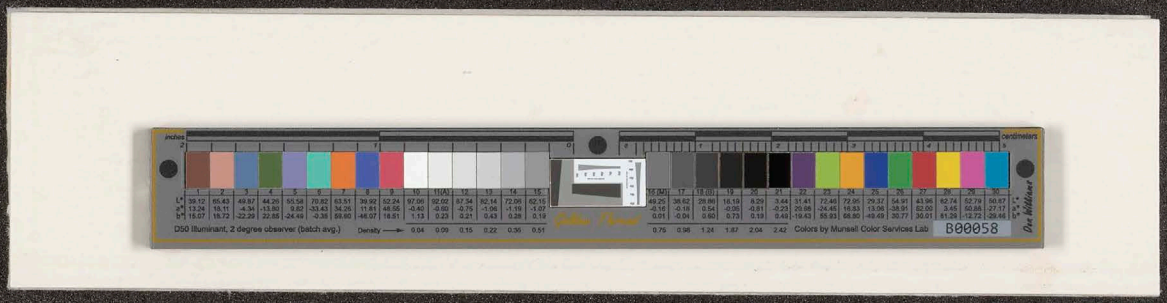
WILSON, JOHN HENRY
M-182

JOURNAL(1889)

Diary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D50 Illuminant, 2 degree observer (batch avg.)
Density
Colors by Munsell Color Services Lab
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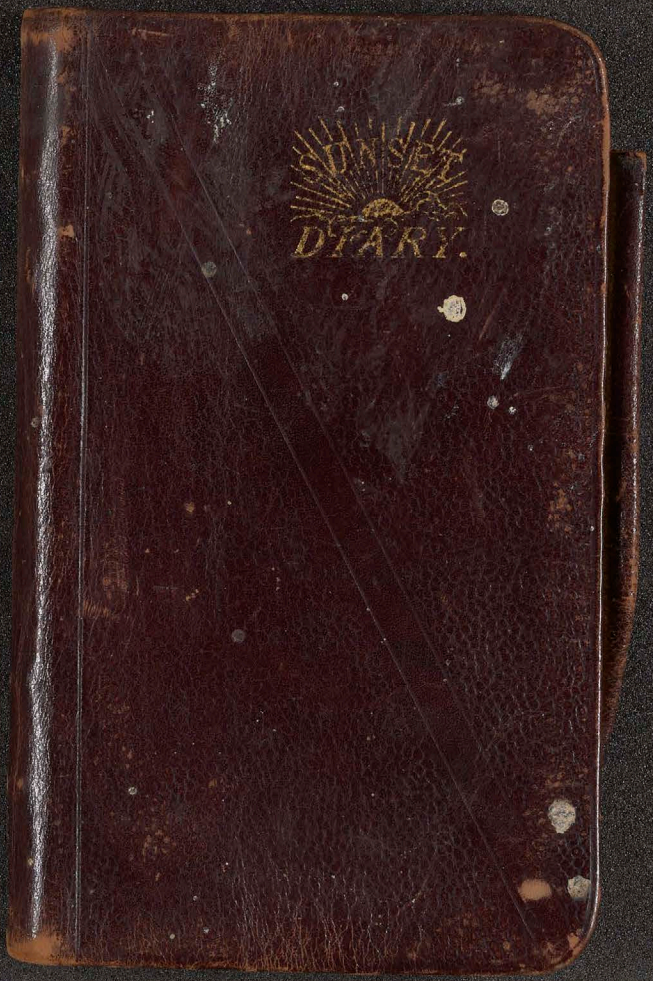
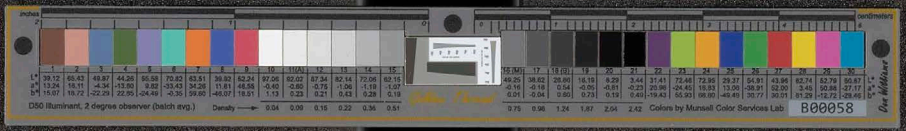

SUNSET
DIARY.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Density
Colors by Munsell Color Services Lab
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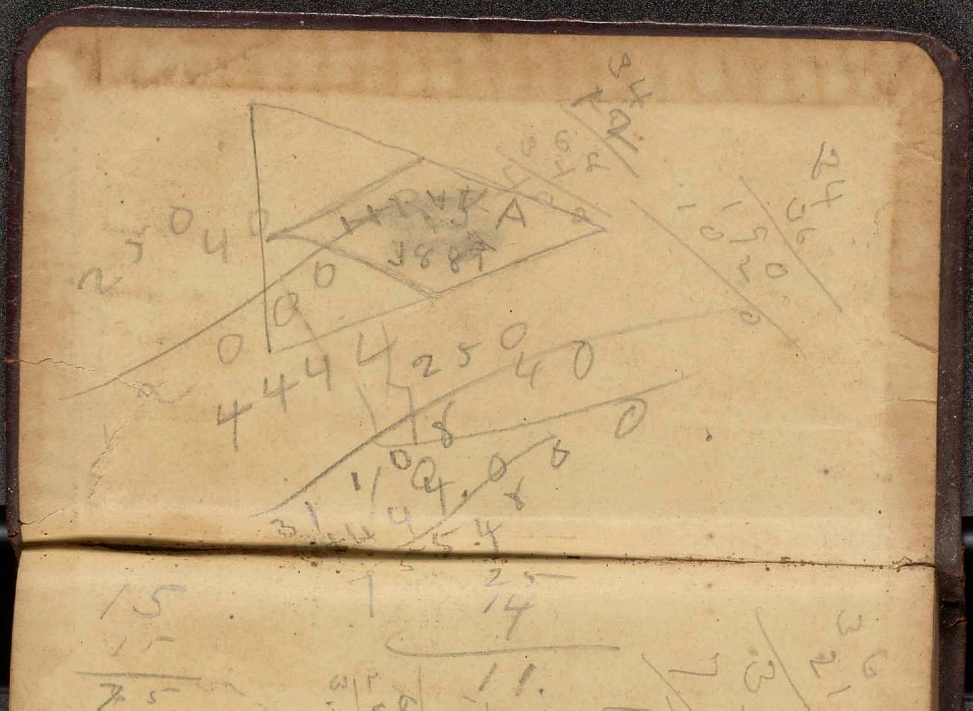
Inches
Centimeters
D50 Illuminant, 2 degree observer (batch avg.)
Density
Colors by Munsell Color Services Lab
B00037



inches
centimeters
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
L* 39.12 66.43 49.87 44.28 58.58 70.82 63.51 39.92 62.24 92.06 93.02 87.34 92.14 72.06 62.16
a* 13.24 18.11 -4.34 -13.90 9.82 -33.43 34.25 11.61 48.58 -0.40 -0.92 -0.76 -1.06 -1.19 -1.67
b* 15.07 16.72 -22.29 22.85 -24.49 -0.35 59.80 -46.07 18.51 1.13 0.23 0.21 0.43 0.28 0.19
16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
49.20 38.62 28.86 18.19 8.28 3.44 31.41 72.46 72.95 29.37 54.91 43.96 62.74 52.73 60.87
-0.16 -0.18 0.54 -0.06 -0.01 -0.23 20.98 -34.48 16.53 13.06 -38.91 52.00 3.45 50.55 -27.17
0.01 -0.04 0.69 0.73 -0.19 0.49 -19.43 55.03 58.80 -49.48 30.77 30.01 81.29 -12.72 -29.46
D50 Illuminant, 2 degree observer (batch avg.)
Density 0.04 0.09 0.15 0.22 0.36 0.51
0.75 0.96 1.24 1.87 2.04 2.42
Colors by Munsell Color Services Lab
B00058
Dr. Hilliard

11,000
40
440
122
5000
0.50
100,000
Cash up 25,000
carpet 9,000
34,00
reaping 3665
41,065.00
Seat

1225
3
3665
120
5000
600,000
3000
3
9,000

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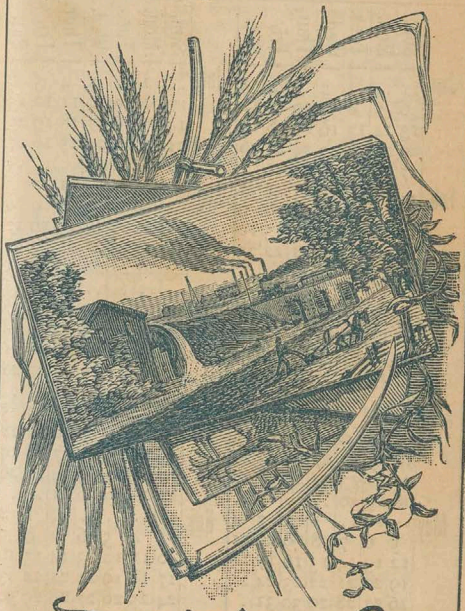
The

The SUNSET



DIARY

1889

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1889

	Sun.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
Jan.	..	..	1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31	..	..
Feb.	..	..	..	..	..	1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	..	..
Mar.	..	..	..	..	..	1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31	..	..	..	..	..	..
April	..	1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	..	..	..	..
May	..	..	..	1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	.
June	..	..	..	..	..	..	1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	..	..	..	..	..	..

	Sun.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
July	..	1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31	..	..	..
Aug.	..	..	..	..	1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
Sept.	..	..	..	..	..	..	..
	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	..	..	..	..	..
Oct.	..	..	1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31	..	..
Nov.	..	..	..	..	..	1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	..	..	..	..	.	..	..
Dec.	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31	..	..	..	.

Astronomical Calculations.

ECLIPSES.

There will be five Eclipses this year, three of the Sun and two of the Moon, as follows:

I. A Total Eclipse of the Sun Jan. 1. Throughout all the States east of Dakota, Nebraska, and Eastern Texas, the Sun will set more or less eclipsed. The total phase will be visible in California from Pt. Arena to Sacramento and Carson City to Fremont's Peak. Duration of total obscuration, two minutes.

II. A Partial Eclipse of the Moon January 16 and 17, visible generally; size, 8.4 digits, the Moon's diameter being 12 digits.

III. An Annular Eclipse of the Sun June 28, invisible in North America.

IV. A Partial Eclipse of the Moon July 12, invisible in the United States.

V. A Total Eclipse of the Sun Dec. 22, invisible in the United States except at the extremity of Cape Hatteras and the peninsular of Florida.

MORNING AND EVENING STARS.

Mercury—Morning, from Feb. 14 to April 25, June 19 to Aug. 7, and Oct. 15 to Dec. 7; Evening, until Feb. 14, and from April 25 to June 19, Aug. 7 to Oct. 15, and after Dec. 7.

Venus—Morning, after April 30; Evening, until April 30.

Mars—Morning, after June 17; Evening, until June 17.

Jupiter—Morning, until Mch. 27; Evening, after Mch. 27.

Saturn—Morning, after August 16; Evening, until August 16.

Uranus—Morning, until Jan. 11, and after Oct. 15; Evening, from Jan. 11 to Oct. 15.

THE SEASONS. (*Washington Mean Time.*)

		D.	H.	M.			D.	H.	M.
Winter begins,	1888, Dec.	21	3	53	mo., and lasts		89	0	49
Spring "	1889, Mch.	20	4	42	"	"	93	1	28
Summer "	1889, June	21	6	10	"	"	93	9	17
Autumn "	1889, Sept.	22	3	27	eve.,	"	89	18	25
Winter "	1889, Dec.	21	9	52	morn.,	Year,	365	5	59

CHRONOLOGICAL CYCLES.

Dominical Letter, .	F.	Roman Indiction, .	2
Epact (Moon's age Jan. 1),	28	Julian Period, .	6602
Lunar Cycle (Golden No.),	9	Dionysian Period, .	218
Solar Cycle, . .	22	Jewish Lunar Cycle, .	6

Herschel Weather Table.

"PROBABILITIES" BASED ON CHANGES OF THE MOON.

CHANGE BETWEEN	IN SUMMER.	IN WINTER.
12 and 2 A. M.,	Fair.	Frosty unless S. W.
2 " 4 "	Cold, with showers.	Snow, and stormy.
4 " 6 "	Rain.	Rain.
6 " 8 "	Wind and rain.	Stormy.
8 " 10 "	Changeable.	Rain, W.—Snow. E.
10 " 12 Noon,	Frequent showers.	Cold,—high wind.
12 " 2 P. M.,	Very rainy.	Snow or rain.
2 " 4 "	Changeable	Fair and mild.
4 " 6 "	Fair.	Fair.
6 " 8 "	Fair, if wind N. W.	Fair and frosty, N.
8 " 10 "	Rain, if S. or S. W.	Rain or snow, S.W.
10 " 12 Midn't,	Fair.	Fair and Frosty.

OBSERVATIONS.—1. The nearer the Moon's phases are to midnight, the fairer will be the weather for the next 7 days.

2. The nearer to noon, the more foul or wet weather.

3. Happening during six of the afternoon hours, *i. e.*, from four to ten, may be followed by fair weather, but this is mostly dependent on the wind, as is noted in the table.

Value of Foreign Coins.

U. S. MINT ASSAYS.

G: GOLD. S: SILVER.

	D.	C.	M.
Argentine Republic—			
Peso fuerte, G . .	1	0	0
Austria—Ducat, G .	2	28	3
Belgium—Franc, G & S	0	19	3
Brazil—Milreis, G .	0	54	6
Central America—			
Escudo, G . . .	1	84	4
Chili—Peso, G	0	91	2
China—Copper cash,	0	0	1
Cuba—Peso, G . .	0	92	5
Denmark—Crown, G	0	26	8
Egypt—Piaster, S .	0	4	0
France—Franc, G & S	0	19	3
German Empire—			
Mark, G	0	23	8
Great Britain—			
Sovereign (pound), G	4	86	6
Crown, S . . .	1	12	5
Florin, S . . .	0	45	0
Shilling, S . . .	0	22	5
Sixpence, S . .	0	11	3
Greece—Drachma, G & S	19	3	
Hayti—Dollar, S .	0	95	2
Hindostan—Rupee, S	0	45	7
India—Rupee, S .	0	39	0
Italy—Lira, G & S .	0	19	3
Japan—Yen, G . .	0	88	8
Mexico—Dollar, S .	0	89	4
Doubloon, G . .	15	59	3
Netherl'ds—Ducat, G	2	26	5
Norway—Crown, G	0	26	8
Peru—Sol, S . . .	0	82	3
Porto Rico—Peso, G	0	92	5
Portugal—Crown, G	5	86	7
Russia—Rouble, S .	0	65	8
Spain—Peseta, G & S	0	19	3
Sweden—Crown, G	0	26	8
Switzerl'd—Franc, G & S	19	3	
Tripoli—Mahbub, S	0	74	3
Tunis—Piaster, S .	0	11	8
Turkey—Piaster, G	0	4	4
U.S. of Col.—Peso, S	0	82	3

Rates of Postage.

DOMESTIC.—First Class.—Letters and all written matter, sealed or unsealed, and other matter fastened so that it cannot be easily examined, 2 cents per ounce or fraction thereof. Postal Cards furnished by Government, 1 cent. Special 10-cent stamp in addition to lawful postage attached to a letter entitles it to immediate delivery in any place of 4,000 population or over, between 7 o'clock A. M. and midnight.

Drop-Letters.—Delivered by carrier, 2 cents; not delivered by carrier, 1 cent.

Second Class.—Newspapers from office of publication or from news agency, to actual subscribers or to news agents, 1 cent per pound or fraction thereof, prepaid.

Third Class.—Printed matter of general information by any process except handwriting, copying-press, or type-writer, unsealed, including written correction of typographical errors, and manuscript copy accompanying proof-sheets, 1 cent for each 2 ounces or fraction thereof. Limit of weight, four pounds, except for a single book, which may weigh more.

