	3.41	2.88
<u>40</u>		<u>24</u>	<u>7</u>		<u>11</u>	<u>17</u>	<u>23</u>	<u>40</u>

+50

1.51	Dr.	2.02	2.11	2.49	3.17	2.26	Lawn	3.64
<u>40</u>		<u>9</u>		<u>12.5</u>	<u>17</u>	<u>25</u>		<u>40</u>

T, P,

9.35

1111.22

2.11

1101.87

68+0

8.65	Lawn	8.79	7.92	8.52	8.95	8.75	Lawn	7.01
<u>40</u>		<u>18</u>	<u>10</u>		<u>15</u>	<u>20</u>		<u>40</u>

+50

7.11	Lawn	8.00	7.56	8.73	8.26	Lawn	8.80
<u>40</u>		<u>11</u>		<u>13</u>	<u>19</u>		<u>40</u>

69+0

5.82	Lawn	6.93	7.00	6.79	7.03	Lawn	7.12
<u>40</u>		<u>17</u>	<u>9</u>		<u>16</u>		<u>40</u>

+50

4.40	Lawn	* 6.04	* Drive	6.34
<u>40</u>				<u>40</u>

7111.22

E W

7070

4.31 Lawn 5.32 5.07 5.65 5.17 Lawn 5.35
40 10 13.5 16 40

+50

3.54 3.54 5.11 4.24 4.03 4.63 4.39 Lawn 3.96
40 30 11.5 6 13.5 16.5 40

7170

2.32 2.47 4.20 3.39 3.02 3.55 3.25 Lawn 2.83
40 32 12 7 14.5 15 40

T.P. 8.00 1118.01 1.21 1110.01

rock between Drives # 7651 10' w. rd. edge

+50

2.70 Lawn 7.74 7.38 8.62 8.54 8.62 Dr. 8.25
40 18 11.5 6.5 12.5 40

7270

6.55 Lawn 6.78 8.31 7.51 7.10 7.45 8.11 7.70 5.69
40 19.5 12 8.5 11 12.5 21.5 40

750

5.90 Lawn 5.93 7.24 6.60 5.95 6.00 6.36 7.12 6.25 6.00
40 16 11 8.5 11 14.5 16.5 20 40

7370

5.98 5.38 5.40 6.30 5.20 4.80 5.00 5.39 6.05 5.70 5.46
40 30 16 11 8.5 11 14.5 16 18 40

+50

5.00 Lawn 5.15 5.98 4.54 4.20 4.30 5.36 4.45 Woods 4.79
40 16.5 11 7 11 16 20 40

7470

5.40 Dr 4.50 3.92 4.30 5.21 4.55 4.25
40 9 13 18 20 40

B.M. # 6.00 1119.76 4.25 1113.76 (13.68) (.08 corr)

vert spk w. side 50" Maple 7470

1119.76

74+50

7.40	6.92	7.57	6.13	5.55	6.05	6.93	6.40	5.76
40	15	11.5	8		14	16	20	40

75+0

7.39	6.63	7.23	6.09	5.42	3.89	6.62	5.82	5.53
40	16	11.5	9		14	12.5	20.5	40

+50

7.35	6.37	7.07	5.72	5.31	5.77	6.65	5.59	5.27
40	15	12	8.5		14	12.5	20	40

76+0

6.98	5.96	6.60	5.56	4.96	5.45	6.50	5.14	4.58
40	16	11.5	8.5		14	16.5	19	40

+50

6.98	6.00	6.55	6.39	5.28	4.81	5.11	4.00 Low	4.10
40	32	16	11.5	5		14		40

77+0

6.80	5.60	6.48	7.11	5.95	5.77	5.52	Dr.	5.31
40	22	15	12	10		11.5		40

+50

7.31	6.76	8.04	6.21	5.62	6.07	7.20	Low	6.54
40	19	13	9		14	18		40

B.M. 4.89 1118.65 6.00 1113.76

vert spk. w. site so Maple

6-26-20

T.P. 5.06 1117.88 5.83 1112.82

78+0

5.56	5.20	6.36	4.93	4.15	4.71	5.78	4.95	5.13
40	19	13	7.5		15	19	26	40

+50

6.22	5.35	6.65	5.75	4.30	4.78	5.94	5.42	5.12
40	19	13	10		14	18-19	23	40

		1117.88				E	W								
79+0						6.13 40	5.79 20.5	7.09 13.5	5.03 7.5	4.17	4.76 15	6.24 20	5.69 24.5	5.70 40	
+50						6.00 40	5.45 18	6.44 14	4.32 9	3.77	4.17 13.5	6.55 17	5.83 19	5.67 40	
80+0						5.34 40	5.67 25	5.12 18	5.84 12.5	4.22 9	3.75	4.20 14.5	5.64 19	5.05 24	5.07 40
+50						4.85 40	5.26 25	4.69 19	5.28 12	4.28 10	3.40	3.93 14	5.24 18	5.14 22	4.98 40
T.P.	5.77	1120.92	2.73	1118.15		5PK	E side	T.P.	3P	86					
81+0						8.10 40	8.06 25	7.38 20	8.11 13	7.13 10	6.87	6.65 18	7.78 17	7.43 23.5	7.66 40
+50						7.32 40	7.24 19.5	7.75 13	6.49 10	5.74	6.34 14.5	7.55 18	7.37 22.5	7.17 40	
82+0						7.04 40	6.81 19	7.45 12.5	6.15 7.5	5.36	6.15 14.5	7.32 18	6.97 23	6.97 40	
+50						6.76 40	6.48 19	7.08 12.5	5.60 7.5	4.87	5.50 15	6.84 18	6.59 20	6.85 40	
83+0						6.22 40	5.85 20	6.45 13	4.80 10	4.16	5.03 15	6.22 18	5.89 23	6.18 40	
+50						5.54 40	5.18 19	5.87 13	4.26 10	3.55	4.36 15	5.21 18	5.35 23	5.50 40	

1120.92

84 + 0

$\frac{4.60}{40}$ $\frac{4.58}{20}$ $\frac{5.25}{13}$ $\frac{3.53}{10}$ 2.88 $\frac{3.72}{15}$ $\frac{4.80}{18}$ $\frac{4.46}{22}$ $\frac{4.61}{40}$

+50

$\frac{4.10}{40}$ $\frac{3.72}{20}$ $\frac{4.19}{13}$ $\frac{2.92}{10}$ 2.21 $\frac{3.19}{15}$ $\frac{4.02}{17}$ $\frac{3.23}{20}$ $\frac{5.50}{48}$

T.P.

6.48 1125.05 2.35 1118.57

85 + 0

$\frac{7.13}{40}$ $\frac{6.65}{23}$ $\frac{7.53}{13.5}$ $\frac{6.46}{16.5}$ 3.68 $\frac{6.50}{15}$ $\frac{2.14}{17}$ $\frac{6.30}{20}$ $\frac{6.59}{40}$

+50

$\frac{5.94}{40}$ $\frac{5.57}{22}$ $\frac{6.97}{13.5}$ $\frac{5.61}{11}$ 4.91 $\frac{5.78}{15}$ $\frac{6.18}{17}$ $\frac{5.68}{18}$ $\frac{6.00}{40}$

86 + 0

$\frac{4.25}{40}$ $\frac{3.71}{19}$ $\frac{6.85}{13.5}$ $\frac{4.48}{10}$ 3.82 $\frac{4.40}{13.5}$ $\frac{6.74}{16.5}$ $\frac{4.51}{18}$ $\frac{3.70}{23}$ $\frac{3.98}{40}$

+50

$\frac{4.00}{40}$ $\frac{2.81}{14}$ $\frac{3.23}{17}$ $\frac{4.50}{19}$ $\frac{1.88}{21}$ $\frac{2.15}{40}$

T.P.

8.48 1130.15 3.38 1121.67

+50

$\frac{7.68}{40}$ $\frac{7.75}{21}$ $\frac{10.08}{13}$ $\frac{8.45}{10}$

87 + 0

$\frac{6.72}{40}$ $\frac{6.25}{20}$ $\frac{9.01}{13}$ $\frac{7.32}{10}$ 6.60 $\frac{7.34}{14}$ $\frac{8.77}{17}$ $\frac{6.89}{23}$ $\frac{5.85}{40}$

+50

$\frac{5.40}{40}$ $\frac{5.28}{21}$ $\frac{7.60}{13.5}$ $\frac{6.71}{10}$ 5.86 $\frac{6.55}{14.5}$ $\frac{7.77}{17}$ $\frac{5.42}{23}$ $\frac{4.78}{40}$

A B 6100
 6000 3000
 20 5000

1130.15

88+0
 +50
 89+0
 T.P. 7.47 1136.³~~20~~ 1.32 1128.83
 +50

90+0
 +50
 91+0
 T.P. 6.97 1140.³~~24~~ 2.93 1133.³~~27~~
 +50

92+0
 +50

4.53 4.11 6.73 5.21 4.74 5.30 6.24 2.65 2.20
 40 20.5 13.5 9.5 13.5 16.5 22 40

3.05 3.08 6.80 ~~4.98~~ 3.54 4.84 5.27 1.98 1.83
 40 19 13 9 14 16 21 40

2.00 1.75 2.28 4.17 2.88 ² 7.32 3.00 9.32 1.40 1.20
 40 30 19 13 10 13.5 16.5 22 40

7.87 7.45 9.03 7.61 7.19 7.90 9.11 6.41 6.30
 40 19 13.5 10 13.5 16 22 40

7.30 6.40 7.73 6.59 5.70 6.69 7.85 5.54 5.80
 40 19 13 10 13 16 21 40

6.40 5.42 6.66 5.71 4.78 5.42 6.57 4.71 4.80
 40 20 13.5 10 13 16 21 40

5.04 Lawn 4.13 3.81 4.66 5.58 3.78 3.87
 40 10 13.5 15.5 24 40

Top of Dr. Pipu N. end House # 7785

8.01 Lawn 7.41 7.14 8.26 8.81 7.76 7.35
 40 9 14.5 16 23 40

7.31 Lawn 6.27 6.01 6.66 7.38 6.44 5.81
 40 11 12 15 20 40

6.61 Lawn 5.66 5.13 5.74 6.77 5.84 5.03
 40 12 12 14.5 16 40

1140.24

9370

+50

9470

T.P.

5.92

1143.¹~~25~~

3.11

1137.²~~83~~

+50

9570

+50

9670

+50

T.P.

3.55

1140.⁵~~75~~

6.17

1136.⁹~~88~~

9770

E. W.

5.50
405.40 6.42 5.44 4.37 4.89 5.92 5.07 4.60
20 15 12.5 12 14 16 405.20
404.69 5.41 4.34 3.47 4.26 4.81 4.21 2.91
20 14.5 12 12 14 17.5 405.01
403.59 4.88 3.80 2.86 3.57 4.28 3.00 3.00
20 14 12 12 14 21 407.45
406.44 7.42 6.42 5.43 6.10 6.62 Low 5.42
17 14 12 12 14 406.73
406.30 7.01 6.08 5.22 5.98 6.62 Low 5.40 5.80
16 14.5 12 12 14 30 406.44
406.35 6.88 6.12 5.18 5.81 6.56 Low 5.22 5.22
28 17 15.5 13 12 14 25 406.69
406.13 6.32 6.90 5.76 5.09 5.61 6.70 Low 4.91 5.23
28 17 15.5 12 11 14 30 406.70
406.24 6.40 6.96 6.02 5.34 5.90 6.66 Low 5.25 5.78
28 16 14 12 11 14 30 404.56
404.56 3.96 4.52 3.92 3.12 3.52 3.96 3.10 2.95
25 18 15 12 12 14 16 40

1140.43⁵

97+50

E					W				
4.20	4.29	4.62	4.19	3.76	4.00	4.75	3.84	Lawn	3.77
40	21	14	11		9	13.5	18		40

98+0

5.20	5.13	6.36	5.28	4.81	5.27	5.78	4.48	Lawn	4.18
40	21	15	13.5		12	13.5	22		40

750

6.12	6.07	7.35	6.06	5.72	5.86	6.90	5.31	Lawn	4.88
40	18.5	15	8		7.5	14.5	21		40

99+0

6.71	6.65	8.11	7.07	6.45	6.58		Lawn	6.41
40	19.	15	9		7.5			

T.P.

2.67 1135.32⁴ 7.78 1132.5³

+50

2.50	2.40	2.91	3.24	2.85	2.25	2.50	2.70	Lawn	2.77
40	18.5	14.5	12.5	7.5		8	8.5		40

100+0

3.46	3.40	4.95	4.11	3.75	3.25	3.46	3.20	Lawn	3.26
40	18	14	12.5	10		7.5	30		40

+50

4.28	4.63	6.08	5.34	4.85	4.28	4.52	Lawn	4.38
40	18	15	13	9		8		40

101+0

4.99	X 5.75	7.21	6.24	5.68	6.08	Lawn	5.49
40		17	14	9	8		40

+50

6.62	7.00	8.23	7.16	6.57	7.00	Lawn	6.28
40	18	14	9		8.5		40

102+0

7.88	8.18	9.15	8.03	7.55	7.91		7.76
40	18	14	9		8		40

1135.⁴82

T.P. 3.04 1131.¹84 7.32 1128.¹80
102+50

103+0

+50

104+0

T.P. 4.84 1127.⁷88 8.20 1122.⁹84

+50

105+0

+50

106+0

+50

E. W.

Top Rock House # 7865

$\frac{4.35}{40}$ $\frac{4.99}{16.5}$ $\frac{5.82}{14}$ $\frac{4.45}{9}$ 4.13 $\frac{4.69}{8}$ Lawn 4.23
40

$\frac{5.43}{40}$ $\frac{6.04}{17}$ $\frac{6.705^{80}}{17.5}$ $\frac{5.30}{14}$ 4.84 $\frac{4.88}{8}$ $\frac{5.72}{14.5}$ Lawn 4.86
40

$\frac{7.10}{40}$ $\frac{6.63}{17}$ $\frac{7.31}{14}$ $\frac{6.51}{12}$ $\frac{5.93}{9}$ 5.65 $\frac{5.90}{8}$ $\frac{6.10}{13.5}$ Lawn 5.69
40

$\frac{8.16}{40}$ $\frac{7.42}{17}$ $\frac{7.91}{14.5}$ $\frac{6.49}{12.5}$ $\frac{6.39}{9}$ 6.12 $\frac{6.25}{8}$ $\frac{6.35}{10}$ $\frac{7.18}{13}$ Lawn 6.42
40

$\frac{5.60}{40}$ $\frac{5.64}{23}$ $\frac{4.72}{17}$ $\frac{4.81}{14}$ $\frac{4.05}{12}$ $\frac{3.60}{9}$ 3.15 $\frac{3.27}{8}$ $\frac{3.65}{9}$ Lawn 3.28
40

$\frac{6.10}{40}$ $\frac{5.22}{16.5}$ $\frac{5.49}{15}$ $\frac{4.61}{12.5}$ $\frac{4.13}{9}$ 3.58 $\frac{3.76}{9}$ $\frac{4.30}{17}$ Dr. 4.32
40

$\frac{6.35}{40}$ $\frac{6.28}{27}$ $\frac{5.62}{18}$ $\frac{6.21}{16}$ $\frac{5.59}{13.5}$ $\frac{4.80}{9.5}$ 4.09 $\frac{4.20}{9}$ $\frac{4.62}{13}$ Lawn 4.73
40

$\frac{6.21}{40}$ $\frac{5.73}{17}$ $\frac{6.56}{15}$ $\frac{5.91}{13.5}$ $\frac{5.16}{8.5}$ 4.70 $\frac{4.85}{8}$ $\frac{5.14}{13}$ 4.78
40

$\frac{6.30}{40}$ $\frac{6.18}{29}$ $\frac{5.85}{17}$ $\frac{7.09}{14.5}$ $\frac{6.06}{7.5}$ 5.39 $\frac{5.56}{7.5}$ $\frac{6.11}{15.5}$ 4.90
40

1127.88

107+0

 $\frac{5.97}{40}$ $\frac{6.00}{20} \frac{7.77}{15.5} \frac{7.03}{14} 5.97 \frac{6.09}{7} \frac{6.62}{14} \text{Low} \frac{5.77}{40}$

+50

 $\frac{6.15}{40}$ $\frac{6.59}{19} \frac{8.30}{15} \frac{7.46}{12.5} 6.74 \frac{6.95}{7} \frac{7.41}{13} \text{Low} \frac{6.28}{40}$

108+0

 $\frac{7.31}{40}$ $\frac{7.87}{18} \frac{8.80}{16} \frac{7.89}{13} 7.21 \frac{7.35}{9.8} \text{Dr.} \frac{7.69}{40}$

+50

 $\frac{8.77}{40}$ $\frac{8.52}{20} \frac{9.64}{15.5} \frac{7.84}{12} 7.16 \frac{7.26}{7} \frac{8.75}{18} \frac{7.40}{40}$

T.P.

