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KRISTIINA JOHANSON

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Natural and residual finds in Estonian archaeological collections

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Institute of History and Archaeology, Faculty of Arts and Humanities,
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Supervisors:	Prof. Aivar Kriiska, Department of Archaeology, Institute of History and Archaeology, University of Tartu Dr. Tõnno Jonuks, Estonian Literary Museum
Opponent:	Dr. Sonja Hukantaival, School of History, Culture and Art Studies, University of Turku
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The Great Stonytotem was a very grand name for a rather insignificant object. The Great Stonytotem was, in fact, a stone, an odd-shaped stone that Benka had found. If you were feeling generous you could say it was shaped like a little old man sitting down and staring at his navel, like a Buddha. The Reds immediately made it their special trophy, and gave it mighty power. That was enough for the Whites to feel it was their sacred duty to get hold of it at all costs. The fiercest battles of all had raged over the Great Stonytotem. It might seem odd that so much importance was attached to a small stone…

(Astrid Lindgren. Kalle Blomkvist mystery: Living dangerously)

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In Tartu, October 2018

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II **Jonuks, T; Oras, E. & Johanson, K. 2013.** Materiality of Religion: Religion-Related Artefacts in Estonian Archaeological Collections. In: *Folklore. Electronic Journal of Folklore*, 55, 151–176.
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Author contribution: conceptualisation, data collection, methodology, interpretation, writing parts of the article and editing the text

III **Johanson, K. & Jonuks, T. 2015.** Superstition in the House of God? Some Estonian Case Studies of Vernacular Practices. In: *Mirator*, 16 (1), 118–140.
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1. INTRODUCTION

Many items in our archaeology collections are preserved on the storage shelves and have been kept there for years and decades. After finding nobody has given much thought about why they have been gathered at all or what (if any) was their purpose or meaning for the past people. Amongst others are fossils, round and smooth pebbles and lumps of mineral. Thus, we have finds in our storages that have been collected but have very often not been regarded as true finds. They are looked past in excavation reports and publications and only very seldom have they been considered worth a detailed analysis in the general treatment of an archaeological site (*e.g.* Konsa 2014 for Madi stone grave). Surprisingly also archaeologists who have gathered them have mostly not tried to interpret them. The story of artefacts that appear in contexts chronologically later than their production time (*e.g.* Stone Age stone axes, flint finds in Iron Age or medieval sites) is similar. As a rule, these are not discussed in publications and their interpretations, if present, are often rational and very alike – they must indicate at an earlier settlement at the site, and the artefacts have reached the chronologically 'wrong' context in the course of the mingling of the cultural layer during later occupation periods.

The using of written sources, folklore and ethnographic material as analogies, the unusual and well-documented find context of single attractive examples have occasionally brought apotropaic or healing magic into archaeological interpretations. This mostly concerns exceptional and solitary specimens, *e.g.*, bronze-framed Neolithic arrowheads from the Novgorod Medieval town context (Sedova 1957; Tyanina 2008) or hundreds of sea-urchins from Dunstable Downs (*e.g.* McNamara 2011). Although Ralph Merrifield's legendary publication brought the debate of witchcraft and magic-related artefacts into the focus of the researchers already 30 years ago (Merrifield 1987), the Estonian as well as broader European tradition is characterised by the scarcity of academic and analytical treatments of magical items until the last years (Bremmer 2015; Hutton 2016). Concern about the continued ignoring of the phenomena discussed by Merrifield in the medieval, early modern and modern period contexts has been expressed by Gilchrist (2012, 229) and Hutton (2016, 2) and systematic research in the field of *materia magica* has only just begun (*e.g.* Houlbrook 2014; Manning 2014; Hukantaival 2016; see also below). Partly the lack of systematic treatments is connected with the ambivalence of magic and it being grounded on narrative, which is why the magical items are difficult to be recognised, classified and thus scientifically studied. The main reason for that is two-fold. On one hand, archaeology has long been regarded as an exact science, where only measurable and quantifiable data have been considered interpretable, while questions concerning mental structures have been considered too difficult to discuss by archaeological evidence. Therefore, these questions have been the almost exclusive preserve of anthropologists and ethnologists (Carelli 1997, 406), as well as folklorists, as will be shown below in case of fossils and

also historians in case of amulets. Concerning building concealments, a similar trend has been put forward where earlier discussions are found among scholars of folklore, ethnology and religious studies, while archaeological debates began only from the late 1980s (Hukantaival 2016, 31). Burström (1999, 35) offers an alternative idea according to which the creation of archaeological discipline (in Sweden it happened in the 1870s) led to archaeology starting to focus on chronology and considering folklore to be superstition without scientific value. According to Burström this attitude prevailed for more than a century and meant that for decades it was pretty much an axiom in theoretical archaeology that archaeology is not able to study religion and magic at all (Hawkes 1954). The latter argumentation brings forth the second aspect, namely the archaeology's endeavour to be well-proven and rational so that the ambiguous interpretations are likely avoided.

Thus, the research traditions are the main reason why in academic papers magic has mostly been studied on the basis of textual corpuses of the antique world, such as spells and descriptions of curing practices, as well as textual finds, like curse tablets and amulets (*e.g.* Faraone & Obbink 1991; Ogden 2002; Luck 2006; Boschung & Bremmer 2015). Artefacts have remained secondary and rather in an illustrative role. In Estonian archaeological material, textual-magical items are missing, but the treatments of vernacular curing practices and apotropaic magic are generally based on narrative (folkloric) sources. There are a few kinds of artefacts which are generally more prone to attract suggestions of their apotropaic meaning, for example, pendants (Jaanits 1961; Luik 1999; Valk 2004; Reidla 2012; see also discussion in Kurisoo 2018), figurines (Jaanits 1961) or oval fire-striking stones (Pellinen 1999, 33ff; Tvauri 2012, 298) (comp. Article 2, 153–155). Nevertheless, archaeological artefacts with a clear proper function (see more below) has seldom been included in the studies of magical practices (but see the exception, *e.g.* Jonuks *et al.* 2010) and its main reason is the closed circle where artefacts that are not regarded as potentially magical are not reflected in find publications or other studies. Therefore, they are neither recognised, considered important or worth detailed documentation nor gathered during excavations. Careful explanations have been put forth (see below: toadstones, curing stones, thunderstones), but these, with only a couple of exceptions, have been left in non-published reports. The circle can be stepped out, as demonstrated by the European and American systematic treatments. A good example is offered by building concealments in Finland which were not recognised before the first studies on the matter (Hukantaival 2007; 2009), but ever since the issue started to be discussed, the amount of source material increased. So, one possibility to enlarge the circle of potentially magically used items is to bring the issue into academic discussion. The latter means foremost the discussion of already gathered artefacts that are preserved in collections but have not been interpreted – **does their find context, characteristic appearance, analogies in ethnographic material or references in folkloric or written sources imply that they have been used in apotropaic or curing magic**? These questions form the main focus of the current dissertation.

This does not mean that all the uninterpreted finds in storages should be regarded as potentially magical. Therefore, in the following, I will suggest several interpretations with magical practices forming only one, although a dominant, part. At the same time, I will not discuss all possibly magically used items, because according to the concept of everyday magic different everyday artefacts may become part of an apotropaic or a curing ritual, provided that the executors of the practice ascribe it the role of the mediator of some supernatural power (Article 2). For example, we know from the folklore records that soil from the churchyard, pieces from the rope of the church bell, fragments from an altar candle and the apron or scarf worn in church, not even mentioning the holy water and the host were used in magical curing practices (Article 4). Sieve and scissors were used in divination (Valk 2004), axe and iron nails (Valk 1995) or foodstuff (*e.g.* salt) in repelling harmful magic (Hiiemäe 2012, 72, 87ff). At the same time the find contexts of artefacts used in apotropaic or curing rituals, when they are left in archaeological context, might not be informative at all. Thus, selecting out all potentially magically used artefacts in archaeological material would have been too voluminous. Therefore, I decided to concentrate on a few groups of finds, namely those **that have been mostly considered natural and ignored in publications** (fossils, pebbles) **or interpreted one-sidedly** (Stone Age edged tools in later contexts). Partly it seems complicated to treat them together, since today fossils and minerals are studied by geologists (*e.g.* Christopher Duffin, Kenneth McNamara), the reuse of Stone Age artifacts by historians-archaeologists. On the other hand, from the historiographical perspective, in lapidaries and encyclopedias, all stones have been represented similarly and discussed according to analogous standards. The differentiation between fossils, minerals and antiquated stone artefacts is the problem of the researchers from the 19th century onwards and similarly to lapidarists and encyclopedists, did not concern the perception of ordinary people in the prehistoric, medieval and modern period. The present research proceeds from the same guiding principle and, therefore, the archaeological source material used could be named 'formed stones'. Episodic insights will also be made into other find groups.

My research on this topic began with thunderbolts, *i.e.* Stone Age artefacts secondarily used in apotropaic magic (Article 1). Since according to folklore records it can be suggested that in Estonia smooth round pebbles and fossils have been regarded as thunderstones as well, the studying of magical items soon extended further from the secondarily used items. Also, with the proceeding of the research, it turned out that magic is for most groups of artefacts only one possible explanation, *e.g.*, in case of smooth round pebbles several possible utilitarian interpretations can be suggested, such as playthings, pottery polishing pebbles or ammunition stones. In addition, pure collection instinct or natural processes may have been the reasons for a given pebble to reach one or the other context (Article 5). The purpose of the study is thus twofold: bringing the missing interpretations into scientific discussions and at that same time suggesting possible functions for the so far uninterpreted finds. The artefactual source material derives from the find collections of different periods of Estonian

archaeological past since the Stone Age to the modern period that enables making some diachronic observations. In possible interpretations, I use written historical sources from Estonia and elsewhere in Europe, but also folklore records. Besides, the research has a methodological purpose: to explain why archaeologists have considered it necessary to gather 'natural' finds at all and why these have later been forgotten into find lists and not been included in publications.

In case of some source kind (pebbles) I discuss several possible functions, with magic being only one, although the most prominent role. Therefore, it is necessary to delve more thoroughly into the theory of magic. Since curing rituals are the most widespread among magical practices, I will also concentrate on medical anthropology. In case of both, I wish to emphasize the vernacular approach, setting the person (the practitioner) and his/her choices to the fore. This means that the practicing of both magic as well as folk medicine is dynamic and democratic – the practitioners choose to what level they use the elements from dominant discourses (*e.g.* institutionalized religion – Christianity; institutionalized medicine) in their practices and to what extent common knowledge and subjugated knowledge. Often people move back and forth among the elements of alternative and official religion/medicine, using components from one or the other, depending on the practice. From the perspective of practitioners, we are dealing with a synthesis of vernacular and official Christian or medical knowledge as well as common-sense decisions to guarantee good life (Ventsel *et al.* forthcoming). While describing indigenous people, several anthropologists and historians of religion have concluded that in preliterate societies experiences coincide and penetrate each other, thus forming a symbolically whole and systematic universe (*e.g.* Wax & Wax 1962; Douglas 1970). Vernacular belief systems are flexible and open where adding new 'effectual' elements is context-specific (*ad hoc*); at the same time the system is not arbitrarily made up but consists of components that have been structured according to the system-specific logic.

The primary purposes of the current dissertation can be shortly verbalised as:

(1) To draw attention to the so far uninterpreted or one-sidedly interpreted finds in archaeological collections
(2) To apply the interpretation of magic for archaeological material
(3) To methodologically discuss the choices that archaeologists make on the field concerning the natural and residual finds

2. HISTORIOGRAPHY

Historiography in the context of the present study is very voluminous and consists of two more prominent aspects, as is the case with the objective of the study. On one side the purpose of the study is concentrated on interpretations, meanings that have been ascribed to the formed stones, archaeologically collected, folkloric or ethnographic material. On the other side, the artefacts themselves are focussed on – their find contexts, use-wear traces, conspicuous aspects in their appearance. This means that on one hand, the chapter of historiography is also concerned with the 'formation' of formed stones in their historiographical and historical perspective; their possible meanings to the past people will be looked into. On the other hand, the gathered but so far uninterpreted archaeological artefacts will be centred on; magical explanations as their possible interpretation will be brought into focus.

2.1. History of research of formed stones from the Antiquity to the modern period

Using of formed stones and minerals in magical and medicinal procedures has been amply described since the antique authors. A thorough review of the handling of geological formations (fossils, minerals, rocks) in the history of medicine has been provided by Duffin (2008; 2012; 2013), who declares that differently from zoopharmacy and herbalism, geopharmaceuticals have very few studies dedicated to the historical uses of fossils, minerals, rocks and earths (Duffin 2013, 7). Next to geopharmaceuts also cryptopalaeontological[1] studies are concerned with the identification of fossils and minerals from descriptions by antique and medieval authors as well as their magico-medicinal using (*e.g.* Liñán et al 2013). We are dealing with an extensive topic which comprises a large part of the scientific literature from the antique, medieval and modern period and discussing here the whole history and historiographic nuances of cryptopalaeontological studies is neither reasonable nor relevant at this point, all the more since it is present in several thorough reviews (*e.g.* Adams 1938; Rudwick 1976; Duffin 2013). A short history would be wise though.

The most significant texts about rocks, stones, fossils, and earths are lapidaries[2]. Lapidaries are texts that describe and give names to a list of stones that

[1] Cryptopalaeontology is the analysis of historical references to fossils in ancient texts, combining the discovery of fossils at archaeological sites as well as the study of oral traditions of different cultures. The discipline extends across the fields of palaeontology, history, archaeology and folklore (Liñán *et al*. 2013, 45).

[2] Duffin (2005, 58) names three kinds of lapidaries – scientific, Christian and astrological. In the present context, scientific lapidaries are the most relevant. Christian lapidaries focus on the exegesis of Biblical passages pertaining to precious stones (Riddle 1970, 39f), while astrological ones describe the relationship between various gems and zodiac (Duffin 2005, 58).

stand out for their particular shape, colour or shine and which have magical and curative properties attributed to; the magico-medicinal characteristics of stones are considered the primary output of lapidaries (Duffin 2005; Liñán *et al.* 2013, 45). Most lapidaries are alphabetically organized, since the chemical composition or physical properties (hardness, translucency, flakeability, *etc.*) of the minerals were unimportant for the authors, except for the colour or shine, which were also sometimes used in the classification (Adams 1938, 149). These do contain little information about the composition and structure of rocks, and relatively modest knowledge is provided about their physical appearance. However, detailed analysis is offered about their medicinal, magical and mythical virtues, that were undoubtedly ascribed to rocks and metals and which is why they were often treated with respect (Adams 1938, 143). Lapidaries were amply written by the Ancient Greek and Roman scholars and constantly rewritten and supplemented by the following medieval scientists in their lapidaries and encyclopedias (see Duffin 2013 for detailed historiography). For example, the medical knowledge of Dioscorides was very influential, was repeatedly re-written and formed the basis of pharmacology for the next 1600 years (*ibid*., 10 and the references therein). Also the texts of the Roman Pliny the Elder were accomplished from multiple re-writings. Supposedly collating 20 000 facts from the perusal of 2000 books written by 100 selected authors, his *Historia Naturalis* preserves a remarkable record of Roman scientific and folk belief, where the last of the 37 books comprises the descriptions of fossils, rocks, and gems, that were known by the time as well as their magical and medicinal uses (Duffin 2012, 179).

What concerns the historiography of thunderbolts, the contribution of antique authors is the creation of terminology and certain classification. Referring to the descriptions of Pliny King (1867, 77–78) suggested that the term *ceraunius/ ceraunia* (lightning bolt/thunderbolt in Latin) has meant two broader aspects: on one hand, it was used as an adjective or an epithet to denote shiny and glittery lightning-like rock, most likely different types of corundum, bluish beryl as well as red ruby (King 1867, 77–78); on the other hand it was believed to be a weapon fallen from the clouds. *Ceraunia* as the rocks fallen from the sky have included several objects with different shapes and colours: black and round were called *Baetyli* (identified as shaft-hole axes), the elongated ones *Ceraunia* (identified as stone axes without shaft-hole) (King 1867, 79). Other celestial rocks were discussed next to *Ceraunia*. For example, *Brontia* were believed to have fallen with lightning strike from the sky, ended up in the brains of turtles with the storm and obtained several important magical qualities, *Ombria* or *Notia* have descended from the sky with heavy rainfalls (all identified as fossilised sea-urchins) (King 1867, 81; Adams 1938, 118) and *Glossopetra* is a stone that falls during new moon and is tongue-shaped (identified as fossilised shark teeth (Adams 1938, 118). Besides, belemnites were also believed to have fallen from the sky, as its arrow-like shape and depending on the rock often characteristic light yellow colour have very likely been sufficient reasons to consider them celestial thunderbolts (see also Adams 1938, 117). Naturally, *Ceraunia*

have included meteorites as well as different conspicuously looking stones (*ibid*., 119). In the Middle Ages, the Latin name *Ceraunia* was continuously used. In the modern period, the Latin names and classifications were discarded and terms in native languages were formed – *e.g. Donnerkeile, Donneraxte* (Adams 1938, 120), *Thor-kil, Thors-wigg* (Jensen 1999, 558; see more in Blinkenberg 1911) – that include all stones associated with the celestial legend.

Medieval 'mineralogy' (and 'science' generally) is characterised by two dominant aspects. Inspired by the general atmosphere of the era that stressed the exceptional, abnormal and miraculous (Le Goff 2000, 453), medieval encyclopedias and lapidaries mostly treat the magical properties of rocks and minerals. Belief in the magical and curing properties of rocks and minerals is directly connected to the idea valid through the Middle Ages and the Renaissance period and even later that Earth is a living organism in the centre of the Universe. This kind of organic cosmology was the symbiosis of Christian and classical ideas and one of its characteristics is a hierarchical system that included all creatures on Earth. The purpose of the whole Universe, including animals, plants, rocks and spheres, is to serve people and their well-being (Jensen 1999, 560). It was believed that everything that the living Mother Earth had given birth to – plants, rocks, minerals, and metals – had curing properties that could be used by humans who were higher in the hierarchy for their own benefit (*ibid*., 561). The other characteristic feature is relying on the Bible truths and earlier authorities; scholasticism established that earlier authorities had said everything about the world and nothing is to be added (*ibid*., 562). This meant that science was about repeating and rewriting; new conceptual research problems did not occur which is why the 'discovery' of thunderbolts as human-made artefacts or fossils as once living organisms had to remain in the following periods. The fact that Biblical times were seen as identical to the contemporary medieval European era contributed to this. Since the medieval scholars were even less aware of historical changes than the Greek and Roman authors had been, the interest in the material remains of the past was virtually absent (Trigger 1989, 31ff).

The research history of thunderbolts well illustrates this central feature of medieval 'mineralogy' to describe mainly magical and exceptional properties. Qualities attributed to thunderbolts as undoubtedly magical items by antique authors as well as descriptions of their using remained unchanged through the Middle Ages which is illustrated by similar examples in encyclopedias and lapidaries. Bishop Marbode in his lapidary from the 11th century wrote that thunderbolt protects its owner and house from a lightning strike, drowning at sea, losing battles and guarantees a good night sleep (Merrifield 1987, 11). According to a record by Danish priest Harpestræng from the 13th century, thunder arrows fallen from the sky were good against witchcraft (Carelli 1997, 402). Belief in magical thunderbolts may be considered similar to several other phenomena as antique knowledge moulded by medieval perceptions. For example, Gilchrist (2008, 151) considers the reason for the custom to place quartz pebbles in prehistoric and early medieval graves to be the rock's continuing meaning as the symbol of water and regeneration which was easily

absorbed in Christian beliefs, in line with the efficacy of water in cleansing sin through baptism. Similarly, medieval church started to consider thunderbolts as relics of heavenly war and treated them with respect, for example, Byzantine emperor Alexius Comnenus about 1081 sent an artefact to the Holy Roman Emperor Henry III, which has not been properly identified but which has been translated as a celt of meteoritic origin mounted in gold (Evans 1897, 59; Skeat 1912, 66). In this way, thunderbolts may be considered a phenomenon that has in a way exceeded the border of pre-Christian ideology and acquired new features in the Christian context, *e.g.* its role in the heavenly war. An example of churches using thunderbolts is a big jadeite axe that was found in the roof of the granary of a ruined Cistercian nunnery in Bonn and which had probably been placed there sometimes after the 12th–13th century for protection against lightning strikes (Merrifield 1987, 13; see also Evans 1897, 58). Apparently for the same reason, a flint dagger has been immured into the wall of a church in Skåne (Blinkenberg 1911, 90).

In the Renaissance period, the first critical views were developed. One of the first scientific texts to be mentioned is *De Natura Fossilium* (1546) by Georgius Agricola, that tried to create the first scientific classification of rocks, minerals, and fossils (Duffin 2013, 29), discussing the valid knowledge of their origin critically. He was the first to abandon the idea of the heavenly origin of thunderbolts (Agricola 1955, 98, Book V). Noteworthy is Anselmus de Boodt's *Gemmarum et Lapidum Historia* (1609) where the author demonstrated his contempt for magical and medicinal qualities attributed to stones, stating that these qualities are promoted by those who make business with the stones. To prove his words, he added a self-conducted experiment to get a toadstone from the head of a toad, but was not successful and verified that the story of the toadstone is a fabrication (Duffin 2005, 62). In palaeontology Renaissance brought along discussions on forms and origins of fossils. Mostly these led to fantastical interpretations (see *e.g.* Adams 1938, 250ff and figs. 50–54), for example Falloppio of Padua thought that the figured stones (fossils) were generated by vapors due to a process of fermentation set up in the rocks in those places where they were found; also pots and buried urns were created by circular movement of such vapors. Gesner and Agricola both were on the opinion that some fossils were animals turned into stone, but others were the products of the earth itself (Adams 1938, 257; see also McNamara 2011, 191).

The 15th and the 16th centuries may be considered as the time of breakthrough, concerning the history of mineralogy, palaeontology, and indirectly also archaeology. Namely then mystique and magic started to be left out of the lapidaries and other texts about minerals, while the physical characteristics of stones were concentrated on. One of the reason for this has been seen in the founding of new mines in the 15th and the 16th century in Saxony, Harz Mountains and Bohemia (Adams 1938, 171) as well as the general increasing interest in natural history between the middle of the 1450s and the 1650s, developed as a result of new social conditions (appearance of naturalists into courts), expeditions and discoveries (Findlen 1997, 57f). A very big role was played by the

formation of large natural history collections during the 16th and the 17th centuries, which meant that many specimens of *ceraunia* could be assembled and compared to one another as well as to fossils and minerals and the specimens brought from the New World (Goodrum 2008, 497). Although the thinking of scientist had changed and was already similar to the following centuries, research questions that would be independent of the medieval legacy and would trigger intrigues and search for solutions were missing for the time being. Thunderbolts still remained the heavenly stones, but differently from the Middle Ages, more and more studies appeared that tried to explain their origin in scientific way. The treatments of Renaissance were often with a very utilitarian and practical purpose and with a strong religious foundation because both Catholic and Protestant theologies stressed the divinely authorised ability of man to utilise the products of the world (Rudwick 1976, 16). Since the naturalists often had a medical education or practiced as physicians, it was common that they were especially eager to reflect the curing properties of stones, similarly to earlier lapidaries and encyclopedias. In addition, recommendations were given about their use against various health issues (*ibid*., 17).

The real breakthrough came with the 17th century which has also been named as the time of scientific revolution and secularisation (Jensen 1999, 563). New and independent research topics, new kinds of questions[3] and a new way to classify, sort and identify objects between the classes of *Naturalia* and *Artificiala* (*ibid*., 554) took the study of the origin of fossils and thunderbolts to a new level. One of the essential triggers for the birth of new knowledge was secularisation – slowly a tendency grew to substitute supernatural explanations of the phenomena with natural ones and acquire more skeptical view of magic. The concept of nature was more and more tied to science and magic started to be seen as in opposition to science. The faith in the power of science to explain the world increased rapidly (Oja 1999, 302) and reverse, but working logic is used to doubt and refute the medieval and Renaissance theories. Many objections to earlier opinions of the heavenly origin of thunderbolts also occurred in the 17th century, although the argumentation may sound naïve and incomprehensible today. For example, Grant Allen refers to a 17th century Chinese encyclopedia where after a statement that a 'thunderstone' can have the shape of an axe, knife or a hammer: *And then, by a curious misapprehension, the sapient author of that work goes on to observe that these lightning stones are used by the wandering Mongols instead of copper and steel. /---/ So deeply had the idea of the thunderbolt buried itself in the recesses of his soul, that though a neighbouring people were still actually manufacturing stone axes almost under his very eyes, he reversed mentally the entire process, and supposed they dug up*

[3] For example, in 1703 Emanuel König in his *Regnum Minerale* wrote: *It is difficult to decide how it is that the Ceraunii have forms identical with the various objects made by man . . .* and continued *What do these forms signify unless "Archaeus sive spiritus fulminans" fashions and makes them for his own pleasure out of the metallic or stony material drawn up from the earth into the clouds?* (cited in Adams 1938, 123).

the thunderbolts which he saw them using, and employed them as common hatchets. (cited in Allen 1889). However, there were several scholars at the end of the 16th and most certainly in the 17th century who did not doubt in the human origin of thunderbolts with the shape of axe- or arrowheads. For example, *Metallotheca* by Michele (Michael) Mercati (1541–1593), superintendent of the botanical gardens of Vatican, which had circled as a manuscript already in the 16th century was published in 1717. Mercati used the notes of classical authors, analysed prehistoric artefacts in his large collection of fossils, minerals and stone items, used the stories from Old Testament as a comparison and reached the conclusion that *ceraunia* had been made by working flint before iron was used. He stated that *many people believe they are thrown to the ground by lightning, but those who know history think that in early times before iron was used to make weapons people made blades and arrowheads of hard flint* (cited in Goodrum 2008, 495). Mercati's theory derived from the 16th century, but as it initially remained in manuscript, it is not known how many of the 17th century naturalists were familiar with it (*e.g.* Goodrum 2008, 497). Thus, it took almost the whole 17th century to prove the hypothesis that thunderbolts may be remains of fossilised animals or human-made artefacts, but by the end of the century the idea was finally accepted. In the middle of the 18th century, Carl Linné stated that thunderbolts are not *monstrum naturae* but remnants from the past (Jensen 1999, 559). However, this comprehension concerned mostly the acadeic circles. I will look into the understanding of common folk about thunderbolts below (Chs. 4; 5.1).

Similar steps can be followed in the identification of the origin of fossils. Nicolaus Steno in his *Prodromus* in 1669 compared fossil and modern mollusc shells, arguing that fossil shells were the remains of once-living animals (Trigger 1989, 52). Unfortunately, *Prodromus* remained somewhat unnoticed at the time, with several scholars disagreeing with Steno (Adams 1938, 259, 364), so the discussion whether fossils were animal moulds, continued to be very lively in the 2nd half of the 17th century. Johann Beringer's *Lithographiae Wircebrugensis* (1726) gave the last blow to the theory of fossils as weird formations created inside the earth as a result of some force and successfully defended the theory of fossils as once living organisms (Adams 1938, 259f).

In the 19th century, first publications were issued that summarise the knowledge of antique authors as well as medieval and modern period lapidaries (King 1867; Wallace 1894; Adams 1938), but are often ironical about the 'superstition' of 'primitive' folk (*e.g.* Allen 1889). This concerns both the thunderbolt-beliefs as well as vernacular curing methods. The development of medical science as well as growing literacy of common folk meant that through written word people started to be taught about superstitious measures in folk medicine as well as preferred and prohibited cures. These kinds of texts were also published in the Estonian language since the 2nd half of the 18th century (Wilde 1766; 1771; Luce 1829; for calendric literature see Alatalu 1992; Martsoo 2007).

2.2. Magic as an interpretative tool for (archaeologically collected) artefacts

As said, the material side of magic has attracted the systematic attention of neither Estonian nor European archaeologists[4], probably because of the difficulties of recognising the artefacts that would enable magical interpretation in archaeological material. Many definitions of magic have been provided (see below), but as definitions usually are, these are very general and only partly suitable for defining magical artefacts. This has led to the situation where predominantly artefacts that have started to be perceived as magical according to the broad definitions are constantly considered as such, without asking further questions, for example, tooth pendants or anthropomorphic pendants as the carriers of supernatural power invested in ancestors' spirits or animals. Also, some artefacts (*e.g.* Stone Age artefacts or some fossils) have, in association with the antiquarian collecting phase where they reached cabinets of curiosities and museums, but also due to widespread folk beliefs and reuse connected with these, attracted attention also when finding from archaeological contexts. Relevant treatments can be found from the 19th century (Allen 1889; Evans 1897; Johnson 1912 and the references therein). At this point, the collection of sea urchin fossils from Dunstable Downs should be reminded that already at the time of finding at the end of the 19th century were associated with apotropaic 'heart urchins' and 'fairy loaves' known from folklore (Johnson 1912, 303–304). All the mentioned authors have concentrated on single artefact types (stone artefacts, fossils) which show references to magical use. As seen below, find context is important – settlement context does not readily enable discussion of magical use, even if both the folkloric as well as the ethnographic records provide hints of specific artefacts used as *e.g.* apotropaic thunderbolts or construction deposits.

Collections that were formed due to antiquarian interest often included magically used artefacts gathered from people as well as those found from the ground – both were supposed to be illustrations for each other, but in reality folklore was rather in the centre and thus respective archaeological finds only supported the ancient folk beliefs. The interest in folklore is symptomatic to the period of the 19th and the beginning of the 20th century. Possibly the reason behind the increasing interest towards folklore was connected to the Romanticist ideas on primitive peasants and their culture which was considered to be more genuine and sincere than urban culture (see *e.g.* Herder 1773) but also with the raised interest in witchcraft and witchhunt (Cheape 2008, 230). One of the early examples is given by Hugh Cheape who reflected a Scottish parish minister Joseph Train's account of a pierced stone disc from 1845, which

[4] In fact, all lapidaries and encyclopedias may be treated as studies of the materiality of magic, since these list curing magical and apotropaic uses of rocks and minerals. However, in this part of historiography, I am concerned with the retrospective view of archaeologists and others scholars concerned with the past.

he found from the ruins of an old byre where it had apparently been placed for the protection of the cattle (Cheape 2008, 228f). Cheape (2008) suggests that certainly by the late nineteenth century, assumptions were being made about the possible magical use of perforated stones, even examples retrieved from the soil or archaeological strata (*ibid*., 229). Around that time the Scottish Museum of Antiquities collected a remarkable collection of charms and amulets, both gathered from the people with a recorded usage history as well as single ones found from the ground. The same year the assistant keeper of the museum, G. F. Black published "Scottish charms and amulets" (1892), which can be considered as one of the most systematic treatments in the field of *materia magica*, that in addition to folklore and recorded contemporary usage, mentions fragments of similar archaeological material. Slightly later example is provided by Christian Blinkenberg, whose thorough treatment about thunder weapons in religion, folklore, and archaeology in Scandinavia and Germany is still widely referred to by researchers interested in the subject (Blinkenberg 1911). Herbert Toms was especially interested in flint nodules and sponge fossils and beliefs connected to these, concentrated on collecting holed stones (the collection is preserved in Brighton, Royal Pavilion and Museums), and published the first thorough overview of the necklace made of *Porosphaera* sponge fossils found from Higham Marsh Bronze Age burial site in England (Toms 1932; see also Duffin 2011). Edward Lovett could be mentioned in this connection – British folklorist, who gathered chams and amulets and whose collection is currently held at the Pitt Rivers Museum. Ellen Ettlinger has written about amulets in London museums and among others treated thunderbolts which include minerals, fossils as well as Stone Age axes (Ettlinger 1939). Skeat (1912) concentrated on the folklore of snakestones (ammonites) and thunderstones, but discussed some archaeological finds as well. For example, he treated the Pitt-River's excavation in Rotherly and Woodcuts where the *unnatural number of flint echinoderms or sea-urchins* was found in the surface soil as well as in the pit-dwellings. Pitt-Rivers concluded that the habitants must have noticed the conspicuous fossils and collected these, and used as a species of currency, while Skeat proposed a specific magical virtue for their gathering (Skeat 1912, 56). It is remarkable that folk beliefs connected to fossils and stone axes were discussed in many publications around the turn of the 19th and the 20th century in Great Britain, but predominantly by folklorists. The archaeological material was turned to when a suitable example was available that proved the great age of the discussed belief. Some noteworthy treatments on the magical perception of quartz pebbles as well as the interpretation of their archaeological significance were issued at the beginning of the 20th century (Lebour 1914).

Through the 20th century fossils were continuously discussed by folklorists, but differently from the beginning of the 20th century, the general treatments (*e.g.* Evans, Johnson, Kunz) were later substituted by individual topics (specific genera of fossils and their folklore and magical). The geologist Kenneth Oakley gave the first thorough overview of fossils from archaeological contexts (1965a; 1965b; 1978). Also, he discussed the folklore attached to the species of fossils.

According to him, folklore has preserved relics of ideas which were current in the former ages (1965a, 9), which explains his attempts to connect archaeological examples from as long ago as the Palaeolithic with folk beliefs. His treatments are very much different than the earlier ones – Oakley set archaeological material (or, in fact, palaeontological material in archaeological contexts) into focus and used folklore as an illustration. Geologist Michael Bassett (1982) continued the tradition of the turn of the century and concentrated on more widespread types of fossils and their folklore. He did not use material from archaeological contexts, although touched the using of fossils in architecture. Numerous treatments by geologist Christopher Duffin are similar, generally discussing single species of fossils, folklore, and especially healing qualities. Duffin's particular interest is cryptopalaeontology, attempting to identify fossils and minerals listed and described in classical and medieval texts. The approach of palaeontologist Kenneth McNamara (2011) is somewhat different as his special studies on the sea urchin fossils are primarily based on archaeological finds.

As apparent, interpreting fossils through the 20th century has largely been the preserve of folklorists and palaeontologists, with archaeological material rather used as an illustration. Very likely we are dealing here with the symptomatical definition problem of an archaeological find – natural, seemingly unused finds cannot be archaeological (see Leeming 2015; Gilchrist 2008). Moreover, no function can be ascribed to them. It cannot be said that archaeologists have not treated fossils at all in their texts that are based on archaeological finds. They have, but very often only passingly, although there are exceptions (see cases in Ch. 5.2.1). Treatments of fossils by palaeontologists, folklorist and archaeologists seem to concentrate almost exclusively on British material. It may reflect an artificially designed situation since British literature has been the most available, *e.g.*, the journal Folklore has published articles on fossils since the beginning. On the other hand, it may reflect the situation as it is, since the treatments, especially the initial ones, were connected to the availability and abundance of eye-catching cases. For example, numerous Cretaceous fossils in the southern part of England (especially sea-urchins, but also belemnites) have attracted attention for centuries, prominent folklore exists and has been written down and this in its turn has aroused interest in researchers. Once the interest exists, it is much easier for following scholars to continue the studies.

While the magical uses and meanings of fossils can be found predominantly from the texts of folklorists and palaeontologists, the occurrence of antiquated artefacts in later contexts is specifically the problem of archaeologists. The finds have been published (see references from the beginning of the 20th century in *e.g.* Mildenberger 1969), and since the beginning of the 20th century they have been interpreted as well, for example, Karl Jacob suggested that the Neolithic stone axes from German urnfields can be utilitarian tools as well as artefacts perceived as thunderbolts (Jacob 1908, 95). Oscar Montelius (1906, 67ff) mentioned the wide distribution of the thunderbolt-belief and presented a few archaeological cases, with some very explicit ones – an axe with runic signs

from Uppland and an axe decorated with a geometric ornament from Westergötland. At least from this time onwards the idea of a stone axe as a magical item in itself has existed among the researchers. For example, the thought has been proposed that already in the Neolithic axes and adzes had cultic or magical role next to practical function, the proof for which was found in the existence of large and unpractical axes as well as depictions of axes on rock panels (Mildenberg 1969, 6 and the references therein; also Salo 1990). The significance or even holiness of the hole drilled or pecked in the axe has been referred to as well; additional support for this interpretation has been seen in the cup-mark motive in rock art (Barner 1957, 10). The idea valid in the 20th century about stone axes in later contexts, at least on the basis of German literature, can be summarised followingly: in the Neolithic and the Bronze Age when axes were still practically used, there existed unpractical cultic axes (Mildenberg 1969, 6), later, since the Iron Age, stone axe became the symbol of the thundergod (Barner 1957, 10). The latter idea was easy to bring straight from the Antique world and the European Iron Age to the 19th and the 20th century, because both the Greek written sources as well as the contemporary ethnographic examples referred to the perception of stone axes as apotropaic thunderbolts (Blinkenberg 1911; Barner 1957). Blinkenberg (1911) mostly concentrated on his contemporary folkloric sources, but a large part is made up of the discussion on the age and origin of the belief. In this connection, he brought examples of amuletic stone axes from Ancient Greek and Asia Minor as the original home of the 'thunder weapon'. Thunderbolt-belief was treated by folklorists ever since the end of the 19th century (*e.g.* Evans 1897; Balfour 1929).

While it was relatively more straightforward to connect the idea of a stone axe as an apotropaic instrument with burial sites as sacral contexts, it was much more complicated in the case of settlement contexts. This is in a way surprising because ever since the 18th-century records exist how thunderbolts (be they fossils or antiquated artefacts) are kept in houses, hid and used for safety; moreover, the respective folkloric material is mainly about using apotropaic thunderbolts in everyday contexts. However, despite the folkloric motivation it has been difficult to associate magical items with everyday contexts (settlement sites, buildings). According to Carelli, Stone Age tools had been found from Lund since the 1890s, but before his publication in 1997 nobody tried to connect these with the thunderbolt-belief. In this way, the presence of Stone Age artefacts in later settlement contexts has rather been associated with an earlier settlement site (see about the residuality concept in Ch. 3.4; the same has been said about Scandinavia in Carelli 1997, 408f; see references also in Mildenberger 1969, 7f). However, treatments of thunderbolt-belief inspired by single artefacts from archaeological settlement sites can be found at least since the middle of the 20th century (*e.g.* Barner 1957; Sedova 1957; for Scandinavian references from the 1950s see Carelli 1997). One of the earliest systematic examples is "Verschleppte Bodenfunde" (1969) by Gerhard Mildenberger, which treated numerous finds of stone axes from demolished buildings all over

Germany and Austria that hade been published in the 1950s and 1960s. Mildenberger is one of the first to discuss in more detail the Neolithic stone axes from later settlements, opposing their interpretation as an indication of a Neolithic habitation and trying to prove their secondary use as thunderbolts and later deposition in archaeological context in connection with this belief (1969, 7ff). Mildenberger used ethnographic and folkloric examples of the wide distribution of the belief as a proof but also referred to missing accompanying finds from the Neolithic (*ibid.*). For archaeologists, the thunderbolt-idea found wider resonance thanks to one of the first general treatments that specifically concentrated on the use of the archaeological material in magic and witchcraft – „The archaeology of ritual and magic" (1987) by Ralph Merrifield which is probably the most cited publication for archaeologists concerned with the material side of magic. Merrifield (1987, 14) re-interpreted the numerous stone axes from London, not linking them to the Neolithic settlement, but rather to the activities between the Anglo-Saxon period and the 18th century. During the last decades the thunderbolt-topic has been repeatedly studied by several archaeologists while specialised studies on separate items (*e.g.* Asplund 2005; Thäte & Hemdorff 2009), single sites (*e.g.* Myhre 1988; Carelli 1997; Tyanina 2008; Zheltova *et al.* 2017) or general treatments about larger areas (*e.g.* Vasks 2003; Muhonen 2006; Article 1; Søvsø *et al.* 2016) have been issued. In all these latter studies the thunderbolt-belief is treated in its entirety, concentrating on fossils as well as stone artefacts.

Next to fossils and old stone tools magical interpretation has also been ascribed to pebbles. As in the case of fossils and antiquated artefacts, the earlier treatments of pebbles are based on the folkloric material. It makes no sense to offer a separate historiography, since pebbles have been discussed in different treatments of folklore on thunderstones (*e.g.* Blinkenberg 1911) witch's stones (among others holed pebbles, Toms 1932), snakestones (Skeat 1912) and curing stones (Black 1894) next to fossils and Stone Age axes. Special attention should be paid to George Kunz's "The magic of jewels and charms" (1915) where several pebbles which have been valued and used in apotropaic or curing rituals all over the world were discussed. Duffin (2012 and several other publications) has mainly concentrated on identifying fossils and minerals from Antique, medieval and modern period written sources. Duffin is also the first to touch the topic of gastroliths, though not in association with archaeological material. Archaeologists have been very reluctant to treat pebbles, probably mainly for the same reason that was mentioned in case of fossils – they have not been considered true finds. Besides, while stone items and some species of fossils can more easily be associated with one or another charm mentioned in the written sources or folklore records, in case of pebbles this is more or less impossible. The find context should be explicitly deliberate for archaeologists to offer any suggestions about the magical use of pebbles in archaeological material. There are exceptions, but these concern particular kind of pebbles, *e.g.*, Pictish painted quartz pebbles (*e.g.* Ritchie 1972; Arthur *et al.* 2014), Azilian painted pebbles (Burkitt 1926; Kraft & Tolksdorf 2018), but quartz pebbles generally

(*e.g.* Carlie 1999, Ringstad 1988, Gilchrist 2008) which due to the direct association with rock crystal have been considered as valued thunderbolt (see in more detail about the examples in Ch. 5.2.2).

All in all, it can be said that archaeological material reached the studies about magical practices episodically already at the end of the 19th and the beginning of the 20th century, but previously the idea of archaeology as a rational science prevailed, rather instigating folklorists and ethnologists to engage in the topic. Since the middle of the 20th century more and more specifically archaeological publications were issued that treated some behaviour connected with (apotropaic) magic (*e.g.* Howard 1951; Kivikoski 1965). More systematical studies where archaeological items were treated as the primary source with the purpose to identify magical practices in the past started from the 1980s. One of the first notable treatments was Audrey Meaney's "Anglo-Saxon amulets and curing stones" (1981) that concentrated on potentially magically used items of a specific archaeological period, whereas for the first time finds that until then were mostly untreated and uninterpreted, such as animal amulets (incl. fossils), antique items (incl. stone axes), but also minerals and smooth pebbles, were discussed. This is an excellent overview, where, in addition to archaeological material, references to written sources available in the Early Middle Ages as well as to folkloric material are made. Merrifield (1987) summarised the ritual deposits known by the time. His work is outstanding and widely used ever since because his source material covered all over Great Britain, but also Ireland and the western part of the European mainland. More than half of the contents concerned Roman and Anglo-Saxon period, but he continued to consider deposits from the Christian centuries, and to treat them in much the same way (Hutton 2016, 1). One of the relevant topics, deposition of particular items within or beneath buildings as measures of protection and aversion, has gained popularity in the last two decades and several notable treatments about the study of concealments in medieval, pre-modern and modern period town contexts have been issued. The systematic study of construction deposits started already with the collecting of concealed shoes by June Swann in the 1960s (*e.g.* Swann 2016), but has gained momentum especially in the 21st century (see Hunt 2006; Falk 2008; Manning 2012; Houlbrook 2013; Hukantaival 2016; about the historiography see Hukantaival 2016, 33). Discussions have also concerned the nature of depositional patterns in prehistoric periods (Chadwick 2012). In addition to concealment practices, all sorts of (everyday) magic are being studied from prehistoric to the Modern times. The prominent article by Roberta Gilchrist (2008) about the existing archaeological data for magical acts in England during the later medieval period should be mentioned in this connection. Several collections of articles about the materiality of magic have been published in the last decade, *e.g.* Houlbrook & Armitage (eds.) 2015, Boschung & Bremmer (ed.) 2015, Billingsley *et al.* (ed.) 2017, Hutton (ed.) 2016 to name a few. Witchcraft treatments also abound (*e.g.* Davies 2017). In general, the contemporary research is characterized by the abundance of case-studies and specific topics as well as

the notion that archaeological material itself is used in the creation of interpretations and not as an illustrative addition to an already existing framework.

In Estonian tradition of using the archaeological material in magical interpretations, we mostly have single and episodical examples as well. Also, other features characteristic of Europe can be followed here. In the middle of the 19th century learned societies were established that concentrated intellectuals, who, under the influence of general romanticist interest towards the local past, set the collecting of past artefacts as their purpose and fulfilled the task by carrying out archaeological excavations. First, in 1838 the Learned Estonian Society was established, then in 1842 Estonian Literary Society was created which developed into Provincial Museum, and in the 2nd half of the 19th century Balto-German societies were founded in smaller towns (Tvauri 2005, 225–227). Collections of the societies formed arbitrarily, depending on what kind of antiquities were to be found (Stone Age artefacts around Pärnu) and what was considered old and valuable, therefore, the old collections of societies have often started out from archaeological assemblages. Objects connected to religion have usually reached the collections as curiosities (*e.g.* god figurine of St. Olaf's Church; Arctic artefacts collected in expeditions by the Balto-German seafarers – see Rousselot & Grahammer 2004) and not as a result of systematic collection policy. In the 2nd half of the 19th and throughout the 20th century large-scale campaigns were initiated to collect local old things, old beliefs and word magic that continued to the 20th century. In 1911, the Estonian National Museum instigated an extensive collection campaign with the purpose to collect predominantly national costumes, tools, and other commodities. Artefacts associated with magic and witchcraft were secondary. The emphasis of the first permanent exhibition was on scientificity that had to guarantee the 'authenticity of the presented picture' (Nõmmela 2009, 143–144). Similar were prerequisites for archaeological material.

Although the basis of collection policy was somewhat similar around Europe, then perhaps due to the character of the source material and specific interest of single researchers, differences can be followed. When, for example, in England, but also in Scandinavia, imposing collection of witch's stones, snakestones, and thunderstones were obtained during the period together with beliefs and using descriptions, then in Estonia apotropaic or curing magical items are scarce in museums. Thus, the majority of thunderbolts and thunderstones have not reached our collections due to the collection campaigns of old things or folk beliefs, but thanks to Martin Bolz, a doctor in Pärnu who had enormous antiquarian interest in archaeological artefacts, but who fortunately recorded the using of the gathered axes and adzes as curing and apotropaic thunderbolts (Article 4). The folklore collecting campaigns of Jakob Hurt and Matthias Johann Eisen through correspondents brought along detailed information of offering stones and springs as well as descriptions of raven stones, thunderstones and other curing stones as well as their uses, but since this kind of material was only seldom collected in the material form we do not know what they looked like. The probable reason for this is that we did not have a researcher who would be interested enough in pebbles to start collecting them and at the same time we did not have

such a strong and widespread belief, like snakestones in ammonite-rich parts of Britain, that would arouse such specialised interest. Thus, magical side of artefacts was paid attention to, but rather through folklore and not the artefacts themselves. Another reason for the limited amount of magically used artefact could lie in the way of asking for them during collection trips. For example, Barner (1957, 2) described an occasion during his collection trip of archaeological items in 1916 in Heinsen. When he asked for stone axes, nobody reacted, but when he asked for thunderbolts, these were brought out. So as late as in 1916, people in rural areas in Germany could not always associate thunderbolts with stone tools. Perhaps archaeology students in Estonia during their collecting campaigns of archaeological items in the 1920s similarly asked only for stone axes? It is possible that for many people the name 'thunderbolt' was the only name they knew for Stone Age tools and that Bolz asked specifically for thunderbolts. There are several items in Bolz's catalogue for which the Estonian name *pikse nool* (thunderbolt) or *pikse talv* (thunder adze) has been written down, but not how they were used. There are some examples when the thunderbolts were used for expedient functions, *e.g.* instead of a missing leg of a chest (Bolz 1914b, no 39) or ironing a bonnet (*ibid*., 74). It is doubtful that the same things were valued as curing or apotropaic magical items. It is more likely that by the late 1890s when Bolz collected the artefacts, they were not actively used in curing magical practices, but the name *pikse talv* had attached as a proper (and in many cases the only known) noun.

Specific aspects of magic have been thoroughly studied on the basis of folklore texts, like spells (Kõiva 2018), apotropaic magic (Hiiemäe 2012; 2017); descriptions of magical curing methods are included in studies on folk doctors (Kõivupuu 2000) and some aspects of folk medicine (Tupits 2009; Sõukand & Kalle 2016). In the case of archaeological material, there are two kinds of magical interpretations ascribed to them. First, interpretation of magic has classically been used about Stone Age figurines and different pendants (Jaanits 1961, 58) – a thesis used in exhibition guides continuously since the times of the first exhibitions in the 1920s (*e.g.* Pajos & Landberg 1960, 15). Second, interpretation of magic has been used in single and episodical cases when a researcher has, perhaps because a more conventional interpretation could not be seen, found folklore records to support his/her hypothesis. The few archaeologists who have used magic, although quite modestly, in their interpretations include Richard Indreko (1939, 30), Lembit Jaanits (1953, 330), Vello Lõugas (1996, 116–117), Romeo Metsallik (see in detail Ch. 5.2). Artur Vassar used the interpretation of magic in the 1930s for several phenomena in the research of Iron Age stone graves (1943). The parallels to Vassar's magic derive primarily from the Fenno-Ugric ethnographic material, for example, he explained the destruction of grave goods and encircling the grave with a stone circle, as well as the deposition of stone axes and adzes in stone graves with repelling magic. In the last decades, Heiki Valk has more systematically looked into the magical use of artefacts. In a comprehensive treatment of medieval village cemeteries he has associated several everyday items (knives and other edged tools, coins,

needles, keys) with possible apotropaic magic, using folklore as the central parallel (Valk 1995). A separate topic is the symbolics of lattice on artefacts which Valk connects with the motive of sieve used for fortunetelling in folklore (Valk 2004).

In the last two decades, similarly to other Europe, magic, like generally religion and ritual, has started to be included in archeological research in Estonia too. For example, peculiar animal bones (like these of a hedgehog, a squirrel or an eagle owl) in the Stone Age burial and settlement sites (see references in Jonuks 2009a, 126f) have generally been associated with magical depictions. Fertility magical interpretation has been used for some artefact types, like the oval fire-striking stone (Tvauri 2012, 298). Magical protection has discussed as a potential interpretation for otherwise more conventionally explained artefacts, such as glass beads (Kallis 2010, 164ff) or a horseshoe (Vedru 2014). Also, several treatments of single artefacts, *e.g.*, the disc with magical symbols from Rattama (Jonuks *et al.* 2010) or specific artefact types, *e.g.* tooth pendants (Jonuks & Rannamäe 2018), where magic is seen as one of the main interpretations have been published lately.

In addition to archaeological artefacts ethnographic material should be briefly mentioned as well. Artefacts enabling magical interpretation have been collected mainly into the Estonian National Museum (ENM) where in the course of collecting campaigns at the beginning of the 20th century several artefacts reached the museum. Of these different dolls/figures – Peko, Tõnn, *kratt* are the very few that look attractive and have therefore been used in several publications by folklorists (Eisen 1926) and ethnographers (Õunapuu 2015). The rest of the artefacts used in everyday magical practices include pebbles and fossils as well as everyday artefacts, like a belt, a coin, and brooches used for curing (Kuningas 2014; see Ch. 5.1 and Article 4). Interest in magic that has arisen in the last decades is also demonstrated by exhibitions or parts of exhibitions that concentrate namely on magical items (Article 4).

As a conclusion, it can be said that while the interest of Estonian folklorists in magic has been relatively systematic, the same cannot be said about archaeologists and ethnographers who have used magic in their interpretations rather episodically. Narrative assemblages have been more convenient sources for studying magical practices than artefacts which have not been collected as magical (ethnographic) and/or which do not enable unambiguous interpretation (archaeological). In the interpretations of specifically archaeological material, the using of long-lasting rhetoric for more than a hundred years is apparent, for example, the interpretation of pendants as associated with repelling or apotropaic magical practices (see references in Kurisoo 2018), while using magic to explain other finds is sporadic. In connection with the development of the archaeology of religion in Europe in the last decades of the 20th century, changes have reached us too; however, using magic in interpretations is still connected to a few researchers. Generally, the processes in Estonia follow the example of Europe.

3. THEORETICAL FRAMEWORK

In the chapter of theory, I will base my discussion on the hypothesis that all artefacts gathered by archaeologists have reached the archaeological site by human activity. This means that we should leave aside one possible explanation for the source material, namely their organic location in the specific archaeological context, which in case of the natural objects discussed in the current research (fossils and smooth pebbles) is also likely but cannot be proved or refuted in many cases. So we should proceed from the hypothesis that the initial motive behind the collecting of the pebbles and fossils is that they were perceived somehow curious and unusual. The first step of this process occurred when the past people collected a peculiar stone, attributed significance to it and brought it to the site. The last action took place when the archaeologist picked a strange-looking stone during excavations and decided to preserve it. Putting this thought as the basis for the following discussion the first approach to be mentioned is the theory of human universals (about the theory Brown 1991) – there are universal markers in human awareness that unconsciously influence human behaviour. This universality is also the reason behind 'pebble-mania' or 'lithomania' named so by George Kunz for the inherent trait of all mankind to collect curious stones that is present from the most primitive man to the most modern in a greater or lesser degree (Kunz 1915, 19; see also von Franz 1964, 209). Although there are several uses of pebbles that are connected to their physical qualities and are thus intuitively ontological (see below), in this chapter I will look more closely at the contraintuitive perception of the world which is also the basis for the religious/magical/supernatural thinking.

Contraintuitivity will be discussed in connection with the general theory of magic and anthropology of medicine. Both theories are in their practices connected with the question of vernacularism which in the frames of the current work includes vernacular healing and apotropaic magical practices. Vernacular religion or the religion as it is lived (see Primiano 1995) emphasises the personal or emic choice of practices considered efficacious by the practitioner, in the current case the healing and apotropaic procedures, which usually follow some pattern (*e.g.* principles of sympathetic magic, the agency of death, *etc.*) but where the specific choices are context-specific and rich in varieties (see also Article 3). This implies that different qualities, most importantly efficacy, ascribed to the used measures are also personal and context-specific. So the agents influencing the effectiveness of magical instruments and practices will be discussed.

Finally, the reuse-theory will be briefly treated, but this is relevant only in case of the Stone Age artefacts used in later contexts. It should be kept in mind that all theory is etic, the researchers' tool to make sense of the artefacts and practices they experience while working with a given culture. Also, this is obvious in the current case too: magical worldview is our assessment to the reasoning the logic of which seems non-rational in the frames of the scientific

worldview (*e.g.* communicating with plants or ascribing healing properties to fossils); reuse of Stone Age artefacts is reuse for us, but not for the people who picked up a curiously shaped stone from the ground and brought it home.

3.1. Cultural universals and counterintuitivity

One of the cultural universals considered by psychologists is magical thinking. For example, Nemeroff and Rozin (2000) have discussed the universality of magical worldview, namely the universal background of the two main principles of magic (law of contagion and law of similarity). With several experiments, they proved that the principles influenced the test subjects even before they themselves were aware of it. Magic which by broad definitions is the use of [supernatural] forces in the world for the sake of human goals (see more below) is by methods analogous to religion (Smart 1997, 72). According to Pyysiainen (2002, 112), counterintuitiveness is one quality that is universal to all religions, and thus it is also inherent to magical worldview. In counterintuitiveness, the boundaries separating domains of intuitive ontology are violated, for example, by transferring psychological properties to solid objects, or denying physical and biological properties to a person. Such phenomena violate people's intuitive, tacit expectations of how entities normally behave. So a conclusion is that supernatural elements, present in any magical or religious ritual, are counterintutitive. It is in the nature of human cognition to form counterintuitive ideas, and Pyysiainen argues that mere ambiguity of perception is not enough for the concept of counterintuitive agents to rise. What is also needed is a cognitive fluidity that allows for the mixing of knowledge from different ontological domains (Pyysiainen 2002, 122). Fiction, mental disturbance, and even scientific representations are usually in some sense counterintutitive, as science is based on similar analogies and ontological violations as religious symbolism (*ibid.*, 115). However, the latter are not relevant in the current discussion but it is important to note that counterintuitiveness alone is not a sufficient quality of religion or magic, because it does not explain the background of counterintuitive perception. So other aspects, like religious belief, should be discussed (*ibid*., 116–117; see also below).

If we take counterintuitive perception as one of the main criteria of potential magical use of artefacts it is natural to ask whether we can follow if an (archaeological) artefact has been regarded as having counterintuitive properties. While interpreting artefacts, archaeologists naturally first try to find indications at their intuitive perception by the past culture as well as their using in accordance with their physical properties, *i.e.* instrumentally. However, the form or the find context or the initial function of an artefact in many cases is not sufficient to follow whether it has been perceived intuitively or counterintuitively. In the case of many artefacts these perceptions are not possible to be separated nor is it reasonable. For example, in the early lapidaries malachite and galenite have been mentioned as having been used as natural pigments as well

as in magical curing practices (Duffin 2013, 8). In the case of potboilers, their heating to get hot water for regular cooking as well as producing symbolic smoke in religious practices has been discussed (Thomas 2010). The continuous discussion about the balance between the differing roles of pendants as apotropaic protection as well as ornamentation should be mentioned (Kurisoo 2018; Article 2, 166). Also, the role of knives and needles in apotropaic magic in the medieval period (Valk 1995) and later (Hiiemäe 2012) is relevant. There is no need to make a clear-cut distinction as there probably was none in the past human perception either or at least the distinction was not considered significant. In principle, many commodities may become laden with symbolic agency for different reasons, either because they are used to change the form or properties of some other substances (knives used for cutting, penetration), which material is considered apotropaic (silver jewellery, coins) or which are empowered by the closeness of death (*e.g.* graveyard soil) or the agency of the church *(e.g.* different things brought to church). Ascribing agency to physically inanimate artefacts or personificating these is closely connected to ascribing counterintuitive properties to them, in other word violating their intentional qualities. According to Pascal Boyer (2010, 30), the first rule of the religious or generally supernatural concept is the limited violation on the domain level. For example, a table which has the quality of being non-intentional but is believed to hear the conversation of people is regarded as the domain-level violation. At the same time, the table is still the table, its physical properties have not changed. It is likely that the domain-level violations can take place whenever considered necessary by the practitioner and this is also why separating between artefacts' roles as tools/commodities and apotropaic/healing means is complicated.

The whole thing is especially remarkable in case of trivial or everyday items that in some particular context become laden with the intentional agency, *e.g.* the witch-bottles (Merrifield 1987), old shoes or clothing items (Houlbrook 2013), magical pouches (Hukantaival 2018b), sauna stoves or whisks (Muhonen 2013), *etc.* If only the artefactual side of the finds is considered, we could easily wish to interpret the finds as rubbish, for example, nails struck into the trees (*e.g.* Ülendi offering linden in Article 2, 158). This has been further emphasised by Sonja Hukantaival for old artefacts, pieces of bones, ceramics and natural stones that could be seen as rubbish by archaeologists since this would be their status today, but which context indicates at their apotropaic function (Hukantaival 2016, 198). A good example is provided by the artefacts chosen as the charms by the soldiers and sailors in World War I, surely men who could not control their faith themselves and needed extra protection. Their amulets included holed stones, bits of amber, tropical seeds, four-leaved clovers, hyoid bone of a sheep, Mandrake root and ladies garters (Gardner 1942, 97). So the specific (ritual) context actualises the ritual agency which is potentially present in the object. The point is well illustrated by the case of stones from sauna stove which had constantly present initial and contextual meanings (*i.e.* heating, but also ritual healing), but might acquire occasional or temporal meanings (an actual healing ritual or an attempt to protect cattle from evil) when necessary

(Muhonen 2013, 129). The dependence of the function of an object on the context is one facet of the discussions about ritual deposits *vs.* rubbish (Hill 1995; see also Hurcombe 2009, 39 and the references therein) or generally sacred *vs.* profane (*e.g.* Garwood *et al.* 1991) and there is a danger to stay circling in the matter, especially when the contexts of trivial finds are not so precisely documented making any plausible conclusions complicated.

3.2. Magic

In relation with counterintuitive ideas, the theoretical side of magic and the difficulties of defining magic as a phenomenon should be discussed. Archaeologists in their work, while defining magic or describing magical rituals have mostly used the treatments of anthropologists (*e.g.* Bronislaw Malinowski, Edward Burnett Tylor) and historians of religion (*e.g.* Lynn Thorndike, James Frazer). To say it simply, through the 20th century two differing approaches have been used to explain magic that rely on two paradigms of anthropologists: (1) evolutionist, which sees magic as the most primitive developmental stage in the series of magic-religion-science; magic as the inevitable step in the (intellectual) progress of mankind (Tylor, Frazer, Thorndike); (2) functionalist, which emphasises the role of magic as a result of anxiety (Malinowski) (Mitchell 2011, 12–13). Many theorists of religion during the last century have proceeded from one or the other perspective, usually adding their own nuances to the basic idea, both to reach a universal definition of magic as well as to explain specific phenomena. It is noteworthy that despite the philosophical paradigm that one or another author uses to describe or understand magic, the definitions that rise are still very similar. The reason for this might lie in the fact that in a way the evolutionary sequence as a red line penetrates all the other approaches, despite the functionalist and structuralist share present. It might be said that the evolutionary sequence is the basis for the theory of magic. Evolutionist and functionalist approaches are often used in various combinations whereas the source material itself mostly conditions the chosen approach; so differences in universal explanations and definitions, as well as the dichotomies created (*e.g.* religion *vs.* magic, see below), are mostly due to the used source material which often derives from a local case study.

Let us take a look at some of the widespread definitions. Ruth Benedict has written that magic is the *manipulation of the external world by techniques and formulae that operate automatically* (Benedict 1937, 40); for Frazer magic is an attempt to control events through the application of the laws of similarity and contact (see Cunningham 1999, 20); for Ninian Smart *methods analogous to religious ritual which are used to control forces in the world on behalf of human goals are typically referred to as magic* (Smart 1997, 72); for Valerie Flint *magic may be said to be the exercise of a preternatural control over nature by human beings, with the assistance of forces more powerful than they* (Flint 1991, 3); according to Brian Morris magic is *harnessing of occult power for instru-*

mental purposes (Morris 2006, 234); and according to Merrifield conscious manipulation of supernatural force by the people and for their benefit (Merrifield 1987). What the definitions all have in common is the view of magic as an attempt to control nature with the help of supernatural forces. This desire to influence events, to look into the future and manipulate it can be regarded a common feature of the 'triangle' of magic, religion and science (see *e.g.* Jarvie 1964; Mitchell 2011, 41). Stephen Mitchell (2011, 41) has named the common trait 'human instinct' [a cultural universal], which only works with 'magical worldview' present.

If we leave aside the definitions of magic that claim to be universal (a common aspect in the classical definitions of magic), there is a possibility to define magic in a specific context, in a particular period or culture. In the theories of anthropologists and historians of religion, magic is tried to be verbalised through what it is not, in other words, confronting it to other phenomena, for example, magic *vs.* religion, magic *vs.* conventional medicine, magic *vs.* rationality, magic *vs.* science. But these oppositions always have specific chronological and/or spatial context, even if the authors ostensibly move towards universality. Thus, in the Middle Ages, magic was generally rejected as non-religion, as opposed to true religion. Today magic is condemned as non-science since *our faith has long been in science* (Ankarloo & Clark 2002, x). Perhaps it could be said in a very simplified way that during the medieval period, magic was opposed to religion and since the modern period to science which is demonstrated, for example, by the concept of superstition. Superstition was equalled with something irreligious for the medieval scholars, and with irrational or unscientific for the modern scientists (see also Ankarloo & Clark 2000, x). In this respect, the idea that there are similar counterintuitive ideas behind magic, religion, science but also mental disturbances should be reminded, which is perhaps also why the most fierce oppositions have risen between magic *vs.* religion and magic *vs.* science. Also, the altered state of consciousness connected sometimes to magical practices might be interchanged with mentally disturbed states of mind.

3.2.1. Magic *vs.* religion

The dichotomy of magic and religion has been long discussed by historians of religion, whereas opinions have ranged from one extreme, where magic and religion are viewed as in strict opposition with each other, to the other where the term 'magic' has been regarded as a 'semantic trap' and expelled from scientific circulation altogether (see more Graf 1991, 188). Mostly, though, keywords have been looked for to characterise the difference between them, *e.g.* supplicative *vs.* manipulative; symbolical *vs.* practical; private/secret *vs.* public or individual *vs.* collective.

The contrasting of magic and religion gained impetus with evolutionist approaches in the 19th century, although Georg Wilhelm Friedrich Hegel stated

already decades before that magic was the oldest, rawest, crudest form of religion, characterised by the manipulation of nature (Hegel 1987 [1840], 272). The supplicative nature of religion *vs.* manipulative nature of magic emerges most clearly from Frazer's idea that although magic often deals with similar spirits that religion does; magic, differently from religion, treats the spirits as it treats inanimate agents, constraining and coercing, instead of conciliating or propitiating as religion would do (Frazer 1990, 51)[5]. Frazer's statements about all magic being sympathetic magic applied in the form of the law of similarity and law of contiguity[6] led to his next assertion that the influence of magic to its object is imminent and direct and the effectiveness of magic is automatic (Mauss 2009, 16). This immediate effect of magic *vs.* indirectness of religion is one of the main pairs of adjectives in the opposition of magic and religion. The manipulation-supplication dichotomy is another side to it.

Malinowski was perhaps the first to look beyond the evolutionary scheme, since, leaning on his fieldwork among the Trobrianders, he clearly stated that magic, religion, and science all exist in all societies; magic and science similarly contribute to a purpose in any practical activity (Malinowski 1948, 15). Possibly, the reason behind his statement lies in his fieldwork experience, since many researchers of magic were solely armchair-scientists, trying to verbalise generalisations, while Malinowski made his conclusions on the basis of an existing society. However, Malinowski had his own clear-cut difference between magic as primarily practical and religion as primarily expressive (see Cunningham 1999, 29). In other words, magic is a means through which ends are achieved (*e.g.* rituals to prevent death in childbirth), religion comprises acts which are themselves the fulfilment of their purpose (Malinowski 1948, 20f) (*e.g.* ritual celebrating a birth). Naturally the practical *vs.* symbolical dichotomy discussing the expressions or the goals of rituals has much to do with the dichotomy of supplication-manipulation discussed above and has everything to do with the widespread and long-lasting approach according to which magical rituals are used to control forces in the world on behalf of human goals, whereas religious ritual activity is addressed to sacred beings, such as gods or ancestors (Smart 1997, 72).

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[5] The influence for this viewpoint has been suggested to have its roots in the late 16th and early 17th century English Protestant propagandists, who distinguished between religious acts as intercessionary and magical acts as coercive rituals, which naturally led to the statement that magic is false religion and inefficacious, since true God cannot be manipulated (see Tambiah 1990, 19). The early intellectualists' distinction between magic and religion strongly leaned on the distinction between true and false religion, which was developed in Judaism and maintained in the Bible (*ibid.*). So, the early intellectualists were as much influenced by the 19th-century evolutionism as by religious fanatics.

[6] Many later anthropologists and researchers of magic have relied on the two principles of thought of sympathetic magic, introduced by Frazer: that of homeopathic magic, which obeys the law of similarity (like produces like) and that of contagious magic, which obeys the law of contact (things which have been in contact with each other continue to act on each other at a distance) (Frazer 1990, 11).

The view of the orientation of magic towards human goals is in a way linked to the structuralist approaches which regarded all phenomena as actors in the larger social 'stage'. Durkheim as the most influential of the school stated that magic and religion both belong to the sacred sphere of life, that is, they are substantially similar, being the unified systems of beliefs and practices relative to sacred things (see Durkheim 1915, 47), however, while religion unifies its practitioners, magic does not (*ibid.*; see also Cunnigham 1999, 44). That leads us to another one of the most widespread dichotomies of magic and religion, the central one in structuralist approaches – magic as individual and religion as collective. Magical rites are private, mysterious, secretive, separated and do not take part in any organised cults, they are usually not performed publicly, they have different agents than religious rituals, so they are very close to being prohibited (see Mauss 2009; Niehaus 2010, 433). Marcel Mauss (2009, 27) stated that *it is the fact of prohibition itself which gives the spell its magical character*, postulating that the main difference between magic and religion lies in the forbiddenness or permittedness of the ritual. However, Mauss is somewhat controversial, since one of his theories of magic maintains that the whole community has to believe in the efficacy of the activity to be called magical, which in a sense rejects the dichotomy of public *vs.* private when talking of magical practices (*ibid.*, 23). Individual *vs.* collective has been developed and revised by many scholars after Durkheim and Mauss, so adjectives like critical, irregular, unscheduled, performed in the personal emergency have been added to the magical ritual. At the same time calendrical, recurrent, scheduled, communal, and performed by priests are thought to characterise religious ritual (*e.g.* Titev 1960, 293f).

