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HYDROMETER CORRECTION TABLES AND THERMAL-DENSITY COEFFICIENTS FOR VEGETABLE TANNING EXTRACTS

By

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PREFACE

Representatives of the leather-tanning industry have expressed the need for reliable tables for the correction of hydrometer readings made at various temperatures to the standard temperature 60° F. In compliance with their request, an investigation was undertaken of the density and thermal expansion of several of the most commonly used vegetable tanning extracts. It is believed that the data presented here will be of considerable assistance to the industry.

LYMAN J. BRIGGS, *Director*.

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ABSTRACT

Tables are presented for correcting hydrometer readings made in vegetable tanning extracts at observed temperatures in degrees barkometer, in degrees Twaddle (also spelled Twaddell), and in degrees Baumé to readings at the standard temperature 60° F. Thermal-density coefficients are also included, which make possible the calculation of the density of a tanning extract at any temperature within the range of the investigation if its specific gravity at 60°/60° F is known. These tables are based on an investigation carried out by the National Bureau of Standards on the density and thermal expansion of several vegetable tanning extracts—quebracho, oak bark, hemlock bark, chestnut, and mangrove bark extracts. The range is from 1.00 to 1.12 specific gravity at 60°/60° F and from 50° to 100° F.

CONTENTS

I. INTRODUCTION

1. BASIS OF TABLES

The hydrometer correction tables and thermal-density coefficients contained in this Circular are based on an investigation of the density and thermal expansion of several vegetable tanning extracts supplied by The American Leather Chemists Association, at whose request the investigation was made. This study is reported in Bureau Research Paper RP1612,[1] where the experimental details, the reduction of observations, and the method used in calculating the corrections are discussed.

[1] M. G. Blair and E. L. Peffer, J. Research NBS 33, 341 (1944) RP1612

2. APPLICABILITY OF TABLES

The tables are designed to apply to any vegetable tanning extract within the range of the tables, which cover the density and temperature ranges ordinarily used in commercial practice. The accuracy with which the tables give the true specific gravity of any particular extract is dependent upon the closeness with which the rate of expansion of that extract agrees with the composite rate. The extracts investigated were quebracho, oak bark, hemlock bark, chestnut, and mangrove bark. The maximal error for any extract, due to assuming the same thermal-density coefficients for all extracts, is 0.00015 specific gravity. This error occurs for the extract with rate of expansion furthest from the composite value and at the highest concentration and greatest temperature difference included in the range of the tables. Over most of the temperature range and for most of the extracts studied, the discrepancy is much less. Hence, the tables should be applicable to all vegetable tanning extracts included in this investigation without the introduction of errors in excess of those that unavoidably occur in the reading of hydrometers under industrial laboratory conditions.

3. SURFACE TENSION

No investigation was made of the surface tension of the tanning extracts studied. Hence, if the surface tension of the liquid in which the hydrometer is read differs appreciably from the test liquid (sulfuric acid) of hydrometers used in tanning extracts, slight errors will occur as a result of this surface tension difference.

4. HYDROMETERS

In the calculation of the hydrometer correction tables, it was assumed that the instruments were made of glass with a coefficient of cubical expansion equal to 0.000023 per degree centigrade. The tables may be used also with hydrometers of other glass, e. g., Pyrex, if suitable corrections are applied to obtain the corresponding reading on a hydrometer made of glass with a coefficient equal to 0.000023. These corrections are obtained by the aid of the formula for conversion of density basis:

$$D\frac{t}{15.56}=D\frac{15.56}{15.56}+\Delta D\frac{15.56}{15.56},$$

in which

$\Delta=\alpha(15.56-t)$
α = coefficient of cubical expansion of glass
t = temperature in degrees centigrade.

The correction to be applied is

$$+(\alpha'-0.000023)\ (15.56-t)D\frac{15.56}{15.56},$$

in which α' is the coefficient of expansion of the hydrometer. For example, suppose a Pyrex hydrometer having a coefficient of 0.000010 reads 100° bk at 95° F (35° C.) The corresponding reading on a hydrometer made of the kind of glass assumed in the tables is calculated as follows: $1.1000+(0.000010-0.000023)\ (15.56-35)\ (1.1000)=1.10028$ specific gravity, or 100.28° bk.

5. METHOD OF READING THE HYDROMETER

Hydrometers for tanning extracts are calibrated to give correct indications when read at the principal surface of the liquid. In taking the reading, the eye should be placed slightly below the plane of the surface of the extract and should then be raised slowly until this surface, seen as an ellipse, becomes a straight line. The point at which the line cuts the hydrometer scale should be taken as the reading of the instrument.

In case the extract is not sufficiently clear to allow the reading to be made as described, it is necessary to read from above the surface of the extract and to estimate as accurately as possible the point to which the extract rises on the hydrometer stem. The reading at the top of the meniscus should then be corrected by an amount equal to the height to which the extract creeps up on the stem. The amount of this correction may be determined with sufficient accuracy for most purposes by noting the differences between a few readings made in each fashion on a more dilute solution. The hydrometer will read too low (numerically) when read at the top of the meniscus; hence, the correction for the meniscus height should be added.

6. DEFINITION OF HYDROMETER SCALES

The barkometer, Twaddle (also spelled Twaddell), and Baumé scales are defined by their relationship to specific gravity as follows:

$$\text{Degrees barkometer} = \frac{\text{sp gr } 60°/60° \text{ F} - 1}{0.001}$$

$$\text{Sp gr } 60°/60° \text{ F} = \frac{1000 + \text{° bk}}{1000}$$

$$\text{Degrees Twaddle} = \frac{\text{sp gr } 60°/60° \text{ F} - 1}{0.005}$$

$$\text{Sp gr } 60°/60° \text{ F} = \frac{1000 + (\text{°Tw} \times 5)}{1000}$$

$$\text{Degrees Baumé} = 145 - \frac{145}{\text{sp gr } 60°/60° \text{ F}}$$

$$\text{Sp gr } 60°/60° \text{ F} = \frac{145}{145 - \text{°Bé}}.$$

NOTES TO ACCOMPANY TABLES 1, 2, AND 3

TABLE 1 shows the degrees barkometer at 60° F of a vegetable tanning extract for which, at the observed temperature, the degrees barkometer (hydrometer reading) is as indicated. For example, if the observed degrees barkometer is 60.0 at 80° F, the degrees barkometer at 60° F will be 63.0. The headings "Observed degrees barkometer" and "Observed temperature" signify the true indication of the hydrometer and the true temperature of the tanning extract, that is, the observed readings corrected for instrumental errors. This table is so computed as to take into account the thermal expansion of the glass of which the hydrometer is made. A coefficient of cubical expansion of 0.000023 per degree centigrade is assumed.

TABLE 2 shows the degrees Twaddle at 60° F of a vegetable tanning extract for which, at the observed temperature, the degrees Twaddle (hydrometer reading) is as indicated. For example, if the observed degrees Twaddle is 6.0 at 75° F, the degrees Twaddle at 60° F will be 6.4. The headings "Observed degrees Twaddle" and "Observed temperature" signify the true indication of the hydrometer and the true temperature of the tanning extract, that is, the observed readings corrected for instrumental errors. This table is so computed as to take into account the thermal expansion of the glass of which the hydrometer is made. A coefficient of cubical expansion of 0.000023 per degree centigrade is assumed.

TABLE 3 shows the degrees Baumé at 60° F of a vegetable tanning extract for which, at the observed temperature, the degrees Baumé (hydrometer reading) is as indicated. For example, if the observed degrees Baumé is 9.0 at 54° F, the degrees Baumé at 60° F will be 8.9. The headings "Observed degrees Baumé" and "Observed temperature" signify the true indication of the hydrometer and the true temperature of the tanning extract, that is, the observed readings corrected for instrumental errors. This table is so computed as to take into account the thermal expansion of the glass of which the hydrometer is made. A coefficient of cubical expansion of 0.000023 per degree centigrade is assumed.

TABLE 1.—*Reduction of observed degrees barkometer to degrees barkometer at 60° F*

[See explanatory note on p. 4]

Observed temperature in °F	Observed degrees barkometer									
	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
	Corresponding degrees barkometer at 60° F									
50	------	0.4	1.4	2.4	3.4	4.4	5.4	6.4	7.4	8.4
51	------	.5	1.4	2.4	3.4	4.4	5.4	6.4	7.4	8.4
52	------	.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5
53	------	.6	1.6	2.6	3.6	4.5	5.5	6.5	7.5	8.5
54	------	.6	1.6	2.6	3.6	4.6	5.6	6.6	7.6	8.6
55	------	.7	1.7	2.7	3.7	4.7	5.7	6.7	7.6	8.6
56	------	.7	1.7	2.7	3.7	4.7	5.7	6.7	7.7	8.7
57	------	.8	1.8	2.8	3.8	4.8	5.8	6.8	7.8	8.8
58	------	.9	1.9	2.9	3.8	4.8	5.8	6.8	7.8	8.8
59	------	.9	1.9	2.9	3.9	4.9	5.9	6.9	7.9	8.9
60	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
61	.1	1.1	2.1	3.1	4.1	5.1	6.1	7.1	8.1	9.1
62	.1	1.2	2.2	3.2	4.2	5.2	6.2	7.2	8.2	9.2
63	.2	1.2	2.2	3.2	4.3	5.3	6.3	7.3	8.3	9.3
64	.3	1.3	2.3	3.3	4.4	5.4	6.4	7.4	8.4	9.4
65	.4	1.4	2.4	3.4	4.4	5.5	6.5	7.5	8.5	9.5
66	.5	1.5	2.5	3.5	4.5	5.6	6.6	7.6	8.6	9.6
67	.6	1.6	2.6	3.6	4.6	5.6	6.7	7.7	8.7	9.7
68	.7	1.7	2.7	3.7	4.7	5.7	6.8	7.8	8.8	9.8
69	.8	1.8	2.8	3.9	4.9	5.9	6.9	7.9	8.9	9.9
70	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
71	1.1	2.1	3.1	4.1	5.1	6.1	7.1	8.1	9.1	10.1
72	1.2	2.2	3.2	4.2	5.2	6.2	7.2	8.3	9.3	10.3
73	1.3	2.3	3.3	4.3	5.3	6.4	7.4	8.4	9.4	10.4
74	1.4	2.4	3.4	4.5	5.5	6.5	7.5	8.5	9.5	10.5
75	1.5	2.5	3.6	4.6	5.6	6.6	7.6	8.6	9.6	10.6
76	1.7	2.7	3.7	4.7	5.7	6.7	7.7	8.7	9.7	10.8
77	1.8	2.8	3.8	4.8	5.8	6.8	7.8	8.9	9.9	10.9
78	1.9	2.9	3.9	4.9	6.0	7.0	8.0	9.0	10.0	11.0
79	2.1	3.1	4.1	5.1	6.1	7.1	8.1	9.1	10.2	11.2
80	2.2	3.2	4.2	5.2	6.2	7.3	8.3	9.3	10.3	11.3
81	2.4	3.4	4.4	5.4	6.4	7.4	8.4	9.4	10.5	11.5
82	2.5	3.5	4.5	5.5	6.6	7.6	8.6	9.6	10.6	11.6
83	2.7	3.7	4.7	5.7	6.7	7.7	8.7	9.8	10.8	11.8
84	2.8	3.8	4.8	5.8	6.9	7.9	8.9	9.9	10.9	12.0
85	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.1	11.1	12.1
86	3.1	4.1	5.1	6.2	7.2	8.2	9.2	10.2	11.2	12.2
87	3.3	4.3	5.3	6.3	7.3	8.4	9.4	10.4	11.4	12.4
88	3.5	4.5	5.5	6.5	7.5	8.5	9.6	10.6	11.6	12.6
89	3.6	4.6	5.6	6.7	7.7	8.7	9.7	10.7	11.8	12.8
90	3.8	4.8	5.8	6.8	7.9	8.9	9.9	10.9	11.9	12.9
91	4.0	5.0	6.0	7.0	8.0	9.0	10.1	11.1	12.1	13.1
92	4.1	5.1	6.2	7.2	8.2	9.2	10.3	11.3	12.3	13.3
93	4.3	5.3	6.3	7.4	8.4	9.4	10.4	11.4	12.5	13.5
94	4.5	5.5	6.5	7.5	8.6	9.6	10.6	11.6	12.6	13.7
95	4.7	5.7	6.7	7.7	8.7	9.8	10.8	11.8	12.8	13.8
96	4.8	5.9	6.9	7.9	8.9	10.0	11.0	12.0	13.0	14.0
97	5.0	6.1	7.1	8.1	9.1	10.2	11.2	12.2	13.2	14.2
98	5.2	6.3	7.3	8.3	9.3	10.4	11.4	12.4	13 4	14.4
99	5.4	6.5	7.5	8.5	9.5	10.6	11.6	12.6	13.6	14.6
100	5.6	6.7	7.7	8.7	9.7	10.8	11.8	12.8	13.8	14.9