5.39

1124.87

8.60

1119.88

109+0

 $\frac{6.15}{40}$ $\text{Savage Rd.} \frac{5.06}{10} 4.58 \frac{4.72}{11} \frac{5.01}{14} \frac{3.92}{40}$

+50

 $\frac{6.72}{40}$ $\frac{5.51}{21} \frac{6.56}{15} \frac{5.93}{13} 5.14 \frac{5.26}{14} \frac{3.88}{40}$

110+0

 $\frac{6.06}{40}$ $\frac{5.29}{21} \frac{6.69}{14} 5.59 \frac{5.88}{13} \frac{4.11}{30} \frac{3.85}{40}$

+50

 $\frac{8.04}{40}$ $\frac{6.71}{19} \frac{8.13}{13.6} \frac{7.36}{12} 6.47 \frac{6.42}{9.5} \frac{4.29}{40}$

111+00

 $\frac{8.17}{40}$ $\frac{8.25}{20} \frac{8.86}{15} \frac{7.85}{12} 6.91 \frac{7.30}{12} \frac{4.83}{30} \frac{4.71}{40}$

24.47

E.

W.

111750

T.P.

5.81

1121.21²

9.17

1115.80⁴

$\frac{9.58}{40}$

$\frac{8.18}{19}$

$\frac{10.00}{14.5}$

$\frac{8.76}{12}$

7.91

$\frac{8.45}{12}$

$\frac{5.84}{25}$

$\frac{6.70}{8}$

11270

$\frac{7.45}{40}$

$\frac{6.22}{18}$

$\frac{8.06}{15}$

$\frac{6.71}{12}$

5.83

$\frac{6.30}{11}$

$\frac{3.45}{30}$

$\frac{7.20}{40}$

+50

$\frac{9.17}{40}$

$\frac{7.68}{18}$

$\frac{9.25}{14.5}$

$\frac{7.85}{11.5}$

6.97

$\frac{7.36}{15}$

$\frac{4.70}{40}$

11370

$\frac{9.50}{40}$

$\frac{8.90}{18}$

$\frac{10.10}{12}$

$\frac{9.25}{11.5}$

8.57

$\frac{8.55}{15}$

$\frac{6.45}{30}$

$\frac{5.65}{40}$

+50

T.P.

8.28

1123.59⁶

5.80

1115.21⁴

$\frac{11.13}{40}$

$\frac{10.52}{19}$

$\frac{17.50}{15}$

$\frac{11.70}{13}$

10.42

Country Ln.

$\frac{9.24}{40}$

B.M.

1.65

1124.84²⁰

1111.

Drive Profiles
 X Road Culverts

BM#5 3.97 1101.72 1097.75

62+58

64+00

64+70

65+94

T.P. 8.88 1108.88 1.72 1100.00

66+62

67+50

69+50

T.P. 8.80 1117.67 0.01 1108.87

71+62

71+79

Vert. spk; W. side 24" Maple stump sta. 61+60 E.

	E		W
	1098.58		1097.00
field Dr.	$\frac{3.14}{80}$		4.22

1093.99	1093.01	1092.42	1092.22	1091.34	1089.47
7.73	$\frac{8.71}{40}$	9.30	$\frac{9.50}{14}$	$\frac{10.38}{40}$	$\frac{12.25}{100}$
100		12.15			

1096.54		1097.94	1096.35
5.18	Gravel Dr.	3.78	Gravel Dr.
100			100

1099.52		1099.72
2.20	Gravel Dr.	2.00
100		

1100.63	1100.45
8.25	Paved Dr.
	100

5.04	Paved Dr.	7.05
100		

3.76	Paved Dr.	3.76
		100

1109.63	1109.82
8.04	Paved Dr.
	$\frac{7.85}{80}$

1110.72	1110.54
7.55	Gravel Dr.
	$\frac{7.13}{80}$

1112.67

74+08

B.M. 5.51 1119.17 4.01 1113.66

76+99

79+30

T.P. 6.01 1120.42 4.76 1114.41

T.P. 9.86 1129.80 0.48 1119.94

T.P. 7.99 1137.77 0.02 1129.75

91+85 0.77 1137.00

T.P. 4.35 1141.35

97+19

100+33

T.P. 0.30 1133.53 8.12 1133.23

T.P. 2.30 1130.50 5.33 1128.20

101+77

102+35

E.

W.

1110.72

6.95 Gravel Dr.

100

spx w. side 36" Maple

1114.02

3.65

73+96 E.

1114.28

4.89 Gravel

1114.58

Dr. 4.59

100

1110.00

9.45 Ditch

100

1110.62

8.35

11

1114.07

5.10

1110.82

8.35 Ditch

16

1112.35

7.10

100

32.67

5.10 Gravel Dr.

100

1133.98

3.79

Gravel Dr.

35.83

1.94

100

1137.09

4.26

Gravel Dr.

1138.52

2.83

100

1131.40

9.95

Gravel Dr.

1133.25

8.10

100

1128.15

2.35

Gravel Dr.

1129.02

1.48

100

1127.17

3.33

Gravel Dr.

1127.68

2.82

100

1130.50

~~1030.50~~

104+59

105+0

T.P.

2.53

1026.14

6.89

1123.61

~~1023.61~~

107+95

108+82

108+96

109+18

T.B.M.

3.49

1123.63

~~1023.63~~

6.00

1120.14

110+56

T.P.

2.25

1115.80

~~1015.80~~

10.07

1113.55

~~1013.55~~

113+50

113+15

114+0

115+0

+56

E.

W.

1124.45

6.05 Gravel Dr.

1124.75

5.75
1.00

1124.11

6.39 Gravel Dr.

1124.10

6.40
1.00

1120.46

5.68 Paved Dr.

1121.10

5.04
1.00

1120.19

5.95 Paved Dr.

1121.54

4.60
1.00

12" CMP
F/L \nearrow 270°

13.44	10.27	8.84	8.83
<u>160</u>	<u>60</u>	<u>20</u>	<u>18</u>

1120.14

6.00

1117.94

8.20

16

X

Savage Rd.

6.75
200

7.55
100

6.50

Spk. E. side CEI # 235578

109+18

16' W.

(OFF # Savage Rd)

1117.96

5.67

Gravel Dr.

1122.08

1.55
1.00

Country In.

4.32

1.06
1.00

0.05
1.50

1108.86

12' x Rd. Culvert.

6.94

13

1109.21

6.59

17

6.84

10.10

11.96

		1115.80		
		1075.80		
T.P.	8.93	1123.91	0.22	1115.58
		1023.91		1015.58
? BM.			3.11	1120.80
				1020.80
T.B.M.			3.29	1120.12
				1020.12

Profile \perp N. of Catsden

BM. #5	3.52	1101.27		1097.75
60+50			4.92	.35
60+0			4.40	
59+50			4.26	
59+0			4.38	
58+50			5.84	
58+0			7.46	
BM			3.52	1097.75

spk w. side 24" Maple (stump) str 61+60 E

H. Patterson
D. Wenzel
G. Winters

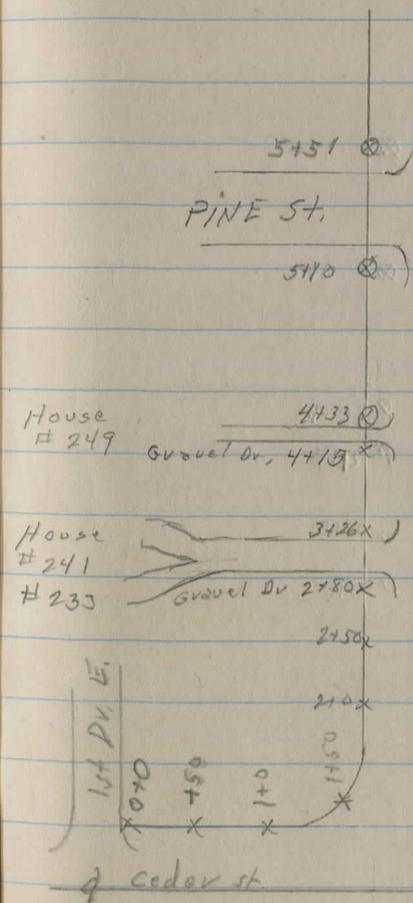
Cedar & Franklin St.
Ditch Profile

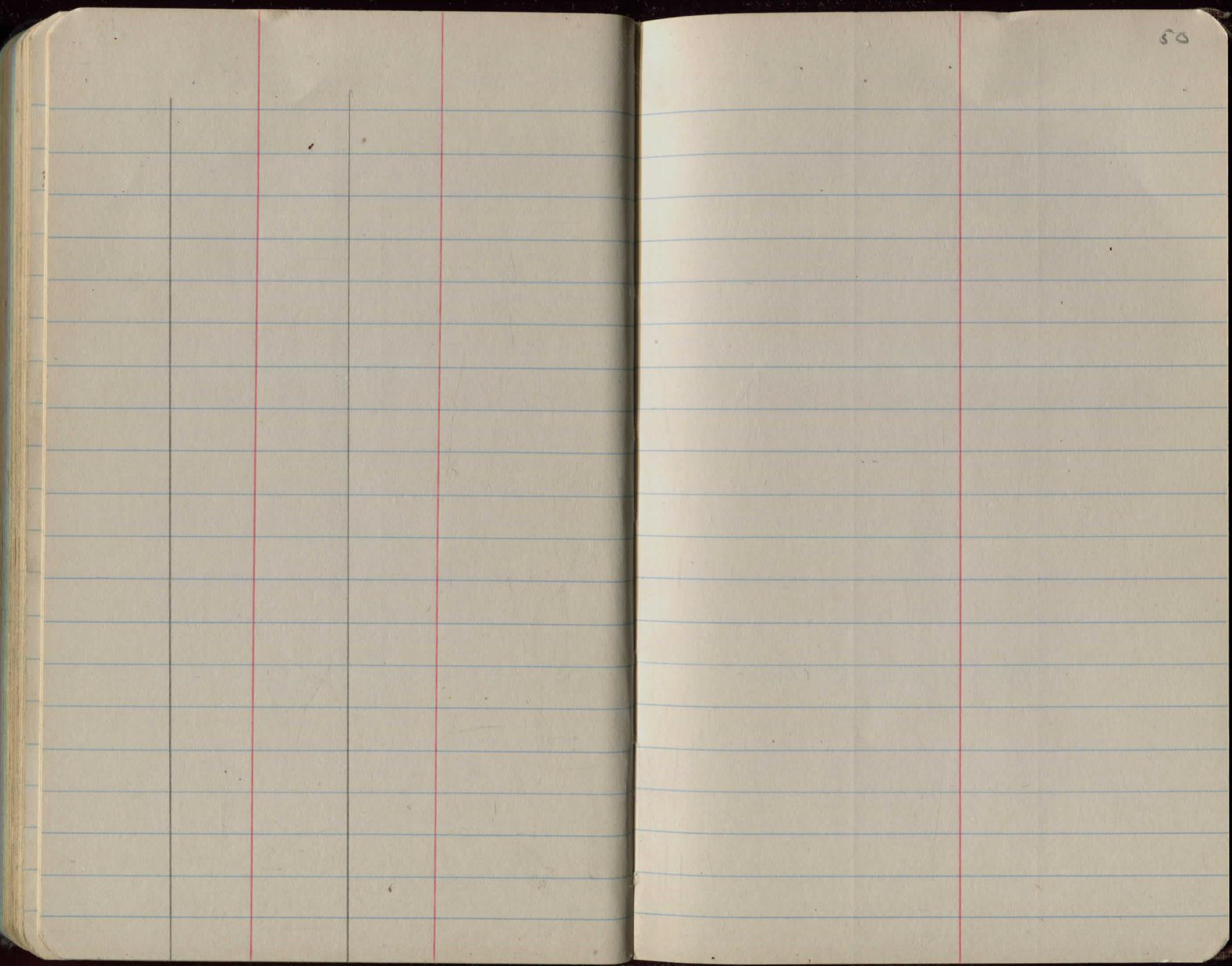
3/24/72 snow 83°

B.M.	5.73	105.73	100.00
0+0		5.57	100.20
+50		5.86	99.87
1+00		6.62	99.11
+50		6.46	99.27
2+00		6.68	99.05
+50		7.10	98.63
2+80	12" CMP. Dr. Pipe N. end	7.14	98.59
3+26	s. end	7.29	98.44
+50		7.22	98.51
4+00		7.45	98.28
+15	12" CMP. Dr. pipe N. end 15' eq. storm sewer	7.65	98.08
+33	Catch Basin	8.10	97.63
5+00	" "	8.70	97.03
5+51	" "	9.57	96.16
B.M.		5.73	100.00

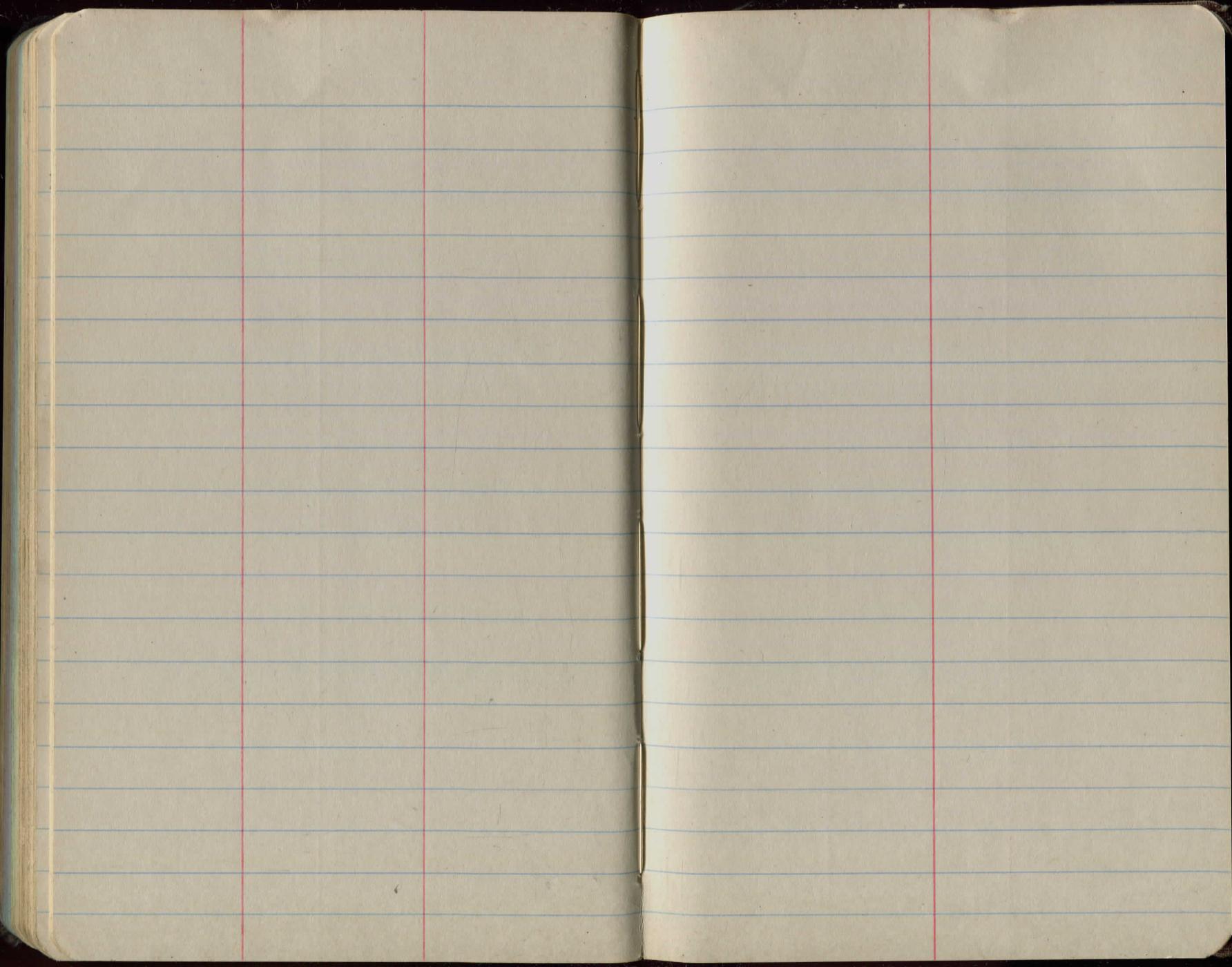
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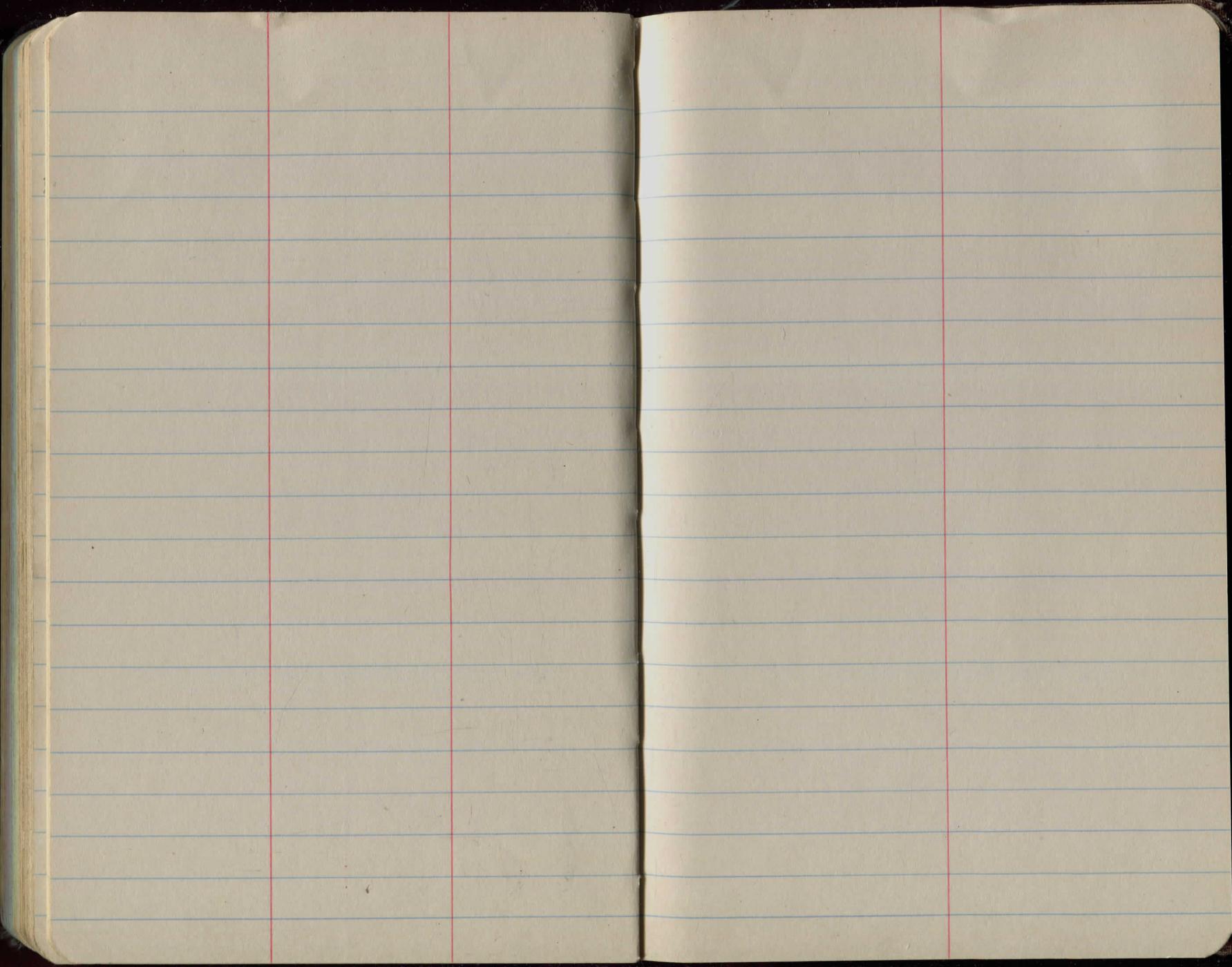
S&K. C&T. # 55591 opp. Cedar St.
& Franklin