In a way this is a kind of vicious circle, where the different adjectives of magic seem to prove the evolutionary aspect and the evolution of magic through religion to science[7] in its turn has made to confess the existence of proper characteristics. It is interesting that already early anthropologists saw the exceptions to the elaborated 'rules', *e.g.* the fertility ritual or sacred marriage described by Frazer (Frazer 1990, 32). Mauss already at the beginning of the 20th century indicated at the several so-called grey areas, bringing examples of the constraining character of religious rites and the assistance of spirits in magical rites (Mauss 2009, 26) or claiming that the mass of practices fall into the category of neither magic nor religion (*ibid*., 27). The same has many times been repeated by other researchers after him, *e.g.* Weber (1978, 630), retaining to the evolutionary scheme, stated that the later religions had preserved magical elements. Karen Jolly (2002, 8) spoke of the coercive power of the prayers of saints and the supplicative nature of charm rituals to name few. The coexistence of Christian and pagan (magical) elements in Anglo-Saxon medical

[7] The evolutionary sequence is not absolute and ever-present in the historiography of magic, *e.g.* Malinowski, but generally it is there and influences the conclusions. There are outliers to the general sequence, *e.g.* Mauss regarded that religion pre-dated magic, since collective form had to be earlier (Cunningham 1999, 47).

texts (*Leechbook, Lacnunga*) and healing rituals has been stated by several researchers (*e.g.* Grattan & Singer 1952; Jolly 1996). Similarly, the Our Father has been regarded both as an incantation as well as a prayer, considering the context and the purpose of its use; both were similarly used to communicate with the supernatural world (Uuspuu 1938; Pihelgas 2013, 32f; Kõiva 2018, xv–xvi). Despite the theoretically acknowledging the existence of grey areas, most of the researchers still see actual cases as black or white, creating and listing parametres for rites to be called either magical or religious *(e.g.* Mauss 2009, 23).

3.2.2. Rationality debate

What comes to the differentiating between magic and science then the major dichotomy to discuss would be rationality. The rationality of magic has been regarded as the classical problem in both history and anthropology (see Kieckhefer 1994, 813). The birth of the dichotomy of magic as unsystematic and irrational compared to the rationality of scientific thought should be regarded in the same evolutionary view of the development of magic-religion-science (Jolly 2002, 8)[8]. However, the early anthropologists and theologians whose views have been dominant in the 20th-century discussions of magic have never so clearly verbalised this. To make it clear – already for early intellectualists primitive people themselves were rational in their goals, but the basis for their actions and explanations was erroneous, in other words, magic was seen as an intellectual error (Cunningham 1999, 19). Ian Jarvie expanded this statement, seeing two aspects in the rationality of magical and ritual actions: first, they are rational because they are goal-directed (and all actions usually are, so people are rational); second, they are rational in the society's context, *i.e.* the belief in their efficacy makes them rational (Jarvie 1964, 132). The latter – the bringing in of the context of the society – is an essential aspect in the rationality-debate. It was first introduced already by Max Weber at the beginning of the 20th century. Weber believed that human actions could be understood through the process of empathy based partly on shared rationality and partly on an attempt to conceptualise the world in terms of the performers of the actions (Cunningham 1999, 10).

The rationality debate arose in the religion anthropological discipline from the 1950s, when the broad questions about the nature of rational thinking (universal or context-specific), its connections with cultural and historical context, and definitions of rationality started to be discussed. In this rationality debate the once topical questions, *e.g.*, the similarities and differences between religion,

[8] Joanna Brück (1999) in her paper argues that the conception of ritual, described according to modern western criteria as non-functional and irrational, is a product of post-Enlightenment rationalism; so the dichotomy of ritual-secular arises from the similar irrational-rational, non-functional/impractical-functional/practical opposition that divides actions according to the Modern age views (see also above).

sorcery and magic as well as science and cosmologies (*e.g.* Frazer, Lévy-Bruhl, Malinowski, Evans-Pritchard) rose again to the fore (Gross 2011, 211). Both Tylor and Frazer contrasted magic with science, naming the former the 'bastard sister' of the latter (Cunningham 1999, 19). In his discussion of Melanesian savages, Malinowski repeated this, stating that magic is akin to science because both have a definite aim, practical ends, they are governed by theory, and they choose the method most suitable to gain the goal (Malinowski 1948, 116). However, he agreed with Frazer to name magic 'pseudo-science' (*ibid*., 117). So we could rephrase Malinowski's idea and say that magic for him was not irrational (as opposition to rational) but pseudo-rational (as an alternative to rational). Cunningham has seen a change in the views to rationality with Jack Goody's ideas, emphasising that Goody reject the notion of crude rationality with regards to magic and religion, replacing it with irrationality and non-rationality (Cunningham 1999, 78). However, it seems that it all comes down to terminology, since the ideas of Goody have really quite slight differences compared to the early anthropologists – he regarded magic as something that has pragmatic ends, but the end is not achieved or is achieved for other reasons than the practitioners suppose (Cunningham 1999, 78). Jarvie & Agassi went further, when they refined the definition of rationality, distinguishing between strong rationality (science) and weak rationality (magic and religion). Both rationalities share the characteristic of goal-orientedness, but only in strong rationality *is action based on a belief that satisfies some standard or criterion of rationality which has been adopted, such as that it is based on good evidence, or is beyond reasonable doubt, or is held open to criticism, etc.* (Jarvie & Agassi 1967, 55). This view is well represented in the widely acknowledged principles of science as well – *e.g*. objectivity, the principle of falsification, proved facts, *etc.* (see *e.g.* Chalmers 1998).

The problem of strong and weak rationality is connected with Jesper Sørensen's idea of strong and weak causality, which in its turn is related to the question of the efficacy of magic and the topic of the magical agency. In the case of ritualised actions the same cognitive processes which are valid in ordinary actions, are not there, *e.g.* regular causal relations (Sørensen 2005, 178). Sørensen differentiated between strong causal conclusions and weak causal conclusions, whereas the latter are *based on perceptual relations of contagion, similarity, and contiguity* (*ibid.*). Goody similarly defined ritual *as a standard behaviour (custom) in which the relationship between the means and the end is not 'intrinsic', i.e. is either irrational or non-rational* (Goody 1961, 159); that is the relationship between the means and the end has no strong (rationally explained) causality. To clarify this further – when strong causal relations cannot explain an action, it lacks rationality and may be called irrational (*e.g.*, was the horse killed by evil eye or upset stomach; and more – what caused the upset stomach – evil eye [weak causality] or overeating fresh grass [strong causality]). This is a very logical train of thought indeed. However, many authors are hardly

satisfied with naming magic irrational[9], stating that many magical techniques possessed their own kind of general rationality (Clark 2002, 108). The kinds of attributes of rationality were present in Frazer's laws of contact and similarity (see above) and were named as perceptual relations of weak rationality by Sørensen. An alternative to weak causality was offered by Rosalie and Murray Wax (Wax & Wax 1962), who brought in the concept of magical causality which should describe the inner (animistic) logic of the world. They stated that for us we live in a logical world of causal relationships *and the primitive as dwelling in a world of happenstance. Yet, the actuality is to the contrary: It is we who accept the possibility and logic of pure chance, while for the dweller in the magical world, no event is 'accidental' or 'random,' but each has its chain of causation in which Power, or its lack, was the decisive agency* (Wax & Wax 1962, 183). This thought is true as well – magical actions could be said to have their own rationality (other than rational ends only) and causality. In her dissertation about contemporary apotropaic magic, Reet Hiiemäe has, as the counterpart of magical, weak or irrational causality, used the notion supernatural causality, and saw its connection with the so-called just-world hypothesis: the world is a just place where everybody gets what he/she has deserved. The idea in its turn enables excluding coincidences and accidents and seeing direct connections between behaviour and consequences (see Hiiemäe 2017, 27). According to Richard Kieckhefer (1994, 821), natural magic, approved religion and demonic magic could all be rationally explained but by appeal to different types of causal principles (occult virtues within nature, divine intervention, demonic intervention); these causalities are irrational or non-rational only from the position of present-day attitudes (the emic-etic relation) (*ibid.*, 824), which leads us to the next issue.

The triangle of irrationality/non-rationality – weak rationality – strong rationality comes into question when the emic and etic viewpoints are discussed. For instance it has been stated that a historian's approach to the past should be similar to the anthropologists' approach to alien society – a complete open-mindedness (De Blécourt 1998, 337 and the references therein). Clark also warned historians against taking sides in the thing being studied (the efficacy of magic in the modern period in his case) and encouraged researchers to leave the issue in the hands of those they study (Clark 2002, 107). Both Clark and Kieckhefer similarly stated the general rationality of medieval and modern period magic (Kieckhefer 1994, 814). Not taking sides in the matter that a researcher studies, gives rise to the overall problem of objectivity-subjectivity

[9] The two words, irrational and non-rational, are very confusing indeed. Philosophically, the difference is as follows: the first indicates that there is a scale with rational in one end and irrational in the other; they share similar background system, so they should be able to be studied using the same parametres (irrational as the opposite of rational). Non-rational refers to something being outside the scale of rationality. I am not convinced that this philosophical plane has been taken as the basis for making differences between the conceptions by most of the authors.

matter in science, which has motivated the self-reflexive studies in humanities. So there is no easy way out of the terminological and methodological issues.

Similarly, Brück drew attention to the problem by saying that ritual activities in prehistory have been identified according to a contemporary functionalist rationale, but that equation of ritual with non-functional action has failed to distinguish between ritual and non-ritual activities (Brück 1999, 317). Brück went further, asserting that we should not make any *a priori* conclusions about past people and as functionality and practicality (like rationality) are culturally-specific terms, using these in alien contexts is not justified at all (Brück 1999, 329). This point is further illustrated by William S. Sax, who, in his discussion of the efficacy of [religious] ritual, summarised that the explaining what ritual is, is apparently 'our' problem because we need a term to cover all techniques or methods, that in our view are non-rational, ineffective. For 'them' they are techniques: dancing, healing, or simply 'work' (Sax 2010, 4). Stanley J. Tambiah stated that magical acts cannot be studied in our present scientific terms: *magical acts are ritual acts, and ritual acts are in turn performative acts whose positive and creative meaning is missed and whose persuasive validity is misjudged if they are subjected to that kind of empirical verification associated with scientific activity* (Tambiah 1985, 60). Similarly, Kieckhefer referred to Aron Gurevich's suggestion that the majority of people in the Middle Ages did not see the difference between church rituals and magical ones, and stated that this is underestimation of people, since conceptually it is not difficult to see difference between praying to God, inviting demons and using natural forces[10]. It is just that they saw no need to locate different behaviours in the system of abstract categories as we do (Kieckhefer 1994, 836). The kind of idea was presented already by Mary Douglas who stated that our Western experience and our rituals take place in separate compartments, in oral societies experience overlap and interpenetrate; the rituals in these societies create a single, symbolically consistent universe (Douglas 1970; see below). Similarly, Muhonen (2013, 131) and Hukantaival (2007, 70) have highlighted in the context of modern period folk practices that for the people, there probably was no significant difference between a mechanically functional action (*e.g.* locking the door with an iron lock) and a ritually functional action (*e.g.* locking the house with a magical practice).

A key to thinking outside categories is offered by the notion of vernacularism by Leonard Primiano (Primiano 1995; 2012). Primiano uses the notion vernacular religion to emphasise the private or personal component in it, religion as people understand, interpret and practice it or religion as it is lived. This means that vernacular practices involve different elements in different combinations. Thus, the character of practices is dependent on the situation and con-

[10] Kieckhefer brought very clear-cut examples, but it should be noted though, that drawing differences between permitted and forbidden acts from the point of view of Medieval and Early Modern Christianity was definitely not easy, even for the clergy themselves. E.g. the examples in the 16th century Italy presented by Mary O'Neil (O'Neil 1984).

text and universal or unambiguous patterns cannot be found. The reason for this is the point mentioned above that the origin or categories of the elements used in practices have not been important for the people since the result does not depend on that. Examples of vernacular practices in churches see Article 3. Researchers in several studies have, to my mind, discussed a similar concept, but provided different names. For example, Karen Jolly marks that Anglo-Saxon Christians saw the relationship between the world and the individuals holistically, which led them to combine ideas from the Graeco-Roman, Christian, and Germanic traditions. Jolly emphasises that while scholars are eager to trace the pagan, Anglo-Saxon and Christian origins of the remedies, they need to understand that remedies existed in their own time as integrated wholes, without any self-consciousness of a conflict of traditions or beliefs. She suggests that pagan or magical should be dismissed from the treatments of this view and recommends folk-Christianity, popular Christianity or Christian folklore instead (Jolly 1996, 170). Reet Hiiemäe (2017, 17), who has analysed the contemporary apotropaic magical practices, suggests that the motivation to use apotropaic magic or other religious apotropaic mechanisms is often not the wish to use magic or step into contact with the supernatural powers, but rather the need to find a practical solutions to a problem; thus the origin of the means is not important, even if their different background (*e.g.* liturgical *vs.* supernatural) is recognised. Pascal Boyer, in connection with several anthropological cases from Africa also reminds that not the 'powers' of supernatural beings matter but powers that are relevant to *practical* concerns (Boyer 2002, 86).

3.2.3. Efficacy of magic

The efficacy of magic has been still another widely discussed issue next to rationality. Does magic actually work and what makes it work? The first question is out of the question if we wish not to take sides in the matter and proceed from the vernacularist theory. *E.g.*, for Clark the ubiquity of magic is in a way the proof of its efficacy – it had to work when so many were practicing it (Clark 2002, 107). What are the prerequisites for the magic to be efficacious? Several authors have started with a very general and universal precondition, naming it magical consciousness or magical worldview. Mitchell has formulated the idea as following: *few observers would disagree that spiritual life – religion, magic, and so on – represents an area where human beings demonstrably share common impulses across time and space* (like desire to influence events, to look into the future and manipulate it) (Mitchell 2011, 41). The key to understanding this very common strive of human beings has been called magical worldview (*ibid.*). Wax & Wax (1962, 186) took a far-reaching approach to magic, stating that defining magic within magical worldview[11] allows overcoming difficulties

[11] The concept worldview is actually quite confusing (see more about the difficulties in applying the concept in Löfgren 1981). The concept can be characterised as a certain general

that are associated with the concept and bringing theoretical formulations more into accord with field experiences. For them, magical worldview was the overall belief in (magical) causation, a world where nothing is accidental but rather the result of the actions of others (see above); every action is dependent on and tied to some other act. Magical worldview could be compared to magical consciousness, a concept elaborated by Susan Greenwood (Greenwood 2005; 2009), but which can be suggested to have its roots in Rudolf Otto's *mysterium tremendum*. The elements of the latter have been translated as awfulness and mysteriousness, understood as an overpowering might that had to be experienced to be understood. According to Otto, the adjective *tremendum* comprises of the elements of awfulness, the element of overpoweringness and the element of energy or urgency (Otto 1970, 12–24); *mysterium* could be understood as the 'wholly other' or the feeling of consciousness of it (*ibid.*, 25–30). The underlying notion here is that *mysterium tremendum* is beyond our apprehension and comprehension since the kind and character of the wholly other is incommensurable with our own (*ibid.*, 28). Greenwood discusses 'magical consciousness' (2005) and uses Lucien Lévy-Bruhl's term 'law of participation' to make the concept understandable; thus magical consciousness is a fundamental state of mind, a thinking that created relationships between things through unseen forces and influences; dependent on specific context, it can be called altered states of consciousness, shamanic states of consciousness, *etc.* (Greenwood 2005, 104). Similar ideas have been suggested by structuralists and especially symbolist approaches, which have differentiated between two contrasting modes of thought – *e.g.* mystical and empirical in the context of Zande system of beliefs (Evans-Pritchard 1937); primitive mentality and Western logic, discussed by Lucien Lévy-Bruhl with regard to the socio-mental evolution (1926; comp. also Douglas 1970), *etc.* The key to understanding the magical worldview or consciousness is the notion of counterintuitiveness, which, according to Pyysiainen, is universally innate to all religious phenomena, including magic (Pyysiainen 2002, 112; see also Boyer 1994).

In a way, Sørensen's magical interpretation forms the same kind of state of mind, the field of meanings, background system, that the magical worldview or magical consciousness offers. According to Sørensen, the two hermeneutical ways that the participants use to interpret rituals, determine the direction of their efficacy: the first is magical interpretation which is dependent on the inner factors and direct context of the ritual; thus, it focuses on the relations between ritual actions performed, ritual force and magical agency, and the overall goal or purpose of their performance. The second is symbolic interpretation which

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cognitive perception of the world, *a framing concept, as a label which can be put around some cultural phenomena, or as categories of descriptive or analytical purpose* (Löfgren 1981, 26). Löfgren readily makes a list of possible contents of a worldview and under "cosmology" he states questions – What kinds of supernatural forces or principles exist in life? What is secular and sacred, profane and religious? So, perhaps magical worldview could be compared then with "cosmology".

directs attention to the issue of how ritual actions are connected to overarching symbolic or doctrinal systems, *i.e.* to the meaning of the ritual action (Sørensen 2005, 177). Which is really interesting in Sørensen's approach is that the two ways of interpretation allow explaining how the same ritual is seen as an efficacious means addressing specific problems, and in another context as a symbolic reference to a system of doctrines, which in its turn allows maintaining the distinction between magic and religion as two different interpretations (*ibid.*, 176). Sørensen's idea of magical and symbolical interpretation of rituals has direct links with Harvey Whitehouse's (2004) conception of two modes of religiosity. The key words for the doctrinal mode include ritual leaders, centralisation, certain orthodox control of rituals, anonymous communities, wide distribution, while the imagistic mode comprises emotionality, less control over the conduct of rituals, coherence, lack of institutionalised leaders, *etc.* Many of those keywords are compatible with tags for magic and religion, *e.g.* magic as private (coherence by Whitehouse), lack of ritual leaders, variousness of rituals, emotionality, religion as orthodox, centralised, with leaders. So in a way, Whitehouse continues with the scission between magic and religion similarly with many researchers before him.

The magical consciousness, worldview, interpretation has one more counterpart, 'faith', an attitude towards religious things that has been said by ritual practitioners to be indispensable to ritual efficacy (Sax 2010, 8–9). However, what is interesting at this point, is that rephrasing Pierre Bourdieu, William Sax states that faith is not a state of mind, but rather a state of the body (*ibid.*, 9 and the references therein), emphasising the somatic experiences, the embodiment. A similar view is offered by Johannes Quack, who, analysing Catherine Bell's ideas, discusses the notion 'ritual sense', a common 'habitus', which, however, is restricted to given societies and is in this sense nothing universal (see Quack 2010, 177).

So to briefly summarise the above said, one of the components for magic to work is the overall background – be it a magical worldview, magical consciousness or magical interpretation, faith, [ritual] sense. However, next to this 'state' of magic we should discuss the main characteristic of magic – the ability (or non-ability) to be effective, efficacy, called the (magical) Power, agency, force, might. Wax & Wax (1962, 182–183) used the term Power and understood it as an intrinsic feature of the natural order, being thus equalled to a sort of energy which can be accumulated and discharged by contact with improper objects. They equalled it to similar notions of Southern Pacific indigenous cultures, like *mana* which has been characterized as the sacred impersonal power, an anonymous force existing in the universe, the source of all religiosity (see Durkheim 1915, 229), and later characterised as the quality of efficacy (not necessarily 'magical' efficacy) (Lindström 2010, 440 and the references therein). With this notion, the Wax did not come about with anything entirely new but just took a step further in the discussions of magic of their time. For Sørensen, the thing that makes the magical performances efficacious is 'magical agency'. Some element participating in the ritual, is ascribed magical agency – it can be ascribed

to spirits, deities; in strongly stipulated ritual traditions magical agency often resides in the very actions performed, religious office (*e.g.* the position of the priest), artefacts without specific people or specific actions, *etc.* (Sørensen 2005, 174–175).

Most of the efficacy-debate I have touched on here is concerned with what has been regarded as the source of efficacy (in a way an emic viewpoint, proceeding from the a priori conclusion that magic is efficacious). However, the classical anthropological view that emphasised the inefficacy of magical techniques in itself should be mentioned too. *E.g.*, Durkheim at the beginning of the 20th century suggested that efficacy lies in the mind of people, in other words, even though people believe that their rituals act on things, it is actually their minds that are acted on (see Cunningham 1999, 46 and the references therein). This, to my mind, is not stating the inefficacy of magic, but drawing a sharp difference between mind and body, which, in its turn is rather a medicinal or a philosophical than an anthropological issue. The medicinal approach to the efficacy of magical healing has been taken by Edward Bever (2008; comp. also Brody 2010; see more in the next chapter 3.3.).

3.3. Illnesses and curing

Magical curing[12] practices form a very (perhaps even the most) voluminous part of magical practices. In fact, the principles of magic are impossible to separate from the ideas of holistic healing. Examples can be found from using different minerals for curing, *e.g.*, using toadstones against poisoning (as toad itself is poisonous) or pebbles taken from the ground against diseases that come from earth (*maa-alused* in Estonian), to name a few (see more in Article 5). These examples work on the two principles of sympathetic magic: similarity and contagion. Similarly to other magical practices, the using of elements of different origin and different character to reach a specific end is also common in vernacular practices of medicine. It is the goal – curing illness – that matters.

The background to the holistic medicine is the humoral theory which was first introduced by the Greek Hippocrates and later improved by the Roman Galen. The theory was based on the concept of four primary elements which, in order to explain the functioning of the human body, was developed into the model of four central bodily fluids – blood, phlegm, yellow bile and black bile which were associated with heart, brain, liver and spleen respectively (Kalling 2017, 61, 69). These fluids had to be in balance for the body to be healthy (Alatalu 1992); falling ill was regarded as losing the humoral balance. The humoral balance was influenced by many outer agents, such as climatic, topo-

[12] Arthur Kleinman has differentiated between curing of disease and healing of illness, where disease is biological and illness mental (Hsu 2002, 9). Most of the anthropologists of medicine as well as the practitioners in science-based medicine are no longer comfortable with the distinction. In this research, I will use the two words as synonyms.

graphical, astronomical, astrological, liturgical and calendrical ones as well as the inner agents, like lifestyle, diet or everyday habits of the person (Kalling 2017, 61–62). Therapy in the humoral medicine meant the re-establishment of the balance that had been lost with the illness. One of the most widespread treatments was bloodletting used to treat fevers and inflammations. As blood was considered a hot substance, the excess of blood caused the hyperthermia of the body and had to be removed from the body. Phlegm was in excess after catching a cold and was removed from the body as sputum and snot. The same principle – removing bodily fluids that are in excess in the body – induced the treatments that prescribed making the patient urinate, vomit or sweat. The systematised humoral theory of Galen played an important role in medicine until the 19th century (Kalling 2017, 75). No doubt the general beliefs in ethnomedical practices about the power of blood, saliva, sweat, sperm, urine, and excrements are the result of the widespread galenic humorism. When the symptoms of the disease had been ascertained, the re-establishing of humoral balance could include the cures that were regarded either similar or opposite to the treated illness. The first included, for example, using snakestones against snake-bites, eating glass against sharp inner pain or using thunderbolts for sudden attacks of illness. Herbal medicine very often leaned on the *similia similibus curantur* principle, today also recognised in homeopathy, where curative plants were chosen for their shape, colour or some other quality similar to the symptom or the corresponding body part. The latter, *contraria contrariis curantur,* included treatments that worked by the principle of antipodes, *e.g.* where chalk was recommended for rubella or cooling against fever (Kalling 2017, 49), but the same general principle (allopathy) is the basis of the present institutional Western medicine too.

In the 18th century, the first texts were written and published about the perception of illnesses and cures used by the Estonians as well as the treatments recommended by the contemporary doctors (see Wilde 1766; 1771; Luce 1829; Kreutzwald 1879). From these, we can see the general acceptance of bloodletting as well as widespread using of herbal medicine by homeopathic principles. Using human and animal excrements, ashes, tar, coal, various insects, chalk, ink, clay, shells, copper, different foodstuff, *etc.* for curing was widely accepted as well as the efficacy of sulphur, mercury, lime, saltpetre, alum stone, gunpowder, *etc.* mentioned (Alatalu 1992, 40–41). Even though the minerals and chemicals were known and accepted as curing substances also earlier, sulphur and mercury were recommended afresh by the Paracelsian or chemical medicine from the 16th century onward (see Rein 2010). The scholars of the time deplored some clearly dangerous means (*e.g.* eating glass grinding against fulgurant pain) but also using curing steam or word magic (in Estonian *soolapuhumine*) (see Wilde 1766, 10–11). It can be noted that while the 18th-century scholars were influenced by the galenic as well as paracelsian medicine, they seem to have made a difference between instrumental/rational and magical means. Rational meant that something was taken in, while magical meant spells and touching. The kind of disagreement has been hinted at, for example, in the

folkloric curing methods of malaria (in Estonian *halltõbi*) (see Paal 2006) but it can be expanded to other conditions as well. For the doctors of the time, only the rational means were acceptable.

As with treatments, it is difficult to say anything about the believed causes of illnesses before the written sources. The folklore records written down in the 2nd half of the 19th and the beginning of the 20th century clearly show the influence of humoral pathology, possibly inspired by the official medicine of the time, but supernatural causes were proposed as well (comp. Jolly 2002, 30 – the material (natural) and spiritual (unnatural) causes of illnesses). For example, the winter cold was clearly caused by the imbalance in the body caused by environmental conditions, whereas the sudden attacks of illnesses (so-called *rabandus*) had to be sent by a witch. Bloodletting did not help in the latter cases and different cures, involving counter-witchcraft, were required. It could be suggested that humoral pathology which is generally about the maintaining of balance in the body (the microcosm) is connected with the just-world hypothesis which explains the retaining of balance in the macrocosm. Melvin Lerner has suggested that belief in a just world is a fundamental and probably even universal inclination that allows people to cope with the anxieties of human existence (Lerner 1980), but in written sources, the belief in just world has been first discussed by the antique authors. The just world hypothesis states that people need to believe in a just world in which everyone gets what he or she deserves and deserves what he or she gets (Dalbert & Donat 2015). So the basics of general balance in the world, including the humoral balance in the body, could be considered universal and thus inherent to the human perception. Another probably also universal belief is the principle of limited goods, which means that resources in the world are limited, *e.g.*, when someone becomes rich or healthy, someone else has been deprived of these resources (Foster 1965). The limited goods principle is behind the belief in supernatural causes of illnesses or unhealthy conditions and some of the expressions of this principle have also been dated back to the Antiquity, *e.g.* the internationally spread belief in the evil eye. These universal beliefs guided the perception of the causes of illnesses and the cures sought for also in Estonia and very likely since more distant past than the period of written sources and folklore records.

3.3.1. The efficacy debate in medicine – the placebo effect

Modern Western institutionalised medicine has been based on the idea of scientific knowledge of how the body works and the treating of separate symptoms. David Aldridge (2002, 233) has pointed out that scientific medicine emphasises one particular way of knowing among others. The critique of natural scientific view to health care stimulated innovation in clinical medical research and therapy in the 1990s which has brought along growing awareness by doctors of the importance of patient's social and cultural milieu and a recognition that a patient's health beliefs and understanding of personal meanings should be

incorporated into treatment (*ibid*). It is the holistic idea of the unity of body and mind that has been emphasised. Since the 1990s there has been an abundance of studies emphasising the necessity of holistic medicine, discussing the efficacy or non-efficacy of non-conventional therapies (spiritual healing, energy-flows, manual therapy, *etc.*) as well as the ethical side of inert medicine (placebo effect).

From the point of view of my dissertation, the opposition between the non-conventional or alternative therapies and institutionalised medicine is not relevant. Medical anthropologists have emphasised that the holistic approach to illnesses is, in fact, something universal to different past as well as anthropological societies. So the placebo effect, being an essential component of the holistic idea, should be looked into. Placebo by medically accepted definition is a substance or technique that is objectively without specific activity for the condition being treated, and the placebo effect is a therapeutic effect produced by this 'objectively inert' substance or technique (see Moerman & Jonas 2002, 471 and the references therein). Moerman asks how something inert can cause a therapeutic effect and introduces the notion 'meaning response'. To say it simply, Moerman (2002, 16) has brought out that there are three ways how human beings respond to injury: (1) autonomous responses – processes which the organism can invoke to regain health or equilibrium; (2) specific responses – responses of the body to the content of medical treatment, *e.g.* to the salicylates in willow bark tea or the antibiotic of penicillin; and (3) meaning responses which follow from the interaction with the context in which healing occurs, *e.g.* the red colour of a pill or a picture on a bandage[13]. So, meaning responses are the physiological and psychological effects of meaning in the origins or treatment of illness (Moerman & Jonas 2002, 472). Most elements of medicine are meaningful, like the practitioner's white coat, manner and style of talk, language, diagnosis and prognosis which he/she gives to the patients, the physical environment of the treatment process, but also the form of treatment (pills, surgery) chosen and even the ideas connected to specific conditions in a given culture (Moerman 2002; Moerman & Jonas 2002; Moerman 2013). Medical anthropologists have emphasised that the illnesses people experience not be merely biological processes; culture always plays a role in shaping them (Hsu 2002, 5). Successful treatment often depends not only on the biomedically ascertained efficacy of treatment (therapeutic efficacy by Hsu) but more importantly on the patient, macro-social contex, like the attitudes to the illness in a given society, as well as the interpersonal relationships, such as the view of his/her supporters to the success of the treatment (therapeutic success by Hsu) (*ibid*., 9).

[13] Comp. 'total drug effect' in medical anthropology, where the effect of the drug depends not only on its chemical activity, but also its appearance and packaging, the dispenser and his/her belief in the drug, the recipient and his/her beliefs and micro- and macro-context in which the drug is consumed (Hsu 2002, 10). Differently from Moerman`s meaning-response-theory, the notion of total drug effect involves the administration of a (not necessarily an active) drug.

Lately, placebo effect has been reinterpreted to be very similar to meaning responses as occurring in response to the contextual components of the therapeutic encounter and a person's individual interpretation of these (see *e.g.* http://www.lukerickardsosteopath.net/placebo-the-meaning-response/). Luke Rickard also adds that placebo effect rises from the brain effects; thus, placebo effect emerges from the patient and is not something 'administered' (*ibid*.). The idea is very similar to what Edward Bever has noted about Early Modern folk healing techniques. He has pointed out (Bever 2008, 276) that many ways of (magical) healing techniques are not direct, but they influence the nervous system indirectly through their symbolic or visceral effects, in order to stimulate the body's defensive, analgesic, and therapeutic mechanisms. In other words, they intentionally change the consciousness of people to mobilise unconscious processes that are not accessible in the normal waking state of mind. Placebo, autosuggestion (*ibid.*, 288ff), social support via reflection of emotions, imagery, and visualisation, also narratives, vocalisation, especially rhythmic vocalisation (chanting), can trigger specific physiological changes with direct therapeutic effect[14]; moreover, vocalisation and other chanting have a very close connection with pain-reducing chemicals like endorphins and enkephalins (*ibid.,* 297). So for Bever, there is no question about the early modern folk healing techniques, like incantations, objects, different activities whose effects cannot be accounted for by some direct physiological effect, actually having physiological effects, in other words, symbolic and ritual activities can help the body heal beyond its unaided capacity (*ibid.*, 287).

In medicine, there is nothing novel or unique in Bever's conclusion in the sense that body and mind are a united whole and changes in one influence the changes in the other; thus, the process of recovery, in fact, depends on the well-being of both. What comes fore from his approach is that there is nothing really 'magical' (in the traditional sense of the word – unworldly or supernatural) in the great part of magical healing, since all used techniques serve a very practical and straightforward purpose. The remedies chosen contribute to the recovery very perceptively; they are chosen to affect the body and the mind, or more precisely, the body through the mind. When looking at the folk healing stories from the 19th century Estonia, there are those which describe a direct physical approach to healing (*e.g.* pouring water on hot stones and leading the steam into the sore ear), and those which use more 'indirect' techniques to affect the body through influencing the mind (*e.g. If a person who has* Lichen planus *picks up three stones that stand near each other, spits once under each of the stones and puts the stones back as they used to, the rash will go away*[15]). The difference

[14] Bever has cited several benefits of visualisation, e.g. eliciting changes in blood glucose, gastrointestinal activity, and blister formation, slowing the heart rate, decreasing blood pressure, increasing salvation, and stimulating or inhibiting the immune system (2008, 291).

[15] *Kui inimene, kellel sammaspoolik on, kolm ligistikku seisvat kivi üles tõstvat, iga ühe alla korra sülitavat ja siis nad jälle vana moodu tagasi maha panevat, siis kaduvat ära* (H III 20, 731 (27) < Viljandi khk., Uusna v. – Hilda Nigul (1894)).

here is between specific responses (instrumental) and meaning responses (mental) to illnesses which are triggered to a different extent in different remedies chosen.

Counterintuitivity is a covering term which emphasises that on a very general level contraintuitive ideas are characteristic to religion, magic as well as science. Thus, on a general level we are dealing with a similar universal capability to accept that phenomena may go through domain-level violation. We may call this acceptance also faith in the magical agency, which is still present only in the context of the magical worldview. Everything that follows – the ideas about what is rational, what is effective – is observable in the framework of this belief or acceptance. In other words, if we believe that the honeycomb-shaped stone picked up from the ground has an inherent and intentional agency to cure earache (see below), using it to cure ear diseases is a rational choice and considered efficacious. Even if efficacy, in this case, would generally be regarded as psychological, rather than mental, it is hardly the case. The concept of placebo-effect or preferably the meaning-response offers good examples. If the stone is heated up and hot steam led into the ear, the healing effect may, in fact, be due to warming – an instrumental act considered as mainly efficacious by the general rationale (strong rationality and causality) and also institutional medicine. However, if universal contraintuitivity accepted, we do not know the share of warming effect and the meaning response induced by the curing stone in the final result of the procedure.

To my mind, the three most important aspects of magical practices are their practical ends, rational means, and personal nature. The motif for conducting a magical practice is always a practical problem, the chosen methods are always rational for the practitioner, even if not rational by the standards of strong causality or scientific worldview, and usually the issues to be solved are of personal nature – either curing an illness, enhancing a desirable quality or improving one's performance. Although there are plenty of examples of communal magical rites from the ethnographic past, everyday magic which is of particular interest in the current dissertation is mostly concerned with personal interests. Therefore, the concept of vernacularism which also comprises the personal and practical aspects of religious practices suits very well for the analysis. Meaning responses, discussed mostly by medical anthropologists (Moerman) is a convenient concept to be also introduced in the efficacy and rationality debates of other weak causality-practices (generally called magical). Important aspects to be noted are then: (1) personal meanings that certain people have about different practices or materials (*e.g.* personal 'contact' with a specific crystal) and (2) shared cultural environment where the practices are conducted (*e.g.* general counterintuitive ideas about crystals having particular influence on the well-being of people; the attitude of surrounding friends, family, *etc.*) (see also Teidearu 2017). So the concept of vernacular religion does not mean situations where everything is possible or behaviours that cannot be predicted. According to Primiano (1995, 45–52), individual and personal interpretations occur on the basis of shared beliefs and practices in a given culture or religion (Teidearu 2017, 16). For example, beliefs about the nature and effect of semi-precious

stones are shared (*e.g.* books of crystals that are very similar in structure and contents) but personal practices and experiences can be very different (*ibid*.).

According to Hiiemäe's research on contemporary practices, the users of religious apotropaic mechanisms (*e.g.* artefacts, verbals, behavioral rituals, *etc.*) wish to believe, on one side, that fate conducts their destiny, but at the same time they want to make their own choices. Believing and not believing may take place simultaneously in the same person and hence the pragmatical function of religious apotropaic mechanisms – they can be included in practice when needed (Hiiemäe 2017, 30). Hiiemäe is talking about the contemporary situation where the cultural context includes knowledge about both magical (weak-causality) as well as rational (strong-causality) behaviours, and in case of a danger, tendency arises to use them all (*ibid*., 34–35). This tendency is connected to the notion of baseball magic (*e.g.* Niehaus 2010, 435 and the references therein) according to which magical behaviour gives practitioners a sense of confidence and control (nobody would run faster or perform better as a result of particular magic activities). It has been argued that the interpretation of magic as an expression of desire that has psychological rather than physical efficacy is rooted in recent (the 1990s) historical and anthropological work, namely magic gives and sustains confidence, giving emotional support for the practitioners and clients (Kieckhefer 1994, 827). So magic in that sense is something that is done just in case, to be prepared, to say that I have tried everything, to convince yourself that you actually control the course of events (*e.g.* the carrying of thunderbolts in a sewing basket, not crossing the road after black cat), to affect the body through influencing the mind. In this way magic is always inherently efficacious, in the sense that to bigger or smaller extent it always is meaningfully chosen by the people who use it. In medicinal terms, via placebo-effect, all techniques chosen have a somatic, physical effect on people.

Vernacular religion is a concept very much welcome in archaeology because the discipline of archaeology would improve if we would stop searching for the phenomena of religion as something separate or unequivocally discernible from the bulk of material culture but accept that 'religion as it is lived' does offer 'confusing messages'. So there can be no visible specific rules for the researcher, but the rules exist and are connected to practical concerns, rational solutions that might include both contraintuitive and intuitive ideas. Thus, in reality, a single item may enclose both ideas, and in a single practice, both ontological as well as counterintuitive solutions can be regarded similarly rationally reasonable and efficacious. What about the rules? The shared principles that people probably lived by for centuries could be the principle of just world, limited goods, and humoral balance, perhaps also the belief of the Earth as living organism where minerals, plants, animals are all meant for the well-being of humans. It is another matter, of course, to follow how these principles and mixed ideas might have affected the use of artefacts. People acted in the frames of these principles and chose material remedies for their needs. The artefacts can be nothing special or remarkable in appearance or essence, but their agency in the performance is actualised by the overall magical context of the

procedure, made up of counterintuitive ideas, magical worldview and belief in the efficacy of the practice. In the following, the character of artefacts used in the magical practices will be analysed.

3.4. Reuse theory

Reuse has always been characteristic of human behaviour since mostly it requires less resource than making new artefacts. Katina Lillios (1999, 241) has even considered the need to remember or manipulate the past through material culture a fairly common and enduring trait of humankind, so a cultural universal. However, what makes it challenging for archaeologists is the variety of reasons of reuse, *e.g.* emotional (remembering of ancestors), practical (gleaning for suitable tools) or arbitrary (collecting/preserving curious things), whereas the result of some formation processes may mistakenly appear as reuse. Brian Schiffer (1996, 108) suggests that gleaning will occur to some extent in any settlement where discarded items are readily accessible. Different reuse strategies have been documented in ethnographic cultures (*e.g.* Schiffer 1996) as well as sometimes proved by archaeological examples. However, it has been stated (Amick 2007, 226) that archaeologists are generally worried about the possible chronological mixup that the reuse brings about, and are not especially interested in the motives or ways of reuse. Similarly, Lillios (1999, 238) has claimed that distinctively heirlooms are regarded as anomalies, noise or complications in the archaeological record. A curious example of the disinterest on the archaeologist's side towards reuse can be followed in Scania where a horse skull with a Neolithic dagger driven through it was found from the bank of Ullstop creek. Before dating the skull, it was valued as one of the oldest known horses in Scandinavia, discussed in terms of ritual sacrifice from the Neolithic, and exposed in Ystad Museum (Stensköld 2006, 203). However, after radiocarbon analysis revealed that the skull actually derived from the time between the Viking Age and the Early Middle Ages, roughly 11th–12th century AD, the skull was gradually forgotten. According to Eva Stensköld (2006, 208), the reuse of material culture that the horse expressed led to total disinterest instead of posing new questions. Linda Hurcombe considers the concept of residuality[16] as one of the biggest oversights of archaeological research. For example, when flint objects are found from later contexts, *e.g.*, a post-Roman cemetery, they are assumed to be residual and only limited information is provided for them in

[16] Residual is used for objects which come from a much earlier period; they have been understood as either having remained in plough soil or among general debris and reincorporated by chance (Hurcombe 2009, 51). The uncritical acceptance of residuality not only causes problems for acknowledging reuse strategies, but also for recognising the larger variety of usage patterns. For example, lithic artefacts from Iron Age or Roman sites in Britain have typically been seen as **having** to be residual than **possibly** the product of flint working in those periods (Hurcombe 2009, 51). The possible flint using in post-Stone Age sites in Estonia will be discussed below.

excavation reports (White 1988, 1; Hucombe 2009, 51). The same kind of attitude is quite typical for Estonian material as well. The finding of chronologically earlier artefacts in considerably later sites has not brought along a discussion on the matter in Estonian archaeology. When interpreted at all, these are explained as being residual and indicative of an earlier settlement on the spot or in the area (*e.g*. Trummal 1964, 83–84; Mandel 2000, 25–26; Mandel 2008, 87; Lang 1996, 379; Lavi 1981). In the current research, reuse strategies are important mainly for understanding the antiquated items; in case of pebbles and fossils, their primary archaeological use and context cannot be identified, even if these were being curated and reused as well.

Reuse in archaeology includes two major topics – the reuse of artefacts and the reuse of sites. Compared to the reuse of artefacts the reuse of sites is a substantially more thoroughly studied phenomenon (*e.g.* Bradley & Williams, eds. 1998; Bradley 2002; Jones 2007; Thäte 2007; Georgiadis, ed. 2009; Semple 2009; Crewe 2012). Very often the reuse of sites comprises large, conspicuous monuments like megalithic graves in case of which the reuse involves new burials (*e.g.* Williams 1997; Holtorf 1998). Also, very common is the erection of burial mounds on top of the previous house remains (*e.g.* Thäte 2007; Crewe 2012). In Estonia, the reuse of sites has extensively been recorded within Stone Age, especially in case of suitable shores of water bodies, like in Riigiküla (Kriiska 1999b), shores of Lake Peipsi (Roio *et al.* 2016) (comp. Gudaitienė 2018 for Neris River Mesolithic habitation). Reuse can be followed in case of repeatedly habited seasonal hunting camps in Hiiumaa (Kriiska 2002). The larger time gap between occupations from different periods is visible in case of the Corded Ware culture sites that in many cases are located at Mesolithic sites (Kriiska 2000). Reuse of Stone Age settlement sites has been recorded also in later periods, for example, an association can be followed with Iron Age stone graves (Johanson 2006a, 90–91; Jonuks 2009a, 202). A specialized study about the reuse of sites has been published by Gurly Vedru (2015).

The acknowledgement of reuse and its influence on the archaeological formation processes started with the processual archaeology in the 1960s and became a theoretical premise in the next decade with the rise of behavioural archaeology. According to Schiffer (1996, 28), reuse of artefacts means any change in the user, function or shape of the artefact that follows its initial use. Schiffer distinguishes several kinds of reuse: (1) lateral cycling, which involves the change of the user, whereas the function remains the same; (2) recycling where the form of the artefact changes and together with that also its identity; (3) secondary use where the artefact obtains an entirely new function but without going through changes in its appearance; (4) conservatory processes where the artefact is preserved consciously. Often reused artefacts may fall into several categories, and this is fine too since classifications are meant to systematize the material, not give unambiguous answers. Risto Nurmi distinguishes between reused and repaired artefacts while the main difference being that reused artefacts have been remade to fit a new function, *e.g.*, old pipe stems reworked to be used as fishing sinkers or pottery shards reworked into counting and gaming

pieces, while repaired artefacts have preserved their appearance and often, though not always, their old function, *e.g.*, pots used for keeping different stuff, other than food and liquids, after repairing (Nurmi 2011, 136). Basically, his reuse is the same as Schiffer's recycling and repairing similar to Schiffer's secondary use.

Lateral cycling, *e.g.*, movement of clothing, furniture, tools from one person to another, is very common in contemporary societies but is very difficult to be proved in archaeological material if the time gap between the users is very small and reusing occurs within the same settlement. Ethnoarchaeological examples show that lateral cycling is customary in different kinds of society for various reasons. For example, hunter-gatherer groups might lack individual property rights and thus artefacts may change their user constantly (Schiffer 1996, 29). A good example is provided by Deal and Hagstrum who, on the basis of Mayan ethnoarchaeology, conclude that reusing of ceramic vessels is a universal phenomenon in pottery-using societies and suggest that the majority of earthenware pots in archaeological material is actually in reuse stage (Deal & Hagstrum 1995, 124).

Thus, it seems as in case of archaeological material it is somewhat more possible to talk about the three other types of reuse, either on the basis of the changes in the appearance of the artefact or the conspicuous find context. Recycling in Schiffer's term (repaired artefacts in Nurmi's term) usually involves small-scale changes in artefact morphology, and the function may remain similar to the primary role. Typical examples include reworking an artefact after breaking to be able to use it in similar ways. There are plenty of examples in Estonian collection of stone axes with secondary holes, drilled after breakage at the primary shaft-hole has occurred. On the basis of ethnographic accounts, Daniel S. Amick (2007, 226–227 and the references therein) has stated that recycling of lithics is a fairly common behavior among prehistoric peoples in many parts of the world and that archaeologists need to consider the scavenging of suitable blanks as regular lithic procurement strategy in situations where archaeological sites are exposed on the surface. Scavenging of lithics to be reused as raw material or as artefacts has recently been suggested also in Estonia, for example, in case of Mesolithic Sindi-Lodja (Kriiska & Lõugas 2009), and in Lithuania (Gudaitienė 2018, 227). The role of lithics in post-Stone Age tool use has been a scarcely studied topic and has started to gain impetus only lately (see *e.g.* Ford *et al.* 1984; Young & Humphrey 1999; Högberg 2004; Humphrey 2004; Migal 2004). In Estonia, the topic is basically unstudied. So a substantial part of lithics from multi-period sites with Stone Age and later occupation might very likely be scavenged and reused, but without detailed use-wear studies, it is difficult to prove since usually, the stratigraphical sequence is not possible to follow. Possible examples of lithic reuse could be Kloostrisaar (Johanson *et al.* 2014), where Mesolithic occupation is followed by Corded Ware period habitation at the same spot, and lithic artefacts were gathered from the depth of the occupation layer. Also in Jägala Jõesuu hillfort Comb Ware and later Iron Age occupation was detected at the same place, with Stone Age lithics probably reused during the later period (see more below).

Perhaps the most widespread examples involve secondary use in Schiffer's term, which means new function but with no or only marginal changes in the artefact's appearance. If the new function is similar to the primary one, it could be complicated to discern secondary use, like in case of scrapers reworked into and reused as burins. Only microanalyses were able to clarify the reuse of a blade from Mesolithic Ullafelsen site in Austria, used as laterally hafted weapon insert, but when the edge was damaged, the blade was turned around, so that the side used to be hidden inside the shaft became a new cutting edge (Pawlik 2004, 170). A great example from Eiguliai 1B settlement site shows Swidrian flint arrowheads made into burins (Gudaitienė 2018, fig. 22). A similar case is formed by Stone Age tools being used as gunflints in Alban Hills in Italy where on flint-poor areas scavenging of earlier settlements occurred to obtain suitable flint tools in the modern period (*e.g.* Altamura 2013). While gunflints are, though not always, of recognisable rectangular shape, the simple fire-striking flints, used until the 20th century are more difficult to be distinguished. In Estonia, fieldwalking trips commonly reveal Iron Age, medieval and/or post-medieval pottery together with flint flakes which sometimes have use-wear on their sides. Without excavations it is virtually impossible to identify the site as a multi-period site, where Mesolithic material is residual in later settlement, as an Iron Age, medieval or post-medieval settlement where flint tools from Stone Age, possibly gathered somewhere nearby, have been reused as tools, *e.g.* fire-striking flints, or collected as curiosities, or as an Iron Age, medieval or post-medieval site where flint has been procured as nodules and worked on the site.

Secondary use involves many cases where the secondary function is totally different from the primary one(s), for example, ceramic pots used to cover the roof ridge (Deal & Hagstrum 1995), pottery or glass shards used as counting or gaming pieces (Nurmi 2011; Heinloo 2011, 36) or pipe stems with drilled holes used as whistles (Nurmi 2011, 137). A possible whistle made of a pipe stem has also been found from the Modern period layer in Tallinn (AI 6219: 151). Common examples involve coins used as pendants in necklaces, *e.g.*, in case of spoked coin pendants produced in the 19th century, 17th or the 18th-century coins were sometimes used (Reidla 2012, 80). From the point of view of the topic of the current study, stone axes retrieved and used considerably later as apotropaic or medical instruments should be mentioned. Perhaps a case in point is also formed by a Bronze Age sword from Vajangu later possibly reused as an ethnographic wedding sword (Lang & Jonuks 2001). A more thorough analysis concerns a dolostone disk with marks which has been cut out of a mould of cross-pendants and probably used as a magical item (Jonuks *et al.* 2010). The latter two are also among the few so far published specialised studies concerning secondary use in the archaeological material in Estonia.

Conservation processes in Schiffer's terminology mostly reflect the issue of heirlooms, that is, artefacts consciously preserved and maintained in circulation for generations (Lillios 1999, 241). However, in the archaeological material it is often quite impossible to determine this practice. Our dating methods are not so precise to enable the determination of heirlooms that have been in use for a few generations, similarly to later cycling. Sometimes, when the time gap is more

extensive, it can be suggested. A good example is offered by a Roman Iron Age disc-shaped plate fibula from the medieval Siksälä cemetery. The fibula was accompanying burial no 108 dated to 1400–1475, making the fibula nearly 1000 years older than the burial (Valk *et al.* 2014b, 123). It is likely that the fibula was found from a Roman Iron Age *tarand*-grave destroyed in the Middle Ages, taken along as a curiosity, and after reusing reached a burial context again (Jonuks & Johanson 2017, 190–191). In case of settlement finds, single older items are generally regarded as residual, not heirlooms. On the basis of ethnographic heirloom studies, Lillios (1999, 252) has concluded that heirlooms can be items of ornamentation, agricultural implements, textile, weapons, ceramic or metal vessels; thus, pretty much everything archaeologists find on sites can be included. So it is likely that archaeologists regularly handle ancient heirlooms without knowing it.

In the case of archaeologically visible processes, reuse usually means that the artefact has been removed from the systemic context at some point and entered into the archaeological context. Thus, it has been deposited or buried and later taken into use afresh, *i.e.* reclaimed (Schiffer 1996), and the time gap between the different uses is large enough to be archaeologically recorded. We cannot be sure that the functionality of the artefact is perceived similarly to its initial use, especially when the time gap between the deposition and reclamation is substantial. For example, we know from oral tradition that recovered stone axes in the 19th and the 20th century might have been tried to be used to cut trees. As far as we know this might be the axe's primary use and we may call it lateral cycling. But the rare records show that compared to iron axes the stone axes failed in this function and were either tossed away, thus entering into archaeological context again, used as something else, such as a press, a doorknob, a bell pull or a candle holder, thus secondarily used in Schiffer's terms, or kept as curiosities, thus conserved in Schiffer's terms.

Similarly to magic, reuse is also a researcher's term to usage practices. Today, reuse can partly be regarded as a conscious ecologically motivated choice to organize the consumption, but in the past, it could instead be suggested that pragmatical stimuli guided reuse. This assumption means that people, while using things, made conscious choices about which artefacts were suitable for different everyday tasks, whereas their previous using was not important, except when emotional reasons were included, like in the case of heirlooms. Concerning the latter, it is impossible to know whether the ancient owner knew that the heirloom was really old or kept it as a curiosity (Lillios 1999, 255). The distinguishing between use and reuse on the basis of the change in the user or function of the artefact becomes blurred and even pointless if the concept of system function and proper function of artefacts is considered (see more in Kokkov 2015). Artefacts have been made with the purpose of a given function, that is the proper function, but things can be used in different ways, *i.e.* system functions. For example, a chair is made for sitting (proper function) but it can be used as a ladder (system function); a glass is made for drinking from but it can be used as a vase. These examples are quite convenient, as the functions are connected to the same properties of the artefact, in the case of the chair its

property to support is important, while in case of the glass the property of being vessel-shaped and liquid proof is the key. But there are more complicated examples, like a sieve or scissors, which can be used for sieving or cutting (proper function) but both have been used for divination (system function), whereas specific physical properties of these artefacts were needed for the system function. After reworking, artefacts usually acquire new system functions; the same thing happens when artefacts are retrieved from archaeological contexts and enter into system contexts. Thus, archaeologically recognisable reuse practices generally mean new system functions for the artefacts.

In Nurmi's terminology, reuse is understood as non-primary use. Nurmi makes a difference between random and systematic non-primary use. It could derive from traditions and learned behaviour (systematic) or it can have been dictated by temporary need and availability (Nurmi 2011, 131). Random non-primary use includes largely case-sensitive solutions to often occasional problems. The artefact was taken into use because it was suitable for a specific problem. Systematic non-primary use includes observable patterns in reuse practices, *e.g.*, newspapers traditionally placed under wallpaper (*ibid*., 134). In archaeological material random and non-random reuse is sometimes possible to be identified, for example, coins reused as pendants could be regarded as non-random because at some point it probably was a traditional or customary behaviour. However, reusing old flint tools can be viewed as random, if suitable flakes were gathered now and then when a need for such a tool arose. For example, excavations in modern period Tornio yielded glass sherds with side retouch, reminiscent of prehistoric scraping and cutting tools (Nurmi 2011, 133) – an excellent example of random glass reuse. However, people could deliberately seek for Stone Age flint tools with the purpose to reuse them like in Alban Hills (Altamura 2013). It should be kept in mind, though, that even when traditional behaviour did exist to collect and reuse some artefacts (*e.g.*, stone axes as thunderbolts), the specific choice to use it or not was made by a particular individual.

Different classifications clearly demonstrate that it is very difficult to understand the use and reuse practices in archaeological material to its depth. Artefact biographical approach is of help here (*e.g.* Kopytoff 1986) because it does not try to draw clear-cut borders between different uses of artefacts. Artefacts can have an initial life with proper/primary function and system functions, which all can entail practical, ideological and social meanings, as well as second, third, fourth, *etc.* lives with additional non-random or random system functions with associated practical, ideological and social aspects. Also, things can move from an heirloom state to a non-heirloom, commodity state and back many times during its single life history (Lillios 1999, 243). It is important to try to establish the different uses and functions of artefacts but at the same time keep in mind that the variety of possible system functions for individual users can be quite substantial while the specific find contexts of artefacts are clearly related to this using pattern. So understanding the variety of using and reusing practices might help with the interpretation of find contexts as well.

4. NARRATIVE SOURCES

4.1. Written sources

Narrative sources on the topic include two major parts: written sources and folkloric sources. In case of Estonian area, we are mostly dealing with folkloric sources. Among written sources on the topic, predominantly texts written elsewhere in Europe are of relevance, the earliest ones of which include lapidaries and encyclopedias, which were discussed already in historiography and will not be concentrated on in this chapter. Medieval and early modern period written sources about Estonian area are not specifically about apotropaic or healing magical artefacts; references to magical procedures can be found from remarks about peculiar and deplored folk religious practices. However, the interpretation of these records is problematic; for example, records about the superstition of Estonians in the 11th–13th-century sources have rather been considered to be the stereotypes of Christian Europe about pagans (Jonuks 2018, 14). Besides, it has been brought out that notes on superstition were used to show and emphasise the heathen, peculiar and deplorable culture of the locals, thus stressing the superiority of the Christian culture (Tamm 2003). The 15th–16th-century materials of the provincial synod, synodal statutes and instructions of synodal visitations mention honouring of snakes, trees and other natural phenomena, especially thunder, burying into unconsecrated soil, witchcraft, divination, and conjuring. Here, we are partly also dealing with universal practices ascribed to 'pagan' people, but partly these are written by eyewitnesses and should at least to some extent reflect the situation adequately. *E.g.*, in case of Johannes Kyvel's visitation some specific questions, for example, about honouring thunder (Sild 1937, 41–42), imply that these practices were apparently widespread in the region and we are not dealing with stereotypes. A text describing the violation of the First Commandment in the catechism of 1694 forms a notable example: *If a man gives worship, which is meant only for God, to those who are not worth it, if: idols are worshipped, dead Saints appealed to, gifts brought in special times, Earth Mother or* Maa-alused *worshipped, some places, hills, stones, springs, steam of sauna, groves or trees in the forest considered holy, sacrifice made to them or in other ways idols served...*[17] (Catechism 1694, 9). Here the author Johann Hornung must have personally encountered the beliefs to use them as examples (Jonuks 2009b, 27).

After the Reformation, from the 16th century onward, the number of chronicles reflecting the pagan behaviour of people increased. One and the main reason for this is that the reformed church demonised the Catholic Church and saw

[17] *Kui Innimenne se Auu, mis Jummalalle ükspäine peab annetama, sellele annab, kennele se ei sünni; kui: Kujud palluma, ärasurnud Pühhad appi hüüdma, säetul Ajal umbusklikud Tootused vima, Ma-Emma ehk Maallusid tenima, mõnda Paika, Mäggesid, Kivvi, Hallikuid, Sauna-Leili, Hied ehk Puid Metsas pühhaks piddama, neile vahest Ohvrid vima, kahja teggema, ehk teisitau võrad Jummalad piddama* (Cathechism 1694, 9).

witchcraft also in the Catholic practices that were continuously practiced by the common folk. In the 17th century, the court protocols of witchcraft trials (Uuspuu 1937; Kahk 1987; Madar 1987) and protocols of church visitation included glimpses of folk religious practices. The records from the pre- and post-Reformation chronicles about the 'superstitious' behaviour of Estonians were targeted at outrooting the superstition. Mainly the large gatherings of people and offering practices at sacred stones, springs and trees are deplored; thus the records are clearly against social events. Very little is known about the private everyday magic or artefacts used in these practices. So it is possible that everyday magical practices were not considered dangerous or curious enough to focus on or perhaps very little was known about these domestic procedures. It has been suggested that the church was more eager to fight the higher pagan gods and the lower folk religion, including everyday magic, whereas the domestic witchcraft did not attract serious attention in the 13th–17th century (Valk 1998, 84), and for this reason it is poorly represented in the written sources of the time. The change in the attitude of the church to folk religious practices can be seen since the 17th century when in 1685 "Superstitious manners, ways and habits of simple Estonians" by Boecler (Forselius) was printed. The text was written down as assistance to the Lutheran clergy to recognise superstition, *i.e.* beliefs and habits deviating from the official ecclesiastical practices (Valk, Ü. 2018, 160). It is a rare early source about Estonian folk religion, where the purpose of the text motivated the methodical approach to the topic of superstition, systematically reflecting magical procedures connected to large variety of different everyday activities. The everpresent fear for witchcraft is demonstrated in trial protocols (Uuspuu 1937; Ruben 2016) and obviously protective instruments were needed. Forselius discussed several apotropaic, premonition and divination rituals already in the 17th century ([1685] 1915), however, extensive use of charms and amulets of natural origin, like animal body parts, plants, stones, shells, edged tools, is reflected in folklore texts only from the end of the 19th century (see Kõiva 2018 forthcoming, xix–xx). In the court protocols, the emphasis was mainly on malevolent witchcraft (Ruben 2016; Kahk & Salupere 1991, 591; see also Hukantaival 2016, 30); benevolent magic or healing was mentioned only to rehabilitate the defendant, but usually, the specific practices and means were not mentioned.

As said, the written sources do offer records of folk religious practices, but what about the material side of these practices which is the topic of the current research? Antonio Possevino, a 16th-century papal legate, wrote in his letter from 1585 that Estonians used consecrated bread, salt, milk, butter, seeds, wax, candles, copper rings and water in their apotropaic and healing magical practices (Possevino 1973, 19f; see also Fabricius 2010, 63). An apotropaic magical value was ascribed to jewellery with Christian symbols or religious meaning, such as rosary beads or Our Father Cross necklaces. It is known that Saint Anthony's cross-shaped pendants were regarded as powerful apotropaic amulets in the Middle Ages, which, especially when smeared with asafoetida, protected against witchcraft and the evil eye (Manninen 2009, 356; Reidla 2012, 76).

Carrying along a piece of the Host or some other holy artefact helped against (were) wolves (Possevino 173, 22). Many folk religious practices accepted during the Catholic times (*e.g.* offering wax figurines at church) were regarded superstition by the Lutheran clergy and deplored, but the customs were slow to disappear. The role of the church and ecclesiastical objects (*e.g.* rope of the church bell, church candles, the Host, holy water, *etc.*) in apotropaic and healing magical practices remained important until the 19th and the first half of the 20th century but had to be used secretly (see Article 3). Forselius's discussion mostly concentrated on superstitious premonitions and customs while artefacts used are poorly represented: in addition to the Host and holy water, foodstuff, knives, red string and excrements were mentioned. The most relevant record by Forselius in the frames of the current research is the description of Estonians striking their heads with a stone during the first thunder of the year to avoid headaches (Forselius 1915 [1685], 31). Nothing specific was given of the stone, but it is possible that we are dealing with a valued thunderstone (see below).

Artefacts used in witchcraft have sometimes been mentioned in court protocols. For example, defendant Marrit was found with a sack which contained a dried bat, wax, salt and woollen thread, which she used for bewitching (Uuspuu 1937, 125). A Lappish witch Johan Canutson used a piece of cloth (Ruben 2016, 223), Haiki Jaan a piece of yellow thunderstone (*ein gelb Donnerstein*), ice stone (*Eischnattenstein*) and an iron nail (*ibid*, 184), while the famous witch Pudell used wool and wire (*ibid*., 179) for witchcraft. The trial of Wielo Ado revealed that the defendant used a piece of cloth and a stone for witchcraft (Uuspuu 1938, 19).

It might seem that benign and neutral magic prescribed the using of consecrated artefacts or those with Christian symbolics while items related to evil forces were chosen for witchcraft, but in reality, the situation was much more complicated. Differentiating between black and white magic has raised many discussions through the history of Christianity (*e.g.* Kieckhefer 1989, 80) and there have never been simple and unambiguous answers. The situation became especially complicated after the Reformation. Extraordinary need (*e.g.* witch trials) sometimes forced to verbalise the difference between benevolent, neutral and malicious magic (*e.g.* Samson 1626). In these texts, it becomes clear that the difference lies not in the practices but rather the intentions. Later folklore records revealed the two-faced character of the snake, which has been regarded a poisonous witch's animal and the creature of the devil as well as a household-protecting deity or a soul animal (Hiiemäe 2012, 102). Similarly, wool has generally been regarded as a binding element in love magic, but in malicious magic could mean anything (Ruben 2016, 179). A case in point is offered by modern period building concealments which meaning and effect depended on the intention and not on the material representation, for example, a bone could have been concealed by the dwellers for apotropaic reasons but it could have been hidden by ill-wishing neighbours for malevolent purposes (Hukantaival 2016, 176). Also the consecrated and blessed artefacts were equally good in protective or healing magic as well as neutral or malevolent witchcraft.

In the 18th century, together with the Enlightenment, interest towards history, folk culture, and folk traditions appeared which fostered the studying of religious phenomena. Characteristically to the Enlightenment and (preliminary) Romanticism, pagan cultures started to become heroised and pagan customs were no longer seen as deplorable superstition (as modern period Lutheran texts did) but as something noble and pure (*e.g.* Herder 1773). While the 18th-century study of religion was based on antique mythology, the respective treatments by Garlieb Merkel or August Wilhelm Hupel concentrated on romantic offering sites, springs, stones and trees whereas everyday magical practices were naturally not involved. Everyday magical side can be found from the original publications of the 2nd half of the 18th and the 19th century on healthcare (*e.g.* Wilde 1766; 1771; Luce 1829; Kreutzwald 1879) as well as missionary and weakly papers, describing popular healing practices as well as methods recommended and deplored by the doctors of the time. Wilde (1766, 10–11) blamed people of their foolishness and superstitious ideas, stating that when people do not understand the origin of the illness, they ascribe it to witchcraft and seek cure also from witches. Accordint to Wilde's accusations, the witch takes a litre of vodka or beer, mumbles a few words, and gives some magic remedy which probably is simply salt. In addition to counting on the mumbled-on-salt, Wilde severely deplored people's habit to give up the pharmacy medicine if these have no instant effect as well as using curing smoke. Wilde himself recommended several curing means: in addition to pharmacy medicines, different plants and foodstuff were considered effective.

Proceeding from the valid understanding of pathogens and functioning of the body, the majority of the suggested curing methods can be regarded as rational and well-reasoned in the context of the time. By the 18th century, the learned doctors must have been aware of the paracelsian teaching according to which good and efficacious medicines were chemical, such as sulphur, mercury, gold formulations, antimony or alum (Rein 2010, 111), clearly poisonous by the present standards. Similar recommendations to use very acidic or very alkaline vitriolic substances are present in Wilde's texts, for example, he advised to use alum on open wounds for drying skin and quicker healing, as well as gunpowder, sulphur, white lead, antimony, potas, kerosene, saltpetre, but also more handy alkaline (*e.g.* egg shells, lime, mollusc shells) or acidic stuff (vinegar) (Wilde 1766, 1771; Luce 1829). Institutional medicine that evolved hand in hand with folk medicine also used popular explanations to diagnose illnesses, and the principles of humoral pathology were followed in the 19th century curing methods similarly in institutional as well as folk medicine (Paal 2006, 113), *e.g.*, bloodletting as well as curing with excrements, urine, saliva were recommended by Wilde, Luce and the calendars (Alatalu 1992; Martsoo 2007) as well as slightly later folk records. Ilmari Manninen has brought out that in the process of making the illness withdraw the means had to be as severe as possible, so poisonous pharmacy chemicals were used next to the attempts to scare the illness off (1925, 458). Thus, striking fire above a sick child, placing knives next to the sick, but also using dirty substances like excrements, sweat, urine,

dirt under fingernails, various insects like lice, ants or bedbugs were used to startle the disease off (*ibid.*, 458–459; see also Wilde 1766). According to folkore texts, blood, meat, skin, and excrements of animals were considered good as curing means also because of their life force (Loorits 1990, 11). So we may conclude that unpleasant stuff was considered powerful because of their repulsiveness or their hidden life fource. Unfortunately, none of the medicinal texts from the 18th and the 19th century have substantiated the principles behind their recommendations. The influences are especially intriguing in the case of the long and thorough descriptions of curing procedures where the order of steps and nuances of the elements are clearly significant. For example, in case of snakebite it was advised to scrape soot from copper cauldron and consume this with ashes produced from burning some plants and elk antler (Wilde 1766, 72). All in all, there were many similarities between the recommendations of medical texts and the folk medical practices; influences from humoral pathology, galenic as well as paracelsian principles can be followed in both directions. So the recommended curing methods were of different background and no doubt the learned doctors added their own opinion which had to be influenced by the culture where they and the surrounding people lived. The two things deplored the most – soothsaying (blowing on salt) and curing with smoke – were the remnants of Catholic times but very popular with the people and perhaps because of that clearly disapproved. Curing with old boot leather severely deplored by Wilde (1766, 30) refers to the sympathetic magical principle of finding the cure from the place where the illness originated or some elements connected to it. While smoking was practiced for skin condition named *maa-alused,* the boot which has been in contact with land was perfect for its cure (see also Manninen 1925, 456); similarly, soot referring to fire was suitable against inflammations (*ibid.*). Sympathetic magic and *similia similibus curantur* are in a way parts of the same idea, but the difference for the scholars of the time might be in the direct or indirect connection between the condition and the cure – vitriolic ('burning') substances were good against inflammations ('burning' conditions) because the contact and effect was direct and thus rational, but smoke from old boots could not have direct influence on skin condition. Well, in this light it is still difficult to see the acceptance of soot or excrements as curing means, but perhaps the main difference is between the physical consuming of the medicine (taking in, smearing on) and having no tangible contact with the medicine. Unfortunately, recommendations of prohibitions concerning curing methods with pebbles or fossils have not been mentioned in these books, although, using of minerals has very shortly been treated in "Heilmittel…" by Luce (1829), a book, that was meant to give an ethnographic overview of the curing methods that Estonians used. It seems that the verbal medicine as a substitute for mechanical methods was the most disapproved. So perhaps the using of pebbles was not considered dangerous nor preferred enough to be mentioned in publications.