Fourth Class.—Mailable merchandise and matter not included in foregoing classes, unsealed, 1 cent per ounce or fraction thereof. Limit of weight, four pounds.

Unmailable.—Obscene and fraudulent matter, liquids, and anything liable to injure the mails or handlers thereof.

FOREIGN.—Canada.—First-class matter, same rates as domestic postage; unsealed samples of merchandise under 8 ounces, 10 cents. Merchandise excluded.

Europe and all Postal Union Countries.—Letters, 5 cents per fifteen grams (½ oz.); postal cards, 2 cents each; unsealed matter and samples, 1 cent for each two ounces.

REGISTERED MATTER.—First, third, and fourth-class matter, domestic or foreign, may be registered; name and address of sender must be indorsed on envelope or package; fee, 10 cents, in addition to regular postage, for each letter or package.

MONEY ORDERS.—Postal Note.—Issued for any amount less than $5, and payable to bearer when duly receipted; fee, 3 cents.

Money-Order.—Issued for any amount not exceeding $100. Rates: not over $10, 8 cents; $10 to $15, 10 cents; $15 to $30, 15 cents; $30 to $40, 20 cents; $40 to $50, 25 cents; $50 to $60, 30 cents; $60 to $70, 35 cents; $70 to $80, 40 cents; $80 to $100, 45 cents.

Population of the United States.

STATES.

1	New York,	5,082,871
2	Pennsylvania,	4,282,891
3	Illinois,	3,316,208
4	Ohio,	3,198,062
5	Missouri,	2,217,529
6	Indiana,	1,978,301
7	Massachusetts,	1,941,465
8	Michigan,	1,856,100
9	Iowa,	1,753,980
10	Kentucky,	1,648,690
11	Texas,	1,591,749
12	Wisconsin,	1,563,423
13	Tennesee,	1,542,359
14	Georgia,	1,542,180
15	Virginia,	1,512,565
16	North Carolina,	1,399,750
17	New Jersey,	1,278,033
18	Kansas,	1,268,562
19	Alabama,	1,262,505
20	Mississippi,	1,131,597
21	Minnesota,	1,117,798
22	South Carolina,	995,577
23	Louisiana,	939,946
24	Maryland,	934,943
25	California,	864,694
26	Arkansas,	802,525
27	Nebraska,	740,753
28	Maine,	648,936
29	Connecticut,	622,700
30	West Virginia,	618,457
31	New Hampshire,	346,991
32	Florida,	341,722
33	Vermont,	332,286
34	Rhode Island,	276,531
35	Colorado,	194,327
36	Oregon,	174,768
37	Delaware,	146,608
38	Nevada,	62,266
	Total,	51,530,658

TERRITORIES.

1	Dakota,	415,610
2	Washington,	175,000
3	Dist. of Columbia,	161,515
4	Utah,	143,963
5	New Mexico,	119,565
6	Indian Territory,	78,310
7	Arizona,	40,440
8	Montana,	39,159
9	Idaho,	34,641
10	Alaska,	32,189
11	Wyoming,	23,181
	Total,	1,263,573
	Total Pop.,	52,794,231

PRINCIPAL CITIES.

1	New York, N. Y.,	1,350,000
2	Philadelphia, Pa.,	847,170
3	Chicago, Ill.,	700,353
4	Brooklyn, N. Y.,	650,000
5	St. Louis, Mo.,	475,000
6	Boston, Mass.,	390,597
7	Baltimore, Md.,	332,190
8	Cincinnati, O.,	300,000
9	S. Francisco, Cal.,	233,956
10	Cleveland, O.,	227,000
11	New Orleans, La.,	216,140
12	Buffalo, N. Y.,	202,818
13	Louisville, Ky.,	161,000
14	Milwaukee, Wis.,	158,500
15	Pittsburg, Pa.,	156,381
16	Detroit, Mich.,	155,000
17	Jersey City, N. J.,	153,513
18	Newark, N. J.,	152,988
19	Wash'gton, D.C.,	147,307
20	Minneapolis, Mn.,	129,210
21	Providence, R. I.,	118,070
22	St. Paul, Minn.,	111,397
23	Kansas City, Mo.,	105,042
24	Rochester, N. Y.,	100,003
25	Albany, N. Y.,	90,903
26	Indianapolis, Ind.,	90,054
27	Allegheny, Pa.,	78,681
28	Columbus, O.,	69,074
29	Worcester, Mass.,	68,383
30	Syracuse, N. Y.,	65,854
31	Nashville, Tenn.,	65,000
32	Lowell, Mass.,	64,051
33	Richmond, Va.,	63,600
34	Paterson, N. J.,	63,280

Weights and Measures.

Measures of Weight.—AVOIRDUPOIS: 16 drams equal 1 ounce; 16 ounces 1 pound; 112 pounds 1 hundred-weight; 20 hundred-weight 1 ton. TROY: 24 grains equal 1 penny-weight; 20 penny-weights 1 ounce; 12 ounces 1 pound. APOTHECARIES: 20 grains equal 1 scruple; 3 scruples 1 dram; 8 drams 1 ounce; 12 ounces 1 pound

Surface or Square Measure.—144 square inches equal 1 square foot; 9 square feet 1 square yard; 30¼ square yards 1 square rod or pole; 40 square rods 1 square rood; 4 square roods 1 square acre (43,560 ft.); 640 square acres 1 square mile.

Measures of Length.—16½ feet equal one rod or pole; 40 rods 1 furlong; 8 furlongs (5,280 ft.) 1 mile; 60 geographical miles 1 degree. ROPES AND CABLES: 6 feet equal 1 fathom; 120 fathoms 1 cables-length

Solid or Cubic Measure.—1,728 cubic inches equal 1 cubic foot; 27 cubic feet 1 cubic yard; 40 cubic feet of round timber 1 ton; 50 cubic feet of hewn timber 1 ton; 16 cubic feet of wood 1 cord foot of wood; 8 feet (or 128 cubic feet) 1 cord; 1 perch of stone equal to 24.75 cubic feet.

Dry Measure.—8 quarts equal 1 peck; 4 pecks 1 bushel; 8 bushels 1 quarter; 36 bushels 1 chaldron.

Liquid Measure.—60 drops equal a teaspoonful; 4 teaspoonfuls 1 tablespoonful; 1 tablespoonful one-sixth gill; 4 gills one pint; 2 pints 1 quart; 4 quarts 1 gallon; 2 gallons 1 peck; 9 gallons 1 firkin; 36 gallons 1 barrel; 54 gallons 1 hogshead (ale measure).

Measures of Capacity.—DRY: 2150.42 cubic inches equal 1 United States (or Winchester) bushel, the dimensions of which are 18½ in. diameter inside, 19½ in. outside, and 8 in. deep; 2747.70 cubic inches 1 heaped bushel, the cone of which must be not less than 6 inches high. LIQUIDS: 231 cubic inches equal 1 United States standard gallon; 282 cubic inches 1 ale gallon; 31½ U. S. gallons 1 barrel; 42 gallons 1 tierce; 63 gallons 1 hogshead; 84 gallons a puncheon; 126 gallons 1 pipe; 252 gallons 1 tun.

Comparative Weights and Measures.—1 GALLON, U. S. standard, contains: distilled water 8.3389 avoirdupois pounds, ale 10.05, sperm oil 7.25, linseed oil 7.75, proof spirits 7.9375, spirits of turpentine 7.3125; 1 CUBIC FOOT contains: bricks 124 pounds, clay 230, sand or loose earth 95, common soil 124, cork 15, marble 171, granite 165, cast-iron 450.55, wrought-iron 486.65, copper 555, lead 708.75, brass 534.75, tin 436, white pine 29.56, elm 34.9. English oak 60.04, sea water 64.03, fresh water 62.05, air .07529, steam .03689.

The Metric System.

Myria means 10,000, Kilo 1,000, Hekt 100, Deka 10, Deci .1, Cent .01, Mill .001. The Meter is the unit.

MEASURES OF LENGTH.

The Meter is 1 ten-millionth part of the distance from the equator to the pole. It is equivalent to 3 ft. 3⅜ inches.

Metric Denominations and Values.		Equivalents in Denominations in use.
Myriameter	=10,000 meters	=6.2137 miles.
Kilometer	= 1,000 meters	=0.62137 m., or 3.280 ft. 10 in.
Hektometer	= 100 meters	=328 feet and 1 inch.
Dekameter	= 10 meters	=393.7 inches.
Meter	= 1 meter	= 39.37 inches.
Decimeter	= .1 of a meter	= 3.937 inches.
Centimeter	= .01 of a meter	= 0.3937 inch.
Millimeter	=.001 of a meter	= 0.0394 inch.

MEASURES OF SURFACE.

The Arc is equal to a square whose side is 10 meters, and is 100 square meters.

Hectare	= 10,000 square meters	= 2,471 acres.
Are	= 1,000 square meters	= 119.6 square yards.
Centare	= 1 square meter	= 1.550 square inches.

MEASURES OF CAPACITY.

The liter is the capacity of a cube whose edge is a decimeter.

Names.	No. Liters.	Cubic Measure.	Dry Measure.	Wine Measure.
Kiloliter	=1,000	=1 meter	=1,308 cu. yds.	=264.17 galls.
Hectoliter	= 100	=.1 meter	=2 bu. 3.35 pks.	=26.417 galls.
Decoliter	= 10	=10 decim.	=9.08 quarts	=2.6417 galls.
Liter	= 1	= 1 decim.	=0.908 quart.	=1,0567 qts.
Deciliter	= .1	=.1 decim.	=6.1022 cu. in.	=0.845 gill.
Centiliter	= .01	=10 centim.	=0.6102 cu. in.	=0.338 fl'd oz.
Milliliter	= .001	= 1 centim.	=0.061 cubic in.	=0.27 fl'd dr.

WEIGHTS.

The gram is the weight of a cubic centimeter of water.

Names.		No. Grams.	Weight of what Quantity of Water at maximum density.	Avoirdupois Weight.
Millier or tonneau	=	1,000,000	= 1 cubic meter	=2204.6 lbs.
Quintal	=	100,000	= 1 hectoliter	=230.46 lbs.
Myriagram	=	10,000	=10 liters	=22.046 lbs.
Kilogram or kilo	=	1,000	= 1 liter	=2.2046 lbs.
Hectogram	=	100	= 1 deciliter	=3.5274 oz.
Dekagram	=	10	=10 cubic centim.	=0.3527 oz.
Gram	=	1	= 1 cubic centim.	=15.432 grs.
Decigram	=	.1	= .1 cubic centim.	=1.5432 grs.
Centigram	=	.01	=10 cubic millim.	=0.1543 gr.
Milligram	=	.001	= 1 cubic millim.	=0.0154 gr.

Business Information.

NOTES.

Demand Notes are payable on presentation, without grace, and bear legal interest after a demand has been made, if not so written. An endorser on a demand note is holden only for a limited time, variable in different States.

A Negotiable Note must be made payable either to bearer or order; if to order, must be properly endorsed by the person to whose order it is made. If the endorser wishes to avoid responsibility he can endorse "without recourse."

A Joint and Several Note is one signed by two or more persons, who each become liable for the whole amount.

Three days' grace are allowed on all time notes, after the time for payment expires; if not then paid, the endorser, if any, should be legally notified, to be holden.

"For value received" is usually inserted in a note, and should be, but is not absolutely necessary, as it is presumed by the law or supplied by proof.

Notes falling due Sunday, or on a legal holiday, must be paid the day previous. Notes dated Sunday are void.

Altering a note in any manner, by the holder, makes it void.

BILLS OF EXCHANGE.

A Bill of Exchange or Draft is an order drawn by one person or firm upon another, payable either at sight or at a stated future time.

It becomes an "Acceptance" when the party upon whom it is drawn writes across the face "Accepted," and signs his name thereto; and is negotiable and bankable the same as a note, and is subject to the same laws.

In many States both Sight and Time Drafts are entitled to three days' grace, the same as notes; but if made in form of a bank check, "pay to," without the words "at sight," it is payable on presentation, without grace.

EQUATION OF PAYMENTS.

Multiply each debt by the time in which it is payable, and divide the sum of the products by the sum of the debts.

ONE DOLLAR LOANED 100 YEARS

at compound interest, would amount to the following sums:

1 per cent.,	$2.75	12 per cent.,	$84,675.00
3 "	19.25	16 "	1,174,405.00
6 "	340.00	18 "	15,145,207.00
10 "	13,809.00	24 "	2,551,799,404.00

Interest Calculations.

Rule.—Multiply the principal by as many one-hundredths as there are days, and then divide as follows:

Per cent.,	4	5	6	7	8	9	10	12
Divide by	90	72	60	52	45	40	36	30

Examples.—Interest on $100 for 90 days at 5 per cent.: 100 x .90=9.00, divided by 72=1.25 (1 dollar and 25 cents); on $1 for 30 days at 6 per cent.: 1 x .30=.300, divided by 60=.005 (5 mills).

Table.—Showing the number of days from any date in one month to the same date in any other month.

FROM \ TO	Jan.	Feb.	Mch.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
January	365	31	59	90	120	151	181	212	243	273	304	334
February	334	365	28	59	89	120	150	181	212	242	273	303
March	306	337	365	31	61	92	122	153	184	214	245	275
April	275	306	334	365	30	61	91	122	153	183	214	244
May	245	276	304	335	365	31	61	92	123	153	184	214
June	214	245	274	304	334	365	30	61	92	122	153	183
July	184	215	243	273	304	335	365	31	62	92	123	153
August	153	184	212	243	273	304	334	365	31	61	92	122
September	122	153	181	212	242	273	303	334	365	30	61	91
October	92	123	151	182	212	243	273	304	335	365	31	61
November	61	92	120	151	181	212	242	273	304	334	365	30
December	31	62	90	121	151	182	212	243	274	304	335	365

Example.—How many days from May 5 to October 5? Look for May at the left hand and October at the top; in the angle is 153. In leap-year add one day if Feb. is included.

Income on Investments.—Par value $100.

COST.	5 per ct.	6 per ct.	7 per ct.	8 per ct.	10 per ct.
$50.00	$10.00	$12.00	$14.00	$16.00	$20.00
60.00	8.33	10.00	11.66	13.33	16.66
70.00	7.14	8.57	10.00	11.42	14.28
75.00	6.66	8.00	9.33	10.66	13.35
80.00	6.25	7.50	8.75	10.00	12.50
85.00	5.88	7.05	8.23	9.41	11.76
90.00	5.55	6.66	7.77	8.88	11.11
95.00	5.26	6.31	7.36	8.42	10.52
100.00	5.00	6.00	7.00	8.00	10.00
105.00	4.76	5.71	6.66	7.61	9 52
110.00	4.54	5 45	6.36	7.27	9 09
115.00	4.34	5.21	6.08	6.95	8.69
120.00	4.16	5.00	5.83	6.66	8.33

VALUABLE INFORMATION

In case of Injury where a Physician can not be secured.

Extracts from Instructions "For First Aid to Injured."

A Shock.—If faint and cold, give stimulant in small doses, once in fifteen or twenty minutes, and secure warmth by external applications or rubbing.

Bleeding from Wound.—If from an artery, stop the current of blood to the wound by putting a compress or cloth pad over the artery. Fasten it firmly by a handkerchief or bandage, which may be tightened by twisting in a stick as a binder. The location of the artery can generally be determined by the throbbing sensation. If from a vein, apply pressure directly over the wound or by exposure or application of cold water. Perchloride of iron may be applied with cloth or lint. Keep the part elevated.

Wounds.—The part should be properly cleansed of all foreign matter, the edges brought together and fastened with strips of plaster; apply some anodyne solution; give stimulant, laudanum with brandy, if necessary.

Bruises.—Apply tincture of arnica and wormwood or hamamelis; keep well covered and warm.

