



# The Origin of the Story of Ancient Greek Mathematician Thales Transporting Salt with Mules

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## Abstract

This article explores the origin of the story of ancient Greek mathematician Thales transporting salt with mules. Through the investigation of Thales in historical works on mathematics, it was found that British historian of mathematics James Gow might first introduce this tale in *A Short History of Greek Mathematics* in 1884. Gow argued that the story originated from Plutarch or Aristotle, but such claims have not been accepted by Western historians of mathematics. American mathematician Howard Eves proposed a connection to Aesop, whereas *Aesop's Fables* is a collection of literary fables, and thus lacks historical authority. Furthermore, no historians of mathematics prior to the mid-20th century had proposed such a view. Finally, as time progressed, the narrative of Thales transporting salt with mules has increasingly acquired fictional characteristics. These findings indicate that the story of Thales transporting salt with mules has no credible documentary evidence. It can be concluded that the story of ancient Greek mathematician Thales transporting salt with mules is not genuine scientific history, but a fabricated tale about Thales that emerged in the late nineteenth century.

## Subject Areas

History of Mathematics

## Keywords

Thales, Anecdotes of Thales, The Story of Transporting Salt with Mules, History of Greek Mathematics, Popularization of History of Mathematics

## 1. Introduction

Thales (ca. 625-547 BCE), often called Thales of Miletus, also known as the first

of the Seven Sages of Greek, is usually regarded as the first mathematician and first philosopher in the history of Western science and philosophy [1] [2]. Thales, therefore, is widely recognized as the progenitor of Western science and philosophy and thus occupies an important position in history of civilization. Thales' contributions and anecdotes have been widely disseminated globally, and his stories have even been incorporated into school textbooks, which has had a significant impact on the educational and cultural undertakings of many countries. In 2022, Chinese mathematician Cai Tianxin published a popular science book titled *Mathematical Legends* in Chinese, which presents the scientific achievements and legends of 32 distinguished mathematicians throughout the history of mathematics. This book was warmly welcomed after publication, and won a major science popularization award in China. It quickly captured the attention of Western academia. The English edition was published by the renowned Springer Press in 2025. In Chapter One, Cai introduced the scientific contributions and anecdotes of the ancient Greek mathematician Thales. When introducing the legends of Thales, Cai told a story of Thales transporting salt with mules:

“Once, when he [Thales] was using mules to transport salt, one of them slipped into a stream, causing some of the salt to dissolve and thereby noticeably lightening its load. As a result, the mule deliberately rolled into the water at every stream it came to. In order to rid the beast of this bad habit, Thales loaded a sponge onto its back so that instead the weight it carried would be doubled upon contact with water. The mule never dared again to get up to its old tricks from that point on.” ([3]: pp. 3-4)

Unfortunately, Cai did not provide a source for the story. In fact, all the legends of mathematicians told by Cai do not have any references in *Mathematical Legends*. Obviously, this is not a rigorous work on the history of mathematics. The literature review found that Chinese scholars seldom reference this tale when discussing Thales in their historical works on mathematics, and almost no one mentions the story's origin. For example, Liang Zongju (1924-1995), a famous modern Chinese historian of mathematics, wrote a biography of Thales which introduced the story of Thales transporting salt with mules but did not provide any source [4]. The same is true in the West. When Western historians of mathematics introducing Thales, they rarely mention this anecdote, let alone its origin [5]-[7]. This problem has sparked author's interest in tracing the origin of the story about Thales transporting salt with mules. In a recent study, Niu (2026) [8] found that certain scholars have asserted that the story of Thales transporting salt with mules originated from Aesop. However, an in-depth review of the English literature reveals that this is not the sole source of the story, and some scholars have presented alternative perspectives. Therefore, it is necessary to explore and clarify all the origins of the story about Thales transporting salt with mules.