Written sources include also a few newspaper articles from the first half of the 20th century where the tools of witches are mentioned. The newspaper Sakala described *a horrid find on Visaku road* – a bag filled with snakeheads, wasp

combs, toads and different bugs, all dried (*Õudne leid*… 1930). Apparently, these were supposed to belong to a country doctor. The newspaper Postimees told a story of a man who called police as he suspected his female neighbour of throwing a witchcraft object in front of his barn on an early morning of St. George's day to damage his animals. It was a rotten piece of wood with three nails struck in it and red and yellow yarn and a string of white cloth sparsely wrapped around the nails (*Kuidas*…1934).

4.2. Folkloric sources

At the beginning of the 19th century together with the development of Estonian intelligentsia, living tradition started to be valued as the primary source of folk beliefs and customs. This tendency resulted in several campaigns to collect folk narratives, customs, and beliefs led by Jakob Hurt and Matthias Johann Eisen in the second half of the century. Folkloric sources gathered by correspondence networks form the other voluminous kind of narrative sources that contains material on magically used artefacts. The collectors emphasised the need to collect records of folk beliefs and superstition, old curing methods, spells, *etc.* (Hurt 1888, see also Laugaste 1989, 34), but the attitude to superstitious beliefs of the common folk of this period was probably two-fold. On one hand, we are dealing with Christian pastors, so the personal reaction to superstitious practices must have been negative, for example, for Hurt Christian belief had to form the basis of any human and a whole nation (Laissaar 2015, 21). In his early works, Jaan Jung was especially hostile to superstitious behaviour (*e.g.* Jung 1879). Apparently, one of the main reasons to start gathering folklore was to get to know the enemy (superstition) and learn how to fight it. On the other hand, as Estonian scholars who were raised among common countryfolk, they were eager to record the disappearing local customs and saw their activity in a way as taking responsibility for the future (Laugaste 1989, 6).

Folklore records include much more information on magically used artefacts than written sources, but the problem with these is their origin only since the 2nd half of the 19th century; in other words, it is difficult to ascertain to what extent they reflect earlier beliefs. During the collecting campaigns and also later, the records from the end of the 19th and the beginning of the 20th century were used to reconstruct prehistoric religion. Later the kind of approach has been mainly critisised because religion is always changing and never static (Beyer 2011). Clear interruption in the village Catholic customs is seen at the end of the 17th and the beginning of the 18th century when the positions of Lutheranism strengthened, primarily via the movement of the Unity of the Brethren and Pietism but also due to the vast population losses following the Great Northern War, famines and plague epidemic (*e.g.* Laur 1995). While it is difficult to prove anything about prehistoric religion from folklore records, there is a clear tendency to do so in the case of medieval and modern period religious practices. This is perfectly understandable as there are many similarities between the

described traditions of the 19th and the 20th century folklore and early modern written sources, for example, offering practices at holy springs, rocks and woods, using excrements, blood, urine, saliva for curing, keeping snakes, especially vipers as pets and household guardians or using the Host for different witchcraft. However, some practices are described in folklore texts but never appear in written sources, for example, using pebbles, scrapings from silver coins and everyday items fur curing. While the honouring of thunder has been mentioned in the majority of the medieval and modern period written sources, using thunderstones is not mentioned at all (excluding the possible reference by Forselius). Perhaps the fractional and hidden character of the vernacular beliefs and practices was the reason for scarce representation of everyday magic in medieval and modern period written sources as suggested by Valk (1998, 84)? It could precisely be the case, as the special treatment of everyday customs by Forselius demonstrates the variety of superstitious practices which are very difficult to notice unless living within the community, as these were daily intertwined with other activities and more or less implicit. In many practices, the magical or superstitious component could have been hidden behind the rationally perceived elements, for example, while using ear stones against the earache producing warming steam might have shadowed the magical side of the practice, namely, that the stone had to be ear-shaped. Only more explicit customs were noticed or considered noteworthy, such as the using of Christian instruments in witchcraft or soothsaying.

Concerning the specific source material of the study – predominantly fossils and stones, as mentioned above, written sources contain almost no indications about the possible using of pebbles and fossils in magical practices. However, the folklore collections include considerably more data on the topic. Among these, I looked through mostly the texts connected with curing, witchcraft and divination practices which involved the using of different stones. Very few stones can be associated with witchcraft and divination and instead randomly picked pebbles have been chosen for these purposes, whereas the choosing principles have not been explained further. However, in curing magic, stones have played a significant role. The stones used in various practices can roughly be divided into multi-ritual and single-ritual tools. In the first case, stones are used in multiple curing incidents and preserved as such, in the second case, the stone works on the principle of contact magic, it is used only in a single episode and not kept. The stones used in curing procedures can be divided according to illnesses: stones were predominantly used to cure skin and ear conditions. In the context of the present study, it would be most suitable to classify the texts according to the materials used (fossils, round pebbles, antiquated items) but considering the descriptions available in texts this is not always possible, because ‘thunderstone’ might mean a fossil, a peculiar pebble or an old stone axe. Moreover, in many texts, the appearance of the pebble is not described to such a detailed level that would allow the speculation of their nature. Therefore, in the following overview, I will proceed from the meanings ascribed to the stones and their uses.

4.2.1. Multiritual stones

In the case of ear conditions the stones used are multiritual. The parallels of ethnographic collections (see below in the chapter of material sources) indicate that ear stones used in curing procedures are fossils in nature – bryozoans and corals. Several texts from the end of the 19th and the beginning of the 20th century reveal that the nature of ear stones was known: *'Ear stone' is looked after carefully because it is not to be found everywhere. These so-called 'ear stones' are nothing else but old pieces of corals, remains from the sea that used to cover our land.* (H I 9, 922 (V)). *When ears are aching, smoke from ear stones is led into the ear, that takes away the pain. These ear stones (corals) are found from fields and highly respected.* (H I 9, 42 (31)). *Ear stone = fossil of a honeycomb coral* (RKM II 400, 369). *It was full of holes like a honeycomb. These could be found only from the beach* (RKM II 400, 106 (2)). Comparing ear stones with honeycomb commonly in texts (*e.g.* E 47416 (17), ERA II 26, 423, E 19629 (524), RKM II 400, 36, ERA II 148, 267 (43)) refers to a chambered coral, *e.g.*, a tabulate. Some records refer more clearly to a bryozoan fossil, *e.g.*, grey conical stone (RKM II 111, 90 (278)), a stone with spiral base, one sharp and one blunt end (ERA II 191, 585 (33)), a small white stone which has rimose circles on it (RKM II 4, 161 (17)). A few texts include illustrations (*e.g.* ERA II 289, 430 (49)), where conical porous stone depicted also proves that we are dealing with a bryozoan fossil. A fossil of a coral or a bryozoan is also referred to by descriptions of a round stone with small holes, named a crow-stone (H II 37, 732 (7)) or a porous stone with many holes about the size of a fist (RKM II 81, 523 (8)). Single records may refer to fossils of other organisms. For example, the following description – *if a stone resembling a snail shell with a penetrating hole in the middle (called ear stone) is found from a field, it is used to blow air through into the aching ear, this should help* (H II 15, 380 (14)) – may indicate at a gastropod fossil with the central fragile part broken. Similar gastropod fossils have been gathered archaeologically (see below). Ear conditions have also been treated with 'the heart of limestone' (RKM II 111, 39 (93)) – the name clearly refers to fossils broken from limestone slabs; it seems, though, that mostly cephalopod fossils have been meant by the name. According to the sympathetic magical principles, stones which are analogous to the treated body part have been used in curing magic. Thus, ear stones have been described also as stones shaped like an ear (KKI, KS < Pöi, Asva), ear-shaped limestones (ERA II 288, 188/9 (11), (ERA II 254, 281/2 (42), (ERA II 288, 181/3 (3)), or stones which have ears (E 15038). These descriptions might indicate at fossils of *Bivalvia* shells. Several texts mention an ear-shaped hole inside a stone as the only characteristic feature of an ear stone (ERA II 193, 506 (2), ERA II 193, 506 (2), H II 40, 885(54)). This does not allow any more precise identification, but it is very likely that pebbles with natural holes were also used as ear stones. Although sometimes it is mentioned that suitable stones for curing ears are found often from fields (E 19629 (524)) or seashore (RKM II 111, 90 (278), ERA II 202, 135 (153)) or that in old times

every farm had one (ERA II 26, 423), there are several records where ear stones are named rare (RKM II 400, 369; H I 9, 922 (V)). Although fossils are more easily found in coastal areas with limestone bedrock exposed or under very thin sediments, this cannot be followed from the geography of the texts. As limestone fossils are distributed all over Estonia in moraine sediments (see below), the fossils are more easily found in areas with extensive arable farming.

Ear stones are used mostly against earache, but also in the case of hypacusis. In the case of earache, the typical curing method consisted of heating up the stone in the oven or on the stove, dipping milk (RKM II 400, 106 (2); RKM II 81, 254 (10); ERA II 202, 135 (53); RKM II 400, 369), water (ERA II 254, 281/2 (42), ERA II 289, 475/6 (11), H II 37, 732 (7), H I 9, 922 (V), RKM II 111, 67 (177), ERA II 285, 269 (46), ERA II 290, 45 (1), ERA II 193, 506 (2)) or juice from baked onions (ERA II 288, 188/9) on it and leading the steam produced in this way into the ear. Sometimes (*e.g.*, in case of a bryozoan fossil with a suitable shape), the heated stone was stuck into the sore ear with its sharper end first (RKM II 4, 161 (17), (RKM II 111, 90 (278)).

The general idea behind using a heated stone against pain is warming the ear, which is definitely a rational choice. Pursuing warming effect is in a way apparent in the case of other curing methods of ear conditions too, for example, burning the rope of the church bell to get a warming and curing smoke (E 16806 (19)), E 76578 (7); ERA II 199, 388 (16); EVR 12, 68 (6), H I 4, 391 (2) H II 43, 373 (59), H II 46, 662 (29), H III 6, 585/6 (53), RKM II 2, 301 (22)), holding wool from black sheep/ram on the aching ear (ERA II 189, 160 (137); ERA II 288, 189/90 (12); H II 20, 735 (3)), holding woolly sock inside out (ERA II 283, 480 (11)) or the sock of the left foot against the ear (RKM II 400, 100 (9)). In these mentioned methods, the magical element is quite obviously also present, and an essential component – the sock has to be inside out or from left foot, wool had to be taken from black ram, the smoke had to be obtained from burning the rope of the church bell. The church was a powerful place, and its instruments had to contribute to the curing process. The same can be said about the manor. The using of different church instruments in magical practices has been discussed elsewhere (Article 3). At this point, attention should be paid to the church bell – according to the principles of sympathetic magic, the cure had to resemble or be somehow related to the illness. The characteristic feature of a church bell is making a sound to be heard, thus creating a direct link with ear diseases. In addition to smoking the church bell rope, earache could be relieved by secretly scraping copper from the church bell itself, placing it on a hot stone and leading the steam into the ear (H II 53, 173 (9)). Another sympathetic magical principle is at work in case of throwing salt into burning oven and running out of the room before it starts to crackle (H III 9, 801 (182); RKM II 81, 261 (23)). The role of salt in magical procedures, especially divination, but also healing and apotropaic practices since the antiquity up to the present day, has been discussed in several publications (Hiiemäe 2012, 87–89; Kõivupuu 2013, 187; Macari 2015), but here fire is used to help cure inflammations. The using of hot ashes (RKM II 411, 441 (3)) to warm the ear might

also have the link to curing inflammations. In the case of hypocausis or congestion, a common method was blowing through the hole of the ear stone into the ear (*e.g.* H I 3, 57 (2), ERA II 187, 280 (91), (ERA II 254, 538 (56)). At the same time, other objects with holes to blow through might do as well, *e.g.*, the bobbin of a spinning wheel (E 80553 (2)) or a wedding ring (H I 1, 367 (43), RKM II 81, 258 (16)).

In the case of thunderstones and thunderbolts (Article 1), the folklore texts describe several kinds of stones. *There are three kinds of thunderbolts: one is like a ball, the other is like an arrow, and the third one comes with fire. One breaks, the other shatters, the third burns* (ERA II 27, 311 (26)). This text reflects the classification apparent already in the antique written sources. In the artefactual material, the two first kinds could include round smooth pebbles (in several places also fossilised sea-urchins – see McNamara 2011) and stone axes and adzes, in case of the third kind we might be dealing with lightning or even ball lightning. Descriptions of a thunderbolt as a black stone which has one sharp end and the other dull end or two pointed ends and a hole in the middle (E 217/18/22a, ERA II 24, 90 (41), E 8º9, 9 (24), E 8º11, 89 (214), E 8º12, 5 (4), AES MT 218, 19/20), H II 38, 774 (2)) might refer to stone axes. According to several texts, thunderstones are like whetstones, grey with sharp ends (ERA II 28, 305 (52), ERA II 77, 738 (17), (RKM II 204, 328/9 (11), (ERA II 24, 209 (75)) that may also indicate at stone axes or adzes, perhaps also oval fire-striking stones or flint arrowheads. The thunderstones in Saaremaa were round and smooth, usually small and of dark colour, brownish, but sometimes white instead (Lõugas 1996, 116). According to many folklore texts thunderstones are often round, of the size of a fist or a chicken egg, black or grey, sometimes blue and with smooth surfaces (*e.g.* E 81489 (6b), ERA II 63, 605 (47), ERA II 27, 270 (65), ERA II 27, 207 (10), ERA II 158, 167 (14), ERA II 158, 211 (20), RKM II 14, 33 (60), H II 4, 402 (71)) which implies that we might be dealing with water-polished pebbles. Thunderbolts have also included stones found from the beach which emit the smell of sulphur when broken (ERA II 38, 666 (22)) as well as small white hard stones gathered from fields which were used to strike fire from with fire-steel (ERA II 188, 248 (85)). In case of the latter, we might be dealing with the quartz pebbles found all over Estonia, but the beaches have also yielded Cretaceous flint pebbles imported here as ship ballast which were gathered and used for striking fire by the local people (Saar 1975). However, some texts indicate that thunderbolts have included fossils, for example the following: *Arrowstone – round core of the stone, the size of a pigeon egg. It was used to press the boil three times. Was supposed to remove it* (RKM II 111, 39 (94)).

Thunderstones can be used both for curing ear diseases as well as skin conditions, whereas in case of earache the routine was the same as with ear stones – the stone had to be heated and water poured on it to get warming steam for the ears (*e.g.* ERA II 306, 207 (73), ERA II 130, 597 (17)). In the case of skin conditions the stone was used to press furuncles and boils (*e.g.* ERA II 306, 219 (33), E XI 29 (79), ERA II 34, 193 (3), ERM 64, 59164, E IV 12 (36), ERA II

195, 180 (48), E 8º11, 94 (227)), quite similarly to the other stones used in skin cure (see more about single-ritual stones). Sometimes the stone had to be placed back in the same place where it had been taken: *The thunderbolt was used to press boils and swellings. The stones that were taken from the river to press the skin and were put back afterwards, had to be taken from the place with heavy current* (ERA II 306, 216 (16), but in most cases it has not been mentioned what to do with the stones after the curing procedure. The thunderstone was also scraped or ground to get powder which was then used against toothache (E 57314, E 8º12, 5 (14)), but especially against strokes, by adding the grindings into food and drink (*e.g.* E 8º12, 5 (14), ERA II 27, 270 (65), ERA II 77, 57 (43), H II 40, 501 (35), (ERA II 13, 222/3 (3), ERA II 13, 569 (37), ERA II 13, 151 (14), ERA II 25, 131 (7)). The stroke was a general name for suddenly appearing health conditions (in Estonian *rabandus, lendva, äkis, läbilööja*) and very often it is lethal especially for animals (see more in Susi 1996). Using of thunderbolts against strokes refers to sympathetic magic – the thunderbolt which has suddenly fallen from the sky with lightning was the most suitable to cure this kind of conditions. The thunderstone was a general curing means, although some texts mention its using against strokes and others against pressing furuncles, however, in several texts it appears that the stone was good to treat different health issues (see also Lõugas 1996). The folklore texts usually deal with a single aspect of thunderbolts: the records either describe the process of obtaining a thunderbolt, its appearance, using it in curing procedures or as apotropaic means. For this reason, it is difficult to assess if there was a difference between using a stone axe or a pebble if both were named thunderbolts. It can be suggested, though, that archaeological items (stone axes and adzes, oval fire-striking stones, flint arrowheads) which are not easily found were rather used as multi-ritual means with grindings scraped to be swallowed. The legends of some archaeological stone axes (*e.g.* AI 3551) and damage to their surfaces also prove that powder was scraped off the axes to cure the stroke. Quartz and other pebbles often found in fields could be used as contact magical single-ritual means for pressing skin conditions. However, records of archaeological finds show that more rarely found adzes (Tab. 3: 64; Bolz 1914b, no 85) could be used to press furuncles too. So it might be suggested that if a rarely found stone axe, adze or an oval fire-striking stone has come across and thunderbolt legend got attached to it, it was used to cure various illnesses as well as used for general apotropaic purposes.

According to several texts, thunderbolts had to be carried along to avoid being struck by lightning (*e.g.* E 8º11, 94 (227), E 81489 (6b); comp also Forselius 1915 [1685], 31), getting into trouble (E 8º12, 5 (4)) or getting shot (EKnS 2, 130 (4)). In spring, thunderbolts were carried around animals to keep them from being attacked by a wolf (E 15038) or placed in sowing basket to prevent crop failure (H II 38, 776/7 (2)). In several texts thunderbolts have been mentioned to be good for witchcraft but in these cases, it seems that general apotropaic or repelling magic was meant (ERA II 34, 90 (17), H II 16, 447 (31), ERA II 260, 426 (34)).

4.2.2. Single-ritual stones

Single-ritual stones are generally used to cure skin conditions (scabs, swellings, furuncles, erysipelas, warts). If in the case of ear diseases, relief could be found from a curing stone kept in the cupboard, then skin conditions demanded contact magical approach. This meant that every curing incident required freshly picked stones that were tossed away after the procedure of pressing or rubbing the sore spot. The appearance of the stones has usually not been significant in contact magic, but in some texts the look has been described, *e.g.*, the stones had to be white limestone pebbles (RKM II 111, 19 (29), mottled (H I 5, 153 (19), round (H II 37, 731 (2)) or scabby (ERA II 77, 591 (115)), grey and holey (EVR 19, 106 (2)). In the case of some texts, it may be suggested that fossils have been used as single-ritual means, *e.g.* pressing of furuncles should be conducted with the heart of the stone (H II 41, 286 (10), H II 57, 551 (137)): *the heart of limestone lying in the field – the lower side of it can be used to press the furuncle and the stone heart must be placed back where it was taken* (H II 47, 19 (12)). According to a text, stone heart is a petrified thing or an animal which is found inside limestone and is suitable for pressing swellings and furuncles (H II 38, 774 (2)). More important than the appearance is the find context of the stones, for example, according to some texts, the stone has to be taken from the wheel rut (E 56672 (101), RKM II 111, 90 (277), RKM II 75, 373 (26), ERA II 260, 463 (58)), picked up from the road where the stone was ground smooth under the sledge runner (ERA II 148, 564 (61)), picked up from the crossroads ((H III 25, 50/1 (35), ERA II 42, 261 (1)), or from the place where the hearse has crossed (ERA II 24, 209 (76)). Sometimes the suitable stone is to be found from the land of three manors (E 42180 (11), ERA II 1, 816 (40)) or picked up from *keris*-oven (H II 47, 482 (13), RKM II 17, 458 (7), RKM II 111, 161 (515), H III 29, 12 (5), RKM II 27, 350 (66)). Sometimes the time of picking the stone or conducting the ritual is mentioned as significant, for example, it should be a dewey morning (H I 408 (55)) or a Thursday afternoon (E 45695 (2), H III 25, 50/1 (35)). A single stone (ERA II 77, 591 (115)) would help, but more often three (H III 6, 583/4 (44), E 18261 (2)) or nine (E 45695 (2), E 56672 (101), H I 5, 153 (19), ERA II 1, 224 (3)) are to be used.

According to the texts, two kinds of treatment were used. First, a single-ritual contact magical use should be mentioned, where the inflammatory spot was pressed with the gathered stones three or nine times; the stones had to be placed back where they were taken (H III 6, 583/4 (44), (E 18261 (2), RKM II 75, 373 (26), RKM II 111, 90 (277), ERA II 260, 463 (58), ERA II 1, 816 (40)), stones taken from the *keris*-oven had to be put back on the *keris* (H III 29, 12 (5), RKM II 27, 350 (66)) or thrown into the oven (H II 47, 482 (13), RKM II 17, 458 (7), RKM II 111, 161 (515)). Sometimes one had to spit on the stones before placing them back ((H III 25, 50/1 (35), ERA II 127, 164 (78), EÜS VII, 830 (6), RKM II 248, 484 (58), (H I 408 (55)). The stones in these rituals act as mediators and are not attributed the curing efficacy. The skin diseases are very often believed to come from the ground (so-called *maa-alused, maalised* in

Estonian), so according to sympathetic magical approach, the disease will be won if it is returned to its original place or the cure has association with the ground, *e.g.*, touching the infected skin with the paw of a mink (H I 9, 322 (164)) or a mole. Even though the stones were often used as mediators (here too their origin in the ground added to the efficacy), other things could be used to create the contact: a piece of bread (ERA II 189, 492 (19)), an apple fallen from the tree (ERA II 283, 151 (32)), a coin (ERA II 193, 646 (1); ERA II 290, 129/30 (92); H II57, 538 (42)), a piece of paper or a strip of cloth, nails and brooches (RKM II 111/2 (368). According to a text, the item used to press the furuncles was not important at all, but it had to be obtained on a Thursday evening at the crossing of three roads (RKM II 390, 4 (3)). Apparently, food-stuff, money or jewellery was used as mediators when it was believed that cure could only happen when the disease was picked up by another person, a bird or an animal; stones were used when it was believed that the disease had to be returned to the ground.

According to the second common curing method the stones had to be heated and placed in water. It was the water that acted as the cure (EVR 19, 106 (2), E 45695 (2), E 56672 (101), H I 5, 153 (19), RKM II 111, 130 (435), ERA II 1, 224 (3)). Many 'empowering' elements were included – there had to be 3 or 9 stones; stones had to be picked up from a manor's land or paternoster had to be said during the process (RKM II 101, 431 (74)); sometimes silver had to be scraped into the water (H I 5, 153 (19), E 45695 (2)) or the ritual had to take place on a Thursday afternoon. Usually, the texts do not mention what one had to do with the stones after the ritual, but the water had to be poured away very carefully in a carefully chosen place (for example, in the three corners of the garden). There are three weathered limestone pieces in the collections of ENM which were used in similar ritual (see below). Thus, stones used in the contact magical ritual were sometimes also kept to be used several times.

Curing with small pebbles, also named as thunderstones or the stones of Perun, was mentioned among the activities on the well-known offering stone Jaanikivi in Seto region in southeastern Estonia (Zurov 2017, 278; 282; 284; 287). Similarly, Mare Piho has recalled seeing small pebbles on larger boulders in Setu County, where they likely were connected with similar practice described by Zurov (Mare Piho, pers. comm., 1.12.2016). The latest (leaving out the nowadays popular esoteric healing with semiprecious polished pebbles) records of curing with pebbles were registered in the 1970s by Mare Piho also in Seto County. Piho recalled a healer and a witch using an oblong pebble and an archaeological oval fire-striking stone for curing (Mare Piho, pers. comm., 1.12.2016) and a specific treatment of a snake-disease in Vastsõ village (a disease that occurred to a pregnant woman after she had seen a snake); accordingly tobacco, sewing machine oil and five pebbles with coloured spots were used in the curing practice (Mare Piho, pers. comm., 18.01.2017).

With few exceptions, it can be said that in the curing procedures of skin conditions the appearance or conspicuous features of the stones were not important. However, the stone had to be suitable for the given procedure, so

gathering it from a specific location at a particular time was necessary. As the contact magical procedures stipulated that the stones had to return to the ground, there is very little chance to find these from settlement sites.

Stones used in divination are also single-ritual means. On the basis of the few texts describing these practices, it can be concluded that the appearance or even the origin of pebbles used was not considered significant. Texts note that if somebody tries to find out the culprit, he/she should take a stone (or 3 or 9) and name it after the suggested culprit; the stone is then put to boil, and if foam occurs around the stone, the culprit is proved guilty (E 8º4, 29 (55), H II 51, 45 (i)). Although not stated, it is possible that the stones could not be used more than once.

4.2.3. Animal body parts

Different animal body parts have been used in various types of magical practices, but usually, we are dealing with easily decaying soft tissues or viscera. For example, in the case of hair loss, the bile of trout, perch, hair, and crow was used (ERA II 283, 485/6 (21)); in the case of earache, wool from ram or wether (H II 20, 735 (3), ERA II 288, 189/90 (12)) was used; swellings were treated with the head of a dried snake (H I 7, 599 (9)) or the skin of a killed mouse or a rat (E 63622 (12)); the skin condition *maa-alused* was cured with the heads of Baltic herring (ERA II 60, 267 (49)). At this point, the bag with dried snake-heads, toads and different bugs, belonging to a country doctor, must be reminded (Sakala, 15.03.1939, p.3). Animal bones have also been used in curing magic, but the texts are much scarce. *E.g.*, warts were pressed with horse skull that had to be buried back where it was taken (H II 11, 610 (4)), or mink's paw (H I 9, 322 (164)). In apotropaic magic, chicken sacrum had to be carried around the neck to avoid the Evil eye (ERA II 267, 250 (18)). In love magic, a widespread means was a love fork made from a frog bone. More than a hundred Estonian folklore texts discuss the love fork and records exist from elsewhere in Europe as well as America (Hiiemäe 2015, 158). Generally speaking, animal body parts were powerful, and different parts were good for various conditions. In addition, due to magical principles, more than one quality was at work at the same time. For example, the lifeforce (in Estonian *vägi*) was intense in key parts of animals; teeth, paws, and claws (Hukantaival 2018b). However, choosing the teeth of a particular animal depended on other magical principles. Mink's paw to treat the skin condition *maa-alused* that was believed to originate in the ground was considered a suitable cure because mink goes everywhere and there is a certain life-force in the paw; and no doubt, its rare occurring probably added to its value as a medicine.

The bulk of the folkloric material is enormous and in the current research I predominantly focussed on stones. However, the corpus of texts is much more varied and the materials used show considerable overlap between the written sources and the folkloric records, for example, in the case of using bodily fluids,

such as urine, saliva and excrements or foodstuff, like salt, fat and eggs in apotropaic and curing magic as well as ill-wishing witchcraft. Exact equivalents cannot always be found since virtually everything could be used. A good case in point is formed by seemingly occasional artefacts many of which are literally trash. In the case of curing skin conditions, one could use garbage and sweepings, dew water, ashes, condensed water, coal, *etc.* Anything could be used as a graft, for example, clothing, bloody pieces of meat, animal hair or food. Often the unnatural combination suggests a malicious intention. A text describes making witchcraft with a bundle from *old rags and filled with all sorts of stuff – burnt ends of matches, chickenshit, old rags, woollen threads, dried bread crusts and whatever somebody wished* (KKI, KS < Häädemeeste, Kägiste M. Mäesalu 1963). The few court protocols and newspaper articles also connect strange bunches with malicious witchcraft. Pudell, accused of witchcraft had a stick with incisions, silver *killing*, three rings from copper wire, piece of red woollen thread and green moss, while Kopso Maye and her daughter Ello had a sack full of human hair, animal hair and cornflower blossoms (Kahk 1987, 147; see also above the reference to Postimees). The interpretation of the two 'magical dolls' in ENM is a good illustration of this too – a strange combination that cannot be adequately explained (see below).

As a conclusion of the narrative sources, it can be said that folk medical practices combine elements that derive from different traditions: galenic humoral pathological, Paracelsian, principles of sympathetic magic. Characteristic to this vernacular curing is that all methods are carefully chosen and always depend on some universal idea (*e.g.* the *similia similibus curantur* principle) but the specific process is contingent on the nuances of the condition and the available means, local traditions and apparently also the conductor of the ritual. Sometimes the ritual had to be empowered by adding elements, *e.g.* the time and place of conducting the procedure, the origin of the cure, the accompanying words or gestures, *etc.* A record describes the treatment of swellings: a stone that was picked up from the northern side of the stable was used to press swellings three times, then tossed to the roof of the stable; after falling down the stone had to be returned to its original place (E 46439 (15)). In another text the stone had to be taken from *keris* with the left hand; after pressing furuncles with it the stone had to be returned without looking back (RKM II 55, 167 (4)). Characteristic of this vernacularism is that there might be no consensus about which element is actually efficacious. This aspect is well illustrated by the texts on curing erysipelas which traditionally included taking blue paper, writing words on the paper and holding the paper on the inflammatory skin. However, in some texts, the blue paper is considered efficacious, in others the words written and in some even the ink used to write the words. Sometimes the magical connection between the illness and the cure is difficult to follow, for example, the role of the roof in several texts. It is important to note that there are rules and patterns present in all practices and apparently also were in archaeological past. However, in the archaeological material we cannot see the practices, rules or intentions, only the means used (if we recongnise them) and everything else is a (re)construction.

5. MATERIAL SOURCES

5.1. Ethnographic sources

Although the primary source material of the dissertation is archaeological artefacts, we cannot ignore the ethnographic ones, which, having been gathered around the time of collecting folklore, offer a valuable comparison to the texts about the character and using of the curing and apotropaic stones. There are not many artefacts used in magical practices preserved in Estonian museum collections. The largest collections are located in the ENM and Pärnu Museum (Article 4); a single witch's stone (HM 436 E) used for curing is kept in Haapsalu Museum. In addition, archaeological collections of Tallinn University hold two ear stones, fossils of bryozoans (AI 2643: 40–41), gathered as stray finds, as well as a few stone axes and adzes which, according to their legend, have been considered thunderbolts and/or used in curing magical ways. The artefacts in Pärnu Museum – stone axes, adzes, and an oval fire-striking stone – have been used as thunderbolts and thunderstones as well and will be discussed below with archaeological sources.

In ENM, the artefacts connected with magical practices are distributed between different collections: they have been catalogued with national costumes (a belt used in curing practices), jewellery (brooches used in curing practices), and medical instruments together with cupping horns, dental forceps, ear spoons, and medicine bottles. The most significant selection of artefacts considering the topic of the current research is preserved in the collection of medical artefacts – curing and witch's stones which include both smooth pebbles as well as fossils. The pebbles have been named according to their suggested function. Curing with thunderstones (altogether five, including pyrite pieces and granite pebbles) has included pressing the swellings with the stone (in three cases), but also scraping grindings from the stone and swallowing these in case of suddenly attacking diseases – strokes (in a single case). Witch's stones are the most common (altogether twelve) but only in one case (a smooth gneiss pebble, ERM A 509: 6369) the using of the stone has been described – namely grindings were scraped from it to cure strokes and snake bites. Other witch's stones lack any descriptions of usage. The witch's stones include two so-called *Imatra* stones which unusual appearance has apparently been the reason for their collecting and ascribing them a meaning. *Imatra* stones are the grinders found in the bottom of the glacial potholes; they may be spherical or flat (Salmi 1959), but also in the shape of a spinning top which is also the shape of the witch's stones held in ENM. In the case of the witch's stones that lack any description of their using it is possible that the legend was forgotten, but it is even more likely that artefacts were gathered which seemed unusual for the

donator but had never been used or nothing was known about their using[18]. Pebbles intended for curing specific illnesses include a heart stone (pyrite pebble, ERM A 509: 6368) for curing heart diseases, a *narrits*-stone (sun coral, ERM 13726) intended to cure a specific udder disease of cattle, a navel stone (limestone pebble with artificial hole, possibly a spindle whorl[19] (ERM 7403) that was used for cupping and two limestone pieces (ERM 10504; Article 4, fig. 2: 4) soaked in hot water to make a curing brew against the skin disease *maa-alused*. The curing stones also include a so-called monk's bead, a small (1.5 cm in diameter) holed stone (ERM A 509: 6158) that was used against diarrhoea of cattle. A special item is a raven stone (ERM 7797; Article 4; fig. 2: 2) – perfectly smooth black amphibolite pebble used to press sore spots. According to the legend, the stone had really been found from a raven's nest and had, therefore, such an immense curing efficacy (see about raven stones in folklore in Kreutzwald 1856; Eisen 1926, 311).

A substantial amount of fossils is preserved in the folk medical collection of ENM, the majority of which are ear stones (altogether 12, out of them eight bryozoan fossils and four corals, mostly tabulates). In one case, doubt exists that the specific item has not been used at all, but rather the legend has been attached to the artefact because it was known that similar items were used as ear stones (see below). The ways of using are the same that have been described in the folklore texts – the heated stone has been placed in water and steam led into the ear or, in case of bryozoan fossils, the stone was put in the ear with the sharp end first. In addition, two cephalopod fossils have been collected, whereas in one case using it to cure swellings and bumps has been mentioned. In the case of the other, using it as curing means has been only suggested. However, it was found from a birch bark bushel in a barn together with a meteoritic stone and has got a shiny smooth and heavily scraped surface, which does prove that it was valued and most likely used in some way.

Even though in most cases stone axes and adzes morphologically similar to a bolt or an arrow have been named thunderbolts, it was not always the case and a round pebble called a thunder adze (in Estonian *piksetalb*, ERM 6753) is among the artefacts too. It is remarkable that there are several stones in the collection of folk medicine in case of which it is not certain that they have been used at all, like most of the witch's stones. In case of a thunderstone (ERM 16152; Article 4, fig. 5: 3) the collector's diary includes a remark that the stone might have been used for witchcraft, but nothing of the kind has been mentioned in the collection book. It is likely that the conspicuous look of the stone is the reason for gathering it and the legend was later attached to it. Doubts exist in case of a few other finds too, for example, neither curing nor any other magical use has been mentioned for some pebbles with polished

[18] The abundance of witch's stones may be due to the collector's way of asking for the donations, *e.g.* the limestone pieces used to cure the *maa-alused* were brought out only after the collector specifically asked for witch's stones.

[19] Identification confirmed with Riina Rammo.

surfaces (*e.g.* ERM A 509: 6366; ERM A 397: 2a) and a fallos-shaped naturally formed limestone, named priapus (ERM 13368; Article 4, fig. 5: 1), possibly found from the ground by the collector himself. In one case, an ear stone has been later removed from the collection (according to the description a honeycomb fossil, so perhaps a tabulate) – the collector might have donated a fossil which similar counterparts have been used against an earache[20]. Fossils of corals have been sent to the museum as possible curing stones also after the collecting campaigns, for example, in 1936 *a piece of petrified honeycomb* was sent to the museum, since the donator had previously seen the kind of stones in the museum. Although, the specimen was first recorded as a possible curing stone, it was later removed from the collection. The legends of a few other finds suggest that finds analogous to curing stones may have been donated to the collectors. In case of a smooth pebble (ERM 6748) the legend says: *They say that in old times it was used to rub swellings* (ERM collection book 83: 103).

The overlapping of folkloric texts and ethnographic sources does exist, especially in case of ear stones. The stones described as ear stones in folklore records respond very well to the fossils of bryozoans and tabulates, ethnographically known ear stones (Article 4, fig. 3). Also the descriptions of using ear stones overlap in these two kinds of sources. In the case of other curing stones similarities exist as well, *e.g.*, according to folklore records these are of the size of a chicken egg that fit into the palm and have a smooth surface; the colour varies from brownish-red (granite?) to greenish grey (diabase?) and black (amphibolite?). The ways of using are similar too, although according to the folklore texts, multi-ritual thunderstones were mostly used against strokes/ suddenly appearing diseases, while single-ritual stones were used to rub swellings and furuncles. We may suggest that many curing stones were actually used to relieve various different conditions. The assumption is proved by a few folklore texts, according to which efficient and special pebbles could cure *rheumatism, swellings, toothache and back pain* (ERM 64, 59164).

Ethnographic collections must include several magically used artefacts other than stones, but they are difficult to track down. As the few written sources and folklore texts show, the variety of items that can participate in magical practices is large. First, these are ordinary household tools, *i.e.* artefacts which proper function is something else. For example, the folklore records describe scraping silver from brooches and finger-rings (ERA II 148, 19 (23), E 5161 (125), H I 9, 33 (1), EVR II 29 (105), ERA II 150, 387 (45)) or using sharp metal tools, like needles (H II 57, 541 (73), H II 57, 445 (21), H II 39, 974/6 (926) RKM II 166, 241 (212)), nails (E 8º12, 66 (224), scythes (ERA II 3, 61 (15)) and knives (RK II 346, 454/6 (28)) in repelling magical practices (see also Hiiemäe 2012). Also, different items of clothing (belts, scarves), coins, hymnals, keys, sieves, *etc.* have been used. The dilemma with the initial cataloguing of this sort of items on the example of ENM has been discussed in Article 4. In short, the artefacts were

[20] According to the collection books, the same collector (August Pulst) brought several fossils from Tori parish in 1914 which he had found himself, but these were not registered.

mostly catalogued according to their proper function only – the belt as the national costume, brooches as jewellery, while the stone axes and adzes were delivered to the archaeological department in Tallinn. The problem is that in some cases (the axes and adzes), the other (system) functions of artefacts have not been included in the rewritten or retyped museum catalogues and in time the information may even get lost. In other cases, due to the described pattern of cataloguing it is virtually impossible to find the possibly magically used artefacts from the ethnographic collections of museums without reading through all initial collector's diaries, collection books, and acquisition books. Besides, there is always the possibility that not all system functions of the artefacts were written down while collecting them. For example, the jewellery collection includes six brooches accompanied by a description of their use in healing practices, which involved scraping silver from them. An additional forty has no such description attached to them, but the damage evident on the edges of the artefacts suggests they were used for the same purpose (Kuningas 2014, 6). Similarly, it has been noted that the national costume collection holds belts that have been used for curing snake bites and erysipelas (Õunapuu 2015, 167), while only one piece of a belt with similar meaning has been catalogued under curative instruments (ERM 282). There is only one coin – a Russian kopeck from 1781 (ERM 14356) which, according to the accompanying legend, has been filed for scrapings to be used against broken bones. Moreover, to my knowledge, there are no edged tools preserved in the ethnographic collections which legends would suggest their use in magical practices.

Secondly, ethnographic collections include animal body parts which, according to sympathetical magical principles, were used as a cure against different health issues. For example, in the case of a sore throat, one had to drink through seal's dried throat (ERM A 492: 14), pig's bladder (ERM A 835: 21) was used to cure kidney problems and pieces of ox's dried penis (ERM A 282: 110, Article 4, fig. 4: 2) had to be added to the drinking water of livestock in the case of urinary system inflammations. The witchcraft items preserved include a wolf's tail (ERM A 35: 1; Article 4, fig. 4: 3) and a bear's claw (ERM A 285: 4). The power invested in wolf's different body parts, including the tail, has been discussed thoroughly by Ilmar Rootsi (2008); the love magical effect ascribed to the tails, also for the item preserved in ENM, is first introduced in the antiquity (*ibid*., 17). The idea that nails and claws have life force in them has been discussed widely in Estonian folk religion (see *e.g.* Loorits 1990, 12; comp. Hukantaival 2018b), while parts of the bear, such as canines, claws and penis bones occur among magical and curing objects in the modern period folk religion and folk medical practices (*e.g.* Stark 2015, 137; Kirkinen 2017; Hukantaival 2018b). However, the using of a much wider variety of animal body parts in repelling, apotropaic or curing magic is evident in numerous folklore records (see above).

As seen, the ethnographic material contains examples that without the narrative explanation would be very difficult to be associated with magical practices. There are pebbles and fossils, everyday tools and commodities, animal

body parts as well as a few wooden objects – a ring-branch (in Estonian *nõiasilm*) that has grown naturally forming a circle, a piece of a board with a natural burl and an artificially bent bat-like object. Even the few magical dolls preserved in the folk religious collection, seemingly clear cases, are very ambiguous finds without the accompanying narrative or interpretation given by the collectors. For example, *tont/hernehirmutis/pisuhänd* (ERM A 291: 503; Article 4, fig. 4: 1) is a bunch of rags and twigs found from a field; in the interpretation it has been connected to the folkloric goblins who steal things for their maker and master (in Estonian *kratt*). *Tõnn* (ERM A 563: 782) should be discussed in this connection too. It is a ram's testicle turned inside out and attached to a branch; it was collected from a farmhouse where the item had hung next to the oven and become thoroughly smoked. In the original description, it was named an Estonian fertility deity but also the possibility that we are instead dealing with a testicle turned inside out to be dried in this way was mentioned. However, later the first interpretation has become considerably more pronounced (*e.g.* Õunapuu 2015, 54ff).

When the ethnographic material is compared to folklore texts, it is apparent that similar sort of material is represented in both kinds of sources except for easily decaying substances, such as foodstuff and excrements, which are present in folklore records but not in ethnographic material. However, the durable artefacts, like pebbles and fossils, animal body parts, metal artefacts, textiles, and minerals, are similarly represented. If archaeological artefacts are considered, similar substances can potentially be found – pebbles, fossils, edged metal tools, animal bones, minerals, and if lucky, also textiles. Out of these only pebbles and fossils lack proper function that would enable unambiguous cataloguing, and this feature is very similar in case of archaeological as well as ethnographic material. Animal bones also do not have a proper function but similarly to tools and textiles, utilitarian formation processes can explain their presence in archaeological cultural layer. For that reason, pebbles and fossils are the most abundant kind of finds among the magically used artefacts in the ethnographic collection. However, differently from ethnographic material archaeological finds reach the museum collections without the narrative. In this way, we have very little to rely on when examining whether the found metal tool has, next to its proper function, had any magical system function, whether some animal bones might be interpreted differently from feast leftovers or simply remains from a dead animal, or moreover, whether a curious pebble was kept as a charm, used as a toy or occurs in the cultural layer because of natural geological processes. Sonja Hukantaival has suggested that the interpretation of the signs of everyday customs and beliefs is based on the combination of object and context and supported by analogies of known practices in later periods (Hukantaival 2018a, 83). I totally agree, however, these combinations may also lead to following a pattern that is not there – overinterpretation (see Nurmi 2011, 149). However, a start should be made and I choose to start with the finds which have no associated proper function (pebbles, fossils) or which proper function is not applicable with the find context (antiquities).

5.2. Archaeological sources

The primary source material of the research is formed by archaeological artefacts that may have been used in magical practices. The focus is set on stones, but everyday tools offer comparative material. Magical meaning is systematically seen behind the using of different pendants (see references above) as well as artefacts, which lack a clear proper (utilitarian) function, *e.g.* figurines. If we look at the variability of magically used artefacts in ethnographic material and folklore texts, it is apparent that the circle of potentially magical artefacts should probably be much wider also in archaeological past, but their identification is problematic. Lately, the emphasising of the ambivalence of magical inventory known from folklore and ethnographic material has acted as the reason why several researchers have started to stress that archaeologists probably ignore the potentially magically used artefacts during excavations and later interpretations. An example is provided by pebbles and fossils found from the British early medieval burial sites; only in the last decades has their possible apotropaic meaning started to be discussed more systematically (see *e.g.* Gazin-Shwartz 2001, 272–273; Gilchrist 2008, 138–139; see also above). Similarly, old and fragmented artefacts and pieces of bones, ceramics, or natural stones that would generally seem as insignificant rubbish by archaeologists have proved to be revealing about the past belief systems (Hukantaival 2016, 198). Thus, no doubt that the variability of magically used artefacts is higher in archaeological material than we have recognised this far or which we can identify at all. There are three points of reference for identification: (1) archaeological context referring to a possible magical practice; (2) artefacts which kind have been used in magical practices according to written sources or folklore records; (3) artefacts which kind have been found from archaeological contexts referring to possible magical practice elsewhere in Europe or treated as such. Naturally, none of these anchor points provide certainty that we are dealing with a curing magical or an apotropaic artefact. Besides, all three anchor points are hardly ever unambiguously followed, for example, archaeological context can be very confusing, especially in the case of settlement sites. While the purpose of many curing or apotropaic magical practices is to provide help in everyday situations, they would generally be found from settlement contexts. However, if the same artefacts are used daily according to their proper function as well, we would not know how to recognise them.

All archaeologists have made choices on the field what to gather and what to leave. The primary principle appears to be a subconscious judgement about the research and scientific value of the found objects, a judgement that has developed through years. So until the researcher does not perceive a fossil or a pebble as a potential find, he/she is not motivated to collect it. It is likely that in the case of conspicuously looking finds, a spontaneous decision has been made to pick them up, even if these have been considered naturally occurring in the soil. However, it is also plausible that when making the find lists or excavation reports the natural finds are often left out and only classical artefacts, *i.e.* made

and/or clearly used by humans, are listed as finds. It is also characteristic that proper documentation has been enabled for those finds that can be used to date the site or explain its character. In this way the find places of fossils and pebbles as completely undatable regarding the site's age, even if collected and preserved, have often not been adequately documented. Animal bones and antiquated artefacts, such as stone axes, have been documented and regarded as finds, but in their case, the commonsensical interpretation has been made beforehand – animal bones are regarded as food leftovers and ancient artefacts as residual. So even if gathered, fossils, pebbles, old artefacts, and animal bones have generally neither been included in further analysis nor their potential used to clarify the site's character.

As said, ancient artefacts have generally been collected and preserved in museum collections, even though not necessarily discussed. However, there is no way to find out how many pebbles and fossils have been found but not collected or found and collected but later left out of find lists. We can, though, look into the possible reasons why archaeologists have chosen to collect these natural finds on the example of Estonian material. The following analysis of pebbles and fossils preserved in Estonian museum collections is very much dependant on the archaeologists' choice. So in the case of pebbles and fossils, we are in the first place looking at the specimens considered worth gathering by the archaeologists and only then can it be discussed whether these were considered significant, brought to the site and used by the past people.

Altogether 46 different archaeologists have gathered fossils, while 60 have gathered pebbles. Most of the archaeologists who have conducted excavations have also gathered single fossils or pebbles from a few sites. Twenty or more pebbles have been gathered by Richard Indreko, Lembit Jaanits, Aivar Kriiska, Vello Lõugas, Harri Moora, Marta Schmiedehelm, Heiki Valk and Artur Vassar. Also, the number of different sites is the highest in their case. It strikes the eye that among the archaeologists who have gathered the most pebbles are several Stone Age researchers (Indreko, Jaanits, Kriiska; also Moora has excavated many Stone Age sites). Apparently, they have looked at the pebbles as possible raw material indicative of the site's lithic technology and preferences. In addition, being familiar with the site's geological circumstances has influenced the choices made during fieldwork, *e.g.*, pebbles in the otherwise pure sand of the Narva-Jõesuu settlement sites formed on dunes have been regarded as transported by people and collected by the archaeologists because of that (Aivar Kriiska, pers. comm., 2.10.2018).

The most fossils have been gathered by Maarja Olli and Anu Kivirüüt, Marta Schmiedehelm and Kaarel Jaanits, but in their case, we are mostly dealing with only a single site. Olli and Kivirüüt gathered everything that looked important from Aakre *tarand*-grave, regardless of their (human) origin. Jaanits gathered round fossils from Vaida settlement site apparently as gaming pieces made of clay, so he collected the fossils as human-made artefacts. Schmiedehelm collected the majority of fossils as examples from Rannamõisa III early *tarand*-grave in a very fossil-rich area. Otherwise, the number of gathered fossils and

the number of sites, which have yielded fossils, is quite homogenously divided among archaeologists.

So what has been the conscious or unconscious justification for gathering pebbles and fossils, viewed from the archaeologists' side? Although in the majority of cases not formulated, it can quite safely be concluded that the reasons behind collecting pebbles and fossils fall into three main categories: (1) influences of folklore, (2) unconventional context and (3) personal readiness or motivation of the archaeologist to collect natural finds. In the case of the first aspect, archaeologists who are influenced by folklore have gathered pebbles and named them according to folkloric names, whereas the precise context or association with other finds or features has not been important. The find context obviously influences the second reason – pebbles have been collected that have been found from burial sites in close contact with the burials or which, judging after the function of accompanying finds (*e.g.* net-sinkers, grain grinding stones) have been ascribed a similar function. The third reason means that many pebbles have been collected just because they looked important, interesting, beautiful or peculiar, probably because of the idea that being conspicuous outside might mean that the pebble is interesting archaeologically. It is noteworthy that although fossils are well-represented in classical and medieval written sources (lapidaries, encyclopedias), these texts seem not to have influenced the interpretation of fossils by archaeologists in Estonia and fossils are more likely to have been collected mostly because of the third reason. It almost seems that in this way fossils are regarded slightly more as finds than pebbles, and thus the gathering of fossils does not have to be justified in reports or publications any further.

In addition to the three general reasons, every single decision whether to collect pebbles and fossils, depends on the situation, for example, during research related excavations archaeologists tend to collect more non-artefacts than during rescue excavations. The reasons might lie in the more strict time-limit of the rescue excavations but more importantly the archaeologists' personal and more profound interest in the site during the research-related excavation. Also, natural finds are more readily collected when other (more eloquent) finds are scarce. However, sometimes the ecological circumstances might be the essential aspect. For example, in fossil-rich areas – in Estonia, areas where Silurian and Ordovician limestones form the bedrock, where the fossils are also more common finds in the moraine than in other areas – archaeologists tend not to collect fossils, as these do not feel remarkable enough, and it is more difficult to decide if the fossil has been brought to the site on purpose. The feeling that widespread phenomena cannot be anything special is thus also ascribed to the studied communities.

Influences of folklore

Researchers active in the beginning and also in the middle of the 20th century relied, to some extent, on folklore since only recently the national campaigns for gathering folklore and old artefacts had been initiated and this must have had

some influence on archaeologists. For example, namely at the beginning of the 20th century, the collection of the witchcraft and curing magical items of the ENM started. In the 1930s, Richard Indreko conducted excavations in Asva fortified settlement and collected several round and smooth granite pebbles, of which he interpreted two according to folk religion as 'toadstones with bewitching power' (AI 3658: 602) (Indreko 1939, 30; Article 5, fig. 8: 1–2). Indreko brought a short overview of the toad as an important magical creature in folk religion and called attention to the fact that in German folk religion similar pebbles, oval or round and smooth, yellowish-brown of reddish like in Asva, played a significant role. These were named toadstones[21] and were used for curing several diseases, by touching a sore place with the pebble or scraping grindings from it for the sick to swallow (*ibid*., 47). Toad is known in Estonian folklore on the example of German Christian culture as the embodiement of the Devil (Valk, Ü. 1994) and acted as an escort or an embodiment of a witch or a goblin (*kratt*) sent by a witch (*e.g.* Eisen 1926, 231ff). Toads have been used in magical practices as mediators in Estonian folklore; however, the local folk religion does not know toadstones[22]. Although first records of toadstones are known from the 2nd century by Kyranides, toadstones became especially popular in the medieval curing magic. Toadstone was a highly prized gem, used in the cases of snakebites, against poisoning and several internal diseases. According to the legend, toadstones grew in the head of a toad and had to be obtained from a living animal, but were indeed the fossilised teeth of a Late Jurassic fish *Lepidotus maximus* that was distributed all over northwestern Europe. The stones used during the Middle Ages are approximately 1.5 cm in diameter and of brownish grey colour (Duffin 2008, 34–43; 2010, 3–4). According to the similarity principle of magic, toadstones were good against poisoning since frogs and toads produce toxins under their skin (Duffin 2008, 36 and the references therein). Bites of snakes, insects, spiders, and rats could be healed by touching the stone against the place of injury. In addition, the stone helped against many conditions, *e.g.* internal poisons due to humoral imbalance could also be treated with toadstones. It was useful in the cases of tumours, biliousness, fevers, sores, tuberculosis (scrofula), diarrhoea, epilepsy, and even the plague (Duffin 2010). Indreko must have leaned upon the medieval Christian belief in the power of the toad and toadstone while interpreting the Asva pebbles, but the fact that there were toad bones among the finds from Asva supported his assumption. Indreko studied folklore and ethnography as well during his archaeology studies at the university (Kriiska & Lang 1991, 9); thus, his extensive interest in this topic is clearly explained by this background.

[21] Toad bones were found from Asva too. According to folklore texts, toad bones have been used to cure illnesses. Indreko admitted that there was no proof that the inhabitants of Asva fortified settlement used toads in curing practices but considered it possible that they might have had similar meaning (Indreko 1939, 46).

[22] Confirmed with Reet Hiiemäe, pers. comm. 13.12.2016.

Another example is formed by serpent stones two of which were recognised by Aita Kustin among the finds of Paatsa and Valjala hillforts (AI 4300: 304, 305) (Kustin 1963a, 1963b; Article 5, fig. 8: 3–4). Snakes are well-known magical creatures in Estonia (*e.g.* Eisen 1926; Fabricius 2010) but the using of snakestones for curing or apotropaic magic is unfamiliar in Estonian folklore[23]. This fact is surprising since accounts of serpent stones or adder stones are known across much of the world and their appearance and medical uses have been discussed in lapidaries since the classical times through the medieval to modern period (Pymm 2016). According to Pymm (2016), serpent stones can be divided into five categories: round white stones (from the head of a dragon), a smooth lens-shaped black stone (from the head of the snake), ammonites, artificially made beads, and serpentinite. Snakestones are very common around Europe (*e.g.* Skeat 1912; Pauli 1975) where they also include pebbles with natural holes. In several countries, snakestones incorporated pebbles that were believed to be carried along by snakes (for Finnish snake's court stone or *käärmeenkäräjäkivet* see Hukantaival 2018b, 5; see also Stark 2015, 146) or which can be found in snakes' bodies and which help against snake bites (*e.g.* Halliday 1921). Although several therapeutical properties were ascribed to serpent stones, they were highly valued as having magical powers and being generally protective against witchcraft. Perhaps Kustin relied on Finnish folklore as during the Soviet time Finnish archaeological literature was more freely available and finds of possible magical snakestones in Finnish Viking Age graves were discussed by Ella Kivikoski (1965, 31). The names chosen by Indreko and Kustin should not be overestimated since these likely denoted general magically used pebbles for them, quite analogically to different magical pebbles in other European countries.

As seen above, Estonian folklore knows several differently tagged magical pebbles used in the apotropaic magic (*e.g.* thunderstones, witch's stones, raven stones) and folk medicine (*e.g.* ear stones, curing stones) but earlier authors preferred published literature to folklore. Differently from Kustin and Indreko, Vello Lõugas relied on Estonian folklore, suggesting that several pebbles in burials and hillforts could have been brought to the site and regarded as thunderstones (Lõugas 1996, 116–117), however, not connecting any specific pebble with the magical use. Amulet stones connected to thunder are mentioned first in the Roman written sources, and from there the descriptions and understandings reached the medieval lapidaries and encyclopedias. Several modern period and contemporary authors have given an overview of stones supposedly fallen from the sky and their descriptions in classical and medieval sources. Frank Dawson Adams (1938) divided these into three categories: fossils (*Echinoidea*, *Belemnoidea,* and *Glossopetrae*), archaeological stone or metal implements, and true meteorites which really are of extra-terrestrial origin (Adams 1938, 124). One of the common characteristics of a thunderstone is roundedness, which can refer to echinoid fossils (see Adams 1938), but also to round pebbles (Blinkenberg

[23] Confirmed with Reet Hiiemäe, pers.comm. 13.12.2016.

1911, 107), sandstone or ghoetitic concretions, like Moqui marbles (Mayor 2005, 156–157). As seen above, thunderstones are quite familiar in Estonian folklore, and next to stone axes/adzes and fossils round pebbles of different colour were regarded as such. Similar healing methods with a thunderstone described in Estonian folklore records, *e.g.*, rubbing swellings, scraping grindings for suddenly appearing diseases, heating the stone and producing curing steam against a toothache or an earache, have been written down from the Slavs, Germany and Finland (see *e.g.* Eisen 1926). Thunderstones (pyrite balls, granite pebbles) are also among the folk medical collection in the ENM.

Ethnographic and folkloric knowledge of curing stones has influenced Heiki Valk, who made the following remark about the grandmother of one of his informants: *... she who knew the art of curing and treated illnesses with round, pigeon-egg-shaped pebbles* (Valk 2005, 3). With this quote Valk has indirectly explained why he has gathered pebbles during archaeological excavations – the fieldworks in medieval settlement site of Uusvada, near where the grandmother in the quote lived, yielded three small smooth pebbles (TÜ 116: 352, 353, 1130; Article 5, fig. 9). Similar indirect connection between archaeologically gathered pebbles and folklore is offered by the activity of Lembit Jaanits mentioned finding possible curing and witchcraft stones during the excavations (Jaanits 1953, 330). He connected only two from Tamula, actually found by Moora (see below) with amuletic function, naming these as *toadstones or snakestones used magically for curing diseases or other witchcraft and sometimes worn as amulets* (Jaanits 1961, 40), while gathering altogether 77 pebbles from ten different sites. Jaanits was very likely influenced by Richard Indreko's discussions and, similarly to Kustin, also by Finnish folklore. Romeo Metsallik collected a small round pebble from a medieval excavation site in Tartu town; together with a lump of crude iron and a brick with animal footprints he regarded the set of artefacts as a construction sacrifice buried beneath an iron melting furnace (Metsallik 1982, 8).

Unconventional context

Another reason for gathering natural pebbles has been the remarkable find context for the excavating archaeologist. This, however, mostly concerns burial context. A good case in point is offered by a Late Neolithic Corded Ware Culture burial no 2 in Sope where a handful of gravel stones were found under the shoulder of the skeleton (Indreko 1933) (Article 5, fig. 4). After the bones were removed, the area around the skeleton was dug through, but just sand was present. So the pebbles were very likely placed in the grave deliberately as a single event, as Indreko suggested (*ibid.*); however, he did not discuss the reasons for this behaviour. Pebbles were also found from Tamula Neolithic burial site, in association with burial no 7, where two pebbles (AI 3960: 272, 273; Article 5, fig. 5: 1–2) had been placed on the breast of the deceased next to each other. These were interpreted as grave goods (Moora 1946). Both pebbles are very smooth, probably water-polished, but deliberate polishing or carrying along as amulets has been suggested too (Jaanits 1961, 40). Although Tamula burial site

and the specific burial no 7 (a 6–10-year old child) have been discussed on several occasions, usually more eloquent grave goods, like the wing bones of crane and animal teeth, which refer to a possible ritual specialist, have been debated. However, the burial site in the peat implies that the pebbles could not have occurred in the soil naturally, so we must be dealing with a deliberate placement. Using round smooth (water-polished) pebbles in Stone Age burial ritual has parallels in Finland, where Stone Age graves often contain small stones (Ahola 2017). Marja Ahola has connected at least some of them with the need to raise certain body parts of the deceased in the grave (Ahola 2015, 27, 32), similarly to Liv Nilsson-Stutz (2003, 335)[24]; however, in some graves, such as Kukkarkoski 11, the row of pebbles has been placed on the deceased (Ahola 2015, 32). Especially noteworthy is the Mesolithic burial site in Jönsas, where almost all graves included water-polished pebbles. In some graves only 1–2 were present, but the maximum amount per grave was 200 pebbles, that formed heavy stone setting over the burial feature. In Jönsas pebbles were commonly placed in a linear formation at the middle axis of the grave (Ahola, pers. comm. 16.11.2015). In Finland several burial sites from the Mesolithic and Neolithic contain water-polished pebbles and cobbles, but nowhere else are they so numerous as in Jönsas. Ahola suggests that pebbles were deliberately chosen and brought to the site since this kind of stones is not present naturally in Jönsas. According to her, these pebbles were of significance to the Stone Age people and were used especially in ritual contexts. This interpretation is supported further by two anthropomorphic pebbles found from the Finnish rock art places which are believed to be connected with Saami *sieidi* sites, while the Saami worshipped portable pebbles that functioned as the foci of worship at a wider sacred site (Lahelma 2006, 19). Lahelma suggests that similarly to *sieidi*, the portable pebbles were talked to and fed during sacrificial feasts – a case in point here is the pebble from Valkeisaari found inside a pot (Lahelma 2006, 19; comp. also Thomas 2010 for British potboilers). Ahola sees the pebbles in the Stone Age sites in the same system with the worshipping of portable stones.

Another example of a pebble found in a burial site in a specific context comes from Raatvere 11th-century burial of a smith. A small smooth limestone ball with the diameter of only 1.7 cm (AI 5295: 98; Article 5, fig. 5: 3) was found together with a silver coin and a fragment of a leather belt from the thigh area of the skeleton. The location of the finds refers to the possibility that the coin and the ball were carried along in a pouch. The perfect ball-shape of the stone is not natural, and possibly a piece of limestone has been modified into a ball or we are dealing with a cystoid fossil which characteristic features have

[24] In Estonia larger cobbles or stone slabs in graves have also been interpreted as supporting the dead body. For example, Estonian Stone Age burial sites cobbles have been found from Narva-Joaoru III, Tamula XII and Valma III graves that enable this interpretation (Tõrv 2016, 191). Of later burials, two stones were found from the foot of the burial no 94 of Siksälä medieval cemetery, also interpreted as the support of legs (Valk *et al.* 2014b, 112). The modern period cemetery of Kohtla-Järve revealed fist-sized limestone cobbles behind neck part or under thigh bones (Schmiedehelm 1946).

been worn off. It might have been used as a marble; however, marbles have rather been found from settlements. It could also have been an amulet of some sort and carrying it in a pouch with a coin suggests its particular value for the owner. We might perhaps find an analogue with white quartz pebbles, placed in graves since the Neolithic to the Middle Ages (see Ch. 5.2.2. for more detail). In Estonian material, though, the particular preference for white stones (*i.e.* quartzite) cannot be followed. Quartz is a common mineral in Estonian soil, so if quartz pebbles were preferred, their share should be much higher among the gathered pebbles.

Perhaps many of the pebbles gathered from burial sites have been picked up because of the special (ritualised) context, even if no indication of the motives has been made in excavation reports. In the case of settlement sites, the reason for picking them up was rather the peculiar look of the pebbles; however, exceptions are present. A fresh example of pebbles which gathering by the excavating archaeologist was also motivated by specific find context comes from Lüganuse. Here the digging of a settlement site yielded a curious structured deposit with a few fire-cracked stones, five whetstones, some sherds of wheel-thrown pottery and two water-polished pebbles (Fig. 1) that according to the finder seemed to have been deliberate additions in the deposit (Tõnno Jonuks, pers. comm., 19.10.2018). We might be dealing with a set of grinders, since it is known that pebbles have been used for polishing pottery and bone artefacts (see below), however, no traces of grinding nor any usewear could be followed on the pebbles. One of the pebbles, possibly quartzite, was even covered by an intact water-polished crust.

Fig. 1. 'Whetstone-burial' from Lüganuse. Photo: T. Jonuks.

Unworked pebbles and cobbles have sometimes been gathered when found together with stones interpreted more conventionally. An example is formed by the Mesolithic net remains from Siivertsi. Here in addition to a sandstone net-sinker with cord remains of several unworked limestone cobbles were collected, but which apparently were also interpreted as net-sinkers (Indreko 1932). Grain grinding stones form similar cases – these have generally been ground into multi-faceted, usually cylindrical shape, but it seems that many smooth cobbles of various shapes that have been found together or in the vicinity of the 'proper' grinding stones have been picked up considering the same function, although not stating it out.

5.2.1. Fossils

The presence of fossils in archaeological sites is not unusual, but there are not many publications on the topic. In most cases, the occurrence of fossils has been recognised without further study, sometimes determined to genus or species level, but very seldom has their likely origin been discussed (Bar-Yosef *et al.* 2010, 385). For example, a study on British and Irish Neolithic and Bronze Age sites with fossil finds suggests that altogether 200 sites from these two periods contain fossils; however, only a fragment of these have been published or discussed in any way (Peter Leeming, pers. comm., 12.11.2017). Joanna Brück has also stated that natural objects such as shells, stones, and fossils accompany many Early Bronze Age British burials, but there is no catalogue of these finds, and their significance remains poorly understood (Brück 2008, 29). Closer inspection refers, though, that while some fossils have been collected in the neighbourhood of the settlement and some may have been brought to the site together with building or raw material, there are definitely those that have deliberately been transported by people. The reasons for gathering fossils have not been dealt with, especially if these have not been worked into artefacts or pierced to get a pendant (Bar-Yosef *et al.* 2010, 385). Sponge fossils with natural holes found abundantly from Anglo-Saxon houses in southern England provide a good example. Their frequent collecting by archaeologists is explained by the fact that they have been interpreted as beads with artificially made holes (Meaney 1981, 116). Also, Leeming (2015, 20) finds that although striking examples have been gathered and noticed by archaeologists and geologists already for a long time, fossils are still seldom treated as finds: *'Missing' fossils in the interpretation of the above sites are a hindrance to our understanding; evidence is being ignored or marginalised.* The reason, according to him (*ibid.*, 17), is that archaeologists have been reluctant to discuss fossils from sites because the emphasis has been upon archaeology as the interpretation of actions of past people and this has been confined to objects which show human action. While fossils are usually unmodified, they have not been considered artifacts in the strict sense of the word and have been discussed only when there are no such fossils to be found naturally in the locality or if the position within site is

highly suggestive of a deliberate placement (see examples in Mayor 2011, 165). An excellent example of ignoring is an Early Bronze Age cemetery in Kiltierney in Northern Ireland where 30 crinoid fossils were found in the 1970s. These were the most numerous finds in the whole site but have neither been discussed nor illustrated further. According to the director of the excavations, it is not possible that it was a necklace since the crinoids are abundant in the local limestone (Leeming 2015, 19). Also, Kenneth Oakley (1965a; 1965b) who was the first to concentrate on folklore of fossils and to consider fossils from archaeological sites finds, more precisely jewellery or amulets holding magical power, has named his interest towards fossils apparently gathered by past people 'a category of useless knowledge' (Mayor 2011, 165). Nevertheless, fossils have started to be noticed more and more and treated as archaeological finds which may partly be inspired by the writings of Oakley more than half a century ago. However, the trend continues rather to address and publish more prominent examples, *e.g.* sea urchins (McNamara 2011; 2012) or ammonites (Taylor 2016). It is noteworthy that fossils from archaeological contexts have been more systematically treated in Britain (*e.g.* Oakley 1965a, 1965b; Meaney 1981; Gilchrist 2008; Gazin-Schwartz 2001; McNamara 2011; Leeming 2015), whereas in other European countries the interest seems to be confined with single researchers, who discuss the topic in manuscripts (*e.g.* Samdal 2000; Olli & Kivirüüt 2015) or publications (*e.g.* Guminski & Bugajska 2016; Boyadziev 2008; Glørstad *et al.* 2004; Connell 2011; Bar-Yosef *et al.* 2010). Often fossils have been treated by palaeontologists (*e.g.* Oakley, Duffin, Taylor). In recent years some research has been published discussing the issue of locally found and imported fossils (*e.g.* Bar-Yosef *et al.* 2010). As fossils are generally considered non-functional and rather decorative finds or with magical meaning, they have been more intriguing for the archaeologists of religion.

Fossils can be found all over the world, but depending on the stratigraphical situation the species present can differ a lot. In short, fossils are the remains, traces or imprints of once-living organisms which have preserved because of favourable conditions. Dead organisms can preserve as fossils if their mineral or soft tissues have, in the course of chemical reactions, been substituted by well-preserving minerals, *e.g.* calcite, apatite or pyrite (Puura 2006, 4).