TABLE 1.—*Reduction of observed degrees barkometer to degrees barkometer at 60° F*—Continued

Observed temperature in °F	Observed degrees barkometer									
	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0
	Corresponding degrees barkometer at 60° F									
50	9.3	10.3	11.3	12.3	13.3	14.3	15.3	16.3	17.3	18.3
51	9.4	10.4	11.4	12.4	13.4	14.4	15.3	16.3	17.3	18.3
52	9.4	10.4	11.4	12.4	13.4	14.4	15.4	16.4	17.4	18.4
53	9.5	10.5	11.5	12.5	13.5	14.5	15.4	16.4	17.4	18.4
54	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5	18.5
55	9.6	10.6	11.6	12.6	13.6	14.6	15.6	16.6	17.6	18.6
56	9.7	10.7	11.7	12.7	13.7	14.7	15.7	16.7	17.7	18.7
57	9.7	10.7	11.7	12.7	13.7	14.7	15.7	16.7	17.7	18.7
58	9.8	10.8	11.8	12.8	13.8	14.8	15.8	16.8	17.8	18.8
59	9.9	10.9	11.9	12.9	13.9	14.9	15.9	16.9	17.9	18.9
60	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0
61	10.1	11.1	12.1	13.1	14.1	15.1	16.1	17.1	18.1	19.1
62	10.2	11.2	12.2	13.2	14.2	15.2	16.2	17.2	18.2	19.2
63	10.3	11.3	12.3	13.3	14.3	15.3	16.3	17.3	18.3	19.3
64	10.4	11.4	12.4	13.4	14.4	15.4	16.4	17.4	18.4	19.4
65	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5	18.5	19.5
66	10.6	11.6	12.6	13.6	14.6	15.6	16.6	17.6	18.6	19.6
67	10.7	11.7	12.7	13.7	14.7	15.7	16.7	17.7	18.7	19.7
68	10.8	11.8	12.8	13.8	14.8	15.8	16.8	17.8	18.8	19.8
69	10.9	11.9	12.9	13.9	14.9	15.9	16.9	17.9	18.9	20.0
70	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.1	19.1	20.1
71	11.2	12.2	13.2	14.2	15.2	16.2	17.2	18.2	19.2	20.2
72	11.3	12.3	13.3	14.3	15.3	16.3	17.3	18.3	19.3	20.3
73	11.4	12.4	13.4	14.4	15.4	16.4	17.4	18.4	19.4	20.5
74	11.5	12.5	13.5	14.5	15.6	16.6	17.6	18.6	19.6	20.6
75	11.6	12.6	13.7	14.7	15.7	16.7	17.7	18.7	19.7	20.7
76	11.8	12.8	13.8	14.8	15.8	16.8	17.8	18.8	19.8	20.9
77	11.9	12.9	13.9	14.9	15.9	17.0	18.0	19.0	20.0	21.0
78	12.1	13.1	14.1	15.1	16.1	17.1	18.1	19.1	20.1	21.2
79	12.2	13.2	14.2	15.2	16.2	17.2	18.2	19.3	20.3	21.3
80	12.4	13.4	14.4	15.4	16.4	17.4	18.4	19.4	20.4	21.4
81	12.5	13.5	14.5	15.5	16.5	17.6	18.6	19.6	20.6	21.6
82	12.7	13.7	14.7	15.7	16.7	17.7	18.7	19.7	20.8	21.8
83	12.8	13.8	14.8	15.8	16.9	17.9	18.9	19.9	20.9	21.9
84	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.1	21.1	22.1
85	13.1	14.1	15.2	16.2	17.2	18.2	19.2	20.2	21.2	22.2
86	13.3	14.3	15.3	16.3	17.3	18.3	19.4	20.4	21.4	22.4
87	13.4	14.4	15.5	16.5	17.5	18.5	19.5	20.6	21.6	22.6
88	13.6	14.6	15.6	16.6	17.7	18.7	19.7	20.7	21.7	22.8
89	13.8	14.8	15.8	16.8	17.9	18.9	19.9	20.9	21.9	23.0
90	14.0	15.0	16.0	17.0	18.0	19.1	20.1	21.1	22.1	23.1
91	14.1	15.1	16.2	17.2	18.2	19.2	20.3	21.3	22.3	23.3
92	14.3	15.3	16.3	17.4	18.4	19.4	20.5	21.5	22.5	23.5
93	14.5	15.5	16.5	17.6	18.6	19.6	20.6	21.7	22.7	23.7
94	14.7	15.7	16.7	17.8	18.8	19.8	20.8	21.8	22.9	23.9
95	14.9	15.9	16.9	17.9	19.0	20.0	21.0	22.0	23.0	24.1
96	15.1	16.1	17.1	18.1	19.2	20.2	21.2	22.2	23.2	24.3
97	15.3	16.3	17.3	18.3	19.3	20.4	21.4	22.4	23.4	24.4
98	15.5	16.5	17.5	18.5	19.5	20.6	21.6	22.6	23.6	24.6
99	15.7	16.7	17.7	18.7	19.7	20.8	21.8	22.8	23.8	24.8
100	15.9	16.9	17.9	18.9	19.9	20.9	21.9	23.0	24.0	25.0

TABLE 1.—*Reduction of observed degrees barkometer to degrees barkometer at 60° F*—Continued

Observed temperature in °F	Observed degrees barkometer									
	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0
	Corresponding degrees barkometer at 60° F									
50	19.3	20.3	21.3	22.2	23.2	24.2	25.2	26.2	27.2	28.2
51	19.3	20.3	21.3	22.3	23.3	24.3	25.3	26.3	27.3	28.3
52	19.4	20.4	21.4	22.4	23.4	24.4	25.4	26.4	27.4	28.4
53	19.4	20.4	21.4	22.4	23.4	24.4	25.4	26.4	27.4	28.4
54	19.5	20.5	21.5	22.5	23.5	24.5	25.5	26.5	27.5	28.5
55	19.6	20.6	21.6	22.6	23.6	24.6	25.6	26.6	27.6	28.6
56	19.7	20.7	21.7	22.7	23.7	24.7	25.7	26.7	27.7	28.7
57	19.7	20.7	21.7	22.7	23.7	24.7	25.7	26.7	27.7	28.7
58	19.8	20.8	21.8	22.8	23.8	24.8	25.8	26.8	27.8	28.8
59	19.9	20.9	21.9	22.9	23.9	24.9	25.9	26.9	27.9	28.9
60	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0
61	20.1	21.1	22.1	23.1	24.1	25.1	26.1	27.1	28.1	29.1
62	20.2	21.2	22.2	23.2	24.2	25.2	26.2	27.2	28.2	29.2
63	20.3	21.3	22.3	23.3	24.3	25.3	26.3	27.3	28.3	29.3
64	20.4	21.4	22.4	23.4	24.4	25.4	26.4	27.4	28.4	29.4
65	20.5	21.5	22.5	23.5	24.5	25.5	26.5	27.5	28.5	29.5
66	20.6	21.6	22.6	23.6	24.6	25.6	26.6	27.6	28.6	29.6
67	20.7	21.7	22.7	23.7	24.7	25.7	26.7	27.7	28.7	29.8
68	20.8	21.8	22.8	23.8	24.8	25.9	26.9	27.9	28.9	29.9
69	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0
70	21.1	22.1	23.1	24.1	25.1	26.1	27.1	28.1	29.1	30.1
71	21.2	22.2	23.2	24.2	25.2	26.2	27.3	28.3	29.3	30.3
72	21.3	22.4	23.4	24.4	25.4	26.4	27.4	28.4	29.4	30.4
73	21.5	22.5	23.5	24.5	25.5	26.5	27.5	28.5	29.5	30.6
74	21.6	22.6	23.6	24.6	25.6	26.6	27.7	28.7	29.7	30.7
75	21.7	22.8	23.8	24.8	25.8	26.8	27.8	28.8	29.8	30.8
76	21.9	22.9	23.9	24.9	25.9	26.9	27.9	28.9	30.0	31.0
77	22.0	23.0	24.0	25.0	26.1	27.1	28.1	29.1	30.1	31.1
78	22.2	23.2	24.2	25.2	26.2	27.2	28.2	29.2	30.2	31.3
79	22.3	23.3	24.3	25.4	26.4	27.4	28.4	29.4	30.4	31.4
80	22.5	23.5	24.5	25.5	26.5	27.5	28.5	29.6	30.6	31.6
81	22.6	23.6	24.7	25.7	26.7	27.7	28.7	29.7	30.7	31.8
82	22.8	23.8	24.8	25.8	26.8	27.8	28.9	29.9	30.9	31.9
83	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0	31.1	32.1
84	23.1	24.1	25.1	26.1	27.2	28.2	29.2	30.2	31.2	32.2
85	23.3	24.3	25.3	26.3	27.3	28.4	29.4	30.4	31.4	32.4
86	23.4	24.4	25.5	26.5	27.5	28.5	29.5	30.5	31.5	32.6
87	23.6	24.6	25.6	26.6	27.6	28.7	29.7	30.7	31.7	32.7
88	23.8	24.8	25.8	26.8	27.8	28.8	29.9	30.9	31.9	32.9
89	24.0	25.0	26.0	27.0	28.0	29.0	30.0	31.1	32.1	33.1
90	24.1	25.2	26.2	27.2	28.2	29.2	30.2	31.3	32.3	33.3
91	24.3	25.3	26.4	27.4	28.4	29.4	30.4	31.5	32.5	33.5
92	24.5	25.5	26.6	27.6	28.6	29.6	30.6	31.6	32.7	33.7
93	24.7	25.7	26.7	27.8	28.8	29.8	30.8	31.9	32.9	33.9
94	24.9	25.9	26.9	28.0	29.0	30.0	31.0	32.1	33.1	34.1
95	25.1	26.1	27.1	28.1	29.2	30.2	31.2	32.2	33.2	34.3
96	25.3	26.3	27.3	28.4	29.4	30.4	31.4	32.4	33.5	34.5
97	25.5	26.5	27.5	28.6	29.6	30.6	31.6	32.7	33.7	34.7
98	25.7	26.7	27.7	28.8	29.8	30.8	31.8	32.9	33.9	34.9
99	25.9	26.9	27.9	29.0	30.0	31.0	32.1	33.1	34.1	35.1
100	26.1	27.1	28.1	29.2	30.2	31.2	32.3	33.3	34.3	35.3

TABLE 1.—*Reduction of observed degrees barkometer to degrees barkometer at 60° F*—Continued