## 2. The Origin of the Story of Thales Transporting Salt with Mules

The story of Thales transporting salt with mules is rarely found in early works on the history of mathematics. According to Wang (2017) [9], the first classic work on the history of mathematics in history was *Histoire des Mathématiques* published in 1758 by the French historian of mathematics Jean Montucla (1725-1799). However, when Montucla introduced Thales' scientific contributions and anecdotes, he did not mention the story of Thales transporting salt with mules [10]. In 1880, the German historian of mathematics Moritz Cantor (1829-1920) began to publish *Vorlesungen über Geschichte der Mathematik*. This work quickly replaced Montucla's work, and became the most influential work on the history of mathematics during that time. However, when Cantor introduced the scientific contributions and anecdotes of Thales, he also failed to mention the story of Thales transporting salt with mules [11]. These facts indicated that early Western scholars on history of mathematics rarely mention this story in their works when introducing Thales.

### 2.1. Originated from Plutarch or Aristotle

British historian of mathematics James Gow (1854-1923) is likely the first to introduce the story of Thales transporting salt with mules in historical works on mathematics. In 1884, Gow published *A Short History of Greek Mathematics*, which explored the history of Greek mathematics. When introducing Thales' anecdotes, Gow cited the works of Plutarch and Aristotle, saying:

“Thales used mules to carry his salt to market; one of them, having slipped in fording a stream, found its load considerably lightened by the melting of the salt; and afterwards several times fell in the water purposely. To cure it of this trick, Thales loaded it one time with rags and sponges.” ([12]: p. 139)

Gow argued that the story of Thales transporting salt with mules originated from Plutarch or Aristotle. However, we did not find the story in Plutarch's *The Lives of the Noble Grecians and Romans* [13]. The Chinese version of Plutarch's work was translated from the English version which was translated by Bernadotte Perrin for *The Loeb Classical Library*. We also did not find it in *The Complete Works of Aristotle* [14]. The Chinese edition of *The Complete Works of Aristotle* was compiled by Miao Litian (1917-2000), a renowned Chinese historian of Greek philosophy, and is mainly based on *The Loeb Classical Library*. This work is regarded as an authoritative Chinese version, and has won many national book awards in China. However, none of these works mentions the story of Thales transporting salt with mules. Analyzing the reason, it might be due to different versions. The works of Plutarch and Aristotle cited by Gow are significantly different from those in *The Loeb Classical Library* version. The original text of *The Lives of the Noble Grecians and Romans* or *The Complete Works of Aristotle* in *The Loeb Classical Library*, has already removed this story.

In order to find the source of the story, we investigate the English version of Plutarch and Aristotle's works, such as Plutarch (1952) [15], Aristotle (1984) [16]. The edition of Plutarch's Lives translated by John Dryden is a classic and has been widely welcomed by readers. The Oxford Translation of Aristotle is universally recognized as the standard English version of Aristotle's works. However, these English editions also do not mention the story of Thales using mules to transport salt. These facts indicate that the claim made by Gow that the story of Thales transporting salt with mules originated from Plutarch or Aristotle is highly questionable. The same is true in the works on history of Greek philosophy. The well-known works on the history of Greek philosophy, when introducing Thales, also rarely mention the story of Thales transporting salt with mules. For example, Richard McKirahan's *Philosophy before Socrates* is regarded as the standard sourcebook in presocratic philosophy. However, when introducing the ancient Greek philosopher and mathematician Thales, McKirahan (2010) [2] mentioned many anecdotes about Thales except for the story of Thales transporting salt with mules.

