

MARBLES: THE ENIGMATIC ALL-ROUNDERS AMONG STONEWARES



Sabrina Liebetrau · EAA conference 2023 · Belfast/online · Session 279

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Marbles? What marbles?



'...so-called Knicker or small fired and glazed balls...'
(Engelhard 1778, 179)

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These glazed balls which **we** call stoneware marbles are neither diagnostically nor art-historically interesting. Studied by Stephan, Gartley and Carskadden back in the 90s, they otherwise remained understudied.

They appear randomly in papers and are often not measured, dated or separated from earthenware. Statements on their use are also rather scarce, just like in historic sources. As an everyday object, they were rarely described in detail. And that has transferred to today's research.

YES... they were used as toys and projectiles! But I think there is more to marbles than just playing and shooting. Therefore I want to present some different ways of looking at them.

Stoneware marble production in Großalmerode

'...fired in an ordinary potter's kiln in and between the other crockery. They get their brownish or blackish glaze in the same way as the brown apothecary jars, namely by salt being scattered in the kiln.'

(Gatterer 1790, 26)



Stoneware marbles and sherds embedded in kiln wall fragments. Großalmerode, Obere Scheidquelle 10 (HLM VF 2014/117f).

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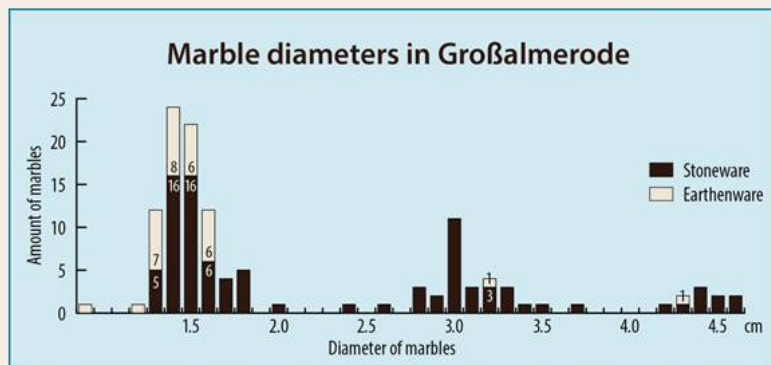
Stoneware marbles were made in various places in Großalmerode from about 1600 to 1900; that's mainly later than Raeren or Frechen.

In 1790, Gatterer described how marbles were fired in potter's kilns. Such marbles often feature iron or manganese slips, but they might not be fully sintered or salt-glazed. The photo shows wasters from this form of production. The property where these finds were discovered belonged to a family of potters and still featured a kiln in 1867.

Apart from it being quite economical to fire such by-products in potter's kilns, there must have been more reasons why stoneware marbles were in demand. Maybe the sintered fabric qualified stoneware marbles for special purposes.

[HLM = Hessisches Landesmuseum Kassel]

Stoneware marble size range



125 marbles from Großalmerode, Obere Scheidquelle 10 (HLM VF 2014/117e). About $\frac{3}{4}$ stoneware.

Stray finds from Witzenhausen (HLM VF 2014/277c).
5.2 cm = Gatterer's 'Extralarge'? →

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In 1790 Gatterer writes that the smallest marbles are about 0.8 cm in diameter and the largest 3.5 cm. He also mentions extra-large ones.

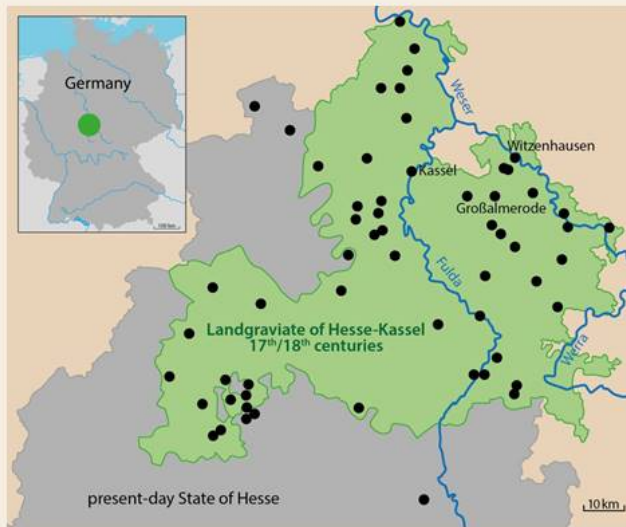
In 1857, Leuchs Warenlexikon lists the following size groups, intended for certain needs or consumers:

- small for blow-guns
- medium or Dutch
- large or English

The chart contains the diameters of marbles from the collection mentioned earlier. 29 % have diameters of 1.4 to 1.5 cm. The most frequent sizes roughly coincide with Stephans 1995 results, while Gatterer's smallest and largest are underrepresented.