Many archaeological sites have revealed fossils. Although not interpreted enough, some general trends can be followed. First, it strikes the eye that the share of fossils gathered or at least interpreted seems to be the largest in Stone Age sites and perhaps even specifically in the Palaeolithic contexts. The reason might be the comparatively homogeneous find material, which is why fossils come forth. Perhaps the discussions of the sources of artistic and religious reasoning in the Palaeolithic play the role here too, as fossils have been often used in these debates. According to the supporters of the long-range theory of religious thought, hominids gathered fossils and rock crystal as early as 900,000–800,000 years ago. Also, in the Early Palaeolithic first figurines, pendants, and beads were produced (Bednarik 2008, 103). Recognising iconicity in natural forms and the practice of modifying natural objects to emphasise some iconic

quality has persisted ever since, such as recognising a human form in a stone and emphasising it with carving out the distinctive elements, or modifying the natural groove in fossil sponges to make them into beads (Bednarik 2008, 91). The debate with the short-range theorists who see the beginning of the religious thought only in the Late Palaeolithic, concerns the aspect of deliberate behaviour. Gathering of fossils has been suggested since the Early Palaeolithic, but this early it is not certain whether the collecting was occasional or deliberate. For example, the discussion has been going on whether *Porosphaera globularis* sponge fossils in Acheulian settlement sites have been collected and their natural holes widened to obtain beads or whether the concentrations of fossils are natural (Rigaud *et al.* 2009 and Bednarik 2014). Exceptional finds of flint tools with exposed fossilised sea urchins exist from the Early Palaeolithic Acheulian as well as the Middle Palaeolithic Mousterian culture (see McNamara 2012; White 1992, 544), proving that the fossils, even if unintentionally exposed from the flint nodule, were perceived as outstanding after uncovering. Chantal Conneller has made a similar observation that many fossils were exposed by accident while flint working for the Late Palaeolithic Magdalenian sites (Conneller 2011, 97). Nevertheless, in the Late Palaeolithic, the examples abound that prove the deliberate looking for fossils and using them as charms or for decoration. Especially rich in fossil finds are the Magdalenian sites – according to Conneller, two-thirds of all fossil finds from the Late Palaeolithic can be associated with this cultural tradition (2011, 95). It has been suggested that fossils were gathered mostly to be used as beads, but in some cases, their possible magical power was emphasised (*e.g.* examples in Oakley 1965a; 1965b), although the differentiating between amulets (supernatural reasons) and beads (decorative reasons) in human culture can be regarded as complicated and even futile. Also, fossils were sometimes imported to archaeological sites as unworked manuports, like sea urchins, ammonites and belemnites, proving that adorning body was not the only reason for their gathering. Deliberate choices in the Late Palaeolithic are indicated at by fossils imported from long distances (*e.g.* Conneller 2011, 95; Oakley 1965a, 11; 1965b, 122, Jochim 2011, 105), even as much as 650 km. For example, fossils shells originating by the Black Sea have been found from settlements much further to the north and the distribution pattern suggests that the fossil shells were exchanged for furs (Jochim 2011, 116).

It has been suggested that the reason for the fossils to be regarded as curiosities and valuables and collected in the Palaeolithic was the evolving abstract way of thinking which might have seen the fossils as spirit animals *emerging from the membrane of the stone* by the presence of a specific non-human agency; this agency was realised in the stones that were transformable and could take the shape of animals (Conneller 2011, 95, 97 and the references therein). Cave art with cracks in rock used to depict animal contours, might have had a similar background (*ibid.*). A famous example is provided by the Magdalenian site Arcy-sur-Cure (Grotte du Trilobite) which yielded a trilobite fossil (see also Oakley 1965b, 121) and a beetle figurine carved from lignite – these together seem to emphasise the belief in the transformative power of stones that is

initiated by a supernatural creature or effected by the stone itself (Conneller 2011, 93). This idea goes hand in hand with the idea of the culturalisation of nature as suggested generally for foraging Stone Age societies. According to Håkon Glørstad *et al.* (2004, 106), the Mesolithic society took elements from nature and transformed them into cultural products, but holding on to the original natural power; so we are dealing with a certain interdependence of society and nature. This culturalisation of nature in the Late Palaeolithic societies has been seen in the growing number of pendants of very varied choice of materials, including limestone, schist, talc-schist, steatite, mammalian teeth, bone, antler and ivory, fossil and contemporary species of marine and freshwater shells, fossil coral, fossil belemnite, jet, lignite, hematite, and pyrite (White 1992, 549). Thus, generally, the peculiar appearance of fossils has been regarded as the reason for their initial gathering. According to the widespread views, these have been preserved as curiosities and exposed in artefacts for the same reasons in the Early and Middle Palaeolithic. Together with the evolution of abstract, metaphorical and symbolistic reasoning, fossils started to be considered as the residence of power as well as the embodiment of a certain quality and the agency and transformativity of stones started to be believed.

Next to the widespread interpretations of fossils as curios or pendants, several utilitarian functions have been suggested for fossils since the Stone Age. For example, crescent-shaped limestone fossils from Dudka and Szczepanki Mesolithic burial sites in Poland might have been used to fasten clothing (Guminski & Bugajska 2016, 494). Belemnites from the same sites were initially explained as playthings accompanying children's graves, but later re-interpreted generally as accessories (*ibid.*). Since the belemnites occurred in children's graves, the apotropaic function could be suggested instead. A second example comes from Bulgaria where 14 belemnites found from Kodzadermen Neolithic tell settlement have been interpreted as possible arrowheads since they were found together with flint arrowheads (Boyadziev 2008, 288). Boyadziev argues that belemnites have been found from the burials of both men and women, connecting the fossils with the burial ritual and the thunderbolt-belief. This would explain finding these (divine darts) together with real (earthly) arrowheads (*ibid*., 89f). Although such early records of thunderbolt-belief are not known from the written sources, the significance of belemnites has been suggested. A belemnite has been proposed for the instrument of the Egyptian fertility god Min, and allegedly it appears on an odd design depicting Min on a palette dating to as early as 3100 BC (Najovits 2003, 36). A third example of a utilitarian explanation comes from the Viking Age central site of Haithabu, where a total of 185 fossils, 128 of which were sea urchins, were found from a semi-circular bank of earth surrounding the settlement. Gathered from the beach and brought to the site, these could have been used in board games as gaming pieces (Metzger-Krahé 1978, 41ff; comp. the case of Vaida in Estonia, see below).

From the Iron Age onwards with the advent of science in Ancient Greece first attempts to recognise once living or still living organisms in fossils were made and reflected in the written sources. This mostly concerns the fossils of

sponges and bivalves recognised by Pythagoras in the 6th century BC and Pliny the Elder in the 1st century AD (Wyse Jackson 2002, 142). In addition, the magical virtues of rocks and minerals were first described in the Greek and Roman sources. Beliefs connected to rocks and minerals known in the Iron Age probably derived from earlier periods, so written sources can, at least to some extent, be used to discuss the beliefs of the past centuries as well.

Perhaps due to the existing written sources providing curing magical and apotropaic explanations for rocks and minerals, the almost only possible interpretation offered for fossils found in the Iron Age and medieval sites is a charm. Many fossils in these periods have been collected from burial sites, and their interpretation as magical charms is expectable (*e.g.* Gilchrist 2008; Meaney 1981; Samdal 2000); however, the interpretation of charm has been used for settlement site finds as well. In these cases, cryptopalaeontological deduction has been used, but also folklore, especially in the case of medieval finds.

5.2.1.1. The case of Estonia

In Estonia the fossils are abundant in Palaeozoic carbonate rocks, *i.e.* Ordovician and Silurian limestones (Fig. 2); the Devonian sediments in Estonia are predominantly without fossils (Pirrus 2001, 43–44). The Ordovician layers, especially the Middle and Upper Ordovician, are very rich in fossils, such as brachiopods, trilobites, cephalopods, bryozoans, cystoids, rugosans (Nestor & Mark-Kurik 1997; Puura 2006, 10). Silurian saw the increase of corals (rugosans and tabulates) and stromatoporoids, but the fossils known in the Ordovician period are continuously present too – brachiopods, bryozoans, trilobites, cephalopods (Nestor & Mark-Kurik 1997; Puura 2006, 11). Estonian sedimentary rocks are rare in the world since they have preserved for hundreds of millions of years, untouched from orogeny or deep burial by later sediments. Therefore, the Estonian fossils are well preserved too. The areas richest in fossils are the Middle and Upper Ordovician limestones of North Estonian Klint, Northeast Estonian oil shale layers and some localities on Saaremaa. A large part of Quaternary deposits in Estonia are made up of glacial sediments, *i.e.* formed by the attritional, accumulative and transportative activity of the glacial ice sheet and meltwaters. The sediments are divided into local moraine (developed from the bedrock material of the specific area), transit moraine (developed from the local as well as distant material) and migratory moraine (developed from the distant material) (Raukas 1995, 105). The fossils gathered by people in archaeological past have very likely been picked up from the moraine. Naturally, the local moraines are the most widespread, which explains the abundance of fossils in moraine in the areas with the Silurian and Ordovician bedrock. Fossils in the migratory moraine in Devonian outcrop area are less numerous and thus more difficult to find. The direction of movement of the glacial ice sheet locally has been determined by several features, like the direction of glacial striae on

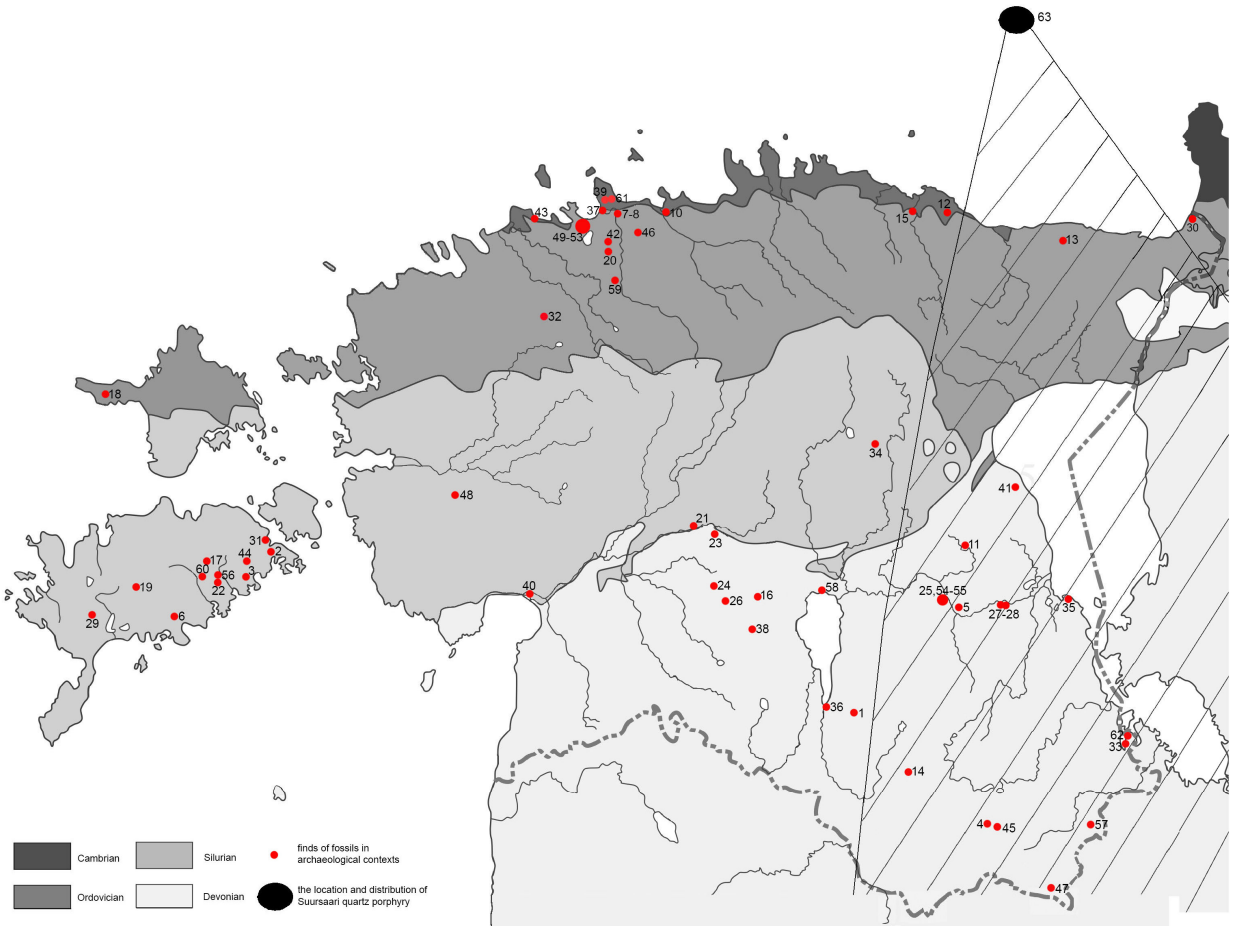

Fig. 2. Estonian geological map and the finds of fossils in archaeological contexts. The numbers to Table 2 in Appendices. Map prepared with the help of Kristel Roog.

bedrock and in South Estonia also the direction of oblong pebbles in moraine (Raukas & Rõuk 1995, 141, fig. 52). Considering the calculated movement of glacial ice, there is a slight possibility that finding a rare fossil in archaeological site away from its prognosed distribution trajectory indicates at bringing it to the site by the people. However, as there are geological deposits in the bottom of the Baltic Sea with fossils settled that are not entirely known, in addition, the local movement of ice cannot be reconstructed in detail and full confidence, the conclusions do remain speculative.

In the context of the present research, the macrofossils of invertebrate animals are of relevance. The frequency of different genera in the bedrock varies, *e.g.*, limestone with the fossils of brachiopod species *Borealis borealis* (in Estonian *rõngaspaas*) or with the high frequency of stem fragments of Echinodermata (in Estonian *sõrmuspaas*). Although fossils can be found in the till pretty much all over Estonia, they are not especially widespread outside the Pre-Devonian limestone bedrock. Thus, it can be suggested that fossils found within the archaeological sites of South Estonia refer to artefacts brought by people, although the original location may not be far. At the same time, an eye-catching fossil from an archaeological site in limestone area may not be in its original place, but brought to the site by people or considered unique. Even in the case of stone graves made of limestone slabs, we cannot exclude the possibility that namely the fossil-rich slabs were preferred (see Johanson 2006a, 88). On the other hand, the fossils that are not in their geological position might not refer to their deliberate transportation by people. For example, several fossils have been gathered from the occupation layer of Tartu hillfort, including a remarkable gastropod fossil, but in their case a possibility exists that these were brought to the hillfort inside limestone slabs picked in the agricultural fields, were exposed during construction works and left behind (Tõnu Meidla, pers. comm. 2.11.2017; see also below).

Estonian fossils can be very eye-catching, especially if their internal mould is composed of shiny sparry calcite. In the distribution area of Cretaceous sediments, the internal mould of a fossil is usually silicified as flint, which makes them somewhat more prominent finds than our limestone fossils. There the certain mysteriousness – white chalk shell surrounding yellow or black internal mould – may have played some role too. If we look at the archaeological finds in Europe, then the more published examples very often come from the Cretaceous areas, especially the outstanding sea-urchins, but also ammonites and belemnites. Relatively fewer examples come from the limestone areas, *e.g.* the Ballycarty passage tomb in the Carboniferous outcrop area in Ireland (Wyse-Jackson & Connolly 2002). Polish Mesolithic burials have yielded limestone fossils as well but compared to the more conspicuous belemnites these have not been determined nor treated in more detail (Guminski & Bugajska 2016). It is clear that in areas where limestone fossils, as well as those with silicified internal mound, are both present, the latter have deserved more attention from the researcher's side.

In Estonian archaeological collections, I analysed 287 fossils from 62 different sites (Tab. 1). Archaeologists have sometimes gathered limestone pebbles with natural holes as fossils too (n = 10), but these are not accounted as such in the present dissertation. Archaeologists have not always gathered fossils as such, but rather as artefacts; however, this is the case only with particular fossils with natural penetrations (*e.g.* stem fragments of Echinodermata). These have been regarded as stone beads and probably used as such too. Several fossils have been gathered as stones with holes or pebbles. In many cases the fossil origin could be determined (*e.g.* a Bryozoa fossil from Tartu town or Bryozoans, *Cyclocrinites* (a genus of likely green Algae) and Echinodermata from Vaida settlement site, see same chapter below), but in case of severe wear, it might not be possible. Archaeologists have also gathered several fossils as burnt bones, for example, among the bone finds from Madi stone grave (Tab. 1: 25), eight fossils were found which all had been gathered as burnt bones (Konsa 2014). However, this kind of revision has been very rarely conducted.

The largest collection of fossils (n = 85) has been gathered from Aakre *tarand*-grave (Tab. 1: 1), and this has been due to the decision of the excavating archaeologists to gather everything that seemed noteworthy during excavations, whereas the human origin of the finds was not considered a necessary criterium. The case of Kukruse cemetery (Tab. 1: 13) forms a similar case where also everything interesting was picked up during excavations, including seven fossils. In case of the latter three sites (Madi, Aakre, Kukruse) there are a few more outstanding pieces, but this does not change the overall impression that we are rather dealing with small and unimpressive specimens for ordinary people; thus, it is implausible that past people have deliberately collected them. Therefore, in the case of Madi, the small size and unimpressive appearance of the fossils probably means that these were carried to the site with moraine (Konsa 2014, 9). The same was suggested for Aakre (Tõnu Meidla, pers. comm., 2.11.2017). The fact that similar fossils can be found inside more massive limestone slabs in the surroundings as well as the lack of any concentration areas of fossils inside the grave seems to confirm the suggestion. Since Kukruse Late Iron Age cemetery is situated in the fossil-rich area in northeastern Estonia and the fossils gathered from the site are very small, it is likely that these are original additions in the soil and not brought to the site deliberately. Nevertheless, the possibility cannot be excluded that larger and more outstanding fossils (*e.g.* some intact horn corals from Aakre and Madi and a bryozoan from Kukruse) have been deliberately collected after being exposed in the till following heavy rain and placed in the grave. Olli and Kivirüüt (2015, 20) suggest that fossils or stone slabs with fossils may have been deliberately chosen for the infill of the grave while fossils later came off the rock due to natural weathering – a process that is also producing nicely preserved and collectable palaeontological material in many Estonian sites. Similar observations were made by Tõnno Jonuks and Marge Konsa while digging the stone grave at Kunda Hiiemägi (Jonuks 2009a, 160–161). Analogously, in Ballycarty passage grave in Western Ireland, several Carboniferous fossils, like species of brachiopods, cephalopods, gastropods,

corals and bryozoans were found inside the passages as well as the filler soil. Although the grave is situated in the fossil-rich area, the researchers dismiss the possibility that the fossils reached the grave by natural erosion; instead, they suggest that fossils were placed with the remains of the dead as ceremonial decorations, ornaments or charms. It was noticed that all the fossils had a slightly roughened surface texture, indicating that they were exposed on the surface for some time. The exposure loosens the fossils from the surrounding rock matrix which would have made it relatively easy for the builders of the passage grave to winkle out complete or near-complete specimens (Wyse Jackson & Connolly 2002).

It can be said that all fossils gathered from Estonian archaeological sites can be found from the territory of Estonia and generally from their outcrop area or more to the south from the moraine. Two quite conspicuous fossils form an exception– a rugose coral (AI 3536: 11; Tab. 1: 46) and a cephalopod (AI 3536: 12; Tab. 1: 46) (Article 5, fig. 3: 1–2) from Saha Chapel Hill. Unfortunately, the exact find context of these two specimens is not known. The founding of the predecessor of the standing chapel – a stone church – together with a cemetery has been dated to around 1220. Other finds from Saha Chapel Hill found at the beginning of the 20th century (jewellery, a fire steel, a knife and a spearhead) refer to the Late Iron Age underground cemetery which can be dated to 1150–1250 (Vedru 2007, 7). These fossils cannot be gathered from the soil in the area since they are naturally exposed in the Late Ordovician limestone layers to the south and their natural northward movement would be unlikely (Tõnu Meidla, pers. comm., 1.2.2018). The reason for this is the glacial ice movement southwards during the Ice Age, which means that fossils broken by ice from the Silurian and Ordovician bedrock cannot have moved northwards except when they are transported to the north later by rivers. However, the latter case is not suggested here as the two fossils were found together and in some distance from any rivers. So human transport is more plausible. Even though the finds of fossils cannot be associated with the burials, the destroyed wooden church or the stone chapel erected in the 15th century, they might have been grave goods and perhaps considered apotropaic magical means to protect the dead. Cephalopod fossils have, according to folklore records and medieval written sources, been regarded valuable thunderbolts. Perhaps this could be the case here too. Since folklore texts reveal that cemeteries have been deemed as powerful places for different benevolent as well as malevolent magical practices, the two fossils could also have been transported to the cemetery to be used in some witchcraft. According to a record from the end of the 19th century, people used to offer coins and cure their ears in the chapel (Winkler 1900, 13). While the surrounding of Saha chapel has been used as a cemetery until now, the time of bringing of the fossils to the site is difficult to estimate.

A find that is certainly brought to the site is a subfossil of an eatable gastropod (probably from the family of *Buccinidae*; AI 7032: 1594; Tab. 1: 50) found from the medieval and modern period settlement in present Tallinn. The mollusc shell could not have reached the site as a food leftover since the kind of

shells were not found from the Baltic Sea and they would not have stayed fresh during transportation when imported from elsewhere in Europe. In addition, the stage of fossilisation indicates that the shell was imported to Estonia already as a fossil, perhaps as a curiosity. Discernable usewear is not present on its surface, its tip has broken off but judging after the fracture surface, it must have happened a long time ago. Similar example is a *Patellidae* gastropod shell from a 16th century Rakvere Franciscan monastery (RM A 77: 323).

If we leave out Aakre, Kukruse and Madi, mostly 1–2 fossils have been gathered from one site (Tab. 1). The collectors of fossils are more or less the same as in the case of pebbles, which refers to the mental readiness of the researcher to gather natural, but significant finds. The tendency to rather gather fossils from Devonian areas can be followed (Fig. 2), *i.e.* in areas where archaeologists do not expect fossils. This is certainly one of the main reasons for gathering such an amount of fossils from Aakre *tarand*-grave – the site in present-day Valga county is not situated in the naturally fossil-rich area, and the finding of such an amount of fossils from a single excavation site was considered surprising. According to Tõnu Meidla (pers. comm., 2.11.2017), the occurrence of such an amount of fossils in one place is not, in fact, unexpected, but the shape and character of the pieces do not imply that they were considered special, picked up and placed in the grave by the people. Collecting fossils from the northern Estonian areas rich in fossils has usually been considered unreasonable, especially when stone graves made of limestone slabs are excavated. I experienced the difficulty myself during the excavations of Rebala stone-cist graves where the abundance of mostly cephalopod fossils meant that none of them could be considered significant, regardless of their exact find place in the grave. However, there are exceptions, for example, 35 cephalopod fossils have been collected from Rannamõisa III early *tarand*-grave (Tab. 1: 43) by Marta Schmiedehelm. Fossils have also been picked up from other sites in the area of the Silurian or Ordovician limestone, such as Iru settlement and hillfort, Asva fortified settlement, Kunda Lammasmägi settlement and Viimsi I *tarand*-grave which allows suggesting that the choice to gather fossils was made spontaneously. It is possible that in some cases already gathered fossils were decided to be thrown away when excavations yielded more and more fossils and their potential value for the site's interpretation was reconsidered. However, this kind of decisions is never discussed in excavations reports.

5.2.1.1.1. Cephalopods

The most numerous of the gathered fossils – 65 – are cephalopod fossils, whereas more than half (n = 35) have been collected by Marta Schmiedehelm from Rannamõisa III early *tarand*-grave (Tab. 1: 43). A significant proportion of the rest has been collected from Tallinn (n = 10; Tab. 1: 49–53) and Tartu (n = 5; Tab. 1: 54–55) town layers. Burial contexts have yielded altogether 42 cephalopod fragments, whereas Iron Age stone graves, such as Rae I (n = 1; Tab. 1: 42), Rannamõisa III (n = 35) and Aakre (n = 1), underground

cemeteries, like Saha Chapel Hill (n = 1) as well as medieval town cemeteries represented by St. Barbara's in Tallinn (n = 4; Tab. 1: 53) are among the find places. It is impossible to ascertain whether these were considered significant during the time of using the burial sites, or were they merely loose finds in the moraine.

Estonian nautiloid fossils formed in the Palaeozoic limestone are taxonomically related to belemnites – extinct cephalopods in Mesozoic Jurassic and Cretaceous flint areas, although the commonly brownish (or sometimes pale yellow) colour, massive calcite composition and pointed end of the latter are distinctively different from our limestone cephalopod fossils that are composed of originally hollow or gas/liquid-filled chambers filled in later by the sediment, sparry calcite or other secondary minerals. Belemnites, as the word indicates (*belemnon* in Greek, meaning 'dart'), refers to the possibility that already in Ancient Greece they were perceived as darts from heaven, *i.e.* thunderbolts. Belemnites were also referred to as Ida's fingers by Pliny, as the fossils have a certain similarity to human fingers and they were first or in abundance met on Mount Ida (Adams 1938, 117). As their colour often resembles that of livid skin, they have been thought to be a good remedy against jaundice (Duffin 2008, 16, 28; Liñán *et al.* 2013, 55). Since the 16th century, belemnites were also recognised as lynx's stone (*Lapis Lincis*) and used against bladder stones (Duffin 2008, 23). Belemnites are connected with thunder and lightning arrows in the folk religion of different areas (see *e.g.* Bassett 1982; Boyadziev 2008; van der Geer & Dermitzakis 2008) and this belief is reflected in their use in folk medical practices. For example, their use against sharp pain is connected to their dart-like ending (van der Geer & Dermitzakis 2008). In Britain they are known as St. Peter's fingers or Devil's fingers and in the southern part of Britain used against rheumatism; the link can be explained by sympathetic magic since rheumatic fingers are distorted but belemnites as their cure are straight and strong (van der Geer & Dermitzakis 2008). Belemnites were also used to cure horses of worms and sore eyes in both men and horses (Bassett 1982, 9). The using of cephalopod fossils in curing practices in Estonia is proved by two ethnographic finds as well as several folklore records about stone hearts which very likely mostly referred to cephalopod fossils. It is difficult to prove from the available written sources but it is likely that cephalopods were regarded as generally apotropaic thunderbolts in Estonia, analogously to belemnites elsewhere in Europe. A strong case in point is a cephalopod fossil (TM A 15: 1000; Tab. 1: 54) from Tartu hillfort; it has broken into three fragments by now, but while intact was approximately 13 cm long. Other finds that could be interpreted as thunderbolts have been found from Tartu hillfort as well – a stone axe (TM A 14: 402) and a flint arrowhead (TM A 16: 304), so it is very likely that thunderbolt-legend was known at that time in Tartu, and the cephalopod fossil might be viewed in the frames of this belief. The cephalopod fossils from the St. Barbara's cemetery (Tab. 1: 53) are quite small and modest and are not part of the long and conspicuous fossilised spiky shell. Considerably many cephalopod fossils have been gathered from medieval and early modern settlement contexts

in present-day Tallinn. Their find places in the occupation layer cannot be considered remarkable and many are quite insignificant fragments. However, some must have attracted attention during the formation of the occupation layer, such as a piece of an *Endoceratid* (AI 6958: 99; Tab. 1: 52) from the excavation of Small Coastal Gate bastion that's internal space is entirely filled by calcite, making it attractively shiny and translucent, as well as a curved *Lituites* (AI 6004: I 186; Tab. 1: 49) fragment from Härjapea modern period site should be mentioned.

A beautiful coiled nautiloid fossil has been collected somewhere from the town of Pärnu (Tab. 1: 40; Article 5, fig. 3: 3). Unfortunately no find context for the fossil is provided, but apparently, we are dealing with an archaeological find, so that it could be of medieval or modern period date. Estonian nautiloid fossils are related to the fossil ammonites with similar coiled shells, which are perhaps the most well-known invertebrate fossils. They were known to man since the early Greek times when they were associated with the coiled horns of the ram and regarded as sacred (Bassett 1982, 3). Ammonites have been considered valuable charms in different parts of the world (see Pymm 2016) but they have perhaps been the most common in Great Britain where they were associated with serpents and called snakestones (see also Skeat 1912). In some parts, they were known as crampstones or associated with fairies (Bassett 1982, 4; Pymm 2016). Although ammonites were used in folk medicine, for example, curing cramps in cows, they were mostly credited with magical effects or religious significance, *e.g.*, generating prophetic or heavenly dreams. The Pärnu nautiloid has a hole in the middle. The inner part might have been broken naturally, but the edges of the hole leave the impression of deliberate removal of this part of the shell. The find might have been valued merely as a peculiar natural item, while the hole implies that it could have been used as a charm to be hung.

5.2.1.1.2. Echinoderms

Altogether 54 fragments of fossilised echinoderms, mostly stem fragments, have been found. It is likely that in most cases we are dealing with ecofacts used as beads, either as part of necklaces or single beads. The stem columnals mostly include examples with round cross-section; occasional pieces are star-shaped. Twenty fragments have been gathered from burial contexts where they could have been parts of necklaces accompanying the deceased. However, Kukruse is situated in a very fossil-rich area, and the stem fragments found are quite small. Besides, the burial no 1 (with three stem fossils) was mixed already prior the excavation, and thus the exact locations of finds are not precisely known, whereas the burial no 29 was a cenotaph with only goods indicating at a male grave. So in both cases, the exact context of the fossils in connection with the burials is difficult to estimate. A beautiful and conspicuous exemplar has been found from Ilpla Viking Age stone grave (AI K 1: 190; Tab. 1: 6; Fig. 3) – it is quite large, 2 cm in diameter, and leaves the impression of having been engraved on purpose. Microscopic studies were carried out to look for possible

wear traces in the hole or on the surface of the piece, but no explicit traces were revealed. As in case of Ilpla we are dealing with a stone grave with burnt remains and grave goods scattered among the filler stones, the fossils are present in the local limestone, and moreover, the find context of the artefacts is mostly missing (Karu 1924, 111), the stem fragment might be in the grave by accident. However, there are several glass beads among the grave inventory too, and necklaces often included beads of different origin (see Kallis 2010, 160); so using this beautiful fossil as a bead is very plausible. Stem columnals have been collected also from Aakre (n = 5; Tab. 1: 1), Käku (n = 4; Tab. 1: 19), Jaagupi (n = 1; Tab. 1: 9), Lepna (n = 1; Tab. 1: 22) and Tõnija (n = 1; Tab. 1: 56) Iron Age stone graves and Mäksa medieval cemetery (n = 1; Tab. 1: 28).

Fig. 3. The echinoderm stem fragments: 1, 1a – Ilpla (AI K 1: 190), 2, 3 – Asva (AI 4366: 1212, 911). Upper right photo: AI; microphoto: stereozoom microscope Leica M205A.

Several stem fragments have been collected from settlement sites and hillforts: Stone Age Kõnnu (n = 5; Tab. 1: 17) and Ihaste (n = 2; Tab. 1: 5) settlements, Bronze and Iron Age Asva fortified settlement (n = 7; Tab. 1: 3) as well as Iron Age Soontagana (n = 3; Tab. 1: 48) and Valjala hillfort (n = 2; Tab. 1: 60). Solitary stem columnals have been gathered from Stone Age Naakamäe (Tab. 1: 29) and Kõpu VIII (Tab. 1: 18), multi-period Jägala Jõesuu (Tab. 1: 10) and Mustivere (Tab. 1: 26) as well as Iron Age Iru (Tab. 1: 8) settlement sites. It is possible that some limestone beads or holed stones, for example, several gathered from Kunda Lammasmägi (Tab. 1: 15) Stone Age settlement site, may be of fossil origin, but wearing them has deleted all characteristic features. Several fossil stems have 'worn' surfaces too, *e.g.* one from Naakamäe Neolithic Combed Ware Culture settlement site (AI 4211: 1099) or two from Asva fortified settlement (AI 4366: 911, 1212), but ascertaining whether the wear is the result of natural erosion or wearing as a bead, is impossible to say. Anyhow, fossil stem fragments are of convenient size and shape to be used as beads, and

since they are common in moraine and can be very attractive, using these as beads is very likely.

Next to stem fragments there are three possible cystoid (*Echinosphaerites*) fossils. A half of a cystoid fossil has been gathered from Narva-Jõesuu IIb Neolithic settlement site (TÜ 2190: 932; Tab. 1: 30) where it has probably been brought by people since Narva-Jõesuu lies north of the Ordovician limestone layers with well-preserved fossils. The other two are perfectly round limestone balls. The piece from the medieval and modern period settlement in present-day Tallinn (AI 7032: 2192; Tab. 1: 50) has small pores visible on the surface demonstrating its fossil origin. Another has been found in connection with the 11th-century smith's burial in Raatvere (AI 5295: 98; Tab. 1: 41) from a possible pouch. It might be a limestone piece deliberately formed into the shape of a ball (see also above) but it could also have a fossil origin with its characteristic features eroded by constant carrying it along. The round shape of the two latter artefacts is perfect for marble rolling games. In the case of the fossil from Tallinn, using it as a marble is very plausible since next to the more common clay marbles the stone ones were also used and marble games were popular in the Middle Ages (see below). Also, the worn surface of the artefact might prove that it was used. In the case of the ball from Raatvere, using it as a marble is less likely.

5.2.1.1.3. Gastropods

There are altogether 22 gastropod fossils and these perhaps include the most exceptional artefacts among the gathered fossils, whereas six have been collected from burial contexts, 15 from hillforts and settlement sites and one is a find from excavating a monastery. A conspicuous example is provided by a *Subulites gigas* gastropod (TM A 16: 563; Tab. 1: 54; Article 5, fig. 6) fossil from the possible Viking Age context of the Tartu hillfort, found during the 1950s excavations. One side of the fossil shows traces of grinding. There is a possibility that the wear-traces are ice scratches produced at the time when the fossil was still locked in limestone, whereas the fossil might have reached the site in a limestone slab imported as building raw material (Tõnu Meidla, pers. comm., 2.11.2017). The natural outcrop of the potential original layers for this limestone is in North Estonia, in the zone between Moe and Roela. Larger limestone pieces could have been found from the moraine fields south of the outcrop, but they would be quite rare around Tartu (Tõnu Meidla, pers. comm., 18.10.2018). According to Andres Tvauri, the find contexts of the Tartu hillfort are not entirely certain, as diagonally deposited strata were excavated by arbitrary layers in the 1950s, so the deposition of the gastropod cannot be unequivocally dated. However, limestone was not found during the excavations of the 1950s. According to the present knowledge, the prehistoric hillfort was wooden and in case of the medieval hillfort, only construction details were hewn of limestone (Andres Tvauri, pers. comm., 4.4.2018). Thus, according to the present knowledge, it is more plausible that the fossil reached the site already as

a fossil. Abrasion by ice might be responsible for some of the scratches on the fossil while it was still locked in the limestone slab. However, one of the sides has been ground down to an almost polished appearance, leaving the surface of this side of the fossil slightly convex, which can instead be the result of a deliberate human action. So it is very likely that the artefact has been brought to the site consciously and its side ground down for a purpose. We know from the written sources that snail fossils with spiral-shaped shells were called *caracole* stones by Plinius and valued so much that copies were carved from limestone (Liñán *et al.* 2013, 53). Gastropods have been 'carved' from stone in different periods because they were much valued. Sporadical archaeological material reveals that gastropods were treasured since the Palaeolithic when they were likely used as an adornment; one of the more famous examples is a fossil found from the Lascaux cave, which is believed to originate in Ireland, more than 1000 km away (Oakley 1965a, 10f). Miocene gastropod shells have been found from the Neolithic temples in Malta, and in some of these temples limestone helicoids modelled as copies of internal casts of these fossil gastropods have been discovered (Oakley 1965a, 11). Unfortunately, beliefs that could specifically be associated with gastropod fossils are missing in Estonian folklore, but folklore records of using gastropods are scarce elsewhere in Europe too. One of the few texts reveals that helicoid gastropod fossils were known as screwstones in southern England (Oakley 1965a, 11; Bassett 1982, 12) but more specific beliefs connected to these are not known. Stone hearts (mostly cephalopods, but could be different limestone fossils) have been one kind of valuable thunderbolts and were used in curing magical practices. Dust ground from the surface of the thunderbolt has been used to cure toothache and mixed in the drinking water of farm animals to treat suddenly appeared diseases. Perhaps this was the reason for grinding the given fossil too.

An exceptional specimen is an almost complete inner mould of a *Hormotoma* (?) gastropod fossil (AI 2430: 28; Tab. 1: 32) found from Oru Mikkuri Pre-Roman and Roman Iron Age stone grave (Fig. 4). There is no doubt that a find like this had to attract attention in moraine and its occurrence in the grave is thus likely not to be considered accidental. Unfortunately, the excavation report (Tallgren 1921) does not allow any proof for this conclusion, because the find contexts of single finds were not recorded. However, according to Tallgren, no finds were collected from the topsoil, only between the stone slabs, where burnt and unburnt human bones were found with spiral tubes and other bronze and iron artefacts.

Fig. 4. A gastropod fossil from Oru Mikkuri stone-cist grave. AI 2430: 28.

Even though the fossil is not an unexpected find in this area, its find context deep between stones with other finds implies that likely it has not weathered off from limestone after the construction of the grave but has been deliberately placed in the grave.

An intriguing find is a *Pararaphistoma qualteriata* fossil from Jägala Jõesuu hillfort and settlement site (Fig. 5). The fossil has been collected as four separate pieces (TÜ 1444: 93, 435, 611, 614; Tab. 1: 10) from two different excavation plots that are separated by a hundred meters and are situated in diametrically opposite perimeters of the hillfort. The pieces found in 2005 derive from side-by-side squares, from different depths in the erosion layer of the hillfort rampart which does not allow any conclusions about the initial stratigraphy of the find context. The pieces from 2007 derive from opposite corners of the excavation plot, nearly 8 meters from each other. The depth of one piece is unavailable, so their location in relation to each other is not known. It is possible that the initially intact fossil was first broken into two pieces while taking sand from the plateau of the hillfort to erect the surrounding rampart. Later both halves were further broken into two due to some natural formation processes in the soil. However, it should mean that the sand for the opposite banks of the hillfort was dug from the same spot, but this is hardly likely since it is more logical to take the soil from the closest area as possible. The possibility that fossil has been broken into four pieces by natural processes and carried by eolian activity to different parts of the hillfort is very doubtful (Tõnu Meidla, pers. comm., 14.6.2018). The pieces have all been found from the occupation layer. The fossil, especially when intact, had to catch attention. So it is plausible that people noticed it, broke it deliberately or accidentally and took the pieces to different perimeters of the hillfort. The Iron Age hillfort of Jägala Jõesuu covers the occupation traces of a much earlier, Neolithic Comb Ware Culture settlement which were partly mixed by later activity (Johanson & Veldi 2006, 36–37). So it is not completely clear whether the fossil has been found and used during the Neolithic period or the Iron Age phase. Clear usewear is missing, so the possible using or reasons for valuing the piece are unclear too. It might have been the stone transformed into an animal, as suggested for the Stone Age period. Or perhaps it was broken into two halves

Fig. 5. Gastropod fossil from Jägala Jõesuu Iron Age hillfort and Stone Age settlement site. TÜ 1444: 93, 435, 611, 614.

and deposited in the rampart at the two edges of the hillfort to magically protect the site.

The collection of gastropods includes two small Bellerophontida fossils. One has been collected from Iru settlement site (AI 3429: 926; Tab. 1: 8; Article 5, fig. 7: 2) and the other from Viimsi I *tarand*-grave (AI 5914: 105; Tab. 1: 61; Article 5, fig. 7: 1). They both have the diameter of approximately 2 cm and a hole in the middle. The example from Iru has extremely smooth and shiny, clearly polished surface. The small size, penetrating hole and polished surface indicate that we might be dealing with an artefact, perhaps worn around the neck; however, the smooth surfaces could also refer to carrying it along in a pocket. It is possible that the hole was deliberately bored in the centre of these fossils. However, the central part of Bellerophontida fossils is very thin and liable to break, so breaking due to frost weathering could have occurred. Microscopic analyses were conducted on both fossils, and it appeared that the piece from Iru had very fine grooves on the edge of the hole, just opposite the weightiest part of the fossil (Fig. 6), so it is suggested here that the item has a characteristic wear from hanging and moving on a string for a considerable time. The surface of the Viimsi fossil is slightly roughened, and neither polish nor wear traces could be followed. It is possible that in Viimsi the fossil was exposed to weather conditions and therefore lost all indicative traces. Wearing it as an amulet or a bead might, though, be proposed too, as one of the most significant collections of limestone pebbles with natural holes [*i.e.* pseudo-fossils], interpreted as beads, was also found from the same grave (Lang 1993b).

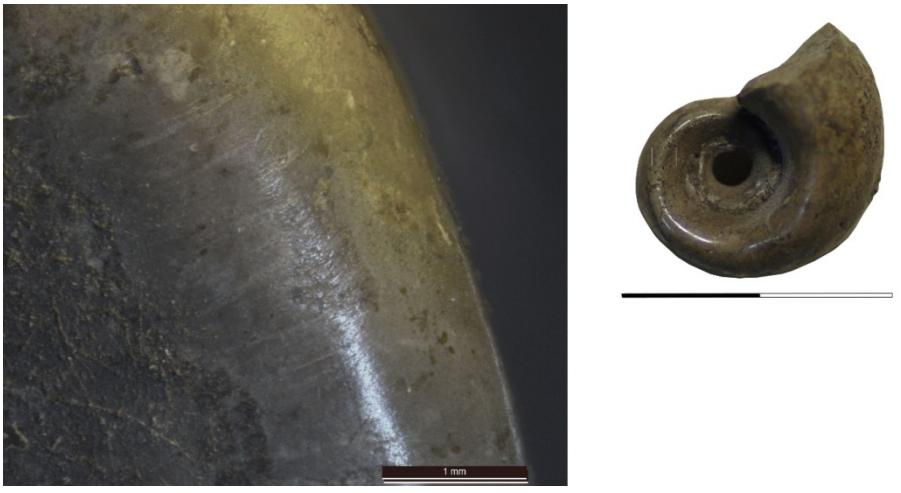

Fig. 6. Gastropod fossil from Iru settlement site. AI 3429: 926. Microphoto: stereozoom microscope Leica M205A.

5.2.1.1.4. Corals

Altogether 64 different fossil corals have been collected, of these 26 tabulates and 28 rugose corals, whereas the majority were found from Aakre *tarand*-grave (21 and 18 respectively). Both tabulates (also known as chain-corals) and rugosans (horn-corals), especially if intact, are very eye-catching, as they are comprised of many small corallites and form a porous and airy structure. A remarkable find is the rugose coral from Saha Chapel Hill (see above). An intact rugosan has been collected from Kobratu multi-period burial site (Tab. 1: 11), but its exact find context has not been documented. At Kobratu a Roman period *tarand*-grave, a Late Iron Age and a medieval inhumation cemetery are all situated in one place so that the fossil may be associated with any of the periods. A fossil of a tabulate and a rugosan have been collected from Siksälä early medieval cemetery (Tab. 1: 47). Both were collected during excavations in the 1980s and the beginning of the 1990s because they looked significant, but were added to the find list only with the inventory of the collection and digitising the find list years later. While nothing is known about the rugosan, the tabulate was first associated with burial no 206 – a 30–40-years old woman inhumated with a necklace of beads and cowry shells, a wreath, a knife and a finger-ring. However, in the summarising publication the fossil has not been mentioned (Valk *et al.* 2014b, 213). It is, of course, possible that the tabulate was an occasional find in the infill of the grave; however, the fact that it was noticed and collected by the excavator implies that it might have been in a more direct association with the buried woman. However, as the find could not be interpreted as a grave good, it was collected and kept just in case but perhaps not considered worth a more detailed documentation. At least three tabulate fossils are preserved as ear stones in the collections of ENM (Article 4, fig. 3: 3; Article 5, fig. 10: 5). The descriptions of folklore records too indicate that chain corals were used in curing magic. However, the few finds from archaeological cemeteries hardly allow any suggestions about their use in folk medical practices.

5.2.1.1.5. Bryozoans

Altogether bryozoan fossils have been collected[25]. Conical bryozoans are easily recognised and have probably attracted attention. At least 6 of the genus *Diplotrypa*, used as ear stones, are preserved in the folk medical collection of ENM (Article 4, fig. 3: 1, 4; Article 5, fig. 10: 4). The conical shape of the fossils was of value here, since according to the descriptions, one end of the fossil had

[25] From Vaida (see in more detail below) 24 ball-shaped fossils were found. According to Tõnu Meidla (pers. comm., 2.2.2018) the phylum Bryozoa and genera *Echinosphaerites* and *Cyclocrinites* are represented in the material. However, as they all have very worn surfaces, the assignment of the majority of specimens could not be identified without breaking them. So, in statistical calculations, I decided to distribute the 24 fossils evenly among the three groups.

to fit into the ear. Records of using porous conical fossils to cure ear inflammations are abundant in folklore.

Next to bryozoans rugose corals might have been used as earstones too since these are very often of conical shape like a small horn. *Diplotrypa* fossils have been found from Stone Age (Kõpu VIII settlement site), Bronze Age (Asva and Ridala fortified settlement sites), Iron Age (Rõuge hillfort) as well as medieval (Lehmja rural settlement; Tartu town) contexts. The latter – a small fossil with worn surfaces found from Rüütli Street in Tartu (TM A 50: 98; Tab. 1: 55; Fig. 7) – is noteworthy. It was found from the layer mixed with lime mortar, glass, faience and tripod sherds dated to the 2nd half of the 16th or the 17th century (Arvi Haak, pers. comm., 15.05.2018). The small fossil could be in the soil naturally, but its surface is so rubbed that its conical tip is rounded and the characteristic pores cannot almost be followed. This ascpect could imply that we are dealing with an artefact carried along in a pouch or a pocket, perhaps because it was considered valuable in curing magical practices. Folklore records and ethnographic earstones derive from the end of the 19th and the 20th century but 18th century written texts (*e.g.* Luce, Wilde) do not mention using earstones at all. However, these, especially Wilde, mostly concentrated on methods that were especially recommended or considered dangerous. Thus, earstones could have been insignificant for the authors or perhaps using earstones was not a very widespread custom after all. A more convenient explanation might be that the fossil was used as a gaming piece and therefore has highly worn surfaces, similarly to the fossils from Vaida. From prehistoric and medieval settlement site of Vaida 24 small stone balls with the diameter of 1.5 cm have been collected (AI 6248; Tab. 1: 59; Fig. 8). Kaarel Jaanits (1999, 103, fig. 3) has considered them clay marbles which is perhaps why he has chosen to gather them. However, we are actually dealing with fossils belonging to at least three different animal species which are all naturally distributed in the area: bryozoans (*Diplotrypa*), cystoids (*Echinosphaerites*) and algae (*Cyclocrinites*), but the more specific identification is impossible because the pores on their surfaces have been worn off almost without a trace. Nevertheless, the similar size and worn surfaces of the fossils show that they were likely used as marbles because clay balls and sometimes pebbles of similar size are common finds in medieval towns and rural settlements; in addition, playing with marbles has been proved by medieval written sources and gravures (see below). The find context of the balls does not allow precise determination of

Fig. 7. Bryozoan fromTartu. TM A 50: 98.

their function – they were found all over the 2464 m² large excavation plot; at least one was discovered in the vicinity of an oven and one under a pavement of a modern period smithy where no prehistoric or medieval finds were gathered. Most of the balls were found separately, but there was also one set of two and one set of four balls. These two sets were discovered from neighbouring squares and can refer to forgotten or deliberately abandoned playthings. The others that were found singly may have been accidental losses. Although the fossil found from the pure soil under the pavement imply that the balls could be natural finds in the soil, their worn surfaces and similar size instead suggest that they were consciously brought to the site, perhaps from the fields nearby.

Fig. 8. Bryozoan, Echinosphaerites and Cyclocrinites fossils from Vaida settlement site. AI 6248.

Elsewhere in the world, I have come across only a few records of Bryozoa fossils in archaeological contexts. For example, seven fossils were gathered from the site of Harris of Mogollon culture (New Mexico, USA) dating to the 2nd half of the 1st millennium. One of the fossils has a bored hole indicating its use as a pendant. The fossils were associated with certain household rituals and interpreted as deliberate building offerings under the floor, in the walls and under the roof (Key *et al.* 2014, 399ff).

5.2.1.1.6. Trilobites

Only three fossil trilobites have been collected from archaeological sites, but two deserve a longer discussion. A fragment of thorax and pygidium has been collected from Pirmastu village cemetery (VM 8873; Tab. 1: 38; Fig. 9: 1) by

schoolchildren together with a few coffin nails, a finger-ring and some copper coins. However, as the specimen was not gathered in association with any burials, it could have been picked up as a curious stone from the moraine. The other, a pygidium fossil (AI 3993: 204; Tab. 1: 26; Fig. 9: 2), was found from Mustivere settlement site. This example has a very smooth surface and could have been used as a talisman worn in a pocket or a pouch. The use of trilobites as special finds is suggested by a few Palaeolithic finds, *e.g.*, from Grotte du Trilobite. It has been named a beetle stone, an ant stone or a scorpion stone in lapidaries since the Antiquity. Their magical use according to sympathetic magical principles involved aid against the poisonous sting of scorpions, but the fossil is known to be used as an aphrodisiac (Liñán *et al.* 2013, 47). Both in Pirmastu and Mustivere the fossils could have been regarded as beetles turned into stone and considered significant because of that.

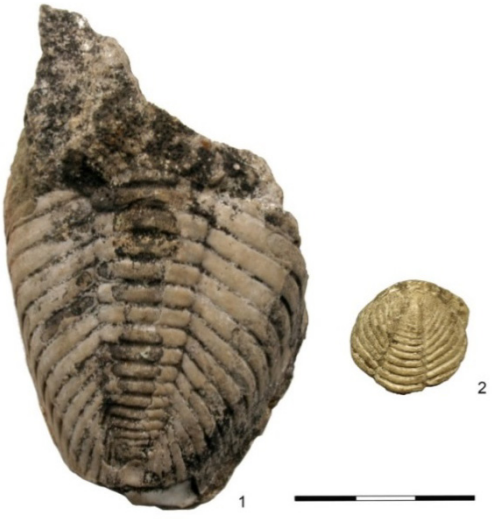

Fig. 9. Trilobite fossils from 1 Pirmastu (VM 8873) and 2 Mustivere (AI 3993: 204).

5.2.1.1.7. Cyclocrinites

Altogether 11 *Cyclocrinites* fossils were detected among the fossil finds in archaeological contexts. Out of these, the intact specimen from Maarja churchyard (TM A 35: 544; Tab. 1: 24) in Tartu is noteworthy. The find context of the fossil by the northwestern churchyard wall, apparently from the debris layer, does not allow its association with actual burials. As the churchyard wall was laid of large boulders and bricks (Malve *et al.* 2012, 139), which were available locally, limestone was very likely not used. Therefore, it is improbable that the fossil has weathered off from a limestone slab; instead, it was likely deliberately brought to the site.

Fig. 10. *Cyclocrinites* fossil from Tartu St. Mary's churchyard. TM A 35: 544.

5.2.1.1.8. Pseudo-fossils

Altogether 110 round and oblong limestone pebbles with natural holes and furrows (or pseudo-fossils (Fig. 11) have been gathered from 33 find places. These have been collected by archaeologists mostly as net-sinkers or beads and have often been identified as fossils. Several have been gathered as stray finds; so apparently they have often been regarded as something human-made. Technically they are not fossils; according to Männil (1966) they are petrified and impregnated by phosphate material, broken off from the seabed and rounded by waves; burrowing activity of different organisms created holes and furrows. Valter Lang, who gathered 14 from Viimsi I *tarand*-grave, considers these to be formed by nature (Lang 1993b, 37), but the furrows have been partly deepened to get penetrating holes. In some cases, it seems as not only the penetrating hole has been deepened, but also the side furrows, perhaps to make them more similar to glass beads. The similarity with glass beads can be followed namely in these sites where both glass beads and pseudo-fossils have been gathered, like in case of Viimsi I (*e.g.* AI 5014: 159, 277). The similarity with especially melon-shaped glass beads can be followed in case of one specimen from Lehmja settlement site (AI 5310 VII: 502). However, some stone beads are bigger and more robust, so it has been suggested that they might have been used as loom-weights or spindle whorls instead (Lang 1993b, 37). A parallel can be drawn with *Porosphaera globularis* sponge fossils which are the most common fossil finds in early medieval Anglo-Saxon sites. They are round, with a natural hole, and numerous in local Cretaceous bedrock and moraine.

Fig. 11. Pseudo-fossils and a fragment of a cephalopod fossil from Pärnamäe. TLM A 14.

They have been used in necklaces as beads, but loose finds in settlements allow the conclusion that in case of many we are instead dealing with the most usual type of 'holed stones' (Meaney 1981, 116). Stones with holes were called hag stones in British folklore and were used generally against witchcraft and nightmares and it is suggested that they were regarded as such already by the Anglo-Saxons (*ibid.*). Pierced stones have no particular folklore in Estonia, except that ear stones could also have been holed pebbles. However, there are a few pebbles with drilled holes preserved in the folk medical collection of ENM: a limestone spindle-whorl used for cupping (ERM 7403), a small, only 1.5 cm in diameter, pebble used to cure diarrhoea in cattle (ERM A 509: 6158), a limestone pebble with small hole used as an ear stone (ERM 751: 69) and an egg-shaped pebble with polished surfaces with a small drilled pit used in witchcraft (ERM A 509: 6368; Article 4, fig. 2: 5). These examples could suggest that holed stones generally could have been valued here too (see also Fig. 17).

The described pierced pebbles from Estonian sites could have had different functions. The set gathered from Viimsi I *tarand*-grave could have been used as beads; the gastropod fossil, very likely worn (see above), adds confidence to this suggestion. They could have been regarded as having apotropaic protection and therefore added to the grave. Some could have been used as net-sinkers or loom weights, such as six items gathered as stray finds from Pärnamäe as net-sinkers (TLM A 14; Fig. 11) or two from Rutiränk Late Iron Age stone grave together with several deliberately pierced limestone pieces (AI 3884: 3816). In the case of the latter find, we might be dealing with a fishing-net placed on top of the grave, so the deliberately pierced limestone pieces, as well as these pseudo-fossils, could have been used together as net-sinkers. In many cases, the pseudo-fossils have probably been collected as curiosities and never used, *e.g.*, when the hole has been cemented by sediments and the item is unsuitable for hanging. However, these have always been found together with the ones with penetrating holes. So they must have been collected together, brought to the site and the existing furrows of some deepened to get penetrating holes, but some left untouched. Holed limestone pebbles could have been used also as playing pieces, especially when found from settlement sites (see also below). The majority of the pseudo-fossils have been gathered locally and mostly from the northern Estonian parishes; however, there is at least one, found from the pond of Kurna manor, which is of bluish-grey, probably Cretaceous flint covered with white patina. It could be another flint pebble that reached the Estonian coast with the ballast of cargo ships common in the medieval and modern period, but perhaps it was actually imported as a hag stone? Unfortunately, the find context does not allow any conclusions.

5.2.1.1.9. Non-fossilised shells

A few words are in order for non-fossilised shells. One of the few debated examples is the river shell *Margaritifera margaritifera* found from burial no 2 in the Late Neolithic Corded Ware Culture burial site in Sope. Its find context

next to the knee of the deceased suggests a deliberate grave good. It is known that similar shells were found with other burials in Sope but these were so poorly preserved that were not collected (Indreko 1933). The location of the find did not allow interpretating it as jewellery or clothing accessory so that it could have been placed in the burial as a vessel or for symbolic reasons. Necklaces made of the beads produced from the shells of the same species as well as perforated shell discs of *Margaritifera margaritifera* and *Margaritifera auricularia* have been found from the Corded Ware Culture burials in the Czech Republic and Elbe-Saale region in Germany (Turek 1997; Kyselý 2017). The oval shells have usually been worked into rounded shape, covered with pitted ornament and often have two perforated holes. In this way, they have been interpreted as having been fastened to clothing, thus serving as brooches or studs (Kyselý 2017). They have usually been placed near the head and under the knee, similarly to the shell from Sope. They have been paralleled with amber discs found from the Baltic and Ukrainian Corded Ware Culture burials as well as similar bone and antler discs further west (*ibid.*). The discs with pitted ornamentation often creating a cross have been interpreted as solar symbols (Šturms 1956). The shell discs are usually associated with female burials (Kyselý 2017). Although nothing is known about the other shells from Sope, the preserved specimen shows clear parallels with the Central European custom, such as the species and the location of the shell in the knee area. However, there are differences too – the Sope shell has neither been worked nor ornamented and is therefore different from round amber discs.

The most widespread non-fossilised shells in Estonian archaeological contexts might be cowry shells (*Monetaria moneta*), common in burial sites since the Late Iron Age, but especially in the 13th–15th century (Valk *et al.* 2014). They have generally been used as adornment in necklaces and wreaths; their apotropaic magical meaning has been suggested as well. Also, oyster shells are widespread, but mostly in medieval and modern town contexts. Despite being food leftovers, they were used in folk medicine. For example, according to Wilde (1766, 17f) oyster shells that were collected from the streets, had to be boiled, ground into pieces and used against stomach-ache and cold.

A boxful of snail shells has been gathered from Soontagana hillfort. Unfortunately, these have not been considered as proper finds – they are preserved in the storage, but have not been reflected in the find list or the excavation report; thus, they are missing find context which does not allow drawing any conclusions. A handful of snail shells were collected from Iru hillfort (AI 3428: 768, 780, 787), from the area outside the end rampart of the outer bailey, between stones together with a pig's fang, an animal bone, melted bronze items, a whetstone and a piece of slag. Thus, it was decided that it not be a naturally formed heap of snail shells. It could be that we are dealing with food remains; however, the character of the finds does suggest a structured settlement deposition (comp. Herva & Ylimaunu 2009, 237). Local small river mussels (TM A 116) have been gathered from several sites where they are potentially natural finds, *e.g.* swampy areas flooded by the River Emajõgi.

5.2.2. Pebbles

Small smooth pebbles of different kind and colour have become very popular during the last years with a growing interest in esotericism (see Teidearu 2017). Crystal therapy performed with semi-precious stones and minerals can be studied at respective courses and now and then a new shop selling pebbles and teaching crystal therapy comes on the market. However, the interest in the energy and curing quality of pebbles is not new. For example, George Kunz named already a century ago the inherent trait of all mankind as 'pebble-mania' or 'lithomania' and from the most primitive man to the most modern this trait is present in a greater or lesser degree. Curious people would collect pebbles for their colours or markings, for transparency or translucence (see Kunz 1915, 19). According to Barbara Freire-Marreco, people used to carry a pebble along that had once attracted their attention and acquired sentimental value since, was ascribed a role in successful endeavours and became an amulet (referred by Meaney 1981, 88f). Also, written sources ever since they first appeared to reflect the role of minerals and pebbles both in curing practices as well as magical procedures.

However, treatments of pebbles found from archaeological contexts are scarce, and the existing ones are concentrated on the few popular and more discussed topic. Differently from fossils which have been more systematically collected by archaeologists and published without offering an interpretation, pebbles have traditionally been published only when an explanation can be found for their presence at the site. This means that more attention has been paid to the pebbles that have been modified or designed by people, but which function is unclear, *e.g.* the Palaeolithic painted pebbles (Burkitt 1926; Jochim 2008), Pictish painted quartzite pebbles (Ritchie 1972; Arthur *et al.* 2014) or Native American charmstones (*e.g.* Sharp 2000; Hector *et al.* 2005 and the references therein), all gathered from settlement contexts, and pebbles which have been found from burial sites, *i.e.* ritual contexts. The discussions of the meaning of unworked pebbles in archaeological material can sporadically be found from different periods (*e.g.* Indreko 1939; Meaney 1981; Bowden & McOrmish 1987; Ringstad 1988; Samdal 2000; Cahill 2009); however, a more systematic view to the issue has raised over the last decade when the researchers have started to draw attention to the variety of pebbles in archaeological material which need to be (re)interpreted (*e.g.* Ringstad 1988; Gilchrist 2008; Thomas 2010; Muhonen 2013; Gravel-Miguel *et al.* 2017).

The modified pebbles have been tried to be interpreted in different ways. Often utilitarian functions have been suggested, no doubt because of the settlement context but in the end, the ritual explanation is always favoured the most. Painted pebbles from the Magdalenian and Azilian settlement sites from central and southwestern Europe are rounded river pebbles smoothed by water and painted with red ochre as dots, bars, wavy lines or their combinations. The function of these mostly quartzite pebbles has not been entirely interpreted, while the equivalent of money, counting boards, talismans and simple playthings have

been proposed as their function (Burkitt 1926, 12–13). Generally, early art dominates in the interpretations, which means that painted pebbles are treated together with engraved stone slabs and bone and antler objects while parallels are found with cave art. Hundreds of engraved stone slabs and pebbles have been found from several sites in France, Pyrenees, Northern Spain, Germany, Switzerland, Bohemia and Moravia, while these are the most common in southwestern France and the Pyrenees particularly during the late Magdalenian (Jochim 2011, 107 and the references therein). The meaning of the depictions is, however, not any clearer if we name it art. Thus, it has been suggested that marking of time and seasons as economically important milestones was reflected in many objects. Some of the objects decorated with lines and dots are interpreted as 'calendars' marking the passage of time or perhaps the phases of the moon (*ibid*).

Pictish painted pebbles from the 1st millennium AD, 55 of which had been found by 2014 from sites around the Scottish Highlands and islands, is a conundrum that has not yet been fully explained (Arthur *et al.* 2014; see also Ritchie 1972). These are white beach-worn pebbles with the average size of 50×30 mm, which have been decorated with dark brown and reddish dyes. The motifs are simple but carefully made, including circles and dots, linear motifs, saltires and s-scrolls (Ritchie 1972, 299; Arthur *et al.* 2014, 5). The significance of quartz for these people has been discussed by some researchers, suggesting that the translucent and bright rock was perceived as the stone of light, symbolising the sun, life and re-birth (Arthur *et al.* 2014, 6 and the references therein; see also above). For the painted pebbles it has been suggested that these might have served as slingstones with applied owners' marks, or decoy eggs to attract wild birds, but both have been later considered as unlikely. The most common interpretation is that we are dealing with charm-stones, which were used for healing and other apotropaic magic. Proof has been found from Scottish folklore where attractive pebbles, selected for their aesthetic shape and colouration, were considered effective as aids in curing sickness in animals (Ritchie 1972, 299 and the references therein; Arthur *et al*. 2014, 7). A recent interpretation holds that painted pebbles may have been one element of a Pictish shaman's equipment, thus holding magical powers (Arthur *et al.* 2014, 7).

A third example is offered by the human-modified Californian 'charmstones' which usually have a hole in it. It has been suggested that the stones might have been used in fishing technology as net-sinkers, in warfare as slingstones or bolas, in textile production as weights, in different tasks as pestles, rubbing stones or hammers, in ornamentation as pendants or ear ornaments, in religious or ritual use as amulets, charmstones or phallic representations, as drum rattles, plummets or game stones (Hector *et al.* 2005, 7, Tab. 1). Ethnographic data rather support their using as different charms in fishing, hunting, rainmaking, to control wildfire and bring fresh air into the house, as well as curing means and love charms (Sharp 2000, 241, Tab. 1). Although ethnographic analogues support the ceremonial or symbolic explanation, these are generally treated with suspicion by archaeologists, as indicated by Sharp (*ibid*, 235). The case of charmstones shows how many different possible uses a pebble could

have, whereas using the stone as a utilitarian tool, *e.g.* a net-sinker or a loom-weight, does not exclude considering it a charmstone.

In some cases, the deliberate modification of pebbles is a matter of discussions (comp. the debates concerning the *Phorosphaera* sponge fossils; also, the question whether the holed limestone pebbles [pseudo-fossils] from Estonian sites have natural perforations or were bored deliberately, should be reminded here). A case in point is formed by the study of broken pebbles found from the Palaeolithic burials in Spain which have been sporadically collected but never interpreted. The research emphasises the significance of the seemingly accidentally broken pebbles that lack clear traces of human modification, their careful collecting and documenting to make further conclusions. The authors investigated 29 oblong pebbles with the maximal diameter of 10 cm, compared the relationship of their length, width and thickness with the corresponding measurements of the beach pebbles and concluded that the pebbles were collected from the nearby beach and had to have been carefully chosen. The traces of ochre on many indicate that several could have been used to smear ochre on the dead bodies and some were deliberately broken after that (Gravel-Miguel *et al.* 2017).

The main conclusion about the trends in interpreting unmodified pebbles is the explicit dependence of the interpretation on the type of archaeological site in question. A good example are slingstones – according to Mike Seager Thomas (2013), beach pebbles from the British hillforts have uncritically been assessed as slingstones, although they might have had other uses. Similarly, burnt pebbles from occupation layers have usually been acknowledged as potboilers, although the term is considered outdated by now and has been replaced by more neutral fire-cracked-rocks, which could also have had more functions than heating liquids in pots (Thomas 2010, 357).

The context determines that in case of burial sites the presence of pebbles, if interpreted, is generally thought to have symbolical or magical meaning, with only a few exceptions, *e.g.* considering the raising of certain body parts (see above). The magical and symbolical interpretations are the most accentuated in case of white quartz(ite) pebbles. The using of white quartz pebbles in burial rituals and other ritual contexts has been studied since the beginning of the 20th century (Lebour 1914); these have been documented in the prehistoric, Anglo-Saxon and Medieval British graves (Evans 1897; Meaney 1981, 88ff; Daniell 1997; Gilchrist 2008; Arthur *et al.* 2014; for Scottish burials see Black 1894, for the Isle of Man burials, see *e.g.* Kermode & Herdman 1904) sometimes in great quantities, accompanying inhumations as well as cremations and found around the graves, inside or among the filler stones. In some cases, *e.g.* the Burgie near Forres, their transportation to the site from the distance of several kilometres has been proved (Arthur *et al.* 2014, 6). Quartz as a mineral has been interpreted as an amulet against witchcraft and illnesses (Ringstad 1988, 339), the symbol of water and regeneration (Gilchrist 2008, 151) or the sun, life and re-birth (Arthur *et al.* 2014, 6 and the references therein). The latter interpretation rests upon the quartz' translucency and the ability to reflect light, which is provided

in quartz flakes and not the crusted pebbles. In the case of Mull Hull in the Neolithic Isle of Man, quartz pebbles believed to have been brought from the sea-shore were found from the burials as well as settlement sites (Kermode & Herdman 1904, 34). In the latter case, these were interpreted as fire-striking stones and potboilers, while their presence in burials seems not to be connected to either of these interpretations. The stones were found scattered through the grave without obvious arrangement or carefully deposited on the floor around the urns. Kermode & Herdman (1904, 39) proposed that the pebbles might refer to the *superstitious dislike the natives still have to the use of the 'claghbane' or 'white stone'* to such an extent that the fishermen will refuse to go to sea in a boat which has a white stone in the ballast. Audrey Meaney (1981) has also paid thorough attention to pebbles in the Anglo-Saxon cemeteries. According to her, these might be missed during excavations, unless explicitly associated with the body. The gathered ones are predominantly quartz, and Meaney suggested that quartz pebbles as attractive specimens were the most frequently used and picked up also by the modern man, so the dominance of quartz pebbles in archaeological material might have been more due to the excavators and less the Anglo-Saxons (Meaney 1981, 89). However, the dominance of namely quartz among pebbles has been observed by later researchers as well (Gilchrist 2008, 138f). Meaney concluded that several examples of quartz pebbles in graves as well as Pictish painted quartzite pebbles reveal that this mineral probably had magico-religious meaning for the inhabitants of the British Isles (Meaney 1981, 90). Quartz pebbles have also been found from the Scandinavian graves, *e.g.* in Norway, Bjørn Ringstad (1988, 339) has interpreted seven small white quartz pebbles from a Migration period female grave in Kvåle in Sogndal as amulets against witchcraft and illnesses, although they might have been playthings accompanying the other burial in the same grave – that of a 8–12-years old child. The other grave goods, such as an Early Neolithic diabase stone axe, pieces of rock crystal and mica as well as a miniature silver mask (Ringstad 1988) might still suggest a magical meaning of the set of grave goods. Magne Samdal (2000) mentioned quartz pebbles from the western Norwegian Iron Age graves. Quartz flakes have been abundantly met west from Estonia, especially in Sweden where quartz has been added to stone graves and barrows since the Bronze Age until the Viking Age, and the amounts vary from a single flake to 500 (Tiraholm) or even 1000 kilograms (Sannarp) (Carlie 1999, 54). Anne Carlie considered the white colour of the rock to be the primary reason for adding quartz into the graves; she connected the colour with fertility cult used in burial rituals to symbolise life cycle and rebirth. She saw the magical and apotropaic function of white stones, especially in graves where quartz had been gathered in large quantities, the crushed pieces built in the grave construction and often the layer of quartz placed on top of the grave as to protect it (Carlie 1999, 55–57). We have a few similar cases in Estonia too, for example, Roman Iron Age *tarand*-graves in Võhma and Uusküla, where the deliberate breaking of quartz pebbles on graves has been suggested (Lang 2000, 160). As quartz and rock crystal have been mentioned as valued thunderbolts since the Antiquity,

the use of quartz as an apotropaic mineral in the mentioned contexts is plausible. It is likely that although the general apotropaic idea may have dominated the pebbles and crushed quartz were perceived slightly differently. Both in Estonia as well as western Norwegian Iron age graves (Samdal 2000, 55, Tab. 5.2.2h) where similar statistical analyses have been conducted, quartz pebbles make up one-fifth of all gathered pebbles whereas among rock flakes quartz is still the most common. So all round and smooth pebbles could have had a similar meaning as lucky stones, but they could also have had different connotations (thunderstones, raven stones) due to their colour (*i.e.* mineral content) and thus also been used slightly differently.