Observed temperature in °F	Observed degrees barkometer									
	30.0	31.0	32.0	33.0	34.0	35.0	36.0	37.0	38.0	39.0
	Corresponding degrees barkometer at 60° F									
50	29.2	30.2	31.2	32.2	33.2	34.2	35.2	36.1	37.1	38.1
51	29.3	30.3	31.3	32.3	33.2	34.2	35.2	36.2	37.2	38.2
52	29.4	30.4	31.4	32.3	33.3	34.3	35.3	36.3	37.3	38.3
53	29.4	30.4	31.4	32.4	33.4	34.4	35.4	36.4	37.4	38.4
54	29.5	30.5	31.5	32.5	33.5	34.5	35.5	36.5	37.5	38.5
55	29.6	30.6	31.6	32.6	33.6	34.5	35.5	36.5	37.5	38.5
56	29.7	30.7	31.7	32.7	33.6	34.6	35.6	36.6	37.6	38.6
57	29.7	30.7	31.7	32.7	33.7	34.7	35.7	36.7	37.7	38.7
58	29.8	30.8	31.8	32.8	33.8	34.8	35.8	36.8	37.8	38.8
59	29.9	30.9	31.9	32.9	33.9	34.9	35.9	36.9	37.9	38.9
60	30.0	31.0	32.0	33.0	34.0	35.0	36.0	37.0	38.0	39.0
61	30.1	31.1	32.1	33.1	34.1	35.1	36.1	37.1	38.1	39.1
62	30.2	31.2	32.2	33.2	34.2	35.2	36.2	37.2	38.2	39.2
63	30.3	31.3	32.3	33.3	34.3	35.3	36.3	37.3	38.3	39.3
64	30.4	31.4	32.4	33.4	34.4	35.4	36.4	37.4	38.4	39.4
65	30.5	31.5	32.5	33.5	34.5	35.5	36.5	37.5	38.6	39.6
66	30.6	31.7	32.7	33.7	34.7	35.7	36.7	37.7	38.7	39.7
67	30.8	31.8	32.8	33.8	34.8	35.8	36.8	37.8	38.8	39.8
68	30.9	31.9	32.9	33.9	34.9	35.9	36.9	37.9	38.9	39.9
69	31.0	32.0	33.0	34.0	35.0	36.0	37.0	38.0	39.0	40.0
70	31.2	32.2	33.2	34.2	35.2	36.2	37.2	38.2	39.2	40.2
71	31.3	32.3	33.3	34.3	35.3	36.3	37.3	38.3	39.3	40.3
72	31.4	32.4	33.4	34.4	35.4	36.4	37.4	38.4	39.5	40.5
73	31.6	32.6	33.6	34.6	35.6	36.6	37.6	38.6	39.6	40.6
74	31.7	32.7	33.7	34.7	35.7	36.7	37.7	38.7	39.7	40.8
75	31.8	32.8	33.8	34.9	35.9	36.9	37.9	38.9	39.9	40.9
76	32.0	33.0	34.0	35.0	36.0	37.0	38.0	39.0	40.0	41.1
77	32.1	33.1	34.1	35.2	36.2	37.2	38.2	39.2	40.2	41.2
78	32.3	33.3	34.3	35.3	36.3	37.3	38.3	39.4	40.4	41.4
79	32.4	33.5	34.5	35.5	36.5	37.5	38.5	39.5	40.5	41.5
80	32.6	33.6	34.6	35.6	36.6	37.6	38.7	39.7	40.7	41.7
81	32.8	33.8	34.8	35.8	36.8	37.8	38.8	39.8	40.9	41.9
82	33.0	34.0	35.0	36.0	37.0	38.0	39.0	40.0	41.0	42.0
83	33.1	34.1	35.1	36.1	37.1	38.2	39.2	40.2	41.2	42.2
84	33.3	34.3	35.3	36.3	37.3	38.3	39.3	40.3	41.4	42.4
85	33.4	34.4	35.4	36.5	37.5	38.5	39.5	40.5	41.5	42.6
86	33.6	34.6	35.6	36.6	37.6	38.7	39.7	40.7	41.7	42.7
87	33.8	34.8	35.8	36.8	37.8	38.8	39.8	40.9	41.9	42.9
88	34.0	35.0	36.0	37.0	38.0	39.0	40.0	41.0	42.1	43.1
89	34.1	35.1	36.2	37.2	38.2	39.2	40.2	41.2	42.3	43.3
90	34.3	35.3	36.4	37.4	38.4	39.4	40.4	41.4	42.5	43.5
91	34.5	35.5	36.5	37.6	38.6	39.6	40.6	41.6	42.6	43.7
92	34.7	35.7	36.8	37.8	38.8	39.8	40.8	41.8	42.8	43.9
93	34.9	35.9	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.1
94	35.1	36.1	37.1	38.2	39.2	40.2	41.2	42.2	43.2	44.3
95	35.3	36.3	37.3	38.4	39.4	40.4	41.4	42.4	43.5	44.5
96	35.5	36.5	37.5	38.6	39.6	40.6	41.6	42.6	43.7	44.7
97	35.7	36.7	37.7	38.8	39.8	40.8	41.8	42.9	43.9	44.9
98	35.9	36.9	37.9	39.0	40.0	41.0	42.0	43.1	44.1	45.1
99	36.1	37.1	38.1	39.2	40.2	41.2	42.2	43.3	44.3	45.3
100	36.3	37.3	38.3	39.4	40.4	41.4	42.5	43.5	44.5	45.5

TABLE 1.—*Reduction of observed degrees barkometer to degrees barkometer at 60° F*—Continued

Observed temperature in °F	Observed degrees barkometer									
	40.0	41.0	42.0	43.0	44.0	45.0	46.0	47.0	48.0	49.0
	Corresponding degrees barkometer at 60° F									
50	39.1	40.1	41.1	42.1	43.1	44.1	45.1	46.1	47.1	48.1
51	39.2	40.2	41.2	42.2	43.2	44.2	45.2	46.2	47.2	48.2
52	39.3	40.3	41.3	42.3	43.3	44.3	45.3	46.3	47.2	48.2
53	39.4	40.4	41.4	42.4	43.4	44.4	45.4	46.4	47.3	48.3
54	39.5	40.5	41.5	42.5	43.5	44.5	45.5	46.4	47.4	48.4
55	39.5	40.5	41.5	42.5	43.5	44.5	45.5	46.5	47.5	48.5
56	39.6	40.6	41.6	42.6	43.6	44.6	45.6	46.6	47.6	48.6
57	39.7	40.7	41.7	42.7	43.7	44.7	45.7	46.7	47.7	48.7
58	39.8	40.8	41.8	42.8	43.8	44.8	45.8	46.8	47.8	48.8
59	39.9	40.9	41.9	42.9	43.9	44.9	45.9	46.9	47.9	48.9
60	40.0	41.0	42.0	43.0	44.0	45.0	46.0	47.0	48.0	49.0
61	40.1	41.1	42.1	43.1	44.1	45.1	46.1	47.1	48.1	49.1
62	40.2	41.2	42.2	43.2	44.2	45.2	46.2	47.2	48.2	49.2
63	40.3	41.3	42.3	43.3	44.3	45.3	46.3	47.3	48.3	49.3
64	40.4	41.4	42.4	43.4	44.4	45.5	46.5	47.5	48.5	49.5
65	40.6	41.6	42.6	43.6	44.6	45.6	46.6	47.6	48.6	49.6
66	40.7	41.7	42.7	43.7	44.7	45.7	46.7	47.7	48.7	49.7
67	40.8	41.8	42.8	43.8	44.8	45.8	46.8	47.8	48.8	49.8
68	40.9	41.9	42.9	44.0	45.0	46.0	47.0	48.0	49.0	50.0
69	41.1	42.1	43.1	44.1	45.1	46.1	47.1	48.1	49.1	50.1
70	41.2	42.2	43.2	44.2	45.2	46.3	47.3	48.3	49.3	50.3
71	41.3	42.3	43.4	44.4	45.4	46.4	47.4	48.4	49.4	50.4
72	41.5	42.5	43.5	44.5	45.5	46.6	47.6	48.6	49.6	50.6
73	41.6	42.6	43.6	44.7	45.7	46.7	47.7	48.7	49.7	50.7
74	41.8	42.8	43.8	44.8	45.8	46.8	47.9	48.9	49.9	50.9
75	41.9	42.9	44.0	45.0	46.0	47.0	48.0	49.0	50.0	51.0
76	42.1	43.1	44.1	45.1	46.1	47.2	48.2	49.2	50.2	51.2
77	42.2	43.2	44.2	45.3	46.3	47.3	48.3	49.3	50.3	51.3
78	42.4	43.4	44.4	45.4	46.4	47.5	48.5	49.5	50.5	51.5
79	42.6	43.6	44.6	45.6	46.6	47.6	48.6	49.6	50.7	51.7
80	42.7	43.7	44.8	45.8	46.8	47.8	48.8	49.8	50.8	51.9
81	42.9	43.9	44.9	45.9	47.0	48.0	49.0	50.0	51.0	52.0
82	43.0	44.1	45.1	46.1	47.1	48.1	49.2	50.2	51.2	52.2
83	43.2	44.2	45.3	46.3	47.3	48.3	49.3	50.4	51.4	52.4
84	43.4	44.4	45.4	46.4	47.5	48.5	49.5	50.5	51.6	52.6
85	43.6	44.6	45.6	46.6	47.7	48.7	49.7	50.7	51.7	52.7
86	43.8	44.8	45.8	46.8	47.8	48.8	49.8	50.9	51.9	52.9
87	43.9	45.0	46.0	47.0	48.0	49.0	50.0	51.1	52.1	53.1
88	44.1	45.2	46.2	47.2	48.2	49.2	50.2	51.2	52.3	53.3
89	44.3	45.4	46.4	47.4	48.4	49.4	50.4	51.4	52.5	53.5
90	44.5	45.6	46.6	47.6	48.6	49.6	50.6	51.6	52.7	53.7
91	44.7	45.8	46.8	47.8	48.8	49.8	50.8	51.9	52.9	53.9
92	44.9	46.0	47.0	48.0	49.0	50.0	51.0	52.1	53.1	54.1
93	45.1	46.1	47.2	48.2	49.2	50.2	51.3	52.3	53.3	54.3
94	45.3	46.3	47.4	48.4	49.4	50.4	51.5	52.5	53.5	54.5
95	45.5	46.5	47.5	48.6	49.6	50.6	51.7	52.7	53.7	54.7
96	45.7	46.7	47.8	48.8	49.8	50.8	51.9	52.9	53.9	54.9
97	45.9	47.0	48.0	49.0	50.0	51.0	52.1	53.1	54.1	55.1
98	46.1	47.2	48.2	49.2	50.2	51.3	52.3	53.3	54.3	55.4
99	46.4	47.4	48.4	49.4	50.5	51.5	52.5	53.5	54.6	55.6
100	46.6	47.6	48.6	49.6	50.7	51.7	52.7	53.8	54.8	55.8

TABLE 1.—*Reduction of observed degrees barkometer to degrees barkometer at 60° F*—Continued

Observed temperature in °F	Observed degrees barkometer									
	50.0	51.0	52.0	53.0	54.0	55.0	56.0	57.0	58.0	59.0
	Corresponding degrees barkometer at 60° F									
50	49.0	50.0	51.0	52.0	53.0	54.0	55.0	56.0	57.0	58.0
51	49.1	50.1	51.1	52.1	53.1	54.1	55.1	56.1	57.1	58.1
52	49.2	50.2	51.2	52.2	53.2	54.2	55.2	56.2	57.2	58.2
53	49.3	50.3	51.3	52.3	53.3	54.3	55.3	56.3	57.3	58.3
54	49.4	50.4	51.4	52.4	53.4	54.4	55.4	56.4	57.4	58.4
55	49.5	50.5	51.5	52.5	53.5	54.5	55.5	56.5	57.5	58.5
56	49.6	50.6	51.6	52.6	53.6	54.6	55.6	56.6	57.6	58.6
57	49.7	50.7	51.7	52.7	53.7	54.7	55.7	56.7	57.7	58.7
58	49.8	50.8	51.8	52.8	53.8	54.8	55.8	56.8	57.8	58.8
59	49.9	50.9	51.9	52.9	53.9	54.9	55.9	56.9	57.9	58.9
60	50.0	51.0	52.0	53.0	54.0	55.0	56.0	57.0	58.0	59.0
61	50.1	51.1	52.1	53.1	54.1	55.1	56.1	57.1	58.1	59.1
62	50.2	51.2	52.2	53.2	54.2	55.2	56.2	57.2	58.2	59.2
63	50.3	51.3	52.3	53.3	54.4	55.4	56.4	57.4	58.4	59.4
64	50.5	51.5	52.5	53.5	54.5	55.5	56.5	57.5	58.5	59.5
65	50.6	51.6	52.6	53.6	54.6	55.6	56.6	57.6	58.6	59.6
66	50.7	51.7	52.7	53.7	54.7	55.8	56.8	57.8	58.8	59.8
67	50.8	51.8	52.8	53.8	54.9	55.9	56.9	57.9	58.9	59.9
68	51.0	52.0	53.0	54.0	55.0	56.0	57.0	58.0	59.0	60.0
69	51.1	52.1	53.1	54.1	55.1	56.2	57.2	58.2	59.2	60.2
70	51.3	52.3	53.3	54.3	55.3	56.3	57.3	58.3	59.3	60.3
71	51.4	52.4	53.4	54.4	55.4	56.4	57.4	58.5	59.5	60.5
72	51.6	52.6	53.6	54.6	55.6	56.6	57.6	58.6	59.6	60.6
73	51.7	52.7	53.7	54.7	55.8	56.8	57.8	58.8	59.8	60.8
74	51.9	52.9	53.9	54.9	55.9	56.9	57.9	58.9	59.9	61.0
75	52.0	53.0	54.0	55.0	56.0	57.1	58.1	59.1	60.1	61.1
76	52.2	53.2	54.2	55.2	56.2	57.2	58.2	59.3	60.3	61.3
77	52.4	53.4	54.4	55.4	56.4	57.4	58.4	59 4	60.4	61.4
78	52.5	53.5	54.5	55.5	56.6	57.6	58.6	59.6	60.6	61.6
79	52.7	53.7	54.7	55.7	56.7	57.8	58.8	59.8	60.8	61.8
80	52.9	53.9	54.9	55.9	56.9	57.9	58.9	60.0	61.0	62.0
81	53.0	54.1	55.1	56.1	57.1	58.1	59.1	60.1	61.2	62.2
82	53.2	54.2	55.2	56.2	57.3	58.3	59.3	60.3	61.3	62.4
83	53.4	54.4	55.4	56.4	57.5	58.5	59.5	60.5	61.5	62.6
84	53.6	54.6	55.6	56.6	57.6	58.6	59.7	60.7	61.7	62.7
85	53.8	54.8	55.8	56.8	57.8	58.8	59.8	60.9	61.9	62.9
86	53.9	54.9	56.0	57.0	58.0	59.0	60.0	61.0	62.1	63.1
87	54.1	55.1	56.1	57.1	58.2	59.2	60.2	61.2	62.2	63.3
88	54.3	55.3	56.3	57.3	58.4	59.4	60.4	61.4	62.4	63.5
89	54.5	55.5	56.5	57.5	58.6	59.6	60.6	61.6	62.6	63.7
90	54.7	55.7	56.7	57.7	58.8	59.8	60.8	61.8	62.8	63.9
91	54.9	55.9	56.9	57.9	59.0	60.0	61.0	62.0	63.0	64.1
92	55.1	56.1	57.1	58.2	59.2	60.2	61.2	62.2	63.3	64.3
93	55.3	56.3	57.3	58.4	59.4	60.4	61.4	62.4	63.5	64.5
94	55.5	56.5	57.6	58.6	59.6	60.6	61.6	62.7	63.7	64.7
95	55.7	56.7	57.8	58.8	59.8	60.8	61.8	62.9	63.9	64.9
96	56.0	57.0	58.0	59.0	60.0	61.0	62.1	63.1	64.1	65.2
97	56.2	57.2	58.2	59.2	60.2	61.3	62.3	63.3	64.3	65.4
98	56.4	57.4	58.4	59.4	60.5	61.5	62.5	63.5	64.6	65.6
99	56.6	57.6	58.6	59.7	60.7	61.7	62.7	63.8	64.8	65.8
100	56.8	57.9	58.9	59.9	60.9	61.9	63.0	64.0	65.0	66.0