The Großalmerode marble size range can also be found in Witzenhausen. A notable exception is a 5.2 cm ball – maybe Gatterer's extra-large?

Distribution of marbles in Northern Hesse



Most marble finds

- have diameters of c 1.5 cm
- are found individually or in small groups of 4 to 5
- are stray finds or from consumption contexts

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This map shows marble finds from Northern Hesse. Most of the finds in this area are the small 1.5 cm marbles. Usually there are only single stray finds, rarely more than 4 to 5 marbles, recovered from domestic features.

Clearly, the marble finds do not reflect the production figures or size range. Maybe this is due to small-scale trade like local markets or pedlars.

Larger amounts are only known from the production centre Großalmerode or the trading place Witzenhausen.

Economic relevance of stoneware marbles

Small marbles –
a mass product

Year	Location	Worker/day	Worker/Year
1785	Großalmerode (Gatterer 1790)	10,000	c2 million
c1910	location ? (Krug 1930)	c38,500	c7.7 million

'Toy balls' and
crucibles: part of the
Großalmerode coat
of arms since 1775.
(private collection)



Toy or commodity?
224 stoneware and
earthenware
marbles found in
Witzenhausen.
(HLMVF 2014/345-14)

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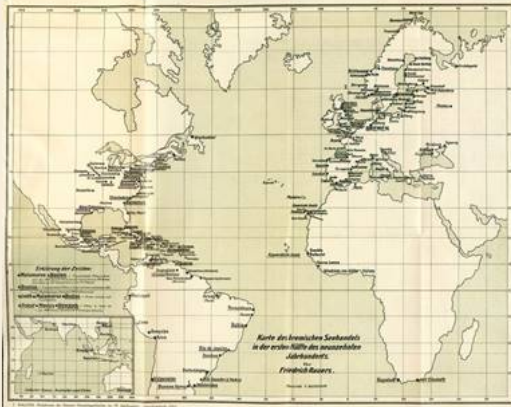
Marbles may be irritatingly scarce in archaeological features, but historical sources speak of their enormous economic importance.

If you try to calculate the production figures from historic sources, you can easily end up with several million per year – per marble maker! Schedel's Waarenlexikon of 1851 also claims that Großalmerode marbles are sold by the millions.

In Großalmerode, marbles were already so iconic in 1775 that they were included in the town coat of arms along with the famous crucibles. The mayor himself was a wholesaler in clay, crucibles, and marbles and had warehouses in Großalmerode and Witzenhausen – address unknown.

But look at these marble finds. They are mostly 1.5 cm in diameter and were found in Witzenhausen only 100 meters from the river Werra. So, did they play an extra serious game of marbles there or does this indicate trade?

Long-distance trade



Bremen maritime trade, 1800–1850.
(Bauers 1913; Staats- und Universitätsbibliothek Bremen; <https://nbn-resolving.de/urn:nbn:de:gbv:46:1-313>; CC0 1.0)

Marbles could have reached all continents!



Rotterdam marble finds, largest stoneware marble 4.5 cm, 1550–1925.

(Museum Rotterdam; <https://museumrotterdam.nl/collectie/item/19719-1-53>; CC BY-SA)



'Bennies' recovered from the Queenstown Courthouse, Maryland, USA.

(Maryland Archaeological Conservation Lab; <https://apps.jefpat.maryland.gov/diagnostic/SmallFinds/Marbles>)

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According to sources from the 1740s to 90s, Großalmerode marbles were shipped to Bremen via Witzenhausen – then to European countries, England, America and Asia. Marbles of German origin were also traded by Dutch and English traders. Perhaps this explains the size names 'English' and 'Dutch'?

The trade via Bremen continued in the 1800s, as marbles are included in the Weser freight tables. One look at the map shows that marbles might have reached all continents.

However, there are two problems: Firstly, historical catalogues reveal nothing about the share of stoneware marbles. They often only list 'glazed' or 'crockery' marbles. Secondly, attribution to a production site is difficult with conventional archaeological methods. For example: the Rotterdam assemblage lacks a narrow time frame. So, the 4.5cm ball could be from Großalmerode, and the small dark brown marbles from Raeren. It would really be necessary to get them XRF'd.

