

**A SHORT AND EASY METHOD
FOR OBTAINING, BY THE HELP OF
A TABLE, THE AVERAGE TIME
UPON BILLS OF MERCHANDISE,
NOTES, ACCOUNTS, &C.**

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A short and easy method for obtaining, by the help of a table, the average time upon bills of merchandise, notes, accounts, &c. by L. Brooks

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L. BROOKS

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A
SHORT AND EASY METHOD
FOR
OBTAINING, BY THE HELP OF A TABLE,
THE
AVERAGE TIME
UPON
BILLS OF MERCHANDISE, NOTES, ACCOUNTS, &c.
CONTAINING
TWO COMPLETE SETS OF PRACTICAL EXAMPLES OF ALL THE DIFFERENT
VARIETIES OF BILLS THAT EVER OCCUR IN BUSINESS, WITH FULL
AND LUCID EXPLANATIONS, NOTES AND DEMONSTRATIONS.
THE WHOLE BASED UPON INTEREST
(THE ONLY TRUE BASIS OF AVERAGE TIME)
AT SIX PER CENT.
TOGETHER WITH
A COMPLETE TIME TABLE.
BY L. BROOKS.
THIRD EDITION, REVISED.
1851.

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THERE is nothing, in the whole routine of business, that merchants and business men find more difficult and perplexing than to ascertain the average date of several Bills bought at different times, or the date when they all average due, by any of the tedious methods generally used.

Our Arithmetics and systems of Book-Keeping contain, at best, but a meagre synopsis of Equation of Payments, which is in many instances utterly valueless to the practical man; and this comprises absolutely *all* that is written upon the subject.

To this total absence of anything like a plain analytical method, fully and clearly illustrated by such examples as actually occur in business, more than to the complicated nature of the operation itself, is to be attributed the fact, that very few business men, in city or country, understand how to average *correctly* every variety of account that may occur; while a very large majority are wholly unable to average even those that are of the simplest form.

These facts, and the constantly increasing want of the business community, as this manner of settling accounts is becoming more widely and generally appreciated and adopted, with the repeated inquiries of merchants for something that would render them some effective assistance in this particular, have induced me to prepare and present this method to the public, which is perfectly accurate, and, as it is very short, facilitates this important item of business, by relieving it of the tediousness, and removing the obscurity, which have hitherto attended it, establishing it upon *Interest*, its own and *only* legitimate basis.

It has been my constant aim to make it *purely* and *wholly* a practical business assistant, studiously avoiding all technicalities, and using such language only as would most clearly and happily express the ideas I wished to convey.

I have purposely used the same language, in explaining the different examples, as far as practicable, and made everything as simple and plain as possible.

And firmly believing that experience will prove this much the shortest, plainest, and the most comprehensive method ever used, it is cheerfully submitted to the test of public scrutiny.

Great Falls, April, 1861.

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AVERAGE DATE.

To find the average date of all the Bills.

RULE.— Find what the interest would be upon each of the bills from the first day of the month in which the first bill was bought until they were severally purchased. Then add the interest of the several bills together, and place four ciphers at the right of the amount, and divide this sum by the amount of all the bills; and against the quotient, or answer, in the Table of Quotients, stands the time from the day from which the interest is reckoned to the average date of all the bills.

N. B. If, in using either method, there are cents in the interest, and none in the bills, annex but two ciphers;— if there are cents in the bills, and none in the interest, annex six ciphers, and proceed as above.

NOTE.— The first day of the month in which the first bill was bought is used in this method, because it is the most convenient; as the number of months from that date until the bills were bought is readily found, and the number of days is always the same as the date of the bills; which is not the case with any other date.

AVERAGE DUE.

To find when all the Bills will average due.

RULE.— Find what the interest would be upon each bill from the first day of the month following the one in which the last bill was purchased, until they are severally due.

Then add the interest of the several bills together, and place four ciphers at the right of the amount, and divide this sum by the amount of all the bills; and against the quotient, or answer, in the Table of Quotients, stands the time from the day from which the interest is reckoned, at which all the bills will average due.

NOTE.— The first day of the month following the one in which the last bill was bought is used in this method, because it is the most convenient; as the number of months that the bills have to run from that date is readily found, and the number of days is always the same as the date of the bills; which is not the case with any other date.

DIRECTIONS.