In 1888, British historian of mathematics Walter Ball (1850-1925) recounted the story of Thales transporting salt with mules while introducing the ancient Greek mathematician Thales in his work *A Short Account of the History of Mathematics*. He wrote:

“It is said that once when transporting some salt; which was loaded on mules, one of the animals slipping in a stream got its load wet and so caused some of the salt to be dissolved; finding its burden thus lightened it rolled over at the next ford to which it came to break it of this trick Thales loaded it with rags and sponges, which by absorbing the water made the load heavier and soon effectually cured it of its troublesome habit.” ([17]: p. 13)

Although Ball introduced the story of Thales transporting salt with mules, he did not provide the source of the story in his book, even in the sixth edition in 1915. Yet by comparing with Gow's story of Thales using mules to transport salt, it can be found that Ball's tale is highly similar to that told by Gow, and both narratives mention Thales using “rags and sponges” to discipline the mule. Gow and Ball are all British historians of mathematics who lived in the same era, and their books on the history of mathematics were published only four years apart. Based on these facts, it is reasonable to infer that the story of Thales transporting salt with mules introduced by Ball very likely refers to Gow's work. And it is true, we did find Gow's work cited in the references of Ball's book, although Ball disagrees with Gow's account of the origin of Thales' story regarding the transportation of salt using mules.

In contrast to Ball's views, it was found that more scholars introduced anecdotes of Thales, even though they referenced Gow's work, but ignored the story of Thales transporting salt with mules. For example, the American historian of science and mathematics Florian Cajori (1859-1930) published *A History of Mathematics*

in 1893. Cajori was the first professor of the history of mathematics in history. He referenced Gow's *A Short History of Greek Mathematics*, but ignored the story of Thales transporting salt with mules [18]. This fact indicates that Cajori did not accept the authenticity of the story told by Gow. Sir Thomas Little Heath (1861-1940), a British classicist and authority on the history of Greek mathematics, also holds a similar view. In 1921, Heath introduced numerous anecdotes about Thales in his book *A History of Greek Mathematics: From Thales to Euclid*. He referenced the work of Gow, but also did not mention the story of Thales transporting salt with mules [7]. Like Cajori and Heath, the renowned American mathematical historian David Eugene Smith (1860-1944) cited Gow's work in his book *History of Mathematics* which was published in 1923, yet he also did not accept Gow's story of Thales transporting salt with mules [19]. In the mid-to-late 20th century, the most important and prominent Western historians of mathematics, including Sarton (1952) [20], Scott (1958) [21], Kline (1972) [22], Neugebauer (1975) [23], and Katz (1992) [24] *et al.* shared a similar perspective while recounting the anecdotes about Thales. None of them ever mentioned the story of Thales transporting salt with mules in their works on the history of mathematics or science.

Conclusively speaking, although British historian of mathematics Gow referenced the works of Plutarch and Aristotle in his publication *A Short History of Greek Mathematics* (1884) to introduce the anecdote about Thales transporting salt with mules, this origin has not been accepted by the leading Western historians of mathematics. When the renowned Western historians of mathematics such as Cajori, Heath, Sarton *et al.* discussed Thales' scientific contributions and biographical anecdotes, they did not mention this particular story. This absence suggests that the narrative concerning Thales transporting salt with mules, which Gow traced back to Plutarch or Aristotle, has not gained recognition within the academic community of Western mathematical history. In fact, the world-famous *Dictionary of Scientific Biography* made no mention whatsoever of Thales' story about transporting salt with mules when introducing the biography of Thales [25].

## 2.2. Originated from Aesop

The origin of the story of ancient Greek mathematician Thales transporting salt with mules is not unique. Besides the one mentioned by Gow (1884) [12] which is attributed to Plutarch or Aristotle, Niu (2026) [8] pointed out in a recently study that the story of Thales transporting salt with mules originated from Aesop. In 1953, American mathematician Howard Eves (1911-2004) told a story about Thales who used mules to transport salt in *An Introduction to the History of Mathematics*. He said:

“And there is the story of the recalcitrant mule which, when transporting salt, found that by rolling over in the stream he could dissolve the contents of his load and thus travel more lightly. Thales broke him of the troublesome habit by loading him with sponges.” ([26]: p. 52)

