

Grimshaw.tex

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1 Gremshaw's thoughts on crosscut saws and saw gauges

From Grimshaw SAWS The History, Development, Action, Classification, and Comparison of Saws of all kinds. 1882 page 201 about crosscut saws.

The Cosscut Saw — The ordinary crosscut saw, among the most primitive and most generally used implements, is one of the advance couriers of civilization. It penetrates the forest almost with rifle and axe, and far in advance of the surveyor's chain, and once it enters a country it stays there. It remains a useful member of society, despite its crudity. It is its very simplicity that has caused it to be so tenacious of its position among needful implements. It requires no foundations, no motor, no special preparation. Where the axe leaves a tree, there the crosscut takes it; and from the newly fallen log upon the virgin shores, to the busy ship-yard that succeeds the primeval forest, the crosscut is never hung up. And yet it is an aggravating, fatiguing, slow-working affair. (*Which explains why it is rarely used in the 2000s as a chain saw solves some of these complaints.*)

Page 222: Kerf is sometimes called “scarf,” and also written “carf.”

From Grimshaw Page 142:

The gauge employed for measuring thickness of saw plates is the so-call “**Stubs**,” or **Birmingham Wire Gauge** (an arbitrary and senseless scale, almost matchless among trade stupidities), shown in part herewithin comparison with the inch and its divisions of the inch in the annexed table (**Figure 5**, page 9 as usual the values in these tables do not match similar values in other tables.) (*There are some errors in the original table, the fixed version is here **Figure 6**, page 11*):

In **Figure 2**, page 4 and **Figure 4**, page 6 these values are plotted. Note that the plot is not a nice smooth line but has some “ugly” bumps on it. (*I could not get a plot similar to the one that Gremshaw has. I generated mine with gnuplot.*)

Page 265: **A Decimal Gauge for Sheet Metal and Wire.** — Gauges, or notched plates for measuring thicknesses of metal sheets and wire, were at first of local origin and innumerable variety. One of the **Birmingham gauges** (the **Stubs**) has been most carefully perpetuated. In America one was introduced by **Brown & Sharpe**, to correct some discrepant proportions in the last, by establishing a regular proportion of the 39 successive steps between 0000 and 36. Starting at 0.46 inch for 0000, each gauge is 10.9478 per cent less than the preceding one; giving 0.005 inch for No. 36, which is 35 of the **Birmingham**.

The great use of the gauge to-day is for purposes of estimate — calculating the value of given superficies or length in weight of material, or *visé versa*; and any notation or division of parts facilitating this would be an advantage. The proposed **Decimal Gauge**, which we owe to the eminent engineer, Mr. Robert Biggs, is based on the successive reduction of an assumed unit of dimension, by $\frac{1}{10}$; or, what is the same, successive increase by $\frac{1}{9}$. The centimetre = 0.3937079 inch, is zero.

Tables **Figure 1**, page 3 and **Figure 2**, page 4 (details of the small gauges are shown here **Figure 3**, page 5 and **Figure 4**, page 6) gives a comparison of the **Decimal**, the **Birmingham**, and the **American** gauges. The diagrams shows the irregularities of the **Birmingham** and its comparison with the other two.

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Original and corrected versions of Grimshaw's data