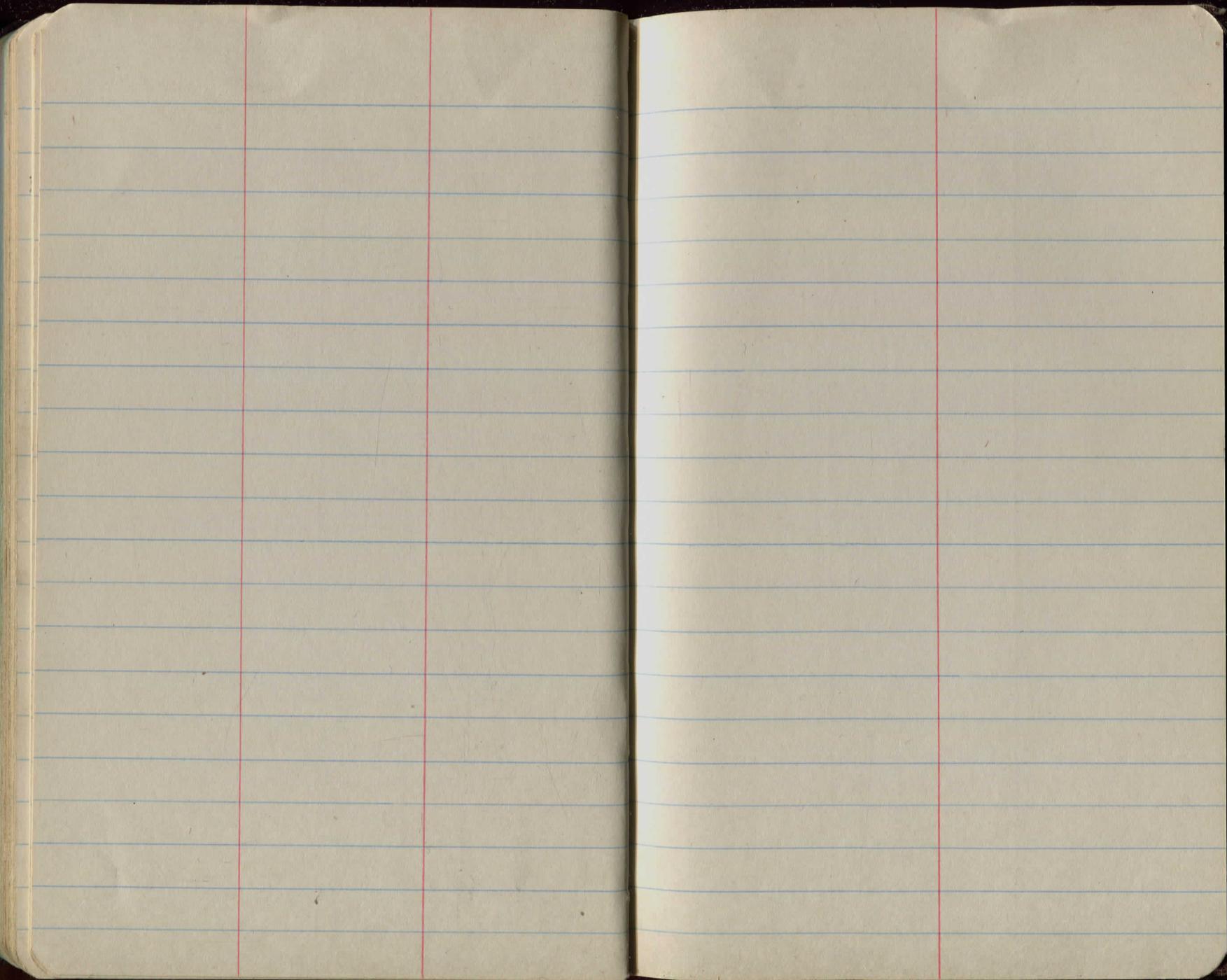


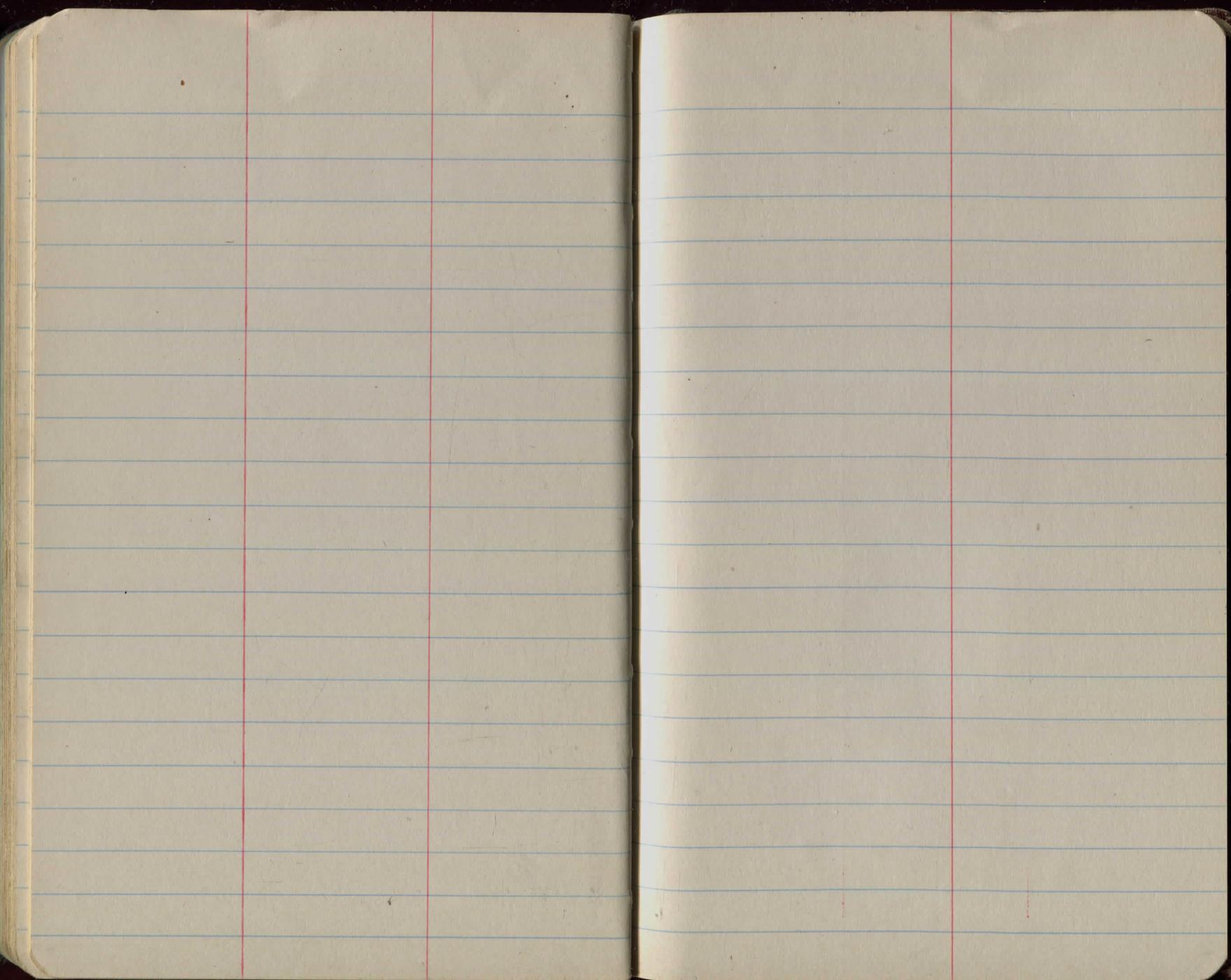


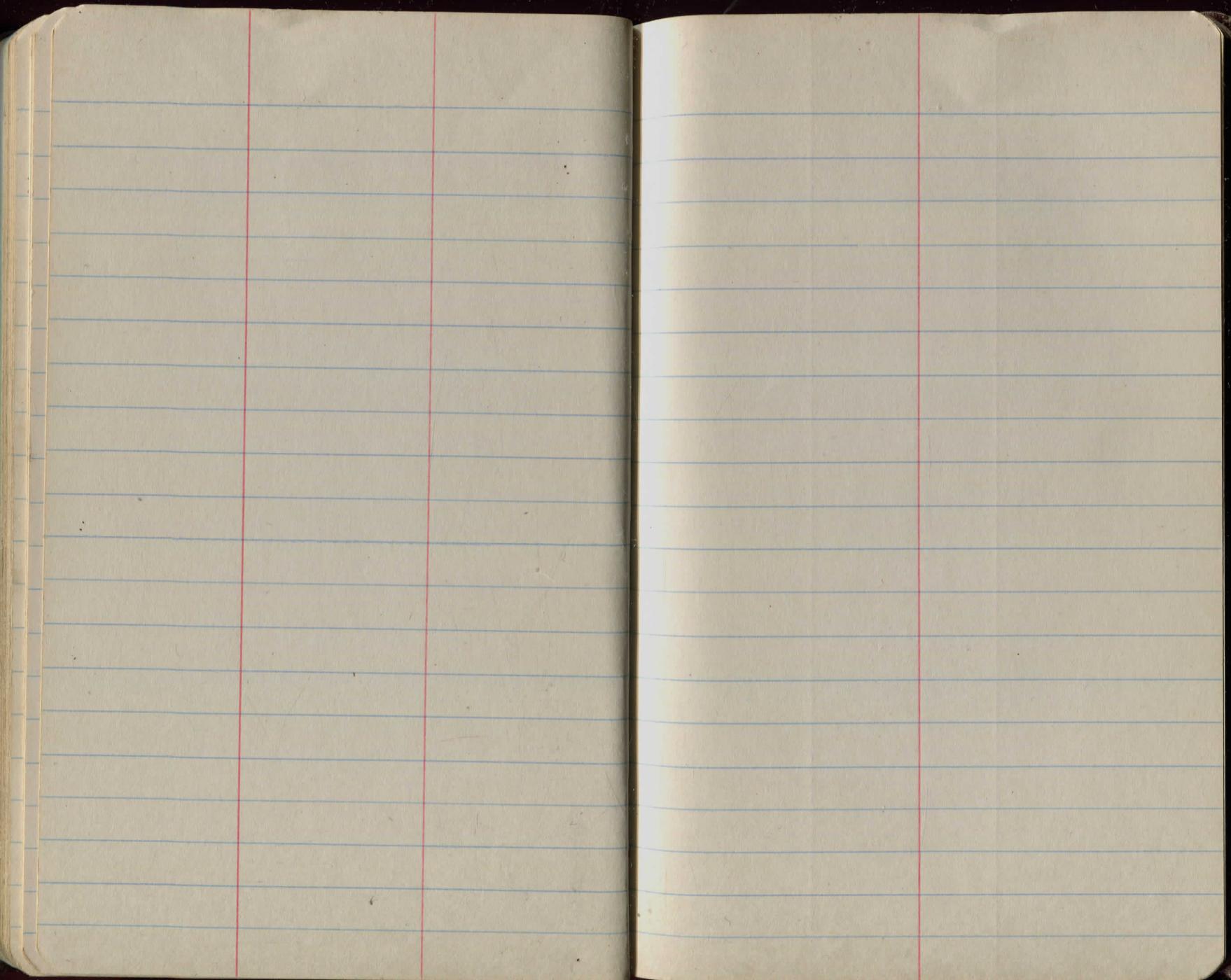
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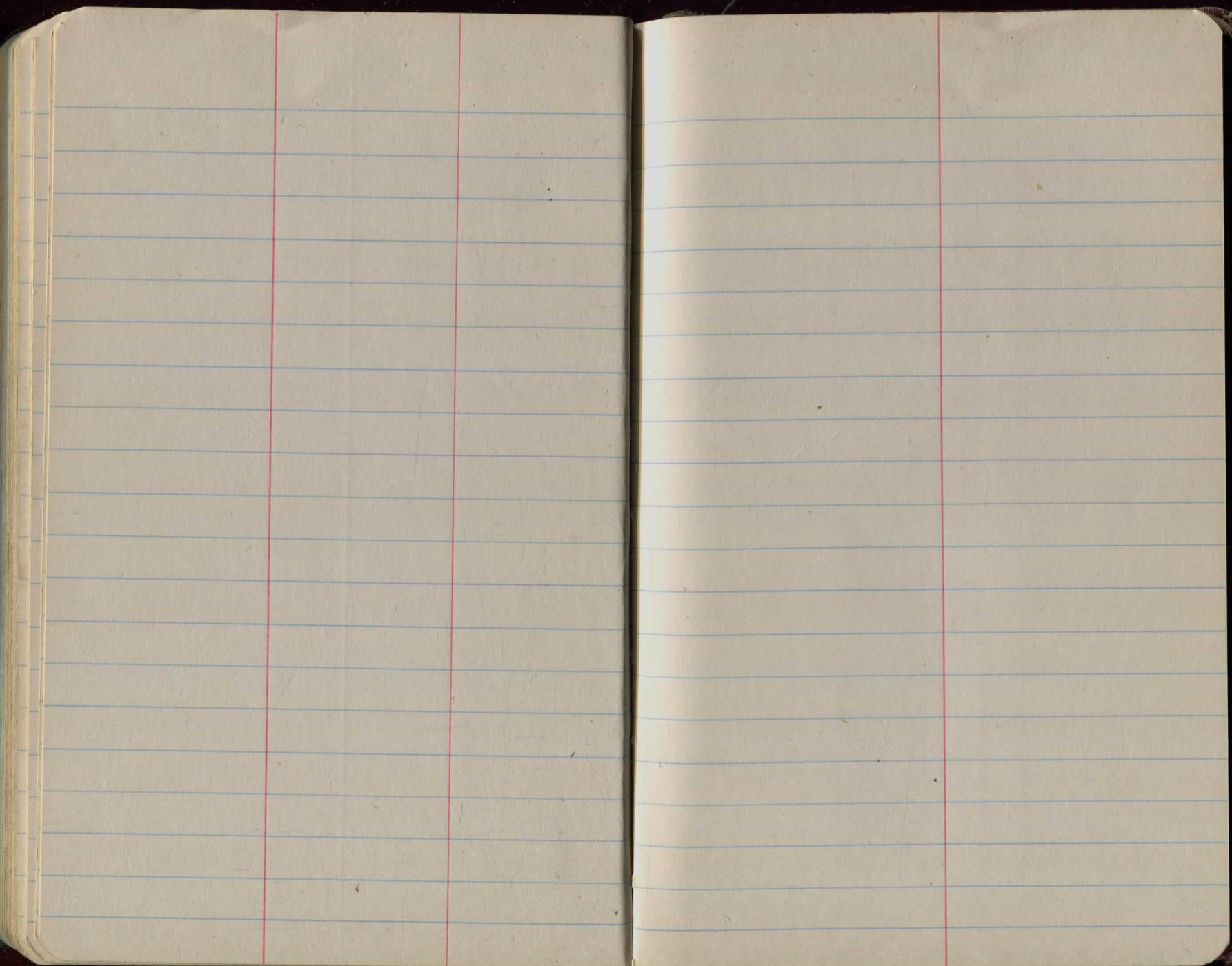