TABLE 1.—*Reduction of observed degrees barkometer to degrees barkometer at 60° F*—Continued

Observed temperature in °F	Observed degrees barkometer									
	60.0	61.0	62.0	63.0	64.0	65.0	66.0	67.0	68.0	69.0
	Corresponding degrees barkometer at 60° F									
50	59.0	60.0	61.0	62.0	63.0	64.0	64.9	65.9	66.9	67.9
51	59.1	60.1	61.1	62.1	63.1	64.1	65.1	66.1	67.1	68.0
52	59.2	60.2	61.2	62.2	63.2	64.2	65.2	66.2	67.2	68.1
53	59.3	60.3	61.3	62.3	63.3	64.3	65.3	66.3	67.3	68.2
54	59.4	60.4	61.4	62.4	63.4	64.4	65.4	66.4	67.4	68.3
55	59.5	60.5	61.5	62.5	63.5	64.5	65.5	66.5	67.5	68.4
56	59.6	60.6	61.6	62.6	63.6	64.6	65.6	66.6	67.6	68.6
57	59.7	60.7	61.7	62.7	63.7	64.7	65.7	66.7	67.7	68.7
58	59.8	60.8	61.8	62.8	63.8	64.8	65.8	66.8	67.8	68.8
59	59.9	60.9	61.9	62.9	63.9	64.9	65.9	66.9	67.9	68.9
60	60.0	61.0	62.0	63.0	64.0	65.0	66.0	67.0	68.0	69.0
61	60.1	61.1	62.1	63.1	64.1	65.1	66.1	67.1	68.1	69.1
62	60.2	61.2	62.2	63.2	64.3	65.3	66.3	67.3	68.3	69.3
63	60.4	61.4	62.4	63.4	64.4	65.4	66.4	67.4	68.4	69.4
64	60.5	61.5	62.5	63.5	64.5	65.5	66.5	67.5	68.5	69.5
65	60.6	61.6	62.6	63.7	64.7	65.7	66.7	67.7	68.7	69.7
66	60.8	61.8	62.8	63.8	64.8	65.8	66.8	67.8	68.8	69.8
67	60.9	61.9	62.9	63.9	64.9	65.9	66.9	67.9	69.0	70.0
68	61.0	62.0	63.0	64.1	65.1	66.1	67.1	68.1	69.1	70.1
69	61.2	62.2	63.2	64.2	65.2	66.2	67.2	68.2	69.2	70.2
70	61.4	62.4	63.4	64.4	65.4	66.4	67.4	68.4	69.4	70.4
71	61.5	62.5	63.5	64.5	65.5	66.5	67.6	68.6	69.6	70.6
72	61.6	62.7	63.7	64.7	65.7	66.7	67.7	68.7	69.7	70.7
73	61.8	62.8	63.8	64.8	65.9	66.9	67.9	68.9	69.9	70.9
74	62.0	63.0	64.0	65.0	66.0	67.0	68.0	69.1	70.1	71.1
75	62.1	63.1	64.1	65.2	66.2	67.2	68.2	69.2	70.2	71.2
76	62.3	63.3	64.3	65.4	66.4	67.4	68.4	69.4	70.4	71.4
77	62.5	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.6	71.6
78	62.6	63.7	64.7	65.7	66.7	67.7	68.7	69.7	70.7	71.8
79	62.8	63.8	64.9	65.9	66.9	67.9	68.9	69.9	70.9	71.9
80	63.0	64.0	65.0	66.0	67.1	68.1	69.1	70.1	71.1	72.1
81	63.2	64.2	65.2	66.2	67.2	68.3	69.3	70.3	71.3	72.3
82	63.4	64.4	65.4	66.4	67.4	68.5	69.5	70.5	71.5	72.5
83	63.6	64.6	65.6	66.6	67.6	68.6	69.7	70.7	71.7	72.7
84	63.8	64.8	65.8	66.8	67.8	68.8	69.8	70.9	71.9	72.9
85	63.9	65.0	66.0	67.0	68.0	69.0	70.0	71.0	72.0	73.1
86	64.1	65.1	66.1	67.1	68.2	69.2	70.2	71.2	72.2	73.2
87	64.3	65.3	66.3	67.3	68.4	69.4	70.4	71.4	72.4	73.4
88	64.5	65.5	66.5	67.5	68.6	69.6	70.6	71.6	72.6	73.6
89	64.7	65.7	66.7	67.7	68.8	69.8	70.8	71.8	72.8	73.8
90	64.9	65.9	66.9	67.9	69.0	70.0	71.0	72.0	73.0	74.1
91	65.1	66.1	67.1	68.2	69.2	70.2	71.2	72.2	73.3	74.3
92	65.3	66.3	67.3	68.4	69.4	70.4	71.4	72.5	73.5	74.5
93	65.5	66.5	67.6	68.6	69.6	70.6	71.7	72.7	73.7	74.7
94	65.7	66.8	67.8	68.8	69.8	70.8	71.9	72.9	73.9	74.9
95	65.9	67.0	68.0	69.0	70.0	71.0	72.1	73.1	74.1	75.1
96	66.2	67.2	68.2	69.2	70.2	71.3	72.3	73.3	74.3	75.4
97	66.4	67.4	68.4	69.5	70.5	71.5	72.5	73.5	74.6	75.6
98	66.6	67.6	68.6	69.7	70.7	71.7	72.7	73.8	74.8	75.8
99	66.8	67.9	68.9	69.9	70.9	72.0	73.0	74.0	75.0	76.0
100	67.1	68.1	69.1	70.1	71.2	72.2	73.2	74.2	75.2	76.3

TABLE 1.—*Reduction of observed degrees barkometer to degrees barkometer at 60° F*—Continued

Observed temperature in °F	Observed degrees barkometer									
	70.0	71.0	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0
	Corresponding degrees barkometer at 60° F									
50	68.9	69.9	70.9	71.9	72.9	73.9	74.9	75.9	76.9	77.9
51	69.0	70.0	71.0	72.0	73.0	74.0	75.0	76.0	77.0	78.0
52	69.1	70.1	71.1	72.1	73.1	74.1	75.1	76.1	77.1	78.1
53	69.2	70.2	71.2	72.2	73.2	74.2	75.2	76.2	77.2	78.2
54	69.3	70.3	71.3	72.3	73.3	74.3	75.3	76.3	77.3	78.3
55	69.4	70.4	71.4	72.4	73.4	74.4	75.4	76.4	77.4	78.4
56	69.5	70.5	71.5	72.5	73.6	74.6	75.6	76.6	77.6	78.6
57	69.7	70.7	71.7	72.7	73.7	74.7	75.7	76.7	77.7	78.7
58	69.8	70.8	71.8	72.8	73.8	74.8	75.8	76.8	77.8	78.8
59	69.9	70.9	71.9	72.9	73.9	74.9	75.9	76.9	77.9	78.9
60	70.0	71.0	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0
61	70.1	71.1	72.1	73.1	74.1	75.1	76.1	77.1	78.1	79.1
62	70.3	71.3	72.3	73.3	74.3	75.3	76.3	77.3	78.3	79.3
63	70.4	71.4	72.4	73.4	74.4	75.4	76.4	77.4	78.4	79.4
64	70.5	71.5	72.5	73.5	74.5	75.6	76.6	77.6	78.6	79.6
65	70.7	71.7	72.7	73.7	74.7	75.7	76.7	77.7	78.7	79.7
66	70.8	71.8	72.8	73.8	74.8	75.8	76.8	77.8	78.8	79.8
67	71.0	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
68	71.1	72.1	73.1	74.1	75.1	76.1	77.1	78.1	79.1	80.2
69	71.2	72.2	73.3	74.3	75.3	76.3	77.3	78.3	79.3	80.3
70	71.4	72.4	73.4	74.4	75.4	76.4	77.4	78.4	79.5	80.5
71	71.6	72.6	73.6	74.6	75.6	76.6	77.6	78.6	79.6	80.6
72	71.7	72.7	73.7	74.8	75.8	76.8	77.8	78.8	79.8	80.8
73	71.9	72.9	73.9	74.9	75.9	76.9	78.0	79.0	80.0	81.0
74	72.1	73.1	74.1	75.1	76.1	77.1	78.1	79.1	80.1	81.1
75	72.2	73.2	74.2	75.3	76.3	77.3	78.3	79.3	80.3	81.3
76	72.4	73.4	74.4	75.4	76.4	77.4	78.5	79.5	80.5	81.5
77	72.6	73.6	74.6	75.6	76.6	77.6	78.6	79.6	80.7	81.7
78	72.8	73.8	74.8	75.8	76.8	77.8	78.8	79.8	80.8	81.9
79	72.9	74.0	75.0	76.0	77.0	78.0	79.0	80.0	81.0	82.0
80	73.1	74.1	75.2	76.2	77.2	78.2	79.2	80.2	81.2	82.2
81	73.3	74.3	75.3	76.3	77.3	78.3	79.4	80.4	81.4	82.4
82	73.5	74.5	75.5	76.5	77.5	78.5	79.6	80.6	81.6	82.6
83	73.7	74.7	75.7	76.7	77.7	78.7	79.7	80.8	81.8	82.8
84	73.9	74.9	75.9	76.9	77.9	78.9	79.9	81.0	82.0	83.0
85	74.1	75.1	76.1	77.1	78.1	79.1	80.1	81.2	82.2	83.2
86	74.3	75.3	76.3	77.3	78.3	79.3	80.4	81.4	82.4	83.4
87	74.5	75.5	76.5	77.5	78.5	79.5	80.6	81.6	82.6	83.6
88	74.7	75.7	76.7	77.7	78.7	79.7	80.8	81.8	82.8	83.8
89	74.9	75.9	76.9	77.9	78.9	80.0	81.0	82.0	83.0	84.0
90	75.1	76.1	77.1	78.1	79.2	80.2	81.2	82.2	83.2	84.2
91	75.3	76.3	77.3	78.4	79.4	80.4	81.4	82.4	83.4	84.4
92	75.5	76.5	77.5	78.6	79.6	80.6	81.6	82.6	83.6	84.7
93	75.7	76.7	77.8	78.8	79.8	80.8	81.8	82.8	83.9	84.9
94	75.9	77.0	78.0	79.0	80.0	81.0	82.0	83.1	84.1	85.1
95	76.2	77.2	78.2	79.2	80.2	81.3	82.3	83.3	84.3	85.3
96	76.4	77.4	78.4	79.4	80.4	81.5	82.5	83.5	84.5	85.5
97	76.6	77.6	78.6	79.6	80.7	81.7	82.7	83.7	84.7	85.8
98	76.8	77.8	78.9	79.9	80.9	81.9	83.0	84.0	85.0	86.0
99	77.0	78.1	79.1	80.1	81.1	82.1	83.2	84.2	85.2	86.2
100	77.3	78.3	79.3	80.4	81.4	82.4	83.4	84.4	85.4	86.5