Regarding the 'Bennies' from around 1880, US archaeologists are confident that these came from Germany. Where exactly is unknown. Großalmerode was still in business in 1885, but questionable in view of the surface. Maybe they came from new factories on new trade routes.

But what for?

Use as toy

'Schusser... used by boys for playing.'

(Zedler 1743, 1693)

Similar term in English marble slang: Shooter, a large marble used to shoot at smaller ones.



Rudolf Kuntz: Two children playing with marbles, 1824. (Graphische Sammlung ETH Zürich; https://doi.org/10.16903/ethz-grs-D_026840; CC0 1.0)

'Knicker... are used for play by children almost all over the world.'

(Gatterer 1790, 24)

'Knickers' in 19th century New York
'Knickers' in present-day Dutch



Marbles in a domestic context in Witzenhausen, c1800. (HLM VF 2010/232c)



Toys lost in the Hersfeld Abbey ruins, doll head: 1920s. (HLM VF 2017/17-3i)

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Everyone would say: Marbles are for playing, full stop. Baxter also found that '...child specific artefacts are dutifully reported but not interpreted' (Baxter 2019, 67).

The game of marbles occurs in many historical terms, for example '*Schusser*' in Southern Germany. It meant that marbles were shot in small pits or at other marbles, similar to 'shooter' in English marble slang. '*Knicker*', according to historic sources, meant the sound they make when they collide. New York children are said to have used this term until around 1900, and the Dutch still call marbles '*Knickers*'. It is unclear if the term migrated with players or marbles.

Historic pictures and archaeological finds mainly comprise small children's marbles. But grown-ups used them too, for example in Berlin where they played marbles for money in around 1800 according to Krünitz. Archaeology does not really help to identify the players. In Bielefeld, for example, marbles were found together with a dice. But who knows if that is gambling evidence.

Use as ammunition

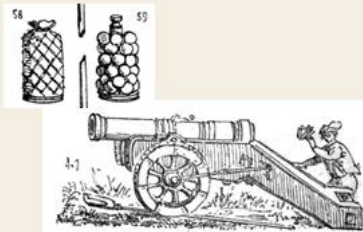


'...to shoot with from a gun...'
(Zedler 1743, 1693)

Common assumption:
fragmented marbles
=used for shooting



'Jalet, Gallet ... clay balls ... that are used
to shoot with a crossbow' (Eggers 1757, 1245)



'...used on ships as canister shot in canons'
(Engelhard 1778, 179; similar: Gatterer 1790, 28)



(Figures: Demmin 1869, 545, 504, 532; Becker 1858, 490)



Böhämmerjagd (Becker 1858, 490)
'The blowgun ... is a cylinder through which
clay balls are projected by blowing into it.'
(Demmin 1869, 490)

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The only other use historically mentioned quite often is ammunition.

Zedlers Universallexikon claims that marbles are used for shooting from guns. 50 years later, Gatter finds the gun theory implausible and considers it more likely that stoneware marbles were used as canister shot on ships. This is more familiar from the Sonneberg limestone marbles bought in bulk by the English Navy. Yet there is one report from the American Civil War that a ship was fired at with marbles, among them glass and porcelain ones.

Marbles in crossbows and blowguns were rather used for shooting birds, for example the so-called Böhämmerjagd in the Pfalz in southern Germany which existed until 1908. The clay balls used in these hunts were usually made locally, but stoneware marbles cannot be excluded because they are harder.

Use as ballast

'...Knicker and Spielkugeln that are mainly used on ships...' (Hochfürstl. Calender 1777, 24)

Canister shot or the following:

'Marmeln, marble balls ... shipped to both Indies by the millions instead of the ballast on the ships, consequently they represent a separate branch of trade.'

(Jacobi 1799, 260)

Stoneware balls could have been an inexpensive option!

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In addition to being used as canister shot, stoneware marbles could have simply been ship ballast.

If marble marbles already served as ballast in 1799, it's hard to imagine that no one had the idea of alternatively using stoneware marbles. According to Krug, marbles were still used as ballast in the early 1900s.

But it is unclear how ballast marbles can be distinguished from mere commodities. While ballast stones can be identified as building material at their destination, stoneware balls might have been sold on as usual.

Use as bottlestoppers?



Glass bottle with a stoneware ball as a stopper, supposedly Black Forrest area, 1820–1840. (Van den Bossche 2001, 354)



Großalmerode stoneware bottle and apothecary jar fragments with stoneware balls from the same assemblage. (HLMVF 2014/117).

