of the tracer arm, that impatience with this very useful instrument is apt to result. Is it not possible to get a standard design made for the use of land surveyors with the scales in most general use and giving the results direct in acres? With a comparatively small order these could be obtained made to such a design without extra cost.

In the absence of the planimeter, or as a check, tracing linen or other transparent substances divided into squares, each containing an acre or a tenth or a hundredth, according to scale and circumstances, and applied to the plan, will give good results. For instance, for taking out the areas of lakes plotted on a scale of ten chains to an inch, a sheet divided into squares of one chain gives results direct in tenths of acres by reading off the number of squares in each column, "giving and taking on" the fractional squares, and totalling the numbers. With a little practice a surprising quickness and accuracy are obtained. I believe the English supply houses make transparent celluloid sheets with squares to various scales.

No matter what is the method employed of calculating the area, with plans to a scale of feet, there is always the tiresome work of converting square feet to acres. I wish to make public some tables which I have had in use for some years and found exceedingly useful, as have others to whom I have given copies. In fact, it has saved many a weary hour of long division. I have now extended and elaborated them somewhat further, and my hope is that they will prove of use. Their purpose is to convert areas contained in square feet into acres and decimals. They are calculated to three places of decimals, so that where addition is necessary in taking areas from the tables, one is always sure of the result to the nearest point in the second place. They show the acreage for every thousand feet up to 500,000, and then for every 500,000 up to 10,000,000 square feet, so that up to the former figure they can be taken out direct, and up to the latter by the simple addition of two numbers. There are small side tables giving acreages for hundreds and tens of feet, which are of use for the smaller acreages where accuracy to the third or second decimal is required:—

Examples:

Convert 487,000 feet to acres: Table: 11.180 acres.
"   3,914,000   "   "

3,500	80.349
414	9.504
	89.853

"   439,650   "   "

439	10.078
650	15
	10.093 ac.

A quick and easy way to convert feet to acres when tables are not at hand is to multiply by 23 and point off six places from the right. This gives a close approximation for field work. To demonstrate, take 43,560 square feet and convert:

$$43,560$$
$$23$$
$$\overline{130\ 680}$$
$$871\ 20$$
$$\overline{1.001\ 880}$$

This shows an error of 19/10,000ths per acre. So that for fairly close work deduct .002 for each acre.

To take the same example as above, convert 439,650 square feet to acres:

$$439,650$$
$$23$$
$$\overline{1\ 318\ 950}$$
$$8\ 793\ 00$$
$$\overline{10.111\ 950}$$

For closeness deduct .002 × 10   .02

$$\overline{10.092\ ac.}$$

Which agrees within .001 with the table.

For another example:

$$4,378,000$$
$$23$$
$$\overline{13\ 134\ 000}$$
$$87\ 560\ 00$$
$$\overline{100.694}$$

Deduct .002 × 100   .2

$$\overline{100.494}$$

which will be found to check within .01 acre. For many purposes that is close enough.

Acreage Table

Square Feet to Acres.