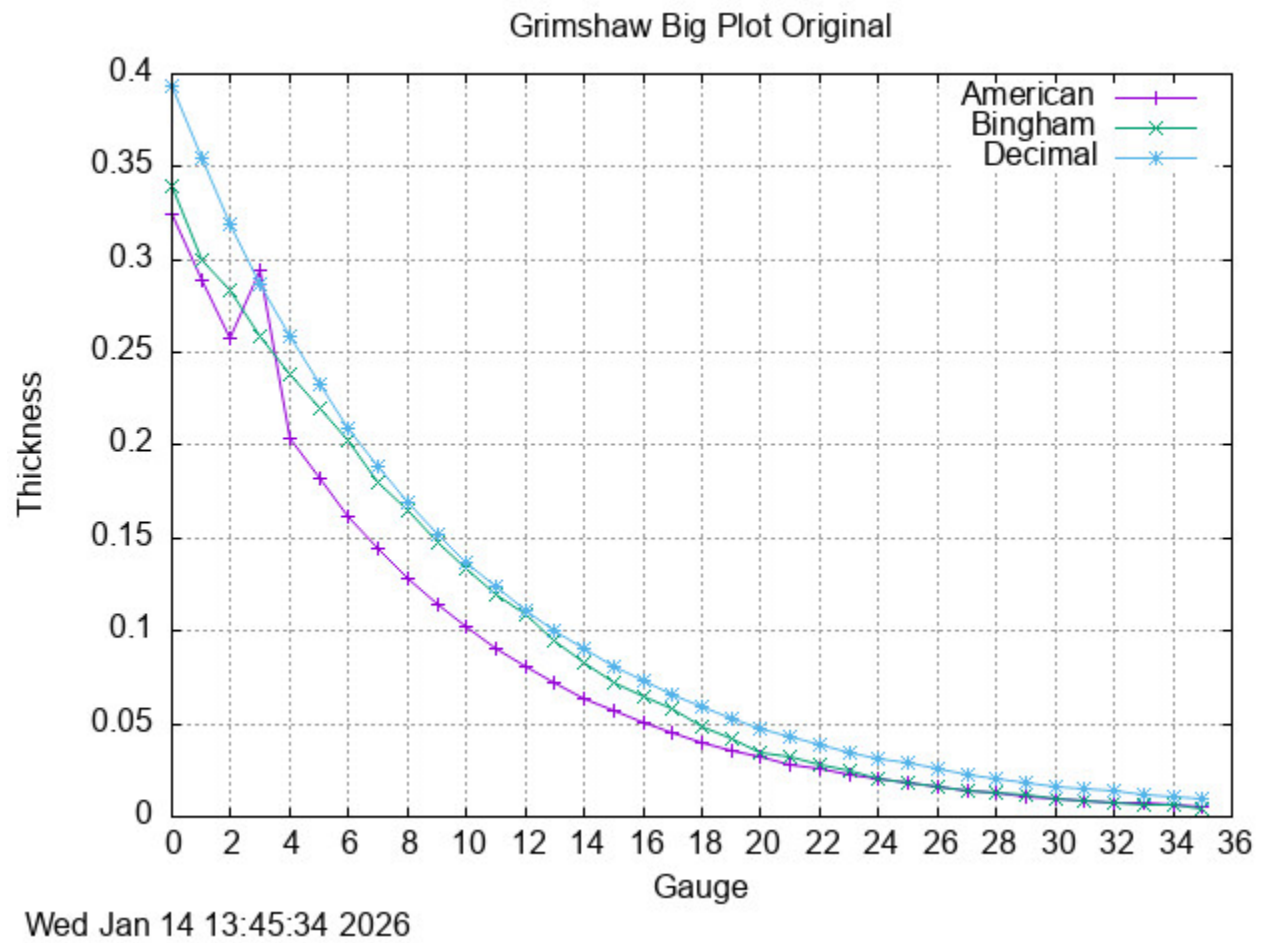


Figure 1: Original plot with errors

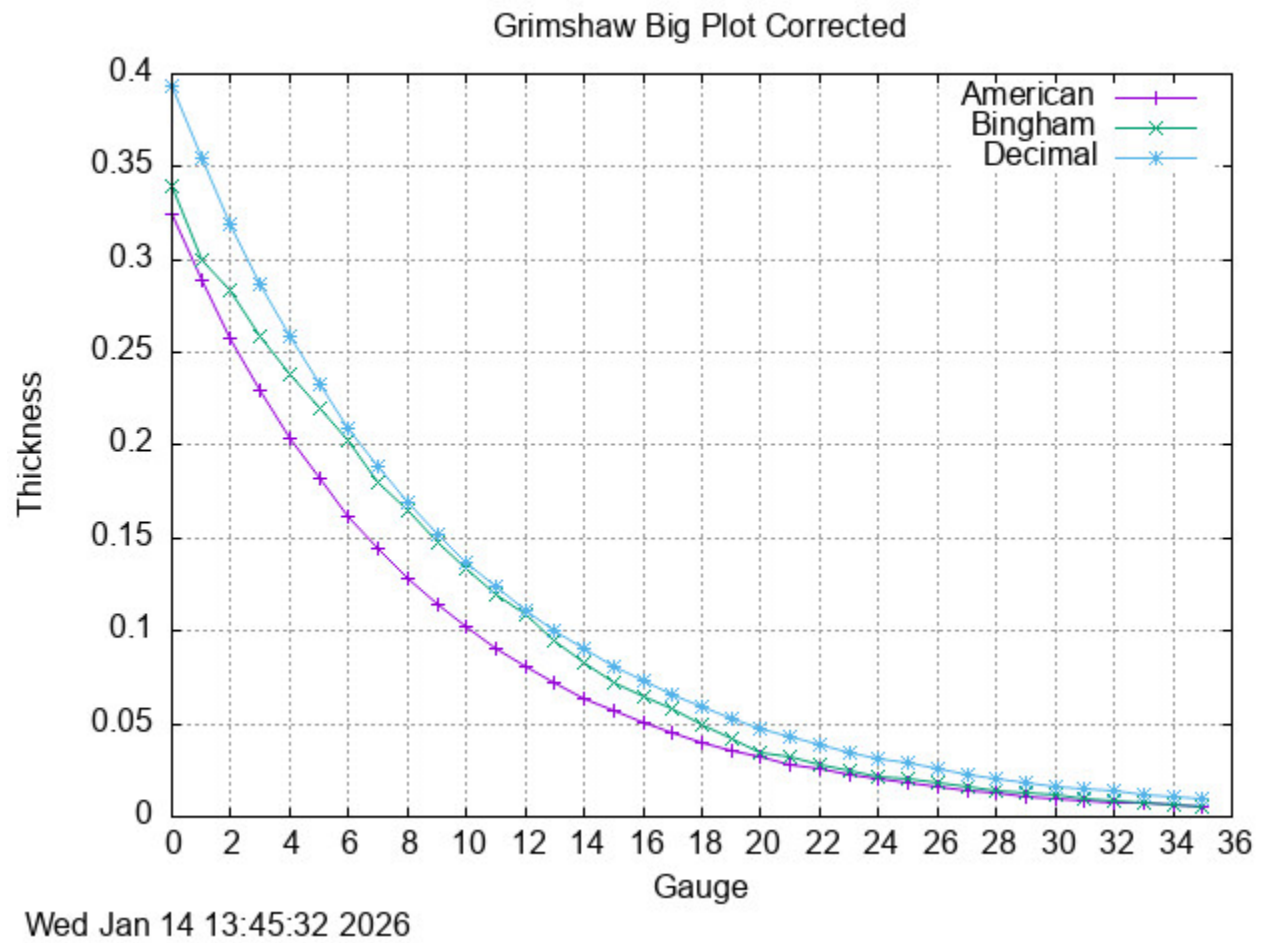