Poisoned Wounds from bite of animals.—Treatment should be prompt. If possible, suck the wound thoroughly two or three minutes; cauterize with either nitric acid, chloride of zinc or nitrate of silver; use whisky freely internally.

Stings of Insects.—Apply spirits of ammonia.

Poisons—*General Directions.*—Give an emetic as soon as possible; tablespoonful of powdered mustard in a tumbler of warm water, or twenty grains of ipecac. After vomiting, give freely of warm drinks.

Special Directions in case of poisoning from Arsenic, Corrosive Sublimate, Verdigris, Blue Vitriol, and from Vegetables kept in copper vessels.—Give emetic and white of egg, sweet oil and milk.

Sugar of Lead.—Give emetic and epsom salts.

Hemlock, Aconite, Belladonna, and Fox Glove.—Give emetic, then tannin and stimulants.

Opium, Laudanum, and Morphine.—Give an emetic, follow with strong coffee, or white of an egg. Keep patient walking two or three hours, and extremities warm.

Nux Vomica and Strychnine.—Give emetic.

Mushrooms and Poisonous Fish.—Give emetic; afterwards from three to five grains of carb. ammonia every hour.

Drowning.—Freely expose the face, neck, and chest in the breeze, except in very severe weather Turn the patient on the face, and elevate the body so that the water in the lungs may flow out at the nose and mouth. First, turn the patient slightly on his side, apply snuff or ammonia to the nostrils, dash cold water in the face, rubbing the body briskly until it is warm. To imitate respiration, turn the patient on his face, then turn the body gently but completely on the side and a little beyond, repeating these measures deliberately, efficiently, and perseveringly fifteen times a minute in all. This number of thoracic movements per minute acts with the natural order of respiratory thoracic dilations and contractions, corresponds with the slow movement of the heart, averaging something less than sixty pulsations per minute. When the prone position is resumed, make equable but efficient pressure along the spine; remove it immediately before rotation on the side. (The first measure augments expiration; the second commences inspiration.) To induce circulation and warmth, continue these measures, rubbing the limbs upwards with a firm pressure and with energy, using handkerchiefs, etc. Replace the patient's wet clothing by such other as can be soonest procured. To incite inspiration, let the surface of the body be briskly slapped with the hand, or let cold water be dashed briskly on the surface, previously rubbed dry and warm.

Frozen Limbs.—Rub with snow or place in cold water until sensation returns. Warm very gradually.

Burns or Scalds.—Do not puncture the skin in case it is blistered, but cover with a piece of linen or muslin slightly coated with simple cerate or moistened with hamamelis. If the skin is broken and comes off, cover with cotton or some other light covering to keep the air out. Dress with beeswax and sweet oil, equal parts, or lime water and linseed oil, or scraped potatoes, or carrots, or sprinkle with flour. Warm applications are preferable to cold. Keep the air from the wound as much as possible.

Suffocation from breathing noxious vapors from Wells, Coal Gas, or Charcoal Fumes.—Remove to fresh air, sprinkle cold water on face and head, rub strong vinegar about nostrils, give drink of vinegar and water; to excite breathing, apply rules given in case of drowning. Unless a candle will burn with a clear flame in a well, near the water, it is unsafe for persons to go down. Air may be purified by showering water into the well.

To remove Stains or Grease from Oil Paint.—Use bisulphide of carbon, spirits of turpentine, or if dry and old, use chloroform. These and tar spots can be softened with olive oil and lard.

Stains, Iron Rust or Ink from Vellum or Parchment.—Moisten the spot with a solution of oxalic acid. Absorb same quickly by blotting-paper or cloth.

Rust from Steel.—Take half ounce of emery powder mixed with one ounce of soap and rub well.

Fruit Spots from Cottons.—Apply cold soap, then touch the spot with a hair pencil or feather dipped in chlorate of soda, then dip immediately in cold water.

Grease from Silks.—Take a lump of magnesia, rub it wet on the spot, let it dry, then brush the powder off.

Iron Rust may be removed from white goods by sour milk.

Scorch Stains from White Linen.—Lay in bright sun.

Mildew.—Moisten the spot with clean water; rub on it a thick coating of Castile soap mixed with chalk scrapings; rub with end of finger, then wash off.

Oil Marks on Wall Paper.—Apply paste of cold water and pipe clay, leave it on all night, brush off in the morning.

Paint Spots from Clothing.—Saturate with equal parts turpentine and spirits of ammonia.

For Cleaning Various Substances. — Alabaster, use strong soap and water.

Black Silk.—Brush and wipe it thoroughly, lay on table with the side intended to show, up; sponge with hot coffee strained through muslin; when partially dry, iron.

To Cleanse House Paper.—Rub with a flannel cloth dipped in oatmeal.

Black Cloth.—Mix one part of spirits of ammonia with three parts warm water, rub with sponge or dark cloth clean with water; rub with the nap.

Furniture, for Finger Marks.—Rub with a soft rag and sweet oil.

Chromos.—Go over lightly with a damp linen cloth.

Zinc.—Rub with a piece of cotton cloth dipped in kerosene, afterwards with a dry cloth.

Hands from Vegetable Stains.—Rub with a slice of raw potato.

Window Glass.—Paint can be removed by a strong solution of soda.

To Clean Tin Ware.—Common soda applied with a moistened newspaper and polished with a dry piece, will make it look like new.

USEFUL

Information for Business Men.

RULES FOR CALCULATING SPEED OF PULLEYS.

I.—The diameter of the driver and driven being given, to find the number of revolutions of the driven:

Rule.—Multiply the diameter of the driver by its number of revolutions, and divide the product by the diameter of the driven; the quotient will be the number of revolutions.

II.—The diameter and the revolutions of the driver being given to find the diameter of the driven, that shall make any given number of revolutions in the same time:

Rule.—Multiply the diameter of the driver by its number of revolutions, and divide the product by the number of revolutions of the driven; the quotient will be its diameter.

III.—To ascertain the size of the driver:

Rule.—Multiply the diameter of the driven by the number of revolutions you wish to make, and divide the product by the revolutions of the driver; the quotient will be the size of the driver.

BELTS.

Leather belts must be well protected against water, and even moisture.

India-rubber is the proper substance for belts exposed to the weather, as it does not absorb moisture, and stretch and decay.

It is desirable to run the grain (hair) side of leather belts on the pulley, in order that the strongest part of the belt may be subject to the least wear.

Leather belts run with grain side to the pulley will drive 30 per cent. more than if run with flesh side. The belt, as well as the pulley, adheres best when smooth, and the grain side adheres best because it is smoothest.

The transmitting power of a double belt is to that of single belt as 10 is to 7. In ordering pulleys, the kind of belt to be used should always be specified.

Belts should be kept soft and pliable. For this purpose

blood-warm tallow, dried in by heat of fire or the sun, is advised. Castor-Oil Dressing is also good.

The motion of driving should run *with* and not *against* the laps of the belts.

If too great a distance is attempted, the weight of the belt will produce a very heavy sag, drawing so hard on the shaft as to produce great friction in the bearings, while at the same time the belt will have an unsteady, flapping motion, which will destroy both the belt and machinery.

If possible to avoid it, connected shafts should never be placed one directly over the other, as in such case the belt must be kept very tight to do the work. For this purpose belts should be carefully selected of *well-stretched* leather.

It is desirable that the angle of the belt with the floor should not exceed 45°. It is also desirable to locate the shafting and machinery so that belts should run off from each shaft in opposite directions, as this arrangement will relieve the bearings from the friction that would result when the belts all pull one way on the shaft.

The diameter of the pulleys should be as large as can be admitted.

The pulley should be a little wider than the belt required for the work.

Having properly arranged the machinery for the reception of the belts, the next thing to be determined is the length and width of the belts.

When it is not convenient to measure with the tape-line the length required, apply the following rule:—Add the diameter of the two pulleys together, divide the result by 2, and multiply the quotient by 3¼, then add this product to twice the distance between the centers of the shafts, and you have the length required.

The width of belt needed depends on three conditions:—1. The tension of the belt. 2. The size of the smaller pulley, and the proportion of the surface touched by the belt. 3. The speed of the belt.

The working adhesion of a belt to the pulley will be in proportion both to the number of square inches of belt contact with the surface of the pulley and also to the arc of the circumference of the pulley touched by the belt. This adhesion forms the basis of all right calculation in ascertaining the width of belt necessary to transmit a given horse-power.

STRENGTH OF BELT LEATHER.

The tensile strength of good ox-hide, well tanned, has been carefully examined, with the following results:—

The solid leather will sustain, per inches of width,			675 lbs.
At the rivet-holes of the splices,	"	"	382 "
At the lacing,	"	"	210 "
Safe working tension,	"	"	55 "

The belts are assumed to be three-sixteenths of an inch thick.

PAINTER, GLAZIER, AND PAPER-HANGER.

One pound of paint will cover about four superficial yards the first coat, and about six yards each additional coat.

About one pound of putty for stopping, will be required for every twenty yards.

One gallon of tar and one pound of pitch will cover about twelve yards superficial the first coat, and about seventeen yards each additional coat.

MASON, Etc.

Ashlar masonry requires about ⅛ of its volume of mortar.

Rubble masonry requires for each cubic yard 1 5-8 cubic yards of stone, and ¼ yard of mortar.

BRICK

Ordinary sizes . . .	=	7¾ × 3⅝ × 2¼ inches.
		8 × 4⅛ × 2½ "
Milwaukee	=	8½ × 4⅛ × 2⅜ "
Stourbridge Fire-Brick	=	9⅛ × 4⅝ × 2⅜ "
American (N. Y.) .	=	8⅞ × 4½ × 2⅝ "

Stone walls are measured by the perch (24¾ cubic feet). Openings less than three feet wide are counted solid; over three feet deducted, but eighteen inches are added to the running measure for each jamb built. Arches are counted solid from their spring. Corners of buildings are measured twice. Pillars less than three feet are counted on three sides as lineal, multiplied by fourth side and depth.

It is customary to measure all foundation and dimension stone by the cubic foot. Water tables and base courses by lineal feet. All sills and lintels or ashlar, by superficial feet, and no wall less than eighteen inches thick.

Brick-work is generally measured by 1,000 bricks laid in the wall. In consequence of variations in size of bricks, no rule for volume of laid brick can be exact. The following scale is, however, a fair average.

7	Common	Bricks	to a	superficial	foot	4″ Wall.
14	"	"	"	"	"	9″ "
21	"	"	"	"	"	13″ "
28	"	"	"	"	"	18″ "
35	"	"	"	"	"	22″ "

Corners are not measured twice as in stonework. Openings over two feet square are deducted. Arches are counted from the spring. Fancy work counted one and one-half bricks for one. Pillars are measured on their face only.

SLATING.

A square of slate or slating is 100 superficial feet.

In measuring, the width of the eaves is allowed at the widest part. Hips, valleys, and cutting are to be measured lineal, and six inches width extra is allowed.

The *pitch* of a slate roof should not be less than one inch height to four inches in length.

COAL AND COKE.

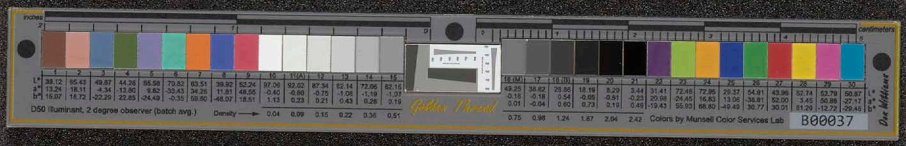
Average Weight per Bushel.

1 Bushel	Anthracite, ...	= 86 lbs.
1 "	Bituminous, ...	= 80 "
1 "	Coke (Connellsville), ...	= 40 "
1 "	Charcoal (hard wood), ...	= 30 "

100 bushels of coal will make 120 bushels of coke.
80 lbs. " " 48 lbs. "

A ton of coal, loose, occupies 40 to 43 cubic feet. Bituminous coal, broken, cubic feet, averages 49 pounds A ton, loose, occupies 43 to 48 cubic feet.

The time in which the earth, departing from one fixed star, returns again to the same star, is called the *sidereal* year, and is 365 days, 6 hours, 9 minutes, and 9 6-10 seconds. The *solar* or *tropical* year consists of 365 days, 5 hours, 48 minutes, 49 7-10 seconds, and is the time in which the sun, departing from some point in the ecliptic, returns to the same point again.



HIGH WATER, ASTORIA.

(STANDARD TIME.)

DAY OF MO.	JAN. H. M.	FEB. H. M.	MAR. H. M.	APRIL. H. M.	MAY. H. M.	JUNE. H. M.	JULY. H. M.	AUG. H. M.	SEPT. H. M.	OCT. H. M.	NOV. H. M.	DEC. H. M.
1	*m.* 47	2 1	0 54	1 31	1 22	1 42	1 52	3 6	4 41	5 46	8 5	8 14
2	1 35	2 40	1 32	2 2	1 51	2 12	2 32	3 56	5 50	7 10	9 5	9 5
3	2 22	3 16	2 7	2 32	2 17	2 49	3 18	4 55	7 15	8 32	9 55	10 1
4	3 7	3 52	2 38	3 1	2 46	3 34	4 10	6 4	8 46	9 39	10 39	10 44
5	3 50	4 28	3 10	3 33	3 20	4 29	5 13	7 26	10 3	10 31	11 22	11 23
6	4 31	5 7	3 44	4 5	4 2	5 39	6 27	8 56	11 0	11 15	11 59	*eve.* 1
7	5 13	5 51	4 24	4 47	4 59	6 57	7 48	10 15	11 47	11 56	*eve.* 34	0 33
8	5 59	6 45	5 1	5 42	6 10	8 16	9 10	11 18	*eve.* 29	*eve.* 34	1 5	1 5
9	6 46	7 40	5 47	6 56	7 33	9 31	10 24	*eve.* 10	1 6	1 9	1 37	1 34
10	7 37	8 36	6 41	8 12	8 52	10 37	11 28	0 56	1 44	1 42	2 7	2 6
11	8 35	9 29	7 46	9 22	9 57	11 37	*eve.* 23	1 37	2 18	2 15	2 38	2 42
12	9 24	10 23	8 51	10 23	10 54	*eve.* 31	1 13	2 16	2 52	2 48	3 12	3 22
13	10 9	11 3	9 51	11 15	11 48	1 23	1 59	2 54	3 31	3 19	3 51	4 11
14	10 49	11 46	10 43	*eve.* 3	*eve.* 38	2 13	2 44	3 30	4 7	3 55	4 43	5 13
15	11 25	*eve.* 26	11 30	0 48	1 29	3 2	3 27	4 7	4 46	4 35	5 51	6 27
16	*eve.* 1	1 7	*eve.* 16	1 34	2 18	3 51	4 7	4 45	5 31	5 29	7 8	7 46
17	0 36	1 48	0 58	2 21	3 10	4 37	4 47	5 31	6 27	6 39	8 25	9 3
18	1 14	2 32	1 41	3 11	4 4	5 26	5 32	6 24	7 31	7 55	9 35	10 11
19	1 55	3 20	2 26	4 6	5 0	6 15	6 16	7 19	8 41	9 6	10 32	11 14
20	2 39	4 13	3 14	5 8	6 0	7 8	7 10	8 19	9 41	10 7	11 28	*morn*
21	3 27	5 14	4 6	6 20	7 1	8 0	8 9	9 18	10 32	10 58	*morn*	0 10
22	4 23	6 30	5 9	7 41	7 58	8 57	9 2	10 10	11 19	11 45	0 19	1 2
23	5 27	8 0	6 26	8 45	8 52	9 46	9 53	10 56	*morn*	*morn*	1 9	1 52
24	6 43	9 29	7 53	9 41	9 40	10 29	10 38	11 36	0 2	0 31	1 59	2 40
25	8 10	10 37	9 13	10 28	10 29	11 8	11 17	*morn*	0 43	1 16	2 48	3 27
26	9 35	11 30	10 16	11 10	11 10	11 44	11 54	0 16	1 24	2 1	3 38	4 12
27	10 46	*morn*	11 3	11 48	11 45	*morn*	*morn*	0 54	2 6	2 49	4 32	4 57
28	11 46	0 14	11 44	*morn*	*morn*	0 16	0 29	1 32	2 51	3 40	5 27	5 45
29	*morn*	....	*morn*	0 23	0 16	0 46	1 4	2 13	3 41	4 37	6 22	6 35
30	0 36	....	0 23	0 51	0 45	1 18	1 41	2 57	4 38	5 44	7 20	7 26
31	1 20	....	0 58	....	1 13	....	2 22	3 46	....	6 55	....	8 26

DAY OF MO.	JAN. H. M.	FEB. H. M.	MAR. H. M.	APRIL. H. M.	MAY. H. M.	JUNE. H. M.	JULY. H. M.	AUG. H. M.	SEPT. H. M.	OCT. H. M.	NOV. H. M.	DEC. H. M.
1	5 11	5 59	4 36	4 26	4 6	3 46	3 58	6 18	8 37	10 5	11 40	11 24
2	5 57	6 32	5 0	5 2	4 37	4 9	4 16	7 27	10 5	11 23	[illegible]	[illegible]

HIGH WATER, PORT TOWNSEND.