Although Eves referenced Gow's work when introducing Thales, he did not concur with Gow's perspective on the origin of the story regarding Thales transporting salt with mules. In fact, Eves did not provide the source of the story. In 1969, Eves recounted the story once more in his book *In Mathematical Circles*, and offered more detailed storylines, yet still failing to provide any origin [27]. However, in the sixth edition of 1990, Eves proposed that the story originated from Aesop, though he provided no evidence [28]. Eves even commented that: "which [tale of Thales], if not true, are at least apposite." ([26]: p. 52) Apparently, Eves tends to believe that the story of Thales transporting salt with mules is a historical fact, though it actually originated from *Aesop's fables*. As we all know, *Aesop's Fables*, which we read today, are the result of many centuries of collection, collation and compilation. They are essentially a collection of literary stories, and have no historical reference value. Taking the edition edited by Stade (2003) [29] as an example, the investigation reveals that Aesop told a story of a peddler using an ass or donkey carrying salt, not that of a mule. Despite some similarities in plot, the storyline of Aesop's tale differs considerably from the story of Thales transporting salt with mules. For example, the protagonist in the story of "The Ass and His Burdens" in *Aesop's Fables* is an anonymous peddler, not the famous philosopher and mathematician Thales.

American mathematician David Burton (1930-2016) was one of the earlier scholars to clearly state that the story of Thales transporting salt with mules originated from Aesop. In 1985, Burton told the story of Thales using mules to transport salt in *The History of Mathematics: An Introduction*:

"Another favorite story is related by Aesop. It appears that once one of Thales' mules, loaded with salt for trade, accidentally discovered that if it rolled over in a stream, the contents of its load would dissolve; on every trip thereafter, the beast deliberately repeated the same stunt. Thales discouraged this habit by the expedient of filling the mule's saddlebags with sponges instead of salt." ([30]: p. 93)

Burton explicitly stated that the story of Thales transporting salt with mules was related to Aesop, and this view was maintained even in the 2011 seventh edition. However, he did not provide any evidence. Furthermore, we discovered that Burton cited Gow's work but did not agree with the view that the story originated from Plutarch or Aristotle. Burton even commented that: "This [the tale of Thales transporting salt with mules], if not true, is certainly well invented and more in character than the amusing tale Plato tells." ([30]: p. 93) It can be seen that Burton argued the story of Thales transporting salt with mules was "well invented", and even more in line with the character of Thales, also more believable than Plato's story of Thales falling into a well while looking up at the stars. Obviously, Burton's viewpoint is hasty, lacks supporting evidence, and is therefore unpersuasive. In fact, in the eyes of historians, history is not an "invention" but a "record". The essence of history is a record of what really happened according to calendars. Even

if a story is well invented, it remains fiction, a form of fictional literature, and can never be classified as history.

With the development of time, the story of ancient Greek mathematician Thales using mules to transport salt in the works on history of mathematics presented more and more detailed information. Taking *Mathematicians are People, Too: Stories from the Lives of Great Mathematicians* as an example, Luetta Reimer and Wilbert Reimer presented the story of Thales and salt in this mathematical popular science book in 1990, which enriches the narrative with additional plot elements, especially adding a lot of fictional dialogues [31]. For instance, they stated that the workers of Thales dug salt out of the salt mine, put it in bags and placed it on the backs of donkeys, which carried it down the mountain and sold it in the market, and also mentioned that the foreman had reported to Thales about a strange incident where a donkey always fell when crossing the river.

It can be seen clearly that in their story, the salt carrier has changed from mule to donkey. In addition, these detailed storylines have never been presented in the works of history of mathematics by scholars of the past, such as Gow (1884) [12], Ball (1888) [17], Eves (1953) [26] *et al.* There is no doubt that these storylines were created by later scholars, and it is probable that Luetta Reimer and Wilbert Reimer invented them themselves. Obviously, these details could not be real history. When introducing the anecdotes of Thales, Luetta Reimer and Wilbert Reimer claim that the tales of Thales were recorded by Aesop and Plato. These facts suggest that the Reimers contributed to the fabrication of a fictional account surrounding Thales, and indicate that they firmly believe that the story of Thales and salt originated from Aesop.