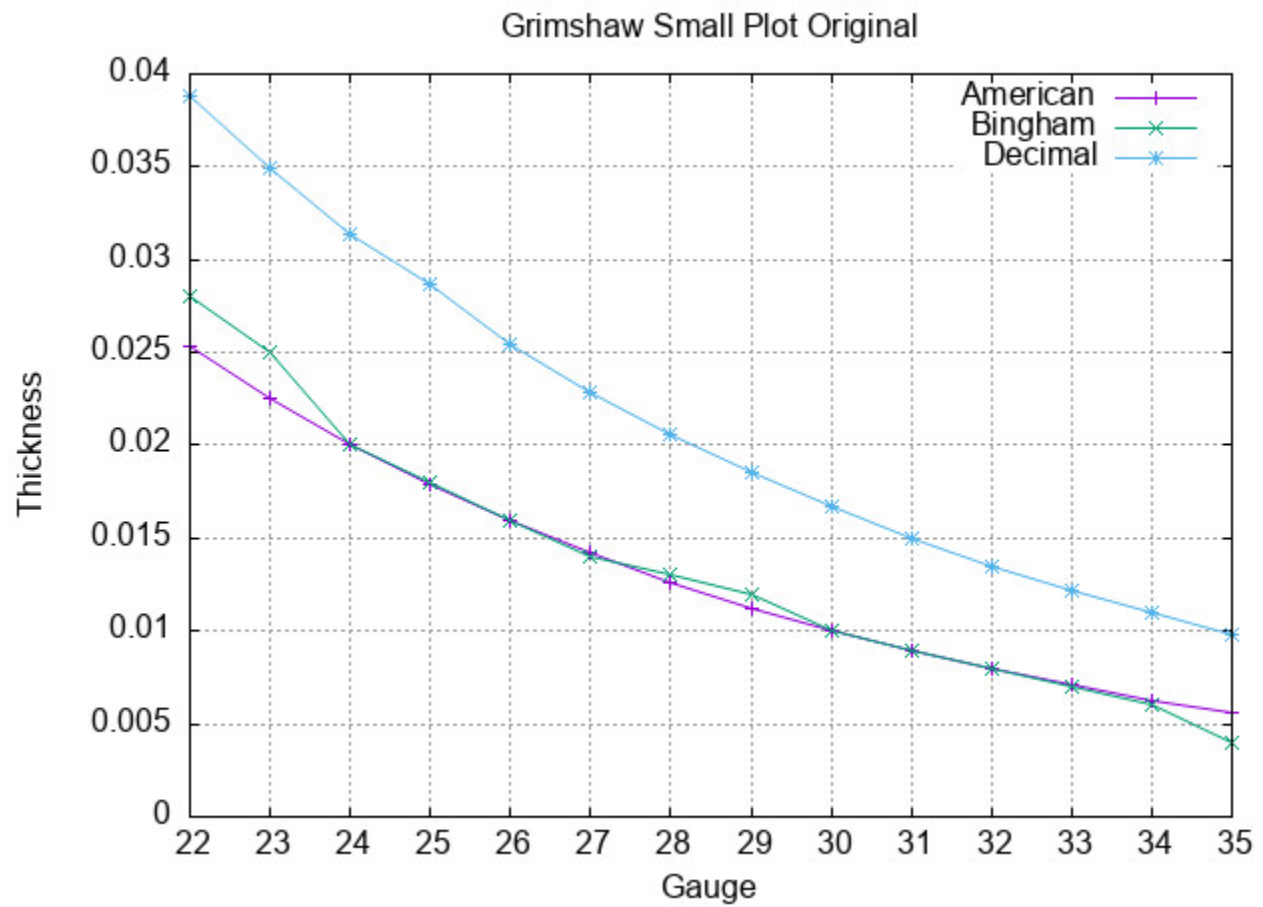


