

JOHN NAPIER (*NAY-peer*), 1550–1617, was a Scottish nobleman who loved mathematics. He invented logarithms, worked in spherical trigonometry, and designed “Napier’s rods,” a mechanical calculating aid.

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“Excuse me, friend, but isn’t that Merchiston Castle up there on the hill?” the traveler asked with a hopeful gleam in his eye.

“That it is!” responded the old farmer as he patted his tired horse.

“I thought so!”

“Are you friends of the baron’s family, then?” asked the farmer.

“Oh, no. We’ve never met,” said the traveler. “I hail from Dundee. But I’ve heard terrible stories of his magic and black arts. I said to the wife, ‘Next time I’m in Edinburgh, I’m going to get a look at the place for myself.’ ”

“Well, you look all you want, but you won’t see any magic,” the farmer replied. “The baron is just a smart man with a lot of ideas and energy. He doesn’t need to use any magic.”

“But how can you know that?” the visitor asked.

“I’ve been working for the Merchiston estate since the baron was a wee little one,” said the farmer. “This is his field right here,

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and you know what? Because of his experiments with farming, we've got the best crop of oats we've ever had. I can't tell you exactly what we're using on this field, but it's working. No sir, there's no magic—there's just brains."

"But what about that story about the rooster?" the visitor asked. "Were you around here when that happened?"

"You can bet I was. I never saw such foolishness, but the baron is always willing to help fools fulfill themselves," laughed the farmer. "You see, he had hired a new batch of workers several months earlier. Then he began to suspect that at least one of them was stealing. At first there wasn't much missing—just a little feed and a tool here and there. But when the cook noticed some of her favorite kitchen things disappearing, well, the baron decided to take action."

The horse jingled its reins and shook its head, reminding the farmer that evening was approaching.

"I'd better get back to work. I've got to finish this field before sundown."

"But you've got to finish this story first," pleaded the traveler.

"All right, but it will have to be quick. Here's what happened. I think you'll agree that I have a smart master. He took his black rooster—the one without a speck of white anywhere—and put him into a dark storage room in the barn. Then he sent the workers in one at a time with instructions to pat the rooster on the back. You see, he'd told them earlier that this rooster could tell if people were honest or not—and since none of them would admit to stealing, he was forced to let the rooster do the telling.

"One by one the workers went in and patted the rooster on the back. The baron had told them that was necessary for the rooster

to tell the truth. Then each person came back out and waited for the others. When they were all outside, the baron asked each worker to hold out his hands, palms up. All of them had black stains on their palms, except one. He was the thief, all right!"

"But I don't understand," said the visitor. "I thought you said he didn't use magic, and now you tell me about this magical rooster that can tell if someone's lying or not."

"If you'll be quiet, I'll finish the story," the farmer said. "You see, the workers didn't know that the baron had rubbed that rooster all full of lampblack, collected when we cleaned the oil lamps. The workers who had nothing to hide went right up and patted that rooster. But the one who felt guilty wasn't about to take a chance, so he didn't touch it. That's why his hands were clean."

The traveler sputtered, "Well, I'll be—."

"Nice chattin' with you, but I've got to get on with the field," the farmer said. "Got chores to do, too."

"Wait!" the traveler called after him. "Do you know the story about the pigeons? Now, that one's hard to explain!"

In Merchiston Castle, it was almost dinner time. John Napier, the eighth Laird of Merchiston, sat busily writing at his desk. Much of the day had been taken up with petty problems managing the estate. Finally he was able to give a few moments to his favorite hobby—mathematics.

He was polishing up an invention. Napier hoped this invention would help mathematicians, and especially astronomers, do their difficult computations more easily. This had not been a quick project; it had taken nearly twenty years to complete. Finally, Napier felt it was ready to be tested.

Napier had invented *logarithms*. This was a new method that

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made numerical calculations easier, more accurate, and less time-consuming. His method reduced multiplying and dividing to adding and subtracting. It saved an enormous amount of time—especially when working with large numbers.