Thousands	0	1	2	3	4	5	6	7	8	9
0	....	.023	.046	.069	.092	.115	.138	.161	.184	.207
1	.229	.252	.275	.298	.321	.344	.367	.390	.413	.436
2	.459	.482	.505	.528	.551	.574	.597	.620	.643	.666
3	.689	.712	.735	.758	.781	.804	.827	.849	.872	.895
4	.918	.941	.964	.987	1.010	1.033	1.056	1.079	1.102	1.125
5	1.148	1.171	1.194	1.217	1.240	1.263	1.286	1.309	1.332	1.354
6	1.377	1.400	1.423	1.446	1.469	1.492	1.515	1.538	1.561	1.584
7	1.607	1.630	1.653	1.675	1.698	1.721	1.744	1.767	1.790	1.813
8	1.836	1.859	1.882	1.905	1.928	1.951	1.974	1.997	2.020	2.043
9	2.066	2.089	2.112	2.135	2.158	2.181	2.204	2.227	2.250	2.273
10	2.296	2.319	2.342	2.365	2.387	2.410	2.433	2.456	2.479	2.502
11	2.525	2.548	2.571	2.594	2.617	2.640	2.663	2.686	2.709	2.732
12	2.755	2.778	2.801	2.824	2.847	2.870	2.893	2.916	2.939	2.961
13	2.984	3.007	3.030	3.053	3.076	3.099	3.122	3.145	3.168	3.191
14	3.214	3.237	3.260	3.283	3.306	3.329	3.352	3.375	3.398	3.421
15	3.444	3.467	3.489	3.512	3.535	3.558	3.581	3.604	3.627	3.650
16	3.673	3.696	3.719	3.742	3.765	3.788	3.811	3.834	3.857	3.880
17	3.903	3.926	3.949	3.972	3.994	4.017	4.040	4.063	4.086	4.109
18	4.132	4.155	4.178	4.201	4.224	4.247	4.270	4.293	4.316	4.339
19	4.362	4.385	4.408	4.431	4.454	4.477	4.500	4.523	4.546	4.568
20	4.591	4.614	4.637	4.660	4.683	4.706	4.729	4.752	4.775	4.798
21	4.821	4.844	4.867	4.890	4.913	4.936	4.959	4.982	5.005	5.028
22	5.051	5.074	5.096	5.119	5.142	5.165	5.188	5.211	5.234	5.257
23	5.280	5.303	5.326	5.349	5.372	5.395	5.418	5.441	5.464	5.487
24	5.510	5.533	5.556	5.579	5.602	5.625	5.648	5.670	5.693	5.716
25	5.739	5.762	5.785	5.808	5.831	5.854	5.877	5.900	5.923	5.946
26	5.969	5.992	6.015	6.038	6.061	6.084	6.107	6.130	6.152	6.175
27	6.198	6.221	6.244	6.267	6.290	6.313	6.336	6.359	6.382	6.405
28	6.428	6.451	6.474	6.497	6.520	6.543	6.566	6.589	6.612	6.635
29	6.658	6.681	6.703	6.726	6.749	6.772	6.795	6.818	6.841	6.864
30	6.887	6.910	6.933	6.956	6.979	7.002	7.025	7.048	7.071	7.094
31	7.117	7.140	7.163	7.186	7.208	7.231	7.254	7.277	7.300	7.323
32	7.346	7.369	7.392	7.415	7.438	7.461	7.484	7.507	7.530	7.553
33	7.576	7.599	7.622	7.645	7.668	7.691	7.714	7.736	7.759	7.782
34	7.805	7.828	7.851	7.874	7.897	7.920	7.943	7.966	7.989	8.012
35	8.035	8.058	8.081	8.104	8.127	8.150	8.173	8.195	8.219	8.242
36	8.265	8.288	8.310	8.333	8.356	8.379	8.402	8.425	8.448	8.471
37	8.494	8.517	8.540	8.563	8.586	8.609	8.632	8.655	8.678	8.701
38	8.724	8.747	8.770	8.793	8.815	8.838	8.861	8.884	8.907	8.930
39	8.953	8.976	8.999	9.022	9.045	9.068	9.091	9.114	9.137	9.160
40	9.183	9.206	9.229	9.252	9.275	9.298	9.321	9.343	9.366	9.389
41	9.412	9.435	9.458	9.481	9.504	9.527	9.550	9.573	9.596	9.619
42	9.642	9.665	9.688	9.711	9.734	9.756	9.779	9.802	9.825	9.848
43	9.871	9.894	9.917	9.940	9.963	9.986	10.009	10.032	10.055	10.078
44	10.101	10.124	10.147	10.170	10.193	10.216	10.239	10.262	10.285	10.308
45	10.331	10.353	10.376	10.399	10.422	10.445	10.468	10.491	10.514	10.537
46	10.560	10.583	10.606	10.629	10.652	10.675	10.698	10.721	10.744	10.767
47	10.790	10.813	10.836	10.859	10.882	10.905	10.927	10.950	10.973	10.996
48	11.019	11.042	11.065	11.088	11.111	11.134	11.157	11.180	11.203	11.226
49	11.249	11.272	11.295	11.318	11.341	11.364	11.387	11.410	11.432	11.455
50	11.478									

Thous'ds.	Acres.	Thousands.	Acres.	Hundreds.		Tens.	
1000....	22.957	5500....	126.262	1....	.002	01....	.000
1500....	34.435	6000....	137.741	2....	.005	02....	.000
2000....	45.914	6500....	149.219	3....	.007	03....	.001
2500....	57.392	7000....	160.698	4....	.009	04....	.001
3000....	68.870	7500....	172.176	5....	.011	05....	.001
3500....	80.349	8000....	183.655	6....	.014	06....	.001
4000....	91.827	8500....	195.133	7....	.016	07....	.002
4500....	103.306	9000....	206.612	8....	.018	08....	.002
5000....	114.784	9500....	218.090	9....	.021	09....	.002
		10000....	229.568				