(STANDARD TIME.)

DAY OF MO.	JAN. H. M.	FEB. H. M.	MAR. H. M.	APRIL. H. M.	MAY. H. M.	JUNE. H. M.	JULY. H. M.	AUG. H. M.	SEPT. H. M.	OCT. H. M.	NOV. H. M.	DEC. H. M.
1	5 11	5 59	4 36	4 26	4 6	3 46	3 58	6 18	8 37	10 5	11 40	11 24
2	5 57	6 23	5 0	5 8	4 27	4 8	4 48	7 31	10 5	11 31	*eve.*23	11 57
3	6 37	6 50	5 26	5 32	4 46	4 37	5 54	8 44	11 53	*eve.*37	0 59	*eve.*31
4	7 11	7 19	5 52	5 53	5 1	5 32	7 21	10 8	*e.*1 21	1 25	1 30	1 14
5	7 41	7 49	6 18	6 16	5 17	6 58	8 50	11 59	2 17	2 1	2 5	1 51
6	8 13	8 15	6 42	6 34	5 48	8 50	10 21	*e.*1 39	3 1	2 33	2 47	2 18
7	8 47	8 40	7 16	6 57	6 48	10 39	*eve.* 7	2 47	3 37	3 3	3 19	2 52
8	9 19	9 19	7 50	7 43	8 42	*eve.* 9	1 40	3 39	4 6	3 31	3 46	3 16
9	9 51	10 5	8 26	8 59	10 48	1 31	2 54	4 27	4 33	4 9	4 8	3 38
10	10 19	10 53	9 6	10 40	*eve.*19	2 42	3 54	4 59	4 59	4 44	4 30	4 1
11	10 53	11 38	9 55	*eve.*12	1 26	3 46	4 47	5 31	5 26	5 9	4 47	4 27
12	11 39	*eve.*22	11 5	1 30	2 24	4 42	5 30	5 57	5 54	5 33	5 7	5 19
13	*eve.*21	1 12	*eve.*18	2 29	3 24	5 37	6 12	6 24	6 27	5 55	5 42	6 41
14	0 55	2 04	1 23	3 15	4 21	6 28	6 47	6 53	6 58	6 17	6 48	8 20
15	1 28	2 58	2 25	4 6	5 18	7 13	7 15	7 22	7 32	6 47	8 18	10 9
16	2 03	3 52	3 16	5 1	6 16	7 54	7 47	7 50	8 6	7 36	10 26	11 50
17	2 45	4 47	4 11	5 59	7 13	8 32	8 20	8 18	8 44	8 52	*morn*	*morn*
18	3 32	5 47	4 57	7 1	8 10	9 10	8 53	8 59	9 41	10 46	0 3	1 15
19	4 25	6 52	5 45	8 2	9 4	9 49	9 25	9 45	10 59	*morn*	1 15	2 28
20	5 27	8 6	6 48	9 16	9 54	10 24	9 56	10 37	*morn*	0 11	2 15	3 33
21	6 38	9 28	7 56	10 28	10 38	10 57	10 32	11 27	0 15	1 20	3 13	4 31
22	7 58	11 9	9 13	11 28	11 20	11 27	11 18	*morn*	1 21	2 21	4 9	5 21
23	9 08	*morn*	10 47	*morn*	11 56	*morn*	*morn*	0 18	2 18	3 9	5 3	6 9
24	10 51	0 41	*morn*	0 14	*morn*	0 5	0 5	1 12	3 10	3 53	5 59	6 51
25	*morn*	1 55	0 15	0 55	0 28	0 49	0 45	2 1	3 54	4 47	6 54	7 30
26	0 45	2 48	1 16	1 30	1 0	1 25	1 21	2 51	4 38	5 43	7 50	8 4
27	2 11	3 31	2 0	2 1	1 42	1 55	1 58	3 42	5 29	6 41	8 38	8 42
28	3 14	4 5	2 35	2 30	2 17	2 21	2 39	4 35	6 29	7 45	9 23	9 17
29	4 5	....	3 4	3 11	2 43	2 48	3 25	5 33	7 32	8 48	10 8	9 53
30	4 48	....	3 32	3 43	3 8	3 18	4 16	6 28	8 43	9 54	10 48	10 26
31	5 27	....	3 58	....	3 28	....	5 12	7 21	....	10 52	....	10 57

Distances from San Francisco.

	Miles.		Miles.
Baltimore,	3,222	Milwaukee,	2,347
Boston,	3,387	New Orleans,	2,449
Big Trees,	168	New York,	3,302
Carson,	324	Ogden,	835
Charleston,	3,254	Omaha,	1,867
Chicago,	2,359	Oregon City,	683
Cheyenne,	1,351	Philadelphia,	3,242
Cincinnati,	2,558	Pittsburgh,	2,888
Colorado Springs,	1,530	Portland,	782
Columbus,	2,547	Prescott,	933
Deming,	1,198	Rawlins,	1,206
Denver,	1,457	Reno,	294
Duluth,	2,671	Sacramento,	139
Geysers,	95	Salt Lake City,	870
Grand Island,	1,713	Santa Fe,	1,515
Hot Springs,	1,406	Santa Cruz,	80
Hanging Rock,	932	St. Louis,	2,340
Indianapolis,	2,530	St. Paul,	2,694
Junction,	17	Sidney,	1,453
Kansas City,	2,096	Stockton,	91
Laramie,	1,294	Tucson,	978
Los Angeles,	482	Washington,	3,263
Merced,	138	Yosemite Valley,	199

New Standard of Railroad Time.

With the enormous increase of railway traveling the necessity arose for inventing some method of counting time which should avoid the complications arising from the use of local mean time, which varies with every mile of east or west travel.

This was brought about in 1884, and the railroads of the United States, of the Dominion of Canada, and many cities and towns in these countries now use the standard time:

Name.	Central Meridian.	Nearest Places.
Pacific,	$120° = 8^h$ west from Greenwich.	$1\frac{1}{2}°$ east of Sacramento.
Mountain,	$105° = 7^h$ west from Greenwich.	Denver, Colorado.
Central,	$90° = 6^h$ west from Greenwich.	St. Louis and New Orleans.
Eastern,	$75° = 5^h$ west from Greenwich.	Between New York and Philadelphia.
Intercolonial,	$60° = 4^h$ west from Greenwich.	About $3\frac{1}{2}°$ east of Halifax.

The *standard meridians* are 15 degrees of longitude or just one hour in time apart.

JANUARY, 1889.

The Rising and Setting of the Sun and Moon are given in Standard Time for San Francisco.

NEW MOON.	FIRST QUAR.	FULL MOON.	LAST QUAR.
1 1 8 E.	D. H. M.	D. H. M.	D. H. M.
31 1 10 M.	8 4 40 E.	16 9 37 E.	24 7 57 M.

DAY OF YR.	DAY OF MO.	DAY OF WEEK	SUN RISES H. M.	SUN SETS. H. M.	MOON R. & S. H. M.	HIGH TIDE. S. FRAN. H. M.	S. DIEGO H. M.
1	1	Tue.	7 26	5 2	*set.ev.*	10 31	8 29
2	2	Wed.	7 26	5 3	6 17	11 19	9 7
3	3	Thu	7 26	5 4	7 23	*eve.* 9	9 46
4	4	Fri.	7 26	5 5	8 32	1 2	10 28
5	5	Sat.	7 26	5 6	9 42	1 56	11 13
6	6	SUN.	7 26	5 7	10 41	2 56	*eve.* 1
7	7	Mon.	7 25	5 8	11 43	4 6	0 58
8	8	Tue.	7 25	5 9	*morn*	5 13	2 18
9	9	Wed	7 25	5 10	0 38	6 39	3 54
10	10	Thu.	7 25	5 11	1 25	8 2	5 30
11	11	Fri.	7 25	5 12	2 24	9 17	6 44
12	12	Sat.	7 25	5 13	3 31	10 21	7 43
13	13	SUN.	7 24	5 14	4 23	11 15	8 29
14	14	Mon	7 24	5 15	5 16	11 59	9 6
15	15	Tue	7 24	5 16	6 10	*morn*	9 37
16	16	Wed.	7 23	5 17	*ris.,e.*	0 38	10 6
17	17	Thu.	7 23	5 18	5 56	1 13	10 33
18	18	Fri.	7 23	5 19	6 55	1 41	10 58
19	19	Sat.	7 22	5 20	7 58	2 3	11 26
20	20	SUN.	7 22	5 21	9 2	2 29	*morn*
21	21	Mon.	7 21	5 23	10 5	3 1	0 3
22	22	Tue.	7 21	5 24	11 10	3 39	0 48
23	23	Wed.	7 20	5 25	*morn*	4 20	1 39
24	24	Thu.	7 19	5 26	0 15	5 2	2 36
25	25	Fri.	7 19	5 27	1 20	5 50	3 45
26	26	Sat.	7 18	5 28	2 33	6 44	4 50
27	27	SUN.	7 17	5 29	3 41	7 39	5 49
28	28	Mon.	7 17	5 30	4 49	8 36	6 41
29	29	Tue	7 16	5 31	5 51	9 30	7 30
30	30	Wed.	7 15	5 32	6 47	10 22	8 15
31	31	Thu.	7 14	5 33	*eve.*	11 13	8 57

FEBRUARY, 1889.

The Rising and Setting of the Sun and Moon are given in Standard Time for San Francisco.

FIRST QUAR.	FULL MOON.	LAST QUAR.
D. H. M.	D. H. M.	D. H. M.
7 0 58 E.	15 2 18 E.	22 3 55 E.

DAY OF YR.	DAY OF MO.	DAY OF WEEK	SUN RISES H. M.	SUN SETS. H. M.	MOON R. & S. H. M.	HIGH S. FRAN. H. M.	TIDE. S. DIEGO H. M.
32	1	Fri.	7 14	5 34	7 17	*eve.* 4	9 38
33	2	Sat.	7 13	5 36	8 18	0 55	10 18
34	3	SUN.	7 11	5 37	9 21	1 48	10 59
35	4	Mon.	7 10	5 38	10 20	2 45	11 40
36	5	Tue.	7 9	5 39	11 18	3 43	*ev.* 28
37	6	Wed	7 8	5 40	*morn*	4 56	1 37
38	7	Thu	7 7	5 41	0 16	6 23	3 20
39	8	Fri.	7 6	5 42	1 11	7 58	5 39
40	9	Sat.	7 5	5 43	2 5	9 17	7 3
41	10	SUN.	7 3	5 44	3 0	10 15	7 47
42	11	Mon	7 2	5 45	3 53	10 58	8 19
43	12	Tue	7 1	5 47	4 41	11 29	8 43
44	13	Wed.	7 0	5 48	5 28	11 58	9 7
45	14	Thu.	6 59	5 49	6 23	*morn*	9 30
46	15	Fri.	6 58	5 50	*vis.*, *e.*	0 23	9 54
47	16	Sat.	6 57	5 51	6 52	0 41	10 15
48	17	SUN.	6 56	5 52	7 58	1 4	10 45
49	18	Mon.	6 54	5 53	9 2	1 33	11 19
50	19	Tue	6 53	5 54	10 8	2 5	11 59
51	20	Wed.	6 52	5 55	11 18	2 42	*morn*
52	21	Thu.	6 50	5 56	*morn*	3 23	0 43
53	22	Fri.	6 49	5 57	0 24	4 13	1 50
54	23	Sat.	6 48	5 58	1 31	5 13	3 5
55	24	SUN.	6 46	5 59	2 38	6 18	4 26
56	25	Mon.	6 45	6 0	3 42	7 22	5 35
57	26	Tue	6 43	6 1	4 39	8 27	6 32
58	27	Wed.	6 42	6 2	5 29	9 25	7 22
59	28	Thu.	6 41	6 3	6 11	10 14	8 9
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MARCH, 1889.

The Rising and Setting of the Sun and Moon are given in Standard Time for San Francisco

NEW MOON	FIRST QUAR.	FULL MOON.	LAST QUAR.
1 2 1 E.	D. H. M.	D. H. M.	D. H. M.
31 3 37 M.	9 9 59 M.	17 3 47 M.	24 4 54 M.

DAY OF YR.	DAY OF MO.	DAY OF WEEK	SUN RISES H. M.	SUN SETS. H. M.	MOON R. & S. H. M.	HIGH TIDE. S. FRAN. H. M.	HIGH TIDE. S. DIEGO H. M.
60	1	Fri.	6 40	6 4	*set,ev.*	11 11	8 50
61	2	Sat.	6 39	6 5	7 8	*eve.* 2	9 30
62	3	Sun.	6 38	6 6	8 10	0 52	10 6
63	4	Mon.	6 36	6 7	9 11	1 40	10 44
64	5	Tue.	6 35	6 8	10 11	2 28	11 26
65	6	Wed	6 34	6 9	11 9	3 27	11 58
66	7	Thu.	6 33	6 10	*morn*	4 43	*ev.* 47
67	8	Fri.	6 32	6 11	0 6	6 21	2 44
68	9	Sat.	6 31	6 11	1 1	8 0	5 19
69	10	Sun.	6 29	6 12	1 55	9 5	6 59
70	11	Mon.	6 27	6 13	2 47	9 46	7 30
71	12	Tue.	6 26	6 14	3 34	10 16	7 47
72	13	Wed.	6 24	6 15	4 18	10 40	8 5
73	14	Thu.	6 23	6 16	4 57	11 0	8 26
74	15	Fri.	6 21	6 17	5 34	11 19	8 47
75	16	Sat.	6 19	6 18	*ris.,e.*	11 42	9 9
76	17	Sun.	6 18	6 19	6 48	*morn*	9 36
77	18	Mon.	6 16	6 20	7 56	0 9	10 11
78	19	Tue.	6 14	6 21	9 5	0 40	10 48
79	20	Wed.	6 13	6 22	10 15	1 17	11 25
80	21	Thu.	6 11	6 23	11 24	1 57	*morn*
81	22	Fri.	6 9	6 24	*morn*	2 46	0 11
82	23	Sat.	6 8	6 25	0 32	3 42	1 11
83	24	Sun.	6 7	6 26	1 35	4 46	2 33
84	25	Mon.	6 5	6 27	2 35	6 0	4 5
85	26	Tue.	6 4	6 28	3 25	7 16	5 20
86	27	Wed.	6 2	6 29	4 8	8 25	6 21
87	28	Thu.	6 0	6 30	4 43	9 23	7 12
88	29	Fri.	5 59	6 31	5 17	10 19	7 58
89	30	Sat.	5 57	6 32	5 46	11 10	8 39
90	31	Sun.	5 55	6 33	*set.ev.*	11 55	9 20

APRIL, 1889.