5.2.2.1. The case of Estonia

Estonian archaeological collections hold numerous pebbles that have been collected just in case – they have neither been interpreted in find reports nor reflected in publications. To concentrate the source material I looked through all existing reports and databased everything that was named simply as stones, more descriptively round, smooth, interesting stones, or more interpretatively curing stones, toadstones, snakestones, massaging stones and bewitching stones. I also inspected grain grinding stones (in Estonian *jahvekivid*), whetstones (in Estonian *lihvimiskivid*) and hammerstones (in Estonian *löögikivid*), *i.e.* artefacts with a specific function that is generally accepted by the researchers and that were named as such in the excavation reports. However, I only included those grain grinding stones, whetstones and hammerstones in further analysis for which I considered additional functions or which I interpreted differently than the excavating archaeologist. In addition to pebbles, I inspected stone flakes, fragments of ground stone artefacts and pieces of raw material, almost exclusively gathered from the Stone Age sites. In case of the majority of these, we are dealing with flakes of different crystalline rocks, probable residue from making axes and adzes or their fragments. A certain amount of stones were apparently picked up during excavations as pottery sherds but kept in the find collection; the majority of this kind of stones has undoubtedly been discarded once the error became apparent. The latter two kinds of stone finds were left out of the further analysis. I do realise that as discussed above in association with valued quartz pebbles and flakes, there is no reason to exclude granite, gneiss or amphibolite flakes from further debate, since these, similarly to pebbles of the same rock, might have had other values than merely raw material. Also, round waterpolished pebbles revealed at settlement sites might indicate at them having been collected as raw material, especially in the case of the Stone Age sites. Nevertheless, flakes of crystalline rocks are connected mainly with the Stone Age sites, but could this be the subconscious designing of the source material? Interestingly, flint and quartz flakes have been gathered from sites of different periods, perhaps since these are interpreted as potential tools. It is likely that flakes of crystalline rocks revealed in sites later than the Stone Age have not

been associated with tools by the excavating archaeologists but rather considered as the remains of some occasional event, *e.g.* as pieces of fire-cracked stones, and were not gathered because of that.

The final selection embraces 587 pebbles from 133 archaeological sites (Tab. 2), but the number of collected pebbles must be larger because of the missing find reports and lists. The final choice includes pebbles that are on the average 3–6 cm in diameter, but remain between 1 and 10 cm. The majority of pebbles have a regular round or oval cross-section but flat longitudinal section; however, there are a few ball-shaped ones. There are pebbles with smoother and rougher surfaces; often the state of smoothness is determined by the rock – the coarser-grained granite is impossible to be polished entirely smooth. The colours of pebbles are very varied – white, pink, red, bluish grey, brown, black. The colour is dependant on the rock, which in all cases are locally found (from Estonia) and mostly very common. All databased stones were examined in the find collections, described and the majority photographed. The raw material was adequately (with the help of Juho Kirs) determined in case of a selection (95) of pebbles, while I myself assessed the material of the rest. The microscopic study with the stereo-zoom microscope Nikon SMZ1000 was conducted on 81 pebbles that either revealed some usewear with the naked eye or which shape and size suggested function (polishing/smoothing) that needed confirmation. Certain usewear (*e.g.* traces of grinding, fine lines, scratches) was detected on 13 pebbles.

The analysed pebbles could be divided according to their qualities (size, shape, smoothness, visible use-wear, when possible also detailed find context) between several possible functions that are ascribed to pebbles in ethnographic as well as archaeological material in different parts of the world, *e.g.* pottery burnishing pebbles, ammunition stones, potboilers, gaming pebbles, hammerstones, whetstones, grain grinding stones as well as curing and apotropaic stones. As we lack exact find context for the majority of the pebbles and some function has been suggested for the collected pebbles by the excavating archaeologists only in individual cases, the discussion runs on speculative trails, and the suggested statistics (Tab. 2) should be taken with great reservations. Many of the pebbles were counted under different groups, *e.g.* burnishing stones were in many cased also counted as curing stones since both could be relatively small and with smooth surfaces; similarly, several ammunition stones were also regarded as potential potboilers. Especially troublesome is the case with curing and apotropaic stones and gaming pieces because no specific physical requirements can be found for them. Finally, despite some remarkable examples, the possibility still remains that a number of pebbles occur at the sites due to geological formation processes and people have not ascribed meaning to these. However, this notion does not mean that human-related meanings should not be sought for.

Above various reasons why archaeologists have chosen to gather pebbles were discussed. Now the question arises why pebbles appear in sites at all. The assessment of possible functions follows (see below), but at first, it should be evaluated whether the pebbles collected from archaeological sites have been

significant for the past people at all. One possibility to find this out is to ascertain whether smooth/polished pebbles have been brought to the site consciously or they are part of the soil where the occupational layer has been deposited and the inhabitants have actually not paid attention to these. If it is proved that the stones were brought to the site, different possibilities for further discussion arise – whether the pebbles were collected as curiosities or because they were considered suitable for specific tasks. In the first case they could have obtained a function also afterwards, *e.g.* they could become toys.

First, deliberate bringing of pebbles to a site is certain when the rock of the pebble is foreign to the area or its particular qualities, such as polished surfaces or roundedness, indicate that we are dealing with a pebble from a particular geological environment. Approximately 90 per cent of all pebbles in archaeological collections are of different granites, which is one of the most common rocks in Estonian soil. The rest are sandstone, limestone, amphibolite, gneiss, feldspar, quartzite or ghoetite, which all can be found all over the country. The only exception is formed by the four pebbles of Suursaari quartz porphyry that can be found only in the eastern part of Estonia (Juho Kirs, pers. comm., 26.04.2017; Fig. 2). One of the pebbles was found from Narva Joaorg (AI 4104: 83; Tab. 2: 54), a multi-period site in northeastern part of Estonia, the other three (AI 5937 II: 1045, 554; 6004 III: 126; Tab. 2: 97) from the medieval and modern period settlement of Härjapea, presently in the centre of Tallinn in northwestern Estonia (Lavi 1992) (Article 5, fig. 2). The latter pebbles have been brought to the site from a distance of 200 km, while ice transport is not possible. Thus, they must have been considered important by the users. The three deep black coloured pebbles are 2–3 cm in diameter with a very smooth surface. It is challenging to assess the actual use of the pebbles at the medieval and modern site, and the context of the finds in the occupation layer with pottery and glass shards and pipe fragments does not enable a more specific function. Two possibilities could be suggested. In the medieval and modern period archaeological contexts round clay balls and sometimes also pebbles have frequently been interpreted as marbles (*e.g.* Höltken & Trier 2012, 177; Søvsø 2012, 530f; Veeckman 2012, 74). The pebbles of the Härjapea site are of a natural oblong shape and thus not suitable for marble rolling, but they could be used in some other pastime as gaming pieces. However, one is not expected to import a gaming piece from a distance of 200 km. So it seems as the black colour of the pebbles, not very common among local Estonian rocks, has been important for the inhabitants. According to Estonian folklore texts, black pebbles make up one type of thunderstones used in curing and apotropaic practices. Also, raven stones (in Estonian *kaarnakivi*) are described as small and black pebbles (Eisen 1926, 313). According to Kreutzwald (1856, no 39) raven stone were believed to cure erysipelas, swellings, eye inflammations, toothache and lots of other diseases. A black, though significantly bigger (with the diameter of 11 cm) smooth pebble is stored in the folk medicine collection of the ENM as a raven stone (ERM 7797) and has been used to rub skin conditions. Elsewhere in Europe small smooth lens-shaped black stones around 3 cm in diameter were

sometimes regarded as serpent stones or adder stones in medieval and modern period written sources. These pebbles that were believed to have been obtained from the head of the snake were used to prevent and cure snake bites by pressing the stone against the wound (Pymm 2016, and the references therein). So there is a strong possibility that the three pebbles were regarded valuable and thus brought to the site from a significant distance. By oral tradition, we can speculate that the reason for this was some (apotropaic) magic or healing practices.

The original environment of pebbles is challenging to be ascertained, but it could be suggested that the pebbles with moderately polished surfaces are of glaciofluvial origin, rounded and smoothed by Ice Age rivers, and can thus be found from the moraine. Very smooth pebbles might, on the other hand, derive from existing waterbodies and have therefore been brought to the site from some distance. Ball-shaped pebbles can be found from glacial potholes which are rare in Estonia; thus these must have been imported or rounded by human hand (Juho Kirs, pers. comm., 14.12.2016).

Second, the importance of pebbles for people is indicated at by the changing of their natural shape or using. For example, the already mentioned ball-shaped stones but oblate or slightly double-conical pebbles too suggest deliberate modification, probably as an outcome of some grinding. Also, many pebbles with smooth surfaces may have been polished during their use. Microscopic use-wear analyses might help out here; however, the polishing of pebbles in water or a pocket might not show different use-wear.

Third, bringing pebbles to a site might be suggested by finding pebbles from the occupation layer together with other finds (*e.g.* potsherds), but since the occupation layer forms into the natural soil, it cannot be proved. Deliberate behaviour may be considered quite certain when the context of the find is special, like pebbles brought to the site to accompany burials (Sope, Tamula, Raatvere) or when pebbles show intentional and repeated use, *e.g.* heating.

5.2.2.1.1. Grinders, burnishers, smoothers

The role of pebbles in different grinding and polishing activities has been discussed in several publications where using pebbles in pottery production, hide and skin processing, polishing stone and metal artefacts have been discussed (*e.g.* Cahill 2009; Skochina *et al.* 2016 and the references therein). Lately, a few studies analysing the microscopic evidence of wear traces have been issued (Skochina *et al.* 2016; Rodríguez Rodríguez *et al.* 2017). Perhaps the most well-known function of pebbles is their use in different stages of pottery production, especially burnishing. According to an example from Gran Canaria in the 1st millennium AD, potter's kidneys (for raising the walls of the vessels), rasps (for removing grit and impurities from the surfaces of the vessels), smoothers and burnishers were used (Rodríguez Rodríguez *et al.* 2017). In some places, the collected pebbles amount to hundreds, for example, among the lithic

inventory of the Native American settlements in the area of Silver Creek at the beginning of the 2nd millennium (339 pebbles, Valado 2014) or the lithics of North-Arizona indigenous people (Woodbury 1954). Pottery polishing stones are still used as a living tradition among Native Americans and even special artificially polished pebbles are sold to the potters. In the living tradition and among archaeological finds we are not dealing with specially produced tools but simple waterpolished oblate pebbles with the diameter of approximately 2–3 cm. The same has been indicated by the experimental potter Jaana Ratas, whose pebbles have been gathered mostly from the beach (Jaana Ratas, pers. comm., 14.10.2016). Ball-shaped pebbles are not suitable. So although burnished pottery is not very common in Estonian archaeological collections, it is very likely that polishing pebbles have been found and can be found from our settlement sites. Since pebbles are also suitable for smoothing the surfaces and shaping the surfaces of the vessels, we should find more pebbles used for designing pottery in different ways than just burnishing from different periods.

The glossy surfaces of some sherds of the Late Mesolithic Narva type ceramics have allowed suggesting that burnishing the fairly dried surfaces with pebbles was practised in Estonian territory already since the start of pottery production (Kriiska 1995, 71). Potsherds with polished surfaces have also been found from the Late Bronze Age and Early Iron Age contexts (Lang 2007, 128, 132, 135), but the fine-grained ceramics with polished, almost burnished surfaces is especially characteristic to the second half of the 1st millennium and the Late Iron Age (Tvauri 2005, 85). It is suggested that before burning the surface of the vessel had to be rubbed with a pebble or a bone (*ibid*.) or a piece of a linen or woollen cloth (Jaana Ratas, pers. comm., 14.10.2016) to gain the burnished surface. From the ethnographic and contemporary sources, we know that pebbles are used for that purpose very often (Rodríguez Rodríguez *et al.* 2017). However, Estonian Bronze and Iron Age sites have not yielded any tools that could be used for polishing or smoothing the surfaces of the pottery vessels. In Estonia, only a single pebble described in the find report as 'a pebble used in pottery production' has been gathered from the excavations of Asva Bronze Age fortified settlement in the 1960s (AI 4366: 1062; Tab. 2: 5). This is a relatively large (8 cm in diameter) regularly shaped oblate pebble of biotite-amphibolite-gneiss, unsuitable for polishing, but has grinding traces on edges, being more suitable for moulding the inner surface of vessels (Jaana Ratas, pers. comm., 14.10.2016), thus used as the potter's kidney or a rasp (see Rodríguez Rodríguez *et al.* 2017). The best possibility to find out whether we are dealing with a pebble used for pottery making is conducting use-wear analyses, which have, for example, been carried out in America (*e.g.* Silver Creek area, see the results in Valado 2014), Gran Canaria (Rodríguez Rodríguez *et al.* 2017) and Tobol (Skochina *et al.* 2016). Valado emphasised that microscopic evaluation was necessary, as macroscopic observation might not show sparse polish and light scratches (Valado 2014 and the references therein). Microscopic studying of the pottery polishing stones experimentally used by Jaana Ratas revealed that the hard rocks, such as quartz and quartz porphyry do not show traces of use-

wear even after long-term exploitation, whereas softer rocks, like poorly cemented quartzite and limestone, show clear lines and scratches (Fig. 12). In addition to the hardness of the rock, the visibility of use-wear is affected by the composition of the clay – when clay is mixed with softer additives, such as crog or plant remains, the use-wear traces will appear on the pebble after much lengthier usage than in case of harder additives, like sand or stone rubble. The precedent processing of the vessel surface and the humidity of the clay also affect the appearance and character of the wear traces (Valado 2014). In Estonian archaeological pebble collection, I discerned 19 possible polishing stones by the shape and size as well as the character of the surface wear (*i.e.* linear traces, polish) on the pebble. These are on the average 2–5 cm in diameter, oblate fine-grained and waterpolished pebbles, and some have traces of reddish or grey soil or clay on the surface, which could verify the interpretation, although it could also be the residue of the soil it was buried in.

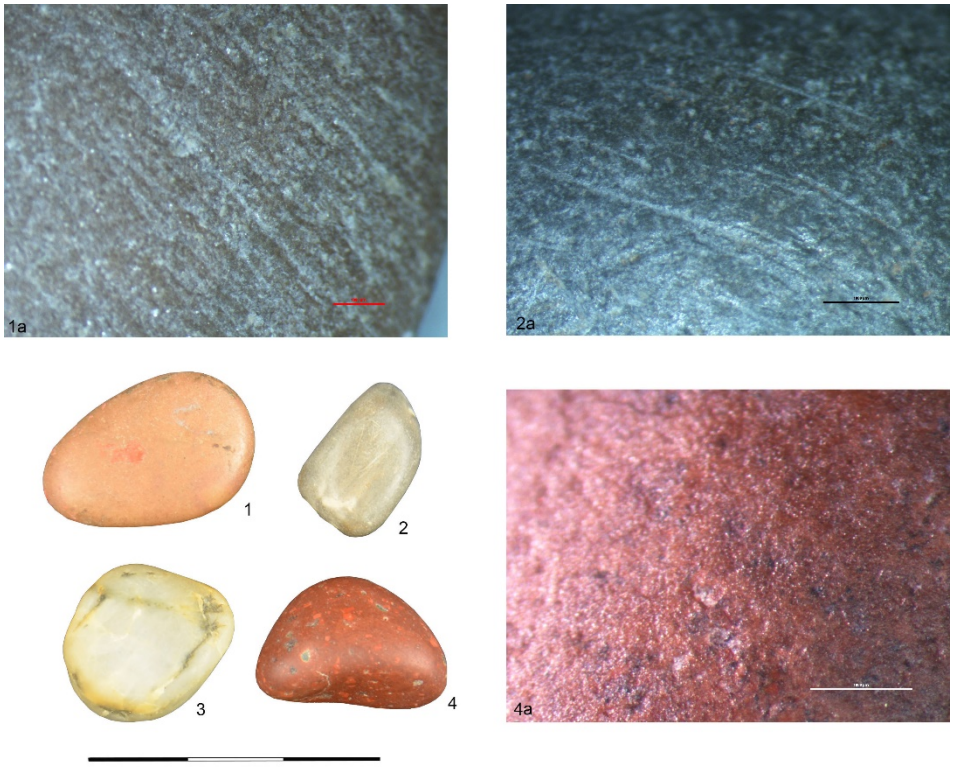

Fig. 12. Experimental pottery polishing pebbles used by Jaana Ratas. 1 – poorly cemented quartzite, 2 – limestone, 3 – quartz, 4 – quartz porphyry. Microphotos: stereo-zoom microscope Nikon SMZ1000, magnification 40x (1a, 2a), 80x (4a).

Possible polishing stones are the most numerous in Asva fortified settlement (n = 9; Tab. 2: 5) and Iru fortified settlement (n = 7; Tab. 2: 9). Regular linear traces similar to the experimental polishing stones were found on three pebbles from Iru hillfort (Fig. 13), two of them fine-grained granite (AI 4154: 15, 50) and one feldspar (AI 4154: 125). One pebble from Iru settlement site (AI 3429: 892; Tab. 2: 10) also revealed linear traces and some greyish substance (clay?) on its one side. Other pebbles have light irregular scratches or polishing, which might also be natural. As said above, experiments have shown that hard rocks might not reveal polishing traces very easily, so the four pebbles from Iru must have been heavily used. Rest of the possible polishing and smoothing pebbles are granite (6), gneiss (2), quartzite (3), flint (2), limestone (1), sandstone (1), amphibolite (1); thus, most of these are hard rocks which in case of moderate using might not reveal any traces. Two pebbles from Asva, those named toadstones by Indreko, revealed traces of reddish clay on their side. Burnishing pebbles should be very fine-grained (Rodríguez Rodríguez *et al.* 2017), but the two from Asva are of medium-grained granite and could instead have served as smoothers or potter's kidneys. Two pebbles from Lüganuse are of interest here too. They were found together with several whetstones in a single depression (Fig. 1) which might refer to a buried collection of polishing and grinding tools, perhaps a structured deposit in a settlement site. Microscopic analyses of the pebbles did not reveal any linear traces that would prove using them for grinding or polishing. Perhaps the most apparent regular linear traces can be followed on a granite pebble with the diameter of 5.5 cm, found from Kuusalu I settlement site (AI 5099: 212; Tab. 2: 35; Fig. 14). I suggest that this could have been used as a pottery smoothing stone too. It is noteworthy that this pebble is one of the few that have been gathered as a tool – it was named a massaging pebble (in Estonian *soonetetasumise kivi*) in the unpublished find list (*Kuusalu…* 1978–1980). A used pebble, named as a slingstone in the unpublished find list (Saadre 1952), has been found from Otepää hillfort (AI 4036: 248; Tab. 2: 60). It is perhaps too round and thick to be suitable for any pottery production activities, but the linear crossing traces show that it has been used for something, perhaps polishing some metal artefacts as suggested for similar traces by Skochina *et al.* (2016). It has been suggested that the majority of pebble tools could be and were used for several functions; in the Tobol area, the most numerous pebble tools were those used both for dressing hide and skin as well as pottery burnishing (Skochina *et al.* 2016, 80). For making more reliable conclusions about the pebbles with usewear traces from Estonian sites, several experimental studies should be conducted to compare experimental and archaeological traces. These studies would have to remain in the future. However, in the current research, I wish to highlight the potential of pebbles for different grinding-abrading-polishing activities. So pebble tools are clearly under-represented in the archaeological material.

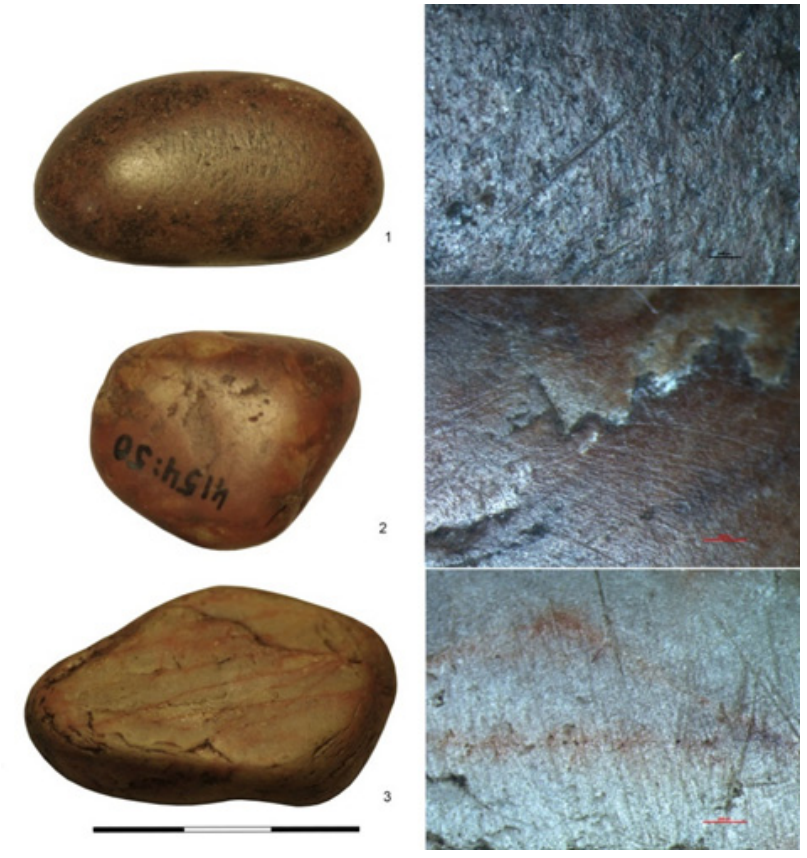

Fig. 13. Possible polishing pebbles from Iru hillfort (AI 4154: 15, 50, 125. Microphotos: stereozoom microscope Nikon SMZ1000, magnification 40x.

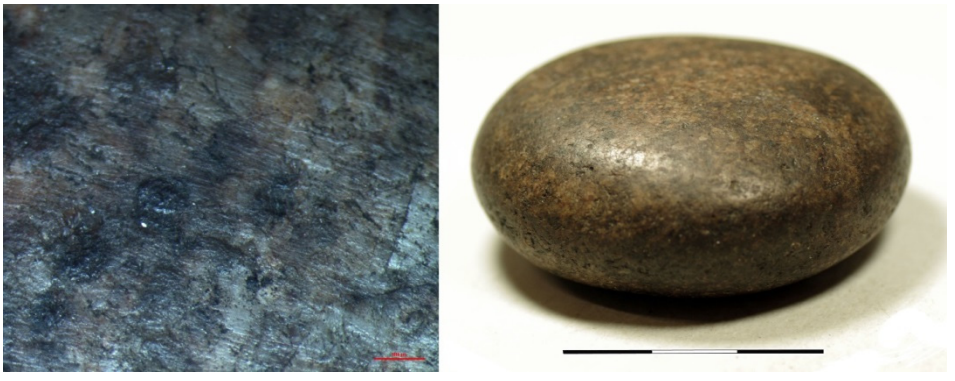

Fig. 14. A massaging pebble from Kuusalu I settlement site. Considering the use-wear, it was probably used as a pottery polishing pebble. AI 5099: 212. Microphotos: stereozoom microscope Nikon SMZ1000, magnification 40x.

5.2.2.1.2. Potboilers and hearthstones

Concentrations of burnt and fire-cracked stones in settlement sites are widespread in the archaeological material everywhere in the world. Numerous stones in different sizes found in archaeological and ethnographic contexts have been interpreted as parts of cooking pits, saunas or potboilers (see Thomas 2010 and the references therein). For example, Adam Chadwick (2015, 43–45), while discussing his excavations in Wattle Sykes, interpreted smooth pebbles brought from waterbodies as potboilers that could have been used in ceramic or leather vessels to heat water and larger cobbles as parts from baking depressions. Payson Sheets (1994) discerned three possible origins for burnt or smudged stone fragments: the larger cobbles could have been used to support vessels in fires, smaller ones to roast food or boil water. Sheets suggested a way to make sure on the basis of the stone flakes which function these might have had. He admitted, though, that this kind of analysis has to be done on the field while preserving all burnt stone rubble in museums is unthinkable. However, it would be wise to document the locations of burnt stone on the spot. Potboilers have got their name after fire-cracked stones found from clay vessels at British Bronze Age settlement sites. Thomas has directed attention to the fact that there are unburnt stones among the pebbles in the vessels and often the stones leave the impression of having been packed into the pots, so we are rather discussing structured deposits in pots than *in situ* potboilers (Thomas 2010, 361 and the references therein). Thomas with his experiments has also tried to show that heating water to boil an egg while constantly replacing cooled-down stones against new ones is very time- and wood-consuming and thus not really cost-effective; however, he does think it possible that water was heated this way as a part of a (funeral) ritual, for example, to produce smoke (see Thomas 2010 and the references therein). Contrary, according to Skibo *et al.* (2009, 59 and the references therein), the placing of hot rocks, from 400 to 600°C into a small vessel brings the water temperature to boiling immediately; thus, stone boiling is considered as the fastest way to boil water (see also Sheets 1994, 217).

In Estonia, the archaeological material of sites from different periods contain burnt or smudged cracked fist-sized or bigger stones that are usually considered a sign of a settlement site; however, the activities which left them behind, have generally not been discussed. The fire-cracked stones have not been systematically collected, although they appear now and then in find collections, *e.g.* some fragments of bloated pebbles were gathered from Narva-Jõesuu IIa settlement site (Kriiska & Nordqvist 2012, 23). Ain Lavi has explained the burnt stones from the occupation layers of the remains of medieval buildings as the remains of the stoves – after dismantling the building the stones from the stove were scattered too. Stones outside building remains have been interpreted as sorted out stove stones, that were later used, for example, to pave the surrounding of the house (Lavi 1997, 90). While interpreting burnt stones, we are dealing with common knowledge, that has not been considered necessary to elucidate in articles. Depressions dug into the ground and filled with occupa-

tional layer (including finds, burnt stones, animal bones)[26] have been interpreted both as stove remains (Lillak & Valk 2009, 67; Roog & Malve 2013) as well as places where household remains were buried. However, in the case of the latter interpretation, it has not been explained how were the stones in these depressions used. Here too the interpretation of the stones as stove stones has been acknowledged by default.

Fig. 15. Fire-cracked stones from Rõuge hillfort. They might have been used as potboilers and hearth-stones. AI 4040: 2308.

Although fragments of burnt stones are rare in Estonian archaeological collections and analyses like Sheets's (see above) are impossible to make in retrospect, the possible potboilers and hearthstones are quite numerous among the analysed pebbles – 108. These are mostly smudged, crumbled or with traces of having been in the fire, bigger ones with the diameter of 7–10 cm and smaller ones approximately 3–5 cm in diameter. Unlike polishing stones, these have a rough surface and/or traces of crumbling (Fig. 15). The notion of potboilers or baking stones is quite unfamiliar in Estonian archaeology. So far researchers have confined themselves to the safe and ambiguous names, such as burned, fire-cracked or heated stone, sometimes mentioning hearthstones. In the future the interpretations would benefit from experiments to clarify numerous issues, such as whether burnt stones from settlement sites have been suddenly cooled down after heating, how many times can stones be heated and cooled before

[26] The interpretation problematics of similar depressions has become a research issue quite recently, especially in connection with the topic of ritualised rubbish or ritual remains (see *e.g.* Brück 1999; Garrow 2012 and the discussion there; Chadwick 2015). It will not be touched in detail here.

they start crumbling, keeping in mind that different rocks surely behave differently and whether the contexts allow suggesting ritual heating of water, to name a few. Also, chemical analyses (fatty acids) of fire-cracked stones would allow suggesting the possible environment (liquid, *e.g.* broth) where the stones were placed (comp. Skibo *et al.* 2009). In the meantime, it would be fair enough to speculate that the smaller ones were used as potboilers and the larger ones are part of a hearth or a stove. The potential potboilers and baking stones are the most numerous in Asva fortified settlement (n = 9, Tab. 2: 5), Lõhavere hillfort (n = 8; Tab. 1: 48), Rõuge hillfort (n = 7; Tab. 2: 82), Pajulinn hillfort in Kuusalu (n = 6; Tab. 2: 67), Jägala Jõesuu hillfort and settlement site (n = 6 Tab. 2: 13), Aindu settlement site (n = 5; Tab. 2: 2), Kudruküla (n = 5; Tab. 2: 31) and Akali settlement sites (n = 5; Tab. 2: 3) as well as Tansi-Jaani stone graves (n = 5; Tab. 2: 103).

The presence of fire-cracked rocks mainly at occupation sites is expected, but finding these from graves might seem surprising. Fire-cracked stones in stone graves might indicate at the remains of a funeral pyre (*e.g.* Mandel 2003, 149; see also critique in Wessman 2010, 51). Burnt stones from Võhma stone grave were interpreted as material brought to the grave from settlement sites (Lõugas [*s.a.*]); depositing used heating stones of ovens in the grave has been suggested also for Tõnija (Mägi 2001b, 49). In addition to burnt stones from hearths or cooking events, also grain grinding stones (Vassar 1941; 1943, 125ff) and net-sinkers (Viljat 2016, 27) have been found from stone graves. In case of these, the bringing of settlement remains deliberately to graves is suggested by several researchers and the sacral character of this behaviour has been pointed out (*e.g.* Lang 2007, 109; Kustin 1962, 207; Viljat 2016, 27; see also Wessmann 2010, 89ff and the references therein); however, more thorough discussion on the topic in Estonia is missing so far (see also Laneman 2012, 101; 2013, 110). According to Wessmann, iron slag, pottery, stone, burned clay and daub is frequently found from Finnish Late Iron Age graves, interpreted as rubbish from the previous or subsequent settlement at the site by the Finnish archaeologists, but seen instead as part of the burial ritual in Scandinavia (Wessmann 2010, 89ff). The presence of net-sinkers in graves could also have a convenient reason – a net was spread out on top of the grave and later when the net decayed, the net-sinkers fell between the gravestones. The question undoubtedly remains, whether the net was laid on the grave to dry it, and in this case, why was it not collected afterwards, or was it a conscious deposition similar to the grain grinding stones and hearthstones.

5.2.2.1.3. Ammunition stones

Ammunition stones include pebbles thrown from hand or by sling and cobbles or bigger rocks thrown by catapults. All have been used since the prehistorical periods. Bigger stones thrown by catapults have included larger, probably more than 5 kg heavy rocks collected from nearby fields. Fist-sized stones have been interpreted as a pile of throwing stones left under the burnt fence of the hillfort

in several cases (*e.g.* Johanson & Veldi 2005 for Jägala hillfort, Moora 1939, 112 for Peedu Kerikmägi hillfort, Valk *et al.* 2012, 32 for Märdi hillfort). In the article concentrating on Peedu hillfort, Moora suggested that the stones might have held the cover of the roof and sunk on the occupation layer after the building burnt down. Also, stones might have been among the infill of the wooden border construction of the hillfort (see Moora 1939, 107–109). The interpretation of throwing stones overlaps the explanations of slingstones, which, in this wording can be found only once in Estonian excavation reports for a possible slingstone from Otepää hillfort (excavated by Osvald Saadre in 1953) (Tab. 2: 60). No archaeological slings have been found from Estonia, but due to poor preservation conditions leather and textile have not preserved in prehistoric and medieval rural settlements and hillforts, and thus the lack of slings is understandable. The Livonian Chronicle of Henry mentioned that Estonian defenders threw stones to strike back the attackers in the Livonian Crusade (*e.g.* HCL XIV, 11), but slings were not referred to.

Slings as weapons are known all through the world since the Palaeolithic (Korfmann 1973; Ferrill 1985; Grunfeld 1996). In Europe and Asia, slings were used in the Persian, Greek, Roman and Mesopotamian armies and they have been considered to be equal to or better than bowmen (Korfmann, 1973; see also Harrsion 2006). In Europe, slingstones have been found from Iron Age hillforts. For example, in England, the development of slings has been seen in connection with the construction of more solidly fortified hillforts and multi-vallation during the Middle Iron Age. The slingstones were excellent for defence; large quantities of stones have been found from the depressions by the entrances of the Danebury and Maiden Castle hillforts (Cunliffe 2005, 489). At the same time, it has been pointed out that slingstones are found from difficultly accessible places and the defensive function of the hillforts might have been somewhat symbolic (see Thomas 2010, 357 and the references therein). Nevertheless, the sling has been considered the most effective personal projectile weapon until the 15th century (Harrison 2006; see also Bradbury 2004, 247). Slings were also needed in settlement sites, where they were used to scare off wild animals or as hunting weapons (*ibid*.) Slingstones were of different size, ranging from smaller pebbles to large cobbles. According to ethnographic analogues, preferred slingstones were 3 – 8 cm in diameter (Thomas 2013, tab. 1) and with smooth and waterpolished surfaces, as these are more precise because of the smaller drag coefficient (Harrison 2006). Slings make excellent weapons since the stones could be found everywhere and they cost nothing; also, making sling was cheap and easy. Ball-shaped cobbles from medieval hillforts have sometimes been considered cannonballs. However, it would be easier and quicker to cast the balls from tin to get perfectly round ammunition, since the stone had to be rounded manually. Stone balls for cannons exist too, but these have the diameter of more than 10 cm since tin balls of this calibre would be too heavy (Ain Mäesalu, pers. comm.). Although most of the stones that are small enough can be thrown by hand as well as by sling, round and smooth ones are more accurate. Size is debatable, I would suggest that it should be less than 10 cm,

but Valk *et al.* (2014a, 82) mention cobbles with the diameter of 15–20 cm as ammunition which would perhaps be too small to throw by catapult, but quite heavy (appr. 2 kg) for slings.

Among the analysed pebbles I discerned 26 possible slingstones (Fig. 16). These have been found from Lõhavere hillfort (n = 7; Tab. 2: 48), Asva fortified settlement (n = 6; Tab. 2: 5), Otepää (n = 1; Tab. 2: 60), Paatsa (n = 1; Tab. 2: 61) and Uue-Kastre hillforts (n = 1; Tab. 2: 113), Mustivere (n = 1; Tab. 2: 51), Pada I (n = 1; Tab. 2: 62), Narva Joaorg (n = 1; Tab. 2: 54) and Kõpu I (n = 1; Tab. 2: 38) settlement sites, Haimre inhumation cemetery (n = 1; Tab. 2: 8) and Virunuka IV *tarand*-grave (n = 1; Tab. 2: 126). The possible slingstones are round, with smooth or slightly eroded surfaces, 3–6 cm in diameter and many have also been classified as potboilers. It is noteworthy that the pebbles interpreted as slingstones are the most numerous at hillforts or fortified settlements, which adds weight to the interpretation. However, as said, any stone could be thrown, and we may suggest that more pebbles and cobbles were brought to the settlements or hillforts as possible ammunition than they have been picked up by archaeologists. For example, finding ammunition stones was suggested in the case of Jägala, Peedu, Uandimägi and Märdi hillfort, but stones have not been collected from these sites. Pebbles of suitable size were gathered only in Peedu Kerikmägi, but these could instead be interpreted as grain processing stones. Stone balls from Uue-Kastre and Paistevälja seem to be rounded by human hand so that we might be dealing with small cannonballs or perhaps playing pieces.

Fig. 16. Possible ammunition stones: 1 – Otepää hillfort, AI 4036: II 248; 2 – Pada I settlement site, AI 5082: 234; 3 – Mustivere settlement site, AI 3993: 427; 4 – Lõhavere hillfort, AI 4133:3558.

5.2.2.1.4. Gaming pebbles

Pebbles and cobbles make excellent toys since these can be found almost everywhere and they come in different colours and sizes. It can be suggested that stones suitable for playing were gathered mostly in the close neighbourhood of the site or from the soil in the site, although eye-catching pebbles could also be gathered further away. We have little information about the past games before the Middle Ages. It is possible, though, that some games demanded rounder or more regularly shaped pebbles, while others requested pebbles with conspicuous colours or shapes. A distant analogy can be found from Mongolia, where ethnographic games have included stone toys. The game is about imitating playing house, where stones are used to designate the whole world – locations of tents, furnishing, livestock – small white stones signify sheep, small blue ones goats, bigger brown or black ones symbolise cows and horses. Pebbles with holes denote harnessed oxen (Nandinbilig 2016). This ethnographic game very likely represents a version of an archaic house-playing through the world. For example, Jesper Hjermind (2012, 561) has mentioned that in the medieval Norway stones with holes signified livestock, in fact, pebbles with holes are still known as cow stones. The possibility that pebbles with holes have been used as toys signifying livestock has been pointed out also by Plith Lauritsen (2012, 584) who asserts that the kind of stones are often found in excavations but are hardly taken to collections.

Pebbles have been used in medieval boardgames as gaming pieces next to bone discs, rounded potsherds, clay marbles (*e.g.* Russow 2012, 428f) as well as stone seeds of fruits (Heinloo 2011, 36). It is as good as impossible to verify the speculations of unworked pebbles used as playing stones. One can be surer if the stone is worked in some way, *e.g.*, flat slate flakes were ground round to get suitable gaming pieces (see Thier 2012, 295).

Balls have been used to play different prowess games, *e.g.* marbles (similar games today are petanque or bowling), the purpose of which is to flick or kick the opponent's balls out of the gaming board. Numerous wooden or clay, especially stoneware balls with the diameter of 1–2 cm have been found from medieval and modern period town layers all over Europe (see *e.g.* Veeckman 2012, 74; Heinze 2012, 145; Ring 2012, 276; Ose 2012, 404) as well as in Estonia (Russow 2012, 428f), although stones with suitable shape could be used as well (Heinloo 2011), *e.g.* sandstone balls (Höltken & Trier 2012, 177). Stone balls are often larger than 1–2 cm, they tend to be 2–5 cm in diameter, like balls found from Ribe, which therefore have also been interpreted as possible ammunition (*e.g.* Søvsø 2012, 530f). Natural ball-shaped stones are scarce in Estonia (see above), but the grinding of pebbles round would have been much more time-consuming than making a wooden or a clay ball; thus, producing stone balls for pastime activities seems implausible.

First gaming stones are known already from ancient Egypt and other classical civilisations in Mesopotamia and Rome. In Estonia, like elsewhere in Europe,

they are more discussed in medieval and modern contexts. Mostly clay balls, but also goethitic balls have been found from different medieval and modern age sites, *e.g.* Järve Reinberg cemetery where they were associated with a child's burial (Schmiedehelm 1946), Keila and Kirumpää forts, Tartu medieval and modern period town layers; in all these places the interpretation as gaming stones is well argued. Possible gaming balls were gathered from Vaida settlement site (Jaanits 1999, 103), but these are really fossils (see above). Little clay balls are also known from Stone Age Tamula I settlement and cemetery, Rõuge Iron Age settlement site, Asva Bronze Age settlement and Mäletjärve stone grave. Pebbles named as gaming pieces are known only from Tartu town where two were named as such (Metsallik 1982, 63).

Fig. 17. Possible gaming pebbles from Niguliste church, Tallinn. TLM 17409 A 124: 124, 564, 567.

In the current study, I discerned 156 possible gaming stones. Although I do realise that games do not require only round and small pebble, the attributes I mostly followed to discern them were the size (up to 5 cm in diameter) and roundedness. Due to these parameters many were also counted as curing or otherwise apotropaic stones. Many of the discerned playing pebbles have been found from medieval and modern period town excavations in Tartu (n = 12; Tab. 2: 105–108) and Tallinn (n = 32; Tab. 2: 93–100) (Fig. 17) as well as Lõhavere (n = 9; Tab. 2: 48) and Iru (n = 7; Tab. 2: 9) Iron Age hillforts. A significant number of pebbles which physical qualities resembled these of playing pebbles, has been gathered from Akali Stone Age settlement site (n = 20; Tab. 2: 3). It is not easy to accept the existence of specialised playing pebbles in a Stone Age context, although the possibility cannot be entirely excluded. The site was situated on a river bank, so it is likely that the unused but waterpolished pebbles were washed to the beach and reached the occupation layer by accident. They could also have been gathered as possible raw material by the Stone Age people

and never used. Microwear analyses were carried out on seven specimens to find any linear traces or polish that would suggest the use of the pebbles as smoothers or burnishers, but no traces could be followed. It is possible that the less intensive using was not exposed on the pebbles since all were either quartzite or granite which are hard rocks.

5.2.2.1.5. Curing and apotropaic pebbles

The interpretation of magical curing or protection has been provided for pebbles that have been found from burials (*i.e.* ritual contexts) or which are modified in a way that does not allow any utilitarian explanation. Both reasons were largely discussed above (see Ch. 5.2.); for example, painted pebbles and charmstones were the examples of stones gathered from settlement sites, whereas especially quartzite pebbles were presented as examples of charms in burial sites. However, from written sources and folklore texts we know that curing stones were used in everyday contexts; thus, their finding from settlement sites would be expected. The problem is how to recognise them. The effective magical agency ascribed to pebbles according to written and folkloric sources demonstrates that there are many various ways how the magical principles work. For example, according to similarity principle, hematite, because of its red colour, helped against bleeding, bufonite or toadstone was good against poisonings since toads produce toxins under their skin, ear stones sometimes had to resemble an ear, stones collected from the ground were good against illnesses (swellings, scabs) that were believed to have been caused by sitting or lying on the ground (especially in Spring) (*e.g.* RKM II 69, 193 (19)) or washing oneself or one's clothes in a stream or a river (*e.g.* ERA II 3, 100/1 (10)), and stones fallen from the sky (thunderstones) had to help against diseases that appeared suddenly, like a lightning strike. So there is always a clear motive to use a particular stone, but most of the time the reason is difficult to follow, *e.g.* in case of the pebbles that helped against swellings, the shape, size or colour of the stone did not matter. Moreover, the 'amuletic essence' of a pebble might have been only perceived by the person who collected it (Adams 2014, 221), also emphasised by the concept of finding one's 'own stone' in the context of the New Age religious trends (Teidearu 2017, 88ff). However, it is suggested that the agency ascribed to pebbles fed on a universal cognitive perception that pebbles of conspicuous colour or shape or with holes had to be special since exceptional in nature had to indicate at a distinctive force that could be used by people for their own good. Similar agency was attributed to different unexpected phenomena, such as ring-branches or Siamese twin animals.

Thus, pebbles used in apotropaic or curing practices can be of a very different shape, colour, mineral content, and size, although they generally are quite small. For example, Alectorius or cock stones were regarded as bean-sized (Carrasco & Duffin 2017, 2f), a variety of snakestones as lentil-shaped and just under 3 cm in diameter (Pymm 2016) to name a few. There are larger specimens too, such as the Lucerne Dragonstone (Pymm 2016). With notable excep-

tions (*e.g.* fire-cracked limestone pieces used to cure swellings and scabs – ERM 10504), pebbles with smooth or even polished surfaces and with the size of up to 10 cm have been listed as curing stones also in the ENM collections.

Supported by the folkloric descriptions curing and apotropaic magical pebbles, analogous pebbles in ethnographic collection, descriptions in written sources, as well as allegedly universal principle that unique façade means inherent powers, I discerned 273 curing and apotropaic stones among the databased pebbles. These were with relatively small dimensions (2–7 cm), regular round and flat shape, smooth or polished surfaces and vivid colours. When possible, I also considered the find context. In discerning the possible magical pebbles I also relied on the researchers' views; therefore, I counted all the toadstones, snakestones, bewitching stones and curing stones thus named by the excavating archaeologists as possible magical pebbles. It is surprising that differently from the British Isles or Scandinavia, in Estonia researchers have been more ready to ascribe magical meaning to pebbles from settlement contexts (*e.g.* toadstones from Asva, snakestones from Paatsa and Valjala, curing stones from Viljandi and Uusvada) than from burials; however, in all the mentioned cases the influences of folklore should be emphasised (see above for detailed discussion).

The most numerous collection gathered from one site is the handful (n = 41) of small pebbles mentioned above from the Late Neolithic Corded Ware Culture burial no 2 of Sope (AI 3175; Tab. 2: 92). Indreko apparently considered the pebbles a grave good and taking into account Indreko's other writings, the magical interpretation was not foreign to him. The general amuletic meaning has been ascribed to the two waterpolished pebbles (AI 3960: 272, 273; Tab. 2: 101) found with a 6–10-year old burial at Tamula Neolithic settlement and burial site (Jaanits 1961, 40) but these could also be perceived as curing stones that might have helped against particular, perhaps lethal, conditions and would have allowed the deceased to live healthy lives in the Otherworld. In the case of Tamula, amber amulets accompanying burials have been regarded as apotropaic and curing means and a connection between burials with amber finds and pathologies has been sought for (Ots 2006, 125). Unfortunately, a clear association between burials with pathologies and amber finds was not found; however, it should be noted that mostly chronical diseases would be revealed on bones. It is remarkable, though, that the Tamula burial no 7 with the pebbles was also accompanied by four amber finds, several tooth pendants, including a bear's fang, bird figurines and crane's wing bones which could all be regarded as apotropaic elements. So it is likely that the child needed extra protection in the Otherworld, perhaps because of his/her way or reason of death. While pebbles that are associated with inhumation burials are more prone to be regarded as grave goods, the collective way of burying in stone graves does not allow the kind of interpretation. However, there are several remarkable cases. A small beautiful smooth pebble of the size of a chicken egg has been gathered from Uugla III stone grave (AM A 1068: 48; Tab. 2: 116), reddish smooth unworked pebble (AI 3899: 40) and a quartz pebble (AI 3899: 58) collected from Tansi-Jaani grave no 3 and a waterpolished pebble (AI 3900: 42) from

grave 4 (Tab. 2: 103). A round granite pebble (AI 4262: 179; Tab. 2: 126) has been collected from Viru-nuka IV *tarand*-grave and a smoothed pebble from Uugla flat-cairn cemetery (AM A 501: 14; Tab. 2: 117). An outstanding case is formed by a cobble with a natural hole from Kohtla-Järve *tarand*-grave (AI 3975; Tab. 2: 27) (Fig. 18). Stones with natural holes have been regarded as apotropaic hagstones in British folklore (Toms 1932), keeping away nightmares (Meaney 1981, 116). Naturally pierced stones have been considered exceptional in many cultures, so it is possible that the stone from the Kohtla-Järve grave was placed in the grave for apotropaic reasons. In none of the mentioned cases have the pebbles been considered grave goods, however, if accepted that the filling of the grave with stones was a well-considered act, just like erecting the grave and burying the dead, it is possible that the few outstanding pebbles had a deeper meaning and were added to the infill knowingly.

Fig. 18. A holed pebble from Järve *tarand*-grave. AI 3975.

The most numerous collections of possible curing and apotropaic pebbles have been gathered from occupation sites (Fig. 19, 20), for example, 24 from Asva fortified settlement (Tab. 2: 5), 17 from Akali settlement site (Tab. 2: 3) and 16 from Lõhavere hillfort (Tab. 2: 48). However, pebbles from occupation sites have not been collected from special contexts, or at least the context has not been emphasised by the excavating archaeologist. So finding solid proof that any of the pebbles were actually used in apotropaic or curing practices is virtually impossible. There are a few cases where the possibility is further supported, *e.g.* by foreign rock, like the pebbles of Suursaari porphyry found from Tallinn (see above for detailed discussion). Small smooth Cretaceous flint pebbles from Tallinn, both from the settlement as well as burial contexts, could be added. There are altogether 15 flint pebbles or fragments of pebbles with the diameter of 2–4 cm from the medieval and modern contexts in present Tallinn (Tab. 2: 93–100). Flint was brought to the harbours, so finding flint pebbles from Tallinn is not exceptional, and Cretaceous flint flakes were often used for striking fire. However, the small pebbles were not suitable for striking fire and could have been used as playing pieces or apotropaic or curing stones. The latter is plausible in case of the burial contexts – three were found from St. Barbara's cemetery. Although none of the pebbles was found in a burial context, one (AI 6415: 258; Tab. 2: 98) has a greenish patina, so it has been in contact with a bronze artefact and may thus be associated with a deceased.

Fig. 19. Curing pebbles from Viljandi. 1 – VM 10847: 984; 2 – VM 10797:134; 3 – VM 10847: 1251.

Fig. 20. Possible curing pebbles: 1 – Toodsi Liidva settlement site, TÜ 1868: 1; 2 – Lõhavere hillfort, AI 4133: 2742; 3 – Rõuge hillfort, AI 4040: 234.

5.2.3. Antiquities – Stone Age artefacts

As said above, reuse is hardly the most popular interpretation for earlier artefacts in later contexts, and very often residuality is suggested instead. The topic is vast and in this section I will be mostly discussing Stone Age artefacts. The reasons for artefact reuse are not always easy to ascertain. There are several examples of residuality being the most plausible explanation, but there are many cases which demonstrate that the antiquated artefacts have deliberately been brought to the later site and used there. Even though in some cases the utilitarian use is compelling (*e.g.* Stone Age tools reused as fire-striking stones in Alban Hills area in Italy, see Altamura 2013), then in case of non-flint artefacts (axes and adzes of crystalline rocks) and when the artefacts show no physical

damage or transformation, non-utilitarian interpretations are suggested instead. In the case of the Stone Age artefacts found from the Iron Age contexts, Thäte & Hemdorff (2009, 43) suggest two parallel interpretations: ancient objects may have served for the veneration of the ancestors; or they could have been taken for apotropaic thunderstones. In my opinion, these two parallel interpretations can intersect in the worldview of a community or a person – an artefact made and used by a mythical forefather was undoubtedly suitable as an apotropaic instrument.[27] The thunderbolt-legend was attached to the already magically perceived artefacts around the birth of Christ as suggested by the Classical authors for Greek and Roman worlds (King 1867, 79), or several centuries later in the Late Iron Age, as is more plausible for Estonia. It is also very likely that some material representation of thunder and lightning was present a long time before that, probably since the beginning of human habitation, and curious then-available objects (waterpolished colourful pebbles, fossils, *etc.*) could become associated with the thunderbolt-legend (similar concept see Sibley 2009). In time, when the human origin and the initial function of stone artefacts had become vague, these too became part of the peculiar formed stones, and the thunderbolt-legend could easily stick to them. In some parts of the world, especially in Scotland and England, stone artefacts have often been associated with arrows shot by elves or other mythical creatures (Davidson 1956; Harte 2009, 27f), thus creating the link between the tools used by mythical beings (including ancestors) and stones fallen from the sky. So Stone Age artefacts, if proven not residual and/or functionally reused, have been regarded as apotropaic items, regardless of their perceived origin in the sky or the elves' world. The idea is very similar to some pebbles and fossils, *e.g.* snakestones, which include several different pebbles and fossils with differently perceived origins, but they all were used against similar conditions.

The name 'thunderbolt' should not be overrated since many different curious formed stones were used in curing and apotropaic magic. They were used for acute conditions when needed and they might have obtained their name consistent with the illness, but they could have acquired a different name when needed to cure another disease. However, no doubt there are objects which physical properties are conspicuously related to a certain condition. For example, the pointed end of belemnites and Stone Age edged tools refer to the lightning strike and could be used to cure suddenly appearing diseases. Limonitic or sideritic nodules with a hollow shell containing loose matter (sand or

[27] Stone axes were deposited, in the course of religious or social rituals, already in the time of their producing, *i.e.* the Late Neolithic (see examples and discussion in Johanson 2006a) when they need not be outdated or strange. Examples exist of Neolithic axes, carefully and deliberately deposited in Bronze Age contexts for non-utilitarian reasons (Edmonds 2012, 150–151). Special significance has been seen in the material, *e.g.* flint items as 'related' to lightning for their ability to produce sparks (Sibley 2009), but Neolithic deposits included pottery sherds, burnt flint and other 'rubbish' too. So, the significance of Neolithic axes in the contemporary or Bronze Age contexts may but need not have anything to do with their later perceiving as thunderbolts.

clay) inside which rattles when shaken were used to prevent miscarriages and ensure easy labour. The structure of these stones, named as aetites or eagle-stones, indicated that the stone was pregnant, hence the idea (see Duffin 2012, 190). Similar cases are also provided by other examples (see above), but it is very likely that often the names of the curing stones changed according to the condition in which they were used. In other words, things attach meanings, which sometimes stick better, when physical properties are supportive. However, things can also change meanings when the situation needed. So it is plausible that the Stone Age tools used since the Iron Age attached the thunderbolt-legend easily because of their physical appearance, but they might have been regarded as curious formed stones or tools from mythical ancestors' times at first but gradually became general apotropaic things during the Late Iron Age and the Middle Ages.

It is generally suggested that stone axes, adzes, flint spear- and arrowheads started to be regarded as thunderbolts since stone artefacts were not functionally used (Salo 1990, 135) and the thunderbolt-legend was first discussed in written sources. The oldest source from Ancient Greek that describes stone artefacts as thunderbolts derives from the 4th–3rd century BC; more certain records were given by Pliny the Elder in the 1st century AD (see above). Iron Age in that part of the world had lasted already for several centuries by this time, and hence it is likely that stone tools were not regarded as functional artefacts. During the Roman period, the idea must have spread in the Roman provinces as well as Barbaric Germania. Lots of records about gathering and preserving stone tools as well as using them in magical practices are found from the Roman provinces. Merrifield brought several examples, altogether 27, of stone axes that have been found from Roman contexts in England (Merrifield 1987, 10 and the references therein). One of these had a groove carved into its edge part which would have inhibited its using in utilitarian ways; thus, we could be dealing with an amulet to be worn on a string. Some of the Neolithic axes have also been interpreted as votive offerings, more examples of which can be found from France with at least 24 Stone Age axes gathered from the Roman-Celtic temples, mostly from Normandy and Burgundy (Merrifield 1987, 10–12).

Similar examples can be found outside the Roman provinces. One of the earliest cases where the finds of Neolithic stone artefacts in later contexts has enabled their interpretation as magical items, *i.e.* possibly thunderbolts, is an Early Roman Iron Age (ca 0–200 AD) cemetery in Brænde Lydinge on Fyn Island. Here a wooden box was accompanying a female burial. Small pebbles and flat stones with the diameter of 3.5–7.5 cm, two sea-urchin fossils, an edge fragment of a Neolithic stone axe and an axe-shaped piece of slate had been placed around the box while another sea-urchin fossil, a Neolithic flint dagger, different shells and personal tools, such as a spindle-whorl, bronze knife and a belt buckle were found inside the box (Samdal 2000, 76f). The nature of the find complex seems to refer to some magical interpretation; however, it is complicated to make sure if all the items were regarded as generally apotropaic thunderbolts. Perhaps we are dealing with a sorceress or a doctor, who used *e.g.*,

a spindle-whorl for fortune-telling, pebbles for curing and sea-urchins and edged tools to protect her and her belongings in the Otherworld. Samdal (2000, 58) has counted altogether 9 Neolithic stone axes and 46 flint artefacts (arrowheads, scrapers, cores) from 36 different burial sites in western Norwegian Iron Age graves dated to 350–1000 AD. The burial context refers to the magical use and meaning of the axes and the flint artefacts in the society. In addition to burial sites with more religious background, stone artefacts enabling magical interpretation have been found from settlement sites. According to Thäte & Hemdorff (2009, 43), earlier stone artefacts from the Iron Age contexts have been found from Denmark, Norway and Sweden, both from the burial sites as well as settlements. For example, a flint dagger was found from an oval depression next to the site's central hearth in the building no 3 in Ullandhaug (Stavanger, Norway) Migration Period and Younger Iron Age settlement site. Diametrically on the other side of the hearth, a round grey quartzite pebble was found in another depression. The symmetrical placement of the finds might indicate at its symbolic meaning (Myhre 1988, 310–324). Building no 1 in the same settlement yielded a stem of a flint dagger, which usewear indicates that the Neolithic or Bronze Age item had been reused as for striking fire (Thäte & Hemdorff 2009, 47). This example vividly demonstrates how things can have magical or symbolical meaning and be used functionally at the same time. It might seem obvious that in this case there is a practically reused tool (fire-striking stone) and the magical item (the dagger in the depression); however, in reality, both may have been regarded as belonging to mythical ancestors or elves or being of heavenly nature and thus considered significant and held in esteem. Perhaps the other dagger broke when (ritual) fire was struck from it? According to Thäte & Hemdorff (2009, 47), the interpretation of fire-striking in case of the intact dagger seems doubtful, but they do not mention if indicative usewear was even searched for this apparently symbolic find.

Although the deliberate placement of ancient artefacts in later contexts seems more attestable in the case of burial sites as already ritually laden places or in the case of special locations in settlement sites (Ullandhaug), the potentially accidental finds in later contexts have been discussed. For example, in Gulle (Norway) abundant traces of Stone and Bronze Age habitation have been found. Stone Age artefacts have also been found from later graves there; however, only in case of two, it has been considered likely that these had been placed into the grave deliberately (Thäte & Hemdorff 2009, 45). Interpretations are complicated because in many places later graves are situated at the same place with the earlier settlement sites, and the danger of over-interpretation of Stone Age items as secondary magical artefacts is great. In addition to whole items, many flint flakes have been found. In these cases, it is likely that flint was still used to make tools in the discussed Iron Age period. It has been suggested for different parts of Europe, though, that the knapping skills had deteriorated by the Iron Age and the technical level was lower then than in the Neolithic or the Bronze Age (*e.g.* Young & Humphrey 1999, 239; Migal 2004; 222; Högberg 2004, 224). Thus, it is probable that the more skillfully produced arte-

facts lying in the ground were supposed to have been made during mythical ancestors' time or even by non-human agents, being thus associated with either remembering ancestors or a sign from the world of elves or gods. In both cases, these could have been regarded as remarkable special enough to be taken into use as amulets.

Stone graves erected at earlier settlement sites are another side to the use of earlier artefacts in later context, which might add to the idea of remembering ancestors (see also below). There are many Iron Age cases from Scandinavia with flint blades as grave goods (see examples in Samdal 2000; Thäte & Hemdorff 2009; Søyland 2017). In some cases, when more skilled artefacts are among the flakes, it is likely that we are dealing with material from earlier settlement site placed in a later grave as symbols of (mythical) ancestors. However, simple flint flakes and blades, as well as expedient tools (*e.g.* scrapers), may be indications of Iron Age flint working which had nothing in common with the daggers, axes and spearheads from a few thousand years time but the material. Flakes or expedient tools produced in the Iron Age may have been placed in graves as regular grave goods. In case of worked flint pieces in Anglo-Saxon graves, Meaney (1981, 211) has suggested that these may have been given to the dead as utilitarian fire-striking flints, similarly to other tools. This suggestion, however, would not explain the amounts of flint added to some graves. Perhaps the flint as the material may have been ascribed some magical meaning, as suggested by Sibley (2009, 28) (comp. also quartz flakes in graves, see above for Estonia)? The latter suggestion is supported by *e.g.* the Late Iron Age burial site in Sannagård (Sweden), where worked flint was found from almost every (more than a hundred) grave; 63 broken flint pieces, including at least three blades, whereas one originating from an axe were gathered from a single grave (Thäte & Hemdorff 2009, 47 and the references therein). In addition, many examples indicate that hazardously worked or even broken flint is often found in graves that refer to the perceiving of flint as special material, *e.g.* in Hålandsmarka in Time (Stavanger, Norway) a Viking Age boat grave included a significant amount of flint debris and quartz pieces, which were placed as a heap on the breast of the deceased man; the context for flint and quartz finds as grave goods is undoubted (see Thäte & Hemdorff 2009, 47 and the references therein). Also, in Larvik in Vestfold (Norway) the fill material of Late Iron Age burial mound abundant Neolithic flint was found that had not been reused for striking fire (Rønne 2007, 42–43). It seems fortuitous, but as no indication of a Neolithic site was found from the vicinity, bringing material from some distance to be inserted into a later grave seems an option. Unfortunately, it is very complicated or even impossible to make sure how different customs and interpretations within one community or an archaeological site relate and intermingle, but there is no sense in presuming that only one notion was accepted. Artefacts and materials that are already significant are much more liable to attach new meanings.

Additional unique and perhaps more clear-cut examples can be found from the medieval period. One of the most famous cases is the centre of Swedish

archbishopric in Lund where altogether 83 different, but mostly Neolithic stone artefacts have been found deliberately deposited in walls, under floors and in thresholds as strategic points (Carelli 1997), generally associated with the apotropaic thunderbolt-belief. Novgorod is not left behind with approximately a hundred earlier stone artefacts in medieval layers, including mostly adzes and shaft-hole axes of Volosovo Culture, flint blades, flakes and small tools as well as oval fire-striking stones of quartzite (Zheltova 2017, 237). Unique medieval finds include Stone Age artefacts that have apparently been made into amulets and which magical meaning is unequivocal. Examples are at hand from Novgorod – two flint arrowheads in a metal frame have been found as well as several flint arrowheads with traces of metal indicating similar framing (Tyanina 2008, 174). Similarly framed flint arrowheads have been discovered from the 16th–17th century Munich (Hansmann 1977). The earliest example of framed amulets – a Neolithic flint blade in a golden frame – comes from the early medieval Carolingian period in Hungary (Ádám 2015). In the case of Novgorod, the possibility of mixing of the earlier settlement with later activity has been suggested for the abundance of Stone Age material in town layers, but the suggestion has been refuted because of the choice of artefacts. The medieval layer includes mostly flint arrow- and spearheads or stone adzes, while the usual settlement material, such as flint flakes and blades and knapping debris, is virtually absent (*e.g.* Tyanina 2008, 174). There is always the possibility that smaller knapping debris has remained unnoticed during excavations but other similar cases rather confirm the suggestion that the artefacts have been brought to the town. For example, in case of Lund, Peter Carelli has pointed out that the choice of Stone Age finds is not compatible with habitual Stone Age settlement material since the share of ground stone axes is very big and several exotic items are among the artefacts, which rather supports the idea that 'thunderbolts' have been imported from significant distances (Carelli 1997, 411). A number of Late Neolithic stone battle axes and adzes have been found from Pskov (Kiristaja 2009, 35), whereas one has a drilled hole in it, clearly indicating at reuse as an amulet during the medieval period. Also, flint flakes, Neolithic flint arrowheads as well as a few combed pottery sherds were found. It is likely that a Neolithic settlement site is under the later town layers; however, corded pottery that would be contemporary with the stone finds is absent. In addition, the flint flakes have been reexamined and associated with using them as gunflints (see Mazurkevich 2009, 401). So it is plausible that the axes, adzes and arrowheads are connected with the medieval habitation and have been used in magical practices.

Altogether 72 Stone Age edged tools (axes, chisels, gouges, spear- and arrowheads, ice-pics, hoes and two imitations of Stone Age tools) were counted among Finnish medieval and modern period building offerings, whereas only one could be associated with the medieval (1200–1500), one with the modern period (1500–1700) and all the rest with late modern period (1700–1950) (Hukantaival 2016, 182). The reason for so few earlier finds is, according to Hukantaival, not due to the thunderbolt belief being unknown but the contrary –

as the stones were highly valued they were likely to be collected for later use when found. However, the amounts of thunderbolts in Novgorod and Lund might show that concealing these objects was just less common in medieval Finland (Hukantaival 2016, 183).

5.2.3.1. The case of Estonia

The database includes 143 stone artefacts that have been found from later contexts and which therefore might be associated with the thunderbolt legend or remembering of ancestors (Table 3). The foremost necessary criterion for compiling the database was that the find places of the archaeological antique items had to be documented at least with the precision of farmstead. Naturally, there are those which status as an apotropaic artefact is more confident and those which could have been reused in some utilitarian way or which accidental appearance in later context is more likely. Sometimes the digging into earlier maps forced to correct the initial assumption. Visits to several find places of stray found stone axes to locate possible Stone or Bronze Age settlement sites for my Master's thesis in 2006 instead yielded Iron Age or medieval finds (Viru-Nigula, Pihlaka). Sometimes only very few potsherds were found. These sites were left out of the current analysis since the connection between the earlier stray find and later site is insufficient.

The chronologically older artefacts discussed below are stone axes and adzes, flint artefacts, such as arrowheads from the Stone and the Bronze Age, and oval fire-striking stones from the Iron Age. In addition, there are many Iron Age and medieval sites where flint flakes have been gathered. Mostly we are dealing with finds gathered during survey trips, generally fieldwalking, which means that the finds cannot be stratigraphically contextualised. So there is no chance to ascertain out without excavating the occupation layer whether we are dealing with settlement sites from different periods that are accidentally in the same place or whether the earlier finds have been brought to the later context knowingly. Examples of the first possibility – sites from different periods that are located in the same place can be found everywhere in Europe and several places in Estonia (see *e.g.* Vedru 2011). Inserting stone artefacts from earlier sites as objects possibly referring to ancestors is the behaviour the other side of which is a new site intentionally established on an earlier habitation place to strengthen the link with ancestors (*e.g.* Johanson 2006a, 90–91; Jonuks 2009a, 202–203; Vedru 2015, 49).

During the current research, I assembled the information on all flint and quartz finds that have been gathered from sites that are chronologically later than the Stone Age. Altogether 285 sites were taken into account; however, the number is potentially larger because I could only take into account information that was available from excavation reports. It could be said that comparatively many settlement sites that contain Iron Age hand-moulded and/or medieval or modern period wheel-thrown pottery include single flint finds. The material

comprises of imported flint, which, although used during the Stone Age to some extent, have generally been brought from the Cretaceous areas as ballast rock and distributed as fire-striking stones all through Estonia. Flakes of local Silurian flint have been found from the areas where the flint is naturally found in the central Estonia and south of it. In the case of single flakes, there is no way to make sure whether the pieces have been knapped during the Stone or Metal Age, medieval or modern period. Estonian flint is suitable for striking fire as well, and it was used for that function. Also, it is very likely that in the Bronze Age and at least in the first centuries of the Iron Age stone artefacts were produced and used as tools. We have very few Bronze Age artefacts, and these too are rather of a prestigious nature. Therefore, flint finds from the Bronze Age stone-cist graves that very likely served as contemporary tools were not calculated under these 285 sites. The same has been suggested for stone artefacts in *e.g.* Napa and Muuksi stone-cist graves by Friedenthal (1927) and Vassar (1938). Stone-cist graves generally contain very few artefacts, such as ornaments, devices used for fastening clothes, small (probably personal) tools and toilet articles (Lang 2007, 255). Small flint knives or scrapers suit the list perfectly as do the fire-striking stones. Using flint and quartz for tools after the Stone Age has been proposed by several foreign authors and some typologies have been issued that are concentrated specifically on the Bronze and Iron Age flint artefacts (*e.g.* Ford *et al.* 1984; Högberg 2004; Humphrey 2004; Migal 2004; Young & Humphrey 1999). In Estonia, special treatments on Bronze and Iron Age flint and quartz use are missing, and the topic is relatively unstudied (an exception – Sperling 2014, 321–322 for Asva). The main reason might be that there are very few sites that have, according to the current knowledge, formed in the Early Bronze Age. Most of the sites that have yielded pottery from the Late Bronze Age or Early Iron Age sites have not been excavated (Lang 2007, 51), and thus flint and quartz finds revealed cannot be unequivocally associated with the Metal Age habitation. It is complicated even when excavations have been conducted. We have some settlement sites from the Late Bronze and Pre-Roman Iron Age (*e.g.* Jägala) where habitation has started already in the Stone Age. In Jägala the Pre-Roman Iron Age layers are full of quartz artefacts. However, we cannot make sure to what extent have the layers got mixed during the habitation activities or to what extent have the earlier quartz finds been deliberately collected and reused in the later occupation period. It is very likely that suitable stone finds from earlier habitation were reused when found accidentally from the site. The expedient nature of flint use during the metal ages (Young & Humphrey 1999; Högberg 2004) as well as scavenging of flint tools from earlier settlements (Butler 2008) has been brought out elsewhere. Reusing retrieved flint scrapers for *e.g.*, striking fire or cutting is, by all means, an example of that expedient use. Besides, it cannot be excluded that flint and quartz finds retrieved from earlier sites were brought to the newly established site to commemorate ancestors, as curiosities or for symbolical or magical reasons as suggested for quartz pieces (Lang 2007, 160; Vedru 2010).