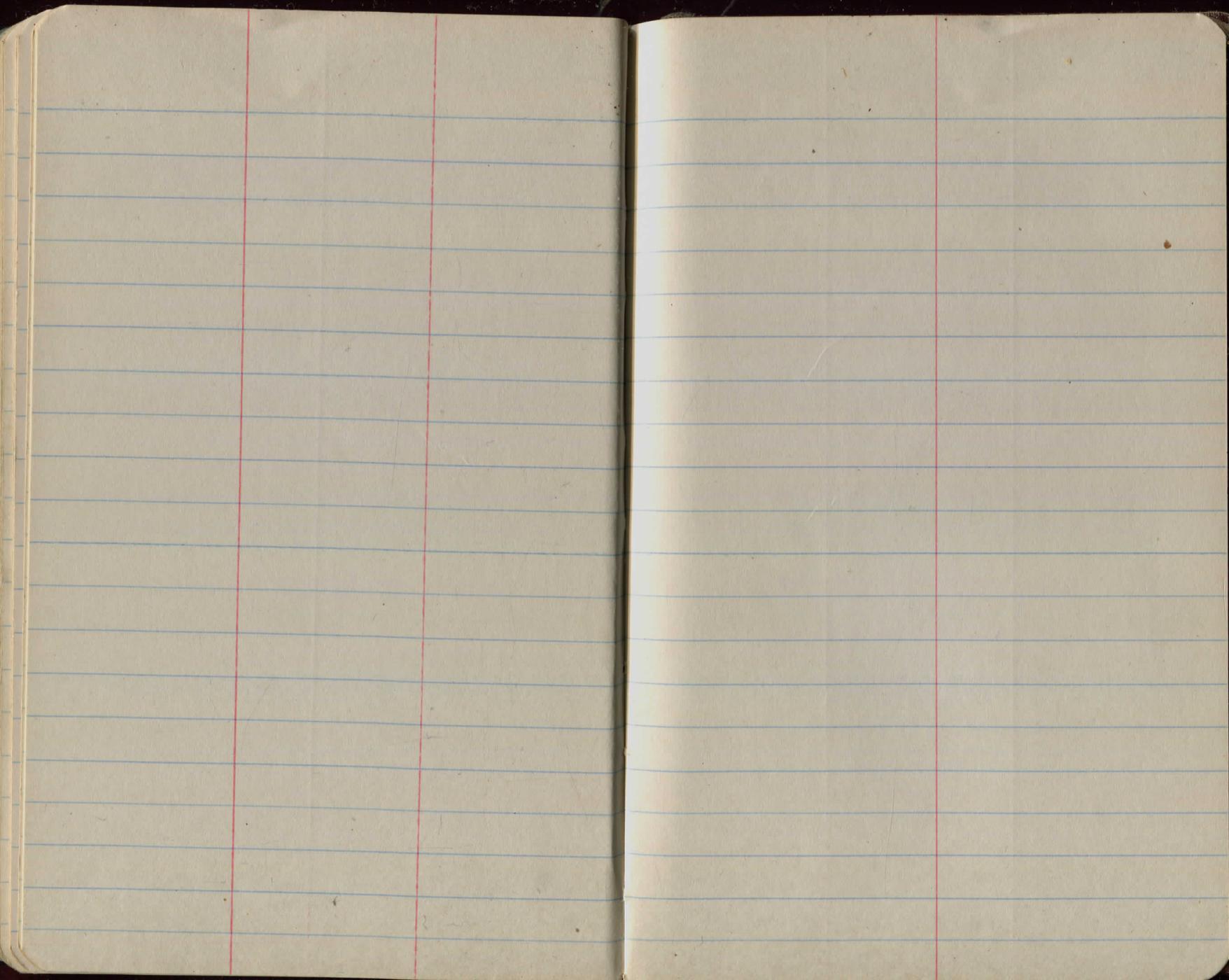


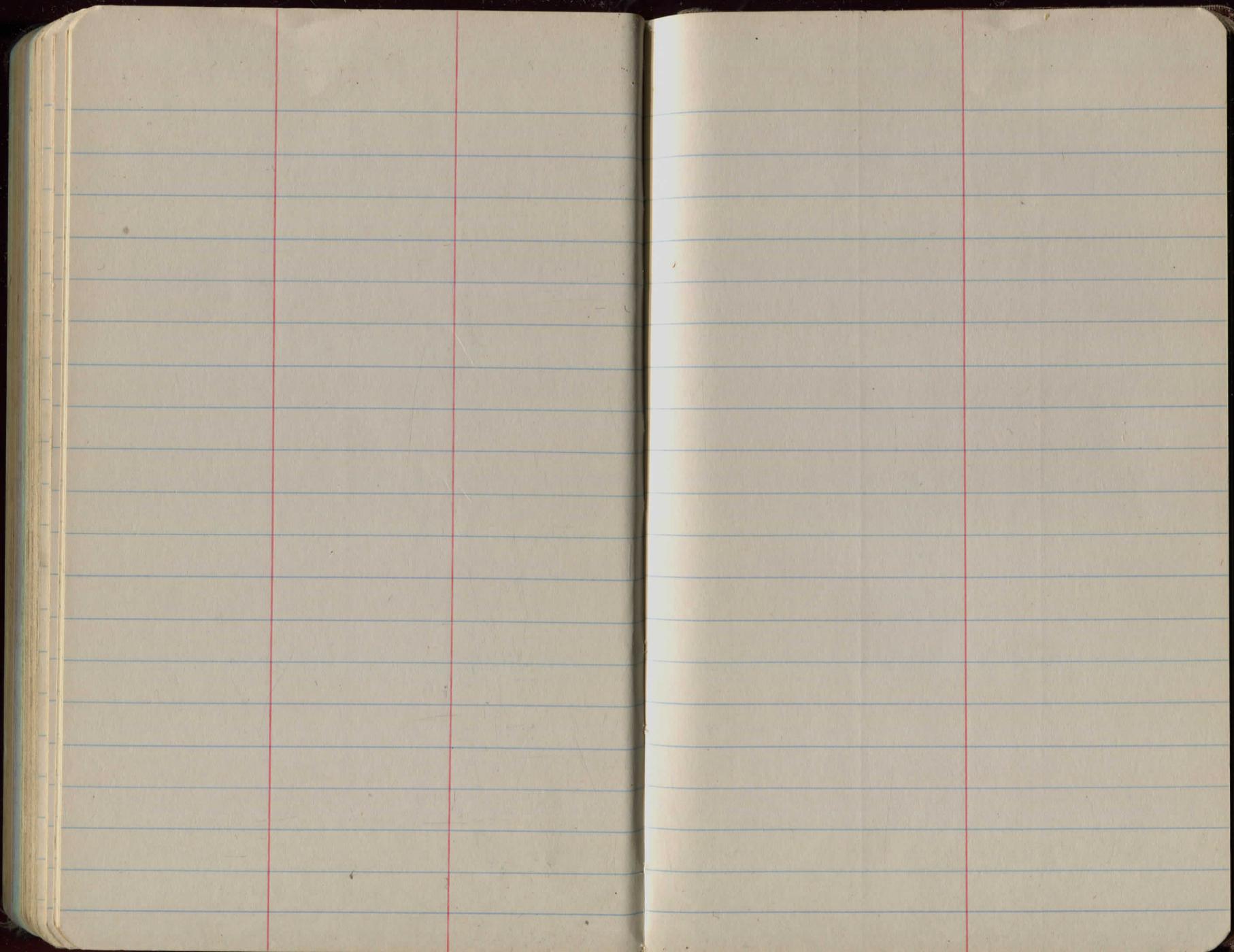


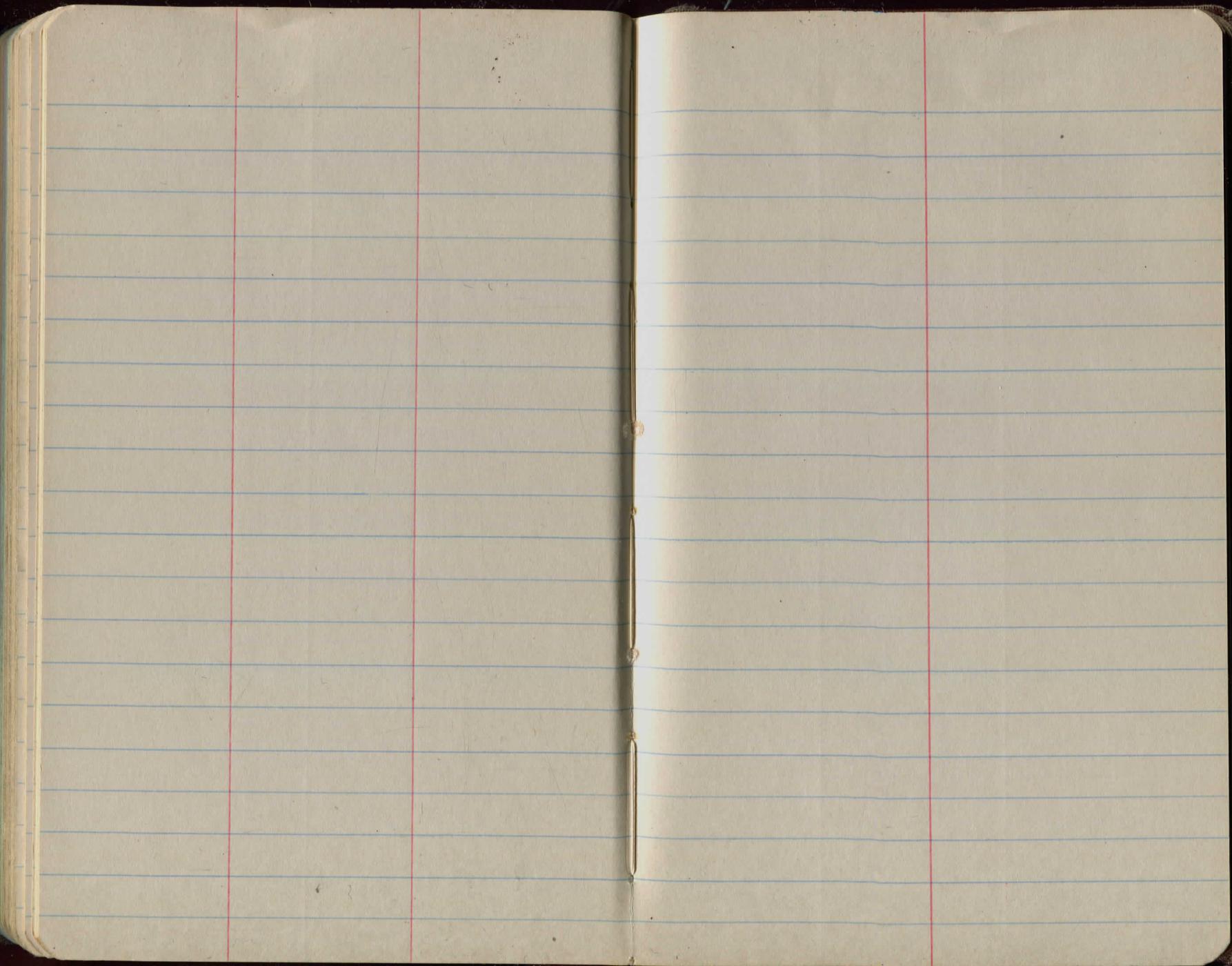


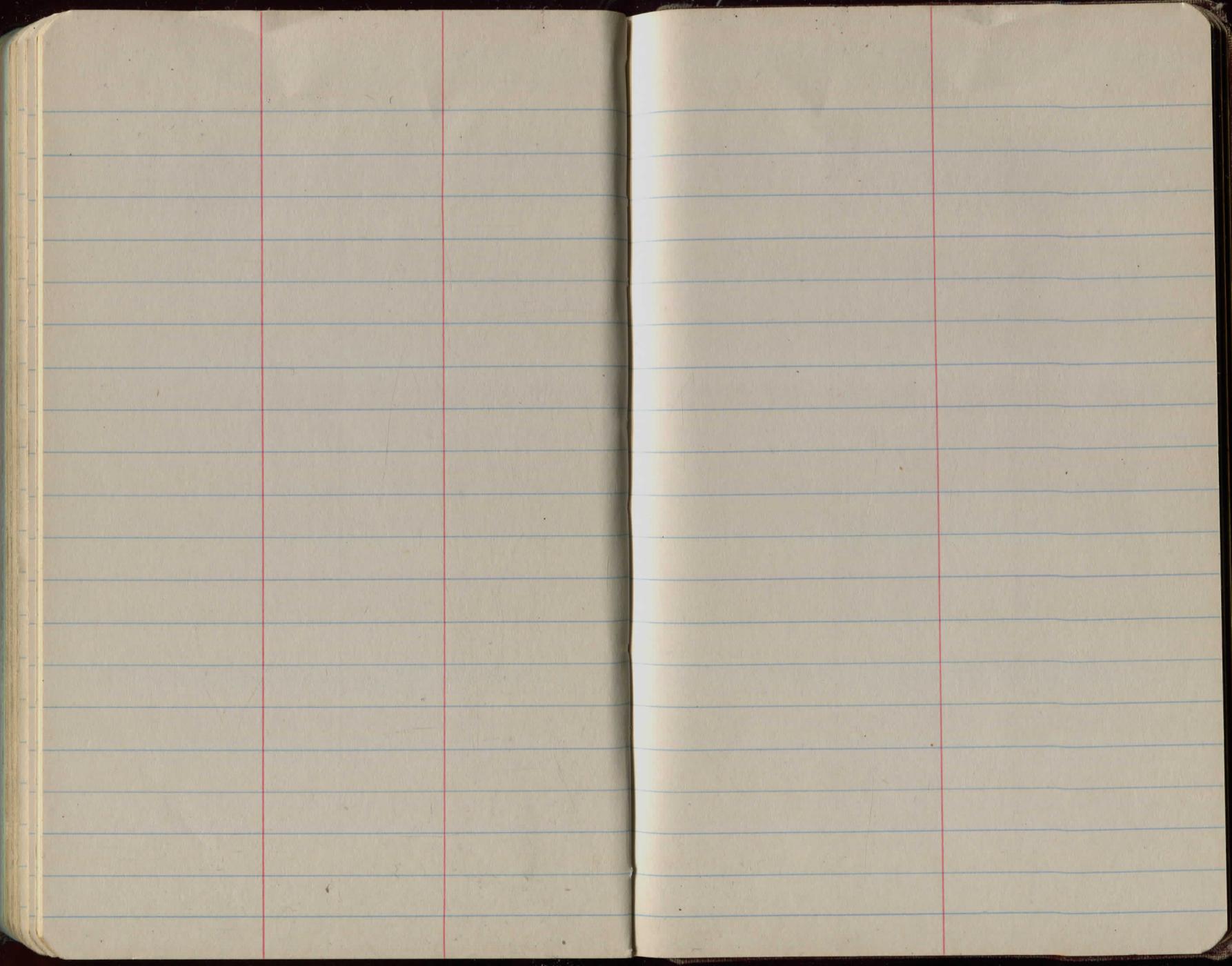


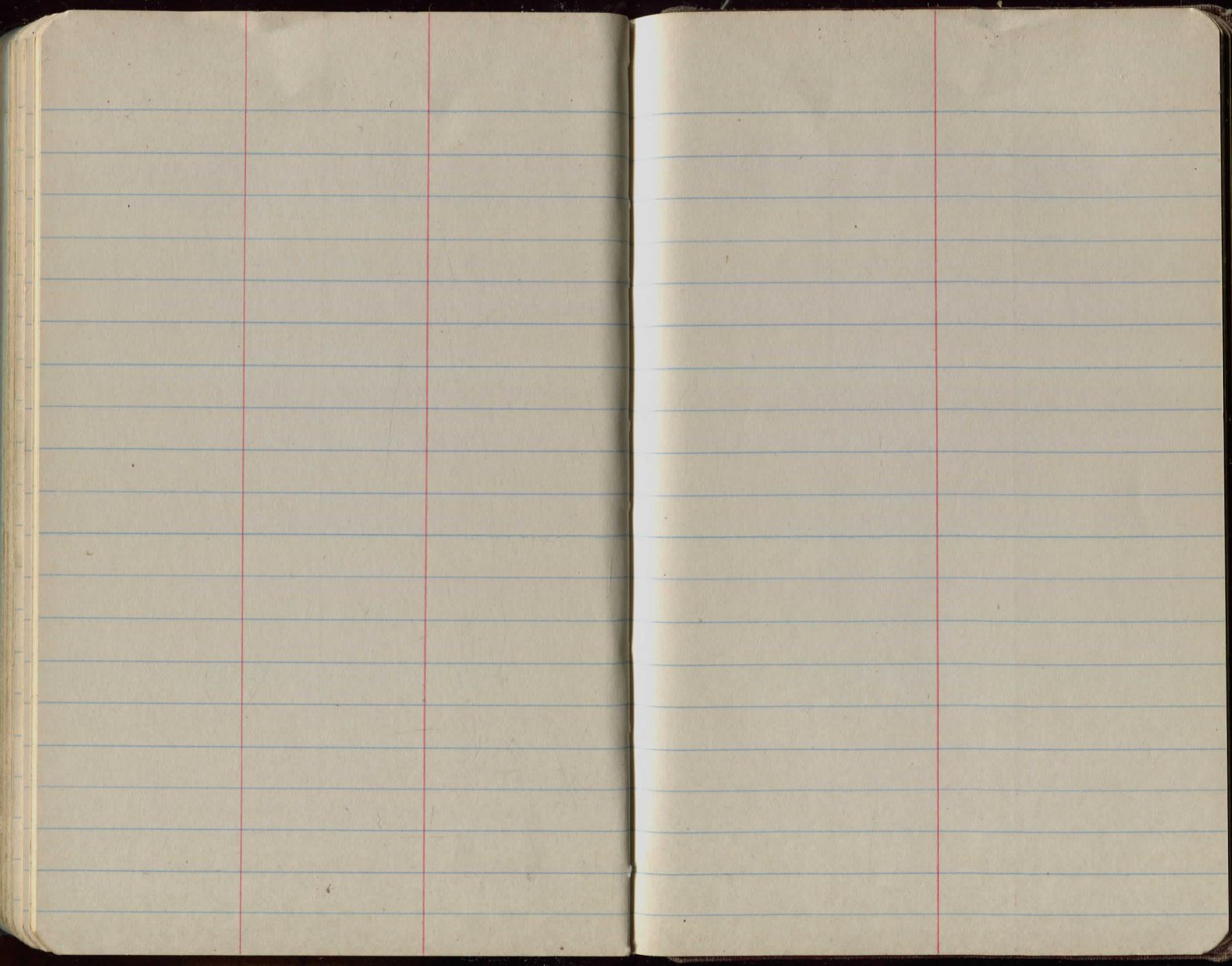


