

# DOUBLE-ENTRY BOOKKEEPING

[by John H. Lienhard](#)

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Today, we learn to keep track of our money. The University of Houston's College of Engineering presents this series about the machines that make our civilization run, and the people whose ingenuity created them.

You're a medieval businessman -- trading wool, pepper, cloth. Money is owed you, you have debts, and it all needs to be recorded. But there's a problem. You track it with a diary, using Roman numerals. For arithmetic you have only some finger-counting methods. Your records would curl a modern accountant's hair.

We talk of many inventions on this program -- engines and airplanes, art and literature. I doubt you ever expected to see double-entry bookkeeping on our list, but it is a profoundly important form of mathematics in our trade-driven world.

Alfred Crosby writes about an explosion of trade in the High Middle Ages. No longer was European trade a mere matter among farmers and villagers. By 1400, after the Plague, Europe was enormously capital-intensive -- its ships moved goods internationally. None of that could happen without bringing money under control.

And so there developed, according to one historian, an atmosphere of calculation. Scholars were learning the new mathematics of algebra -- that game where quantities are balanced across an equal sign -- where quantities are positive on one side and negative on the other.

So Crosby goes looking for the invention of the new algebra of record keeping -- the method called double-entry bookkeeping, where we list debits on one side and credits on the other. It's the method marked by the absolute requirement that those two columns sum to zero. It's the basis for tracking all our vast financial affairs today.

He finds that, in 1300, a Florentine bookkeeper began listing debits and receipts in different ledgers. In 1340 a Genoese accountant listed payouts and receipts on the left and right sides of a single page. For two centuries, the method slowly evolved.

Finally, another Italian, [Luca Pacioli](#), formalized the procedure. Pacioli grew up with the first printed books. He became a Franciscan monk and a noted mathematician. The year after Columbus's first voyage, Pacioli wrote a ponderous book titled *Summa*, and it included the first printed textbook on modern accounting.

The rest of Pacioli's pretentious mathematical summation was soon forgotten. But the section on double-entry bookkeeping was reprinted and translated, and it continued

teaching accountants well into the 19th century. This formal method was, in the words of an early 16th-century accountant, "a magic mirror in which the adept sees both himself and others."

Crosby reminds us that it's also the mirror in which we see ourselves today. This uncelebrated invention -- this peculiar division of all money into plus and minus, black and red -- is a tool without which all the money-fueled engines of the modern world -- would simply grind to a halt.

I'm John Lienhard, at the University of Houston, where we're interested in the way inventive minds work.

(Theme music)

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Crosby, A. W., *The Measure of Reality: Quantification and Western Society*. New York: Cambridge University Press, 1997.

I am grateful to Jim Bell, KUHF Radio, for suggesting the topic and lending me his copy of the Crosby book.

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