1 pound (avoir.)	= 16 oz. = 7,000 grains.
1 bushel	= 1.244 cu. ft.
1 short ton	= 2,000 lb.
1 long ton	= 2,240 lb.

Pressure

1 lb. per square inch	= 144 lb. per square foot. 2.0416 in. mercury at 62 deg. fahr. 2.309 ft. water at 62 deg. fahr. 27.71 in. water at 62 deg. fahr.
1 oz. per square inch	= 0.1276 in. mercury at 62 deg. fahr. 1.732 in. water at 62 deg. fahr.
1 atmosphere (14.7 lb. per square inch)	= 2,116.3 lb. per square foot. 33.947 ft. water at 62 deg. fahr. 30 in. mercury at 62 deg. fahr. 29.92 in. mercury at 32 deg. fahr.
1 in. water at 62 deg. fahr.	= 0.03609 lb. or 0.5774 oz. per square inch. 5.196 lb. per square foot.
1 ft. water at 62 deg. fahr.	= 0.433 lb. per square inch. 62.355 lb. per square foot.
1 in. mercury at 62 deg. fahr.	= 0.491 lb. or 7.86 oz. per square inch. 1.132 ft. water at 62 deg. fahr. 13.58 in. water at 62 deg. fahr.

RELATION BETWEEN VELOCITY, ACCELERATION, TIME AND SPACE PASSED OVER

When the accelerating force is uniform the acceleration will be uniform. The velocity at the end of t seconds, if the body starts from rest, will be

$$v = at;\ whence\ a = \frac{v}{t},\ \text{and}\ t = \frac{v}{a} \qquad (1)$$

The space passed over at the end of t seconds is equal to the product of the mean velocity and the time, or $L = \frac{1}{2}vt$, or $L = \frac{1}{2}at^2$.

The force of 1 lb. when applied to a mass whose weight is 32.17 lb. will produce an acceleration of 1 ft. per second per second when the mass is moving against no resistance (frictionless motion). A force of f pounds acting on a mass of 1 lb. will produce an acceleration of $f \times 32.17$ ft. per second per second.

The relation between force, mass, and acceleration is given by the equation $f = Ma = \frac{Wa}{g}$. Substituting the value of a in terms of v:

$$f = \frac{Wv}{gt} \qquad (2)$$

ABSOLUTE TEMPERATURE

Physicists employ what is known as the absolute scale of temperature, based on the so-called absolute zero of temperature, at which point no molecular vibration exists. This zero is conceived as 491.6 deg. fahr. below the melting point of ice, or 32 deg. fahr., it having been discovered that an ideal perfect gas would change in volume by $\frac{1}{491.6}$ of its volume at 32 deg. for each 1 deg. change in its temperature at constant pressure. Thus, if

TABLE 1. PROPERTIES OF SATURATED STEAM[a]