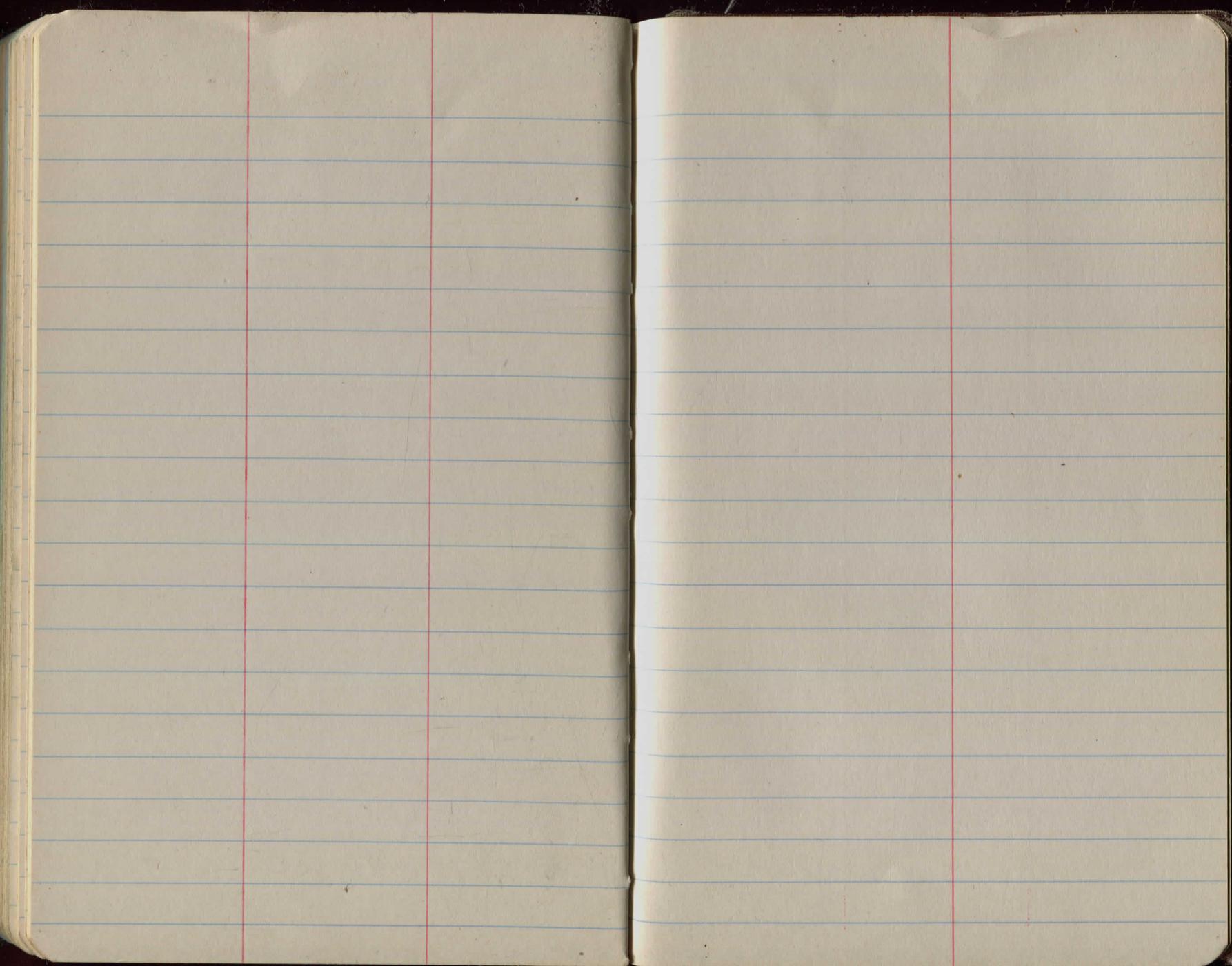


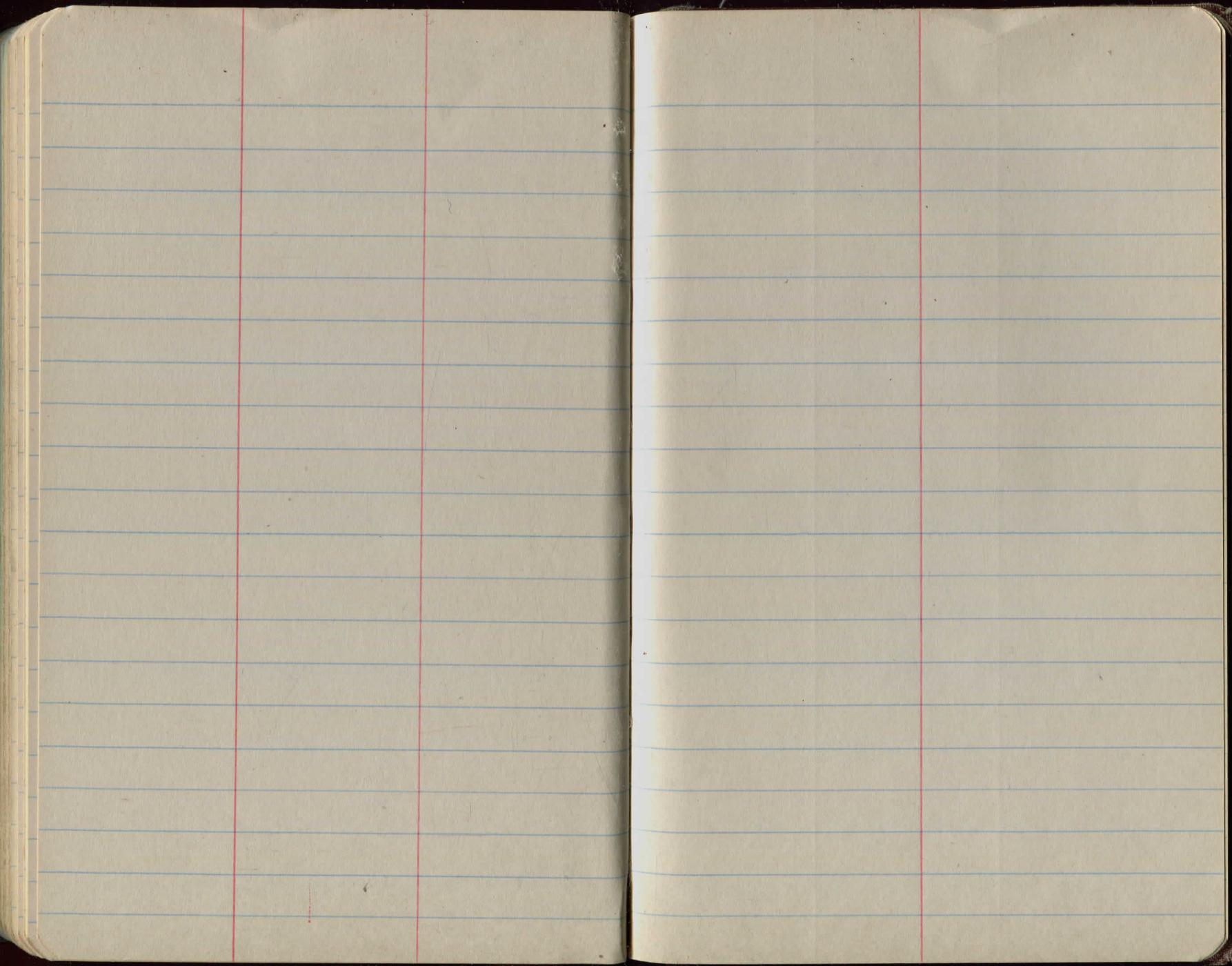


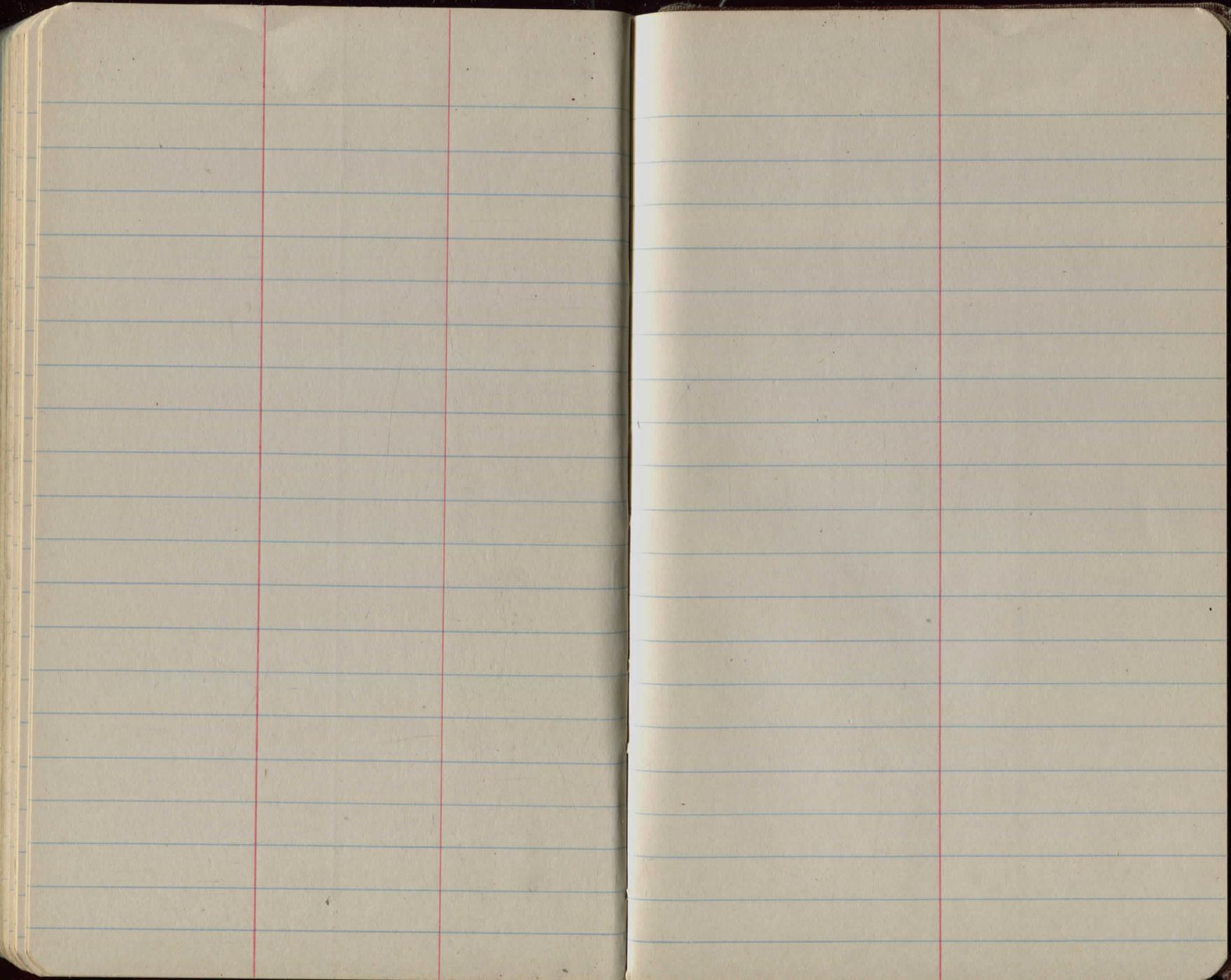


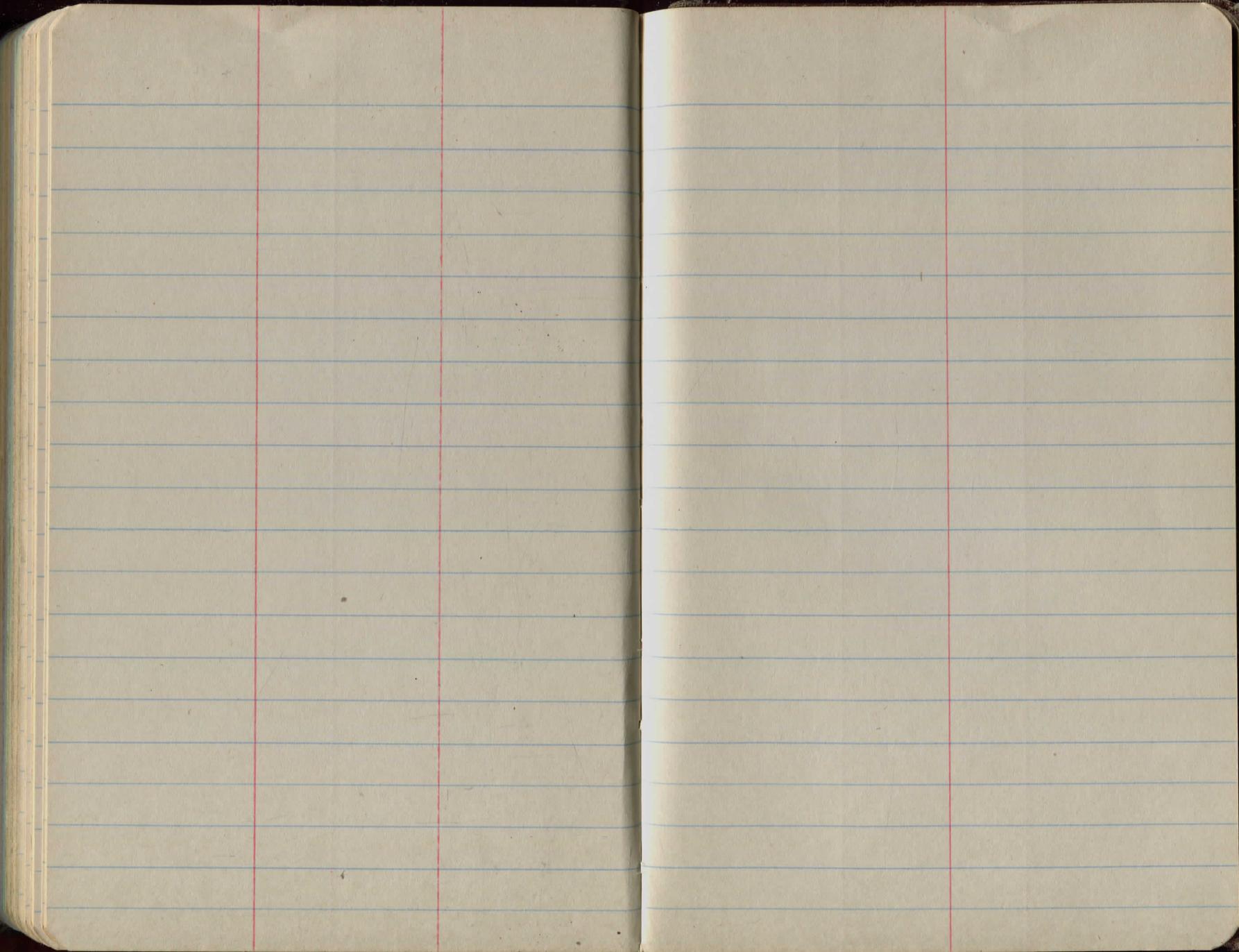


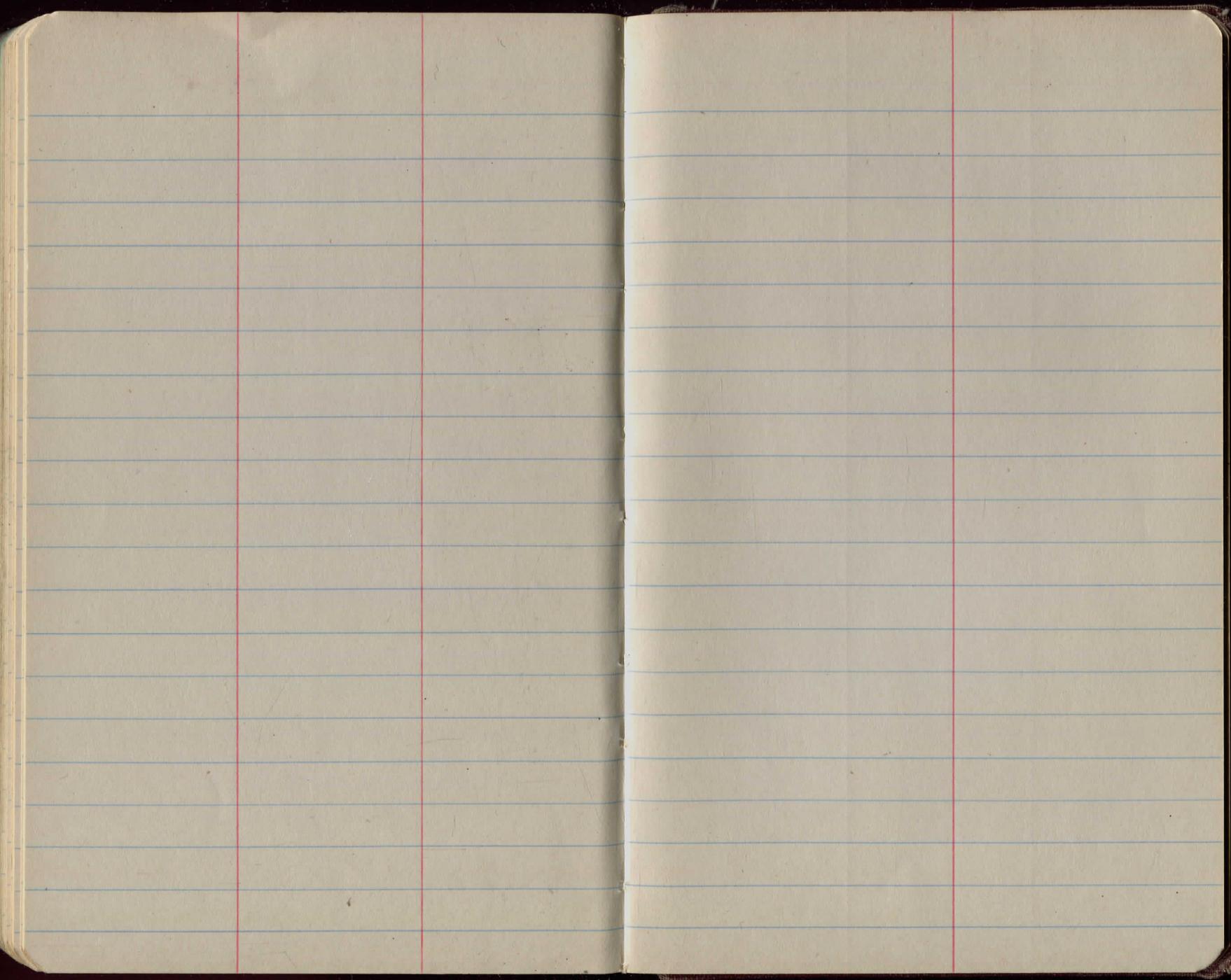


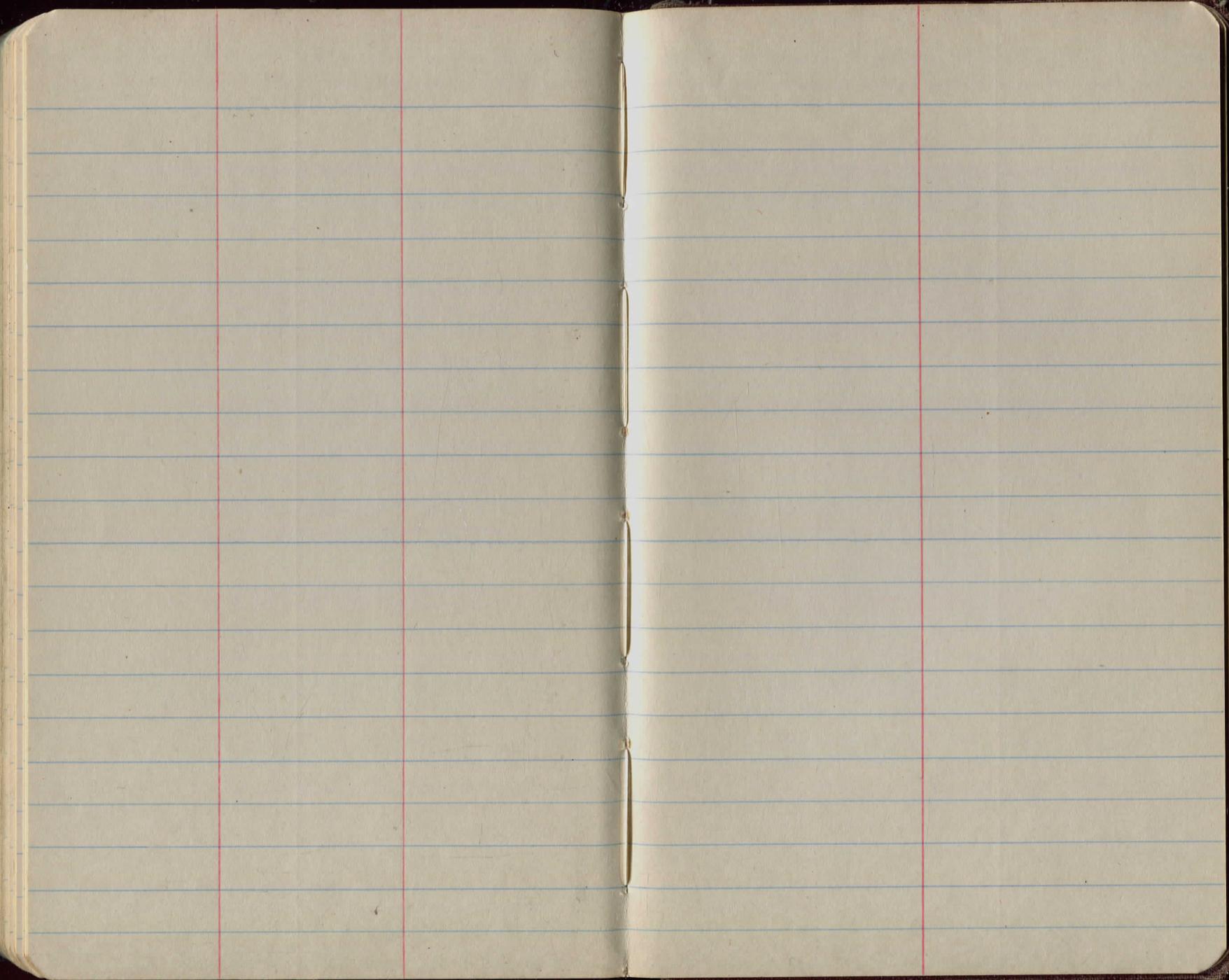