The Rising and Setting of the Sun and Moon are given in Standard Time for San Francisco.

FIRST QUAR.	FULL MOON.	LAST QUAR.	NEW MOON.
D. H. M.	D. H. M.	D. H. M.	D. H. M.
8 5 47 M.	15 2 18 E.	22 5 56 M.	29 6 5 E.

DAY OF YR.	DAY OF MO.	DAY OF WEEK	SUN RISES H. M.	SUN SETS. H. M.	MOON R. & S. H. M.	HIGH TIDE. S. FRAN. H. M.	HIGH TIDE. S. DIEGO H. M.
91	1	Mon.	5 54	6 34	7 54	*eve* 38	9 58
92	2	Tue	5 53	6 34	8 52	1 27	10 29
93	3	Wed.	5 51	6 35	9 50	2 27	11 1
94	4	Thu.	5 50	6 36	10 48	3 19	11 44
95	5	Fri.	5 48	6 37	11 41	4 40	*eve* 41
96	6	Sat.	5 47	6 38	*morn*	6 23	2 11
97	7	SUN.	5 45	6 39	0 36	7 42	3 44
98	8	Mon.	5 43	6 40	1 25	8 27	5 8
99	9	Tue.	5 42	6 41	2 7	8 56	6 19
100	10	Wed.	5 40	6 42	2 47	9 17	6 56
101	11	Thu	5 39	6 42	3 25	9 34	7 13
102	12	Fri.	5 38	6 43	4 1	9 58	7 33
103	13	Sat.	5 37	6 44	4 36	10 23	8 5
104	14	SUN.	5 36	6 45	5 8	10 52	8 37
105	15	Mon.	5 34	6 46	*ris., e.*	11 28	9 6
106	16	Tue.	5 33	6 47	7 54	*morn*	9 38
107	17	Wed	5 31	6 48	9 7	0 4	10 13
108	18	Thu.	5 30	6 49	10 20	0 41	10 52
109	19	Fri.	5 28	6 50	11 29	1 23	11 40
110	20	Sat.	5 27	6 51	*morn*	2 13	*morn*
111	21	SUN.	5 26	6 52	0 32	3 12	0 41
112	22	Mon	5 25	6 53	1 26	4 27	2 4
113	23	Tue	5 24	6 53	2 11	5 30	3 43
114	24	Wed.	5 23	6 54	2 50	7 23	5 1
115	25	Thu.	5 21	6 55	3 24	8 22	6 7
116	26	Fri.	5 19	6 56	3 54	9 23	7 10
117	27	Sat.	5 18	6 57	4 24	10 17	7 47
118	28	SUN.	5 17	6 58	4 50	11 4	8 28
119	29	Mon.	5 15	6 59	5 17	11 55	9 8
120	30	Tue.	5 14	7 00	*set., ev.*	*eve* 44	9 46
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MAY, 1889.

The Rising and Setting of the Sun and Moon are given in Standard Time for San Francisco.

FIRST QUAR.	FULL MOON.	LAST QUAR.	NEW MOON.
D. H. M.	D. H. M.	D. H. M.	D. H. M.
7 10 42 E.	14 10 42 E.	21 1 53 E.	29 9 19 M.

DAY OF YR.	DAY OF MO.	DAY OF WEEK	SUN RISES H. M	SUN SETS. H. M.	MOON R. & S. H. M.	HIGH TIDE. S. FRAN. H. M.	HIGH TIDE. S. DIEGO H. M.
121	1	Wed.	5 12	7 1	8 39	1 36	10 24
122	2	Thu.	5 11	7 2	9 36	2 31	11 2
123	3	Fri.	5 11	7 2	10 30	3 35	11 48
124	4	Sat.	5 10	7 3	11 20	4 49	*eve* 54
125	5	SUN.	5 9	7 4	*morn*	6 00	3 15
126	6	Mon.	5 8	7 5	0 8	6 51	4 36
127	7	Tue.	5 7	7 6	0 50	7 19	5 3
128	8	Wed.	5 6	7 7	1 30	7 41	5 28
129	9	Thu	5 5	7 8	2 5	8 6	5 50
130	10	Fri.	5 4	7 9	2 39	8 34	6 20
131	11	Sat.	5 3	7 10	3 10	9 5	6 54
132	12	SUN.	5 3	7 10	3 39	9 34	7 28
133	13	Mon.	5 2	7 11	4 12	10 13	8 2
134	14	Tue.	5 1	7 12	4 44	10 51	8 36
135	15	Wed	5 0	7 13	*ris., e.*	11 31	9 13
136	16	Thu.	4 59	7 14	9 10	*morn*	9 50
137	17	Fri.	4 59	7 14	10 20	0 12	10 32
138	18	Sat.	4 58	7 15	11 22	0 58	11 19
139	19	SUN.	4 57	7 16	*morn*	1 51	*morn*
140	20	Mon	4 56	7 17	0 13	2 53	0 18
141	21	Tue	4 55	7 18	0 55	4 8	1 35
142	22	Wed.	4 55	7 18	1 31	5 36	3 9
143	23	Thu.	4 54	7 19	2 1	6 58	4 34
144	24	Fri.	4 53	7 20	2 27	8 6	5 44
145	25	Sat.	4 52	7 21	2 55	9 11	6 43
146	26	SUN.	4 52	7 22	3 22	10 10	7 32
147	27	Mon.	4 51	7 23	3 50	11 6	8 20
148	28	Tue	4 51	7 23	4 20	11 59	9 05
149	29	Wed.	4 50	7 24	4 53	*eve* 50	9 47
150	30	Thu.	4 50	7 25	*set, ev.*	1 43	10 29
151	31	Fri.	4 49	7 26	9 17	2 40	11 12

JUNE, 1889.

The Rising and Setting of the Sun and Moon are given in Standard Time for San Francisco.

FIRST QUAR.	FULL MOON.	LAST QUAR.	NEW MOON.
D. H. M.	D. H. M.	D. H. M.	D. H. M.
6 0 1 E.	13 5 58 M.	19 11 36 E.	28 0 53 M.

DAY OF YR.	DAY OF MO.	DAY OF WEEK	SUN RISES H. M.	SUN SETS. H. M.	MOON R. & S. H. M.	HIGH TIDE. S. FRAN. H. M.	HIGH TIDE. S. DIEGO H. M.
152	1	Sat.	4 49	7 25	10 5	3 29	11 53
153	2	Sun.	4 49	7 26	10 50	4 17	*eve* 38
154	3	Mon.	4 49	7 27	11 29	4 55	1 30
155	4	Tue.	4 48	7 28	*morn*	5 26	2 26
156	5	Wed.	4 48	7 28	0 5	5 59	3 19
157	6	Thu	4 48	7 29	0 37	6 33	4 08
158	7	Fri.	4 47	7 30	1 9	7 6	4 52
159	8	Sat.	4 47	7 30	1 48	7 41	5 31
160	9	Sun.	4 47	7 31	2 11	8 15	6 12
161	10	Mon.	4 47	7 31	2 34	8 57	6 54
162	11	Tue.	4 47	7 31	3 19	9 40	7 35
163	12	Wed	4 47	7 32	4 1	10 23	8 16
164	13	Thu.	4 47	7 32	*vis., e.*	11 8	8 56
165	14	Fri.	4 47	7 32	9 3	11 54	9 38
166	15	Sat.	4 47	7 33	10 1	*morn*	10 21
167	16	Sun.	4 47	7 33	10 50	0 44	11 07
168	17	Mon	4 47	7 34	11 29	1 38	*morn*
169	18	Tue	4 47	7 34	*morn*	2 42	0 1
170	19	Wed.	4 47	7 35	0 4	3 53	1 5
171	20	Thu.	4 47	7 35	0 43	5 16	2 26
172	21	Fri.	4 48	7 35	1 1	6 32	3 58
173	22	Sat.	4 48	7 35	1 29	7 50	5 21
174	23	Sun.	4 48	7 36	1 57	9 4	6 30
175	24	Mon.	4 49	7 36	2 25	10 9	7 28
176	25	Tue.	4 49	7 36	2 58	11 6	8 20
177	26	Wed.	4 49	7 36	3 34	11 59	9 5
178	27	Thu.	4 50	7 36	4 15	*eve* 48	9 46
179	28	Fri.	4 50	7 36	*set, ev.*	1 33	10 22
180	29	Sat.	4 50	7 36	8 48	2 15	10 55
181	30	Sun.	4 51	7 36	9 30	2 50	11 27
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JULY, 1889.

The Rising and Setting of the Sun and Moon are given in Standard Time for San Francisco.

FIRST QUAR.	FULL MOON.	LAST QUAR.	NEW MOON.
D. H. M.	D. H. M.	D. H. M.	D. H. M.
5 9 59 E.	12 1 2 E.	19 11 45 M.	27 4 0 E.

DAY OF YR.	DAY OF MO.	DAY OF WEEK	SUN RISES H. M.	SUN SETS. H. M.	MOON R. & S. H. M.	HIGH TIDE. S. FRAN. H. M.	HIGH TIDE. S. DIEGO H. M.
182	1	Mon.	4 51	7 36	10 8	3 17	11 53
183	2	Tue	4 52	7 35	10 42	3 43	*eve* 25
184	3	Wed.	4 52	7 35	11 13	4 15	1 8
185	4	Thu.	4 53	7 35	11 42	4 51	2 0
186	5	Fri.	4 53	7 35	*morn*	5 30	2 56
187	6	Sat.	4 54	7 35	0 9	6 10	3 52
188	7	SUN.	4 54	7 35	0 40	6 51	4 48
189	8	Mon.	4 55	7 34	1 14	7 36	5 41
190	9	Tue.	4 56	7 34	1 52	8 27	6 31
191	10	Wed.	4 56	7 34	2 38	9 16	7 17
192	11	Thu	4 56	7 34	3 31	10 6	8 3
193	12	Fri.	4 57	7 34	*rise.e.*	10 56	8 46
194	13	Sat.	4 58	7 33	8 37	11 45	9 29
195	14	SUN.	4 59	7 32	9 23	*morn*	10 13
196	15	Mon.	5 0	7 32	10 1	0 37	10 57
197	16	Tue.	5 0	7 31	10 35	1 33	11 44
198	17	Wed	5 1	7 31	11 6	2 31	*morn*
199	18	Thu.	5 2	7 30	11 33	3 36	0 38
200	19	Fri.	5 3	7 29	*morn*	4 48	1 48
201	20	Sat.	5 3	7 29	0 1	6 11	3 21
202	21	SUN.	5 3	7 29	0 29	7 39	5 6
203	22	Mon	5 4	7 28	1 0	9 0	6 33
204	23	Tue	5 5	7 28	1 34	10 9	7 37
205	24	Wed.	5 6	7 27	2 11	11 3	8 25
206	25	Thu.	5 7	7 26	2 57	11 49	9 1
207	26	Fri.	5 7	7 26	3 45	*eve* 26	9 29
208	27	Sat.	5 8	7 25	4 39	0 59	9 56
209	28	SUN.	5 8	7 24	*sets.e.*	1 28	10 20
210	29	Mon.	5 9	7 23	8 42	1 48	10 42
211	30	Tue	5 10	7 22	9 13	2 10	11 2
212	31	Wed.	5 10	7 22	9 44	2 37	11 32

AUGUST, 1889.

The Rising and Setting of the Sun and Moon are given in Standard Time for San Francisco.

FIRST QUAR.	FULL MOON.	LAST QUAR.	NEW MOON.
D. H. M.	D. H. M.	D. H. M.	D. H. M.
4 5 27 M.	10 8 43 M.	18 2 51 M.	26 6 0 M.

DAY OF YR.	DAY OF MO.	DAY OF WEEK	SUN RISES H. M.	SUN SETS. H. M.	MOON R. & S. H. M.	HIGH TIDE. S. FRAN. H. M.	HIGH TIDE. S. DIEGO H. M.
213	1	Thu.	5 11	7 21	10 12	3 10	*eve* 12
214	2	Fri.	5 12	7 20	10 42	3 47	0 57
215	3	Sat.	5 13	7 19	11 14	4 28	1 49
216	4	SUN.	5 14	7 18	11 49	5 15	2 58
217	5	Mon.	5 15	7 16	*morn*	6 10	4 11
218	6	Tue	5 16	7 15	0 31	7 8	5 18
219	7	Wed.	5 17	7 14	1 18	8 7	6 16
220	8	Thu.	5 18	7 13	2 16	9 3	7 7
221	9	Fri.	5 18	7 12	3 23	9 58	7 55
222	10	Sat.	5 19	7 11	*rs.*, *e.*	10 50	8 39
223	11	SUN.	5 20	7 10	7 53	11 42	9 22
224	12	Mon.	5 21	7 9	8 28	*morn*	10 3
225	13	Tue.	5 22	7 7	9 3	0 34	10 46
226	14	Wed.	5 23	7 5	9 32	1 26	11 28
227	15	Thu	5 24	7 3	10 1	2 24	*morn*
228	16	Fri.	5 25	7 1	10 29	3 25	0 15
229	17	Sat.	5 26	7 1	11 1	4 36	1 13
230	18	SUN.	5 27	7 0	11 33	6 1	2 45
231	19	Mon.	5 27	6 59	*morn*	7 37	5 24
232	20	Tue.	5 28	6 58	0 9	9 1	6 59
233	21	Wed	5 29	6 57	0 50	10 2	7 44
234	22	Thu	5 30	6 56	1 37	10 43	8 12
235	23	Fri.	5 31	6 54	2 29	11 16	8 36
236	24	Sat.	5 32	6 53	3 25	11 42	8 55
237	25	SUN.	5 33	6 51	4 26	*eve* 7	9 16
238	26	Mon	5 34	6 50	*sets.*, *e.*	0 24	9 35
239	27	Tue	5 35	6 48	7 46	0 45	9 57
240	28	Wed.	5 35	6 47	8 15	1 8	10 19
241	29	Thu.	5 36	6 46	8 47	1 37	10 50
242	30	Fri.	5 37	6 44	9 16	2 11	11 29
243	31	Sat.	5 37	6 44	9 49	2 49	*eve* 12

SEPTEMBER, 1889.

The Rising and Setting of the Sun and Moon are given in Standard Time for San Francisco.

FIRST QUAR.	FULL MOON.	LAST QUAR.	NEW MOON.
D. H. M.	D. H. M.	D. H. M.	D. H. M.
2 11 34 M.	9 5 52 M.	16 8 49 E.	24 6 42 E.