No knowledge of anything that precedes or follows any example in this work is necessary in order to fully understand any particular example; as each is as fully and independently explained as if that was the only example it contained;—

Therefore, when an account is to be averaged, turn to the example which contains the same kind of bills that the account contains; and average the account in the same manner as the example is averaged.

If an account contains more kinds of bills than are found in any *one* example, dispose of each *kind* as it is disposed of in the example containing it.

In getting the interest, when Bills contain dollars and cents, the cents, if under fifty, are omitted; if over fifty, are counted as one dollar.

EXAMPLE I. AVERAGE DATE.

When the Bills are on equal time, and none have become Due.

GEORGE CARPENTER,

DR.

	1850.		March 1st.			Int. 6 pr ct.
0 mos.	Mar. 8	To Merchandise,	6 mos.	\$44 16		06
	" 19	" "		97 83		31
	" 23	" "		26 13		10
	" 28	" "		200 00		93
	" 29	" "		56 00		27
1 mo.	Apr. 6	" "		71 10		43
	" 9	" "		43 60		29
	" 15	" "		66 00		50
	" 17	" "		88 84		70
	" 29	" "		179 00	\$1	76
2 mos.	May 14	" "		24 20		30
	" 17	" "		71 00		91
	" 21	" "		14 79		20
	" 23	" "		470 85	6	51
	" 27	" "		77 11	1	12
3 mos.	June 1	" "		68 87	1	05
	" 3	" "		11 08		18
	" 5	" "		81 00	1	29
	" 13	" "		90 94	1	57
	" 25	" "		61 18	1	17
4 mos.	July 4	" "		16 74		35
	" 12	" "		57 06	1	25
	" 13	" "		384 20	8	51
	" 16	" "		82 12	1	86
	" 19	" "		34 87		81
				\$2418 67	\$32	43

2418.67) 32.430000 (134

Against 134, in the Quotient Table, stands 2 months and 20 days, — the time from March 1st to the average date of the bills, which is May 20th.

EXPLANATION.

In getting the time, in this example, we write 0 against the first month's bills with a pencil on the margin, and against the next months bills, 1, 2, 3, and 4, respectively, which is the number of months; and the date of the bills is the number of days from March 1st until the bills were severally purchased, and consequently the time for which the interest is to be found.

Then we place the interest for each bill (which is found, at a glance, by Brooks & Haley's Interest Table) for the time standing against it on the margin against the bills.

Then we add all the bills together, and find the amount is \$2418.67.

Then we add the interest of all the bills together, and place 4 ciphers at the right of the amount, — thus, \$32.430000, — and divide this sum by the amount of the bills, and get 134 for a quotient, or answer; and against this quotient, in the Table of Quotients, stands 2 months and 20 days, which is the time, from March 1st, to the average date of all the bills, which is readily found, by the Time Table, to be May 20th; and, by the same Table, we see that they will become due Nov. 20th.

NOTE. In this example, all the bills would have earned \$32.43 from March 1st until they were bought, each bill earning its own proportion of this sum, according to its amount and the length of time from March 1st until it was purchased.

Now, as this is the whole amount that all the bills would have earned separately from March 1st until each was bought, the average date would be just as far ahead of March 1st as it would take the whole amount of all the bills to earn the same amount, which is 2 months and 20 days.

The shortest possible method of finding the time in which any given sum will earn a given amount of interest is given in the rule, and used in the example, viz.: annex 4 ciphers to the interest, divide by the principal, and against the quotient, in the Quotient Table, stands the time.

DEMONSTRATION.

	1850.		May 1st.			Int. 6 per cent.
0 mos.	May 3	To Merchandise,	6 mos.	\$100	00	05
1 mo.	June 3	“ “		100	00	55
2 mos.	July 3	“ “		100	00	1 05
				\$300	00	\$1 65

300.00) 1.650000 (55

Against 55, in the Quotient Table, stands 1 month and 3 days, — which is the time, from May 1st, to the average date, which is June 3d.

In this example, it is evident that the average date of all the bills would be June 3d; for, as all the bills are of equal amount, the date of the first bill would be carried forward 1 month, and the date of the last bill be brought back 1 month, which would bring them all together on the date of the second bill, viz., June 3d, which is the result shown by this method; hence, the method is correct.

N. B. As method first and second agree, they mutually prove each other.

EXAMPLE II. AVERAGE DATE.

When the Bills are on unequal time, and none have become Due.

WILLIAM H. CARPENTER,

DR.