TABLE 1.—*Reduction of observed degrees barkometer to degrees barkometer at 60° F*—Continued

Observed temperature in °F	Observed degrees barkometer									
	80.0	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
	Corresponding degrees barkometer at 60° F									
50	78.8	79.8	80.8	81.8	82.8	83.8	84.8	85.8	86.8	87.8
51	79.0	80.0	81.0	81.9	82.9	83.9	84.9	85.9	86.9	87.9
52	79.1	80.1	81.1	82.0	83.0	84.0	85.0	86.0	87.0	88.0
53	79.2	80.2	81.2	82.2	83.1	84.1	85.1	86.1	87.1	88.1
54	79.3	80.3	81.3	82.3	83.3	84.2	85.2	86.2	87.2	88.2
55	79.4	80.4	81.4	82.4	83.4	84.4	85.4	86.4	87.4	88.4
56	79.6	80.6	81.5	82.5	83.5	84.5	85.5	86.5	87.5	88.5
57	79.7	80.7	81.6	82.6	83.6	84.6	85.6	86.6	87.6	88.6
58	79.8	80.8	81.8	82.8	83.8	84.8	85.8	86.8	87.8	88.8
59	79.9	80.9	81.9	82.9	83.9	84.9	85.9	86.9	87.9	88.9
60	80.0	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
61	80.1	81.1	82.1	83.1	84.1	85.1	86.1	87.1	88.1	89.1
62	80.3	81.3	82.3	83.3	84.3	85.3	86.3	87.3	88.3	89.3
63	80.4	81.4	82.4	83.4	84.4	85.4	86.4	87.4	88.4	89.4
64	80.6	81.6	82.6	83.6	84.6	85.6	86.6	87.6	88.6	89.6
65	80.7	81.7	82.7	83.7	84.7	85.7	86.7	87.7	88.8	89.8
66	80.8	81.8	82.8	83.9	84.9	85.9	86.9	87.9	88.9	89.9
67	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0	90.1
68	81.2	82.2	83.2	84.2	85.2	86.2	87.2	88.2	89.2	90.2
69	81.3	82.3	83.3	84.3	85.3	86.3	87.4	88.4	89.4	90.4
70	81.5	82.5	83.5	84.5	85.5	86.5	87.5	88.5	89.5	90.5
71	81.7	82.7	83.7	84.7	85.7	86.7	87.7	88.7	89.7	90.7
72	81.8	82.8	83.8	84.8	85.8	86.9	87.9	88.9	89.9	90.9
73	82.0	83.0	84.0	85.0	86.0	87.0	88.1	89.1	90.1	91.1
74	82.2	83.2	84.2	85.2	86.2	87.2	88.2	89.2	90.2	91.2
75	82.3	83.3	84.3	85.4	86.4	87.4	88.4	89.4	90.4	91.4
76	82.5	83.5	84.5	85.5	86.5	87.6	88.6	89.6	90.6	91.6
77	82.7	83.7	84.7	85.7	86.7	87.8	88.8	89.8	90.8	91.8
78	82.9	83.9	84.9	85.9	86.9	88.0	89.0	90.0	91.0	92.0
79	83.0	84.1	85.1	86.1	87.1	88.1	89.1	90.2	91.2	92.2
80	83.2	84.3	85.3	86.3	87.3	88.3	89.3	90.4	91.4	92.4
81	83.4	84.5	85.5	86.5	87.5	88.5	89.5	90.6	91.6	92.6
82	83.6	84.7	85.7	86.7	87.7	88.7	89.7	90.7	91.8	92.8
83	83.8	84.8	85.9	86.9	87.9	88.9	89.9	90.9	92.0	93.0
84	84.0	85.0	86.0	87.1	88.1	89.1	90.1	91.1	92.2	93.2
85	84.2	85.2	86.3	87.3	88.3	89.3	90.3	91.3	92.4	93.4
86	84.4	85.4	86.5	87.5	88.5	89.5	90.5	91.5	92.6	93.6
87	84.6	85.6	86.7	87.7	88.7	89.7	90.8	91.8	92.8	93.8
88	84.8	85.8	86.8	87.9	88.9	89.9	91.0	92.0	93.0	94.0
89	85.0	86.0	87.1	88.1	89.2	90.2	91.2	92.2	93.2	94.3
90	85.2	86.3	87.3	88.3	89.4	90.4	91.4	92.4	93.5	94.5
91	85.5	86.5	87.5	88.6	89.6	90.6	91.7	92.7	93.7	94.7
92	85.7	86.7	87.7	88.8	89.8	90.8	91.9	92.9	93.9	94.9
93	85.9	86.9	88.0	89.0	90.0	91.0	92.1	93.1	94.1	95.1
94	86.1	87.1	88.2	89.2	90.2	91.3	92.3	93.3	94.3	95.4
95	86.4	87.4	88.4	89.4	90.4	91.5	92.5	93.5	94.5	95.6
96	86.6	87.6	88.6	89.6	90.7	91.7	92.7	93.7	94.8	95.8
97	86.8	87.8	88.8	89.9	90.9	91.9	92.9	94.0	95.0	96.0
98	87.0	88.0	89.1	90.1	91.1	92.1	93.2	94.2	95.2	96.2
99	87.2	88.3	89.3	90.3	91.3	92.4	93.4	94.4	95.4	96.5
100	87.5	88.5	89.5	90.6	91.6	92.6	93.6	94.6	95.7	96.7

TABLE 1.—*Reduction of observed degrees barkometer to degrees barkometer at 60° F*—Continued

Observed temperature in °F	Observed degrees barkometer									
	90.0	91.0	92.0	93.0	94.0	95.0	96.0	97.0	98.0	99.0
	Corresponding degrees barkometer at 60° F									
50	88.8	89.8	90.7	91.7	92.7	93.7	94.7	95.7	96.7	97.7
51	88.9	89.9	90.9	91.9	92.9	93.9	94.9	95.8	96.8	97.8
52	89.0	90.0	91.0	92.0	93.0	94.0	95.0	96.0	97.0	98.0
53	89.1	90.1	91.1	92.1	93.1	94.1	95.1	96.1	97.1	98.1
54	89.2	90.2	91.2	92.2	93.2	94.2	95.2	96.2	97.2	98.2
55	89.4	90.4	91.4	92.4	93.4	94.4	95.4	96.4	97.4	98.3
56	89.5	90.5	91.5	92.5	93.5	94.5	95.5	96.5	97.5	98.5
57	89.6	90.6	91.6	92.6	93.6	94.6	95.6	96.6	97.6	98.6
58	89.7	90.7	91.7	92.7	93.7	94.7	95.7	96.7	97.7	98.7
59	89.9	90.9	91.9	92.9	93.9	94.9	95.9	96.9	97.8	98.8
60	90.0	91.0	92.0	93.0	94.0	95.0	96.0	97.0	98.0	99.0
61	90.1	91.1	92.1	93.1	94.1	95.1	96.1	97.1	98.1	99.1
62	90.3	91.3	92.3	93.3	94.3	95.3	96.3	97.3	98.3	99.3
63	90.4	91.4	92.4	93.4	94.4	95.4	96.4	97.4	98.4	99.4
64	90.6	91.6	92.6	93.6	94.6	95.6	96.6	97.6	98.6	99.6
65	90.8	91.8	92.8	93.8	94.8	95.8	96.8	97.8	98.8	99.8
66	90.9	91.9	92.9	93.9	94.9	95.9	96.9	97.9	98.9	99.9
67	91.1	92.1	93.1	94.1	95.1	96.1	97.1	98.1	99.1	100.1
68	91.2	92.2	93.2	94.2	95.2	96.2	97.2	98.2	99.2	100.3
69	91.4	92.4	93.4	94.4	95.4	96.4	97.4	98.4	99.4	100.4
70	91.6	92.6	93.6	94.6	95.6	96.6	97.6	98.6	99.6	100.6
71	91.7	92.7	93.8	94.8	95.8	96.8	97.8	98.8	99.8	100.8
72	91.9	92.9	93.9	94.9	95.9	96.9	97.9	99.0	100.0	101.0
73	92.1	93.1	94.1	95.1	96.1	97.1	98.1	99.1	100.2	101.2
74	92.3	93.3	94.3	95.3	96.3	97.3	98.3	99.3	100.3	101.3
75	92.4	93.4	94.4	95.5	96.5	97.5	98.5	99.5	100.5	101.5
76	92.6	93.6	94.6	95.6	96.6	97.6	98.6	99.7	100.7	101.7
77	92.8	93.8	94.8	95.8	96.8	97.8	98.8	99.9	100.9	101.9
78	93.0	94.0	95.0	96.0	97.0	98.0	99.0	100.0	101.1	102.1
79	93.2	94.2	95.2	96.2	97.2	98.2	99.2	100.2	101.3	102.3
80	93.4	94.4	95.4	96.4	97.4	98.4	99.4	100.4	101.5	102.5
81	93.6	94.6	95.6	96.6	97.6	98.6	99.6	100.6	101.7	102.7
82	93.8	94.8	95.8	96.8	97.8	98.8	99.8	100.8	101.9	102.9
83	94.0	95.0	96.0	97.0	98.0	99.0	100.0	101.0	102.1	103.1
84	94.2	95.2	96.2	97.2	98.2	99.2	100.2	101.3	102.3	103.3
85	94.4	95.4	96.4	97.4	98.4	99.4	100.5	101.5	102.5	103.5
86	94.6	95.6	96.6	97.6	98.6	99.7	100.7	101.7	102.7	103.7
87	94.8	95.9	96.9	97.9	98.9	99.9	100.9	101.9	103.0	104.0
88	95.1	96.1	97.1	98.1	99.1	100.1	101.1	102.2	103.2	104.2
89	95.3	96.3	97.3	98.3	99.3	100.4	101.4	102.4	103.4	104.4
90	95.5	96.5	97.5	98.5	99.6	100.6	101.6	102.6	103.6	104.7
91	95.7	96.7	97.8	98.8	99.8	100.8	101.8	102.8	103.9	104.9
92	95.9	97.0	98.0	99.0	100.0	101.0	102.0	103.1	104.1	105.1
93	96.2	97.2	98.2	99.2	100.2	101.2	102.2	103.3	104.3	105.3
94	96.4	97.4	98.4	99.4	100.4	101.4	102.5	103.5	104.5	105.6
95	96.6	97.6	98.6	99.6	100.7	101.7	102.7	103.7	104.7	105.8
96	96.8	97.8	98.9	99.9	100.9	101.9	102.9	104.0	105.0	106.0
97	97.1	98.1	99.1	100.1	101.1	102.2	103.2	104.2	105.2	106.2
98	97.3	98.3	99.3	100.3	101.4	102.4	103.4	104.4	105.4	106.5
99	97.5	98.6	99.6	100.6	101.6	102.6	103.6	104.6	105.7	106.7
100	97.7	98.8	99.8	100.8	101.8	102.8	103.9	104.9	105.9	107.0

TABLE 1.—*Reduction of observed degrees barkometer to degrees barkometer at 60° F*—Continued