Figure 2: Corrected plot



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Figure 3: A Section of original plot

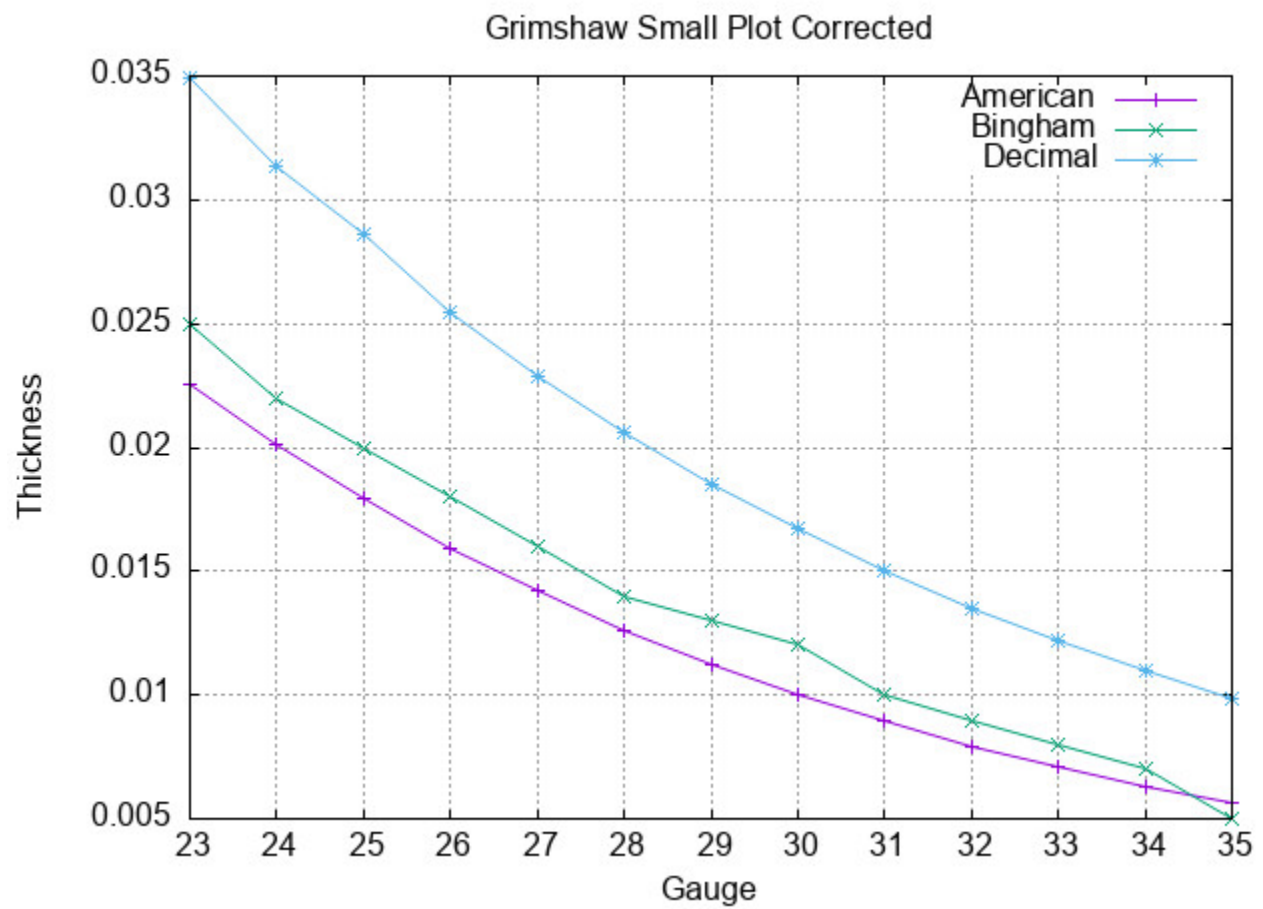


Figure 4: A Section of corrected plot

Gauge	inch	Gauge	inch	Gauge	inch
1	.300	10	.134	19	.042
2	.284	11	.120	20	.035
3	.259	12	.109	21	.032
4	.238	13	.095	22	.028
5	.220	14	.083	23	.025
6	.203	15	.072	24	.022
7	.180	16	.065	25	.020
8	.165	17	.058	26	.018
9	.148	18	.049		

Table 1: Stubs or Birmingham Wire Gauge, from Grimshaw 1882, page 144

4	1/4 scant	9	5/32 scant
5	7/32	10	1/8 full
6	3/16 full	11	1/8
7	3/16 scant	12	1/8 scant
8	5/32	13	3/32

Table 2: Birmingham Wire Gauge, Expressed in “Carpenter’s Measure”, from Grimshaw 1882, page 144

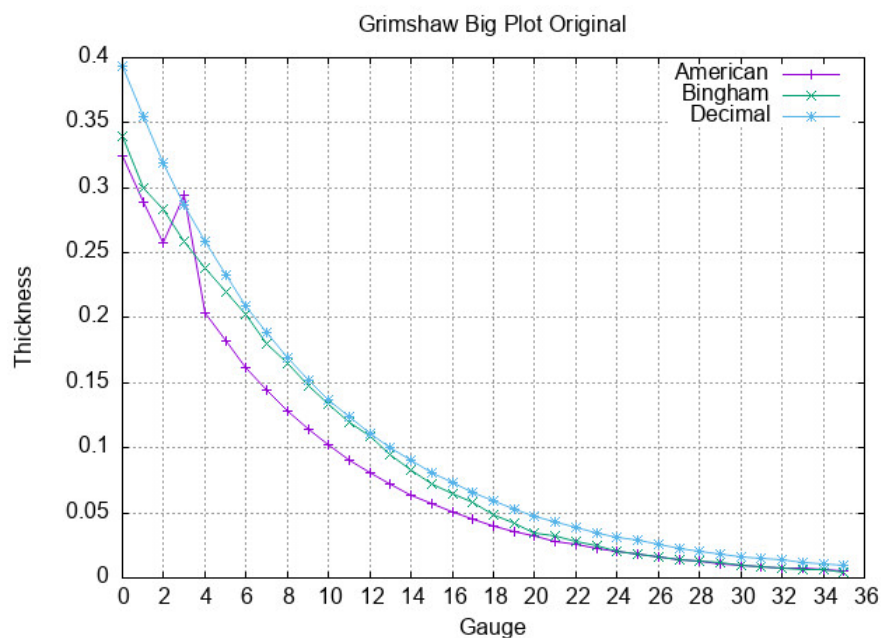
Gauge	Inch	Inch	Gauge	Inch	Inch
1		.3	14		.083
2		.284	15		.072
3		.259	16		.065
4	1/4 ---	.238	17		.058
5	7/32	.22	18		.049
6	3/16 +	.203	19		.042
7	3/16 ---	.18	20		.035
8	5/32	.165	21		.032
9	5/32 ---	.148	22		.028
10	1/8 +	.134	23		.025
11	1/8	.12	24		.022
12	1/8 ---	.109	25		.02
13	3/32	.095	26		.018