In short, though Eves, Burton and Reimers argued that the tale of Thales transporting salt with mules or donkeys originated from Aesop, none of them provided any reliable evidence. There is no doubt that their conclusion is not entirely plausible. In fact, *Aesop's Fables* is a collection of fictional tales, and thus lacks historical authority. The story of "The Ass and His Burdens" found in *Aesop's Fables* significantly differs from the account of Thales transporting salt with mules, and there is even no evidence to suggest any connection between the two. Furthermore, no historians of mathematics prior to the mid-20th century had proposed such a view. At that time, the most influential scholars in history of mathematics, such as, Cantor, Cajori, Heath *et al.* all have not mentioned the story of Thales transporting salt with mules or donkeys in their mathematical history works when introducing the anecdotes of Thales. These facts indicate that none of them agree with the authenticity of Thales' tale of transporting salt with mules or donkeys. Contemporary serious works on history of mathematics rarely reference the views proposed by them, which traced the origin of the story to Aesop.

### 2.3. Undetermined Origins

Regarding the origin of Thales' anecdote of using mules to transport salt, the Brit-

ish historian of mathematics Gow (1884) [12] believes it originated from Plutarch or Aristotle, while the American mathematician Eves (1990) [28] holds that it originated from Aesop. In addition to these two viewpoints, some scholars mentioned the tale in the works on history of mathematics, but did not provide any source of the story.

In 1929, British mathematician Herbert Turnbull (1885-1961) published a work on the history of mathematics titled *The Great Mathematicians*. When introducing the ancient Greek mathematician Thales, Turnbull presented a story of Thales transporting salt with mules:

“It is said that Thales was once in charge of some mules, which were burdened with sacks of salt. Whilst crossing a river one of the animals slipped; and the salt consequently dissolving in the water, its load became instantly lighter. Naturally, the sagacious beast deliberately submerged itself at the next ford, and continued this trick until Thales hit upon the happy expedient of filling the sack with sponges! This proved an effectual cure.” ([32]: p. 4)

Turnbull does not provide the source of the story, and there is no source of the story even in the fourth edition in 1951. In this tale, Turnbull said that Thales had the mule transport “sponges”, but his British compatriots Gow and Ball said Thales had the mule transport “rags and sponges”. The comparison shows that the storylines are not exactly the same. Turnbull was a British mathematician, and was born more than thirty years later than his British compatriots Gow and Ball. It is highly probable that he referenced their works. Indeed, Turnbull explicitly recommends Ball’s work for further reading in his book. The story of Thales transporting salt with mules, introduced by Turnbull, may stem from Ball, but the storyline of the tale has already been refined. For instance, the plot of the story where Thales punished the sly mule by having it carry rags was removed. In fact, whether in the East or the West in ancient times, the cloth used to make clothes was a precious commodity, and usually expensive, the scraps of cloth or rags could not be obtained and disposed of at will.

American mathematics educator Vera Sanford (1891-1971) was likely the forerunner to introduce the story of Thales using mules to transport salt to United States. She published a book on the history of mathematics in 1930, in which she recounted the story of Thales transporting salt with mules:

“It is also reported that he [Thales] had a pack-mule that had discovered that rolling over in the stream which it crossed lightened its usual burden of salt. Thales determined to break the mule of this bad habit, so he ordered a load of sponges to be substituted for the salt. Apparently, the cure was effective.” ([33]: p. 6)

Unfortunately, Sanford did not provide the source of the story. Upon comparison, however, it is evident that the story Sanford recounts closely mirror the version presented by Turnbull. Sanford had referenced Ball’s work, yet the narrative

she stated did not include mention of “rags” either. The story of Thales transporting salt with mules, introduced by American mathematician George Simmons (1925-2019) in *Calculus Gems: Brief Lives and Memorable Mathematics*, bears striking similarity to the narrative presented in Turnbull’s edition, though he provided no reference [34]. But William Dunham, an American historian of mathematics, presents an alternative account of the story about Thales and donkey transporting salt. In 1990, Dunham published *Journey Through Genius: The Great Theorems of Mathematics*, and recounted the story of Thales in this book:

“A similar impression emerges from the story of a farmer who routinely tied heavy bags of salt on the back of his donkey when driving the beast to market. The clever animal quickly learned to roll over while fording a particular stream, thereby dissolving much of the salt and making his burden far lighter. Exasperated, the farmer went to Thales for advice, and Thales recommended that on the next trip to market the farmer load the donkey with sponges.” ([35]: pp. 6-7)

In the story told by Dunham, it was not a mule but a donkey that transported salt, and it was not Thales but a farmer who transported salt using a donkey. Dunham tells of a farmer driving a donkey to the market to sell salt, not Thales driving a donkey to the market to sell salt. This story is not about the anecdotes of Thales’ business dealings, but rather a tale related to Thales. It is clear that Dunham’s story of Thales and salt is completely different from that of previous scholars. It could neither directly come from Plutarch or Aristotle, nor from Aesop. Dunham referenced the works of Burton and Eves but did not concur with their assertion regarding the origin of the story of Thales. Of course, it is entirely possible that Dunham adapted his account of Thales and salt from their versions of the story.

American mathematician Michael Bradley introduced a similar story of Thales and salt in his work *The Birth of Mathematics: Ancient Times-1300* in 2006, which embellishing with numerous fabricated details, such as workers digging salt out of the salt mine, mules carrying sacks of salt several miles to the seashore, workers asking doctors to examine the donkey, etc. [36]. Moreover, what Bradley told was not the story of Thales transporting salt with mules or donkeys, but rather a story of Thales helping workers who transported salt with donkeys punish a cunning donkey. This differs from the account of Thales transporting salt with mules mentioned in early works on the history of mathematics. These facts demonstrate that the fictional elements within the narrative of Thales transporting salt with mules have become increasingly pronounced with the passing of time.

After introducing the achievements and anecdotes of Thales, Bradley provided some further readings. These readings include the aforementioned writings of Turnbull and Reimers. Without a doubt, the story of Thales and salt in Bradley’s work stems from these writings, especially from *Mathematicians are People, Too: Stories from the Lives of Great Mathematicians*, despite the two story is not exactly the same. In fact, Bradley was well aware that the story of Thales and salt told by

Reimers involved a great deal of fictional storylines. However, he still introduced this anecdote of Thales in his works on the history of mathematics. Bradley wrote clearly that some of these stories about Thales may not be true, but he didn't care whether the tale was true or not, let alone clarify the origin of the story. These findings deserve special vigilance from the academic and educational communities in the process of writing and popularizing Thales' scientific contributions and anecdotes.

In 2009, German historian and philosopher Georg Wöhrle published a book in German titled *Die Milesier: Thales*, which is alleged to present all the known testimonies on Thales in the original languages, including Greek, Latin, Arabic and Persian [37]. Later, Richard McKirahan translated it into English in 2014, and supplemented additional testimonies. There is no doubt that Wöhrle's work is the most complete collection of testimonies on Thales. In this work, Wöhrle (2014) recounted the story of Thales and salt, yet what he described was not the story of Thales but rather that of others transporting salt using mules, and said that when Thales heard the story, Thales told the men to use "wool and sponges" instead of salt to discipline the crafty mule [37]. Although Wöhrle claimed to provide the original literature of Thales' story on using mules to transport salt in his book, he neither mentioned that the story originated from Plutarch or Aristotle nor from Aesop. This means that none of the above views about the origin of the story of Thales transporting salt with mules are convincing. Furthermore, the authenticity of the original documents Wöhrle refers to is likely questionable. The reason is that previous distinguished scholars on history of Greek mathematics and science, such as Heath, Sarton, Neugebauer *et al.*, never mentioned this story or these original documents, and not even historians of mathematics once mentioned Thales using "wool" to discipline the cunning mule.