DAY OF YR.	DAY OF MO.	DAY OF WEEK	SUN RISES H. M.	SUN SETS. H. M.	MOON R. & S. H. M.	HIGH TIDE. S. FRAN. H. M.	HIGH TIDE. S. DIEGO H. M.
244	1	SUN.	5 38	6 42	10 27	3 39	1 6
245	2	Mon.	5 39	6 41	11 10	4 37	2 18
246	3	Tue	5 40	6 39	*morn*	5 42	3 42
247	4	Wed.	5 41	6 37	0 4	6 49	5 2
248	5	Thu.	5 42	6 35	1 1	7 57	6 6
249	6	Fri.	5 43	6 34	2 7	8 59	7 0
250	7	Sat.	5 44	6 32	3 17	9 58	7 48
251	8	SUN.	5 45	6 31	4 29	10 52	8 33
252	9	Mon.	5 45	6 30	*ris., e.*	11 43	9 15
253	10	Tue	5 46	6 29	7 28	*morn*	9 55
254	11	Wed.	5 47	6 27	7 56	0 32	10 33
255	12	Thu.	5 48	6 25	8 24	1 18	11 16
256	13	Fri.	5 49	6 24	8 53	2 6	11 48
257	14	Sat.	5 50	6 22	9 23	3 5	*morn*
258	15	SUN.	5 51	6 20	9 57	4 32	0 41
259	16	Mon.	5 52	6 18	10 36	6 3	2 28
260	17	Tue.	5 53	6 16	11 19	7 40	4 8
261	18	Wed.	5 54	6 14	*morn*	8 48	5 18
262	19	Thu	5 55	6 12	0 18	9 31	6 33
263	20	Fri.	5 56	6 10	1 13	10 1	7 18
264	21	Sat.	5 57	6 8	2 11	10 24	7 53
265	22	SUN.	5 59	6 6	3 11	10 42	8 10
266	23	Mon.	6 0	6 4	4 14	11 0	8 27
267	24	Tue.	6 1	6 3	5 19	11 20	8 47
268	25	Wed	6 2	6 2	*sets. e.*	11 46	9 20
269	26	Thu.	6 3	6 0	7 16	*eve* 15	9 47
270	27	Fri.	6 4	5 59	7 49	0 50	10 17
271	28	Sat.	6 4	5 57	8 26	1 29	10 54
272	29	SUN.	6 5	5 55	9 08	2 15	11 36
273	30	Mon.	6 6	5 54	9 58	3 5	*eve* 13
...	..	.....	....	....	.....	.....	.

OCTOBER, 1889.

The Rising and Setting of the Sun and Moon are given in Standard Time for San Francisco.

FIRST QUAR.	FULL MOON.	LAST QUAR.	NEW MOON.
D. H. M.	D. H. M.	D. H. M.	D. H. M.
1 5 33 E.	8 5 25 E.	16 4 37 E.	24 6 26 M.
31 0 30 M.			

DAY OF YR.	DAY OF MO.	DAY OF WEEK	SUN RISES H. M.	SUN SETS. H. M.	MOON R. & S. H. M.	HIGH TIDE. S. FRAN. H. M.	HIGH TIDE. S. DIEGO H. M.
274	1	Tue	6 07	5 52	10 57	4 7	1 47
275	2	Wed.	6 07	5 51	*morn*	5 21	3 21
276	3	Thu.	6 08	5 49	0 3	6 41	4 47
277	4	Fri.	6 09	5 48	1 9	7 55	5 55
278	5	Sat.	6 10	5 46	2 16	9 0	6 51
279	6	SUN.	6 11	5 45	3 23	9 57	7 40
280	7	Mon.	6 12	5 43	4 30	10 48	8 25
281	8	Tue	6 13	5 41	*vis.*, *e.*	11 36	9 5
282	9	Wed.	6 14	5 40	6 25	*morn*	9 47
283	10	Thu.	6 14	5 39	6 56	0 27	10 18
284	11	Fri.	6 15	5 38	7 26	1 19	10 57
285	12	Sat.	6 16	5 36	8 1	2 13	11 42
286	13	SUN.	6 17	5 35	8 39	3 19	*morn*
287	14	Mon.	6 18	5 33	9 23	4 37	0 44
288	15	Tue.	6 20	5 32	10 12	6 6	1 54
289	16	Wed.	6 21	5 31	11 6	7 23	3 28
290	17	Thu	6 21	5 29	*morn*	8 10	4 47
291	18	Fri.	6 22	5 28	0 4	8 40	6 7
292	19	Sat.	6 23	5 27	1 3	9 0	6 43
293	20	SUN.	6 24	5 25	2 3	9 16	6 55
294	21	Mon.	6 25	5 24	3 5	9 38	7 13
295	22	Tue.	6 26	5 22	4 8	10 2	7 48
296	23	Wed	6 27	5 23	5 14	10 28	8 14
297	24	Thu.	6 28	5 20	6 20	11 3	8 42
298	25	Fri.	6 29	5 19	*sets.*, *e.*	11 36	9 13
299	26	Sat.	6 30	5 18	7 6	*eve* 14	9 42
300	27	SUN.	6 31	5 17	7 52	0 53	10 26
301	28	Mon	6 32	5 16	8 46	1 49	11 11
302	29	Tue	6 33	5 15	9 50	2 36	*eve* 5
303	30	Wed.	6 34	5 13	10 57	3 46	1 20
304	31	Thu.	6 35	5 12	*morn*	5 8	2 54

NOVEMBER, 1889.

The Rising and Setting of the Sun and Moon are given in Standard Time for San Francisco.

FULL MOON.	LAST QUAR.	NEW MOON.	FIRST QUAR.
D. H. M.	D. H. M.	D. H. M.	D. H. M.
7 8 5 M.	15 0 36 E.	22 5 43 E.	29 9 28 M.

DAY OF YR.	DAY OF MO.	DAY OF WEEK	SUN RISES H. M.	SUN SETS. H. M.	MOON R. & S. H. M.	HIGH TIDE. S. FRAN. H. M.	HIGH TIDE. S. DIEGO H. M.
305	1	Fri.	6 36	5 11	0 8	6 35	4 25
306	2	Sat.	6 38	5 10	1 15	7 53	5 38
307	3	SUN.	6 39	5 9	2 22	8 55	6 33
308	4	Mon.	6 40	5 8	3 26	9 55	7 26
309	5	Tue.	6 41	5 7	4 28	10 50	8 12
310	6	Wed.	6 42	5 6	5 29	11 43	8 56
311	7	Thu.	6 43	5 5	*rise.e.*	*morn*	9 39
312	8	Fri.	6 44	5 4	6 9	0 35	10 22
313	9	Sat.	6 45	5 3	6 46	1 30	11 5
314	10	SUN.	6 46	5 2	7 26	2 26	11 54
315	11	Mon.	6 47	5 1	8 11	3 29	*morn*
316	12	Tue	6 48	5 0	9 2	4 36	1 0
317	13	Wed.	6 49	4 59	9 54	5 43	3 10
318	14	Thu.	6 50	4 59	10 51	6 35	4 1
319	15	Fri.	6 51	4 58	11 49	7 4	4 36
320	16	Sat.	6 52	4 58	*morn*	7 23	5 8
321	17	SUN.	6 53	4 57	0 49	7 48	5 31
322	18	Mon.	6 55	4 56	1 50	8 15	5 57
323	19	Tue.	6 56	4 55	2 53	8 43	6 29
324	20	Wed.	6 57	4 55	3 59	9 10	7 4
325	21	Thu	6 58	4 54	5 6	9 48	7 38
326	22	Fri.	6 59	4 53	6 18	10 26	8 14
327	23	Sat.	7 0	4 53	*sets.e.*	11 4	8 51
328	24	SUN.	7 1	4 53	6 36	11 45	9 29
329	25	Mon.	7 2	4 52	7 36	*eve*30	10 10
330	26	Tue.	7 3	4 52	8 45	1 21	10 56
331	27	Wed.	7 4	4 51	9 56	2 21	11 51
332	28	Thu.	7 5	4 51	11 5	3 32	*eve*58
333	29	Fri.	7 6	4 51	*morn*	4 56	2 23
334	30	Sat.	7 7	4 51	0 15	6 21	3 53
...	..	.. ..	....	.. .	.. .	.....	.....

DECEMBER, 1889.

The Rising and Setting of the Sun and Moon are given in Standard Time for San Francisco.

FULL MOON.	LAST QUAR.	NEW MOON.	FIRST QUAR.
D. H. M.	D. H. M.	D. H. M.	D. H. M.
7 1 52 M.	15 6 58 M.	22 4 52 M.	28 9 16 E.

DAY OF YR.	DAY OF MO.	DAY OF WEEK	SUN RISES H. M.	SUN SETS. H. M.	MOON R. & S. H. M.	HIGH TIDE. S. FRAN. H. M.	HIGH TIDE. S. DIEGO H. M.
335	1	SUN.	7 8	4 51	1 21	7 35	5 12
336	2	Mon.	7 9	4 51	2 23	8 47	6 18
337	3	Tue.	7 9	4 51	3 24	9 50	7 12
338	4	Wed.	7 10	4 51	4 23	10 50	8 5
339	5	Thu.	7 11	4 51	5 23	11 45	8 54
340	6	Fri.	7 12	4 51	6 22	*morn*	9 37
341	7	Sat.	7 13	4 51	*ris., e.*	0 39	10 24
342	8	SUN.	7 13	4 51	6 0	1 32	11 8
343	9	Mon.	7 14	4 51	6 49	2 24	11 52
344	10	Tue	7 15	4 51	7 43	3 16	*morn*
345	11	Wed.	7 16	4 51	8 39	4 4	0 34
346	12	Thu.	7 17	4 51	9 38	4 43	1 14
347	13	Fri.	7 17	4 52	10 37	5 5	1 57
348	14	Sat.	7 17	4 52	11 37	5 37	2 44
349	15	SUN.	7 18	4 53	*morn*	6 10	3 35
350	16	Mon.	7 19	4 53	0 37	6 42	4 22
351	17	Tue.	7 20	4 54	1 39	7 17	5 3
352	18	Wed.	7 20	4 54	2 44	7 50	5 44
353	19	Thu.	7 21	4 54	3 53	8 30	6 28
354	20	Fri.	7 22	4 55	5 5	9 15	7 11
355	21	Sat.	7 22	4 55	6 17	9 58	7 53
356	22	SUN.	7 23	4 55	*sets, e*	10 43	8 35
357	23	Mon.	7 23	4 56	6 28	11 31	9 17
358	24	Tue.	7 23	4 57	7 39	*eve* 19	10 1
359	25	Wed.	7 24	4 58	8 52	1 13	10 46
360	26	Thu	7 24	4 58	10 3	2 13	11 38
361	27	Fri.	7 24	4 59	11 11	3 20	*eve* 38
362	28	Sat.	7 24	5 0	*morn*	4 41	1 51
363	29	SUN.	7 25	5 0	0 16	5 58	3 18
364	30	Mon.	7 26	5 1	1 17	7 21	4 47
365	31	Tue.	7 26	5 1	2 20	8 39	6 5

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Space is p
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Signs: ☰
☾ Last Qu

☰ Tues. 1.

Wed. 2. Th

JANUARY, 1889.

DAILY MEMORANDA.

Space is provided for recording the state of the Thermometer and weather. The Moon's Changes, and Stated Church Days are also noticed as they occur.

Signs: New Moon; First Quarter; Full Moon; Last Quarter.

TUES. 1. Ther. Weather,

WED. 2. Ther. Weather,

THUR. 3. Ther. Weather,

3 15"

9 12"

654.21

FRI. 4. Ther. Weather,

SAT. 5. Ther. Weather,

SUN. 6. T

MON. 7. T

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SUN. 6. Ther. Weather,

MON. 7. Ther. Weather,

TUES. 8. Ther. Weather,

WED. 9. Ther. Weather,

THUR. 10. Ther. Weather,

FRI. 11. Ther. Weather,

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SUN. 13. T

MON. 14. T

SAT. 12. Ther. Weather,

SUN. 13. Ther. Weather,

MON. 14. Ther. Weather,

TUES. 15. Ther. Weather,

2350.25
47.70
2302.55

WED. 16. Ther. Weather,

THUR. 17. Ther. Weather,

FRI. 18. Th

SAT. 19. Th

SUN. 20. Th

FRI. 18. Ther. Weather,

SAT. 19. Ther. Weather,

SUN. 20. Ther. Weather,

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TUES. 22. Ther. Weather,

WED. 23. Ther. Weather,

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☾ THUR. 24. Ther. Weather,

FRI. 25. Ther. Weather,

SAT. 26. Ther. Weather,

Gretag Macbeth
Colorimetric
Colorimetric
Colorimetric

WED. 30. Ther. Weather,

THUR. 31. Ther. Weather,

FRI. 1. Ther. Weather,

SAT. 2. Ther. Weather,

SUN. 3. Ther. Weather,

MON. 4. Ther. Weather,

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WED. 6. Ther. Weather,

THUR. 7. Ther. Weather,

FRI. 8. Ther. Weather,

SAT. 9. Ther. Weather,

SUN. 10. Ther. Weather,

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THUR. 14. Ther. Weather,

FRI. 15. Ther. Weather,

SAT. 16. Ther. Weather,

SUN. 17.

MON. 18.

UES. 19.

SUN. 17. Ther. Weather,

Septuagesima Sunday.

MON. 18. Ther. Weather,

TUES. 19. Ther. Weather,

WED. 20. Ther. Weather,

THUR. 21. Ther. Weather,

☾ FRI. 22. Ther. Weather,

SAT. 23. T

SUN. 24. T

MON. 25. T

SAT. 23. Ther. Weather,

SUN. 24. Ther. Weather,

Sexagesima Sunday.

MON. 25. Ther. Weather,

TUES. 26. Ther. Weather,

WED. 27. Ther. Weather,

THUR. 28. Ther. Weather,

FRI.

SAT. 2.

SUN. 3.

FRI. 1. Ther. Weather,

SAT. 2. Ther. Weather,

SUN. 3. Ther. Weather,

Quinquagesima Sunday.

MON. 4. Ther. Weather,

TUES. 5. Ther. Weather,

WED. 6. Ther. Weather,

Ash Wednesday.

THUR. 7.

FRI. 8. T

SAT. 9.

THUR. 7. Ther. Weather,

FRI. 8. Ther. Weather,

☽ SAT. 9. Ther. Weather,

MARCH, 1889.

SUN. 10. Ther. Weather,

Quadragesima Sunday.

MON. 11. Ther. Weather,

TUES. 12. Ther. Weather,

WED. 13

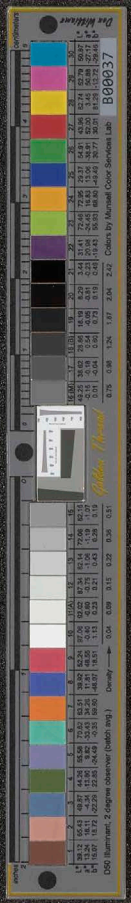
THUR. 14

FRI. 15. T

WED. 13. Ther. Weather,

THUR. 14. Ther. Weather,

FRI. 15. Ther. Weather,



SAT. 16. Ther. Weather,

SUN. 17. Ther. Weather,

MON. 18. Ther. Weather,

TUES. 19.

WED. 20.

THUR. 21.

TUES. 19. Ther. Weather,

WED. 20. Ther. Weather,

THUR. 21. Ther. Weather,

FRI. 22. Ther. Weather,

SAT. 23. Ther. Weather,

☪ SUN. 24. Ther. Weather,

Mid-Lent Sunday.

MON. 25.

TUES. 26.

WED. 27.

MON. 25. Ther. Weather,

TUES. 26. Ther. Weather,

WED. 27. Ther. Weather,

THUR. 28. Ther. Weather,

FRI. 29. Ther. Weather,

SAT. 30. Ther. Weather,

SUN. 31.

MON. 1. Th

TUES. 2. Th

SUN. 31. Ther. Weather,

MON. 1. Ther. Weather,

TUES. 2. Ther. Weather,

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THUR. 4. Ther. Weather,

FRI. 5. Ther. Weather,

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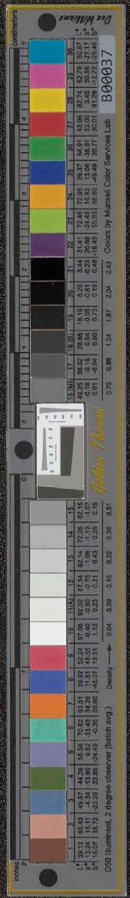
SAT. 6. Ther. Weather,

SUN. 7. Ther. Weather,

MON. 8. Ther. Weather,



TUES. 9. Ther. Weather,

WED. 10. Ther. Weather,

THUR. 11. Ther. Weather,

FRI. 12.

SAT. 13.

SUN. 14.

FRI. 12. Ther. Weather,

SAT. 13. Ther. Weather,

SUN. 14. Ther. Weather,

Palm Sunday.