Observed temperature in °F	Observed degrees barkometer									
	100.0	101.0	102.0	103.0	104.0	105.0	106.0	107.0	108.0	109.0
	Corresponding degrees barkometer at 60° F									
50	98.7	99.7	100.7	101.7	102.7	103.7	104.6	105.6	106.6	107.6
51	98.8	99.8	100.8	101.8	102.8	103.8	104.8	105.8	106.8	107.8
52	98.9	99.9	100.9	101.9	102.9	103.9	104.9	105.9	106.9	107.9
53	99.1	100.1	101.1	102.1	103.1	104.1	105.1	106.1	107.1	108.1
54	99.2	100.2	101.2	102.2	103.2	104.2	105.2	106.2	107.2	108.2
55	99.3	100.3	101.3	102.3	103.3	104.3	105.3	106.3	107.3	108.3
56	99.5	100.5	101.5	102.5	103.5	104.5	105.5	106.5	107.5	108.5
57	99.6	100.6	101.6	102.6	103.6	104.6	105.6	106.6	107.6	108.6
58	99.7	100.7	101.7	102.7	103.7	104.7	105.7	106.7	107.7	108.7
59	99.8	100.8	101.8	102.8	103.8	104.8	105.8	106.9	107.9	108.9
60	100.0	101.0	102.0	103.0	104.0	105.0	106.0	107.0	108.0	109.0
61	100.1	101.1	102.1	103.1	104.1	105.1	106.1	107.1	108.1	109.2
62	100.3	101.3	102.3	103.3	104.3	105.3	106.3	107.3	108.3	109.3
63	100.4	101.4	102.4	103.4	104.4	105.4	106.4	107.5	108.5	109.5
64	100.6	101.6	102.6	103.6	104.6	105.6	106.6	107.6	108.6	109.6
65	100.8	101.8	102.8	103.8	104.8	105.8	106.8	107.8	108.8	109.8
66	100.9	101.9	102.9	103.9	104.9	106.0	107.0	108.0	109.0	110.0
67	101.1	102.1	103.1	104.1	105.1	106.1	107.1	108.1	109.1	110.1
68	101.3	102.3	103.3	104.3	105.3	106.3	107.3	108.3	109.3	110.3
69	101.4	102.5	103.5	104.5	105.5	106.5	107.5	108.5	109.5	110.5
70	101.6	102.6	103.6	104.6	105.6	106.7	107.7	108.7	109.7	110.7
71	101.8	102.8	103.8	104.8	105.8	106.8	107.8	108.8	109.9	110.9
72	102.0	103.0	104.0	105.0	106.0	107.0	108.0	109.0	110.0	111.0
73	102.2	103.2	104.2	105.2	106.2	107.2	108.2	109.2	110.2	111.2
74	102.4	103.4	104.4	105.4	106.4	107.4	108.4	109.4	110.4	111.4
75	102.6	103.6	104.6	105.6	106.6	107.6	108.6	109.6	110.6	111.6
76	102.7	103.8	104.8	105.8	106.8	107.8	108.8	109.8	110.8	111.8
77	102.9	103.9	104.9	105.9	106.9	108.0	109.0	110.0	111.0	112.0
78	103.1	104.1	105.1	106.1	107.1	108.1	109.1	110.2	111.2	112.2
79	103.3	104.3	105.3	106.3	107.3	108.3	109.3	110.4	111.4	112.4
80	103.5	104.5	105.5	106.5	107.5	108.5	109.5	110.6	111.6	112.6
81	103.7	104.7	105.7	106.7	107.7	108.8	109.8	110.8	111.8	112.8
82	103.9	104.9	105.9	106.9	108.0	109.0	110.0	111.0	112.0	113.0
83	104.1	105.1	106.1	107.2	108.2	109.2	110.2	111.2	112.2	113.2
84	104.3	105.3	106.4	107.4	108.4	109.4	110.4	111.4	112.4	113.5
85	104.6	105.6	106.6	107.6	108.6	109.6	110.6	111.6	112.6	113.7
86	104.8	105.8	106.8	107.8	108.8	109.8	110.8	111.9	112.9	113.9
87	105.0	106.0	107.0	108.0	109.1	110.1	111.1	112.1	113.1	114.2
88	105.2	106.2	107.3	108.3	109.3	110.3	111.3	112.4	113.4	114.4
89	105.4	106.5	107.5	108.5	109.5	110.6	111.6	112.6	113.6	114.6
90	105.7	106.7	107.7	108.7	109.8	110.8	111.8	112.8	113.8	114.9
91	105.9	107.0	108.0	109.0	110.0	111.0	112.1	113.1	114.1	115.1
92	106.2	107.2	108.2	109.2	110.2	111.3	112.3	113.3	114.3	115.3
93	106.4	107.4	108.4	109.4	110.5	111.5	112.5	113.5	114.5	115.5
94	106.6	107.6	108.6	109.6	110.7	111.7	112.7	113.7	114.8	115.8
95	106.8	107.8	108.8	109.8	110.9	111.9	112.9	113.9	115.0	116.0
96	107.0	108.1	109.1	110.1	111.1	112.1	113.1	114.2	115.2	116.2
97	107.3	108.3	109.3	110.3	111.4	112.4	113.4	114.4	115.4	116.5
98	107.5	108.5	109.6	110.6	111.6	112.6	113.6	114.6	115.7	116.7
99	107.8	108.8	109.8	110.8	111.8	112.8	113.8	114.9	115.9	117.0
100	108.0	109.0	110.0	111.1	112.1	113.1	114.1	115.1	116.2	117.2

TABLE 1.—*Reduction of observed degrees barkometer to degrees barkometer at 60° F*—Continued

Observed temperature in °F	Observed degrees barkometer									
	110.0	111.0	112.0	113.0	114.0	115.0	116.0	117.0	118.0	119.0
	Corresponding degrees barkometer at 60° F									
50	108.6	109.6	110.6	111.6	112.6	113.6	114.6	115.6	116.6	117.6
51	108.8	109.8	110.8	111.8	112.7	113.7	114.7	115.7	116.7	117.7
52	108.9	109.9	110.9	111.9	112.9	113.8	114.8	115.8	116.8	117.8
53	109.1	110.1	111.0	112.0	113.0	114.0	115.0	116.0	117.0	118.0
54	109.2	110.2	111.2	112.2	113.2	114.1	115.1	116.1	117.1	118.1
55	109.3	110.3	111.3	112.3	113.3	114.3	115.3	116.3	117.3	118.3
56	109.5	110.5	111.5	112.5	113.4	114.4	115.4	116.4	117.4	118.4
57	109.6	110.6	111.6	112.6	113.6	114.6	115.6	116.6	117.6	118.6
58	109.7	110.7	111.7	112.7	113.7	114.7	115.7	116.7	117.7	118.7
59	109.9	110.9	111.9	112.9	113.9	114.9	115.9	116.9	117.9	118.9
60	110.0	111.0	112.0	113.0	114.0	115.0	116.0	117.0	118.0	119.0
61	110.2	111.2	112.2	113.2	114.2	115.2	116.2	117.2	118.2	119.2
62	110.3	111.3	112.3	113.3	114.3	115.3	116.3	117.3	118.4	119.4
63	110.5	111.5	112.5	113.5	114.5	115.5	116.5	117.5	118.5	119.5
64	110.6	111.6	112.6	113.6	114.6	115.7	116.7	117.7	118.7	119.7
65	110.8	111.8	112.8	113.8	114.8	115.8	116.8	117.8	118.8	119.8
66	111.0	112.0	113.0	114.0	115.0	116.0	117.0	118.0	119.0	120.0
67	111.1	112.1	113.2	114.2	115.2	116.2	117.2	118.2	119.2	120.2
68	111.3	112.3	113.3	114.3	115.3	116.3	117.4	118.4	119.4	120.4
69	111.5	112.5	113.5	114.5	115.5	116.5	117.6	118.6	119.6	120.6
70	111.7	112.7	113.7	114.7	115.7	116.7	117.7	118.7	119.8	120.8
71	111.9	112.9	113.9	114.9	115.9	116.9	117.9	118.9	119.9	120.9
72	112.1	113.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1
73	112.3	113.3	114.3	115.3	116.3	117.3	118.3	119.3	120.3	121.3
74	112.4	113.5	114.5	115.5	116.5	117.5	118.5	119.5	120.5	121.5
75	112.6	113.6	114.6	115.7	116.7	117.7	118.7	119.7	120.7	121.7
76	112.8	113.8	114.8	115.8	116.9	117.9	118.9	119.9	120.9	121.9
77	113.0	114.0	115.0	116.0	117.0	118.1	119.1	120.1	121.1	122.1
78	113.2	114.2	115.2	116.2	117.3	118.3	119.3	120.3	121.3	122.3
79	113.4	114.4	115.4	116.4	117.5	118.5	119.5	120.5	121.5	122.5
80	113.6	114.6	115.6	116.7	117.7	118.7	119.7	120.7	121.7	122.7
81	113.8	114.9	115.9	116.9	117.9	118.9	119.9	120.9	121.9	123.0
82	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	122.2	123.2
83	114.3	115.3	116.3	117.3	118.3	119.3	120.4	121.4	122.4	123.4
84	114.5	115.5	116.5	117.5	118.5	119.6	120.6	121.6	122.6	123.6
85	114.7	115.7	116.7	117.7	118.8	119.8	120.8	121.8	122.8	123.8
86	114.9	115.9	117.0	118.0	119.0	120.0	121.0	122.0	123.0	124.1
87	115.2	116.2	117.2	118.2	119.2	120.2	121.2	122.3	123.3	124.3
88	115.4	116.4	117.4	118.4	119.5	120.5	121.5	122.5	123.5	124.5
89	115.6	116.6	117.7	118.7	119.7	120.7	121.7	122.7	123.7	124.8
90	115.9	116.9	117.9	118.9	119.9	120.9	122.0	123.0	124.0	125.0
91	116.1	117.1	118.1	119.1	120.2	121.2	122.2	123.2	124.2	125.2
92	116.3	117.4	118.4	119.4	120.4	121.4	122.4	123.4	124.4	125.5
93	116.6	117.6	118.6	119.6	120.6	121.6	122.6	123.7	124.7	125.7
94	116.8	117.8	118.8	119.8	120.8	121.9	122.9	123.9	124.9	126.0
95	117.0	118.0	119.1	120.1	121.1	122.1	123.1	124.2	125.2	126.2
96	117.2	118.3	119.3	120.3	121.3	122.3	123.4	124.4	125.4	126.4
97	117.5	118.5	119.5	120.6	121.6	122.6	123.6	124.6	125.6	126.7
98	117.8	118.8	119.8	120.8	121.8	122.8	123.8	124.9	125.9	126.9
99	118.0	119.0	120.0	121.0	122.1	123.1	124.1	125.1	126.2	127.2
100	118.2	119.3	120.3	121.3	122.3	123.3	124.4	125.4	126.4	127.4

TABLE 2.—*Reduction of observed degrees Twaddle*[1] *to degrees Twaddle at 60° F*

[See explanatory note on p. 4]