In fact, little is known about the lives of Thales in academic communities. The renowned American historian of mathematics Carl Boyer (1906-1976) admitted publicly that Thales left no reliable historical documents, and stated that Thales was once a salt merchant, but didn't give a detailed account of the story of Thales transporting salt with mules in his mathematical history works [38]. However, this view was removed in the 3rd edition when Uta Merzbach (1933-2017) revised it in 2011. Obviously, Merzbach is a more rigorous historian of mathematics than Boyer, and he completely disbelieved the truth of the story about Thales transporting salt with mules. As for the authenticity of the stories about Thales, distinguished American historian of mathematics Victor Katz wrote clearly that: "Whether this [the tale of Thales' monopoly of oil presses] or any of the other stories is literally true is not known." ([24]: p. 44) He didn't provide any information about the story of Thales and salt in his work, even in the 3rd edition in 2009. Monographs focused on Thales, such as Rossetti (2022) [39] and O'Grady (2016) [40], provide an in-depth account of his achievements and anecdotes. However, they also did not mention the story of Thales and salt at all. These facts demonstrate that rigorous historians of mathematics hardly cite the story in their

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works, and the reason for this is the absence of reliable evidence supporting the story of Thales transporting salt with mules.

### 3. Conclusion

The story of ancient Greek mathematician Thales transporting salt with mules is a well-known scientific anecdote within academic and educational circles. The origin of the story, however, has attracted little attention. This article examines the origin of the story of Thales transporting salt with mules. Through an investigation of Thales in historical mathematical works, we found that British historian of mathematics James Gow might first introduce this tale in his work on history of mathematics in 1884, and said that the story originated from Plutarch or Aristotle. However, Gow's view has not been recognized by Western historians of mathematics. American mathematician Howard Eves argued that the tale of Thales transporting salt with mules originated from Aesop, yet the story of "The Ass and His Burdens" found in *Aesop's Fables* not only lacks historical authority but also differs significantly from the tale of Thales. Although this perspective was accepted and disseminated in some popular science writings, it has rarely been recognized by rigorous historians of mathematics. Finally, we also discovered that the story of Thales using mules to transport salt has become increasingly fictionalized over time. These findings suggest that the story of Thales transporting salt with mules lacks credible documentary evidence. It can be concluded that the story of ancient Greek mathematician Thales transporting salt with mules is not a historical fact of science, but a fabricated scientific story about Thales emerging in the late nineteenth century.

### 4. Discussion

In this study, we examined the origin of the story of ancient Greek mathematician Thales transporting salt with mules. It was found that rigorous historians of mathematics, such as Cajori, Heath, Katz *et al.*, rarely reference the story of Thales transporting salt with mules when introducing Thales in historical works on mathematics. The narrative is primarily presented by non-professional historian of mathematics. For example, Chinese mathematician Cai Tianxin introduced the story in *Mathematical Legends* which was published by Springer Press in 2025, but did not provide the source of the story [3]. In fact, Cai did not verify the authenticity of the story about Thales transporting salt with mules, nor did they cite any references. There is no doubt that *Mathematical Legends* cannot be regarded as a serious work on mathematicians' biographies, but rather a popular science publication in the field of mathematics. The investigation reveals that the story of Thales transporting salt with mules is not grounded in historical records, but a literary tale mainly derived from *Aesop's fables*. This means that the narrative is not a genuine historical account of Thales. Cai is a professional mathematician, but not a professional historian of mathematics. His work lacks the rigor found in serious works on the history of mathematics. Therefore, the authenticity of the

mathematicians' legends told by Cai still requires further verification. These findings suggest that non-professional historian of mathematics, particularly popular science writers, should pay special attention to the authenticity of scientific stories before popularizing history of mathematics.