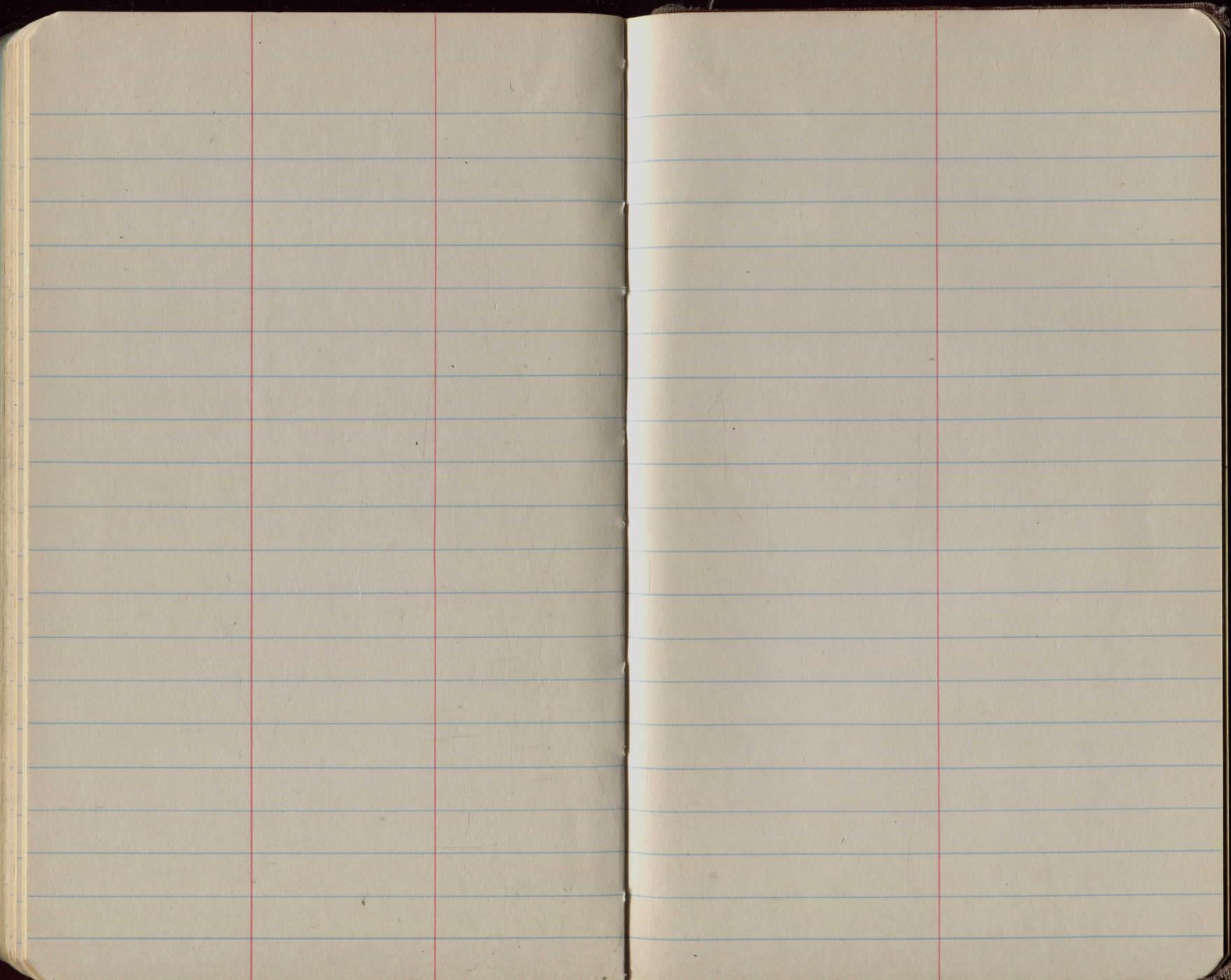


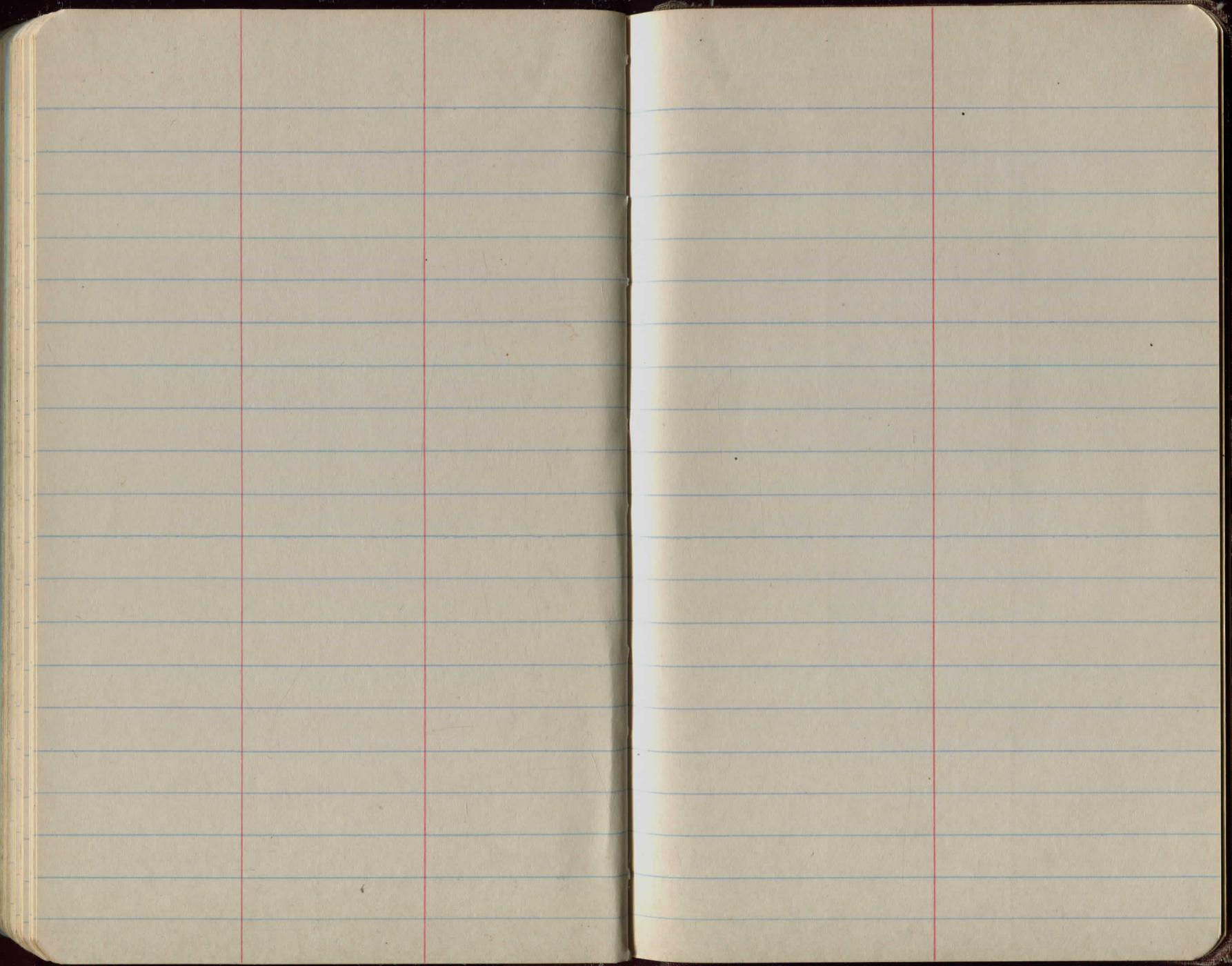


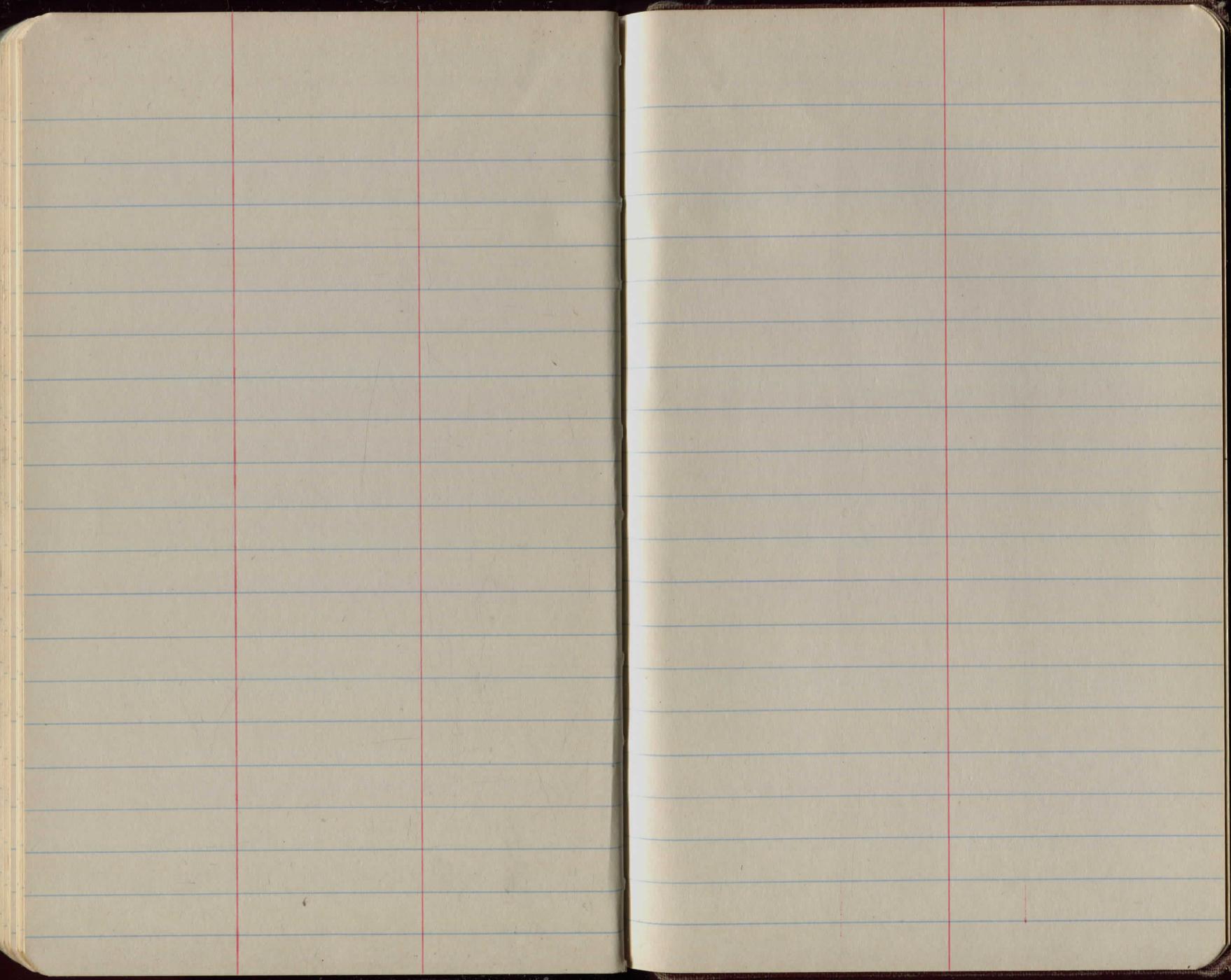


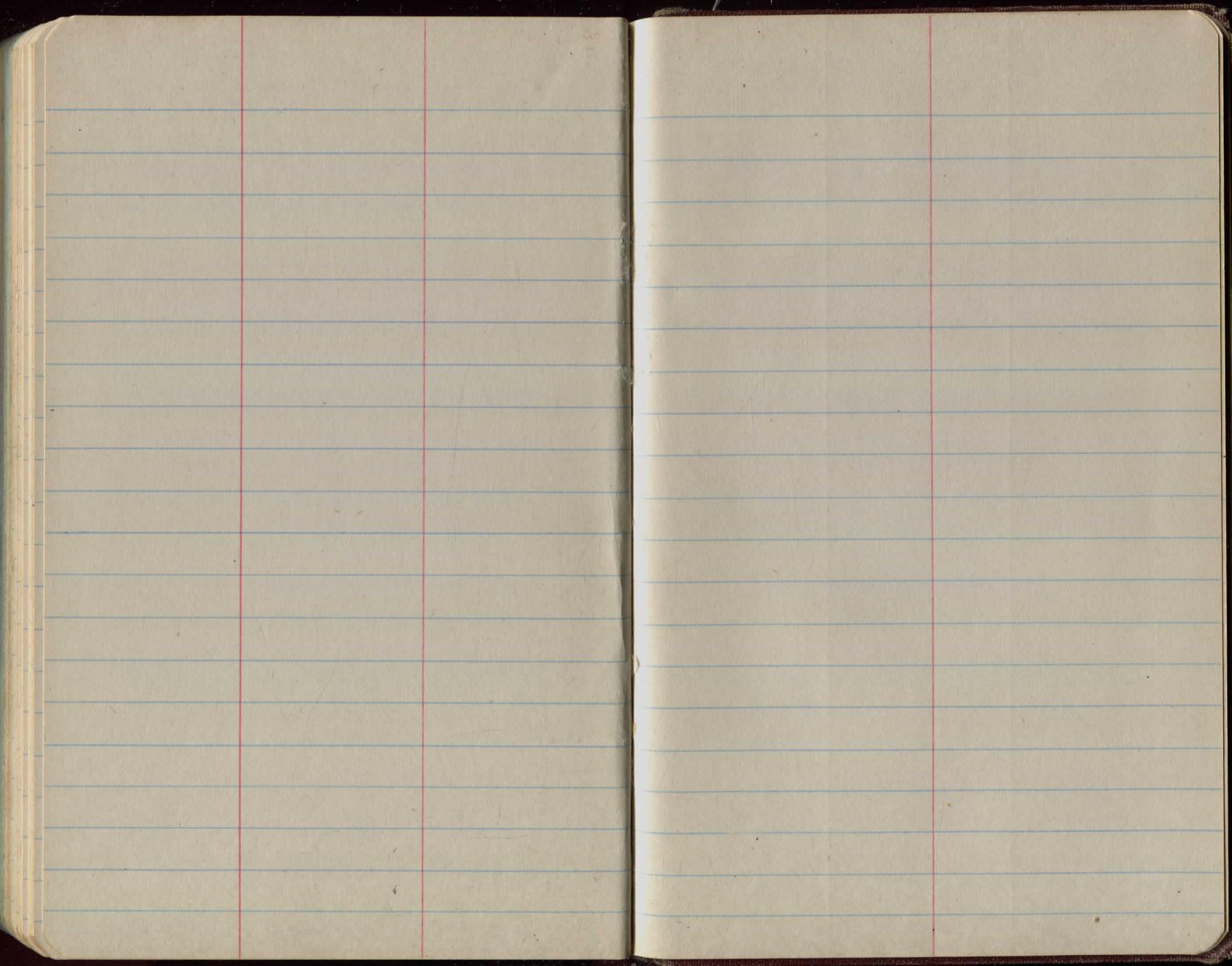


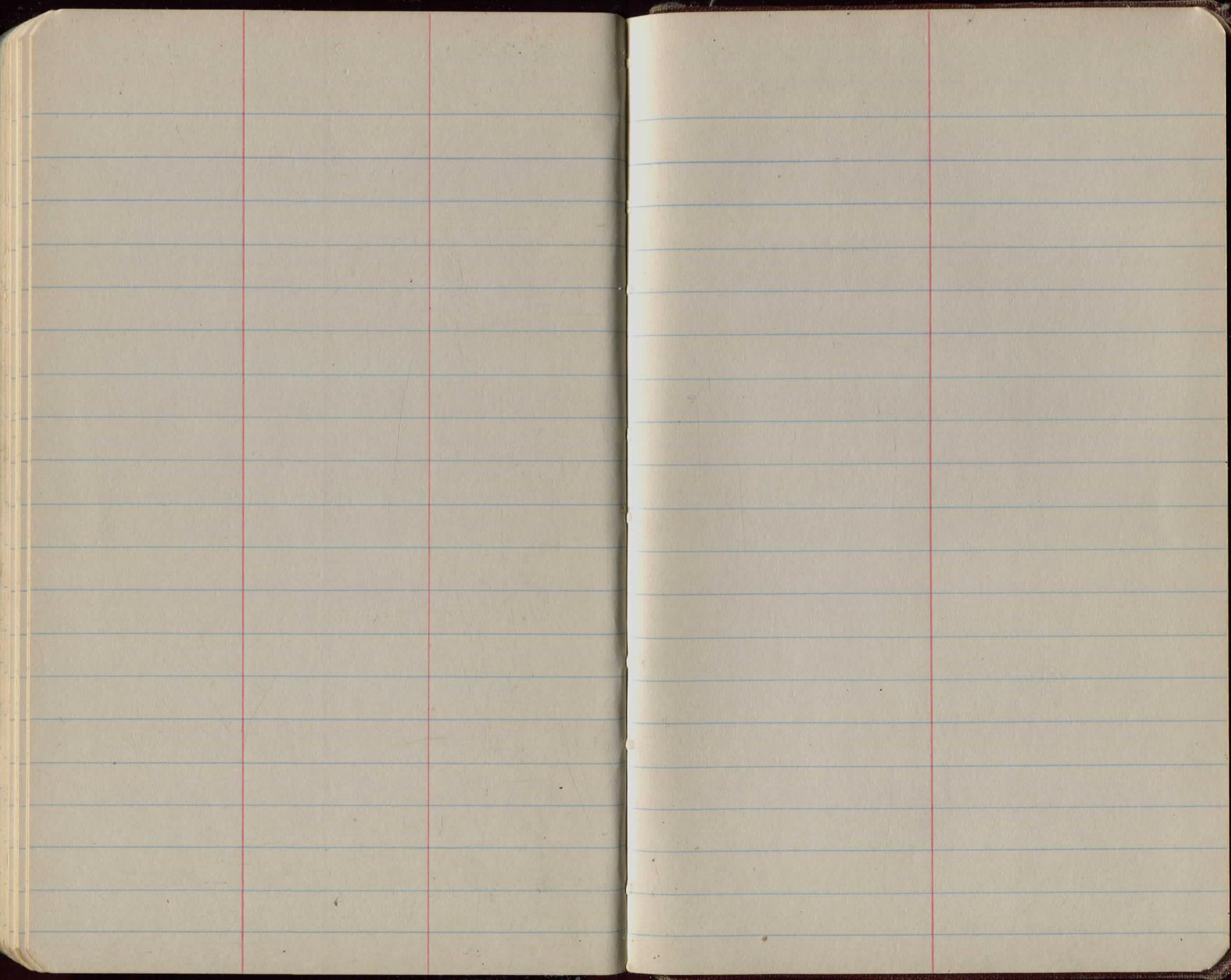