As can be followed from the database (Tab. 3), 39 stone artefacts can be connected to a Late Iron Age or a medieval dwelling site, one with an earlier Iron Age settlement site, and three with possible dwelling remains from the 19th century. Fifteen artefacts can be associated with an Iron Age stone grave, 17 with a Late Iron Age or a medieval burial site and nine with an undated burial site. Additional 60 records reflect stray finds, which cannot be connected to any archaeological site but have either been regarded as thunderbolts after finding in the 19th or the 20th century and used in curing magic or reused in utilitarian ways. Stone artefacts from Bronze Age contexts, *e.g.* stone axes from Asva and Ridala fortified settlements, Lülle ship-setting and Jõelähtme stone-cist, were left out, since they are very likely in chronologically correct context (see also Lang 2007, 28). Asva has yielded a substantial amount of quartz and flint flakes with usewear – an expected find at sites from the Bronze Age when the majority of tools were not made of metal yet (Sperling 2014, 321–322). Out of five stone axes from Asva one could be associated with axes with a bent butt, explicitly dated to the Bronze Age (Indreko 1939, 44). The axe from Jõelähtme (AI 5306: 99) was found from the heap of piled-up soil and might have been lying on the grave; therefore, we probably are not dealing with a Stone Age settlement site under the grave field. Two stone-cist graves in the Jõelähtme grave field (no 21 and 35) yielded flint scrapers, and additional flint pieces were found from grave no 35 (Varul 2012; 2016). In this northern Estonian area, Stone Age people generally used quartz, as evident in the sites of Vabaduse väljak, Kroodi and Jägala since naturally occurring flint is not available here. Both scrapers in Jõelähtme are of imported flint. The exact origin of flint cannot be ascertained without geochemical analyses, but it is likely that the flint from both Asva and Jõelähtme has been imported from Scandinavia. The origin of Bronze Age axes with bent butt has also been seen either in Scandinavia (Meinander 1954, 67) or northern Germany (Indreko 1939, 44); both regions have similar Cretaceous flint. Although the exact deposition place of the axe in the Jõelähtme grave field is not known, the parallel with flint scrapers allows suggesting that the axe might have been a contemporary grave good. The same is likely for Lülle ship-setting where the blank of a stone axe (AI 4409: 31) was found from the 1st ship between the lower bigger infill stones near the 2nd cist (Lõugas 1970, 112), although its position as a grave good has been assessed as unlikely (Lang 2007, 29). Even though we are dealing with a blank without a drilled shaft-hole, the axe could not have been left unnoticed when filling the grave with stones and soil. So it might have been a grave good, similarly to the grain grinding stone found between the fill materials of the 2nd ship (Lõugas 1970, 112). The custom of placing grain grinding stones, hearthstones and net-sinkers into stone graves was briefly discussed earlier (see above); perhaps the axe blank can be regarded as an example of similar behaviour. The placing of stone axes into burials as personal items of the dead is connected to only a single period during the Corded Ware Culture period, with only Külasema and Karlova type axes, regarded as the earliest battle-axes, found from burials (see Johanson 2006a, 73). Lang has proposed that the use of stone axes as personal grave goods has

decreased or even disappeared in the 2nd millennium BC in almost all the Eastern Baltic countries (Lang 2007, 29). Thus, it seems that in case of Lülle as well as Jõelähtme we might instead be dealing with the tradition to add settlement material into graves.

5.2.3.1.1. Artefacts from the Iron Age, medieval and modern period settlement sites

The most numerous category of chronologically earlier stone artefacts has been gathered from the Iron Age and medieval rural settlements (n = 40). The majority of these are stray found stone axes which find places have yielded material from later habitation during later landscape surveys. Sometimes the fieldwalking was specially conducted to find the Stone/Bronze Age habitation traces, *e.g.* in Viru-Nigula (Tab. 3: 43), Pihlaka (Tab. 3: 38), Topi (Tab. 3: 40) and Kukruse (Tab. 3: 16). Hand-moulded or wheel-thrown pottery from the Late Iron Age or Middle Ages was found in most, only in Pihlaka the pottery indicated at a slightly earlier – Roman Iron Age – occupation. Due to the lack of other Late Neolithic or Bronze Age finds, it can be suggested that the stone axes in these settlement sites are in their proper context, *i.e.* they have been used during the Iron Age and the Middle Ages. Mostly, though, the Stone/Bronze Age habitation traces were not explicitly looked for during field surveys. A good example is provided by Lagedi Late Iron Age and medieval settlement site where an edge part of a sharp-butted battle axe (AI 4420; Tab. 3: 1) and a stone adze (AM A 496; Tab. 3: 2) have been found on different occasions. By these two stray finds, Valter Lang (1996, 210) has suggested a Neolithic habitation site, but it is very likely that we are dealing with artefacts brought to the later settlement. Moreover, there are no other finds indicative of a Stone Age occupation at this site (comp. Carelli 1997). However, four pieces of worked flint and a corded pottery sherd have been gathered from Lagedi stone graves approximately 500 meters further northeast from the settlement site. It is plausible that the flint and stone finds, as well as the pottery sherd, all originate in a single Late Neolithic habitation site somewhere in Lagedi, as suggested also by Lang (1996, 380); however, Stone Age finds have very likely been deliberately redeposited into the graves and the settlement site. The axe and the adze have probably been regarded and used as apotropaic items, probably thunderbolts, which is further supported by the damaged surfaces of the axe. The flint finds from graves have confusing use-wear; three out of four have very chipped edges, resembling the result of heavy fire-striking. So perhaps the Stone Age scrapers were reused as fire-strikers and added to the grave as contemporary grave goods? The location of the Lagedi settlement site on the bank of Pirita River is suitable for Stone Age habitation, so is it likely that the Late Neolithic site has located at the same place with the later Iron Age and medieval one? Since the majority of finds in pure Corded Ware Culture settlement sites are corded pottery sherds (*e.g.* Narva-Jõesuu IIb, Riigiküla

XIV), more pottery should have been gathered. It seems justified suggesting that some smaller finds could have been left unnoticed while fieldwalking, for example, the porous corded pottery may shatter into tiny and unrecognisable fragments due to exposure to weather conditions and ploughing. Besides, even when the presence of corded ware is proved, as in case of Kukruse where one of the gathered pottery sherds could have been a tiny piece of corded ware, the axe may nevertheless be located in the secondary context. In Kukruse it is likely that the later settlement was situated on the outskirts of the Late Neolithic site and the axe fragment could have been collected from there (see Jonuks *et al.* 2017). The train of thought is unlikely to be proved before extensive excavations are conducted at the sites.

The axe from Topi is more likely in the secondary context since despite thorough inspection of the find place no pottery – the main indication of a settlement site – that would be contemporary with the axe find was detected. Knapped quartz flakes that could refer to even an earlier, pre-ceramic habitation, were found (Johanson 2015). When analysing the find places of shaft-hole stone axes, it was ascertained that namely the fragments could be associated with settlement sites (Johanson 2006a, 66); thus, very roughly it could be concluded that whole axes from chronologically later sites might not refer to a Stone/Bronze Age settlement site at the same place, but rather to an earlier grave (in case of battle-axes) or some other context looted by the Iron Age or medieval people. The contrary cannot be suggested – axe fragments need not indicate an earlier settlement site since the axes could have broken during later use.

As said, in case of several finds from rural settlement sites, earlier stone items have been found after locating the settlement site. One exception is formed by Mustjala Võhma ring fort where a stone adze (AI 5370; Tab. 3: 104) with charcoal pieces was revealed from the lower layer of the site during trial excavation. The interpretation of the adze is made difficult by several details. As many quartz and flint finds have been gathered from the ring fort as well, the most likely interpretation is that all the stone finds derive from the Early Iron Age activities at the site. Lang (2007, 78) suggested that the adze is older than the rest of the finds and that there might have been a Neolithic site beneath the ramparts. It is likely that the quartz and flint finds, and the adze probably belong to the same time period, perhaps the Neolithic or the Early Iron Age, and while assembling the ramparts the earlier occupation layer was damaged and the finds scattered everywhere around the fort. While no excavation report exists and the exact find situation of the adze cannot be ascertained, finding it together with pieces of charcoal may indicate at a construction offering or a structured deposit inside the ring fort, analogous to *e.g.* the burial of several whetstones from Lüganuse medieval settlement site (see above) or an adze find from a hearth in Neolithic Sindi-Lodja III settlement site (Johanson 2006b, 109). The meaning of the deposit is difficult to determine, especially since the layout and size of the site – two massive ramparts around a tiny area and similarity to Kaali – have

made several authors suggest the general cultic meaning of the Võhma ring fort (Kustin 1959, 69; Lang 2007, 78).

Examples of settlement sites found in the area of earlier stray finds are provided also by Lehmja-Loo III (AI 7027; Tab. 3: 3), Kirimäe (Tab. 3: 27) (Mandel 2009a), Võhma (AI 5115; Tab. 3: 44; Lavi 1981), Rehe (Tab. 3: 69; Mandel 1974), Alasoo (AI 3916; Tab. 3: 105; Kriiska 1990; Karro 2013; Tvauri 2016), Ala-Vagula (AI 2490: 58; Tab. 3: 141; Kiristaja 1998), Puutli (AI 2490: 50; Tab. 3: 142; Zadin 2012). Since the axes have been, as a rule, found in the 1st half of the 20th century, without explicitly describing the find context, none of the finds can positively be connected with the occupation sites. An example worth describing comes from Alasoo settlement site, where the butt part of a Late Neolithic sharp-butted axe (AI 3916) was found from the field between the buildings of Sakala farmstead and a small Lake Vilajärv. The settlement site was discovered in the 1980s when finds were gathered on an extensive area between the buildings and the lake during the survey. The finds refer to human activity in the Iron Age, the Middle Ages and the modern period. However, without knowing the exact find place of the axe and conducting excavations precisely at this point two possibilities exist: either the axe was lost or deposited during the Stone Age and never retrieved or was reused during the later periods. Even in the case of excavations the information needed to interpret the axes might not be available because of the deep ploughing that has resulted in the intermingling of different occupation layers.

A Mesolithic adze (TÜ 2276; Tab. 3: 46) was found from the barrowfield in Tiksipalo (Ervin 2015), but not inside any of the barrows, so it probably cannot be directly connected to a burial context. During a survey trip, wheel-thrown as well as hand-moulded pottery sherds and an iron knife (TÜ 2274) were gathered from the soil between the barrows, which indicate at a Late Iron Age or a medieval occupation at the site. Also, a quartz flake was collected which together with the adze might suggest a Mesolithic settlement site in the area, especially since the find place approximately 200 meters from Lake Janukjärv is suitable for forager habitation. It is likely that both the quartz find and the adze were gathered from a Stone Age settlement site somewhere in the close neighbourhood during a later prehistoric or a medieval period and reused. It is also possible that the adze was reused as an apotropaic grave good in some of the barrows, erected in the 2nd half of the 1st millennium AD, but during the destruction of some barrows, as suggested by some authors (Laja 1925, 23), it might have been relocated. It cannot be disregarded that the adze might have been reused several times and for different purposes, in addition to the possible apotropaic function also as a whetstone as suggested by the finder of the adze, Jaan Veskimäe.

Sometimes the artefacts provide use-wear that is not characteristic to Stone Age use and could be an indication of their reuse. For example, the stone axe from Ala-Vagula settlement site (AI 2490: 58) is intact but very asymmetric; different stages in designing the edge part cannot be followed but the shape indicates that one side of the edge part was very likely secondarily ground. So

the using of the axe as a whetstone can be suggested. Another example is formed by a beautiful edge fragment of a Külasema type Late Neolithic battle axe (AI 2490: 17; Tab. 3: 109) found from Saareküla. Exact find place cannot be determined, but a medieval settlement site was located in the fields of the same farmstead (Vindi 1994). A groove ground inside one of the sides of the axe and severe damage to the cutting edge suggests the secondary use of the axe. The groove might indicate at a magical use, *i.e.* that curing powder was scraped from the axe. A large piece has been struck off from the butt fragment of a sharp-butted stone axe (AI 5115) found from the medieval settlement site in Võhma. The butt of the possible Late Neolithic battle axe (Viru-Nigula museum) from Viru-Nigula Late Iron Age and medieval settlement site has been hewed rectangular. Also, the otherwise intact and carefully polished axe (AI 7027) from Lehmja-Loo III settlement site has severe damage to its butt. The axe found from Lagedi settlement site (AI 4420) is of interest at this point too. Its cutting-edge shows no indication of using; however, at the same time, the axe has been cracked at the shaft-hole after a severe blow which leaves the impression that the axe has been deliberately broken. It can be suggested that the behaviour might indicate at the shattering of *the wonderful thunderbolt to divide it between many people*, as has been described for another axe in Pärnu Museum (Bolz 1914a, 18). Also, the Lagedi axe shows fine lines scraped into the surface of the axe, which might suggest multiple using for different purposes. The damages to the surface may have been created by the movement of the axe in the soil during ploughing; however, the find place very close to the bank of the Pirita River does not suggest heavy ploughing in the area. Moreover, other axes found while ploughing have not revealed such fine lines. The usewear of several axes indicates their using for hewing or chopping, i.e. 'correctly' in terms of proper function. However, it cannot be ascertained whether the damage has occurred during the first use of the axe or in secondary context since only the fresh fractures can be determined on the basis of the colour of the fracture surface. There are exceptions, *e.g.* the butt of the Viru-Nigula axe, originally probably a battle-axe, has been hewn rectangular probably secondarily. Of course we cannot follow different stages between the Neolithic/Bronze Age use and deposition during the Late Iron Age/Middle Ages in the biography of the axe, so it cannot be excluded that some things were found, used and deposited several times as suggested for Kirimäe axe by Mati Mandel (Mandel 2009a).

Although missing contemporary finds, sometimes use-wear or more exact find context add to the potential that an axe discovered from an Iron Age or a medieval settlement site has been retrieved from an earlier site and reused, without excavations the connection between the stray find and the later settlement site remains unreliable. The possibility always remains that the axes were kept as magical and curing items in the modern period and reached the field sometimes after the 18th–19th century when their apotropaic meaning had faded, and the items were forgotten in ramshackle barns and tossed to the field with other old junk. The fieldwalking trips nearly always reveal pottery sherds and

fragments of old iron tools from the 19th and the 20th century. The situation is fairly more trustworthy when earlier stone artefacts are found during the excavations of earlier settlement sites. Proosa settlement site, Pada I settlement site, Konuvere hillfort and Otepää hillfort should be discussed in this connection. The edge part of a stone axe from Otepää hillfort (AI 4036 II: 20; Tab. 3: 121) has a bizarre cross-section, unique facets, asymmetrically positioned shaft-hole whereas the edges of the shaft-hole have been severely worn. It looks as if the axe fragment has been hanging on a cord; perhaps it was used as some weight. The axe fragment was discovered very deep – 4.2 m in the cultural layer just above the change to natural soil. According to the description, it was detected close to the eastern corner of a wall (Saadre 1952), so perhaps we are dealing with a construction offering. A Neolithic slate arrowhead of Pyheensilta type (AI 4036 II: 15; Tab. 3: 120) has also been found from Otepää hillfort inside the occupation layer. Its tip and tang have been broken, and the surface has been severely scratched. The scraping marks are uneven and do not suggest reuse as a whetstone; moreover, the only 5 cm long fragment would not be comfortable as a whetstone. So the wear rather suggests non-utilitarian use. Several flint finds have been gathered from Otepää, but these are mostly of imported flint and rather indicate at fire-striking pieces and not at material potentially retrieved from a Stone Age site. Moreover, the flint from known nearby Stone Age settlement sites, *e.g.* Kloostrisaar in Pühajärv, is predominantly of local Silurian origin (Johanson *et al.* 2014, 35). An interesting find is also an adze from Late Iron Age Konuvere hillfort (AI 4571: 67; Tab. 3: 76). It shows negatives of flakes struck from its surface, but it cannot be ascertained whether these derive from the production process of the adze or reuse. A peculiar feature is the slantingly ground butt part, which is not characteristic of Stone Age tools and might, therefore, refer to secondary use. Whether the adze has been used for grinding or sharpening or in some magical practice is hard to tell, although for sharpening or grinding the longer sides would have suited better than the short butt part. The butt fragment of a stone axe from Proosa medieval settlement site (TLM A 93: 226; Tab. 3: 5) has very asymmetrically positioned shaft-hole but shows no visible damage to the surface. The axe has been made of dolomite which is extremely uncommon material for making stone axes. A grain grinding stone dated to the prehistoric period was detected in Proosa too and this together with the possible axe were used to suggest a so far undiscovered prehistoric settlement site somewhere in the close vicinity (Vedru 1995, 22). According to Valter Lang (Vedru 1995, 22), the axe may have been used in land cultivation. On the basis of the asymmetric hole and the rock used, it could even be suggested that the item may have been produced namely for this purpose – to be used as an ard-point or a hoe. A number of stone tools of soft stone have been found from northern Estonia, one of them – a possible ard blade from Saha-Loo (AI 5975) could be dated to the Bronze Age (Lang 2007, 107). None of the items regarded as possible ard-points has a hole in it, differently from the item from Proosa. However, it is possible that a part of the simple shaft-hole axes from the Late Neolithic, Bronze as well as Early Iron Age may have been used

as blades of primitive ards. It could also be that some axes with severely damaged edges from Iron Age settlement sites, *e.g*. the artefact from Otepää, were retrieved from an earlier site and reused as ard points. Even if the Proosa axe was actually an ard-point, it still had to be a reused artefact in the medieval period, as ard-points were made of iron since the 2nd half of the 1st millennium (Tvauri 2012, 99–100). It is also likely that the axe/ard point and the grain grinding stone were recovered from a nearby settlement site but perhaps were regarded as curiosities. The exact find context of the axe is not available, but it was found very close to one of the small buildings which could have served as garners or granaries (Deemant 1993, 4). A wild guess is that the axe fragment might have been regarded as an apotropaic item and associated with one of the buildings to keep fires away.

Four stone artefacts interpreted as an axe or an adze have been gathered from Pada I settlement site. One of these (AI 5082: 911; Tab. 3: 35) is especially interesting since its shape indicates that it is an edge fragment of a battle-axe, a piece of a perfectly ground and polished artefact. Its surface is cracked showing traces of having been in a fire and a large flake has been struck from the cutting edge. The fragment of the axe was found from the sooty soil in a trench-like depression together with a whetstone and 36 pottery sherds. It is likely that we are dealing with the burial of the remains of a hearth. Could it be that the axe fragment, regarded as a thunderbolt, was hidden into the hearth to keep lightning away as known from folklore (Blinkenberg 1911, 75; see examples in Hukantaival 2016, Appendix 3)? The other stone axe from Pada (AI 5082: 388; Tab. 3: 33) is also represented by an edge fragment, but on the basis of its rectangular cross-section can instead be associated with simple shaft-hole axes. Both the axe and the two possible adzes have been gathered from the cultural layer, although not from a remarkable context. The two possible adzes (AI 5082: 606, 340; Tab. 3: 34, 36) can be whetstones or perhaps broken axes which have been reused later as whetstones. It is noteworthy that all four items are edge fragments. As we know, edged tools have been valued as curing and apotropaic means, so their relative abundance in Pada suggests that the belief was known there. An additional fragment of a stone axe, a butt piece (AI 5366: 64; Tab. 3: 37), has been found from the ploughing layer above the underground inhumation cemetery in Pada very close to the settlement site. The find context of this fragment does suggest a stray find not deliberately connected to the later site. It might be suggested that there is a Stone Age settlement site in the area of the cemetery and all the axe fragments found in the Iron Age settlement have been obtained from there. In this way, the axe from the cemetery could have been an *in situ* find. However, thorough surveys have been carried out in the area around the Pada sites, and the possible Stone Age site should have been discovered.

There are quite many earlier stone artefacts found from the cultural layer of medieval and modern period towns. Tartu is remarkable with ten finds, whereas five have been gathered from Tallinn and one from Lihula. Unfortunately, the lack of excavation reports and find lists makes the interpretation of the finds

very difficult; in some cases, even the artefacts themselves have gone missing. A half of a stone shaft-hole axe (TM A 14: 402; Tab. 3: 110) and a flint arrowhead (TM A 16: 304; Tab. 3: 111) have been found from the excavations of the Tartu hillfort and castle. These together with a few flint finds allowed Vilma Trummal to locate a Stone Age settlement site at the later hillfort area or its vicinity (Trummal 1964, 83), a common explanation for earlier finds (see also Metsallik 1995, 27). The flint finds, recognised as scrapers by Trummal, are rectangular, with chipped edges and of imported flint and are thus much more similar to fire-striking flints that would perfectly suit the dating of the site to the Late Iron Age and the Middle Ages. Local Silurian flint is abundant in central Estonia (Kriiska *et al.* 2011, 79) and can be obtained from the topsoil in and around Tartu; during the Stone Age it was widely used in the area as demonstrated by *e.g.* the Mesolithic site in Ihaste (Jonuks & Johanson 2017, 50–51), while the using of imported flint in this region rather indicates at later prehistoric and medieval use. Several flint finds, predominantly of imported (Cretaceous and Carboniferous) rock, have been gathered from different excavations in Tartu. It cannot be excluded that a Stone Age site has existed somewhere in the present town centre or its vicinity, as suggested by a few Silurian flakes from the excavation plots in the town centre and a beautiful Mesolithic Silurian flint blade (TM A 238: 17) from a pipeline trench in Jaama Street (Roog 2016) approximately 1 km from the town centre. Unfortunately, the character of the majority of flint finds does not allow a confident conclusion on the matter. The closest known Stone Age sites to the town centre are Jummisaare I and II approximately 4 km away with single flint finds and corded pottery gathered from test pits (Möllits & Vimberg 2007/2008) and an extensively excavated Mesolithic settlement site in Ihaste (Johanson & Kriiska 2007; Randoja *et al.* 2017), about 5 km away. Neolithic combed and corded ware sherds have also been gathered from the latter site, referring to a Neolithic habitation there as well. The axe from Tartu hillfort has been found from the soil that had collapsed from a wall, possibly a medieval castle wall that was revealed during the excavations in 1956. The axe fragment has relatively damaged surfaces; abundant scratches and abraded sides reveal heavy using. The context might indicate at the immuring of the axe into the wall, which was sometimes done with an apotropaic thunderbolt to protect the house against lightning strikes and other mishaps (Blinkenberg 1911, 1; Carelli 1997, 404); damage to the surfaces could have been created in the course of immuring. It is also possible that scratches were made while using the axe in curing magical practice, *e.g.* the surfaces grazed to gain healing thunderbolt powder. However, we cannot exclude that the axe half was used as a pestle in practical tasks and was later discarded. Utilitarian function is more doubtful in case of another Neolithic find from Tartu hillfort/castle – a beautiful willow-leaf-shaped flint arrowhead found from the cultural layer close to but not in direct connection to the castle walls. The edges show some damage and the tip of the tang has been broken but these all could have happened during the Stone Age use. It seems plausible that both the axe and the arrowhead are indications of the belief in apotropaic thunder-

bolts; the additional support for this belief is offered by the find of a cephalopod fossil from Tartu hillfort/castle, potentially considered a thunderbolt too (see above Ch. 5.2.1.1.1.), as well as other axe finds from Tartu medieval layers which will be discussed followingly.

An edge fragment of a stone axe (TM A 42: 996; Tab. 3: 112) was unearthed from the plot of present Lossi Street 3, the Late Iron Age and medieval settlement site below the hillfort. The axe fragment was found from a depression next to a wall. Remains of a smithy, a bone working workshop and a tannery from the 14th century (Metsallik 1992) were revealed in the same excavation, and the majority of the finds belonged to the medieval wheel-thrown pottery. So the axe fragment is associated with medieval settlement, and perhaps it was also meant as a deliberate deposition into one of the walls to provide magical protection for the building. Another example is an attractive Neolithic flint arrowhead (TM A 50: 449; Tab. 3: 113), possibly of brownish Carboniferous flint, found from the debris layer between the walls in Rüütli Street. The associated finds, such as the sherds of late medieval pottery, grapen, faience, window glass and stove tiles, date the layer to the 16th century (Metsallik 1995, 32). The find context associated with a wall could mean that the axe was immured into the wall and during the following demolishing activities reached the debris layer. A stone axe was found from the excavation plot of Küüni Street (TM A 40: 2683; Tab. 3: 114) from the upper part of a layer with decayed wood remains. The layer consisted of a few Pre-Viking and Viking Age finds, but would instead be dated to the Late Iron Age (Tvauri 2001, 49). An oval fire-striking stone (TM A 51: 3214) from the Iron Age was found from a nearby excavation, which could have been left behind from the scarce habitation of the 2nd half of the 1st millennium, but together with the stone axe fragment could rather refer to the thunderbolt belief. A stone axe (TM A 45: 1242; Tab. 3: 116) was found from the black sooty layer under a wooden pavement in Block VII. The pavement was dated to the end of the 13th and the beginning of the 14th century (Aun 1998, 113), so the axe could have been placed or discarded under the pavement around that time. It might have been regarded a thunderbolt and placed under the wooden constructions to ensure fire safety. A butt fragment of a Karlova-type Late Neolithic shaft-hole axe (TM A 221: 6963; Tab. 3: 117) was found from Riia Street 2 from a mixed layer underneath one and next to another building (Silja Möllits, pers. comm., 6.3.2017). Constructions of three wooden buildings from the 17th–18th century were unearthed in the excavation, so the axe fragment could roughly be connected to this time period. The find context beneath a building might suggest hiding the axe under the threshold for fire safety; unfortunately, the later mixing of the layers does not allow any more confident conclusions. The find contexts of additional two axe fragments from Tartu town refer to construction debris and filler layers: a butt fragment of a stone axe (TM 2032 A 43: 131; Tab. 3: 115) was found from the excavation plot of the botanical garden from the construction debris. An edge fragment of a possible Late Neolithic shaft-hole axe (TM A 133: 4858; Tab. 3: 119) has been recovered from the plot of Ülikooli Street 14, a filler layer between two stone buildings that consisted of finds from

the 10th century up to the 17th–18th century. The two latter cases could derive from some demolished buildings. The most outstanding case of possible using of thunderbolts in medieval and modern period Tartu is provided by the find of a Neolithic Russian-Karelian type of fluted adze (TM A 222: 9; Tab. 3: 118) from Saint Jacob's cemetery outside the medieval town wall. The adze was unearthed under the left rib case of the burial no 25 – a 30–40 years old woman. It is not clear, however, whether the adze was a grave good associated with this burial (R. Roog, pers. comm., 20.08.2018). The deceased were inhumated in several layers without proper intermediary layers. Often the burials had been damaged by secondary burials. The excavation report is still being compiled, so the exact dating of the cemetery has not been confirmed, but it has been suggested that the cemetery was taken into use between the 14th/15th century and the majority of burials might be dated to the 15th and the 16th century (Liblik 2017, 16). There is no reason to suggest that the axe is there by accident or refers to a Late Neolithic habitation since we are dealing with a tightly buried area and no other find indicative of a Stone Age habitation was unearthed there. So it seems very likely that it is a grave good meant as an amulet for the deceased; however, whether it accompanied the burial no 25 or the one buried beneath her, is still to be determined.

Altogether eleven possible thunderbolts have been found from Tartu, eight of which have more certain find contexts. Compared to other Estonian medieval towns the number is much bigger but not due to more extensive excavations. In this way, Tartu is similar to Lund and Novgorod, which are also centres of the bishopric. What could be the reason for such a pattern? The belief into heavenly thunderbolt was by no means regarded as pagan or otherwise deplored, but highly valued by the clergy as well as secular rulers (Evans 1897, 59). While many of the items from Tartu are fragments and not intact artefacts it is possible that they have been gathered from a Stone Age habitation site in the neighbourhood. However, the mixing of the cultural layer in town is out of the question as this would have resulted in a much bigger amount of Stone Age flint tools and pottery (comp. Tyanina 2008, 174).

A unique find is a butt fragment of a stone axe (AM A 583: 103; Tab. 3: 28) from Lihula hillfort. The axe is made of limestone, which is a very uncommon rock for making stone axes. The item has straight facets and a square butt, which is also uncommon for Estonian shaft-hole axes. It has similarities to the Corded Ware Culture facetted axes that are most common in central Germany and have usually been made of slate that has not been chosen for other axe types (Stock 2001, 174f). So it is possible that the axe has been produced in Germany and was imported to Estonian territory during the Late Neolithic, has been retrieved from a Stone Age site in the Middle Ages, and reused. The location in Lihula is suitable for Neolithic habitation, and several flint finds have been gathered from the excavations which could support the suggestion. Mati Mandel (2000, 25–26) has referred to the find of a possible flint burin and other flint finds and associated these with a Mesolithic settlement site, which, according to him, has been buried under later occupation layers. Mandel also asserted that

the flint finds cannot have been mistaken for a later fire-striking flint (2000, 26) but I do not entirely agree. The flint has been imported; it is very likely of Cretaceous origin and similar to the Scandinavian rock, although no conclusions can be made without geochemical analyses. Some of the flakes do resemble Stone Age material but the majority are rectangular and with several chipped edges, which is somewhat suggestive of later fire-striking flints. The Stone Age origin of some of the flint finds cannot be rejected, but the fact that lumps of Scandinavian flint were imported here during the Middle Ages and used as fire-strikers supports the medieval origin of the flint finds. The axe fragment is of particular interest here since, even if agreed that there is a Late Neolithic occupation site under or in the close vicinity of the Lihula castle, I doubt that the Stone Age finds, especially the axe, reached the later occupation layer by accident. The axe was found close to but still outside a 13th–14th-century house remains (Mati Mandel, pers. comm., 5.9.2018), so perhaps it was placed in the eaves of the building for protection and after its decomposition reached its final context. Thunderbolts were often hidden in the eaves or under the threshold of buildings or immured into the walls (Blinkenberg 1911; Carelli 1997; Sibley 2009). There is a possibility that the axe was reused as a construction stone, perhaps to fill a gap in the stone walls, similar to the seven whetstones which were found between the walls of the castle. Still, it is more likely that the axe was regarded as a thunderbolt. What speaks against the suggestion is that thunderbolts were usually edged tools. At the same time, the immuring of whetstones might also have had an apotropaic meaning as construction sacrifices next to the purely functional significance (comp. Hukantaival 2016). Although I generally support the idea that it is a Stone Age axe, one cannot ignore the unusual shape and appearance of the item. Stone Age masters were skilful, but the straight facets of the axe rather to the use of specialised grinding stones or even emery wheels. So a proposition is put forward that perhaps it is not an axe fragment, but a piece of a construction detail of limestone.

From Tallinn, an adze has been found from Toom-Kooli Street (TLM A 2: 1009; Tab. 3: 10). This item has heavy scrapings on its surfaces, indicating some reuse (Fig. 21). Also, its butt part is very short and might have been filed or ground short. The earliest layers in the excavation plot derive from the 2nd half of the 15th century; however, it has been suggested that a 10th–12th-century settlement site existed there but was removed by quarrying limestone after the great fire of 1433 (Tarakanova & Saadre 1955, 20). So it is not known whether the Stone Age adze was reused in the Late Iron Age, medieval or modern period site, but heavy damage on the axe shows that something was done with it.

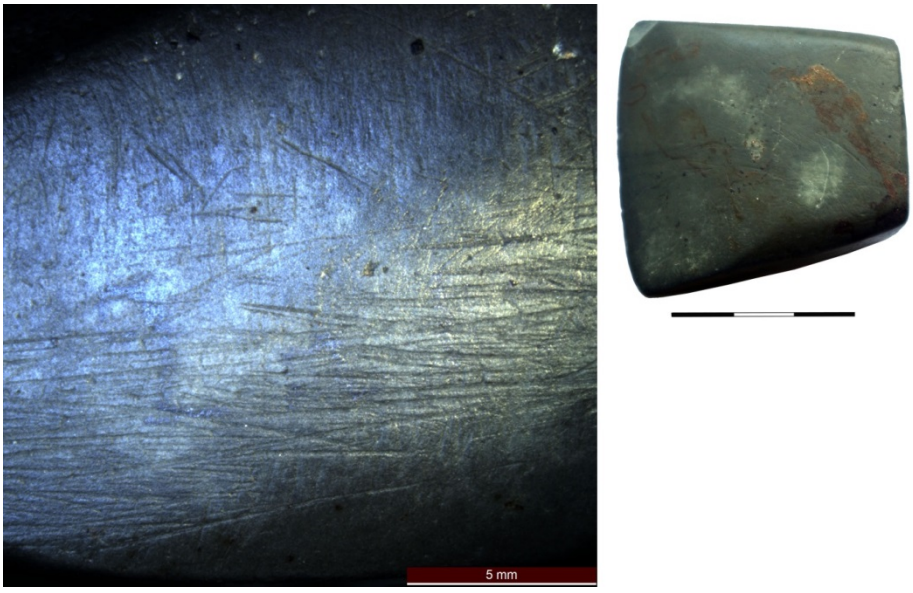

Fig. 21. An adze from Toom-Kooli Street. TLMA 2: 1009. Microphoto: stereozoom microscope Leica M205A.

A more exceptional find is an oval fire-striking stone (AI 5777: 1192; Tab. 3: 9), which kind is generally dated from the Roman Iron Age to the 8th century (Pellinen 1999, 25f; Tvauri 2012, 88). The item was found from the medieval St. Barbara's Cemetery in present-day Tallinn. According to the Christian canons, grave goods were not allowed in the 14th–15th century in Tallinn, and differently from village cemeteries, the ban was severely followed. It is possible that the closeness of the town with its strict rules or the ethnical composition of the population of Tallinn at that time played some role (Sokolovski 1996, 53). So it is quite unlikely that the fire-striking stone was a grave good in the 14th–15th-century cemetery. The earlier burial layer in St. Barbara's was covered by a 1 m thick layer of soil brought from Tõnismägi area during the Great Livonian War in the 16th century. Together with the soil, medieval settlement material, such as keys, locks, door hinges, ice nails, spurs, arrowheads, tools, bone needles, pins and buttons as well as fragments of silver and bronze jewellery and coins reached the cemetery. The majority of the settlement material is slightly older than the first burial layer of St. Barbara's or contemporary with it. In the 16th–18th century, burying was continued at the same place, and the 2nd burial layer was formed (Sokolovski 1996, 53–60). The fire-striking stone was found from the filler layer together with settlement finds between the two burial layers (Sokolovski 1996, 56). It is remarkable that although it is the only find from this early Iron Age at the site, its association with previous settlement site under the cemetery is suggested (Ševeljov 1996, 94). The most likely explanation for the stone is that it was reused in the medieval settlement site situated in Tõnismägi and brought to the cemetery during the 16th century with the filler soil. A less

likely interpretation would be that it was associated with the 2nd burial layer and was a grave good. Since the 16th century, grave goods started to accompany burials (Sokolovski 1996, 57), and in addition to small tools and jewellery knives and sickles were found from burials, perhaps connected to apotropaic magic (Ševeljov 1996, 85–86; Valk 1995, 141–142). Also, several stone axes and a flint dagger have been found from the present territory of Tallinn as stray finds (Tab. 3: 6, 7, 8); however, their association with the medieval and modern settlement has to be studied further.

5.2.3.1.2. Artefacts from the Roman and Middle Iron Age and Viking Age burial sites

Altogether 15 earlier stone artefacts can be associated with Roman or Middle Iron Age stone graves and possible Viking Age burial sites. An example is formed by two flint adzes found from the sand under Jäbara B *tarand*-grave (AI 3172: 360, 821; Tab. 3: 14, 15). Both are made of imported whitish flint, probably of Cretaceous origin. The adzes were found under the burial layer that allowed the excavating archaeologist, Marta Schmiedehelm, to conclude that a Stone or a Bronze Age burial site was located there and the later grave was built exactly at the same spot because of favourable environmental conditions (Schmiedehelm 1934, 28; Vassar 1943). Schmiedehelm (1935, 12–15) excavated the layer underneath the grave until the untouched limestone stratum and found several sooty spots and loose human bones that confirmed her initial suggestion). Schmiedehelm's assumption could be the most likely explanation for the adzes, one of which was found in the depth of 3 cm, the other 11 cm beneath the cultural layer of the grave. The Late Neolithic graves are often shallow, only 30 cm deep, so if some soil was removed to build the later *tarand*-grave, the earlier burials could have been almost exposed. However, if this is the case, the later *tarand*-grave was probably not accidentally erected at the same spot; instead, we are dealing with an intentional behaviour, the meaning of which might be the establishment of a connection with mythical ancestors. The presence of loose bones and absence of corded pottery which is a common grave good in Corded Ware Culture burials indicates that if we are dealing with a Late Neolithic burial site, then it is not intact but has been opened probably while erecting the stone grave, and mixed. The other possibility is that we are dealing with earlier burials, but not from the Late Neolithic, but from the Pre-Roman Iron Age (Vassar 1943, 16), in which case the memory of the earlier burials is more likely to survive. However, even though flint tools were used in the Bronze and Pre-Roman Iron Age, we have no information that they were placed in graves during these periods (but the possible exception of Jõelähtme should be reminded). The third possibility is that we are dealing with a specific ritual while erecting the grave – clearing the area under the grave with fire (sooty spots), burying single meaningful bones (from mythical ancestors?) and flint adzes as apotropaic items. One of the adzes has a carefully polished and unused

cutting edge but a very heavily damaged butt which might suggest some non-functional (not Neolithic?) use. Also, flint adzes are found from Estonian Neolithic contexts, often from the Corded Ware Culture graves, but the instances can hardly be considered frequent. So perhaps the adzes were imported from Scandinavia during the Roman Iron Age as apotropaic items after all, which would support the third possibility. Dating of the bones found under the grave would clarify the situation, but at this point, the situation has to remain a mystery.

Two flint arrowheads derive from the stone graves of Läänemaa from the middle or the 2nd half of the Iron Age: Uugla III and Ehmja. The arrowhead from Ehmja (AM A 554: 390; Tab. 3: 25) has been found inside the stone layer above the burial hole no 5. Mandel (2003, 36) has proposed that the burial holes from the 5th–6th century were looted and refilled with soil and stones in the 11th–12th century when expanding the grave. The small flint arrowhead may have been a grave good in the initial burying phase and remained in the grave after looting, but it could have been an amulet accompanying the 11th–12th-century cremation burials. Arrowheads of similar shape have not been found from Estonian Stone Age archaeological material, but single items are known from the neighbouring countries (Aivar Kriiska, pers. comm., 22.10.2018). The shape of the tang allows using the item as an amulet – the tang widens towards the tip, enabling attaching a cord or a strap of leather to the tang so that it would not slip down. A leaf-shaped flint arrowhead from Uugla III Late Iron Age stone grave (AM A 1068:84; Tab. 3: 29) is remarkable in this connection too. It was found together with a bronze spiral and a potsherd while cleaning the layer of stones in the grave during excavation; thus, it is very likely a deliberate addition to the grave. In addition, two flint flakes, a quartz flake, a quartz lump and a flint lump were gathered from the grave but their find context was not determined further in the excavation report. Considering this, we might be dealing with a Stone Age (Neolithic?) settlement site somewhere in the vicinity of the grave, and the flint and quartz finds were accidentally moved to the grave together with the infill. However, a proper Stone Age settlement site would yield much more respective finds, which speaks against this suggestion. Flint may have been gathered elsewhere, used as fire-strikers in the Late Iron Age and added to the grave as grave goods after that. However, the usewear on the arrowhead does not show obvious damage that would be later than the Stone Age retouch. There is also no clear usewear indicative of the possible wearing of the artefact as an amulet as could be suggested for the arrowhead from Ehmja. The find context does suggest, though, that it had been deliberately deposited, and perhaps protection of the deceased might have been expected of it.

A stone adze has been found from Tõnija *tarand*-grave (SM 1466:519; Tab. 3: 100). This together with a handful of quartz and flint flakes has led Marika Mägi to the conclusion that the stone finds derive from an earlier Neolithic or a Bronze Age dwelling site (Mägi-Lõugas 1997, 35), probably below or in the close vicinity of the grave. It has been ascertained that in Tõnija the later *tarand*-grave has been preceded by an earlier grave probably from the Pre-

Roman Iron Age (Mägi 1998, 98) when rock was very likely still used for making tools so that the lithic finds could have served as grave goods in the earlier grave. It could be suggested that the inserting of stone artefacts into the grave was a deliberate action; perhaps they were found while rebuilding the grave and reused as tools. Another possibility is that the stone finds were found while rebuilding the grave but were chosen to be inserted into the later grave for emotional reasons – perhaps to re-establish the connection with ancestors.

A possible adze (AI 5751: 211; Tab. 3: 103) was found while excavating Võhma Early Roman and Roman Iron Age stone grave (see more about the grave in Viljat 2016). The adze was found from the lower part of a thick coating of burnt stones directly east of the grave. Pottery sherds, grinding stones and peculiar sandstone discs were found from the rubble indicating at discarded settlement material brought to the grave from a nearby occupation site (Lõugas, [s.a.], 14; Viljat 2016, 16) after the most intensive using of the grave. The adze bears a resemblance to Neolithic fluted adzes, although it is heavily worn and has probably been reused as a whetstone or a grinder. It is possible that the adze was found from a Neolithic site and reused in the Iron Age, but the heavy wearing of the item makes it impossible to be entirely sure of its Neolithic origin, and it could have been specifically made in the Iron Age. Anyhow, the artefact was brought to the grave together with the rest of the settlement material in the 2nd half of the 1st millennium. The bringing of settlement remains to graves has been discussed above, and it is hardly possible that the act was utterly trivial. The dating of the finds from the grave indicates that the grave was used for a long time and probably taken care of after the using of the grave had ceased. So the act might have carried the meaning of inserting 'dead' settlement remains to the place they belonged, *i.e.* the grave (*e.g.* Lõugas [s.a.], 14).

Stone axe (AM A 235: 80; Tab. 3: 41), destroyed and lost by now, has been found from Ulvi II *tarand*-grave, a fragment of a ground stone tool, possibly a stone-axe (AM A 349: 568; Tab. 3: 32) has been discovered from Ojaveski *tarand*-grave and a stone adze (AI 3899: 5; Tab. 3: 87) was found from the Tansi-Jaani 3rd grave. Nothing specific can be said about the first two; however, the adze from Tansi-Jaani was found from the upper layer of the grave, suggesting that it might have been used as grave infill. Its edge part had been heavily chipped and butt part broken; also, its surface has deep scratching marks, indicating at some reuse. It could have been retrieved from an earlier settlement site and reused as a whetstone or a hammerstone in the Roman Iron Age, but later deliberately deposited into the grave, as suggested for the settlement finds in *e.g.* Võhma stone grave (see above). An edge half of a straight-butted stone axe (AI 2254: 29; Tab. 3: 45) was discovered from Raiste *tarand*-grave. The axe was found during the excavations of Richard Hausmann who is one of the few researchers who has discussed this kind of finds further. He concluded that as stone items were used later than the Stone Age there is no way of saying whether the axe fragment has reached the grave by accident or has been deliberately deposited (Hausmann 1902, 119–120). It is likely that Hausmann considered the possible apotropaic meaning of the axe as the reason for its

deliberate placement into the grave. A stone shaft-hole axe probably of Karlova type (AI K 91: 43; Tab. 3: 101) has been found from a Viking Age cremation grave of Uduvere (Tvauri 2012, 252, fig. 189). The item is peculiar as it seems that it is an intact but unpolished Karlova-type battle-axe.

A curious case to discuss is offered by a stone adze (AI 3358; Tab. 3: 30) from Iila *tarand*-grave where an adze was found from the loose soil in the 3rd *tarand*. Two burials, probably inhumed in the 2nd century were found from the 2nd *tarand,* while a third burial was inhumed in the 10th century in the same *tarand,* partly destroying the central part of the *tarand* for that (Mägi 1995, 526). There are several possibilities to interpret the adze. First, it could be that the adze was used as a standard building stone in the grave, but this does not seem very likely as it can hardly have been mistaken for a natural stone; so even if used as a building stone, it must have had a special meaning. Second, the adze might have been a grave good intended for the two 2nd century burials but was redeposited with the destruction of the central part of the *tarand.* The third possibility is that the adze was the grave-good meant to accompany the secondary burial from the 10th century. Sometimes after the last burial, a pit was dug in the breast area of the deceased (Mägi 1995, 526), which might have caused dispersal of some of the goods, including the adze. The most probable interpretation seems to be that it was a building stone, but with specific apotropaic meaning; perhaps it was regarded as something belonging to a mythical ancestor or just a curious formed stone believed to protect the deceased in the grave.

5.2.3.1.3. Artefacts from the Late Iron Age, medieval and modern period burial sites

Seventeen Stone Age artefacts can be associated with a Late Iron Age, medieval and in one case a modern period burial site. An edge fragment of a shaft-hole axe (SM A 1468: 37; Tab. 3: 94) was found between the stone slabs of Piila Late Iron Age stone grave in Saaremaa and could not be associated with any specific burial. However, its deposition in the grave cannot be accidental; instead, it could be regarded as an apotropaic item meant to protect the grave. The rest of the Late Iron Age and medieval burial contexts are inhumation cemeteries. A butt part from Pada inhumation cemetery has been discussed (see above). Two stone adzes (AI 3822: 7; Koort coll. no 3; Tab. 3: 89, 90) have been found from Kõruse and one (AI 2490: 30; Tab. 3: 83) from Ardla Late Iron Age cemetery. Unfortunately, nothing more specific is known about their context. A beautiful intact battle axe of Karlova type (AI 2485: 14; Tab. 3: 98) has been found from Saluküla burial site in Saaremaa. Additional finds include an inhumation burial with finds indicative of the Late Iron Age; however, medieval finds have been gathered from the surrounding as well (Laur 1924, 11). The axe has been gathered as a stray find and is not associated with any burials. Considering the find context in the depth of approximately 30 cm and the appearance of the axe it is possible that there is a Corded Ware Culture burial

site, as also suggested by Laur (1924, 9). However, it is likely that the axe was accompanying a Late Iron Age or even a medieval burial as an apotropaic device. The same can be suggested for the stone tools potentially found from the medieval village cemeteries, such as Avaste (AI 3861; Tab. 3: 77), Muhu Viira (AI 4299: 51; Tab. 3: 102), Orstipalu (Tab. 3: 143), Nõo (AI 2439; Tab. 3: 108) and Lähtse (AI 4761: 3; Tab. 3: 4). In the case of Muhu Viira early medieval inhumation cemetery, the find context of the adze cannot be associated with any burials. The adze was found from the southern part of the hillock which had been destroyed while building a cellar; also, only a few loose human bones were gathered there (Kustin 1964). So it is possible that the cemetery never extended to this part of the knoll or the burials were removed before establishing the cellar. The medieval burials in the cemetery hardly had any grave goods; thus, it is implausible that the adze was accompanying a burial that has been destroyed by now. It could be that the adze acted as an apotropaic device for the whole cemetery and was buried into the ground there without accompanying any specific burial. There are no parallels to this behaviour; however, edged stone tools from the collective stone graves might indicate similar conduct. The rounded edges imply utilitarian reuse of the adze, perhaps as a whetstone. So it is likely that the adze was found while building the cellar, probably in the 19th century, either from the cemetery or its vicinity, reused, got lost or was thrown away. The attractive flint arrowhead (AI 2439; Tab. 3: 108) from Nõo Chapel Hill has reached the museum collection through several persons, and the actual find place is thus uncertain. Also, a small fragment of Karlova-type stone axe has been found from Kuude Late Iron Age burial site (Tab. 3: 126).

5.2.3.1.4. Artefacts from undated burial sites

Altogether nine axes have been found from graves which cannot be dated more specifically. For instance, a shaft-hole axe (Tab. 3: 88) was found while removing a grave (in Estonian *kalme (kivikalme?) äravedamisel*) (Moora 1924, 58) in Koimla, Saaremaa; more specific information is not available. Some stone graves, as well as ancient field systems, have been located in the neighbourhood of Koimla village (*e.g.* Sepp 1995), so it is plausible that a grave somewhere in Koimla was destroyed and the axe found from it, but it could have been recovered from a clearance cairn instead. Stone graves situated in later cultivated lands have regularly been reused as clearance cairns; so without proper excavations, the nature of the stone pile is difficult to be ascertained. It is possible that the axe was cleared from the field as a regular stone; however, while removing the cairn, the axe had to be noticed as something different and noteworthy. Damages to edges may have resulted from reuse but perhaps also from throwing the axe to the clearance cairn. A similar case is a shaft-hole axe (AI 3822: 17; Tab. 3: 99) found under a cairn in the field of Suuriku farmstead in Undva, Saaremaa. It is an intact axe, properly ground and polished, so it is doubtful that it was removed from the field without paying attention. Moreover, according to the description of the situation of finding, the axe was found under

the cairn after it was struck by lightning (Moora 1924, 61). Axes have also been found from additional two possible stone graves in Saaremaa: one from Rootsiküla (Tab. 3: 96) and the other from Suurvare in Rootsivere (AI K 91:12; Tab. 3: 97); however, sure stone graves are not known in these villages. A Karlova-type stone axe from Reo cemetery (SM 7804 A 689; Tab. 3: 95) in Saaremaa as well as a shaft-hole stone axe from Kaarma cemetery (SM 10174: 2; Tab. 3: 84) in Saaremaa were categorised under uncertain records. Kaarma cemetery could be associated with an unlocated Late Iron Age cemetery somewhere in the neighbourhood of Kaarma village, named as the battlefield of Kaarma by Holzmayer. Additional two Karlova-type axes (AI K 91: 6, 32; Tab. 3: 85, 86) were found from the so-called battlefield. According to Holzmayer, the battlefield is a 3x2 km large area between the hillfort of Kaarma, Kaarma manor and Uduvere village wherein 1261 a fierce battle between the Germans and the Osilians was fought. Several artefacts have been gathered from the extensive area through years, such as axes, spearheads, bracelets, breastpins, brooches and other jewellery, indicating at a burial site but, unfortunately, the exact location of the site has not been confirmed (Leinbock 1924, 24f). In this way, it is possible that the two Karlova-type axes have been found from the so far undiscovered Late Iron Age burial site, but it is as likely that they derive from an undiscovered Corded Ware Culture burial site, since Karlova-type battle-axes have been used as Late Neolithic grave goods. It is thinkable that an undiscovered Corded Ware Culture burial site existed somewhere in the extensive area, whereas human bones were, for some reason, not noticed when the axes were collected in the 19th century. Alternatively, the axes could have been discovered already in the Late Iron Age and reused as grave goods again several thousands of years later. The third axe from Kaarma cemetery is not a battle-axe, but it has a deep groove on its surface, which could be indicative of some reuse.

A particular discussion is in order for the burial site in Metsiku (Tab. 3: 31). Here according to Grewingk (1887, 173–177), a burial was found with a Late Neolithic stone axe, probably of Külasema type, and a bronze chain that was attached to the shaft-hole of the axe. As the finds and the skeleton have not been preserved preserved, it is difficult to determine what we are dealing with in this case. However, Grewingk was a distinguished geologist and an archaeologist and was familiar with the Stone Age as well as later archaeological finds. So his judgement on the material and type of the finds can be considered entirely trustworthy. Unfortunately, Grewingk neither saw the bones nor the situation of the burial himself, so it is thinkable that the artefacts were associated with the bones by accident or perhaps the vivid imagination of the finder played its role. Nevertheless, it is plausible that we are dealing with a Late Iron Age or more likely a medieval burial site with an apotropaic thunderbolt given to the deceased as a grave good. At this point, another similar example should be introduced. A stone adze has been collected from the Chapel Hill (*Kabelimägi*) in Nurme village in Saaremaa (Tab. 3: 92), allegedly found from a grave that is part of a Late Iron Age cemetery (Leinbock 1924b, 41). Leinbock suggested that it might

be a Stone Age grave or *rather the stone tool was given along to a deceased from later period as a specific 'witch's stone' that sometimes happens* (*ibid*). Unfortunately, he does not specify any analogous cases, but it is likely that he kept in mind namely the burial in Metsiku.

5.2.3.1.5. Folkloric artefacts

Altogether 60 archaeological stone artefacts that were reused in the ethnographic past should be discussed (Table 3). More than half of the artefacts (n = 44) have been recorded and/or collected by Martin Bolz at the end of the 19th and the beginning of the 20th century; 21 of these are still kept in the Pärnu Museum (see also Article 4). Ten are or have preserved in AI, two in AM, one in HKM and one in ERM; additional five have probably never reached a museum context. Nearly a half of the items (n = 27) have been named and valued as thunderbolts but nothing specific is known about their possible use. However, it has been recorded for some that the owners were not ready to sell them for a significant amount of money (*e.g.* Tab. 3: 19).

Ten artefacts have been valued as thunderbolts and used for curing or apotropaic magical practices. Additional ten have been used in curing magical procedures but the name 'thunderbolt' has not been used for these. The descriptions for these are very similar, regardless of their name which suggests that the names might not have been recorded in every single case, for example, when the donator did not mention it. However, it is as likely that the curing stones were not always connected to the thunderbolt-belief or the connection to the belief was lost. For the majority of the artefacts only general curing has been mentioned (Tab. 3: 20, 21, 22, 26, 60, 73, 80, 81, 99). Putting the axe into the children's bathing water has been referred to several times (Tab. 3: 61, 62, 63). According to a more specific record, an adze was soaked in boiling water to give it the healing power (Tab. 3: 93). Also, a grinding stone (Tab. 3: 70) and a stone adze (Tab. 3: 128) had been used to cure erysipelas. Grindings were scraped from a shaft-hole axe to be used against stroke (in Estonian *rabandus*) (Tab. 3: 42); the axe shows severe damage to its surfaces, confirming the secondary use as a curing magical item. In two cases, a stone item had been used to press furuncles (Tab. 3: 64, 82) and in one case a stone adze was put in the drinking water of cattle when they first drank after calving (Tab. 3: 53).

Eleven of the artefacts have been used in some utilitarian ways. The items exploited in utilitarian ways include a shaft-hole axe used to castrate oxen during three generations: *Wurde durch 3 Generationen hindurch zu einer Art von rohen Castration der Stiere (ärjade tagumine) benutzt* (Bolz 1914a, XXIX, no 75; Tab. 3: 137). In this case, it could be suggested that the axe was chosen as a suitable practical tool, but some magical meaning could have been attached to it. Two shaft-hole axes (HKM 512, Tab. 3: 11; Tab. 3: 51) and an oval fire-stone (PäM 3 A 593; Tab. 3: 140) were used as net-sinkers. A butt part of a shaft-hole axe was used to pound oil colours (PäM 3 A 553; Tab. 3: 57). Altogether three artefacts had been used as whetstones (PäM 3 A 754, Tab. 3: 58;

Tab. 3: 23, 59) and one as a candle-holder (Tab. 3: 133). A curious case is formed by a stone shaft-hole axe used in bricklaying (ERM A 564: 958; Tab. 3: 130; see also Johanson 2006a, 119). Two of the artefacts have been named thunderbolts, perhaps suggesting their (other than) practical value for the owners (see above, Ch. 2.2) but have been used in very utilitarian ways. One served to substitute a missing leg of a chest: *diente in der Kleete als Unterstützung für den zu kurzen Fuss einer Kiste und ist zerschlagen worden* (Bolz 1914b, X, no 39; Tab. 3: 138); the other was used for ironing a bonnet: *wurde von der Finderin zum Glattstreichen ihrer Haubn benutzt* (Bolz 1914b, XX, no 74; Tab. 3: 68).

To sum up, the finds discussed in this chapter have very different biographies, and we can only suggest understanding a part. Earlier stone artefacts occur among the finds of later settlement and burial sites, but in most cases, there are more ways than one to interpret them. In many cases, we cannot be sure whether the older items were kept as curiosities, reused in some magical practice or as utilitarian items. We cannot be sure when they reached the later context. Studies of usewear may, but need not clarify the picture – curing magical practices may leave non-utilitarian and non-intentional traces, but so could accidental moving of the items during ploughing or natural formation processes. Breaking could occur when pieces of a wonderful thunderbolt were planned to be given to many people (Bolz 1914a, no 18) or when the finder was curious about the material of the item (*e.g.* Tammepuu 1951, 4). So there are more questions than answers. However, perhaps to get more answers in the future, finds that look like residual and indicating at a Stone Age site somewhere in the vicinity should be more closely inspected and their find context carefully documented.

6. DISCUSSION

Having introduced the theoretical approaches, research history and the ethnographic, folkloric as well as archaeological source material it is time for generalisations. For the current research, I concentrated information on fossils, pebbles and antiquated edged stone artefacts that have been found from Estonian archaeological contexts. Every archaeological find has two main 'landmarks' in their biography – the deposition into archaeological context and the deposition into preservation context (*i.e.* museum collection). The first has to do with the actions of the practitioners/users and the second refers to the activity of researchers/collectors. This notion is a simplification of course since in many cases we may have many occasions of archaeological deposition. Sometimes, like in case of fossils and pebbles we see only one archaeological deposition, while in case of antiquated stone artefacts we know that the first deposition had to occur at the time of their production; however, we also see only the last one and our interpretations are based on that. There are certain similarities in how the practitioners in different periods have perceived and used fossils, pebbles and antiquated objects. Similar ideas guide also the behaviour of researchers, both archaeologists as well as ethnographers when they decide to collect and preserve an item. Finally, there are similarities also between the views and understandings of practitioners and the researchers. Followingly, I will look at the similarities and differences between and within the groups.

Researchers and practitioners have a common trait – universal cultural ideas that guide the processes of making choices, most importantly the idea that a stone that has outstanding outer qualities (appearance, special find context) has also got significant inner properties. Whether to 'give in' to this universal urge is also a choice that researchers and practitioners make. The actual purposes for picking up a specific curious stone are different: while practitioners want to use the outer qualities for utilitarian tasks or hidden agency for magical practices, the researches wish to find out the stone's importance for the practitioners.

Researchers' behaviour is affected by the general readiness which is connected with the mentioned cultural universal ideas, by the background in folkloric material as well as the current valid academic climate which supports or rejects the significance of natural finds (in case of fossils and pebbles) or the idea of reuse (in case of antiquated objects). Of course, the three main aspects become intertwined in a single person and could affect each study differently. However, to take one aspect at a time, the academic climate, clearly and always influenced by the general conceptual and intellectual views in the society seems the most dominant. Although rationality dominated in collection and exhibition policy already before the Soviet period, a good example of which is the first permanent exhibition of the ENM (Article 4), the atheist campaigns, the denial of religious way of thinking and emphasising the scientific rational worldview in the Soviet period affected the scientists' thinking more than before. For example, the most supported interpretation for older artefacts in later contexts in

Soviet publications was residuality, which, I guess, has very often resulted in inadequate documentation of these finds, since the residual finds were not considered to be in their deliberate deposition context and were thus useless for clarifying, *e.g.*, the date or character of the site. The residuality concept has been so exhaustive that even a single Stone Age edged tool might be seen as an indication of it, without doubting that other explanations may be available. At the same time, at the beginning of the 20th century, some researchers considered it plausible that earlier artefacts might have been reused in the later period. For example, Ferdinand Leinbock (1924b, 40) suggested that a stone axe in the Late Iron Age cemetery could have been used as a 'witch's stone', Richard Hausmann (1902, 119–120) emphasised that stone finds do not only belong to the Stone Age but have been used in later periods, and finally Marting Bolz eagerly collected detailed stories of the reuse of archaeological stone artefacts (Bolz 1914a; 1914b). Apart from residuality which affected the antique items, the treatment of natural stones like pebbles and fossils seems to be similar. Fossils and pebbles have been collected during archaeological excavations before and during the Soviet period but were more thoroughly discussed only by Indreko (*e.g.* toadstones from Asva in 1939). The overall rational mentality is illustrated in the dispute of the 1990s between Romeo Metsallik, Ain Mäesalu and Kaur Alttoa (see Metsallik 1996), where the idea suggested by Metsallik of symbolic network of paths and the offering of raw iron lump in medieval Tartu arouse critique with Mäesalu stating that the majority of the past people were practical (Metsallik 1996, 1359). The rationality as a dominating view is not especially characteristic to the Soviet region but illustrates the post-World War II time until the 1990s in the western world too. If we add here the then valid axiom about archaeology being not able to study religion or magic (Hawkes 1954), we get the combination that more or less scared archaeologists from discussing mental issues on the basis of the material culture.

One aspect connected to the rationality and the intellectual background of the researchers is the professional training. The professional education in archaeology has, at least in the past, emphasised the rational view to the source material, so it is only natural that Bolz, who was a doctor by profession and an archaeologist by hobby, or Hausmann, a well-trained historian, but a self-trained archaeologist, were more willing to think outside the period-centred approach to archaeology (Article 4). Naturally there have always been notable exceptions among the researchers, like Richard Indreko, Artur Vassar, Vello Lõugas, Heiki Valk or Romeo Metsallik. The opportunity to study folklore in addition to archaeology had its influence on some researchers (especially Indreko), as this combination was not possible during the Soviet time, but could be accomplished before and after this period.

Folklore has inspired the interpretations of some archaeologists, but only in case of Indreko, the direction of his influence can be followed from his discussion. I suggested that the German folklore influenced Indreko in case of toadstone while Kustin got her inspiration to name a few pebbles snakestones from Kivikoski and Finnish folklore. Lembit Jaanits was probably influenced partly

by Indreko and partly also by Finnish folklore. Vello Lõugas relied on local folklore – he named some pebbles from burial sites 'thunderstones' and brought Estonian folklore texts to support his statements. Heiki Valk named a few pebbles curing stones. However, there are very few folklore texts from the end of the 19th and the beginning of the 20th century that discuss generally curing stones; rather the names are more specific, such as earstones, thunderstones, stroke stones; a heart stone, a *narrits*-stone and a navel stone are also preserved in the folk medical collection of the ENM. Valk has rather leaned on a few of his contemporary records (Valk 2005 about Uusvada) and perhaps also on Zurov's description about curing with small round pebbles at Jaanikivi in the 1930s (Zurov 2017, 278; 282). What characterizes the using of folklore in the texts of archaeologists is that very often more profound discussions into the topic mean that folkore is regarded as timeless and the 19th or 20th-century texts have been presented as an indication of continuing beliefs (*e.g.* Sibley 2009). The other possibility to use folklore is to present it as an illustration for the archaeological material, and this is quite apparent in all Estonian cases.

Even though the period when fossils, pebbles and antiquated stone artefacts were gathered and used was very long, there have been general similarities in people's approaches. One of the main cultural universals that have guided the human perception of nature through history is counterintuitivity. We might say that counterintuitivity is the prerequisite of magical worldview. The main principles of magic – the law of similarity and the law of contagion – are based on the counterintuitive perception of the world. However, specific counterintuitive ideas are created by people and ascribed to different things and creatures. Through these ideas, magical agency is attached to things and creatures. For example, it might be suggested that a universal counterintuitive idea is that stones can cure illnesses or that certain animal body-parts provide magical protection. The specific link between the problem and the solution is created by magical principles which might rely on, *e.g.* the physical parameters of the stone (colour, shape, size) or its supposed origin. Thus, while stones generally can heal, stones that have suddenly fallen from the sky with a lightning strike can be used against strokes/suddenly appearing diseases; stones believed to derive from the head of a toad are good against poisoning; stones that have loose matter inside (iron concretions) are supposed to help pregnant women, *etc.* Colour was often the primary indicator of the suggested efficacy, for example, yellow stones helped against jaundice, red stones against haemorrhages. The law of contagion is illustrated by, *e.g.* the curing methods of ganglion (in Estonian *kooljaluu*) with the agency of death empowering the cure: one had to take the bone of a dead animal from the ground, press it against the swelling and return the piece to its place (RKM II 385, 12 (15)).

The apotropaic and especially the curing magical methods that rely on the sympathetic magical principles are various; virtually everything, including things that would according to our present ideas be viewed as rubbish, can potentially be ascribed a magical agency in the frames of the given 'rules'. For example, we know from the 18th-century written sources that smoking the leather of old

boots was considered a cure against the skin condition believed to have been obtained from the ground and thus named *maa-alused* by Estonians (Wilde 1766, 30) – apparently the old boot that had been in contact with soil was perfect cure against the disease that originated in the ground. Sometimes the link between the cure and the condition is straightforward, for example, eating glass-sherds against sharp internal pains (*e.g.* Kõivupuu 2013, 16); sometimes the association is more difficult to follow, like in case of using blue wrapping paper in the cure of erysipelas. Although nearly everything could become laden with curing magical properties and thus be accepted by the rules, the existence of rules [institutionalisation] probably had some legitimising effect on the procedures, adding a certain awe of credibility to these. Different legitimisation processes could be regarded as adding particular (magical) agency to the cure. Thus, the church and instruments connected to the church (the Host and the holy water, but also hymnals and even rope of the church bell, soil from churchyard, pieces of altar candles or clothing worn in church) were empowered by the institutional position of the church to be used in the magical practices (see Article 3). Similarly, pebbles used in the healing processes sometimes had to be picked from the land of the manor. A parallel can be drawn with several alternative curing or apotropaic means today. For example, a discussion between a geologist and the keepers of a shop that sells semi-precious stones could be reminded where the shop-keepers, emphasising the energy of stones, insisted on completing scientific studies that would physically measure the energy and its effects on human beings (Päärt 2017). The MMS debate in Estonian media has demonstrated how scientific explanations for the efficacy of this poisonous liquid is sought for (see more about the legitimisation of non-institutional directions of medicine and religion in Ventsel *et al.* 2018).

The large variety of apotropaic and curing magical practices as well as artefacts or substances used in these practices indicates that a single illness had various cures and the same cure could be used to treat several different illnesses. The diversity of treatments that depended on various perceptions of the origin of the illness has been demonstrated in the case of erysipelas (*e.g.* Veidemann 1985; Martsoo 2007). The treatments of yellow fever illustrate the diversity of cures within the specific rules – different yellow substances helped, *e.g.* plants with yellow blossoms, coin, piece of yellow cloth, amber (Wilson 2000, 363). Pieces of cloth stained with red menstrual blood, red wool, red textiles or belts with red pattern have been used in the cure of erysipelas (Veidemann 1985, 143); here, in addition to the colour similarity, the life force of blood was exploited. These examples refer that within the frames of these unwritten rules people were free to choose the curing agents, the order of rituals as well as other details of the procedure. However, the free choice might have been at least partly determined by the local communal traditions of how things were done. This free choice within certain rules leads to the next big keyword relevant in the current research – vernacularism. Leonard Primiano introduced the concept of vernacularism generally to abandon the two-tiered view of religion as official (pure, right) and unofficial (folk version, contaminated) and to discuss the lived

experience of religion (Primiano 1995). Although the concept sounds natural and thus omnipresent, it is perhaps the most remarkably exposed in conflict situations, for example, with the advent of Christianity, and later with the introduction of Protestant ideas. The conflict between the right way of following religion (Christianity) and religion 'as it is lived' was brought along by the inclusion of church implements into everyday safekeeping and curing practices. In the present association, I rely on Primiano's concept on vernacular religion but modify it to have vernacular practices. It seems plausible that the sort of vernacularism that Primiano talked about has been prevalent throughout history at least with ordinary people. It seems reasonable to suggest that taking all measures to handle illness or secure one against mishaps is a cultural universal too. In the concept of vernacular practices, this means enhancing the chance of happy ending with several different measures regardless of their origin. However, within the frames of the unwritten rules, the magical agency of the elements, *i.e.* the curing and safekeeping measures, was tried to be increased by institutional (manor, church) or ancestral power (ancestors, perhaps also the agency of death and graveyard could be accounted here).

From the abovesaid, it can be stated that the practitioners (the collectors and users of the pebbles, fossils and antiquated (edged) stone tools) of different periods probably had much in common. First, living in the magical universe, that is, living in a world of supernatural/magical causality where accidents do not occur, but everything that happens has an explainable cause (see also Wilson 2000, xxv). The well-known example by Evans-Pritchard about the death of eight Zande men due to the collapse of a granary should be reminded here. Evans-Pritchard asserted that the Zande know that as termites eat the wood, the granary was supposed to collapse at some point (this causal relationship is clear to the researchers, *i.e.* the followers of strong causality, too), but why did these eight men happen to sit under the granary at this particular moment is unexplainable by strong causality, but can easily be explained as witchcraft by supernatural/magical causality (see more Evans-Pritchard 1937, 69–70). According to Stephen Wilson, in case of magical causality, we are dealing with over-rationalisation, requiring and producing explanations where most would be satisfied to accept things as fortuitous. In this way people feel in control of situations; when causal relations were explained, people could, through chosen vernacular rituals, do something to fix the problem (Wilson 2000, xxv). Second, measures of different origin were taken to deal with the insecure life whereas the number and the details of different elements used in the practices could vary but generally relied on the main magical principles – sympathetic magic. Third, there are similarities also regarding material culture. For example, the collecting of amber and using amber pendants in Stone Age graves is indicative of its special role. Amber goods accompanying some burials with pathologies at the Tamula cemetery of hunter-gatherers referred to the possibility that amber might have been given to the dead as an apotropaic or curing agent. All over Europe amber finds from the Neolithic, Bronze and Iron Ages refer to the special position of this substance (*e.g.* Beck *et al.* (eds.) 2003).