British historian of mathematics James Gow might first introduce the story of Thales transporting salt with mules in historical works on mathematics, and stated that the tale originated from Plutarch or Aristotle [12]. However, we did not find the source of the story in the works of Plutarch or Aristotle, and this view has hardly been accepted by Western historians of mathematics. Gow's view has now been abandoned completely, but which edition of Plutarch or Aristotle's work is cited by Gow is a question worthy of further study. The primary source for the story of Thales transporting salt with mules is Aesop. However, it is not clear who first put forward this view. American mathematician David Burton may have been one of the first to explicitly claim that the story of Thales transporting salt with mules originated from Aesop, but he did not verify the authenticity of the stories' origin [30]. Moreover, the renowned historians of mathematics from the late 19th century to the mid-20th century, such as Cajori, Heath, Sarton *et al.*, never referenced this perspective. These facts suggest that the view about the story of Thales transporting salt with mules originated from Aesop has not been recognized and accepted by the leading historians of mathematics. Although some scholars have claimed, even in influential historical works on mathematics [12] [28] [30], that the story originated from Plutarch, Aristotle, or Aesop, rigorous historians of mathematics hardly recognized any of these origins. This fact indicates that historians of mathematics have found no reliable evidence to support the story of Thales. We strongly recommend that works on the history of mathematics remove the account of Thales transporting salt with mules promptly.

Thales was a figure of significant influence in the history of Western science and philosophy. Although his scientific achievements and anecdotes are widely known, Thales left no first-hand historical materials [38]. Current understanding of Thales in academia comes from accounts provided by ancient writers. According to Heath (1921) [7], ancient authors credited Thales with numerous scientific discoveries and anecdotes, though there is no reliable evidence to support these claims. As research on Thales has deepened, scholars have begun to verify the authenticity of Thales' scientific discoveries and tales. For example, Patsopoulos and Patronis (2006) discovered that the "Theorem of Thales" emerged in European school geometry textbooks until the end of the 19th century [41]. Iversen and Lacks (2012) concluded that there is no evidence to support the claim that Thales discovered, conducted experiments on, or systematically observed electrostatic charging [42]. Netz (2022) insisted that Thales did no mathematics whatsoever [6]. Cantor (2022) even questioned Thales' status as the first philosopher in the historiography of philosophy [43]. Our research reveals that historical mathematical works did not reference the story of Thales transporting salt with mules until the late 19th century, and leading historians of mathematics rarely acknowledged

this tale. These findings demonstrate that the popular depiction of Thales' achievements and anecdotes is not entirely credible.

As a renowned philosopher and mathematician, ancient and even modern writers were willing to attribute some strange and unusual tales to Thales. This gives rise to the stories of Thales, which hold a prominent place in mathematical popular science literature and even in serious historical works on mathematics. Moreover, storytelling, as a technique, is an effective method to attract audiences, and hence widely employed in popular science books, as well as in serious works on the history of mathematics and science. This might explain why such myths are created and perpetuated for a long time. However, we should not only recognize the advantages of storytelling, but also be aware of its disadvantages. Storytelling, or narrative, can indeed propagate scientific misinformation, making it challenging for audiences to distinguish facts from falsehoods [44]. The story of Thales transporting salt with mules fails to enrich public understanding of Thales. On the contrary, it severely damaged Thales' scientific reputation. Because it can easily arouse doubts and criticism from rigorous scholars, in addition, popularization of history of mathematics and science should be based on genuine and reliable historical materials rather than groundless legends. Disseminating apocryphal scientific anecdotes is unacceptable in science popularization and education, let alone deliberately inventing stories about scientists based on some fictional literary works. It is clear that fabricated scientific narratives would obscure the genuine process of scientific discoveries, and thus fail to contribute to the development of students' innovative awareness and capabilities. Therefore, to preserve the reputation of outstanding scientists and ensure historical accuracy in works on history of mathematics and science, it is necessary to verify the authenticity of the scientific anecdotes.

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## Conflicts of Interest

The author declares no conflicts of interest.

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