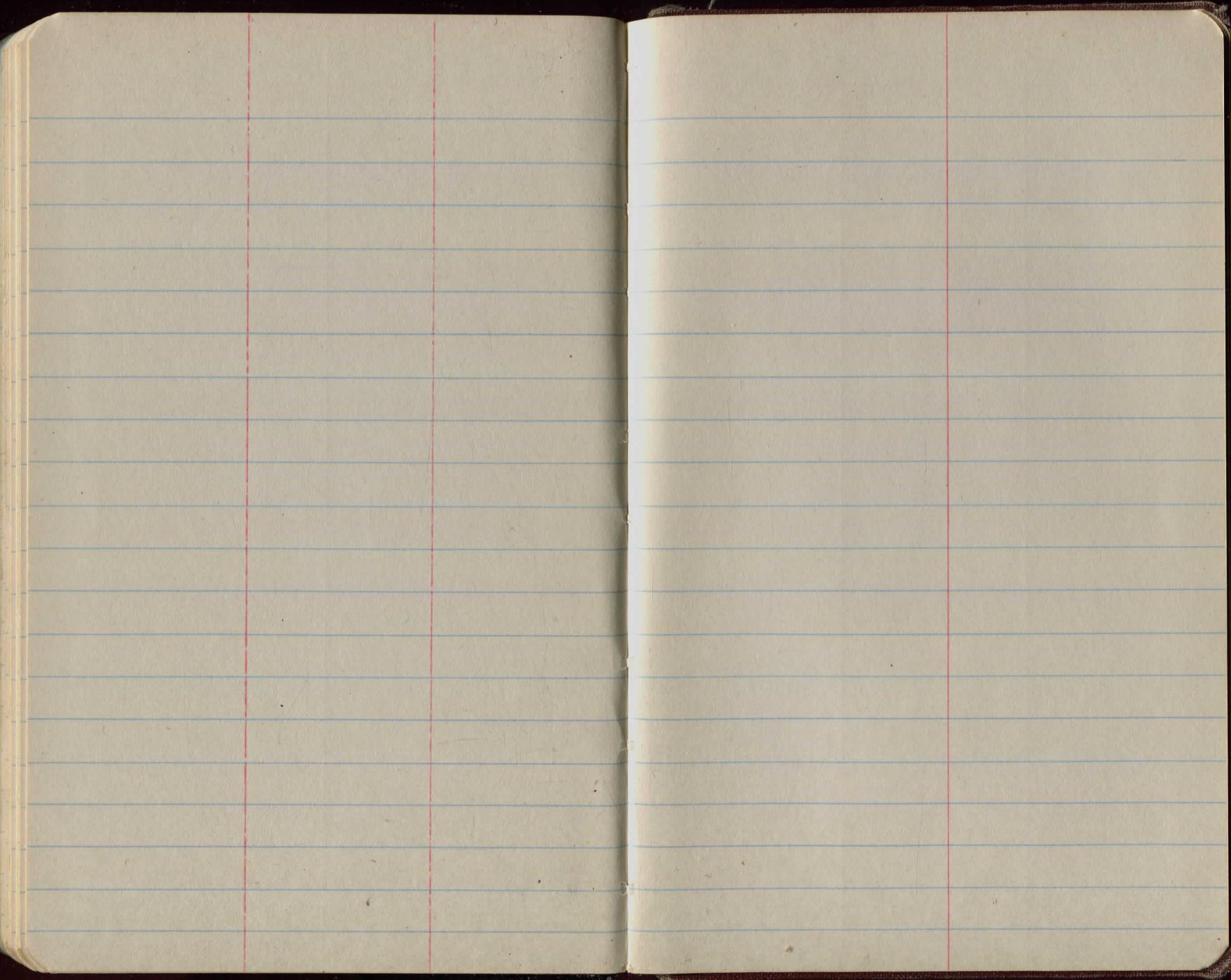


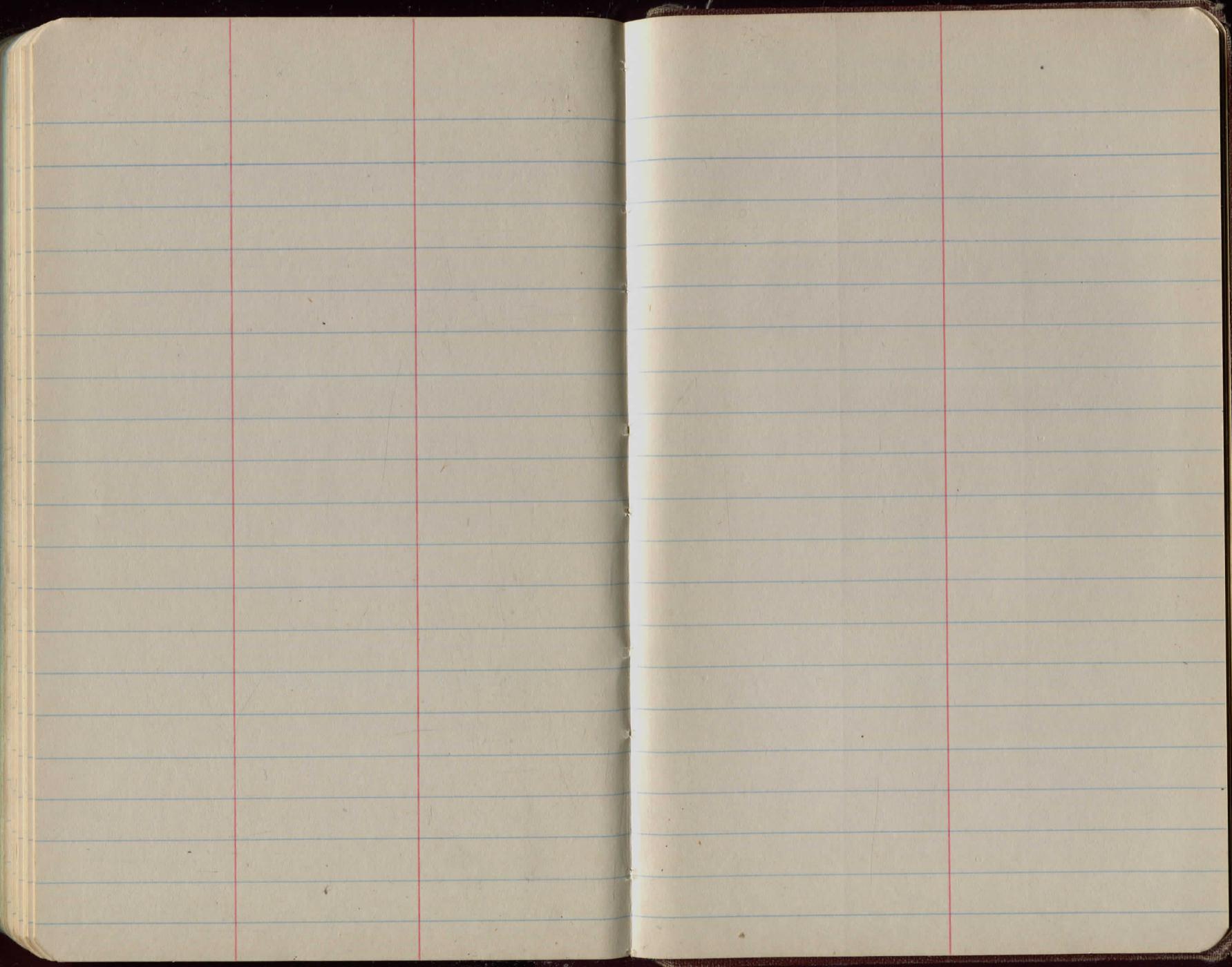


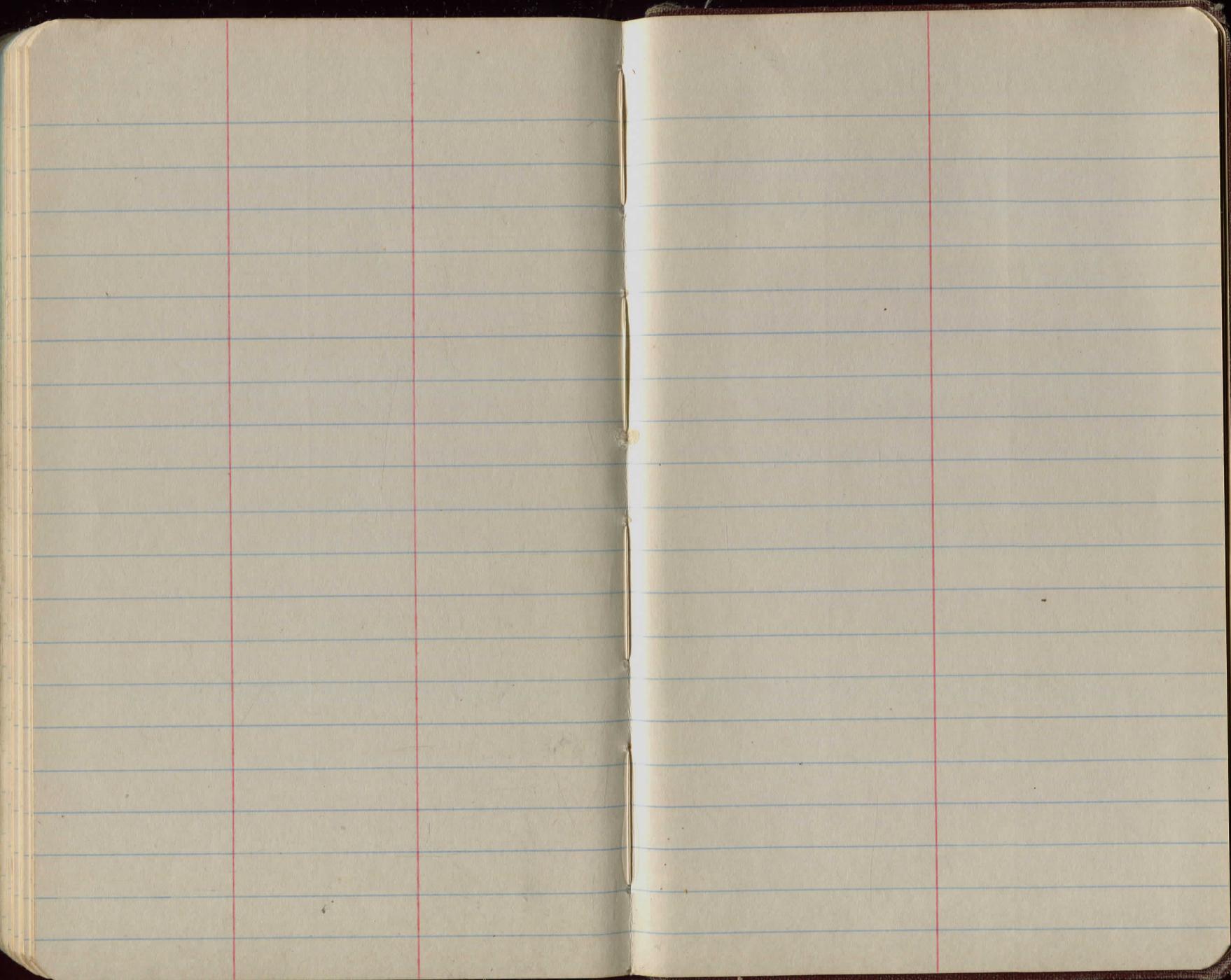


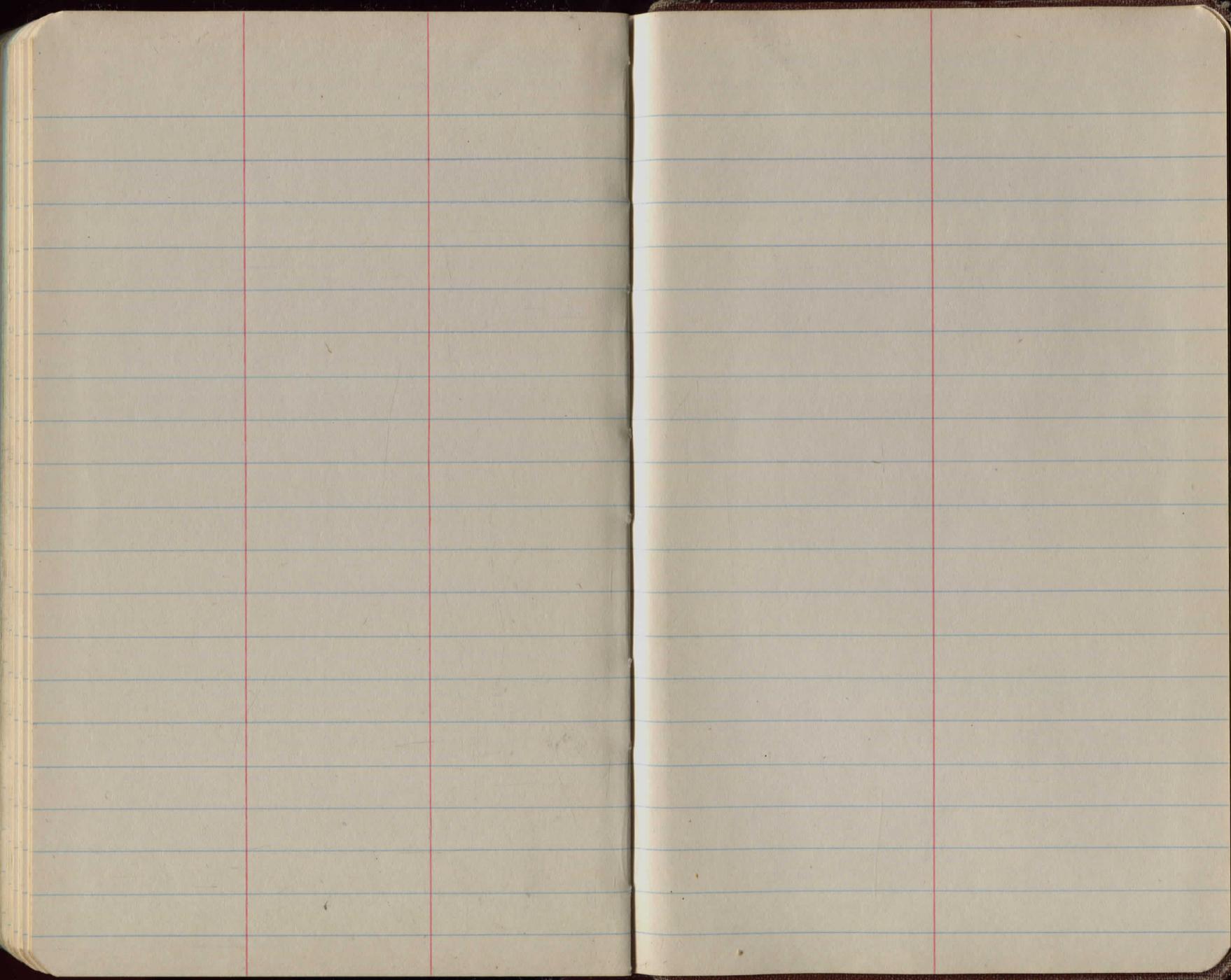


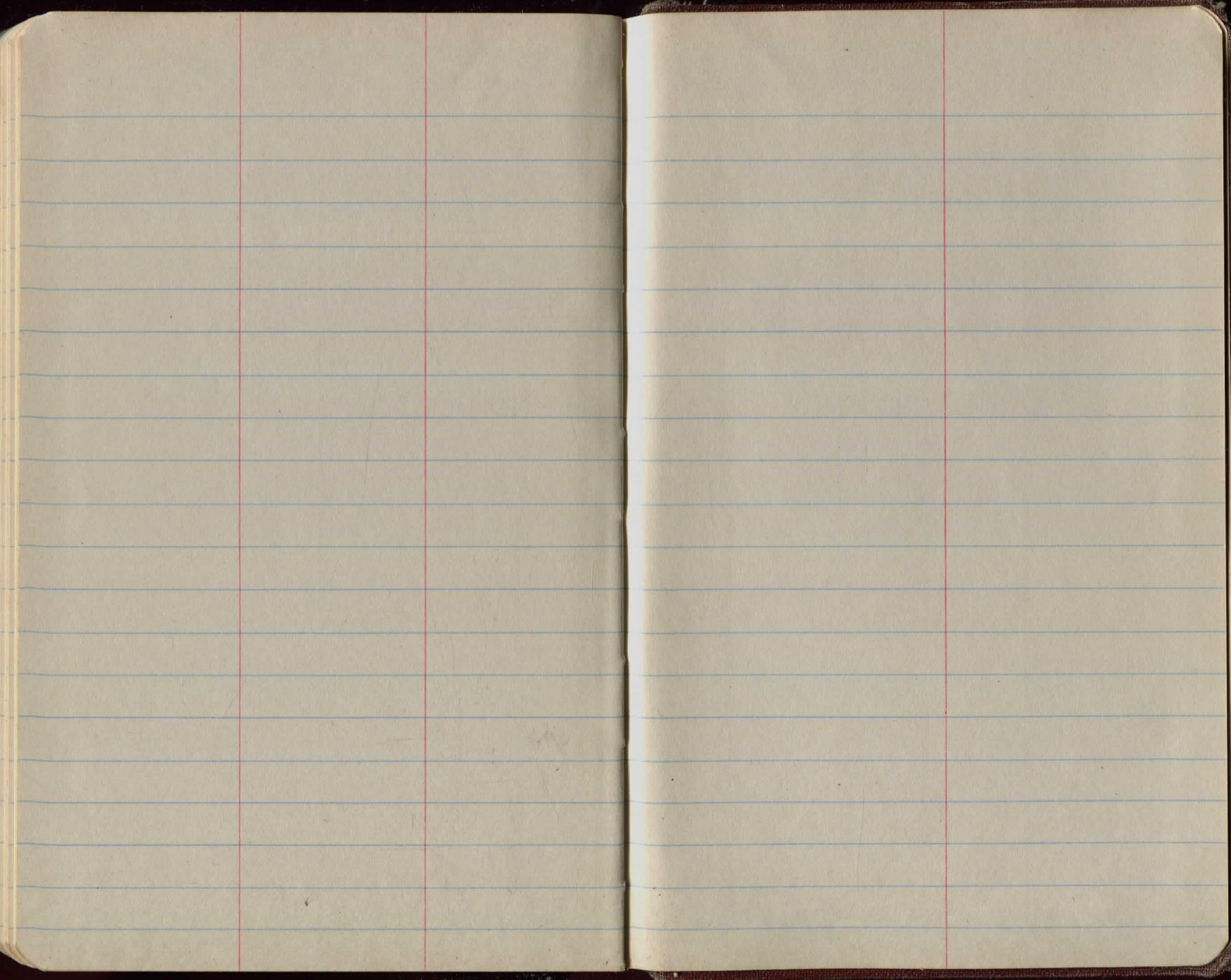


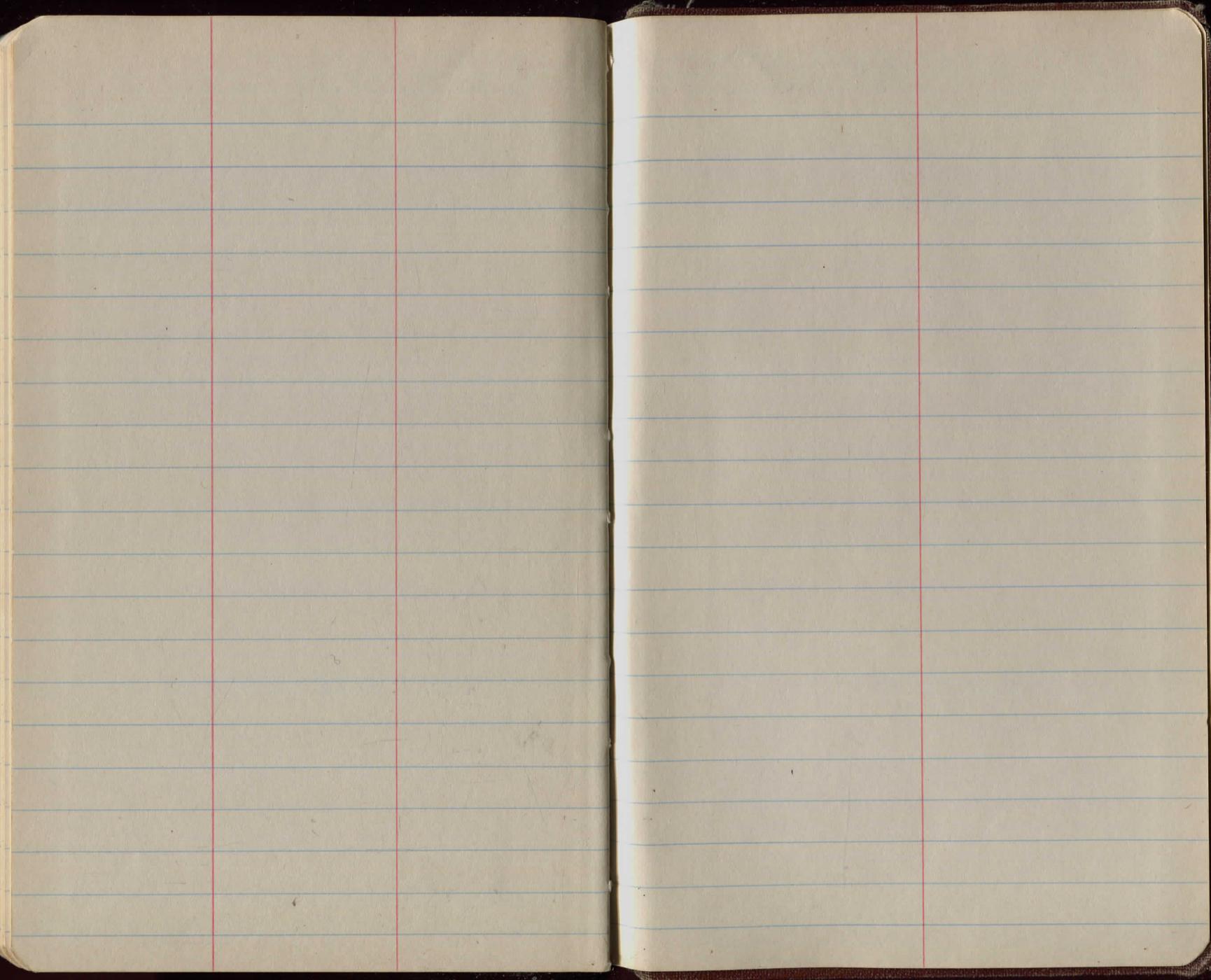