In the Greek texts as well as medieval lapidaries amber was known as the petrified urine of a lynx, hence the name *Lyncurius* or the Lynx's Stone, and was supposed to help against different conditions, such as scrofula, bladder stones, jaundice and intestinal problems (see Duffin 2008, 28). Echinoids have been inserted into graves since the Stone Age (McNamara 2011), they have been regarded thunderbolts since the Antiquity and used for different ailments and mishaps. At the same time, it cannot be said that amber or echinoids were magically or otherwise similarly perceived in all contexts and all periods they appear; however, it can be stated that there are certain substances which regarding as special because of some characteristic features in their appearance or properties is also a universal and recurrent trait of mankind. In case of amber it could be the colour, trapped animals or static electricity and in case of echinoids the oval/round shape and the 'pattern', *e.g.* the five-pointed star in some species that attracted people.

Several universal aspects were listed, but are there any differences between the practitioners of several periods and what sort of dissimilarities between the perceived meaning of the artefacts in question (pebbles, fossils and antiquated artefacts) can we see? In the Stone Age, the available archaeological material shows gathering and use of pebbles and fossils. In the case of the fossils that resemble a living organism (trilobites, ammonites), perceiving them as petrified animals has been suggested; however, this comprehension is not characteristic only for the Stone Age, but continued until the determination of the fossilisation process in the 17th–18th century. In the Stone Age when flint was worked to produce tools, the fossils exposed while knapping might have been regarded as apotropaic or, on the contrary, potentially dangerous. Other fossils that were not like living organisms might have been regarded as curiosities or formed stones that had taken the shape of something else available in the human world, for example, the interpretation of heavenly darts has been proposed for belemnites (Boyadziev 2008). The universality aspect could give the hypothesis some credit – the similarity between the belemnites and the real arrowheads is physically visible to the present researchers and must have been so also to the practitioners, so there might have been a connection sought for while producing the darts. However, most of the associations potentially valid in the Stone Age remain only speculations. As for pebbles, they have very likely been gathered to be used in several utilitarian ways. The small waterpolished pebbles could have been used for polishing pottery or bone, metal and stone artefacts. Pebbles of different size and shape could have been used as potboilers. Rounder and more symmetrically shaped pebbles served as potential ammunition. Also, pebbles of different size, shape and colour could have been used as gaming stones, dependent on the activity. Finally, according to written and folkloric sources, we know pebbles as curing and apotropaic instruments, whereas the requirements for the pebbles depended on the character of the purpose. While the find context and use-wear only occasionally provide clues for the function of the pebbles, mostly speculations remain. We may conclude that if universal 'pebble-mania' accounted, symmetrically or unusually shaped smooth and especially water-

polished pebbles with vivid or outstanding colour were gathered during different archaeological periods, including the Stone Age, as curiosities. Some could have been taken into use as utilitarian tools or playing pieces. Some could have been associated with a certain agency in nature and kept as amulets. The latter interpretation would be more readily accepted in case of special deposition context, *i.e.* burials; a couple of waterpolished pebbles accompanying a burial in Tamula and a handful of small pebbles under the shoulder of the burial no 2 in Sope could be examples of this.

Since the Iron Age, more specifically since the beginning of the 1st millennium AD, written sources appeared where the properties of rocks and formed stones, especially their magical and medicinal qualities were manifested and repeatedly reproduced in encyclopedias and lapidaries. It is not known to what extent the beliefs and customs in written form reflected the actual situation of the time and how many of these traditions were already antiquated and could have been known and practised centuries before. We also do not know how widespread the practices were among the contemporaries of the authors and whether these were confined to a specific social group(s). It is also difficult to estimate the extent of the distribution of the beliefs due to the written sources. Nevertheless, written sources provide us, the researchers, with the knowledge about possible apotropaic and curing agents, but the archaeological finds of fossils, pebbles or antiquated stone objects likely had various meanings and functions. The fossils and pebbles are likely to have had various reasons for their gathering and use, many of which could be similar in the Stone Age and later periods. However, the faith in *ceraunia*, comprising antique edged stone tools, could not have become a belief unless the edged tools were really antiquated, so not before the beginning of the Iron Age. We know from the written sources about the belief, but we do not know the details (*e.g.* the speed and the pace) of the process how an edged tool became a thunderbolt. However, it hardly was a homogenous one. The specific attitudes towards antiquated stone tools could have differed regionally or even communally. Some perhaps took these as past tools, some as belonging to mythical ancestors or non-human forces. The final decision about what to believe and how to take advantage of these items was made personally. Although we are unable to follow the thoughts of single persons, regionally it is likely that the idea of thunderbolts or elf-shots was generally accepted after the production of more sophisticated stone tools (axes, arrowheads, daggers, *etc.*) had ceased and the skill of making them disappeared. It has been estimated that flint industry in the Iron Age existed but was expedient and of low technical degree. This inference is especially apparent in areas with abundant good-quality flint, like in Scandinavia and England, where the masterfully completed flint daggers and axes were no longer produced after the Early Bronze Age. So when a Neolithic flint dagger was found from an earlier site during the Iron Age, it might have been recognised as a tool from the past, but associated with mythical ancestors or perhaps some non-human agents, because the skill itself could not be attributed to the living people. Gradually the already special and outstanding things attached new meanings, including the

thunderbolt-belief. The idea of an axe as the instrument of an ancient thunder-god (Hittite Teshub, Greek Zeus, Scandinavian Thor) has also been put forward already a long time ago, supported by several non-functional axes of the Stone and Early Bronze Age (*e.g.* Montelius 1910; Salo 1990, 143–147), but the direct connection between the instrument of the thundergod, the 'cultic' axes and the thunderbolt-belief attributed to antiquated edged stone tools from the Iron Age onwards (as suggested by Salo 1990) is doubtful. Of course, once the found edged stone tools started to be regarded as special, their perceiving as materialised lightning bolts or the instruments of a personified thundergod were just one step away from each other. With Christianity, the belief in personified thundergod was forced to withdraw, but the belief in thunderbolts remained. In Estonia, we do not have written sources from as early as the 1st millennium AD and it is unlikely that the knowledge of encyclopedias reached the common people here. The ideas valid in the rest of Europe probably moved with merchants and other travellers, and thus it is plausible that the belief of ancient edged stone tools as thunderbolts reached Estonian territory with the Viking Age. The proof for this is to be found from the archaeological material discussed in detail above – a significant number of Stone Age edged tools derive from the Late Iron Age and later sites where their interpretation as apotropaic means is suggested. It is thinkable that edged stone tools, antiquated and not recognised as such at least by the beginning of the Roman Iron Age in Estonia, started to be regarded as special and probably belonging to mythical ancestors, already from the beginning of the 1st millennium AD. It is also possible that the materialised lightning bolts were sought for after thunderstorms ever since the Stone Age and found curiosities, such as fossils or outstanding pebbles, could have been associated with the belief.

In the Middle Ages, the change in the practitioner's attitudes was the most influenced by the introduction of Christianity. On one hand, this had to mean giving up of some pre-Christian beliefs and customs. For example, the using of amulets which were not Christian (*e.g.* Meaney 1981, 10; Griffiths 2003), ancestor worship in the context of eating and drinking on graves (*e.g.* MacMullen 2014), rites by sacred trees, springs and rocks (Bell 2005, 138; Walsham 2010) were generally prohibited. However, much of what was denounced as magic, was naturalised, or integrated into the Christian world. The situation became especially complicated with the advent of Protestantism in the 16th century, when many of the things tolerated so far were deplored, such as the using of wax figurines (see above for Estonian case). Generally, the attribution of some agency to things other than Christian was disapproved as the Christianity's big fear was that Christian sacramentals and other instruments are used in a wrong way, that is, in superstitious practices. However, the wrong way and superstition were not always clear to the church officials either and the thoughts, and approaches of churchmen were not monolithic when unofficial apotropaic customs were concerned (see Watkins 2007). So there was much room for manoeuvre and ambiguousness, proved by court trials held specifically over the churchmen. A good example from Italy in the 16th century describes a Franciscan

Fra Geremia da Udine who gave pieces of paper with the names of 12 apostles to a sick person who had to open one piece of paper every day and burn it until the disease retreated (O'Neil 1984, 58). Officially the change of institutional religion affected the use of amulets and fossils; pebbles and antiquated edged tools were regarded as such. At the same time, medieval encyclopedias reproduced antique texts listing magical and curing properties of plants and rocks whereas according to the valid concept the land was a living organism with plants, animals and rocks all hierarchically beneath people and created for human benefit (see more Jensen 1999). The conflict rather arose from the fear of Christian sacramentals and other instruments being misused or involved into unofficial, *i.e.* vernacular rituals. The belief in the efficacy of different natural and Christian instruments was great among different social groups. The question surely was about the malevolent or benevolent purpose of the act; however, the inappropriate use of the elements was as essential. In Fra Geremia's case, the act of curing was deplored because it seemed as if he wanted to force the apostles, which was considered inappropriate (O'Neil 1984, 59). The use of natural amulets and curing methods was accepted as long as it did not contradict with Christian teaching. As their efficacy was believed in, they were used widely, when in need, in secular as well as religious contexts (see Ch 2.1 Historiography). There are several potential thunderbolt finds in Estonian contexts as well, the most remarkable of which is the Late Neolithic axe from the medieval St. Jacob's cemetery in Tartu. Several other Stone Age edged tools have been gathered from the medieval and modern period town contexts in Tartu. Their precise deposition context is uncertain, but as the possibility of a Stone Age settlement site in the centre of Tartu is improbable because of lack of common settlement material, especially Stone Age pottery, we may rather consider these as imports and very likely imported as magical/apotropaic items. The few more outstanding fossils from towns, *e.g.* a cephalopod fossil from Tartu hillfort and an ammonite from Pärnu, the antiquated stone tools from Tallinn and Lihula add support to the potential belief in thunderbolts in the medieval and modern period Estonia.

During the modern period, the major change concerned the explaining of the origin of many formed stones (fossils, edged stone tools). The process took time and the logical train of thought of the learned men of the time were put into test many times. For example, Ole Worm, a Danish antiquarian, in 1655 was reluctant to acknowledge that the beautiful Danish flint daggers were man-made, as he thougth it impossible for people to work flint in this manner (Balfour 1929, 42). A Chinese encyclopedia in the 17th century refers to the neighbouring Mongols using 'lightning stones' instead of copper and steel for their tools (cited in Allen 1889; see Ch. 2.1). By the 17th and the 18th century, the origin of formed stones was obvious for the scholarly circles, but this did not have any influence on their use as magical items by the ordinary people. In Estonia, proof for the widespread use of different curing and apotropaic stones derives only from the folklore texts written down at the end of the 19th century where pebbles, fossils and stone tools were used either in single-ritual contact magical

curing practices or kept as multi-ritual instruments (Article 1; Ch. 4). We cannot find any direct path between the 19th-century texts and medieval or modern period written sources that would indicate the persistence of practices, in fact, the written sources offer little information on magical artefacts in general. The medieval and early modern texts, when describing dangerous superstition, mostly concentrate on social or communal practices and the ill-use of Christian instruments. The 18th and 19th-century medical manuals warn against patently useless or even dangerous practices, at the same time recommending others (*e.g.* different herbs); however, curing with stones is not mentioned. It was probably regarded neither useful nor dangerous. Nevertheless, the existing ethnographic (Article 4) material as well as stone axes and adzes collected from people who have used them (Ch. 5.2.3.1.) demonstrate that pebbles, fossils as well as stone axes and adzes were used in curing practices as late as the beginning of the 20th century.

Although the current study is concerned with archaeological material, the comparison with the present era is in order too. While the use of fossils and thunderbolts has stopped, the role of apotropaic semi-precious stones is gaining momentum. The process has been called the re-enchantment of the world, while according to a simplified view the modernisation brought along the disenchantment of the world. The patterns of this re-enchantment have been discussed elsewhere (*e.g.* Partridge 2004); at this point, the question of differences of attitude is of interest. Universal traits discussed above should be taken into account – living in a magical universe with counterintuitive ideas of inanimate things having an intentional agency, for example. However, the wholeness of the magical worldview has transformed for sure, since the magical causality is generally not needed to explain the life's mishaps or success. The constitution of science has probably added to this re-enchantment as well; there always remains a room for uncertainties in scientific explanations of the world. So in need of securing success in everyday life, magical explanations are considered equally, and things are used which efficacy cannot be proved by scientific methods. According to Hanegraaff, magic survived the disenchantment of the world (Hanegraaff 2003). To me, this roughly means that nowadays we do not use magic to explain different phenomena, as we have faith in science, but we still need magic to cope with reality and turn our fate into favourable direction. The latter urge can be considered as universal. Also, the attempts to legitimate unconventional approaches by seeking support from science are characteristic of this re-enchantment.

7. CONCLUSIONS

1. The current research grew out from two starting points or problematic issues that got tied together in the course of the process. The first challenge proceeded from the artefacts – there are far too many things gathered by archaeologists in our collections that have never been interpreted or which interpretation is inadequate. Many of these are 'non-finds' (fossils, pebbles) and some (edged antiquated stone tools) are generally regarded as residual. The second challenge proceeded from the interpretative side – there is a missing category of finds in our collections, namely the items used in everyday magical practices. The religious items usually gathered and interpreted so by archaeologists have clear categories: they are either liturgical, narratively magical (spell tablets), amulets or in some cases context-specific (edged tools in graves). I did not simply put two and two together but took into account the written sources, ethnographic material, folklore records, existing interpretations for similar archaeological material as well as universal cognitive ideas about the human nature. So it appeared that there should be more archaeological artefacts that have been used in magical and/or vernacular practices that should be found from different, but especially settlement contexts and from different periods. It also appeared that according to the written, folkloric and ethnographic sources, the so-called formed stones that I chose as my archaeological source material have been used as apotropaic and curing instruments. For example, magical items from Estonia and Finland from the 19th–20th century demonstrate that special artefacts for everyday apotropaic or curing practices were rare (Article 4; Hukantaival 2018b). So my interest developed into the search for potentially magically used artefacts from Estonian archaeological material with special emphasis on non-finds (pebbles, fossils) and items with the simplified interpretation as residual. Similar studies recently completed elsewhere in Europe (*e.g.* Muhonen 2013; Leeming 2015; Hukantaival 2016) motivated to proceed with the topic. Even if I totally understand the fear that one will always find a suitable anthropological parallel to support one's archaeological hypothesis when needed (Fahlander 2004, 190 and the references therein), I also find the opposite true – if you do not look for different interpretations, you will not find them.

2. The source material of the study comprised pebbles, fossils and antiquated edged stone tools from different periods and site types in Estonia. While edged stone tools have always been collected, although their interpretation is limited, the collecting of pebbles and fossils has depended on several aspects of the excavating archaeologist (professional training, general paradigm, personal willingness to gather non-finds, the nature of the fieldwork, *etc.*). Although in most cases their find context has not been documented adequately enough, the fact that they have been collected implies that they were somehow remarkable for the excavator. Therefore, I chose to proceed from the hypothesis that these finds have to have more diverse interpretations than simply regarded as accidental.

3. While trying to find interpretations, I proceeded from the cognitive ideas (counterintuitivity, pebble-mania, laws of sympathy, vernacularism), used the folkloric material, ethnographic analogues and written sources for parallels, and combined these with the archaeological material into a diachronic analysis. According to the widespread or even universal cognitive ideas, the people are liable to gather strangely looking stones as curiosities. The principles of magic allow understanding how some of the stones might be attributed a specific agency and start to be used in curing or apotropaic practices. The general idea of avoiding hazards and enhancing success with different natural and supernatural means stands behind. Vernacularism of practices, which in this context means using elements of the different origin for specific purposes, might also be regarded as a universal line of thought. Some, of course, remained curiosities and/or started to be used for more utilitarian tasks. Although the general interpretative framework can be set, unfortunately, the interpretation of the specific finds will still have to remain speculative. This is because our own perceptions (and the universal ideas elaborated by the present researchers inevitably are part of these too) cannot be traced back in time with a hundred per cent certainty, and rationality, logic and laws of nature need not have meant and likely did not mean what they mean for us today. We cannot know how many formed stones have actually been brought to sites (we only know the number gathered by archaeologists, especially in case of fossils and pebbles) and how many have been used in magical apotropaic or curing practices. We also do not know what should be the find context of these in settlements or other types of sites. We are incapable of following traces of everyday rituals in archaeological sites but no doubt these existed. Some success has been gained, for example, in the case of structured deposits.

4. Altogether 287 fossils were analysed in the frames of the study. It was ascertained that some were apparently used as playing pebbles (Vaida), whereas others (ammonite from Pärnu, trilobites from Mustivere and Pirmastu) could have been perceived as lithified animals and gathered as apotropaic items. Some fossils allowed making assumptions about their using, although the conclusion about the purpose of the use remains more or less speculative. A good case is formed by a *Subulites gigas* fossil from Tartu hillfort, which usewear indicates grinding, perhaps to obtain curing powder. Another example is a *Bellerophontida* fossil from Iru settlement site, which microscopic traces of usewear suggest its using as an amulet. More case studies about fossils from Estonian archaeological material are discussed in Article 5.

5. Altogether 587 pebbles were analysed in the frames of the study. The number is relatively large, compared to the almost absent interpretations offered by archaeologists to these. Utilitarian applications suggested in this study for the pebbles according to their physical parameters as well as folkloric and ethnographic analogues include their use as polishing and burnishing pebbles, gaming pieces, ammunition and potboilers. In addition, I suggested that 273 pebbles might have been regarded as having special agency because of their appearance and therefore used in apotropaic and curing practices. The usewear of selected

pebbles indicated that a number have been used for burnishing and smoothing functions. The extremely polished surfaces, however, allow suggesting that some were carried along as talismans. Selected case studies about pebbles from Estonian archaeological material are discussed in Article 5.

6. Altogether 143 archaeological edged stone tools that have been found from later contexts or which reuse in later periods is apparent were analysed in the frames of the study. The reuse of a significant number as curing means or for apotropaic purposes has been proved by the relevant collectors' notes. The reuse of others has to be suggested only on the basis of the appearance of the artefacts and their find contexts. While the items from the Bronze and Pre-Roman Iron Age burials can more likely be regarded as contemporary grave goods, axes and adzes from the graves since the Roman Iron Age up to the Viking Age could have been associated with (mythical) ancestors and considered apotropaic grave goods. Antiquated edged stone tools from medieval and modern period town contexts as well as rural settlement sites since the Late Iron Age may have been regarded as general protective items – thunderbolts. Unfortunately, little usewear exists to offer any clear suggestions of their use but according to folklore records, thunderbolts were used in curing magical practices that very seldom leave any traces. The thunderbolt legend in folklore and written sources, and archaeological material associated with the belief are further discussed in Article 1.

7. What I learned from the process is that there are artefacts among fossils, pebbles and antiquated edged stone tools which find context is unconventional and which means they were probably deliberate depositions. I learned that some finds bear wear implying their using. However, I also learned that none of the archaeological finds comes with a user manual and there are many finds which using and deliberate deposition cannot be confirmed. I do not want to say that everything that lacks a utilitarian explanation was used in magical practices. That would be a step backwards. At the same time, I am convinced that there are substantially more artefacts that have been used in everyday magical practices which we cannot recognise in archaeological material. This is evident from written, folkloric and ethnographic sources but also the concepts of cognitive universality and vernacularism indicating at the desire to attribute agency to various available things in need to secure one's well-being. Therefore, I wish to emphasise that 'natural' finds or finds that seem to provide no information about the vital questions about the site, like its date or nature, have to be regarded as potential sources of information from the start, they have to be documented as meticulously as other finds and perhaps one day the speculative interpretations provided above can actually be proved.

SUMMARY IN ESTONIAN

Puuduvad tõlgendused. Looduslikud ja jäänukleiuna interpreteeritud esemed Eesti arheoloogiakogudes

1. Sissejuhatus

Käesolev uurimistöö kasvas välja kahest uurimisküsimusest, mis põimusid omavahel töö kirjutamise käigus. Esimene neist sai alguse esemetest – meie arheoloogiakogudes on palju esemeid, mis seisavad hoidlariiulitel ning ilmselt ei ole peale sinna panemist keegi mõtisklenud, mis need on, miks need on kogutud ja milleks (kui üldse) neid võidi kasutada. Sellisteks esemeteks on muuhulgas fossiilid, ümarad siledad veerised, mineraalide tükid jms. Väga sarnane on ka kronoloogiliselt hilisemasse konteksti kuuluvate esemete (nt kiviaegsed kivikirved, tulekivileiud) lugu. Reeglina ei mainita ka neid publikatsioonides või tõlgendatakse esmapilgul loogiliselt ja ühetaoliselt – tegemist peab olema varasema asulaga samal kohal ning hilisema elutegevusega kaasnenud kultuurkihi segamisega on varasemad leiud hilisemasse konteksti sattunud.

Teine uurimisküsimus oli tõlgenduslikku laadi – meie arheoloogiakogudes puudub teatud leiukategooria, nimelt esemed, mida on kasutatud igapäevamaagia praktikates. Arvestades kirjalikke allikaid, etnograafilist materjali, folkloriteateid, olemasolevaid tõlgendusi arheoloogilisele materjalile, aga ka universaalseid kognitiivseid ideid inimloomuse kohta selgus, et ka arheoloogilised kontekstid peaksid sisaldama hoopis enam vernakulaarsetes kaitse- ja ravimaagilistes praktikates kasutatud esemeid. Osalt on süstemaatiliste käsitluste puudumine seotud maagia ambivalentsusega ja põhinemisega narratiivil, mistõttu on maagilisi esemeid raske ära tunda, klassifitseerida ja seega ka teaduslikult käsitleda. Selle peamine põhjus on arheoloogia pikaajaline pidamine ratsionaalseks teaduseks, kus vaid mõõdetavat infot on peetud tõlgendust võimaldavaks, samas kui mentaalsete protsessidega tegelevaid küsimusi peetakse liialt keerukaks, et neid arheoloogilise materjali põhjal lahendada (nt Hawkes 1954). Seetõttu on ka akadeemilistes uurimustes maagiat käsitletud suuresti antiikmaailma tekstiliste korpuste (nt loitsud, ravikirjeldused) ja tekstiliste leidude (nt loitsutahvlid, amuletid) põhjal, samas kui esemed on jäänud teisejärguliseks ja pigem illustratiivsesse rolli. Eestis küll tekstilis-maagilised esemed arheoloogilises materjalis puuduvad, ent ka ulatuslikult uuritud rahvapäraste ravivõtete ja kaitsemaagia käsitlused tuginevad eranditult narratiivsetel (peamiselt folkloorsetel) allikatel. Arheoloogilist materjali ei ole maagiliste praktikate uurimisse seni kaasatud ning selle peamiseks, äratundmisraskusest tingitud põhjuseks on omalaadne suletud ring, kus esemeid, mida ei osata tõlgendada kui potentsiaalselt maagilistes praktikates kasutatuid, ei kajastata ka leiupublikatsioonides ja teistes analüüsides ning see ei võimalda neid ka edaspidi ära tunda, oluliseks pidada või süsteemselt koguda.

Üks võimalus laiendada potentsiaalselt maagiliselt kasutatud objektide ringi on maagiliste esemete kui uurimisteema toomine akadeemilisse diskussiooni. Viimane tähendab aga peaasjalikult juba kogutud ja hoidlas säilivate, aga seni tõlgenduseta esemete üle arutlemist just selles võtmes – kas nende leiukontekst, iseloomulik välimus, analoogiate olemasolu etnograafilises materjalis või viited folkloorsetes või kirjalikes allikates võiks osutada nende kasutamisele kaitse- või ravimaagias? See ei tähenda, et kõik seni tõlgenduseta esemed peaksid olema vaadeldavad kui maagilised. Seetõttu pakun ka oma töös välja erinevaid tõlgendusi ning maagilistel praktikatel on nende seas vaid üks, kuigi selgelt kandev osa. Samas ei analüüsi ma süvitsi kõiki maagiliste praktikatega seotud esemeid, sest igapäevamaagia kontseptsiooni kohaselt võib ükskõik milline igapäevane ese saada osaliseks maagilises kaitse- või tervendusrituaalis, eeldusel, et rituaali läbiviijate poolt omistatakse talle üleloomulikku väge vahendav roll. Loomulikult eksisteerisid mingid reeglid ja suundumused, ent arheoloogilises materjalis ei ole neid enamasti võimalik jälgida. Näiteks on teada, et pärimustekstide kohaselt sai maagilistes tervenduspraktikates kasutada nii kiriku kellanööri, kirikaia mulda, altariküünlaid, kirikuskäimise suurrätti, rääkimata pühast veest ja armulaualeivast (Artikkel 3). Sõel ja käärid olid abiks ennustamisel (Valk 2004), kirves ja raudnael (Valk 1995) või toiduained (nt sool) tõrjemaagias (Hiiemäe 2012, 72, 87ff). Kusjuures kaitse- või ravirituaalides kasutatud esemete leiukontekst, kui need arheoloogilisse konteksti maha jäävad, ei pruugi olla sugugi kõnekas. Seega oleks kõigi võimalike maagilistes praktikates kasutatud vahendite kaardistamine või välja selekteerimine antud töö raames osutunud liiga mahukaks. Nii otsustasin keskenduda vaid vähestele leiurühmadele, kusjuures kriteeriumiks sai senistes käsitlustes suuresti ignoreeritud ja looduslikeks peetud (fossiilid ja veerised) või ühekülgselt tõlgendatud leiud (varasemad, peamiselt kiviaegsed, leiud hilisemates kontekstides).

2. Historiograafia

2.1. 'Vormitud' kivide äratundmise protsess

Historiograafia antud töö kontekstis on väga mahukas ja kahest suuremast aspektist koosnev, nagu ka kogu töö eesmärk, mis ühelt poolt keskendub tõlgendustele ja tähendustele, mida kividele on omistatud, teiselt poolt aga esemetele. Sellest lähtuvalt hõlmab historiograafia osa ühelt poolt 'vormitud' kivide (ingl. k *formed stones,* lapidaarses traditsioonis kasutatud nii fossiilide, erivormiliste veeriste kui piksenooltena kujutatud varaste kiviesemete kohta) kujunemise seletamist ajaloolises perspektiivis, nende tähendust muistse inimese jaoks ning selle protsessi ajaloolist arengut. Teiselt poolt räägime me olemasoleva arheoloogilise materjali mõistmisest maagia kui potentsiaalse tõlgenduse kaudu.

'Vormitud' kivide kasutamist maagilistes või meditsiinilistes protseduurides on kirjeldatud üpris arvukalt antiikautoritest peale. Antiik- ja keskaegsete autorite kirjelduste järgi fossiilide ja mineraalide ära tundmisega ning nende maagilis-

meditsiiniliste kasutuste kirjeldamisega tegelevad geofarmatseutilised ja krüptopaleontoloogilised uurimused (nt Adams 1938; Rudwick 1976; Duffin 2012; 2013; Liñán jt 2013). Kõige olulisemad tekstid kivide, mineraalide, fossiilide ja muldade kohta on lapidaariumid, mis pakuvad võrdlemisi vähe infot kivide koostise ja füüsilise väljanägemise kohta, ent keskenduvad detailselt just meditsiinilistele, maagilistele ja müütilistele omadustele, mis kaheldamatult usuti kivimitel ja metallidel olemas olevat ning mistõttu neid sageli koheldi austavalt (Adams 1938, 143). Lisaks lapidaariumitele, mis on ennekõike pühendatud mineraalidele, kivimitele ja fossiilidele, kirjutati keskajal arvukalt entsüklopeediaid, millest üks või mitu osa keskendus kividele. Keskaja lapidaristid ja entsüklopedistid toetusid oma kirjutistes suuresti antiikautorite teostele.

'Mineraloogiat' (ja 'teadust' üldises mõõtmes) keskajal iseloomustab kaks dominantset aspekti. Ajastu üldisest õhkkonnast innustatuna käsitlevad nii keskaegsed entsüklopeediad kui lapidaariumid enamasti kivimite ja mineraalide maagilisi omadusi. Usk kivimite maagilisse ja ravivasse toimesse on otseselt seotud läbi kesk- ja renessansiaja ja isegi hiljem valitsevaks olnud ideega Maast kui elavast organismist universumi keskpunktis. Selline orgaaniline kosmoloogia oli sümbioos kristlikust ja klassikalisest ideest ning selle üheks iseloomustavaks jooneks oli hierarhiline süsteem, mis haaras ka kõiki elukaid maal. Kogu universumi eesmärk oli teenida inimest ja tema heaolu. Usuti, et elava maa sünnitatud taimedel, kividel, mineraalidel ja metallidel olid ravivõimed, mida neist hierarhias kõrgemal olevad inimesed said enda hüvanguks kasutada (Jensen 1999, 561). Teiseks iseloomustavaks jooneks oli toetumine Piiblis kirjapandule ning klassikalistele autoriteetidele, mis tähendas, et teadus seisneski varasema kordamises, ümberkirjutamises, uusi ja põhimõttelisi uurimisprobleeme ei tekkinud, mistõttu jäi ka näiteks piksenoolte 'avastamine' inimtööriistadena või fossiilidena hilisemasse perioodi. Sellele aitas kaasa ka asjaolu, et piibliaegu nähti identsetena keskaegse Euroopa omadega ning kuna toonased õpetlased olid isegi vähem teadlikud ajaloolistest muutustest kui kreeka ja rooma teadlased, oli huvi mineviku materiaalsete jäänuste vastu praktiliselt olematu (Trigger 1989, 31jj).

Renessansiajal hakkasid kujunema ka esimesed kriitilised vaated. 15. ja 16. sajandit võib pidada mõneski mõttes läbimurdesajandiks, mis puutub mineraloogia, paleontoloogia, aga kaudselt ka arheoloogia ajalugu. Just siis hakati lapidaariumites ja teistes mineraale käsitlevates tekstides müstikat ja maagiat enam kõrvale jätma, arutlema fossiilide kujude ja tekke üle ning keskenduma kivimite füüsikalistele omadustele. Selle üheks põhjuseks oli järjest uute kaevanduste rajamine 15.–16. sajandil Saksimaal, Harzi mägedes ja Böömimaal (vt Adams 1938, 171). Ehkki teadlaste mõtlemismuster oli juba sarnane hilisemale, puudusid esialgu veel keskajast sõltumatud küsimused, mis tekitaks intriige ja lahenduste otsinguid. Samamoodi jäid ka piksenooled veel taevasteks kivideks, ent erinevast keskajast püüti järjest enam nende tekkimist taevas teaduslikul viisil ära seletada.

Tõelise läbimurde ajaks võib pidada pigem 17. sajandit, teadusrevolutsiooni ja sekulariseerimise aega (Jensen 1999, 563). Põhimõtteliselt hakkasid tekkima

keskajast sõltumatud uurimisteemad, uut moodi küsimused, mis viisid fossiilide päritolu ja piksenoolte uurimise värskele tasemele. Sekulariseerimisega suurenes järk-järgult tendents asendada üleloomulikud seletused loomulikega ja võtta pidevalt omaks enam skeptiline vaade maagiale. Looduse kontseptsioon sai üha lähemalt seotuks teadusega ning maagiat kritiseerides viidati sageli just teadusele. Kogu 17. sajand kulus selle hüpoteesi – piksenooled võivad olla fossiilsete loomade jäänused või inimese poolt kujundatud ja kasutatud tööriistad – mitmeid kordi esitamisele, tõestamise katsetele ja viimaks omaks võtmisele 17. sajandi lõpus. 18. sajandi keskpaigaks olid õpetatud ringkonnad selles veendunud, ent lihtrahvast see teadmine veel ei puudutanud ning nii leidub näiteid piksenoole-usu jätkumisest 20. sajandini välja.

2.2. Maagia kasutamine arheoloogiliste esemete tõlgendamisel

Nagu öeldud, ei ole maagia materiaalse poole vastu süstemaatilist huvi üles näidatud ei Eesti ega muu Euroopa arheoloogide poolt ning selle põhjuseks võib peamiselt pidada maagilist tõlgendamist võimaldavate esemete rasket äratundmist arheoloogilises materjalis. Maagia definitsioone on mitmeid, kuid definitsioonidele omaselt on need väga üldised. See aga tähendab, et maagiliste esemete defineerimiseks sobivad need vaid osaliselt ning paljus sõltub eseme maagiliseks pidamine konkreetsetest kontekstidest ja uurijatest. See on viinud olukorrani, kus maagilisteks peetakse eelkõige esemeid, mida on maagia definitsioonist lähtuvalt sellistena järjepidevalt tajutud (ripatsid). Samuti on mõningad esemed (nt kiviaegsed esemed või mõned fossiilid) seoses antikvaarse kogumisfaasiga, tänu kuriositeedikambritesse ja esimestesse muuseumikollektsioonidesse kogumisele, aga ka laialt levinud rahvauskumustele ja -kasutusele üpris selgelt tähelepanu äratanud ka arheoloogilistest kontekstidest leituna ning temaatilisi käsitlusi võib leida juba 19. sajandist (vt nt Allen 1895; Evans 1897; Johnson 1912 ja seal leiduvad viited). Antikvaarsest huvist moodustunud kollektsioonidesse koondati sageli nii inimeste käest kogutud maagiliselt kasutatud asju kui ka sarnaseid maa seest leitud eksemplare – mõlemad pidid olema üksteisele illustratsiooniks, kuigi pigem oli 19. sajandi lõpu ja 20. sajandi alguse käsitlustes keskmes siiski folkloor ning vastavad arheoloogilised leiud ainult kinnitasid kauakestnud rahvauskumusi (nt Black 1894; Blinkenberg 1911; Skeat 1912; Toms 1932; Ettlinger 1939).

Fossiililеidudega arheoloogilises materjalis on läbi 20. sajandi tegelenud peamiselt folkloristid ning sajandi teisest poolest alates enam ka paleontoloogid (nt Oakley 1965a; 1965b; Bassett 1982; Duffin 2008; McNamara 2011). Võrreldes 20. sajandi alguse üldiste ajalookäsitlustega (nt Evans, Johnson, Kunz) keskenduvad hilisemad käsitlused enam spetsiifilisematele teemadele (nt konkreetsetele fossiililiikidele ja nendega seotud folkloorile ning maagilistele kasutustele). Suures osas neist käsitlustest on näha rõhuasetuse muutus võrreldes sajandi algusega – allikmaterjaliks on valitud arheoloogilistest kontekstidest leitud paleontoloogilised leiud ning folklooriteadmisi kasutatakse neile tõlgenduste

leidmisel. Nii paleontoloogide, folkloristide kui arheoloogide fossiilikäsitlustes torkab silma Inglimaa-kesksus. Selle põhjuseks võib olla asjaolu, et selliste leidude süvendatud uurimine on seotud efektsete näidete olemasolu ja rohkusega, nt Inglismaa lõunaosa arvukad kriidiladestu fossiilid (eriti efektsed merisiilikud, aga ka belemniidid) on tähelepanu tõmmanud juba sajandeid ning tänu sellele oli nende kohta käivat folkloori rohkem. Lisaks on alates 19. sajandi teisest poolest fossiile puudutavat folkloori süstemaatiliselt avaldatud Inglise ajakirjas *Folklore*, mis kahtlemata süvendas huvi veelgi.

Kui fossiilide maagilisi kasutusi ja tähendusi leiab enamasti just folkloristidelt või ka paleontoloogidelt, siis vanemate esemete esinemine hilisemates kontekstides on spetsiifiliselt arheoloogide probleem. Neid on publitseeritud ning tõlgendatud juba alates 20. sajandi algusest (Jacob 1908, 95; Montelius 1906, 67; vt viiteid Mildenberger 1969). Vähemalt sellest ajast on uurijate hulgas levinud kujutlus kivikirvest kui maagilisest esemest iseenesest – idee, et juba neoliitikumis oli kirvestel ja talbadel praktilise kasutuse kõrval kultuslik või maagiline roll, mille tõestusena nähti suurte ja kasutamiseks ebapraktiliste kirveste olemasolu, samuti kirveste kujutisi kaljuraienditel (Mildenberger 1969, 6 ja sealsed viited; Salo 1990; Sibley 2009) või idee kirvesse puuritud august kui pühast, mida toetas lohu-motiiv kaljukunstis (Barner 1957, 10). 20. sajandi idee kivikirvestest hilisemates kontekstides võib kokku võtta nii, et neoliitikumis ja pronksiajal, kui kirveid veel praktiliselt kasutati, olid olemas ebapraktilised kultuskirved (Mildenberger 1969, 6), hiljem, alates rauaajast võib rääkida kirvest äikesejumala atribuudina ehk piksenoole-kujutelmast (Barner 1957, 10), millest andsid tunnistust piksenoolte kirjeldused antiikmaailma lapidaariumites (nt Blinkenberg 1911; Barner 1957).

Kui kalmete kui sakraalse iseloomuga kontekstidega oli kivikirve kui kaitsemaagilise atribuudi seostamine lihtsam, siis asulakontekstidest maagilisi esemeid enamasti ei tuvastatud. See on mõneti isegi üllatav, sest juba 18. sajandist on üleskirjutusi, kuidas piksenooli (on nad siis fossiilid või vanad kiviesemed) majades hoitakse, kuhu peidetakse ja kuidas kasutatakse, ning ka vastav folkloorne materjal ju suuresti koosnebki igapäevases kontekstis kasutatavatest kaitsemaagilistest esemetest. Aga ilmselt oli folkloorse materjali innustustest hoolimata keeruline arheoloogilises igapäevakontekstis (asulas, hoones) maagilisi esemeid näha. Seega ongi kiviaegsete esemete esinemist hilisemas asulakontekstis pigem seostatud loogiliselt varasema asulakoha olemasoluga selles paigas (ingl. k. *residuality*) (Mildenberger 1969, 7j; Carelli 1997, 408j). Siiski leiab üksikesemetest inspireeritud piksenoole-uskumuse käsitlusi arheoloogilise asulamaterjali põhjal vähemalt 20. sajandi keskpaigast (nt Barner 1957; Sedova 1957; Mildenberger 1969; Skandinaavia kohta vt Carelli 1997). Laiema kõlapinna sai piksenoole-käsitlus arheoloogide jaoks 1980. aastatel (Merrifield 1987). Viimaste kümnendite jooksul on piksenoole-temaatika arheoloogias enam esindatud, kusjuures leidub nii üksikesemetest (nt Thäte ja Hemdorff 2009; Asplund 2005) ja üksikmuistisest (nt Myhre 1988; Carelli 1997; Tyanina 2008; Zheltova jt 2017) lähtunud kui laiemale piirkonnale keskendunud üldisemaid käsitlusi (nt Artikkel 1; Vasks 2003; Muhonen 2006; Søvsø jt 2016). Mitmes neist kajas-

tatakse piksenoole-uskumust tervikuna, keskendudes lisaks kiviesemetele ka fossiilidele.

Nagu ka fossiilide ja varaste esemete puhul, põhinevad ka veeriste käsitlustes kõige varasemad uurimused folkloorsel materjalil. Veeriseid on analüüsitud erinevates piksekivide (nt Blinkenberg 1911), nõiakivide (muuhulgas auguga veerised, Toms 1932), ussikivide (Skeat 1912; Pymm 2016) ja ravikivide (nt Black 1894) folklooriga tegelevates uurimustes kõrvuti fossiilide ning neoliitiliste kivikirvestega. Christopher Duffin (2012 ja paljud teised artiklid) on võtnud lähtepunktiks narratiivsed allikad (vana-kreeka kirjalikud materjalid, keskaegsed lapidaariumid, aga ka uusaegse folkloori) ning neist lähtuvalt oletab, missuguseid kivimeid ja mineraale on väärtustatud. Üldiselt on arheoloogid väga vähe tegelenud arheoloogilisest materjalist pärit veeriste ning nende võimaliku maagilise kasutusega. Erandeid on, ent need puudutavad väga spetsiifilist laadi veeriseid, nt pikti maalitud kvartsiveerised (Ritchie 1972; Arthur jt 2014) ja Azili kultuuri maalitud veerised (Burkitt 1926; Kraft ja Tolksdorf 2018), aga ka kvartsimunakaid üldiselt (nt Carlie 1999; Ringstad 1988; Gilchrist 2008), mida on hinnatud tänu otsesele seosele mäekristallidega.

Tervikuna võib öelda, et arheoloogiline materjal jõudis maagilisi praktikaid käsitlevatesse uurimustesse episoodiliselt juba 19. sajandi lõpus ja 20. sajandi alguses. Alates 20. sajandi keskpaigast ilmus järjest enam juba spetsiifiliselt arheoloogiaalaseid publikatsioone, mis analüüsisid mingit (kaitse)maagiaga seotud käitumisviisi (nt Howard 1951; Kivikoski 1965). Süsteemsed uurimused, kus arheoloogilisi esemeid käsitleti peamise allikaliigina, et selgitada mineviku maagilisi praktikaid, said alguse 1980. aastatest (Meaney 1981; Merrifield 1987). Viimasel paarikümnel aastal on populaarsust kogunud ehitusohvrite teema ning ilmunud on mitmeid käsitlusi keskaegsete, varauus- ja uusaegsetest linnakontekstidest uuritud hoone ja selle elanike kaitse eesmärgil peidetud esemete kohta (Hunt 2006; Falk 2008; Manning 2012; Houlbrook 2013; Hukantavail 2016; Swann 2016; historiograafia kohta vt Hukantaival 2016). Lisaks on arheoloogilisi esemeid haaratud üha enam igapäevamaagia käsitlustesse esiajaloost kuni kaasajani välja (nt Stensköld 2006; Gilchrist 2008) ning ilmunud on mitmeid kogumikke maagia materiaalsusest, nt Armitage (toim.) 2015; Bremmer (toim.) 2015; Hutton (toim.) 2016; Billingsley jt (toim.) 2017.

3. Teoreetiline raamistik

Selles peatükis tuginen hüpoteesile, et kivide ja veeriste kogumise motiiv on olnud nende tajumine erilisena. Esimene osa sellest protsessist leidis aset siis, kui inimene minevikus korjas silmatorganud kivi ja võttis selle kaasa. Nii saab esimese juhtlõngana käsitleda inimuniversaalsuste teooriat (Brown 1991), mille järgi on inimteadvuses universaalsed markerid, mis alateadlikult kujundavad inimkäitumist. Selline universaalsus avaldub muuhulgas ka nn kivi-maanias (Kunz 1915, 19; Franz 1964, 209). Pärast kaasavõtmist kasutati kivi ilmselt erinevatel viisidel või anti selle tähendusi, millest vaid osa on praeguseks jälgitavad,

näiteks kasutusjälgede või leiukonteksti põhjal. Osana inimuniversaalsest käitumisest korjas arheoloog selle kivi üles ning otsustas leiuna alles jätta.

Üks inimuniversaalsusi on maagilise maailmapildi ja käitumise olemasolu. Maagiale, nagu religioonidele üldiselt, on omane kontraintuitiivsus. Kontraintuitiivsed fenomenid rikuvad inimeste intuitiivseid ja vaikimisi seatud ratsionaalseid ootusi entiteetide käitumisele. Ühe enamlevinud näitena omistatakse psühholoogilisi omadusi elututele asjadele (nt Pyysiainen 2002, 112). Kui võtta kontraintuitiivne taju esemete potentsiaalse maagilise kasutuse peamiseks kriteeriumiks, on loomulik küsida, kas me suudame jälgida (arheoloogilisele) esemele omistatud kontraintuitiivseid omadusi. Paraku ei võimalda eseme füüsilised omadused, leiukontekst või algne funktsioon sellele enamasti vastata ja paljudel juhtudel ei ole intuitiivset ja kontraintuitiivset tajumist ega ka neil põhinevaid kasutusi võimalik eristada. Heaks näiteks on ripatsite erinevad rollid kaitsemaagias või ehtena (Kurisoo 2018, vt ka Artikkel 2, 166), aga ka funktsionaalsete terariistade kasutamine kaitsemaagias (Valk 1995; Hiiemäe 2012). Paljud tarbeesemed võivad saada laetud toimijalisusega (ingl. *agency*), sest neid kasutatakse teiste ainete mingite omaduste muutmisel (nt nuga), nende materjali peetakse apotroopseks (nt hõbe) või neid 'jõustab' surma või institutsionaalse võimuga kontaktis olemine (nt surnuaiast, kirikust või mõisast pärit esemed). Eriti mitmetitõlgendatavad näited on maagilistel eesmärkidel kasutatud igapäevaesemed või tänapäeva mõistes praht (nt vanad riietusesemed või kingad) (vt Ülendi ohvripärna kohta Artikkel 2).

Maagia definitsioone on palju, aga üldjoontes rõhutavad nad kõik sama – maagia on püüe kontrollida reaalsust üleloomulike jõudude abiga. Kitsamalt on maagiat vaadeldud opositsioonis teadusega, konventsionaalse meditsiiniga, religiooniga, ratsionaalsusega jms. Lihtsustatult võib öelda, et 20. sajandil on kasutatud kahte viisi maagia seletamiseks: (1) evolutsiooniline, mis näeb maagiat kui primitiivseimat etappi maagia-religioon-teadus arenguskaalal ning (2) funktsionalistlik, mis rõhutab maagia rolli erinevate olukordadega toimetulekuks.

Erinevust religiooni ja maagia vahel kirjeldatakse tavaliselt opositsioonis olevate märksõnade abil, nt alandlik vs manipuleeriv, sümboolne vs praktiline, avalik vs salajane, kollektiivne vs individuaalne, kaudse mõjuga vs otsese mõjuga. Mõneti on tõlgendustes siiski jälgitav ka nõiaring, kus maagiale omistatud märksõnad näivad kinnitavat evolutsioonilist arenguskeemi ning evolutsiooniline skaala omakorda annab tunnistust iseloomustavate joonte olemasolust. Samas ei ole religiooni ja maagia vahekord mitte selgepiiriline veelahe, vaid tegemist on pigem halli alaga, mida illustreerib hästi näiteks meieisapalve kasutamine loitsu või palvena (Uuspuu 1938; Pihelgas 2013, 32j; Kõiva 2018, xv–xvi).

Maagia ja teaduse vahelise erinevuse kirjeldamiseks kasutatakse kõige enam ratsionaalsuse kontseptsiooni. Maagia kui irratsionaalse ja ebasüsteemse võrdlust teadusliku mõtlemise ratsionaalsusega kasutati juba mainitud evolutsioonilises maagia-religioon-teadus-skaalas. Samas nähti juba 20. sajandi alguse diskussioonides, et ka 'primitiivsed' inimesed olid ratsionaalsed oma eesmärkides, kuigi nende tegude ja seletuste aluspõhi oli ekslik, teisisõnu, maagiat nähti kui

intellektuaalset viga (Cunningham 1999, 19). Ian Jarvie rõhutas, et maagilised ja rituaalsed teod on ratsionaalsed, sest (1) nad on eesmärgipärased ning inimeste teod tavaliselt seda ongi ning (2) nad on ratsionaalsed oma kontekstis, ehk teisisõnu usk maagilistesse rituaalidesse muudab nad ratsionaalseks (Jarvie 1964, 132). 1950. aastaist tõusetus ratsionaalsuse debatt taas ning arutelu alla tõusid küsimused ratsionaalse mõtlemise iseloomust (universaalne või kontekstipõhine), selle seosest kultuurilise ja ajaloolise kontekstiga ning ratsionaalsuse definitsioonid. Vahetegemiseks võeti kasutusele tugeva ja nõrga ratsionaalsuse (Jarvie & Agassi 1967, 55) ning sellega seonduvalt tugeva ja nõrga kausaalsuse kontseptsioon (Sørensen 2005, 178). Väljapääsu maagia ja ratsionaalsuse defineerimise probleemidest nähakse eemilise vaatepunkti rõhutamises – maagilistel praktikatel on oma kausaalsus ja oma ratsionaalsus ning üldist skaalat ehk ei olegi tarvis. Viimase arusaamaga seotuna on rõhutatud ka vernakulaarsuse kontseptsiooni (Primiano 1995). Selle järgi ei ole vernakulaarsete praktikate puhul elementide päritolu oluline, praktikad on situatsiooni- ja kontekstipõhised ning universaalseid ja alati kehtivaid mustreid ei ole olemas. Nii ei ole ka praktiseerijate jaoks erinevat päritolu ning erineva ratsionaalsuse või kausaalsusega elementide kasutamises ühe praktika raames konflikti. Sellest lähtuvalt ei saa ka küsida, kas maagia on tõhus/mõjus (ingl. k. *efficacious*), sest praktiseerijate jaoks ta on seda alati. Maagia töötamiseks on vaja maagilist maailmapilti/maagilist teadvust/maagilist tõlgendust/usku, aga ka maagilist toimijalisust/jõudu, mida teatud praktikas osalevatele elementidele omistatakse.

Ravimaagia moodustab ehk kõige suurema ja tuntuma osa maagilistest praktikatest, sest maagia põhimõtted (sarnasusmaagia, kontaktmaagia) osalevad peaaegu alati holistilise ravi ideedes. Heaks näiteks on maa-aluste raviks kasutatud maast korjatud veerised või usutavalt kärnkonna peast võetud kivid, mis aitavad mürgistuste vastu. Teistele maagilistele praktikatele sarnaselt erinevat päritolu ja erineva iseloomuga elementide kasutamine soovitud tulemuse saavutamiseks on omane vernakulaarsetele meditsiinipraktikatele. Oluline on eesmärk – haigusest võitu saada.

Holistilise meditsiini taust on humoraalteoorias (vt lähemalt Alatalu 1992; Kalling 2017). Selle järgi tuli ravimiseks kõigepealt välja selgitada humoraalse tasakaalu puudumise põhjus ning seejärel otsustada ravi kasuks. Ravi võis põhineda sarnasusprintsiibil ehk homöopaatilise meditsiini põhimõttel. Näiteks sellistest praktikatest on ussikivide kasutamine ussihammustuse vastu, klaasikildude söömine terava sisemise valu vastu või piksenoole kraapimine äkiliste haigusepuhangute vastu. 18. sajandi autorid, olles mõjutatud nii galeenilise kui Paracelsuse meditsiinipõhimõtetest, tegid vahet instrumentaalsete/ratsionaalsete (millegi sisse võtmine ja peale määrimine) ja maagiliste (loitsud, puudutamine) ravivõtete vahel, ning vaid ratsionaalsed olid aktsepteeritud. Samas sissevõetavate ainete nimekiri oli pikk ning sisaldas tänapäeva seisukohast mürgiseid (nt elavhõbe) või arusaamatuid (nt väljaheited) aineid. Laias laastus jagati haiguse põhjuseid loomulikeks ja üleloomulikeks. Võib oletada, et humoraalpatoloogia, mis üldiselt taotleb tasakaalu säilitamist kehas (mikrokosmoses) on seotud õiglase maailma hüpoteesiga, mis seletab tasakaalu säilitamist makrokosmoses. See

omakorda on seotud piiratud ressursside põhimõttega, s.t kui keegi saab rikkaks või terveks, jääb keegi neist ressurssidest ilma. Viimane põhimõte on selgelt haiguste üleloomulike põhjuste taga, mille heaks näiteks on kurja silma fenomen.

Taaskasutus on inimkäitumisele universaalselt omane, sest enamasti nõuab see vähem ressursse kui uute esemete tegemine. Arheoloogide jaoks on väljakutse taaskasutuse põhjuste väljaselgitamine, mis võivad olla näiteks emotsionaalsed, praktilised või juhuslikud (Schiffer 1996). Enamasti ollakse aga kronoloogiliselt konteksti mittesobiva eseme leidmisel rohkem mures kronoloogilise segaduse kui võimaliku taaskasutuse ja selle põhjuste pärast (Amick 2007, 226). Linda Hurcombe'i (2009, 51) järgi on residuaalsuse (ingl. k *residuality*) kontseptsioon arheoloogilise uurimustöö suurim möödalask läbi 20. sajandi, kuigi taaskasutuse teadvustamine algas juba 1960il.

Brian Schifferi (1996, 28) järgi hõlmab taaskasutuse kontseptsioon: (1) lateraalset kasutust (esemed pidevalt vahetavad omanikku); (2) ümbertöötlemist, mis hõlmab eseme morfoloogilist muutust, ent kasutus jääb samaks, nt kivikirvestele uue augu puurimine või tera lihvimine, et neid taaskasutada; (3) sekundaarset kasutust, kus esemeid väliselt ei muudeta, ent muutub funktsioon, nt kõõvitsate taaskasutamine püssilukutulekividena (Altamura 2013), piibuvarte taaskasutus viledena (Nurmi 2011, 137), kivikirveste kasutamine maagiliste piksenooltena jne; (4) konserveerimine ehk esemete säilitamine mälestusasjadena. Kasutuse ja taaskasutuse eristamine eseme kasutaja või funktsiooni muutuse kaudu on hägustatud kui järgida eseme pärisfunktsiooni ja süsteemifunktsiooni kontseptsiooni (Kokkov 2015). Viimaseid võib esemel olla mitmeid ning need võivad kontekstiti muutuda. Lisaks võib eristada juhuslikku ja süstemaatilist taaskasutust (Nurmi 2011), kusjuures mõlemad kirjeldavad süsteemifunktsiooni. Esemete elulookontseptsiooni järgi (nt Kopytoff 1986) on esemetel esimene elu koos pärisfunktsiooni ja süsteemifunktsioonidega, millel võivad olla praktilised, ideoloogilised ja sotsiaalsed väljundid. Sellele võib järgneda teine, kolmas, neljas jne elu juhuslike või süstemaatiliste funktsioonidega, millel omakorda on praktilised, ideoloogilised ja sotsiaalsed väljundid. Lisaks võivad esemed muutuda erinevate elude jooksul kord mälestusesemeks ja siis tarbeesemeks ja vastupidi.

4. Narratiivsed allikad

Narratiivsed allikad antud teemal hõlmavad kirjalikke ning folkloorseid allikaid. Eestit puudutavad keskaegsed ja uusaegsed kirjalikud allikad ei maini otseselt kaitse- või ravimaagiaga seotud esemeid, viiteid sellistele protseduuridele võib leida vaid taunitud või veidraks peetud rahvausupraktikate kirjeldustest. Põhiliselt taunitakse kroonikatekstides suuri kogunemisi ning ohverdamispraktikaid pühade kivide, puude ja allikate juures, seega ollakse selgelt sotsiaalse iseloomuga ürituste vastu. Samas on vähe teada igapäevamaagia ja sellistes praktikates kasutatud esemete kohta. 16. sajandist on teada, et kaitse- ja ravimaagias kasutati preestrite poolt õnnistatud leiba, soola, piima, võid, seemneid, vaha,

küünlaid, vasksõrmuseid ning pühitsetud vett (Possevino 1973, 19j; Fabricius 2010, 63). Kaitsemaagilist tähendust on omistatud ka kristliku sümboolikaga ning usulise tähendusega ehetele, nt palvehelmestele ja paaterristidele. Kiriklikku päritolu esemete kasutamine ravis ja kaitsemaagias muutus taunimisväärseks seoses reformatsiooniga, ent pärimustekstid 19. ja 20. sajandist näitavad, et nende kasutamine ei lõppenud (Artikkel 3). 18. sajandi allikad kirjeldavad raviprotseduurides kasutatud esemeid ja aineid ning siin kumavad mitmete soovitatud ravivahendite tagant maagilised seosed. Näiteks soovitus leevendada haigusnähtusi erinevate loomade või lindude, ka inimese väljaheidetega on seotud maagilise viisiga kasutada ebameeldivaid aga elujõudu sisaldavaid aineid (lisaks väljaheidetele ka veri, higi, küünemusta, putukaid jne) haiguse peletamiseks (Manninen 1925, 458–459, Loorits 1990, 17).

19. sajandi algul koostoimes baltisaksa valgustuse ja romantismiga ning Eesti haritlaste kihi kujunemisega hakati väärtustama usundi ja rahvakommete põhiallikana elavat rahvapärimust, mis alates sajandi lõpust tõi endaga rahvamälestuste, uskumuste ja kommete kogumise organiseeritud kampaaniad. Niiviisi kogutud folkloorsed allikad sisaldavad kõige enam infot maagilistes praktikates kasutatud esemete kohta, ent kuna need pärinevad alates 19. sajandi II poolest, on keeruline tuvastada, kuivõrd need kajastavad üleskirjutamise ajast varasemaid uskumusi. 19. ja 20. sajandi pärimustekstid ja (vara)uusaegsed kirjalikud allikad kajastavad vaid osalt samu praktikaid, ent siiski ei ole tõenäoline, et praktikad, mida on kirjeldatud vaid pärimustekstides, alles 19. sajandil kujunesid. Näiteks pikse austamisest räägib enamus kesk- ja varauusaegseid allikaid, ent piksekivide kasutamist ei mainita pea üldse; samuti on vähetõenäoline, et veeriseid, hõbevalget või igapäevaseid esemeid Eestis ravimiseks enne 19. sajandit ei kasutatud, kuigi kirjalikud allikad seda ei maini. Põhjuseks, miks kesk- ja varauusaegsed kirjalikud allikad igapäevamaagiat nii vähe kajastasid, on oletatud vernakulaarsete uskumuste ja praktikate suuremat killustatust ning varjatud iseloomu. Lisaks ei olnud need ilmselt kroonikute jaoks nii olulised kui rahvakogunemisi hõlmavad ettevõtmised (Valk 1998, 84).

Kesk- ja uusaegsed kirjalikud allikad sisaldavad väga vähe kirjeldusi kivide ja fossiilide võimaliku kasutamise kohta maagilistes praktikates, samas kui folkloorikogudes on andmeid oluliselt rohkem. Nõidumise ja ennustamisega on seotud vaid vähesed kivid ning nendegi puhul võib näha, et tegemist on pigem juhuslikult valitud kividega, mille valikuprintsiipe ei ole pikemalt seletatud. Ravimaagias on kivid olulist rolli mänginud ning neid võib jagada sellisteks, kus konkreetset kivi kasutatakse mitmes raviintsidendis ning säilitatakse ravivahendina (mitmerituaalsus), ning sellisteks, kus kivi töötab kontaktmaagia põhimõttel ning ei kuulu säilitamisele (üherituaalsus).

Kõrvahaiguste puhul kasutatud kivid on olemuselt mitmerituaalsed vahendid. Etnograafiliste kogude paralleelid viitavad, et raviprotseduurides kasutatud kõrvakivid on olemuselt fossiilid – sammalloomad ja korallid ning sama võib kinnitada paljude kõrvakivide folkloorsete kirjelduste põhjal. Kõrvakive kasutati enamasti kõrvavalu vastu, aga ka kuulmislanguse puhul. Kõrvavalu puhul oli tüüpiliseks ravivõtteks kivi ahjus või pliidil tuliseks ajamine, sellele piima

või vee kallamine ning sellisel viisil saadud auru kõrva juhtimine. Vahel (näiteks sobiva kujuga sammalloomade puhul) pandi kuumaks aetud kivi otsapidi haigesse kõrva. Kuulmislanguse või lukus kõrva puhul on tihti puhutud läbi kõrvakivi augu, mis viitab, et ravimiseks kasutati ka auguga veeriseid. Piksekivide ja piksenoolte (Artikkel 1) puhul on pärimustekstide järgi selgelt tegemist mitut erinevat sorti kividega. Kirjeldused piksenoolest kui ühest otsast terava, teisest laia või mõlema terava otsaga, ning mille keskel on auk, aga ka teated luisu moodi piksekividest viitavad kivikirvestele või -talbadele, aga ka mõnedele fossiililiikidele. Paljude pärimustekstide järgi on piksekivid ümarad, peopessa mahtuvad, sageli mustad või hallid sileda pinnaga, mis osutab vees lihvunud veeristele. Piksekive sai kasutada nii kõrva-, naha- kui hambahädade puhul, ent kõige paremini sobisid need äikesega taevast sadanud kivid rabanduse (äkilise loomi tabanud haiguse) vastu. Lisaks olid piksekivid head üldise kaitsemaagilise vahendina.

Nahahaigused (kärnad, paised, roos, soolatüükad) nõudsid kontaktmaagilist lähenemist ning raviks sobisid konkreetseks olukorraks valitud kivid. Arstimisviise oli peamiselt kaks: selgelt üherituaalne kasutusviis, kus korjatud kividega (3 või 9) tuli haiget kohta 3 või 9 korda vajutada ja seejärel samasse kohta maha tagasi asetada. Teise levinud raviviisi järgi tuli kivid kuumaks ajada ja vette panna ning ravivahendiks oli vesi. Kivide välimus ei ole kontaktmaagilise lähenemise puhul enamasti olnud oluline, ent olulisemad olid kivi leidmise asjaolud (ratta roopast, kolme mõisa maa pealt, kastesel hommikul jne), aga ka kivide arv ning muud rituaali panustavad ‘jõustavad’ elemendid, näiteks sõnamaagia.

Rahvameditsiini praktikad hõlmavad erinevatest traditsioonidest pärinevaid elemente: oma rolli mängisid nii humoraalse kui Paracelsuse meditsiini põhitõed kui kontakt- ja sarnasusmaagia. Iseloomulik vernakulaarsetele raviprotseduuridele on kõigi meetodite hoolikas valik ja omavaheline kombineerimine; praktikad sõltusid üldjoontes teatud kehtivast laialt levinud ideest (nt sarnasusmaagia printsiip), ent spetsiifilised võtted ja nende järjekord sõltusid olemasolevatest vahenditest, kohalikest traditsioonidest ning konkreetsest rituaali läbiviijast.

5. Materiaalsed allikad

5.1. Etnograafiline allikmaterjal

Kuigi töö peamiseks allikmaterjaliks on arheoloogilised esemed, ei saa mööda ka etnograafilisest ainesest, mis, olles kogutud samas ajaruumis kui folkloorne materjal, pakuvad kogutud tekstidele väärt võrdlust ravi- ja kaitsemaagiliste kivide olemuse ja kasutusviiside osas. Maagilistes praktikates kasutatud esemeid on Eesti muuseumikogudes teada vaid üksikuid, suurimad kollektsioonid asuvad Eesti Rahva Muuseumis (ERM) ning Pärnu muuseumis (Artikkel 4). Pärnu muuseumi vastavad esemed on kasutust leidnud piksenoolte ja -kividena, ehkki tegemist on arheoloogiliste kivikirveste, -talbade ning tuluskiviga. ERMi kogudes on maagiliste ravipraktikatega seotud esemed hajutatud erinevate

kogude vahel, neid leidub nii rahvarõivaste (ravimiseks kasutatud vöö), ehete (ravis kasutatud sõled) kui arstimisvahendite all koos kupusarvede, hambatangide, kõrvalusikate ning rohupudelitega. Just ravivahendite kogus säilib ka antud töö allikmaterjali arvestades kõige olulisem valik esemeid – ravi- ja nõiakivid, mille hulgas on nii siledapinnalisi veeriseid kui fossiile. Folklooritekstide kirjeldused sobivad hästi etnograafiliste ravikividega, nii on ERMi kõrvakivide puhul tegemist peamiselt ahekorallide ja sammalloomade fossiilidega ning ravi- ja nõiakivide puhul ümarate peopessa mahtuvate siledate veeristega. Lisaks kividele on ravi- ja kaitsemaagiliselt kasutatud loomade erinevaid kehaosi, näiteks kurguhädade puhul kasutatud hülgekõri, aga ka igapäevaesemeid, näiteks leiab kogudest ravimiseks kasutatud mündi, rahvariidevöö katke ning sõlgi. Ilmselt peaks etnograafilistes kogudes maagiliselt kasutatud esemeid rohkemgi olema, ent neile ei ole alati lihtne jälile jõuda. Erinevalt arvukatest folklooriteadetest ei ole (kaitse)maagilist rolli omistatud ühelegi etnograafilises kogus säilivale metallist terariistale. Selle põhjuseks on mitmed kataloogimise raskused (vt Artikkel 4), näiteks pärisfunktsioonile mittevastava kasutuse ignoreerimine kogumisprotsessis. Üldiselt on folkloorset ja etnograafilist materjali võrreldes siiski näha sarnaste esemete kasutamist. Kui võtta võrdluseks ka arheoloogiline aines, siis on sarnane esemeline materjal potentsiaalselt leitav ka muististest – veerised, fossiilid, loomade kehaosad, metallist terariistad, loomaluud, vahel ka tekstiilid. Ent erinevalt etnograafilisest materjalist ei ole arheoloogilistel leidudel narratiivi kaasas. Seega, analüüsides, kas mõnel noal on pärisfunktsiooni kõrval olnud ka maagiline süsteemifunktsioon, kas mõnd loomaluud saaks tõlgendada teisiti kui toidujäätmeid või kas mõnd silmatorkavat veerist kasutati mänguasja või ohutisena või on see juhuslikult oma leiukontekstis, ei ole meil suurt millelegi toetuda. Siiski, võttes arvesse leiukonteksti, analoogiaid hilisematest perioodidest ning eseme väliseid parameetreid on võimalik tõlgendusi välja pakkuda.

5.2. Arheoloogiline allikmaterjal

Siit jõuabki antud töö peamise allikmaterjali juurde, milleks on tõlgenduseta arheoloogilised esemed, mida muuhulgas on võidud kasutada maagilistes praktikates. Rõhuasetus on seatud sealjuures peamiselt kividele, ent võrdlust pakuvad ka erinevad igapäevased leiud. Maagiliste praktikatega on arheoloogilises materjalis tavaliselt seostatud ripatseid (nt Jaanits 1961; Reidla 2012) ning esemeid, millel puudub selge utilitaarne pärisfunktsioon, näiteks figuurid (Jaanits 1961). Kui aga vaadata etnograafilisi ja pärimustekstidest teada esemeid, siis on potentsiaalselt maagiliste esemete ring hoopis suurem ning nende äratundmine hoopis keerulisem. Viimasel ajal ongi just etnograafiast ja folkloorist teadaoleva maagilise inventari ambivalentsuse esile tõstmine olnud põhjus, miks mitmed uurijad on hakanud rõhutama, et arheoloogid tõenäoliselt ignoreerivad potentsiaalselt maagilistes praktikates kasutatud esemeid kaevamistel ja hilisemates tõlgendustes (vt nt Gazin-Schwarz 2001; Gilchrist 2008; Leeming 2015). Ka on

üldiselt ebaolulisteks leidudeks peetud vanad ja katkised esemed, fragmenteeritud luud, keraamikakillud ning looduslikud veerised osutunud oluliseks mineviku uskumussüsteemide seletamisel (Hukantaival 2016, 198).

Kõik arheoloogid on pidanud kaevamistel otsustama, mida leiuna käsitleda ja mida mitte. Peamine põhimõte, millest lähtutakse, näib olevat alateadlik hinnang esemete teadusväärtusele. Seega, nii kaua, kui uurija ei pea fossiili või veerist potentsiaalseks leiuks, ei ole tal ka motivatsiooni seda koguda ja hiljem kogudes talletada. On iseloomulik, et korralikumalt dokumenteeritakse leiud, mida kasutatakse muistise dateerimiseks või iseloomu selgitamiseks. Seega, isegi kui fossiile ja veeriseid on kogutud, ei ole nende leiukoht enamasti piisavalt täpselt dokumenteeritud. Loomaluid ja varaseid esemeid peetakse küll leidudeks, ent enamasti tehakse nende puhul tervemõistuslik otsus – loomaluud on toidujäätmed ning varased esemed viitavad varasemale asustusele samas kohas.

Arhiiviandmete põhjal on kokku 46 arheoloogi kogunud fossiile ning 61 veeriseid. Kõige enam veerised kogunud arheoloogide hulgas on kiviaja arheoloogid (Richard Indreko, Lembit Jaanits, Aivar Kriiska, ka Harri Moora), kes on ilmselt pidanud veeriseid potentsiaalseks toormaterjaliks. Üle 20 veerise on kogunud ka Vello Lõugas, Marta Schimedehelm, Heiki Valk ja Artur Vassar. Kõige enam fossiile on kogunud Maarja Olli ja Anu Kivirüüt, Marta Schmiedehelm ja Kaarel Jaanits, kusjuures enamasti ühest muistisest.