Word spread quickly throughout Europe, and everyone who worked with numbers praised the marvelous discovery. Astronomers were especially pleased. They measured very large distances—like the distance between stars—so they had to work with very big numbers. Pierre Laplace, who lived two hundred years after Napier, said that logarithms, “by shortening the labors, doubled the life of the astronomer.”

Napier was not the first person in his family to achieve fame. In fact, portraits of famous soldiers and statesmen lined the hallways of Merchiston Castle. His uncle, Adam Bothwell, had assisted at the marriage of Queen Mary and later crowned the infant King James VI.

Perhaps the legacy of a famous military family inspired Napier to dream up a collection of weapons for the future. He predicted the invention of sailing devices that would travel underwater. He imagined moving vehicles that could shoot in all directions as they moved. He also described a gun that could kill all cattle within a mile’s radius. Some of these ideas were even too horrible for Napier to dwell on—later he refused to discuss them with his friends. But in World War II, his visions became reality with the use of the submarine, the military tank, and the machine gun.

Napier did not have a profession or an official government position. However, he was always involved in political and religious issues. He wrote many essays and arguments defending his ideas. At the University of St. Andrews, where he studied philosophy

and theology, he was known for his quick temper. But he learned that when he became tense or discouraged, he could always turn to mathematics or astronomy to relax.

Some of Napier's contemporaries were famous for their long, involved computations. The trigonometry that Rheticus published in 1596 showed pages and pages of difficult calculations. Vieta, the famous French thinker, spent days just doing arithmetic. Napier suspected that sometimes mathematicians actually enjoyed making their work look complicated. He preferred the easy way.

In an effort to make arithmetic easier for bookkeepers and accountants, as well as for scholars and astronomers, Napier invented his famous rods. These were an assortment of rods marked off with numbers. When these rods were arranged correctly, they could be used for multiplication and division, and for taking square roots of numbers. They were a sort of movable multiplication table—an early type of slide rule, which is what people used before pocket calculators. Because they were often made of bone or ivory strips they were sometimes called "Napier's Bones." Today, Napier's rods are usually made of cardboard strips. They may seem clumsy compared to a pocket calculator, but in Napier's day they were a great help to people who worked with numbers.

Napier's desire to simplify computations led him to try other ideas. Once he designed a kind of "chess arithmetic" in which numbers were moved around like rooks and bishops on a chess board. That idea didn't work out, but another idea did take hold. He introduced the use of the decimal point to separate the whole number part from the fraction part of a number. This quickly became standard practice in Great Britain.

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Most of the common folk who lived around Merchiston Castle near Edinburgh had no understanding of what Napier was doing. For that matter, neither did his upper-class associates—he once complained that they couldn't do much more than "count on the fingers of their mail-clad hands." Although Napier's accomplishments had nothing to do with the supernatural, it was easier for people to explain them away as "magic." They didn't recognize his hard work and careful scientific processes. After all, there was that story about the pigeons.

"Hey, chap! Aren't you the man who told me the story about Napier and the rooster a couple weeks ago?" It was the traveler from Dundee, pausing at the roadside to wipe his brow. "I've been hoping to run into you so I could ask you again about that pigeon story."

The tired farmer groaned. He was about to steal a moment of rest at his favorite spot near the shore. Might as well give the fellow what he wants, he thought.

"All right, it goes like this. The baron's neighbor was raising pigeons some years ago, but he couldn't seem to keep them at home. Those hungry birds kept coming over to our fields and eating the grain out of the ground before it could even sprout. We warned the neighbor, but it didn't do any good. Finally, the baron had enough. He sent a personal message saying he was going to catch those birds and put them in a cage the next time they flew over his fields.

"The neighbor sent back the message 'You can have them if you can catch them,' knowing full well that no one could catch a flock of pigeons.

"But the next morning, when we came to begin work, we saw the baron himself out in the yard, scooping those pigeons up into a sack."

The traveler stood with his mouth open, ready for the explanation. The old farmer rubbed his beard, covering a trace of a smile. Shall I tell him about how the baron fed the pigeons peas soaked in brandy? he wondered to himself.

Impatient, the traveler demanded, "Well, go on. How did he do it?"

"I dunno. Just magic, I guess."