Table 3: Stubs’ Birmingham Wire Gauge, Expressed in Decimal and Vulgar Inch Fractions from Grimshaw 1882, page 270

No of Gauge	Decimal Gauge Centime- ters	Decimal Inches	Birmingham Gauge Inches	Amer. Gauge. Inches
Grimshaw Table I, Original version				
0000	1.3717	0.5401	0.454	0.4600
000	1.2346	0.4861	0.425	0.4096
00	1.1111	0.4375	0.38	0.3649
0	1.0000	0.3937	0.34	0.3249
1	0.9000	0.3543	0.3	0.2893
2	0.8100	0.3189	0.284	0.2576
3	0.7290	0.2870	0.259	0.2942
4	0.6561	0.2583	0.238	0.2043
5	0.5905	0.2324	0.22	0.1819
6	0.5314	0.2092	0.203	0.1620
7	0.4883	0.1883	0.18	0.1448
8	0.4305	0.1695	0.165	0.1285
9	0.3874	0.1525	0.148	0.1144
10	0.3487	0.1373	0.134	0.1019
11	0.3138	0.1236	0.12	0.09074
12	0.2824	0.1112	0.109	0.08081
13	0.2524	0.10008	0.095	0.07196
14	0.2288	0.09007	0.083	0.06408
15	0.2059	0.08106	0.072	0.05707
16	0.1853	0.07296	0.065	0.05082
17	0.1668	0.06566	0.058	0.04526
18	0.1501	0.05909	0.049	0.04030
19	0.1351	0.05318	0.042	0.03589
20	0.1216	0.04787	0.035	0.03196
21	0.1094	0.04307	0.032	0.02846
22	0.09848	0.03877	0.028	0.02535
23	0.08863	0.03489	0.025	0.02257
24	0.07977	0.03140	0.02	0.02010
25	0.07179	0.02864	0.018	0.01790
26	0.06461	0.02544	0.016	0.01594
27	0.05815	0.02289	0.014	0.01419
28	0.05233	0.02060	0.013	0.01264
29	0.04710	0.01854	0.012	0.01126
30	0.04239	0.01669	0.010	0.01003
Continued on the next page.				

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No of Gauge	Decimal Gauge Centime- ters	Decimal Inches	Birmingham Gauge Inches	Amer. Gauge. Inches
31	0.03815	0.01502	0.009	0.008928
32	0.03434	0.01351	0.008	0.007950
33	0.03090	0.01217	0.007	0.007080
34	0.02881	0.01095	0.005	0.006304
35	0.02508	0.009856	0.004	0.005614
36	0.02253	0.008870		0.005000
37	0.02028	0.007983		0.004453
38	0.01825	0.007185		0.003965
39	0.01642	0.006466		0.003531
40	0.01478	0.005819		0.003144