☺ MON. 15. Ther. Weather,

TUES. 16. Ther. Weather,

WED. 17. Ther. Weather,

THUR. 18.

FRI. 19.

SAT. 20.

THUR. 18. Ther. Weather,

FRI. 19. Ther. Weather,

Good Friday.

SAT. 20. Ther. Weather,

SUN. 21. Ther. Weather,

Easter Sunday.

☾ MON. 22. Ther Weather,

TUES. 23. Ther. Weather,

WED. 24

THUR. 2

FRI. 26.

WED. 24. Ther. Weather,

THUR. 25. Ther. Weather,

FRI. 26. Ther. Weather,

SAT. 27. Ther. Weather,

SUN. 28. Ther. Weather,

Low Sunday.

MON. 29. Ther. Weather,

TUES. 30.

WED. 1.

THUR. 2.

TUES. 30. Ther. Weather,

WED. 1. Ther. Weather,

THUR. 2. Ther. Weather,

FRI. 3. Ther. Weather,

SAT. 4. Ther. Weather,

SUN. 5. Ther Weather,

MON. 6

TUES. 7

) WED

MON. 6. Ther. Weather,

TUES. 7. Ther. Weather,

WED. 8. Ther. Weather,

THUR. 9. Ther. Weather,

FRI. 10. Ther. Weather,

SAT. 11. Ther. Weather,

SUN. 12.

MON. 13.

TUES. 14.

SUN. 12. Ther. Weather,

MON. 13. Ther. Weather,

TUES. 14. Ther. Weather,

WED. 15. Ther. Weather,

THUR. 16. Ther. Weather,

FRI. 17. Ther. Weather,

SAT. 18

SUN. 19.

MON. 20.

SAT. 18. Ther. Weather,

SUN. 19. Ther. Weather,

MON. 20. Ther. Weather,

TUES. 21. Ther. Weather,

WED. 22. Ther. Weather,

THUR. 23. Ther. Weather,

FRI. 24.

SAT. 25.

SUN. 26.

FRI. 24. Ther. Weather,

SAT. 25. Ther. Weather,

SUN. 26. Ther. Weather,

Rogation Sunday.

MAY, 1889.

MON. 27. Ther. Weather,

TUES. 28. Ther. Weather,

WED. 29. Ther. Weather,

THUR.

FRI. 31

SAT. 1.

THUR. 30. Ther. Weather.

Ascension Day.

FRI. 31. Ther. Weather,

SAT. 1. Ther. Weather,

JUNE, 1889.

SUN. 2. Ther. Weather,

MON. 3. Ther. Weather,

TUES. 4. Ther. Weather,

WED.

THU

FRI. 7.

WED. 5. Ther. Weather,

THUR. 6. Ther. Weather,

FRI. 7. Ther. Weather,

SAT. 8. Ther. Weather,

SUN. 9. Ther. Weather,

Whitsunday.

MON. 10. Ther. Weather,

TUES. 1

WED. 12

☺ THUR

JUNE, 1889.

TUES. 11. Ther. Weather,

WED. 12. Ther. Weather,

☺ THUR. 13. Ther. Weather,

FRI. 14. Ther. Weather,

SAT. 15. Ther. Weather,

— Paauoa Springs
Kaanona (W) Mauka
Keanini (K) Mauai
Mary (W)

SUN. 16. Ther. Weather,

Trinity Sunday.

MON. 17.

TUES. 18.

WED. 19.

MON. 17. Ther. Weather,

TUES. 18. Ther. Weather,

WED. 19. Ther. Weather,

THUR. 20. Ther. Weather,

Corpus Christi.

FRI. 21. Ther. Weather,

SAT. 22. Ther. Weather,

SUN. 23.

MON. 24.

TUES. 25.

SUN. 23. Ther. Weather,

MON. 24. Ther. Weather,

TUES. 25. Ther. Weather,

WED. 26. Ther. Weather,

THUR. 27. Ther. Weather,

FRI. 28. Ther. Weather,

SAT. 2

SUN. 3

MON. 1

SAT. 29. Ther. Weather,

SUN. 30. Ther. Weather,

Kuakaha 8"

MON. 1. Ther. Weather,

JULY, 1889.

TUES. 2. Ther. Weather,

WED. 3. Ther. Weather,

THUR. 4. Ther. Weather,

Water low in Mahiki

FRI. 5.

SAT.

SUN. 7.

FRI. 5. Ther. Weather,

Water very low in Malakia and Kafiena

SAT. 6. Ther. Weather,

no improvement in Malakia supply

SUN. 7. Ther. Weather,

Lankaha 8"

JULY, 1889.

MON. 8. Ther. 81. Weather, Clear

Lualaha 7 1/2"

Water in Reservoir 1-feel 8" in 2 hours

TUES. 9. Ther. Weather,

WED. 10. Ther. Weather,

THUR. 1

FRI. 1

SAT. 13.

THUR. 11. Ther. Weather, Cloudy & Showery

Ch. Way house Reservoir
9' 3" 1.45 P.M

FRI. 12. Ther. Weather,

Light rain this evening

SAT. 13. Ther. Weather,

Showery all this evening

Hawaii Vs. Honolulu
at Base Ball Latter won
by 3. to 0. 9 innings
Time 1 h. 13 m

SUN. 14. Ther. Weather,

Showery all night
Very Telephone Leak in pipe
Went to 1/2 way house 1.30
P.M. met Mr Lunan -
Met L. A. Thurston & Mrs Dunn
Hebbard & Wife H. J. Agnew
12 1/2 feet in Reservoir

MON. 15. Ther. Weather,

No Rain:
Strong Trades

TUES. 16. Ther. Weather,

No Rain
Strong Trades

WED.

No

THUR.

Rev

FRI.

Le

Pf

Wa

JULY, 1889.

WED. 17. Ther. Weather,

No Rain

THUR. 18. Ther. Weather,

Rev Mr McIntosh's Gate
Closed for the first
time in my Knowl.
2 P.M.

¶ FRI. 19. Ther. Weather,

Lukaha 8"

Golf Way House Rainfall 9 3

Neilishia Ohia Spring
3 1/4 in 24

SAT. 20. Ther. Weather,

Light Showers last night

J. A. H. Reports no Water on his P.
Crane, Reported plenty, and J. A. H.
Lies also plenty at Boardman &
W. P. Castles.

SUN. 21. Ther. Weather,

Light Showers last night

Went to Kmuaina

MON. 22. Ther. Weather,

No Rain Very Warm

Fire Alarm at 7-07 P.M.
Sunday 21st Papalama

TUES. 23. Ther. Weather,

No Rain
Very Warm last night

Turned Water into New
Reservoir Elect. Work,
Kuakaha — 6 a.m.
Shut off Queen Emma Res.

WED. 24. Ther. Weather,

Dopei's hours for Irrigation
Changed to Middle hour

THUR. 25. Ther. Weather,

No Rain

Shepperd - Reported very
little water after 4. P.M.

FRI. 26. Ther. Weather,

Light Showers in morn and all day Rain Gauge
Mrs. W. L. Green Telephone, no Water
J. A. W. Telephoned no Water on premises
Pump up 4 12. P. 7. 13 times L. R. A
Wey. A.

SAT. 27. Ther. Weather,

Showers all night
and light aft 10. O'clock
Gauge for 24 hours $\frac{28}{100}$ V

Reservoir No 1 & 2 overflow at 18 ft mark

SUN. 28. Ther. Weather,

Showers last night

Reservoir 1 & 2 - 18 ft

Rain Gauge for 24 h -
" " " Wed.

JULY, 1889.

MON. 29. Ther. Weather,

Light Showers last night

Reservoir 182 13 ft.

Fire below Prison @ 10 - 9 m

TUES. 30. Ther. Weather,

Wilcox Taken poss of Palace by force

H. F. Dept. Bill on Rebellion

$238.00

Put the dept. into for active service

WED. 31. Ther. Weather,

Dismissed the Fire Dept from ~~8 a.m.~~ from duty 5 a.m.

THUR. 1. Ther. Weather,

FRI. 2. Ther. Weather,

Went to Vally

SAT. 3. Ther. Weather,

McCalledon Libin

SUN.

Wen
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24 h

MON. 5.

We

TUES. 6.

We

AUGUST, 1889.

☽ SUN. 4. Ther. Weather,

Went to mountain
Salt House 105 lbs 4. P.M
ordered shut down. boy Telegr
back at 4.45 = 80 lbs at 5
7 lbs 5-30
24 hours ✓ R. Gauge = 1/100 fall ✓

MON. 5. Ther. Weather.

Went to Vally

TUES. 6. Ther. Weather,

Went to Vally

WED. 7. Ther. Weather,

Went to Kumaun

J. Edwards & I hauling on Hose stand. Gale leak

Gave to Marshal Sepor list of Firemen and Bills on Pier a/c

THUR. 8. Ther. Weather,

Fire over to Kowlan

Edwards & man to Kumaun

Pipe burst on the Pauoa main, reported by Telephone at 10.15 a.m.

FRI. 9. Ther. Weather,

Left Honolulu on Yatch Healani for Kamauna in Company with Yatch Hawaii at 2 P.M. arrived at destination 5 P.M. ~~Left~~ Hawaii 5.10 P.M. left again at 6 P.M. for Punaluu on a/c of rough weather arr. @ 10.15

☺ SAT.

Left
Bar
5.2
5 = .5

SUN. 11.

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400.
Telepho

MON. 12

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Tele
Shutt
y

SAT. 10. Ther. Weather,

Left Pueblo 4:13 P.M. at Pueblo Bar 4.20 reached Bell Bay 5.20 P.M. Kings Boat House 5.50 "

SUN. 11. Ther. Weather,

Powell meddling with the internal working of the Wm. Works.

Telephoned to him from Y. W. House at 1.15 P.M. re 400. Rs mat. Co. 7.15 P.M. received Telephone from him - at 15th. above. He Reply

MON. 12. Ther. Weather,

8.45 A.M. met Thurman told him, did not like Powell's action. 9. A.M. found Water shut entirely off - ordered turned on. Telephone from Powell as to shutting of Water

Found only 36 hours supply

TUES. 13. Ther. Weather,

Had Gang of men to break & Make connection and had Water on at 12.05 a.m 14th at 11=35 P.m, top of Pipe was above Water and J. D. Dowsett Jr placed his hand into the opening of the pipe

WED. 14. Ther. Weather,

12.15 Water was boiling into reservoir. 12.35 a.m. left for home accompanied by J. D Dowsett Jr. - ordered all hands on deck at 9. a.m 10.15 a m. all O.K.

THUR. 15. Ther. Weather,

Worked on pipes E.W Ks

Electric Reservoir 12.m 12 feet 36 hours running 1/2 Way Home Reservoir empty Had Gate Shut at 1. P.m. 5.45 P.M. only Bay at Brown B.J

FRI. 16

Rain last

Wor

SAT. 17

M tim

Wor Co hire one

☾ SUN.

Ro Electr Re 12-4

FRI. 16. Ther. Weather,

Rains in Kumana, Frost last night, Krakatoa -

Worked on Pipes & Walks.

SAT. 17. Ther. Weather,

Mr. Intake Gate closed for 2nd time 8.40 A.M.

Worked on Pipes & Wks. 8.30 P.M. Completed Connection. Tested pipes, pressure on Gauge 140 lbs one Lead joint leaked slightly

☾ SUN. 18. Ther. Weather, no Gauge

Rowell & Gang Worked on Electric Machinery to-day

Heavy Rains in Kumana 12-40 P.M.

MON. 19. Ther. Weather,

Cloudy & very light Showers in Town

Showery all last night up
Nimmo ~ & all day

Worked on E Wks -
~~Lights lam~~ low

TUES. 20. Ther. Weather, ✓ Rain Gauge 8/100

Lights last evening for a few
min. about 5-0 lights -
Cloudy this morning
every indication of rain

Laid 9 Lengths of 12" Pipe
from new Reservoir (No 3)

WED. 21. Ther. Weather, ✓ Rain Gauge ✓ 1/100

very light Showers last night

C. Nicols - Died - 11. a.m.

THUR.

FRI. 2

SAT. 2

THUR. 22. Ther. Weather,

Cloudy & Sultry
Rain in morning

Pope Blenrout at G. L. Stu inform
fire 1.15 P.M. by Kennicott
Nicols buried

FRI. 23. Ther. Weather,

SAT. 24. Ther. Weather, ✓ Cloudy ✓ 3/100

Light Rains last night

Notified Boardman in written form
as to his violation of inaugural
Sent back word by Crane
to Sell Wilson & Thornton that
he (B) is going to use all the W
when he Cant

SUN. 25. Ther. Weather,

Very Rains this morning
Gauge - 1.08 / 100

MON. 26. Ther. Weather,

Gauge - 1.8 / 100

Winchester & 3 natives began work on Palace Yard Pipes

TUES. 27. Ther. Weather,

No Rain. Very Sultry

Went to Park with Curtis for Shooting. Got 6.

WED. 28

No

Went
Dor

THUR. 29

Went
hea
threa
Rai
Pho
5-

FRI. 30.

WED. 28. Ther. Weather,

No rain, Very Warm.

Went Makitki With Austin
Dove Shooting, got 5.

THUR. 29. Ther. Weather, Cloudy

Went to Valley. Light rain
heavy Clouds on the Mountain
Stream rose considerable 10.9 m
Rained good & Solid at 1.55 P.M.
P.M. until 3.15 P.M.
5-25 P.M. Rain in Town

FRI. 30. Ther. Weather,

√ Rain Gauge - √ 34/100

McIntosh's Gate Chained
& Locked for the first time
to my notice

SAT. 31. Ther. Weather,

11.45 Lower Reservoir reported leaking through the Course 17.50. Reported time that the Water pushed out of Lower Reservoir empty at 4.30?

SUN. 1. Ther. Weather,

Went to Round Top with N. Whig. 9

✓ Rain Gauge $\sqrt{\frac{8}{100}}$

Wodehouse & Robertson Mounted Geese – 9 – Ducks

MON. 2. Ther. Weather,

Cloudy this morning

✓ Rain Gauge $\sqrt{\frac{14}{100}}$

Powell had my Gang repair Dam Reservoir No 3. on E. L. Station

TUES. 3. T

WED. 4. T

Went

THUR. 5. T

Got 6

the pers

Dowse

TUES. 3. Ther. Weather,

WED. 4. Ther. Weather,

Wens 15 Cockain Shooting

THUR. 5. Ther. Weather,

Sch 64 Birds Whitney & Wilson
the pen 4 " "
Dennett & Spaulding 50 - Total 155

FRI. 6. Ther. Weather, Sultry

Heavy Rains in Nunam
Washed away Dam being built
by Ahlo -

SAT. 7. Ther. Weather, Fine, Trader,
Dam Pay Roll #146.50
Went to Nunam, Water
still Muddy in 1/2 Wayhaw
Reservoir. Turned on flood
Gate at 1-10 P.M. full, Gate
at 2-10 Water Lowered 8"

SUN. 8. Ther. Weather,

Light Shower last night
Gauge - 2 1/2
1.00

MON.

12.
above
1/2
Sin

Clou

TUES. 10

No

WED. 11

Ra

☺ MON. 9. Ther. Weather,

12. 10 M. both Reservoirs
above empty
1/2 Way House been running
since Saturday 1.10 P.M.

Cloud Valve at 2.30 P.M.

TUES. 10. Ther. Weather,

No Rain Cloudy & Sultry

WED. 11. Ther. Weather,

Rained last night
very slight Rain
✓ Gauge - 59/100

THUR. 12. Ther. Weather,

No Rain in Town last night
but heavy Rains in the Valley
Roads up Valley muddy
1 P.M. heavy Shower in
Town lasted about ~~an~~ 10"
Cloudy & Sultry all day

FRI. 13. Ther. Weather, Clear

No Rain last night
Gauge - 12/100

SAT. 14. Ther. Weather,

SUN. 1

MON

TUES.