Observed temperature in °F	Observed degrees Twaddle								
	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
	Corresponding degrees Twaddle at 60° F								
50	------	0.9	1.9	2.9	3.9	4.8	5.8	6.8	7.8
51	------	.9	1.9	2.9	3.9	4.9	5.9	6.8	7.8
52	------	.9	1.9	2.9	3.9	4.9	5.9	6.9	7.9
53	------	.9	1.9	2.9	3.9	4.9	5.9	6.9	7.9
54	------	.9	1.9	2.9	3.9	4.9	5.9	6.9	7.9
55	------	.9	1.9	2.9	3.9	4.9	5.9	6.9	7.9
56	------	.9	1.9	2.9	3.9	4.9	5.9	6.9	7.9
57	------	1.0	1.9	2.9	3.9	4.9	5.9	6.9	7.9
58	------	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
59	------	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
60	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
61	.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
62	.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
63	.0	1.1	2.1	3.1	4.1	5.1	6.1	7.1	8.1
64	.1	1.1	2.1	3.1	4.1	5.1	6.1	7.1	8.1
65	.1	1.1	2.1	3.1	4.1	5.1	6.1	7.1	8.1
66	.1	1.1	2.1	3.1	4.1	5.1	6.1	7.1	8.1
67	.1	1.1	2.1	3.1	4.1	5.1	6.2	7.2	8.2
68	.1	1.1	2.2	3.2	4.2	5.2	6.2	7.2	8.2
69	.2	1.2	2.2	3.2	4.2	5.2	6.2	7.2	8.2
70	.2	1.2	2.2	3.2	4.2	5.2	6.2	7.2	8.2
71	.2	1.2	2.2	3.2	4.2	5.2	6.3	7.3	8.3
72	.2	1.2	2.3	3.3	4.3	5.3	6.3	7.3	8.3
73	.3	1.3	2.3	3.3	4.3	5.3	6.3	7.3	8.3
74	.3	1.3	2.3	3.3	4.3	5.3	6.3	7.3	8.4
75	.3	1.3	2.3	3.3	4.3	5.4	6.4	7.4	8.4
76	.3	1.3	2.4	3.4	4.4	5.4	6.4	7.4	8.4
77	.4	1.4	2.4	3.4	4.4	5.4	6.4	7.4	8.4
78	.4	1.4	2.4	3.4	4.4	5.4	6.5	7.5	8.5
79	.4	1.4	2.4	3.4	4.5	5.5	6.5	7.5	8.5
80	.4	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5
81	.5	1.5	2.5	3.5	4.5	5.5	6.6	7.6	8.6
82	.5	1.5	2.5	3.5	4.6	5.6	6.6	7.6	8.6
83	.5	1.5	2.6	3.6	4.6	5.6	6.6	7.6	8.6
84	.6	1.6	2.6	3.6	4.6	5.6	6.7	7.7	8.7
85	.6	1.6	2.6	3.6	4.7	5.7	6.7	7.7	8.7
86	.6	1.6	2.7	3.7	4.7	5.7	6.7	7.7	8.8
87	.7	1.7	2.7	3.7	4.7	5.7	6.8	7.8	8.8
88	.7	1.7	2.7	3.7	4.8	5.8	6.8	7.8	8.8
89	.7	1.7	2.8	3.8	4.8	5.8	6.8	7.8	8.9
90	.8	1.8	2.8	3.8	4.8	5.8	6.9	7.9	8.9
91	.8	1.8	2.8	3.8	4.9	5.9	6.9	7.9	8.9
92	.8	1.8	2.9	3.9	4.9	5.9	6.9	8.0	9.0
93	.9	1.9	2.9	3.9	4.9	6.0	7.0	8.0	9.0
94	.9	1.9	2.9	4.0	5.0	6.0	7.0	8.0	9.1
95	.9	2.0	3.0	4.0	5.0	6.0	7.1	8.1	9.1
96	1.0	2.0	3.0	4.0	5.1	6.1	7.1	8.1	9.1
97	1.0	2.0	3.1	4.1	5.1	6.1	7.1	8.2	9.2
98	1.0	2.1	3.1	4.1	5.1	6.2	7.2	8.2	9.2
99	1.1	2.1	3.1	4.2	5.2	6.2	7.2	8.2	9.3
100	1.1	2.2	3.2	4.2	5.2	6.2	7.3	8.3	9.3

[1] Also spelled Twaddell.

TABLE 2.—*Reduction of observed degrees Twaddle to degrees Twaddle at 60° F*—Continued

Observed temperature in °F	Observed degrees Twaddle							
	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0
	Corresponding degrees Twaddle at 60° F							
50	8.8	9.8	10.8	11.8	12.8	13.8	14.8	15.8
51	8.8	9.8	10.8	11.8	12.8	13.8	14.8	15.8
52	8.9	9.8	10.8	11.8	12.8	13.8	14.8	15.8
53	8.9	9.9	10.9	11.9	12.9	13.8	14.8	15.8
54	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9
55	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9
56	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9
57	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9
58	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0
59	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0
60	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0
61	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0
62	9.0	10.0	11.0	12.0	13.1	14.1	15.1	16.1
63	9.1	10.1	11.1	12.1	13.1	14.1	15.1	16.1
64	9.1	10.1	11.1	12.1	13.1	14.1	15.1	16.1
65	9.1	10.1	11.1	12.1	13.1	14.1	15.1	16.1
66	9.1	10.1	11.2	12.2	13.2	14.2	15.2	16.2
67	9.2	10.2	11.2	12.2	13.2	14.2	15.2	16.2
68	9.2	10.2	11.2	12.2	13.2	14.2	15.2	16.2
69	9.2	10.2	11.2	12.2	13.2	14.2	15.3	16.3
70	9.3	10.3	11.3	12.3	13.3	14.3	15.3	16.3
71	9.3	10.3	11.3	12.3	13.3	14.3	15.3	16.3
72	9.3	10.3	11.3	12.3	13.3	14.3	15.4	16.4
73	9.3	10.3	11.4	12.4	13.4	14.4	15.4	16.4
74	9.4	10.4	11.4	12.4	13.4	14.4	15.4	16.4
75	9.4	10.4	11.4	12.4	13.4	14.4	15.5	16.5
76	9.4	10.4	11.4	12.5	13.5	14.5	15.5	16.5
77	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5
78	9.5	10.5	11.5	12.5	13.5	14.6	15.6	16.6
79	9.5	10.5	11.6	12.6	13.6	14.6	15.6	16.6
80	9.6	10.6	11.6	12.6	13.6	14.6	15.6	16.6
81	9.6	10.6	11.6	12.6	13.7	14.7	15.7	16.7
82	9.6	10.6	11.7	12.7	13.7	14.7	15.7	16.7
83	9.7	10.7	11.7	12.7	13.7	14.7	15.7	16.8
84	9.7	10.7	11.7	12.7	13.8	14.8	15.8	16.8
85	9.7	10.8	11.8	12.8	13.8	14.8	15.8	16.8
86	9.8	10.8	11.8	12.8	13.8	14.9	15.9	16.9
87	9.8	10.8	11.8	12.9	13.9	14.9	15.9	16.9
88	9.8	10.9	11.9	12.9	13.9	14.9	15.9	17.0
89	9.9	10.9	11.9	12.9	14.0	15.0	16.0	17.0
90	9.9	10.9	12.0	13.0	14.0	15.0	16.0	17.0
91	10.0	11.0	12.0	13.0	14.0	15.1	16.1	17.1
92	10.0	11.0	12.0	13.1	14.1	15.1	16.1	17.1
93	10.0	11.1	12.1	13.1	14.1	15.1	16.2	17.2
94	10.1	11.1	12.1	13.1	14.2	15.2	16.2	17.2
95	10.1	11.1	12.2	13.2	14.2	15.2	16.3	17.3
96	10.2	11.2	12.2	13.2	14.3	15.3	16.3	17.3
97	10.2	11.2	12.3	13.3	14.3	15.3	16.3	17.4
98	10.3	11.3	12.3	13.3	14.3	15.4	16.4	17.4
99	10.3	11.3	12.3	13.4	14.4	15.4	16.4	17.5
100	10.3	11.4	12.4	13.4	14.4	15.5	16.5	17.5

TABLE 2.—*Reduction of observed degrees Twaddle to degrees Twaddle at 60° F*—Continued

Observed temperature in °F	Observed degrees Twaddle							
	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0
	Corresponding degrees Twaddle at 60° F							
50	16.8	17.8	18.7	19.7	20.7	21.7	22.7	23.7
51	16.8	17.8	18.8	19.8	20.8	21.8	22.7	23.7
52	16.8	17.8	18.8	19.8	20.8	21.8	22.8	23.8
53	16.8	17.8	18.8	19.8	20.8	21.8	22.8	23.8
54	16.8	17.8	18.8	19.8	20.8	21.8	22.8	23.8
55	16.9	17.9	18.9	19.9	20.9	21.9	22.9	23.8
56	16.9	17.9	18.9	19.9	20.9	21.9	22.9	23.9
57	16.9	17.9	18.9	19.9	20.9	21.9	22.9	23.9
58	17.0	17.9	18.9	19.9	20.9	21.9	22.9	23.9
59	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0
60	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0
61	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0
62	17.1	18.1	19.1	20.1	21.1	22.1	23.1	24.1
63	17.1	18.1	19.1	20.1	21.1	22.1	23.1	24.1
64	17.1	18.1	19.1	20.1	21.1	22.1	23.1	24.1
65	17.1	18.2	19.2	20.2	21.2	22.2	23.2	24.2
66	17.2	18.2	19.2	20.2	21.2	22.2	23.2	24.2
67	17.2	18.2	19.2	20.2	21.2	22.2	23.2	24.2
68	17.2	18.2	19.2	20.3	21.3	22.3	23.3	24.3
69	17.3	18.3	19.3	20.3	21.3	22.3	23.3	24.3
70	17.3	18.3	19.3	20.3	21.3	22.3	23.3	24.4
71	17.3	18.3	19.4	20.4	21.4	22.4	23.4	24.4
72	17.4	18.4	19.4	20.4	21.4	22.4	23.4	24.4
73	17.4	18.4	19.4	20.4	21.4	22.5	23.5	24.5
74	17.4	18.5	19.5	20.5	21.5	22.5	23.5	24.5
75	17.5	18.5	19.5	20.5	21.5	22.5	23.5	24.5
76	17.5	18.5	19.5	20.5	21.6	22.6	23.6	24.6
77	17.5	18.6	19.6	20.6	21.6	22.6	23.6	24.6
78	17.6	18.6	19.6	20.6	21.6	22.6	23.7	24.7
79	17.6	18.6	19.6	20.7	21.7	22.7	23.7	24.7
80	17.7	18.7	19.7	20.7	21.7	22.7	23.7	24.8
81	17.7	18.7	19.7	20.7	21.8	22.8	23.8	24.8
82	17.7	18.8	19.8	20.8	21.8	22.8	23.8	24.8
83	17.8	18.8	19.8	20.8	21.8	22.9	23.9	24.9
84	17.8	18.8	19.8	20.9	21.9	22.9	23.9	24.9
85	17.9	18.9	19.9	20.9	21.9	22.9	24.0	25.0
86	17.9	18.9	19.9	21.0	22.0	23.0	24.0	25.0
87	17.9	19.0	20.0	21.0	22.0	23.0	24.0	25.1
88	18.0	19.0	20.0	21.0	22.1	23.1	24.1	25.1
89	18.0	19.1	20.1	21.1	22.1	23.1	24.1	25.2
90	18.1	19.1	20.1	21.1	22.2	23.2	24.2	25.2
91	18.1	19.1	20.2	21.2	22.2	23.2	24.2	25.3
92	18.2	19.2	20.2	21.2	22.3	23.3	24.3	25.3
93	18.2	19.2	20.2	21.3	22.3	23.3	24.3	25.3
94	18.3	19.3	20.3	21.3	22.3	23.4	24.4	25.4
95	18.3	19.3	20.3	21.4	22.4	23.4	24.4	25.4
96	18.3	19.4	20.4	21.4	22.4	23.4	24.5	25.5
97	18.4	19.4	20.4	21.5	22.5	23.5	24.5	25.5
98	18.4	19.5	20.5	21.5	22.5	23.5	24.6	25.6
99	18.5	19.5	20.5	21.6	22.6	23.6	24.6	25.6
100	18.5	19.5	20.6	21.6	22.6	23.6	24.7	25.7

TABLE 3.—*Reduction of observed degrees Baumé to degrees Baumé at 60° F*

[See explanatory note on p. 4]