Table 4: Grimshaw Table I, Original version, from Grimshaw 1882



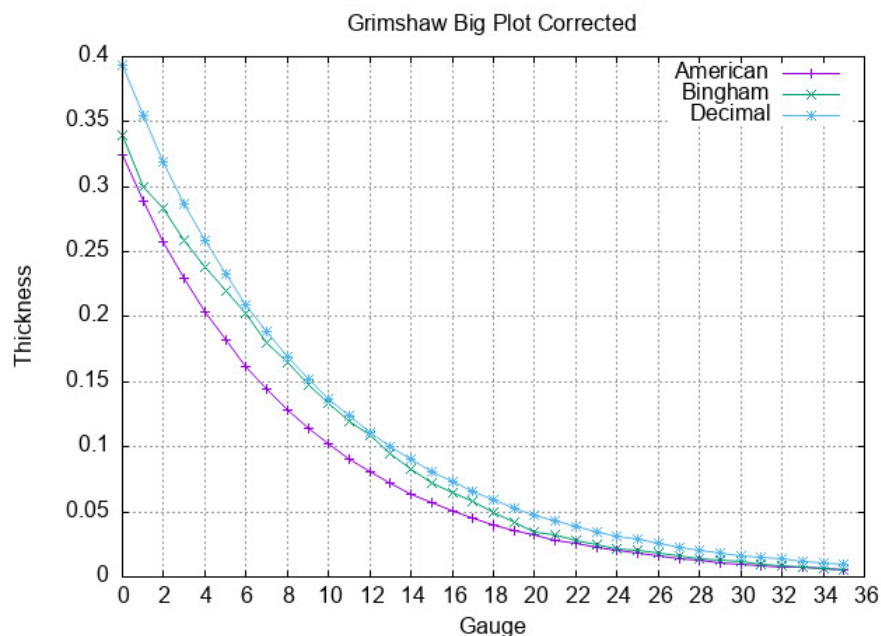
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Figure 5: Grimshaw Big Plot Original

No of Gauge	Decimal Gauge Centime- ters	Decimal Inches	Birmingham Gauge Inches	Amer. Gauge. Inches
Grimshaw Table I, Fixed version				
0000	1.3717	0.5401	0.454	0.46
000	1.2346	0.4861	0.425	0.4096
00	1.1111	0.4375	0.380	0.3649
0	1.	0.3937	0.340	0.3249
1	0.9	0.3543	0.300	0.2893
2	0.81	0.3189	0.284	0.2576
3	0.729	0.2870	0.259	0.2294*
4	0.6561	0.2583	0.238	0.2043
5	0.5905	0.2324	0.220	0.1819
6	0.5314	0.2092	0.203	0.1620
7	0.4883	0.1883	0.180	0.1448
8	0.4305	0.1695	0.165	0.1285
9	0.3874	0.1525	0.148	0.1144
10	0.3487	0.1373	0.134	0.1019
11	0.3138	0.1236	0.120	0.09074
12	0.2824	0.1112	0.109	0.08081
13	0.2524	0.10008	0.095	0.07196
14	0.2288	0.09007	0.083	0.06408
15	0.2059	0.08106	0.072	0.05707
16	0.1853	0.07296	0.065	0.05082
17	0.1668	0.06566	0.058	0.04526
18	0.1501	0.05909	0.049	0.04030
19	0.1351	0.05318	0.042	0.03589
20	0.1216	0.04787	0.035	0.03196
21	0.1094	0.04307	0.032	0.02846
22	0.09848	0.03877	0.028	0.02535
23	0.08863	0.03489	0.025	0.02257
24	0.07977	0.03140	0.022*	0.02010
25	0.07179	0.02864	0.020*	0.01790
26	0.06461	0.02544	0.018*	0.01594
27	0.05815	0.02289	0.016*	0.01419
28	0.05233	0.02060	0.014*	0.01264
29	0.04710	0.01854	0.013*	0.01126
30	0.04239	0.01669	0.012*	0.01003
Continued on the next page.				

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No of Gauge	Decimal Gauge Centime- ters	Decimal Inches	Birmingham Gauge Inches	Amer. Gauge. Inches
31	0.03815	0.01502	0.010*	0.008928
32	0.03434	0.01351	0.009*	0.007950
33	0.03090	0.01217	0.008*	0.007080
34	0.02881	0.01095	0.007*	0.006304
35	0.02508	0.009856	0.005*	0.005614
36	0.02253	0.008870	0.004*	0.005000
37	0.02028	0.007983		0.004453
38	0.01825	0.007185		0.003965
39	0.01642	0.006466		0.003531
40	0.01478	0.005819		0.003144

Table 5: Grimshaw Table I, Fixed version (* = Fixes), from Grimshaw 1882



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Figure 6: Grimshaw Big Plot Corrected

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