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The bottlestopper theory mainly comes from glass collectors' books like Kosler who randomly writes about stoneware balls being used as stoppers in pharmacies until far into modern times.

I was not able to confirm this from period pictures. Yet there is one 1820s bottle featuring a stoneware ball on top. It is impossible to determine if this was the original use, and it is very doubtful if such an unstable construction would even be fit for everyday use.

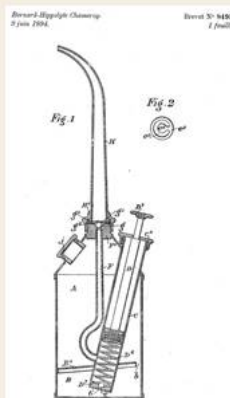
Nevertheless, it cannot be completely ruled out that stoneware balls were produced to match apothecary jars. After all, they were fired together and they fit. Hypothetically, of course!

Use in ball valves

'Klicker... are also very suitable for sealing burettes [and] valves'

(Meyers 1887, 842)

Stoneware balls might have been a good choice – the booming chemical industry needed acid-resistant materials...



Oil can with ball valves patented in 1894.



Anti-abrasion ball valve patented in 1900

<https://depatisnet.dpma.de/DepatisNet/depatisnet?action=pdf&docid=CH000000008495A>
<https://depatisnet.dpma.de/DepatisNet/depatisnet?action=pdf&docid=DK000000003311C>

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A more likely capping function is this... Ball valves are mentioned as early as 1757 in Egger's *Kriegslexikon*. In 1887, Meyer's encyclopaedia claimed that marbles were suitable for valves and burettes. This is reflected in patents like the French-Swiss patent using two balls in an oil can. The Danish patent is intended to prevent balls in valves from one-sided wear.

Neither of them mentions the material. Yet stoneware, with its grease- and acid-resistant surface, would have been quite suitable. In the 1880s, the booming chemical industry built entire machines out of stoneware for handling acids. In this context, Rönneper mentions that explosives factories needed coated stoneware balls for their devices.

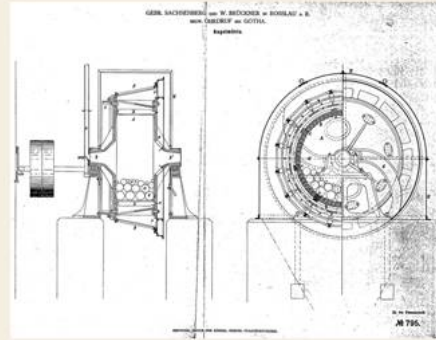
Use as grinding media?



Modern porcelain jar mills

(<https://www.keramik-kraft.com/de/Einrichtung-Maschinen/Waagen-und-Muehlen/Muehlen-Mahltoepfe>)

Could stoneware grinding balls in 18th/19th century jar mills explain the high production figures?



Industrial ball mill patented in 1877.

Balls: 10 – 20 centner, c5.2 – c15.6 cm, unknown material.

(<https://depatisnet.dpma.de/DepatisNet/depatisnet?action=pdf&docid=DE00000000795A>)

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Finally, marbles might have been put into ball mills. Small ball mills can be used to grind and blend materials like paint, drugs, or even peanut butter. Today's laboratory ball mills are made from porcelain and contain porcelain balls. This prevents iron contamination. Since Rönneper claims that pot mills existed as early as 1760, it seems possible that stoneware served the purpose of porcelain at that time.

Today's ball sizes resemble the historic ones. For example, you put about one pound of grinding balls in an 1 litre grinding jar. This would equal about 140 of the historic 1.5 cm Großalmerode marbles.

In contrast, the use of stoneware balls in industrial ball mills is very unlikely because combining iron and ceramics increases abrasion, and small balls would be crushed by larger ones.

All-rounders still to be studied...



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Why all this playing around with marbles?

When studying stoneware marbles, their places of production and trade it should be kept in mind that historic sources repeatedly say that they were produced by the millions and sold worldwide.

Being not only a toy but also a tool, marbles seem to reflect changes in material culture and technology. They even may have served as early industrial ceramics before the rise of special porcelain and plastic.

Some of the possible uses are very speculative. Still, they may have existed, but are currently overshadowed by the 'marbles are for playing' theme.

So there's not only research potential in distinguishing production sites and trade routes but also in identifying unusual places of consumption or wear marks.

See them as all-rounders, not just toy marbles!



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