SUN. 15. Ther. Weather,

No Rain Cloudy

☾ MON. 16. Ther. Weather,

Light Showers last night
Gauge $\frac{18}{100}$

Chinese Scare last evening
the City under Arms
all night - false alarm

TUES. 17. Ther. Weather,

Light Rain last night
Gauge $\frac{14}{100}$

WED. 18. Ther. Weather,

No Rains.

Went to Iowa to select Boat house site with Fran Brown and others

THUR. 19. Ther. Weather,

No Rains last night

Very Cloudy this morning

FRI. 20. Ther. Weather,

SAT. 21.

Rai

SUN. 22.

Rai

MON. 23.

Lig
& e

SAT. 21. Ther. Weather,

Rain last night
✓ Gauge .7
100

SUN. 22. Ther. Weather,

Rain last night
✓ Gauge .26 ✓
100

MON. 23. Ther. Weather,

✓ Gauge .3
Light rain yesterday
& last night

SEPTEMBER, 1889.

TUES. 24. Ther. Weather,

WED. 25. Ther. Weather,

THUR. 26. Ther. Weather,

Light Rain last night
✓ Gauge $\frac{7}{100}$

FRI. 27

Rai

✓

SAT. 28

SUN. 29

Je
abo

FRI. 27. Ther. Weather,

Rain last night

& Gauge .34

SAT. 28. Ther. Weather,

SUN. 29. Ther. Weather,

t night Telephone Leak in 15th Mer

above G. C. Wks

MON. 30. Ther. Weather,

Telephone. Hydraulic Lift
near F. Cortlandt and Ryers

☽ TUES. 1. Ther. Weather,

WED. 2. Ther. Weather,

THUR. 3.

FRI. 4. T

Full

SAT. 5. T

Ro

✓

Clou

THUR. 3. Ther. Weather,

FRI. 4. Ther. Weather,

Cloudy all day Wind southerly

SAT. 5. Ther. Weather,

Rain last night
Rain Gauge 1.16 1/2
100

Cloudy & Sultry

SUN. 6. Ther. Weather,

✓ $\frac{3}{100}$

MON. 7. Ther. Weather,

✓ $\frac{3}{100}$

☺ TUES. 8. Ther. Weather,

Palace Well 36 in. below its normal height

WED.

THUR.

✓

FRI. 1

h

WED. 9. Ther. Weather,

✓ $\frac{9}{100}$

THUR. 10. Ther. Weather,

✓ $\frac{4}{100}$

FRI. 11. Ther. Weather,

Wallers & Wilcox Artica
26 in below the normal
height

in below
ight

S SAT. 12. Ther. Weather,

TUE

M SUN. 13. Ther. Weather,

✓ Gauge – $\frac{14}{100}$

☾ W

☺ MON. 14. Ther. Weather,

✓ $\frac{6}{100}$

THUR

TUES. 15. Ther. Weather,

☾ WED. 16. Ther. Weather,

✓ $\frac{3}{100}$

THUR. 17. Ther. Weather,

✓ $\frac{4}{100}$

FRI. 18. Ther. Weather,

Rain in the Valleys

SAT. 19. Ther. Weather,

on a Rain

SUN. 20. Ther. Weather,

MON. 21

TUES. 22

WED. 23.

MON. 21. Ther. Weather,

Light Rain in the Valleys

TUES. 22. Ther. Weather,

WED. 23. Ther. Weather,

Fire Alarm 2.05 pm

THUR. 24. Ther. Weather,

Rain last night
✓ Gauge - - 8

Cloudy all day

FRI. 25. Ther. Weather,

✓ 4

SAT. 26. Ther. Weather,

✓ 9

Rain all night Cloudy
this morning

SUN. 27. Ther. Weather,

✓ Light Rains 13

MON. 28. Ther. 78 Weather, Cool

✓ 1/100

TUES. 29. Ther. 80 Weather, Cool

✓ 1/100

WED. 30. Ther. Weather,

Very heavy Rains in mountain Valley last night, none in the City

THUR. 31. Ther. Weather,

Cloudy rain in the Mountains

FRI. 1. Ther. Weather,

Gauge 3

Light rains last evening

Wind South

SAT. 2

Sn

SUN. 3

1

MON. 4

R

W

3 P

SAT. 2. Ther. Weather,

Sultry Wind South

SUN. 3. Ther. Weather,

11 a.m Rain in Munam

MON. 4. Ther. Weather,

Rained last night
Gauge 1.$\frac{18}{100}$

Munam Shwa here
13 feet

NOVEMBER, 1889.

TUES. 5. Ther. Weather, FRI.

Gauge - .4

WED. 6. Ther. Weather, SAT.

Changed Water System Water

☺ THUR. 7. Ther. Weather, SUN.

FRI. 8. Ther. Weather,

SAT. 9. Ther. Weather,

Gauge - 6

SUN. 10. Ther. Weather,

Gauge 3

MON. 11. Ther. Weather,

TUES. 12. Ther. Weather,

Gauge 57

" by Mr Gibbins 1.2

WED. 13. Ther. Weather,

Gauge 6

THUR. 14. Ther. Weather,

☾ FRI. 15. Ther. Weather,

1. 2

SAT. 16. Ther. Weather,

/6

SUN. 17. Ther. Weather,

MON. 18. Ther. Weather,

TUES. 19. Ther. Weather,

WED

THUR

FR

WED. 20. Ther. Weather,

THUR. 21. Ther. Weather,

FRI. 22. Ther. Weather,

SAT. 23. Ther. Weather,

SUN. 24. Ther. Weather,

MON. 25. Ther. Weather,

TUES. 26

WED. 27

THUR. 2

TUES. 26. Ther. Weather,

WED. 27. Ther. Weather,

Laid Water Pipes Reservoir
to Nuuanu

THUR. 28. Ther. Weather,

Rain in Nuuanu this
Evening

FRI. 29. Ther. Weather, MON

Rain in Lincoln this morning.

SAT. 30. Ther. Weather, TUES.

SUN. 1. Ther. Weather, WED.

Advent Sunday.

MON. 2. Ther. Weather,

TUES. 3. Ther. Weather,

WED. 4. Ther. Weather,

THUR. 5. Ther. Weather,

FRI. 6. Ther. Weather,

SAT. 7. Ther. Weather,

SUN. 8. Ther. Weather,

Discovered leak in Lithia
Ve near Blacks Ferry

MON. 9. Ther. Weather,

Squally last night
Gauge - .24
.00

Light rain all day

TUES. 10. Ther. Weather,

Light rain last night
Gauge .12

Snowy All day

WED. 11. Ther. Weather,

Snowing all night

Gauge 1.23
J. Wilder 1.20
Dr McKibbin 2 10

THUR. 12. Ther. Weather,

Gauge -
.56
.48 mg 11 K

FRI. 13. Ther. Weather,

Gauge - .50
1.83 mg 11 K

SAT.

SU

MON

SAT. 14. Ther. Weather,

Gauge – 11

☾ SUN. 15. Ther. Weather,

Gauge – .18

MON. 16. Ther. Weather,

TUES. 17. Ther. Weather,

WED. 18. Ther. Weather,

THUR. 19. Ther. Weather,

FRI.

SAT.

SU

FRI. 20. Ther. Weather,

SAT. 21. Ther. Weather,

SUN. 22. Ther. Weather,

MON. 23. Ther. Weather,

Gauge .4

TUES. 24. Ther. Weather,

WED. 25. Ther. Weather,

Christmas.

THU

FRI. 2

SAT. 2

THUR. 26. Ther. Weather,

FRI. 27. Ther. Weather,

SAT. 28. Ther. Weather,

SUN. 29. Ther. Weather,

MON. 30. Ther. Weather,

TUES 31. Ther. Weather,

MEMORANDA.

Race		1/2 mile	Dark
Miss Prichard	1		2
Obscurions	2		3
Camilla	3		
Parahi	4		
Ka Aalani	5		1
Lalla Rookh	6		

Bonwell	1	2.53 1/4	2.49 1/4
3/4		Dark	
Ivory	1	—	1 1.22 1/2
	2		
W.K.P.	3		4 —
Pikomai	4		
~~Hatasa~~	~~5~~		

4	1/2 mile	head	
	1		2
Bonny	1	3	3
Kikila	2	2	2
Surprise	3	1 1.53 1/2	1.54 1/2

over

Pups 5

1 Lelekaio 3
2 Izonbadam 4
3 Wilhelmina 1 1.23
4 Julia S. 2
5

Mill Heats 2 in B

Jasper 2
Dick dis
Mill 1 2 50½ 1. 2.50½ 1.
2.50½ 2.50⅘

8 Raw mill Dogs

1 Hancock 3
2 Obscurios 1 – 1.49
3 Pritchard 4
4 Panaki 2

9 1 1/4 Dash

1 Conspiracy 2
2 J. A. C. 1 2.22 1/5

Job 1 2 w
Mill 2 3 2
J D 3 2
E N. 4 1-2.47 4/5 1.24 5/5
1
2.48

2.47 4/5. 2.45 5/5 2.48

1 1/2 Dash

1 Rob Roy 1 2.50
2 J. A. L 2.

over

18 [illegible] Page 142 [illegible]

1 – Pitcomic ✓
2 Savoy ✓
3 Ironbeder ✓ 1
4 Wilhemina ✓
5 Surprise ✓
6 Red Oak ✓ 1.57
7 Heythine ✓
8 – Hancock Jr ✓

14 – 1 Ellen – 1 1.55
2 Billy C
3 Nikita
4 Molly H
5 Nottie

Wounds
13 [illegible]
Weeds

MEMORANDA.

Kahonawi
Kanhiri
J. Opra

MEMORANDA.

Date.

G. E. Fraley
217. Sansome
S. C.
P. H.

Water Wks. 4/19. for the King
Linakaha – Water
nahola – aa – 25

Cash Account.

Date.		Received.		Paid.	

*

inches 1 2 centimeters 1 2 3 4 5 6
1 2 3 4 5 6 7 8 9 10 11(A) 12 13 14 15
L* 39.12 65.43 49.87 44.26 55.58 70.82 63.51 35.92 52.24 97.06 90.02 87.34 82.14 72.06 62.16
a* 13.24 18.11 -4.34 -15.90 9.82 -33.43 34.26 11.81 48.55 -0.40 -0.90 -0.75 -0.06 -1.19 -1.01
b* 15.07 18.72 -22.29 22.35 -24.49 -9.35 58.65 -46.07 18.51 1.13 0.23 0.21 0.43 0.28 0.19
D50 Illuminant, 2 degree observer (batch avg.) Density 9.04 0.09 0.15 0.22 0.36 0.51
Golden Pencil
16 (N3) 17 18 (B1) 19 20 21 22 23 24 25 26 27 28 29 30
49.25 38.62 28.66 18.19 8.29 3.44 31.41 72.46 72.95 29.37 54.91 43.96 82.74 52.79 50.87
-6.16 -0.18 0.54 -0.25 -0.81 -0.23 20.98 -24.45 15.83 13.06 -38.91 52.00 3.49 32.88 -27.17
0.91 -0.04 0.60 0.73 -0.19 0.49 -19.43 55.53 58.80 -49.49 30.77 30.01 81.29 -12.72 -29.46
0.75 0.98 1.34 1.87 2.04 2.42 Colors by Munsell Color Services Lab B00037
Da Vinci

5 ft 5 seconds - 5 × 7 1/2
5 1/2 × 7 1/2

5 ft 4 seconds - 5 × 9 1/2

CASH ACCOUNT.

Date.	Particulars.	Received.	Paid.

Paid.		Date.		Received.		Paid.	

Cash Account.

Cash Account.

Date.		Received.		Paid.	

Cash Account.

d.	Paid.	Date.	Received.	Paid.

Cash Account.

Date.		Received.		Paid.		Dat

Cash Account.

	Paid.	Date.	Received.	Paid.

Cash Account.

Date.		Received.		Paid.		Da

Cash Account.

Paid.	Date.	Received.	Paid.

Cash Account.

Date.		Received.	Paid.	Date.

Cash Account.

Paid.	Date.		Received.	Paid.

Cash Account.

Date.		Received.		Paid.		Date.

Cash Account.

Paid.	Date.		Received.	Paid.

Cash Account.

Date.		Received.		Paid.		Date.

	Paid.	Date.		Received.	Paid.

Cash Account.

Cash Account.

Date.		Received.		Paid.		Dat

Cash Account.

Received.	Paid.	Date.	Received.	Paid.

Cash Account.

Date.		Received.		Paid.		Date.

Cash Account.

Date.		Received.	Paid.

Cash Account.

Date.		Received.		Paid.		Date

ved. Paid.

Cash Account.

Date.		Received.	Paid.

Cash Account.

Date.		Received.		Paid.	Date.

Cash Account.

d.	Paid.	Date.		Received.	Paid.

Cash Account.

Date.		Received.	Paid.	Date.	

	Paid.

Cash Account.

Date.		Received.	Paid.

Cash Account.

Date.		Received.		Paid.		Date.	

Cash Account.

Paid.	Date.	Received.	Paid.

Cash Account.

Date.		Received.		Paid.		Date.	

Cash Account.

Paid.	Date.	Received.	Paid.

Cash Account.

Date.		Received.	Paid.	Dat

Paid.

Cash Account.

Date.		Received.	Paid.

Cash Account.

Date.		Received.	Paid.

Expe

Date.

Paid.

EXPENSE FOR .....

Date.		Amount.

EXPENSE FOR .....

Date.		Amount.

EXPEN

Date.

Amount.

EXPENSE FOR .....

Date.		Amount.

EXPENSE FOR .....

Date		Amount.

EXPEN

Date.

Amount.

EXPENSE FOR .....

Date.		Amount.

EXPENSE FOR .....

Date		Amount.

EXPE

Date

Amount.

EXPENSE FOR

Date		Amount.

EXPENSE FOR .....

Date.		Amount.

EXPEN

Date

Amount.

EXPENSE FOR .....

Date		Amount.

Notes and Bills

Drawer.	Favor of.	Time.

PAYABLE AND RECEIVABLE.

Favor of.	Time.	Due.		Payable.		Receivable.	

Notes and Bills

Drawer.	Favor of.	Time.

Payable and Receivable.

or of.	Time.	Due.	Payable.	Receivable.

NOTES AND BILLS.

Drawer.	Favor of.	Time.

PAYABLE AND RECEIVABLE.

avor of.	Time.	Due.	Payable.	Receivable.

Summary of Notes and Bills

	Payable.	Receivable
JAN.		
FEB.		
MAR.		
APRIL		
MAY		
JUNE		
JULY		
AUG.		
SEPT.		
OCT.		
NOV.		
DEC.		

BILLS

Receivable

7-32

10

tt

100

Sat 10

Mon 21

25.00
4.50
7.

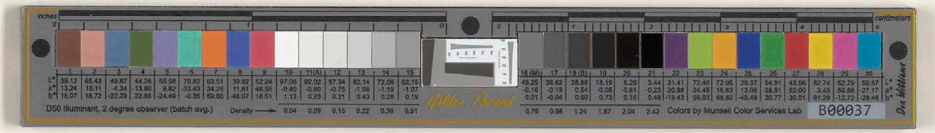
3.50
4.00
6.00
48.50
9.00
39.50
3
7
46.50
2
81.50
5
96
120
60
120
120

G. Nelson 320 Planailoon R

6
7.50
13.50
4.10
9.50
2.0

12 / 200 / 16.55 / 4.50
18
80
74
120
12
24
2 / 6.04 / .60
6.04
4

12/0
3.00
3.00
0


inches
centimeters
D50 Illuminant, 2 degree observer (batch avg.)
Density
Colors by Munsell Color Services Lab
B00037