Observed temperature in °F	Observed degrees Baumé							
	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0
	Corresponding degrees Baumé at 60° F							
50	-------	0.9	1.9	2.9	3.9	4.9	5.9	6.9
51	-------	.9	1.9	2.9	3.9	4.9	5.9	6.9
52	-------	.9	1.9	2.9	3.9	4.9	5.9	6.9
53	-------	.9	1.9	2.9	3.9	4.9	5.9	6.9
54	-------	.9	1.9	2.9	3.9	4.9	5.9	6.9
55	-------	.9	1.9	2.9	3.9	4.9	5.9	6.9
56	-------	1.0	2.0	3.0	4.0	5.0	6.0	6.9
57	-------	1.0	2.0	3.0	4.0	5.0	6.0	7.0
58	-------	1.0	2.0	3.0	4.0	5.0	6.0	7.0
59	-------	1.0	2.0	3.0	4.0	5.0	6.0	7.0
60	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0
61	.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0
62	.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0
63	.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0
64	.0	1.1	2.1	3.1	4.1	5.1	6.1	7.1
65	.1	1.1	2.1	3.1	4.1	5.1	6.1	7.1
66	.1	1.1	2.1	3.1	4.1	5.1	6.1	7.1
67	.1	1.1	2.1	3.1	4.1	5.1	6.1	7.1
68	.1	1.1	2.1	3.1	4.1	5.1	6.1	7.1
69	.1	1.1	2.1	3.1	4.1	5.1	6.1	7.1
70	.1	1.1	2.1	3.1	4.2	5.2	6.2	7.2
71	.2	1.2	2.2	3.2	4.2	5.2	6.2	7.2
72	.2	1.2	2.2	3.2	4.2	5.2	6.2	7.2
73	.2	1.2	2.2	3.2	4.2	5.2	6.2	7.2
74	.2	1.2	2.2	3.2	4.2	5.2	6.2	7.2
75	.2	1.2	2.2	3.2	4.2	5.3	6.3	7.3
76	.2	1.2	2.3	3.3	4.3	5.3	6.3	7.3
77	.3	1.3	2.3	3.3	4.3	5.3	6.3	7.3
78	.3	1.3	2.3	3.3	4.3	5.3	6.3	7.3
79	.3	1.3	2.3	3.3	4.3	5.3	6.3	7.3
80	.3	1.3	2.3	3.3	4.4	5.4	6.4	7.4
81	.3	1.3	2.4	3.4	4.4	5.4	6.4	7.4
82	.4	1.4	2.4	3.4	4.4	5.4	6.4	7.4
83	.4	1.4	2.4	3.4	4.4	5.4	6.4	7.4
84	.4	1.4	2.4	3.4	4.4	5.4	6.5	7.5
85	.4	1.4	2.5	3.5	4.5	5.5	6.5	7.5
86	.4	1.5	2.5	3.5	4.5	5.5	6.5	7.5
87	.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5
88	.5	1.5	2.5	3.5	4.5	5.5	6.6	7.6
89	.5	1.5	2.5	3.5	4.6	5.6	6.6	7.6
90	.5	1.6	2.6	3.6	4.6	5.6	6.6	7.6
91	.6	1.6	2.6	3.6	4.6	5.6	6.6	7.6
92	.6	1.6	2.6	3.6	4.6	5.6	6.7	7.7
93	.6	1.6	2.6	3.6	4.7	5.7	6.7	7.7
94	.6	1.7	2.7	3.7	4.7	5.7	6.7	7.7
95	.7	1.7	2.7	3.7	4.7	5.7	6.7	7.7
96	.7	1.7	2.7	3.7	4.7	5.7	6.8	7.8
97	.7	1.7	2.7	3.8	4.8	5.8	6.8	7.8
98	.8	1.8	2.8	3.8	4.8	5.8	6.8	7.8
99	.8	1.8	2.8	3.8	4.8	5.8	6.9	7.9
100	.8	1.8	2.8	3.8	4.9	5.9	6.9	7.9

TABLE 3.—*Reduction of observed degrees Baumé to degrees Baumé at 60° F*—Continued

Observed temperature in °F	Observed degrees Baumé							
	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
	Corresponding degrees Baumé at 60° F							
50	7.9	8.9	9.9	10.9	11.8	12.8	13.8	14.8
51	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9
52	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9
53	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9
54	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9
55	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9
56	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9
57	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
58	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
59	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
60	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
61	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
62	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
63	8.0	9.1	10.1	11.1	12.1	13.1	14.1	15.1
64	8.1	9.1	10.1	11.1	12.1	13.1	14.1	15.1
65	8.1	9.1	10.1	11.1	12.1	13.1	14.1	15.1
66	8.1	9.1	10.1	11.1	12.1	13.1	14.1	15.1
67	8.1	9.1	10.1	11.1	12.1	13.1	14.1	15.1
68	8.1	9.1	10.1	11.1	12.1	13.1	14.2	15.2
69	8.2	9.2	10.2	11.2	12.2	13.2	14.2	15.2
70	8.2	9.2	10.2	11.2	12.2	13.2	14.2	15.2
71	8.2	9.2	10.2	11.2	12.2	13.2	14.2	15.2
72	8.2	9.2	10.2	11.2	12.2	13.2	14.2	15.2
73	8.2	9.2	10.2	11.3	12.3	13.3	14.3	15.3
74	8.3	9.3	10.3	11.3	12.3	13.3	14.3	15.3
75	8.3	9.3	10.3	11.3	12.3	13.3	14.3	15.3
76	8.3	9.3	10.3	11.3	12.3	13.3	14.3	15.3
77	8.3	9.3	10.3	11.3	12.3	13.3	14.4	15.4
78	8.3	9.3	10.3	11.4	12.4	13.4	14.4	15.4
79	8.4	9.4	10.4	11.4	12.4	13.4	14.4	15.4
80	8.4	9.4	10.4	11.4	12.4	13.4	14.4	15.4
81	8.4	9.4	10.4	11.4	12.4	13.4	14.4	15.5
82	8.4	9.4	10.4	11.5	12.5	13.5	14.5	15.5
83	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5
84	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5
85	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5
86	8.5	9.5	10.5	11.6	12.6	13.6	14.6	15.6
87	8.6	9.6	10.6	11.6	12.6	13.6	14.6	15.6
88	8.6	9.6	10.6	11.6	12.6	13.6	14.6	15.6
89	8.6	9.6	10.6	11.6	12.6	13.7	14.7	15.7
90	8.6	9.6	10.6	11.7	12.7	13.7	14.7	15.7
91	8.7	9.7	10.7	11.7	12.7	13.7	14.7	15.7
92	8.7	9.7	10.7	11.7	12.7	13.7	14.7	15.7
93	8.7	9.7	10.7	11.7	12.7	13.8	14.8	15.8
94	8.7	9.7	10.8	11.8	12.8	13.8	14.8	15.8
95	8.8	9.8	10.8	11.8	12.8	13.8	14.8	15.8
96	8.8	9.8	10.8	11.8	12.8	13.8	14.8	15.8
97	8.8	9.8	10.8	11.8	12.9	13.9	14.9	15.9
98	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9
99	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9
100	8.9	9.9	10.9	11.9	12.9	13.9	15.0	16.0

TABLE 4.—*Thermal-density coefficients for vegetable tanning extracts*

These coefficients may be used with the equation

$$\text{Sp gr}\ \frac{t}{15.56} = \text{sp gr}\ \frac{15.56}{15.56} + \alpha\frac{15.56}{15.56}(t-15.56)$$

$$+\beta\frac{15.56}{15.56}(t-15.56)^2+\gamma\frac{15.56}{15.56}(t-15.56)^3$$

to find the specific gravity of a vegetable tanning extract at any temperature if its specific gravity at $\frac{15.56°}{15.56°}$ C $\left(\frac{60°}{60°}\text{ F}\right)$ is known. For example, if a sample of liquid quebracho extract has a specific gravity of 1.0500 at $\frac{15.56°}{15.56°}$ C, its specific gravity at $\frac{30°}{15.56°}$ C is computed as follows:

$$\text{Sp gr}\ \frac{30°}{15.56°}\text{ C} = 1.0500-0.000224(30-15.56)-0.0000050(30-15.56)^2+$$
$$0.00000003(30-15.56)^3 = 1.0457.$$

Specific gravity at $\frac{15.56°}{15.56°}$ C $\left(\frac{60°}{60°}\text{ F}\right)$	$\alpha\frac{15.56}{15.56}\times 10^5$	$\beta\frac{15.56}{15.56}\times 10^7$	$\gamma\frac{15.56}{15.56}\times 10^8$
1.000	−160	−54	+3
1.005	−167	−54	+3
1.010	−173	−54	+3
1.015	−180	−53	+3
1.020	−186	−53	+3
1.025	−192	−52	+3
1.030	−199	−52	+3
1.035	−205	−51	+3
1.040	−212	−51	+3
1.045	−218	−50	+3
1.050	−224	−50	+3
1.055	−231	−49	+3
1.060	−237	−49	+3
1.065	−244	−48	+3
1.070	−250	−48	+3
1.075	−256	−48	+3
1.080	−263	−47	+3
1.085	−269	−47	+3
1.090	−275	−46	+3
1.095	−282	−46	+3
1.100	−288	−45	+3
1.105	−294	−45	+3
1.110	−301	−44	+3
1.115	−308	−44	+3
1.120	−314	−43	+3

TABLE 5.—*Comparison of hydrometer scales*

Specific gravity 60°/60° F	Degrees barkometer 60° F	Degrees Twaddle 60° F	Degrees Baumé 60° F	Specific gravity 60°/60° F	Degrees barkometer 60° F	Degrees Twaddle 60° F	Degrees Baumé 60° F
1.000	0	0.0	0.000	1.050	50	10.0	6.905
1.001	1	.2	.145	1.051	51	10.2	7.036
1.002	2	.4	.289	1.052	52	10.4	7.167
1.003	3	.6	.434	1.053	53	10.6	7.298
1.004	4	.8	.578	1.054	54	10.8	7.429
1.005	5	1.0	.721	1.055	55	11.0	7.559
1.006	6	1.2	.865	1.056	56	11.2	7.689
1.007	7	1.4	1.008	1.057	57	11.4	7.819
1.008	8	1.6	1.151	1.058	58	11.6	7.949
1.009	9	1.8	1.293	1.059	59	11.8	8.078
1.010	10	2.0	1.436	1.060	60	12.0	8.208
1.011	11	2.2	1.578	1.061	61	12.2	8.336
1.012	12	2.4	1.719	1.062	62	12.4	8.465
1.013	13	2.6	1.861	1.063	63	12.6	8.594
1.014	14	2.8	2.002	1.064	64	12.8	8.722
1.015	15	3.0	2.143	1.065	65	13.0	8.850
1.016	16	3.2	2.283	1.066	66	13.2	8.978
1.017	17	3.4	2.424	1.067	67	13.4	9.105
1.018	18	3.6	2.564	1.068	68	13.6	9.232
1.019	19	3.8	2.704	1.069	69	13.8	9.359
1.020	20	4.0	2.843	1.070	70	14.0	9.486
1.021	21	4.2	2.982	1.071	71	14.2	9.613
1.022	22	4.4	3.121	1.072	72	14.4	9.739
1.023	23	4.6	3.260	1.073	73	14.6	9.865
1.024	24	4.8	3,399	1.074	74	14.8	9.991
1.025	25	5.0	3.537	1.075	75	15.0	10.116
1.026	26	5.2	3.675	1.076	76	15.2	10.242
1.027	27	5.4	3.812	1.077	77	15.4	10.367
1.028	28	5.6	3.950	1.078	78	15.6	10.492
1.029	29	5.8	4.087	1.079	79	15.8	10.616
1.030	30	6.0	4.223	1.080	80	16.0	10.741
1.031	31	6.2	4.360	1.081	81	16.2	10.865
1.032	32	6.4	4.496	1.082	82	16.4	10.989
1.033	33	6.6	4.632	1.083	83	16.6	11.113
1.034	34	6.8	4.768	1.084	84	16.8	11.236
1.035	35	7.0	4.903	1.085	85	17.0	11.359
1.036	36	7.2	5.038	1.086	86	17.2	11.483
1.037	37	7.4	5.174	1.087	87	17.4	11.605
1.038	38	7.6	5.308	1.088	88	17.6	11.728
1.039	39	7.8	5.443	1.089	89	17.8	11.850
1.040	40	8.0	5.577	1.090	90	18.0	11.972
1.041	41	8.2	5.711	1.091	91	18.2	12.094
1.042	42	8.4	5.845	1.092	92	18.4	12.216
1.043	43	8.6	5.978	1.093	93	18.6	12.338
1.044	44	8.8	6.111	1.094	94	18.8	12.459
1.045	45	9.0	6.244	1.095	95	19.0	12.580
1.046	46	9.2	6.377	1.096	96	19.2	12.701
1.047	47	9.4	6.509	1.097	97	19.4	12.821
1.048	48	9.6	6.641	1.098	98	19.6	12.942
1.049	49	9.8	6.773	1.099	99	19.8	13.062

TABLE 5.—*Comparison of hydrometer scales*—Continued

Specific gravity 60°/60° F	Degrees barkometer 60° F	Degrees Twaddle 60° F	Degrees Baumé 60° F	Specific gravity 60°/60° F	Degrees barkometer 60° F	Degrees Twaddle 60° F	Degrees Baumé 60° F
1.100	100	20.0	13.182	1.110	110	22.0	14.370
1.101	101	20.2	13.302	1.111	111	22.2	14.487
1.102	102	20.4	13.421	1.112	112	22.4	14.604
1.103	103	20.6	13.540	1.113	113	22.6	14.721
1.104	104	20.8	13.659	1.114	114	22.8	14.838
1.105	105	21.0	13.778	1.115	115	23.0	14.955
1.106	106	21.2	13.897	1.116	116	23.2	15.072
1.107	107	21.4	14.015	1.117	117	23.4	15.188
1.108	108	21.6	14.134	1.118	118	23.6	15.304
1.109	109	21.8	14.252	1.119	119	23.8	15.420
				1.120	120	24.0	15.536

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