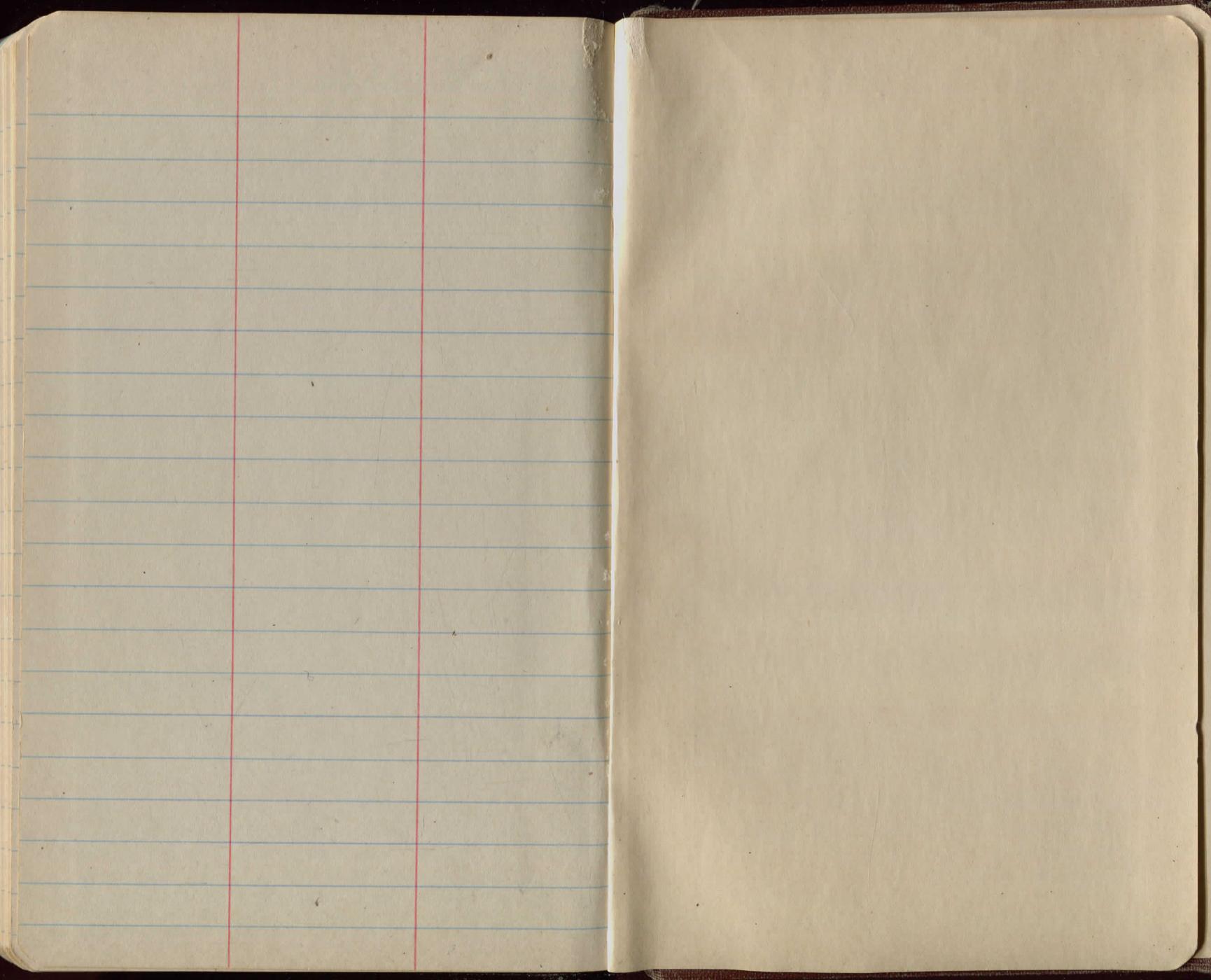












5,735

10.14
3.30
13.44

22
7
546.
20

16,800

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1114.20

113.00
52

61
26
57

1103.95
12.64
1091.34
1101.72
10.38