1850.		Oct. 1st.				Int. @ 6 per ct.	
2 mos.	Oct. 3	To Merchandise,	6 mos.	\$91	00		96
0 "	" 5	" "	4 "	58	90		05
0 "	" 13	" "	4 "	100	00		22
4 "	" 19	" "	8 "	44	60	\$1	04
4 "	" 23	" "	8 "	77	20	1	84
0 "	" 27	" "	4 "	14	87		07
1 mo.	Nov. 2	" "	4 "	92	27		49
3 mos.	" 7	" "	6 "	389	96	6	31
3 "	" 14	" "	6 "	21	24		37
5 "	" 17	" "	8 "	66	00	1	84
5 "	" 20	" "	8 "	44	67	1	28
3 "	" 22	" "	6 "	11	14		21
2 "	Dec. 9	" "	4 "	29	94		35
6 "	" 11	" "	8 "	77	30	2	45
4 "	" 15	" "	6 "	64	83	1	46
4 "	" 19	" "	6 "	43	26	1	00
6 "	" 25	" "	8 "	211	74	7	24
2 "	" 26	" "	4 "	58	33		83
4 "	" 29	" "	6 "	16	10		40
5 "	Jan. 11	" "	6 "	423	90	11	37
7 "	" 12	" "	8 "	41	34	1	52
3 "	" 16	" "	4 "	16	91		31
3 "	" 21	" "	4 "	77	40	1	43
5 "	" 26	" "	6 "	19	00		56
7 "	" 27	" "	8 "	91	80	3	63
				\$2183	70	\$47	23

2183.70) 47.230000 (216

Against 216, in the Quotient Table, stands 4 months and 9½ days, — the time from October 1st to the average date of the bills, which is February 10th.

EXPLANATION.

In getting the time, in this example, we take 4 months as the basis of the operation; and against the 4 months bills in the first month we place 0; and against the 4 months bills in the following months, 1, 2 and 3, respectively.

Then against the 6 months bills of each month we place 2

more, and against the 8 months bills 4 more, than against the 4 months bills of the same month; thus, against the 6 months bills for the first month we place 2, as there is cipher against the 4 months bills; and 4 against the 8 months bills, &c., which is the number of months; and the date of the bills is the number of days, from October 1st, for which the interest is to be found. This virtually resolves all the bills into 4 months bills, by placing the date of purchase as many months ahead of the *real* date as they exceed 4 months in length, which is the same, in fact, as if they had been bought on 4 months, two, and four months *later* than they *really* were; consequently, they will *all* average due *four months* from the average date thus obtained.

Then we place the interest of each bill for the time standing against it on the margin against the bills.

Then we add all the bills together, and find the amount is \$2183.70.

Then we add the interest of all the bills together, and place 4 ciphers at the right of the amount, — thus, \$47.230000, — and divide this sum by the amount of all the bills, and get 216 for a quotient, or answer; and against this quotient, in the Table of Quotients, stands 4 months and $9\frac{1}{2}$ days, which is the time, from October 1st, to the average date of all the bills; which is readily found by the Time Table to be Feb. 10th.

NOTE. In this example, all the bills would have earned \$47.23 interest from October 1st until they were bought (considering them all 4 months bills), each bill earning its own proportion of this sum, according to its amount, and the length of time from October 1st until it was purchased.

Now, as this is the whole amount that all the bills would have earned separately from October 1st until each was bought, the average date would be just as far ahead of October 1st, as it would take the whole amount of the bills to earn the same amount of interest, which is 4 months and $9\frac{1}{2}$ days.

DEMONSTRATION.

1860.	November 1st.				Int. 6 per cent.
0 mos. Nov. 25	To Merchandise,	4 mos.	\$100	00	42
2 mos. Nov. 25	“ “	6 “	100	00	1 42
4 mos. Nov. 25	“ “	8 “	100	00	2 42
			\$300	00	\$4 26

300.00) 4.260000 (142

Against 142, in the Quotient Table, stands 2 months and 25 days, which is the time from Nov. 1st to the average date, which is Jan. 25th.

In this example, there are three bills of equal amount, bought the same day, on 4, 6, and 8 months; and they will, of course, average due in 6 months, and the average date will be the date of the purchase.

But, as we use 4 months as the basis of our calculation, the average date will be 2 months later, or 2 months and 25 days from Nov. 1st, which is the result shown by this method; hence it is correct.