Absolute Pressure, Lb. per Sq. In.	Temperature, Deg. Fahr.	Volume, Cu. Ft. per Lb.	Weight, Lb. per Cu. Ft.	Heat Content in B.t.u.		Latent Heat in B.t.u.		Entropy		
				of Liquid	of Vapor	of Vaporization	Internal	of Liquid	of Vaporization	of Vapor
				i'	i''	r	ρ	s'	r/T	s''
p	t	v''	$1/v''$							
1	101.76	333.3	0.00300	69.76	1105.4	1035.6	973.9	0.1327	1.8448	1.9775
2	126.10	173.6	0.00576	94.02	1116.2	1022.2	957.9	0.1750	1.7452	1.9203
3	141.49	118.7	0.00843	109.38	1122.9	1013.5	947.6	0.2009	1.6862	1.8871
4	152.99	90.6	0.01104	120.9	1127.9	1007.0	939.9	0.2199	1.6438	1.8637
5	162.25	73.5	0.01360	130.1	1131.7	1001.6	933.6	0.2348	1.6107	1.8456
6	170.07	62.0	0.01614	137.9	1135.0	997.1	928.2	0.2473	1.5835	1.8308
7	176.85	53.7	0.01864	144.7	1137.8	993.1	923.6	0.2581	1.5603	1.8184
8	182.87	47.35	0.02112	150.8	1140.3	989.5	919.4	0.2675	1.5402	1.8077
9	188.28	42.41	0.02358	156.2	1142.5	986.3	915.6	0.2759	1.5223	1.7982
10	193.21	38.43	0.02602	161.1	1144.4	983.3	912.2	0.2835	1.5062	1.7897
11	197.75	35.16	0.02844	165.7	1146.2	980.5	909.0	0.2905	1.4916	1.7821
12	201.96	32.41	0.03086	169.9	1147.9	978.0	906.0	0.2969	1.4783	1.7752
13	205.88	30.07	0.03326	173.8	1149.4	975.6	903.2	0.3028	1.4659	1.7687
14	209.56	28.06	0.03564	177.5	1150.8	973.3	900.6	0.3083	1.4545	1.7628
14.7	212.0	26.81	0.03730	180.0	1151.7	971.7	898.8	0.3120	1.4469	1.7589
16	216.3	24.76	0.04038	184.3	1153.4	969.1	895.8	0.3184	1.4337	1.7521
18	222.4	22.18	0.04508	190.5	1155.7	965.2	891.4	0.3274	1.4153	1.7427
20	228.0	20.10	0.04976	196.0	1157.7	961.7	887.3	0.3356	1.3987	1.7343
22	233.1	18.38	0.0544	201.2	1159.6	958.4	883.6	0.3430	1.3837	1.7267
24	237.8	16.95	0.0590	206.0	1161.3	955.3	880.1	0.3499	1.3698	1.7197
26	242.2	15.73	0.0636	210.4	1162.8	952.4	876.8	0.3563	1.3570	1.7133
28	246.4	14.67	0.0681	214.6	1164.3	949.7	873.7	0.3622	1.3452	1.7074
30	250.3	13.76	0.0727	218.6	1165.7	947.1	870.7	0.3679	1.3340	1.7019
32	254.0	12.95	0.0772	222.4	1166.9	944.6	867.9	0.3731	1.3236	1.6967
34	257.6	12.24	0.0818	225.9	1168.1	942.2	865.2	0.3781	1.3137	1.6918
36	260.9	11.60	0.0862	229.4	1169.2	939.9	862.7	0.3829	1.3044	1.6873
38	264.2	11.03	0.0907	232.6	1170.3	937.7	860.2	0.3874	1.2956	1.6830
40	267.2	10.51	0.0951	235.8	1171.3	935.5	857.8	0.3917	1.2871	1.6788
42	270.2	10.04	0.0996	238.8	1172.2	933.5	855.5	0.3958	1.2791	1.6749
44	273.0	9.61	0.1040	241.7	1173.2	931.5	853.3	0.3998	1.2714	1.6712
46	275.8	9.22	0.1085	244.5	1174.0	929.6	851.2	0.4036	1.2640	1.6676
48	278.4	8.86	0.1129	247.2	1174.8	927.7	849.1	0.4072	1.2570	1.6642
50	281.0	8.53	0.1173	249.8	1175.6	925.9	847.1	0.4108	1.2501	1.6609
52	283.5	8.22	0.1217	252.3	1176.4	924.1	845.1	0.4142	1.2436	1.6577
54	285.9	7.93	0.1261	254.7	1177.1	922.4	843.2	0.4174	1.2373	1.6547
56	288.2	7.67	0.1304	257.1	1177.8	920.7	841.4	0.4206	1.2311	1.6517
58	290.5	7.42	0.1348	259.5	1178.5	919.0	839.5	0.4237	1.2252	1.6489
60	292.7	7.18	0.1392	261.7	1179.1	917.4	837.8	0.4267	1.2195	1.6462
62	294.9	6.97	0.1435	263.9	1179.7	915.8	836.0	0.4296	1.2139	1.6435
64	296.9	6.76	0.1479	266.1	1180.3	914.3	834.3	0.4324	1.2085	1.6409
66	299.0	6.57	0.1522	268.2	1180.9	912.7	832.7	0.4352	1.2032	1.6384
68	301.0	6.39	0.1566	270.2	1181.5	911.2	831.1	0.4379	1.1981	1.6360
70	302.9	6.22	0.1609	272.2	1182.0	909.8	829.5	0.4405	1.1931	1.6336
72	304.8	6.05	0.1652	274.2	1182.5	908.3	827.9	0.4431	1.1883	1.6313
74	306.7	5.90	0.1695	276.1	1183.0	906.9	826.4	0.4456	1.1835	1.6291
76	308.5	5.75	0.1738	278.0	1183.5	905.5	824.9	0.4480	1.1789	1.6269
78	310.3	5.61	0.1781	279.8	1184.0	904.2	823.4	0.4504	1.1744	1.6248
80	312.0	5.48	0.1824	281.6	1184.4	902.8	821.9	0.4527	1.1700	1.6227
82	313.7	5.35	0.1868	283.4	1184.9	901.5	820.5	0.4550	1.1657	1.6207
84	315.4	5.23	0.1910	285.1	1185.3	900.2	819.1	0.4572	1.1615	1.6187
86	317.1	5.12	0.1953	286.8	1185.7	898.9	817.7	0.4594	1.1574	1.6168
88	318.7	5.01	0.1996	288.5	1186.1	897.7	816.3	0.4615	1.1534	1.6149
90	320.3	4.905	0.2039	290.1	1186.5	896.4	815.0	0.4636	1.1495	1.6131
92	321.8	4.805	0.2081	291.7	1186.9	895.2	813.7	0.4657	1.1456	1.6113
94	323.3	4.709	0.2124	293.3	1187.3	894.0	812.4	0.4677	1.1419	1.6096
96	324.8	4.617	0.2166	294.8	1187.7	892.8	811.1	0.4697	1.1381	1.6079
98	326.3	4.528	0.2209	296.4	1188.0	891.6	809.8	0.4717	1.1345	1.6062
100	327.8	4.442	0.2251	297.9	1188.4	890.5	808.6	0.4736	1.1309	1.6045
102	329.2	4.359	0.2294	299.4	1188.7	889.3	807.4	0.4755	1.1274	1.6028
104	330.7	4.279	0.2337	300.9	1189.0	888.2	806.1	0.4773	1.1239	1.6012
106	332.0	4.202	0.2380	302.3	1189.4	887.1	804.9	0.4791	1.1205	1.5996
108	333.4	4.128	0.2422	303.7	1189.7	885.9	803.8	0.4809	1.1172	1.5981
110	334.8	4.057	0.2465	305.1	1190.0	884.8	802.6	0.4827	1.1138	1.5965
112	336.1	3.988	0.2508	306.5	1190.3	883.7	801.4	0.4844	1.1106	1.5950
114	337.4	3.921	0.2550	307.9	1190.6	882.7	800.3	0.4861	1.1074	1.5935
116	338.7	3.857	0.2593	309.2	1190.8	881.6	799.2	0.4878	1.1043	1.5921
118	340.0	3.795	0.2635	310.6	1191.1	880.6	798.0	0.4895	1.1012	1.5907

[a] This table is abstracted from *Properties of Steam and Ammonia* by Prof. G. A. Goodenough.