Põhjused, miks arheoloogid on veeriseid ja fossiile kogunud, võib jagada kolmeks: (1) folkloori mõjud, (2) ebakonventsionaalne kontekst, (3) isiklik valmisolek või motivatsioon ‘looduslikke’ leide koguda. Esimesel juhul on folkloorist mõjutatud arheoloogid kogunud veeriseid ning nimetanud neid vastavalt folkloorsetele nimetustele, nt ussikivid (Kustin 1963a; 1963b), kärnkonnakivid (Indreko 1939), piksekivid (Lõugas 1996, 116–117) ja ravikivid (Valk 2005). Teiseks, kogutud on veeriseid, mis on leitud sakraalsest kontekstist, näiteks kalmistutelt mõne matusega seonduvalt (Sope, Tamula, Raatvere) või mille kaasleiud, näiteks võrgukivide või jahvekividena interpreteeritud leiud, viitavad kasutus- ja töötlusjälgedeta kivi sarnasele funktsioonile. Kolmandaks, kogutud on ilusaid, ebaharilikke veeriseid ja fossiile, tõenäoliselt uskudes, et väljast silmatorkavad esemed on olulised ka arheoloogilises mõttes. Lisaks mõjutavad veeriste või fossiilide kogumise otsust rida muid asjaolusid, näiteks kogutakse looduslikke leide enam probleemkaevamistel kui päästekaevamistel, neid võetakse üles ka siis, kui teisi leide on vähe. Mõnikord, eriti fossiilide puhul, mõjutavad keskkonnatingimused, näiteks reeglina ei koguta fossiile Eesti fossiiliderikaste piirkondade muististest.

5.2.1. Fossiilid

Fossiile leidub arvukates paikades, ent sõltuvalt stratigraafilisest situatsioonist erinevad olemasolevad liigid suuresti. Fossiilide leidumine arheoloogilistes muististes ei ole ebaharilik, ent teemat puudutavaid käsitlusi on napilt mitte vaid Eestis, aga ka laiemalt. Enamasti on fossiilide leidmist vaid mainitud, mõnikord on nad ka liigini määratud, ent vaid väga üksikutel juhtudel arutletud nende

päritolu üle (nt Bar-Yosef jt 2010, 385). Põhiliselt on käsitletud üksikuid erilisi (nt merisiilikute) leide, kuigi viimasel ajal on mitmetes käsitlustes hakatud ka fossiilide potentsiaali leiuliigina ära kasutama (Glørstad jt 2004; Boyadziev 2008; Bar-Yosef jt 2010; Connell 2011; Guminski ja Bugajska 2016).

Ühe tendentsina on jälgitav, et fossiile on kogutud väga palju just kiviaegsetest, eriti paleoliitilistest kontekstidest. Kui varapaleoliitikumi puhul ei olda päris kindel, kas fossiile on teadlikult kogutud ja asulatesse toodud, siis hilispaleoliitikumis on lisaks näiteid, mis kinnitavad fossiilide transportimist pikkade vahemaade taha. Kiviaegsete fossiilide puhul tuleks eraldi välja tuua tulekivitöötluse käigus eksponeeritud fossiililеiud – on oletatud, et inimesed uskusid kivide transformeerumist loomadeks ning võisid seetõttu neid amuletina kasutada (nt Conneller 2011, 95, 97). Lisaks on fossiilidele välja pakutud mitmeid utilitaarseid kasutusvälju. Esimesed katsed fossiilides kunagi elanud organisme ära tunda tehti juba Vana-Kreekas, ent see puudutas vaid üksikuid liike, näiteks käsnade ja karpide fossiile (Wyse Jackson 2002 142). Lisaks hakati siis muude kivimite ja mineraalide kõrval kirjalikes allikates fossiilide maagilis-meditsiinilisi omadusi kirjeldama (vt Duffin 2013).

Eestis on fossiilid arvukad paleosoikumi karbonaatsetes kivimites, s.o. Ordoviitsiumi ja Siluri lubjakivides, seevastu Devoni setetes leidub fossiile vähe (Pirrus 2001, 43–44). Kõige enam fossiile on Ordoviitsiumi lubjakivides Põhja-Eesti klindialadel, Kirde-Eesti põlevkivikihtides ning mõnes paikkonnas Saaremaal. Enamasti on arheoloogilistest kontekstidest leitud fossiilid kogutud moreenist Ordoviitsiumi ja Siluri avamusaladel.

Eesti arheoloogilistes kogudes vaatasin läbi 287 fossiili 62 erinevast muistisest (Tabel 1; vt ka Artikkel 5). Lisaks on fossiilidena kogutud auguga lubjakive kogutud (110). Arvuliselt kõige enam fossiile (85) on kogutud Aakre tarandkalmest ja seda on tinginud kaevanud arheoloogide otsus võtta üles kõik, mis tundus kaevamissituatsioonis tähelepanuväärne, kusjuures kogutud leidude looduslik päritolu ei olnud argumendiks. Kukruse kalmistult koguti 7 fossiili ning ka seal sai oluliseks kaevajate otsus võtta üles enam-vähem kõik, mis tundus huvitav.

Üldiselt võib öelda, et kõik Eesti muististest kogutud fossiilid on Eesti territooriumilt leitavad ning valdavalt ka oma avamusalal või sellest lõuna pool ehk liustiku transporditud moreenis looduslikult levivad. Üheks erandiks on Maardu küla Kabelimäelt, ilmselt kõrvalküla Saha kabeli ümbrusest saadud efektne rugoosi (AI 3536: 11) ja peajalgse (AI 3536: 12) fossiil (Artikkel 5, jn 3: 1–2). Fossiilide leiukontekst paikneb looduslikust avamusalast põhja pool ning nii ei saanud liustik neid leiukohta setitada. Seega võiks siin oletada pigem inimese poolt toomist. Kahjuks pole võimalik fossiililеide seostada ei matuste, hävinud puukiriku ega ka 15. sajandil rajatud kivikabeliga, ent efektse välimusega leide võidi kõigil juhtudel pidada kaitsemaagilisteks piksenoolteks. Kindlalt imporditud leiuks on ka Tallinna südalinna kesk- ja uusaegsest asulast leitud söödava gastropoodi (ilmselt *Buccinidae* perekonda kuuluva) poolfossiilne karp (AI 7032: 1594). Karp ei saa olla asulasse sattunud toidujäätmena, sest Läänemeres seda liiki ei ole olnud ning kaugemalt tooduna ei oleks nad

transpordil värskena säilinud. Lisaks viitab karbi fossiilistumise aste, et tegemist pidi olema juba keskajal fossiilse loomaga, seega nähtavasti on gastropood Eestisse toodud kuriositeedi või muul põhjusel olulise esemena. Selgelt eristatavaid kasutuskulumisjälgi selle pinnal ei ole, tipuosa on küll murdunud, ent murdepindade järgi võib oletada, et juba ammu. Sarnane näide on ka kammkarbi leid Rakvere frantsiskaanlaste kloostrist (RM A 77: 323), mis sarnaselt söödavatele tigudele ei oleks transporti toiduainena vastu pidanud, seega ilmselt toodi need Eestisse suveniirina.

Kogutud fossiilidest arvukamad – 65 – on peajalgsete fossiilid. Suure osa moodustavad Tallinna (10) ja Tartu (5) linnakontekstidest saadud näidised. Kalmistutelt on kokku 42 peajalgsete fragmenti, kusjuures esindatud on nii rauaaegsed kivikalmed (Rae I, Rannamõisa III, Aakre) kui keskaegsed kalmistud (Santa Barbara, Saha). Eesti paleosoikumi nautiloidide fossiilide sugulasi – juura ja kriidi ajastu belemniite – on juba Vana-Kreekas peetud taevasteks noolteks ehk piksenoolteks. Peajalgsete fossiilide kasutamist ravimaagias kinnitavad kaks etnograafilist leidu ning folkloriteadetes esinevad kivisüdamed. On tõenäoline, et vähemalt mõnda peajalgse fossiili arheoloogilises kontekstis on peetud piksenooleks, näiteks Tartu linnuselt leitud ja kolmeks tükiks murdunud eksemplari. Piksenoole-uskumuse tundmist keskaegses Tartus näivad kinnitavat samuti piksenoolteks peetud tulekivist nooleotsa ja kivikirve leid linnuselt.

Kokku on arheoloogiakogudes 54 okasnahksete fossiili fragmenti. Enamasti on tegu varrelülidega, mida on ilmselt kasutatud helmestena. Lisaks on kolm merikera, mida nende ümara kuju tõttu võidi kasutada mängukuulidena.

Eesti muististest on kogutud 22 gastropoodi fossiili. Neist üheks erilisemaks leiuks on Tartu linnuselt leitud gastropoodi (*Subulites gigas*) (TM A 16: 563; Artikkel 5, jn 6) fossiil, mille üks külg on veidi kumeralt maha lihvitud. Gastropoodide kohta on folkloorset materjali vähe, ent kuna fossiile on tuntud kui kivisüdameid, mille küljest on loomadele äkki ilmunud haiguse korral puru kraabitud, siis võib spekuleerida, et ravimaagiline kasutus võib olla taolise lihvimise põhjuseks. Teine silmatorkav näide on *Pararaphistoma qualteriata* fossiil Jägala linnamäelt, mis on leitud nelja fragmendina (TÜ 1444: 93, 435, 611, 614) kahest linnuse eri otstes paiknevast kaevandist. On tõenäoline, et fossiil on olnud algselt terve ning kas kogemata purunenud või tahtlikult katki tehtud. Võib spekuleerida, et fossiili võidi kiviajal tajuda kiviks muutunud loomana ning väärtustada ohutisena või tehti rauaajal pooleks ning viidi linnuse eri vallidele, et linnusele maagilist kaitset pakkuda. Iru asulast leitud *Bellerophontida* fossiili (AI 3429: 926) mikroskoobiuuringud kinnitasid selle kandmist ripatsina.

Kogutud on ka 64 korallifossiili, neist 26 tabulaadi ja 28 rugoosi fossiili. Kuigi tabulaate on folkloriteadete ja etnograafilise andmestiku põhjal kasutatud ravimaagias, ei ole arheoloogiliste leidude puhul võimalik sellist kasutust jälgida.

Eristasin 26 sammallooma fossiili. Sammalloomade fossiile on rahvameditsiinis kasutatud kõrvakividena, ent arheoloogiliste leidude puhul on sellist kasutust raske tõestada. Huvitav on Tartust 16.–17. sajandi kihist leitud väga kulunud pinnaga sammallooma fossiil (TM A 50: 98), mis võib olla kaasas

kantud kui ravimaagiline kivi, kuid võimalik on, et tegemist on mängukivina kasutatud esemena. Ka Vaida keskaegsest asulast leitud ilmselt mängukividena kasutatud 24 ümaraks kulunud pinnaga fossiili (AI 6248), mille hulgas oli nii sammalloomi, merikerasid kui keravetikaid.

Vaid kolm trilobiidi fossiili on jõudnud muuseumikogudesse. Neist kahe puhul võib oletada, et neid tajuti kui kivistunud mardikaid ning võidi seetõttu väärtustada.

Lisaks on kogutud 110 nn pseudofossiili kokku 33 leiukohast. Need on tünnikujulised, loodusliku augu ning vahel mitmete soonte ja käikudega lubjaveerised, mille sooni on tõenäoliselt mõnelgi juhul süvendatud läbivaks auguks, et neid helmena kanda. Kuigi arheoloogide poolt sageli fossiilideks peetud, nad seda siiski ei ole.

5.2.2. Veerised

Arheoloogilistest kontekstidest leitud veeriste analüüse on üpris napilt ja needki vähesed on peaasjalikult keskendunud ebaselge funktsiooniga, kuid inimese poolt nähtavalt muudetud välimusega veeristele, näiteks mesoliitilistele maalitud kividele (Burkitt 1926; Jochim 2008), Šoti sümbolitega kividele (Ritchie 1972, Arthur jt 2014) ja Põhja-Ameerika ohutiskividele (Sharp 2000; Hector jt 2005). Lisaks neile asulakontekstist leitud kividele on tõlgendusi otsitud ka kalmetest leitud veeristele. Muudetud välimusega kividele on ilmselt leiukonteksti arvestades otsitud reeglina utilitaarseid funktsioone, ent tihti on peale jäänud ka rituaalne seletus, näiteks Šoti maalitud kive on kohalikule folkloorile toetudes tõlgendatud ravimaagiliste veeristena. Matusekombestikust leitud kivide tõlgendustes domineerib sümboolne või maagiline tähendus, erandiks on kivikeste seletamine vajadusega surnu mõningaid kehaosi toetada (Nilsson-Stutz 2003, 335; Ahola 2015, 27, 32). Maagilised ja sümboolsed tõlgendused on eriti selgelt rõhutatud valgete kvartsimugulate puhul. Neid on arvukalt tähele pandud nii muinasaegsetest kui keskaegsetest kontekstides nii Briti saartel (nt Evans 1897; Meaney 1981, 88ff; Gilchrist 2008; Arthur jt 2014) kui ka Skandinaavias (Ringstad 1988; Samdal 2000).

Eesti arheoloogilistest kontekstidest on kogutud 587 veerist 133 muistisest. Üldiselt on tegemist 3–6 cm läbimõõduga, enamasti ümarate või lapikute veeristega, mis sõltuvalt kivimist on erineva värvuse ja pinnasiledusega. Kõik kivid on Eestist leitavad, ent mitte alati kohalikud. Hea näite pakuvad kolm Suursaare kvartsporfüüri veerist (A 5937 II: 554, 1045; AI 6004 III: 126), mis leiti Tallinnast, Härjapea kesk- ja uusaegse asula kaevamisel. Kuna antud kivim on loodusliku leitav vaid Kirde-Eestis, siis liustiku transport on välistatud ning seega on need kivid Tallinnasse toodud tõenäoliselt inimeste poolt. 2–3 cm läbimõõduga mustad sileda pinnaga veerised võisid asulasse jõuda mängukividena, ent kirjalikele ja folkloorsetele allikatele toetudes võidi neid kasutada ravi- või kaitsemaagias, näiteks kaarna- või ussikividena.

Analüüsitud kive võib nende omaduste (suurus, kuju, siledus, nähtavad kasutusjäljed, võimalusel detailne leiukontekst) järgi jaotada erinevate võima-

like funktsioonide vahel, mida on etnograafilistele ja arheoloogilistele veeristele mujal maailmas omistatud: poleerimis-/silumiskivid, viske-/lingukivid, keedukivid, mängukivid, löögikivid, aga ka ravi- ja apotroopsed kivid. Paljud kivid sobitusid neid parameetreid hinnates mitmesse rühma.

Veeriseid on kasutatud nii keraamika, naha, kivi- kui metallesemete lihvimiseks ja poleerimiseks (nt Cahill 2009; Skochina jt 2016 ja sealsed viited), kõige enam on veerised kasutust leidnud just keraamika tootmises, lisaks pinna viimistlemisele ka näiteks kuju vormimisel ja ebatasasuste ühtlustamisel. Kuigi Eestis on lihvitud pinnaga keraamikat pronksiajast alates (Lang 2007, 128, 132, 135) ja üksikjuhtudel isegi neoliitikumis (Kriiska 1995, 71) tehtud, on meil siiani kogudes vaid üks kaevanud arheoloogi poolt keraamika valmistamise kiviks tituleeritud veeris (AI 4366: 1062), ent see sobiks suuruse ja kasutuskulumise järgi pigem poti siseseina vormimiseks (Jaana Ratas, suuline viide, 14.10.2016). Oma allikmaterjalis eristasin 19 võimalikku poleerimiskivi. Need on keskmiselt 2–5 cm läbimõõduga, peeneteralisest kivimist lapikud ja vees lihvunud pinnaga veerised, millest mõnel on peal punaka pinnase (savi?) jäänuseid. Selgeid lineaarseid eksperimentaalsetele poleerimiskividele sarnaseid kasutusjälgi oli võimalik tuvastada kolmel Iru linnusest pärit kivikesel (AI 4154: 15, 50, 125). Kuna mitmed kasutusviisid ei jäta veeristööriistadele makroskoopilisi kasutusjälgi, mida saaks jälgida väliuuringute ajal, siis võib eeldada, et veeristööriistad on arheoloogilises materjalis alaesindatud.

Kogu Euroopa arheoloogilises materjalis on levinud põlenud kivide kontsentratsioonid asulakohtade materjalis. Arvukate arheoloogilistest ja etnograafilistest kontekstidest leitud erisuuruseid põlenud kive on sageli tõlgendatud potti vee kuumutamiseks asetatud keedukivide või toiduvalmistamise lohkudes toidu kuumutamiseks kasutatud munakatena. On kindlaks tehtud, et 400–600 kraadini kuumutatud väiksemate veeriste kasutamine on kiireim viis vett keeta (nt Sheets 1994, 217; Skibo jt 2009, 59). Eestis on põlenud või tahmanud rusikasuurusi kive asulatelt leitud, ent harva täpsemalt käsitletud, ning vaikimisi on omaks võetud tõlgendus koldekividest. Eesti materjalis eristasin 108 võimalikku söögivalmistamisel kasutatud kivi. Need on põlenud või tahmanud ning jäävad 7–10 (koldekivid) või 3–5 cm (keedukivid) vahele. Kõige enam on neid ootuspäraselt kogutud asulatelt ja linnustelt, ent ka üksikutest kivikalmetest. Viimastest on põlenud kivide leide tõlgendatud kui tuleriidajäänuseid, aga ka asulamaterjali toomist kalmetele, sarnaselt lihvimis- või võrgukividele, millel samuti võib olla sakraalne tagamaa (nt Kustin 1962, 207; Lang 2007, 109; Viljat 2016, 27; vt ka Wessmann 2010, 89ff ja sealsed viited).

Lingud relvana on tuntud üle maailma paleoliitikumist alates (Korfmann, 1973; Ferrill, 1985; Grunfeld, 1996) ning hinnatud väga efektiivseks isiklikuks viskerelvaks 15. sajandini välja. Etnograafilistele andmetiku järgi on linguga lennutamiseks sobivad kivid olnud 3–8 cm läbimõõduga (vt Thomas 2013, tab. 1) ning sileda, vees lihvunud pinnaga. Sellistel veeristel oli õhutakistus väiksem ja kivi lendas täpsemini (Harrison 2006). Eesti materjalis eristasin vastavaid parameetreid arvestades 26 võimalikku lingukivi. Kõige enam ongi laskemoonakividena tõlgendatavaid veeriseid kogutud linnamägedelt. Lisaks on võimalikke

lingukive nimetatud mitme linnamäe kaevamispublikatsioonis, ent kogutud neid ei ole.

Veerised ja munakad on suurepärased mängukivid, sest nad on erineva kuju ja värvusega ning neid leidub kõikjal. Kuigi võib eeldada, et kive on mängimiseks kasutatud läbi ajaloo, on mängukive eristatud just kesk- ja uusaja arheoloogias. Eestis on mängukividena eristatud götiitseid moodustisi ja savikuule, aga ka fossiile (vt Vaida kohta ülalt), samas kui kivikestele on sama funktsiooni omistatud väga harva. Eristasin 156 võimalikku mängukivi, võttes peamiste parameetritena aluseks suuruse (kuni 5 cm läbimõõduga) ja ümaruse, ehkki mängimiseks sobivad igasugused kivid. Paljud eristatud mängukividest on leitud Tartu ja Tallinna kesk- ja uusaegsetest kihtidest, aga ka rauaaegsetelt linnamägedelt.

Eristasin ka 273 võimalikku ravi- ja apotroopset kivi (vt ka Artikkel 5). Need on võrdlemisi väikesed (2–7 cm läbimõõduga), korrapärase ümarlapiku kujuga, silmatorkava värvi ning siledate pindadega. Kui võimalik, võtsin arvesse ka leiukonteksti ning varasemate uurijate tõlgendusi. Matusekontekstidest tuleb mainida 41 kivikest nöörkeraamika perioodi kuuluva Sope naisematuse õla alt (AI 3175) ning kaht vees lihvunud veerist Tamula noorema kiviaja lapsematuse rinnalt (AI 3960: 272, 273). Kuigi kivikalmed on kollektiivsed matmisvormid ning sealt leitud kive ei ole hauapanusteks peetud, võib mõne erilisema (nt Järve Reinbergi auguga veerise) puhul oletada katisemaagilist tähendust. Asulamaterjali hulgas leitud veerised ei pärine tänapäeva uurija jaoks erilisest kontekstist, vaid üksikutel juhtudel (nt imporditud Suursaare kvartsporfüüri veerised Tallinnast) võib oletada ravi- või kaitsemaagilist tähendust. Samas tuleb tähele panna, et kuna igapäevamaagias on kivikesi laialt kasutatud ning igapäevamaagia praktikad toimusid just elupaikades, siis peaks selliseid esemeid asulakontekstides leiduma.

5.2.3. Varased kiviesemed

Tihti on varasemaid esemeid hilisemates kontekstides peetud jäänukiks varasest asustusest samal kohal. Suuremaid kiviaegseid teraesemeid on seostatud ka (müütiliste) esivanemate mäletamisega või kaitsemaagiliste piksekividega (Thähte & Hemdorff 2009, 43). Need paralleelsed tõlgendused võisid ka kogukonna või üksikisiku maailmapildis lõikuda – ese, mille tegi ja mida kasutas (mütoloogiline) esiisa, sobis hästi kaitsemaagiliseks instrumendiks. Kiviaegsed kiviesemed seonduvad piksenoole-legendiga alates 4.–3. sajandist eKr kirjalikes allikates, esmalt Sotacuse tekstis. Leiud kinnitavad, et kiviaegseid kiviesemeid väärtustati nii Rooma provintsides kui kaugemal Skandinaaviamaades juba Rooma rauaajal ehk I aastatuhande algul ja ilmselt oli piksenoole-legend selleks ajaks ka neis paigus tuntud. Keskajast alates on enam selgemaid näiteid piksenoole-uskumuse seostamisest kiviaegsete esemetega. Nii on kümneid neoliitilisi kiviesemeid saadud Lundi ja Novgorodi keskaegsetest kihtidest. Ka on kesk- ja uusajast teada metallraami surutud kiviesemetest tehtud ohutisi.

Kokku eristasin 143 arheoloogilist kivieset, mis on leitud hilisemast kontekstist (84) või mille taaskasutus hilisemal perioodil on tõestatud kogumisel üleskirjutatud legendis (60). Varasemate esemetena käsitlesin kivi- ja pronksiaegseid kivikirveid ja -talbu, tulekiviesemeid, nagu nooleotsi, ning rauaaegseid tuluskive. Lisaks on raua- ja keskaegsetest muististest kogutud märkimisväärne arv tulekivi- ja kvartsikilde. Kahjuks on enamasti leirete käigus saadud leidude puhul keeruline otsustada, kas tegemist on samal kohal paiknenud kivi- ja rauaaegse/keskaegse asulaga või on tulekivist ja kvartsist pisiesemeid kasutatud raua- ja keskajal. Varasemate asulakohtade puhul oleks siiski oodatav ka muu varase leiumaterjali (nt keraamika) esinemine.

Koondatud allikmaterjalist ühe eseme võib siduda varasema rauaaegse asulaga, 42 kivieset hilisrauaaegse, kesk- või uusaegse asulakohaga, 15 rauaaegse kivikalmega, 17 hilisrauaaegse või keskaegse kalmistuga ning 9 dateerimata matmispaigaga.

Raua- või keskaegsetest maa-asulatest leitud kirved on tihti saadud juhuleidudena, mille asukohta kontrollima minnes on satutud hoopis hilisemale asulale, näiteks Viru-Nigula (Tab. 3: 27), Pihlaka (Tab. 3: 38). Muude hilisneoliitiliste või pronksiaegsete asustusjälgede puudumisel on võimalik neid pidada asulate kaasaegseteks leidudeks. Hea näide on Lagedi asulakohalt leitud teravakannalise kivikirve teraosa (AI 4420; Tab. 3: 1) ja kivitalb (AM A 496; Tab. 3: 2). On võimalik, et mõlemad leiud pärinevad ühest mitte kaugel paiknevast kiviaegsest elupaigast, ent hilisemasse asulasse on nad tahtlikult toodud. Ilmselt on mõlemal olnud piksenoole roll, millest annab täiendavat kinnitust tugevad kahjustused kirve pinnal, mis ei oleks saanud tekkida kivikirvena kasutuse käigus. Ainsa rauaaegse asula näitena on arvesse võetud Mustjala Võhma ringvalli kaevamisel koos söetükkidega leitud kivitalb (AI 5370; Tab. 3: 104), mida võib tõlgendada kui omalaadset ehitusohvrit. Sageli on juhuleiud kogutud 20. sajandi algul ilma täpsete leiuandmeteta ning seega ei ole tihti võimalik täie kindlusega neid hilisema asustusega siduda. Vahel võib sekundaarse kasutuse tõendina näha ebafunktsionaalseid kasutusjälgi. Näiteks Ala-Vagula (AI 2490: 58; Tab. 3: 141) kirves on väga ebasümmeetrilise kujuga ning oletuslikult on selle teraosa sekundaarselt maha viilitud. Saareküla Hansu talu maalt leitud kirvele (AI 2490: 17; Tab. 3: 109) on sisse kraabitud soon. Paljude kirveste kasutuskulumisjäljed viitavad tahumisele või raiumisele, ent enamasti pole võimalik öelda, kas kasutus on olnud kivi-/pronksiaegne või hilisem. Erandiks võib pidada Viru-Nigula asula venekirvest (Tab. 3: 43), mille kannaosa on sekundaarselt nelinurkseks tahutud. Kindlamad näited taaskasutatud kirvestest on kaevamiste käigus välja tulnud leiud. Näiteks on Otepää linnuselt leitud kivikirves (AI 4036 II: 20; Tab. 3: 121) ja Pyheensilta tüüpi nooleotsa katke (AI 4036 II: 15; Tab. 3: 120). Kui esimese puhul võib rääkida potentsiaalsest ehitusohvrist, siis nooleotsa tõsiselt kraabitud pind võib viidata mitteutilitaarsele (ravimaagilisele?) funktsioonile. Proosa keskaegselt asulalt on leitud kivikirve kannaosa või adratera (TLM A 93: 226; Tab. 3: 5). Asula kaasaegseks leiuks ta ei sobi, sest sel ajal tehti adraterasid rauast (Tvauri 2012, 99–100), ent ese võib olla saadud varasemast asulast ning toodud hilisemasse leiupaika kurioosumina. Kuna ese

leiti viljaaidana tõlgendatud väikese hoone lähedusest (Deemant 1993, 4), võib tegu olla ka kaitsemaagilise esemega.

Küllalt palju varasemaid kiviesemeid on saadud kesk- ja uusaegsetest linnakihtidest. Tartu paistab silma oma üheteistkümne leiuga, viis on saadud Tallinnast ja üks Lihulast. Poolik kivikirves (TM A 14: 402; Tab. 3: 110) ja tulekivist nooleots (TM A 16: 304; Tab. 3: 111) leiti Tartu linnuselt, kus neid tõlgendati kiviaegse asula jäänusena (Trummal 1964, 83). Kirves, väga kriibitud ja kahjustatud pinnaga, leiti müüri kohalt varisenud mullast, mis võib viidata, et kirves kui kaitsemaagiline piksenool oli seina müüritud. Piksenoole-uskumusele viitavad ka linnuselt leitud tulekivist nooleots ning peajalgse fossiil (TM A 15: 1000). Ülejäänud linnast leitud kiviesemed näivad seda kinnitavat, näiteks kivikirve teraosa (TM A 42: 996; Tab. 3: 112) Lossi 3 krundilt võis samuti olla seina müüritud, nagu ka Rüüti tänavalt 16. sajandi rusukihist saadud tulekivist nooleots (TM A 50: 449; Tab. 3: 113). Huvitav on 7. kvartali 13.–14. sajandi puitsillutise alt mustast söesest kihist leitud kirves (TM A 45: 1242; Tab. 3: 116), mis võidi sillutise alla panna tuleohutuse kaitsemaagiliseks tagamiseks. Samal otstarbel peideti kirveid läve alla, millest võib anda tunnistust Riia tn 2 kaevandi segatud, aga ilmselt uusaegsest kihist, hoone alt leitud kivikirves (TM A 221: 6963; Tab. 3: 117). Kõige erakordsemaks võib pidada Vene-Karjala tüüpi metatuffist kirve (TM A 222: 9; Tab. 3: 118) leidu Jakobi kalmistu 15. või 16. sajandist pärit matuse juurest. Nii paljude piksenoolte leidmine Tartust näitab teatud sarnasust Lundi ja Novgorodiga, mis olid samuti piiskopkonna keskused.

Lihula linnuselt leitud kirvefragment (AM A 583: 103; Tab. 3: 28) on oma sirge kannaosa, teravate kantide ning materjali (lubjakivi) poolest unikaalne. Sarnasus Kesk-Saksamaal toodetud hilisneoliitiliste fasseteeritud kirvestega viitab, et ese võib olla kiviaja lõpus sealt imporditud, maha jäänud ning keskajal uuesti leitud ning kasutusele võetud. Leiukoht 13.–14. sajandi hoone vahetus läheduses võimaldab oletada, et kirves oli peidetud maja seina või katuseräästasse.

Tallinna leidudest on huvitav rauaaegne tuluskivi (AI 5777: 1192; Tab. 3: 9), mis leiti Püha Barbara kalmistult, ent on pigem seotud kalmistu kahe matmiskihi vahele toodud keskaegse asulamaterjaliga.

Viisteist varasemat kivieset on leitud Rooma ja keskmise rauaaja kivikalmetest. Põnevad on kaks tulekivist talba Jäbara B tarandkalme alt (AI 3172: 360, 821; Tab. 3: 14, 15). Kohta võib tõlgendada kui tarandkalmet, mis on rajatud varasemale matmiskohale (Schmiedehelm 1935, 12–15), ent võimalik ka, et kalme rajamisel viidi läbi teatud rituaal – puhastati kalmealune pind ning maeti sinna üksikud (müütiliste esivanemate) luud ning kaitsemaagilised esemed. Kahest Läänemaa kivikalmest on leitud tulekivist nooleots. Neist eriti põnev on Ehmja kalmest leitu (AM A 554: 390; Tab. 3: 25), mille tipu suunas laienev roots on eripärane ning viitab tahtele tagada kinnitamisvõimalus.

Seitseteist kivieset on seostatavad hilisrauaaja või keskaja matusepaikadega. Kahjuks ei ole neist ühtki võimalik konkreetsete matustega seostada. Lisaks on kümme kivieset saadud kronoloogiliselt ebaselgetest matmispaikadest. Neist enam kirjeldatud on Metsiku mõisa maal asuv matusepaik, kust 19. sajandi leiu-

teate järgi saadi Külasema tüüpi kivikirves (Tab. 3: 31), mille silmast oli läbi pandud kett (Grewingk 1887, 173–177). On võimalik, et kirves seostati leidjate poolt luudega kogemata, aga tegemist võib olla ka hilisraua- või keskaja kalmistul mõnele matusele kaasa pandud kaitsemaagilise piksenoolega.

Kõige enam 19. sajandi lõpus ja 20. sajandi alguses kaitse- ja ravimaagias kasutatud kiviesemeid leidub Pärnu arsti Martin Bolzi kogus (Bolz 1914a), aga üksikuid ka teiste muuseumite kogudes. Kõige enam on esemeid, mille kohta on teada vaid see, et neid tajuti piksenoolte või –kividena. Veidi enam kui poolte kohta on teada ka, kuidas neid kasutati. Lisaks kaitse- ja ravimaagilistes praktikates kasutamisele on kiviesemed sobinud ka erinevateks praktilisteks ülesanneteks, näiteks võidi neid pruukida võrgukivide või luiskudena.

6. Diskussioon

Lihtsustatult öeldes on igal arheoloogilisel leiul oma eluloos kaks kinnispunkti – jõudmine arheoloogilisse konteksti ja jõudmine säilituskonteksti (muuseumikogusse). Esimene on seotud kasutajate/praktikute tegevusega, teine viitab uurijate/kogujate tegevusele. Viisides, kuidas kasutajad on tajunud ja kasutanud fossiile, veeriseid ja varaseid kiviesemeid, on teatud sarnasusi. Sarnasusi on ka uurijate (arheoloogide kui etnoloogide) tegevuses, kui nad otsustavad need esemed kogusse paigutada. Ning viimaks on sarnasusi ka kasutajate ja uurijate vaadete ja arusaamade vahel.

Võib öelda, et kasutajate ja uurijate ühiseks jooneks on teatud universaalne kultuuriline idee, näiteks, et väljast erilisel kivil (välimuselt või leiukontekstilt) peavad olema tähelepanuväärsed sisemised omadused. Mõlemad teevad valiku, kas sellele universaalsele tungile järele anda. Kui kasutaja tahab kivi kasutada kas mõnes utilitaarses ülesandes või tema maagiliste omaduste tõttu, siis uurija tahab teada kivi tähtsust kasutaja jaoks.

Uurija käitumine on mõjutatud üldisest valmisolekust, mis on seotud universaalsete kultuuriliste ideedega, võimalikust taustast rahvausundi alal ning kehtivast akadeemilisest õhustikust, mis kas toetab looduslike leidude olulisust või taaskasutuse ideed või mitte. Nõukogudeajal mõjutasid ateismikampaaniad, religioosse mõtlemise alavääristamine ja teaduslik-ratsionaalse maailmapildi rõhutamine teadlaste mõtlemist ning ilmselt seetõttu kujunes varasemate leidude tõlgenduses peamiseks märksõnaks residuaalsus. Veeriste ja fossiilide kogumist ja eelkõige interpreteerimist takistas akadeemiline lähenemine, et inimkäitumine on olemuselt ratsionaalne, mis on tähendanud maagiatõlgenduste pidamist mitteteaduslikuks. Mitmeid arheolooge on siiski inspireerinud folkloor (Richard Indreko, Aita Kustin, Lembit Jaanits, Vello Lõugas, Heiki Valk).

Kuigi fossiilide, veeriste ja taaskasutatud kiviesemete kogumise ja kasutamise aeg on olnud väga pikk, on näha teatud sarnasusi kasutajate vaadetes. Üks peamisi inimesi mõjutanud kultuurilisi universaalsusi on kontraintuitiivsus, mis on maagilise maailmapildi eelduseks. Kontraintuitiivsete ideede kaudu omistatakse asjadele ja olenditele maagiline toimijalisus. Näiteks võib universaalseks kontra-

intuitiivseks pidada ideed, et kivid võivad haigusi ravida. Konkreetse ühenduse probleemi ja lahenduse vahel loovad maagiaseadused, mis võivad toetuda näiteks kivi füüsilistele parameetritele (värv, kuju, suurus) või selle oletatavale päritolule. Seega, kui kivid üldjoontes võivad ravida, siis taevast pikselöögiga kukkunud kivid on head äkiliste haiguste ravis. Sümpateetilisel maagial põhinevad apotroopsed ja eriti ravimaagilised meetodid on väga varieeruvad. Pea kõigele, ka meie mõistes prahile, saab omistada maagilist toimijalisust kehtivate 'reeglite' raames. Näiteks on 18. sajandist teada, et maa-aluste vastu aitas vana kinga naha suits (Wilde 1766, 30), sest maagiaseaduste kehtestatud 'reeglite' järgi oli maast tulnud haiguse parim ravim vana saabas, mis oli pidevalt maaga kontaktis. Maagilist toimijalisust suurendas institutsionaalse võimu legitimeeriv roll, nt kiriku ja mõisaga seotud elemendid lisasid raviprotseduuridele väge (Artikkel 3). Ravimaagia näitab variatiivsust – teatud raamides said inimesed valida ravivaid elemente, rituaalide järjekorda, ning protseduuri detailides muutusi teha. Asjakohane on vernakulaarsuse kontseptsioon. Leonard Primiano (1995) poolt käibele toodud vernakulaarse religiooni kui elatud/kogetud religiooni mõistet võib laiendada vernakulaarsetele praktikatele – erinevat päritolu elementide kasutamine soovitud lõpptulemuse saavutamiseks ehk teisisõnu maagiliste võtete, religioossete palvete ja muude jõustavate elementide, näiteks institutsionaalse väe, kasutamine haigusest võidusaamiseks või hea käekäigu kindlustamiseks. Kõigi vahendite kasutamist eesmärgi saavutamiseks võib pidada omamoodi kultuuriliseks universaalsuseks.

Seega oli erineva perioodi kasutajatel palju ühist. Esmalt, maagilises universumis elamine ehk toetumine maagilisele/üleloomulikule kausaalsusele. Selle maailmapildi järgi õnnetused ei juhtu, vaid neil on põhjus, teisisõnu on tegemist üleratsionaliseeritusega (Wilson 2000, xxv). Teiseks, soovitu saavutamiseks kasutati erineva päritoluga elemente ehk teisisõnu oli tegemist vernakulaarsete praktikatega. Kolmandaks, sarnasused on ka teatud kasutatud ainetes. Näiteks merevaigu või merisiiliku fossiilide erilisust inimeste jaoks on oletatud alates kiviajast kuni kesk- ja uusajani välja. Vaevalt on läbi eri perioodide inimesed neid tajunud või kasutatud ühtmoodi, ent võib oletada, et teatud omadusi on universaalselt väärtustatud, näiteks merevaigu puhul vaiku lukustunud loomi, kuldset värvi või staatilist elektrit, merisiilikute puhul aga ümarat kuju ja mõnede liikide puhul 'mustrit' (viieharuline täht).

Kiviajal on kogutud ja kasutatud veeriseid ja fossiile. Mõnede fossiililiikide puhul võidi märgata nende sarnasust elus organismidega ning pidada neid kivistunud loomadeks. Samas võis selline vaade säilida 17.–18. sajandini välja, kuni fossiilid lõplikult ära seletati ja kauemgi. Kiviajale spetsiifiline joon on ehk võimalus sattuda tulekivi töödeldes fossiilile ning paljandunud looma kas apotroopseks või ohtlikuks pidada. Kui arvestada universaalset 'kivi-maaniat' (Kunz 1915), koguti sümmeetrilisi või ebahariliku kujuga siledaid ja eriti vees lihvunud, silmatorkavat värvi kive erinevate arheoloogilistele perioodidel kui kuriositeete. Mõned võeti kasutusele utilitaarsete ülesannete jaoks või mängukividena, teistele omistati teatud vägi ja hoiti amulettidena.

Rauaajast alates on märksõnaks kirjalikud allikad, mis reprodutseerivad ‘vormitud kivide’ kohta käivaid uskumusi ja nende kasutusviise. Kirjalikes allikates kirjeldatud kommete levik ei ole teada, ent allikad annavad uurijatele teadmise kivide võimalike apotroopsete ja ravimaagiliste kasutuste kohta, kuigi arheoloogilistest kontekstidest leitud fossiilidel, veeristel ja taaskasutatud kiviesemetel oli ilmselt mitmeid tähendusi ja funktsioone. Erinev on piksenoolte lugu, sest vanu kiviesemeid sai selle uskumusega seostada alles siis, kui nende pärisfunktsioon enam primaarne ei olnud. Selle protsessi käiku me ei tea, aga eeldatavasti erines see kogukonniti – mõnes olid need veel minevikust pärit tööriistad, teises müütiliste esivanemate omad ja kolmandas maaväliste jõudude instrumendid. Lõplik otsus, mida uskuda ja kuidas neid kasutada võis hoopis jääda konkreetsele inimesele. Materiaalsete allikate põhjal on võimalik oletada, et Eesti alale jõudis usk maagilistesse piksenooltesse viikingiajal ning tõestust sellele võib leida mitmete kiviesemete leidmises hilisraua- ja keskaegsetes asulates. Vanu kiviesemeid võidi juba rooma rauaajast pidada eriliseks ja (müütilistele) esivanematele kuuluvaks pidada. On ka tõenäoline, et materialiseerunud äikeselööki otsiti pärast tormi juba alates kiviajast ning kurioosumeid, näiteks fossiile ja erilisi veerised, võidi piksekivideks pidada juba siis.

Keskajal korrati kirjalikes allikates antiiktekste ja nende teadmisi kivide maagilis-meditsiiniliste omaduste kohta. Üldjoontes sattus kiriku põlu alla kristlike instrumentide kasutamine mitteametlikes ehk vernakulaarsetes rituaalides. ‘Vormitud kive’ kui loomulikke amulette aktsepteeriti, nende toimesse usuti ning seetõttu kasutati neid nii ilmalikes kui religioossetes kontekstides. Sellest annavad tunnistust ka piksenoole-leiud Eesti linnades, eriti Tartu kesk- ja uusaegsetes kihtides.

Uusaja kandev protsess oli ‘vormitud kivides’ fossiilide ja kiviesemete äratundmine, mis jõudis lõpule 17.–18. sajandiks, ent lihtrahva jaoks ei muutunud siis veel palju. Kinnitust ravi- ja kaitsemaagiliste kivide kasutamisele leiab 19. sajandi lõpul ja 20. sajandi algu üles kirjutatud rahvapärimusest ja etnograafilisest materjalist.

Kuigi tänapäeval ei kasutata kaitsemaagias fossiile ega piksenooli, muutub poolväärikivide kasutamine järjest populaarsemaks. Ehk võib siingi jälgida sarnasusi minevikuga – elamist maagilises universumis koos kontraintuitiivsete ideedega, mille kohaselt on elututel asjadel tahtlik toimijalisus. Maagilise maailmapildi terviklikkus on samas kindlasti muutunud, sest me ei vaja enam maagilist kausaalsust maailma seletamiseks. Hanegraaffi (2003) järgi elas maagia üle moderniseerumise ja teaduse arenguga kaasnenud võlujõu kadumise (ingl. k. *disenchantment*) perioodi. Minu jaoks tähendab see, et kuigi me ei kasuta maagiat nähtuste seletamisel, on meil siiski maagiat vaja tegelikkusega toime tulekuks ning oma saatuse kontrollimiseks. Ja see viimane on ilmselt universaalne tung.

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Abbreviations

AI	Archaeological Research Collection of Tallinn University
AM	Estonian History Museum
Bo	Collection of Martin Bolz, Pärnu Museum
E	Folklore collection of Matthias Johannn Eisen, Estonian Literary Museum
ERA	Collections of the Estonian Folklore Archives, Estonian Literary Museum
ERM	Estonian National Museum
H	Folklore collection of Jakob Hurt, Estonian Literary Museum
HKM	Hiiumaa Museum
HM	Foundation of Haapsalu and Läänemaa Museums
PäM	Pärnu Museum
RKM	Collection of the State Literary Mseum of the Estonian Academy of Sciences (at present the Estonian Literary Museum)
RM	Foundation of Virumaa Museums
SM	Saaremaa Museum
TLM	Tallinn City Museum
TM	Tartu City Museum
TÜ	Archaeological Collections of the University of Tartu
VM	Viljandi Museum

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APPENDICES

Table 1. Fossils gathered from archaeological sites in Estonia

Site name	Site type	Site's date	Cat. No.	Sum	Bio-morphic limestone	Bi-valvia	Brachi opoda	Bryozoa	Cephalo-poda	Cyclo-crinites	Echino-dermata	Gastro-poda	Rugosa	Tabu-lata	Uniden-tifed coral	Pori-fera	Stroma topora	Trilo-bita	Uniden-tified
1 Aakre tarand-grave	burial site	RIA	TÜ 2410	85	11 (48, 208,285, 333,335, 414,446, 447,617, 749,861)		6 (115b, 663, 854, 858, 864, 869)	5 (71,185, 271,858, 437a)	1 (579)	1 (820)	5 (95,126, 212,705, 890)		18 (90, 272,426, 436(2), 437,532, 699,776, 858(2), 888,898, 917,919, 919a,929, 1004)	21 (72, 85,91a, 231,297, 402, 402a, 429a, 436(2), 437,444, 466,468, 474,574, 584,588, 621,858, 863)	7 (49,60, 224,229, 414a,846, 908)		2 (72a, 103)		8 (130, 228, 295, 325, 331, 429, 706, 712)
2 Ardla	stray find		AI 2643	1				1 (41)											
3 Asva	fortified settlement	LBA; PRIA; MiP; PViA	AI 3307; 4366; 7065	8				1 (7065: 2437)			7 (3307: 79; 4366: 911,1212; 7065: 1119, 1121, 2399, 2438)								
4 Handimiku	settlement	LIA; MA	TÜ 1490	1				1 (31)											
5 Ihaste	settlement	Meso	TÜ 640; 2776	8	1 (2677: 355)						2 (640: 215; 2677: 1833)	1 (2677: 1801)	1 (2677: 1828)	1 (2677: 1865)	2 (2677: 423,1831)				
6 Ilpla sone grave	burial site	ViA	AI K 1	1							1 (190)								
7 Iru	hillfort	LBA-ViA	AI 3428	1								1 (1040a)							
8 Iru	settlement	PViA, ViA, LIA	AI 33429	3							1 (211)	2 (267, 926)							
9 Jaagupi tarand-grave	burial site	RiA	AI 3236	1							1 (118)								
10 Jägala Jõesuu	hillfort/settlement site	Ne, IA	AI 2495; TÜ 1444	16					7 (2495: 20,25(2), 30(2); 1444:572, 600)		1 (1444: 1063)	6 (2495: 25,30; 1444:93, 435,611, 614)							2 (1444: 476, 623)
11 Kobratu	burial site	RIA-LIA	AI 3357	1									1 (31)						

Site name	Site type	Site's date	Cat. No.	Sum	Bio-morphic limestone	Bi-valvia	Brachi opoda	Bryozoa	Cephalo-poda	Cyclo-crinites	Echino-dermata	Gastro-poda	Rugosa	Tabu-lata	Uniden-tifed coral	Pori-fera	Stroma topora	Trilo-bita	Uniden-tified
12 Koila	hillfort	PRIA-MA	AI 4034	1														1 (67)	
13 Kukruse	burial site	LIA	TÜ 1777	7				1 (3784)			5 (1167, 1353(2), 2110(2))	1 (2103)							
14 Kuldre	settlement	MA	TÜ 2254	1									1 (58)						
15 Kunda Lammasmägi	settlement	Meso-Neo	TÜ 2268	1								1 (736)							
16 Kuude	burial site	ViA	AI 2524	1				1 (48)											
17 Kõnnu	settlement	Neo	AI 4951	5							5								
18 Kõpu VIII	settlement	Meso	AI 6021	2				1 (145)			1 (145)								
19 Käku	burial site	RIA	AI 3995	5				1 (282)			4 (178, 194,275, 321)								
20 Lehmja	settlement	MA	AI 5310	1				1 (1912)											
21 Lepakose	settlement	Meso	TÜ 352	1									1						
22 Lepna Katkuauk	burial site	MiP	SM 10372	1							1 (489)								
23 Lõhavere	hillfort	LIA	AI 4297	1								1 (224)							
24 St. Mary's churchyard	burial site	MA	TM A 35	1						1 (544)									
25 Madi stone grave	burial site	LIA	AI 2590	8			2	1					3	1					1
26 Mustivere	settlement	PRIA, ViA, LIA, MA	AI 3993	3							1 (209)				1 (683)			1 (204)	
27 Mäksa II	settlement	MA	TÜ 78	1					1										
28 Mäksa	burial site	MA	AI 5765	1							1 (82)								
29 Naakamäe	settlement	Neo	AI 4211	1							1 (1099)								
30 Narva-Jõesuu IIb	settlement /burial site	Neo	TÜ 2190	4	3 (824, 931,2351)						1 (932)								
31 Nenu	stray find		AI 2643	1				1 (40)											
32 Oru Mikkuri stine grave	burial site	PRIA, RIA	AI 2430	1								1 (28)							
33 Pedajasaare	settlement	Neo, LIA, MA, MP	AI 6339	1	1 (8378)														
34 Pedja	settlement	Stone Age	AI 2467	1	1 (5)														
35 Peipsi	stray find		AI 2524	1										1 (51)					
36 Pikasilla Vooremägi	settlement /hillfort	Neo/MA	TÜ 1772	2									1 (282)	1 (230)					

Site name	Site type	Site's date	Cat. No.	Sum	Bio-morphic limestone	Bi-valvia	Brachi opoda	Bryozoa	Cephalo-poda	Cyclo-crinites	Echino-dermata	Gastro-poda	Rugosa	Tabu-lata	Uniden-tifed coral	Pori-fera	Stroma topora	Trilo-bita	Uniden-tified
37 Pirita klooster	monas-tery	MA	TLM A 1	1								1 (267)							
38 Pirmastu village cemetery	burial site	MA	VM 8873	1														1	
39 Pärnamäe	stray find		TLM A 14	1					1										
40 Pärnu	town, stray find	MA		1					2										
41 Raatvere Burial Hill	burial site	ViA, LIA	AI 5295	1							1 (98)								
42 Rae I stone-cist grave	burial site	LBA	AM A 361	1					1 (47)										
43 Ranna-mõisa III tarand-grave	burial site	PRIA	AI 2494	36					35 (77)			1 (77)							
44 Ridala	fortified settlement	LBA	AI 4329	1				1 (224)											
45 Rõuge	hillfort	PViA, ViA	AI 4040	1				1 (1005)											
46 Saha Chapel Hill	burial site	LIA, MA, MP	AI 3536, AI 6913	2					1 (3536:12; 6913:27)				1 (3536:11)						
47 Siksali	burial site	MA	AI 5101	2									1 (659)	1 (5)					
48 Soontagana	hillfort	LIA	AI 2766	3							3 (2766: 503,509; 2767: 1162)								
49 Tallinn/ Härjapea settlement	settlement	PRIA-MP	AI 6004	2					2 (I 186, I 262)										
50 Tallinn/ Kivisilla suburb	settlement	MA, EMA, MP	AI 7032	5					2 (513/36, 1101/6)		1 (2192)	2 (98/2, 1594)							
51 Tallinn/ Old Town	settlement	MA, MP	AI 6648	1					1										
52 Tallinn/ Small Coastal Gate	bastion	MP	AI 6958	1					1 (99)										
53 Tallinn/ St. Barbara's	burial site	MA	AI 5777	5					4 (87, 1154,116 2,500)			1 (926)							
54 Tartu	hillfort	LIA, MA	TM A 15, A 16	3					2 (A 15:1000, 1204)			1 (A 16:563)							

Site name	Site type	Site's date	Cat. No.	Sum	Bio-morphic limestone	Bi-valvia	Brachi opoda	Bryozoa	Cephalo-poda	Cyclo-crinites	Echino-dermata	Gastro-poda	Rugosa	Tabu-lata	Uniden-tifed coral	Pori-fera	Stroma topora	Trilo-bita	Uniden-tified
55 Tartu	settlement	LIA, MA	TM A 36, TM A 42, TM A 50, TM A 124	6	1 (A 36:5994)			1 (A50:98)	3 (A36: 5484, 7245; A42:591)							1 (TM A124: 1324)			
56 Tõnija Tuulingumäe tarand-grave	burial site	PRIA, RIA	SM 10173	2							1 (823)	1 (1094)							
57 Vaarkali	settlement	LIA, MA, MP	AI 6232	1		1 (7857)													
58 Vaibla	stray find		TÜ 434	1												1 (7)			
59 Vaida	settlement	MA	AI 6248	24 (106, 120,121, 200,213 (2),216 (4),226, 228,236, 238,246, 248,259, 264,285, 291,294, 303,313)				8		8	8								
60 Valjala	hillfort	LIA	AI 4300	2							2 (113, 341)								
61 Viimsi I tarand-grave	burial-site	RIA	AI 5914	1								1 (105)							
62 Väike-Rõsna I	settlement site	Stone Age (?), MA, MP	AI 6251	1						1 (2)									
Total				285	16	1	8	26	65	11	54	22	28	26	10	2	2	3	11

Abbreviations: **Meso** - Mesolithic (9000-4200 BC); **Neo** - Neolithic (4200-1800 BC); **LN** - Late Neolithic (2800-1800 BC); **EBA** Early Bronze Age (1800-1100 BC); **LBA** - Late Bronze Age (1100-500 BC); **IA** Iron Age (500 BC-1250 AD); **PRIA** - Pre-Roman Iron Age (500 BC-50 AD); **RIA** - Roman Iron Age (50-450); **MiP** - Migration period (450-550); **PViA** - Pre-Viking Age (550-800); **ViA** - Viking Age (800-1050); **LIA** - Late Iron Age (1050-1250); **MA** - Middle Ages (1250-1558); **MP** - Modern Period (1558-1918)

Table 2. Pebbles gathered from archaeological sites in Estonia

No	Site name	Site type	Site date	Cat. No.	Sum	Ammunition stones	Curing stones	Grain grinding stones	Hammer-stones	Playing pebbles	Polishers/ grinders/ smoothers	Potboilers/hearth stones	Whet-stones	Other
1	Aiamaa	settlement	LIA[28], MA	TÜ 159	1		1 (7)			1 (7)				
2	Aindu	settlement	LIA	TÜ 71, TÜ 113	6		1 (113:120)	1 (71:16)				5 (71:16,107, 264,724; 113:120)	1 (113:145)	
3	Akali	settlement	Meso-EBA	AI 3800, AI 4013	37		17 (4013:3034*, 3400*,4119, 4529*,4980, 5880*,5931, 6269*,6967*, 7082,7130,7136, 7159,7253,7318*, 7508,7529)	3 (3800:392; 4013:8819, 9593)	8 (3800:385; 4013:4335, 5794,5973, 6330,6909, 7619,9103)	20 (4013:3034,3400, 4119,4529,4980,5931, 6269,6873,6940,6967, 7082,7130,7136,7159, 7253,7318,7508,7529, 7821,8397)		5 (3800:392; 4013:2516,3864, 4335,5973)	5 (3800:413; 4013:3099, 5973,6330, 7253)	
4	Ala-Pika	settlement	ViA	TÜ 271, TÜ 318, TÜ 319	9		6 (271:5*,6*; 318:23,147*, 265*; 319:625*)	1 (319:623)	3 (271:10; 319:23*,624*)			2 (319:623-624)		
5	Asva	fortified settlement	LBA, PRIA, PViA	AI 3658, AI 3799, AI 4012, AI 4366	43	6 (3799:436(6))	24 (3658:116, 146*,219,228,236 ,556,602(2)*; 3799:131,226, 233,376,421; 4012:25;4366: 295,489*,775*, 1120*,1126, 1527*,1635(2); 7065:1095,2358)	4 (3658:135, 600;4012:27; 4366:1124)	6 (4366:1635;7065:2359)	4 (4366:162,1062*; 7065:1095,2358)	9 (3658:602(2),4366: 489,775,1062,1120, 1184*,1527,1635)	9 (3658:589; 3799:436(6), 4012:25;4366: 295)	6 (3658:155; 3799:233, 428;4012: 27;4366: 1062,1184)	1 (3658: 116, bead?)
6	Dominican monastery	monastery	MA	TLM A 39	3					3 (82-91)				
7	Ehmja stone grave	burial site	MiP-LIA	AM A 554	1			1 (726)						
8	Haimre	burial site	LIA	AI 3709	4	1 (35)		3 (4,35,51)				2 (2,35)		
9	Iru	hillfort	MiP, PViA, ViA	AI 3428, AI 4117, AI 4051, AI 4154	25		9 (3428: 1039b(2)*,4051: 240,1225,1336; 4154:1,50*,98, 125*)	4 (3428:981; 4117:83,129; 4154:163)	1 (3428:946)	7 (3428:764;4051:362, 553,678,1225,1336; 4154:1)	7 (3428:825*, 1039b(2), 4154:15*, 50,98,125)	1 (3428:981)	7 (3428: 825,946, 1069), 4051:672, 849,1239; 4154:34)	

[28] Abbreviations as in Table 1.
* microscopically analysed pebbles

No	Site name	Site type	Site date	Cat. No.	Sum	Ammunition stones	Curing stones	Grain grinding stones	Hammer-stones	Playing pebbles	Polishers/ grinders/ smoothers	Potboilers/hearth stones	Whet-stones	Other
10	Iru	settlement	PViA, ViA, LIA	AI 3429, AI 4942	10		1 (3429:859)	1 (3429:859)		2 (3429:773,859)	1 (3429:892*)	1 (3429:893)	4 (3429: 133,893; 4942:42, 268)	2 (3429: 402, mould; 4942:212, bead)
11	Jõelähtme	settlement	MiP	AI 6302; AI 6867	2		1 (6302:41)			2 (6302:41;6867:88)			1 (6867:88)	
12	Jõuga	burial site	LIA	AI 4800, AI 5100	5			3 (4800:72, 501,502)		1 (5100:679)		1 (4800:502)		
13	Jägala Jõesuu	hillfort	Neo, IA	TÜ 1444	11		1 (694*)	1 (568)		3 (324(2),694)		6 (688(2), 726(3),1038)	1 (685)	
14	Jägala Jõesuu IV	settlement	IA	TÜ 2303	2		1 (3)		1 (436)	1 (3)			1 (436)	
15	Jägala Jõesuu V	settlement	Neo	TÜ 1972	2					1 (215,2526)			1 (215)	
16	Kaarlijärve	settlement	MA	TÜ 300, TÜ 351	2		2 (300:23; 351:6/16)			1 (351:6/16)				
17	Kaseküla	burial site	PRIA	AM A 476	2		1 (32)	1 (25)					1 (32)	
18	Keila	castle	MA, MP	HMK 2270, HMK 3013	2		1 (2270:153)						1 (3013: A265)	
19	Keldrimäe	settlement	MA	AI 5221	1		1 (134)							
20	Keskvere III	burial site	ViA	AM A 996	1							1 (18)		
21	Kiislova	settlement	MA	TÜ 46	1							1 (7)		
22	Kirumpää	settlement	MA	TÜ 99	1		1 (11)			1 (11)				
23	Kivimägi	settlement	LIA	VM 10742	1								1 (649)	
24	Kivisaare	settlement	Meso-Neo	AI 2334; TÜ 1113	2		1 (AI 2334:1)		1 (TÜ 1113: 2609)					
25	Kobratu	burial site	ViA	AI 3357	2			2 (298,303)						
26	Kohtla-Järve (Kangro stone grave)	burial site	RIA	AI 3982	2			2 (58,197)						
27	Kohtla-Järve Reinbergi *tarand*-grave	burial site	RIA, MP	AI 3975	2		1	1 (792)						

No	Site name	Site type	Site date	Cat. No.	Sum	Ammuni-tion stones	Curing stones	Grain grinding stones	Hammer-stones	Playing pebbles	Polishers/ grinders/ smoothers	Potboilers/hearth stones	Whet-stones	Other
28	Koila	hillfort	PRIA-MA	AI 4009, AI 4034	3			1 (4034:1)				1 (4034:107)	1 (4009:1)	
29	Koorküla Valgjärv	settle-ment	IA	AI 4197	1								1	
30	Kroodi	settle-ment	Meso	AI 3500	2								1 (40)	1 (5, bead?)
31	Kudruküla	settle-ment	Meso	TÜ 1876	5							5 (729-734)		
32	Kunda Hiiemäe *tarand*-grave	burial site	PRIA	TÜ 1325	1								1 (28)	
33	Kunda Lammasmägi	settle-ment	Meso-Neo	AI 3359, AI 3410, AI 4011, AI 4284	8		2 (3359:330, 4284:270*)		1 (3359:330)				3 (3410: 359;4011: 289;4284: 421)	3 (3359:56; 3410:355, 966 beads?)
34	Kuremäe	burial site	LIA	GIM 21028	1		1							
35	Kuusalu I	settle-ment	LIA	AI 5099	5		1 (212*, 448)		1 (309)	1 (448)		1 (421)		1 (382, bead?)
36	Kuusalu III	settle-ment	LIA	AI 5043	4		1 (608)	2 (585,594)	3 (585,594, 618)					
37	Kõnnu	settle-ment	Meso	AI 4951, SM 9621 A 1151	5		1 (4951:35)	1 (4951:44)	1 (4951:57)	1 (4951:35, SM A1151:86)		1 (4951:57)	2 (4951:44, 56)	
38	Kõpu I	settle-ment	Meso, Neo	AI 5150, AI 6007	8	3 (5150: 76/1*, 76/2*,79)		1 (5150:76/2)				7 (5150:11, 76/1,76/2,76/3, 76/4,79; 6007:41)		1(5150:80, artefact frgm.)
39	Kõpu XI	settle-ment	Neo	AI 6106	1								1 (497)	
40	Kääpa	settle-ment	LIA, MA	AI 4992	1		1 (54)							1 (54 (mould))
41	Külitse	settle-ment	MA	TÜ 237	1					1 (11)				
42	Lahepera	burial site	ViA, LIA	AI 4978	1		1 (28)			1 (28)				
43	Laukna Korvi stone grave	burial site	LIA	AI 3789	2								1 (514)	1 (406 (bead))
44	Lihula	settle-ment	MA, MP	AM A 585	1		1 (218)						1 (218)	1 (buil-ding offering?)

No	Site name	Site type	Site date	Cat. No.	Sum	Ammuni-tion stones	Curing stones	Grain grinding stones	Hammer-stones	Playing pebbles	Polishers/ grinders/ smoothers	Potboilers/hearth stones	Whet-stones	Other
45	Linnaaluste II	settle-ment	ViA, LIA, MA	TÜ 1260	1								1 (35)	
46	Linnaaluste III	settle-ment	ViA	TÜ 1114	1							1 (175)		
47	Loona	settle-ment and burial site	Neo, IA, MA	AI 4129	3		2 (212,830)	1 (900)				1 (900)		
48	Lõhavere	hillfort	LIA	AI 3578; 4133; 4297	22	7 (4133: 1424,2104, 2174,3558, 3591,3693; 4297:576)	16 (3578:1139; 4133:1424,1798, 2104,2158,2662*, 2742,2779,2846, 3222,3558,3759; 4297:134,428, 576,1250)		2 (3578:1139; 4297:576)	9 (4133:1798,2104, 2174,2742,2779,3222, 3558;4297:134,428	2 (4133:2662,2846)	8 (4133:1424, 2104,2174,2183, 3558,3591,3693; 4297:576)	1 (4297: 1250)	2 (4133: 3759;4297:1250 (loom-weigths/netsinkers)
49	Lüganuse	settle-ment	MA		2								2	
50	Maidla	stone grave	IA	AM A 1105	1		1					1		
51	Mustivere	settle-ment	PViA, ViA, LIA, MA	AI 3993	10	1 (427)	7 (427,609,619 ,622,680,976/ 1,1531)			3 (622,976,1531)		2 (427,613)	1 (613)	4 (609 (mould); 964,976/2 (beads);1531 sinker)
52	Viljandi/Musumägi	settle-ment	LIA	VM 10952	1		1 (728*)							
53	Muuksi Sepa (no 70)	burial site	BA	AI 3583: 100	5			2 (110,120)	1 (37)				2 (85,100)	1 (100 (firestrik-ing stone)
54	Narva Joaorg	settle-ment	Meso-LIA	AI 4101	12	1 (84)	4 (10(2)*,83/3*, 83/4*)	2 (84(2))		2 (83/1*,83/2*)	2 (10(2))	2 (84(2))	1 (61)	1 (61 figure)
55	Narva-Jõesuu I	settle-ment	Neo	TÜ 1786	3		2 (796*,813*)						1 (881)	
56	Narva-Jõesuu IIa	settle-ment	Meso, Neo	TÜ 1841	3		3 (110,154*, 188*)				2 (110,188)			
57	Narva-Jõesuu IIb	settle-ment	Meso, Neo	TÜ 2190, TÜ 2610	15		7 (2190:301*, 659*,701,1310, C20;2610:670, 1286)		1 (2190:621)	4 (2190:301,659,701, 1310)	1 (2190:1321)	3 (2190:621, 623,683)	4 (2190: 585,1103, 3072;2610: 578)	
58	Nehatu	burial site	PRIA	AI 3430	1								1 (66)	

No	Site name	Site type	Site date	Cat. No.	Sum	Ammuni-tion stones	Curing stones	Grain grinding stones	Hammer-stones	Playing pebbles	Polishers/ grinders/ smoothers	Potboilers/hearth stones	Whet-stones	Other
60	Otepää	hillfort	ViA-MA	AI 3578; AI 4036	3	1 (4036:II 248*)		2 (3578:779, 1086)				1 (3578:779)		
61	Paatsa	hillfort	LIA, MA	AI 4337	4	1 (309)	1 (161)	1 (305,309)		3 (161,309,310)		1 (309)	2 (305, 310)	
62	Pada I	settle-ment	PViA, ViA	AI 5082	6	1 (234)		2 (229,648)	1 (217)	1 (234)		1 (217)	2 (212*, 827)	
63	Pada Kohina	settle-ment	PViA, ViA	AI 4961	2		1 (26)	1 (54)						
64	Pada hillfort I	hillfort	PViA-LIA	AI 5249	1		1 (3)							1 (3 (weight))
65	Pada inhumation cemetery	burial site	LIA	AI 5366	3			1 (16)					2 (20,21)	
66	Paistevälja	stray find		TÜ 941	1	1 (2)		1 (2)						
67	Pajulinn	hillfort	LIA	AI 3427	6							6 (10,98,99, 154,164,165)		
68	Pedäjäsaare	settle-ment	Neo, LIA, MA, MP	AI 6339	1		1 (9276)							
69	Peedu Kerikmägi	hillfort	MiP, PViA, ViA	AI 3452	4		1 (62)	4 (62,309, 361,551)		1 (62)				
70	Pihla stonecist grave	burial site	PRIA	AI 3909	1								1 (23)	
71	Popovitsa	settle-ment	MA	AI 6819	5					5				
72	Proosa stone grave	burial site	MiP, PViA	TLM A 79	1								1 (215)	
73	Pulli	settle-ment	Meso	AI 4476	9		8 (122*,157*, 195,570*,676, 730,1179,1180)			1 (195,731)	2 (122,157,570)	1 (730)		
74	Pällamõisa Sutu	settle-ment	ViA, LIA, MP	AI 6711	1							1 (53)		
75	Raatvere Kalmemägi	burial site	ViA, LIA	AI 5295	1		1 (98*)			1 (98)				
76	Randvere	burial site	PRIA	AI 3894	3			2 (1,33)				1 (33)	1 (4)	
77	Rebala	settle-ment	ViA	AI 5916	1						1 (110*)			

No	Site name	Site type	Site date	Cat. No.	Sum	Ammunition stones	Curing stones	Grain grinding stones	Hammer-stones	Playing pebbles	Polishers/ grinders/ smoothers	Potboilers/hearth stones	Whet-stones	Other
78	Rebasemõisa	hillfort	ViA	TÜ 1865	3		1 (316*)	1 (233)	1 (233)	2 (72,233)	1 (233)			
79	Riigiküla II	settle-ment	Meso	TÜ 1507	2		2 (110a*,110b*)			2 (110a,110b)				
80	Riigiküla VI	settle-ment	Meso	1688:210	2				1 (205)	1 (210)				
81	Riigiküla XIV	settle-ment	Neo	NLM 2181	1								1 (1186)	
82	Rõuge	hillfort	PViA, ViA	AI 4040	15		4 (234,2308(3))	2 (756,4912)		8 (234,2308(2),3103, 4139,4479(2))		7 (2308(7))	2 (2308(1), 4660)	
83	Rõuge	settle-ment	IA	AI 4100	7		3 (859,1021, 6808)	4 (5710,5738, 6808,7663)		2 (859,1021)		4 (1021,5738, 7213,7663)		
84	Saha	settle-ment	PViA	AI 5294	1		1 (1)						1 (1)	
85	Salu	hoard/ settle-ment	LIA	AI 6717	1					1 (17)				
86	Sammaste (Taru) *tarand*-grave	burial site	RIA, ViA	AI 5793	1		1 (145)							
87	Sargvere	settle-ment	MA, MP	TÜ 1574	1		1 (121)							121 (net-sinker?)
88	Siimusaare	settle-ment	Meso, Neo	VM 9305	1			1 (737)	1 (737)					
89	Siksali	cemetery	LIA, MA	AI 5101	1		1 (CLXXVI:1)							1 (CLXXVI: 1 weight?; CCXIa:1 gastro-lites?)
90	Sindi-Lodja I	settle-ment	Meso	PäMu 15360 A 2553	2		1 (61)	1 (75)	1 (75)					
91	Sinialliku	hillfort	LIA	AI 4407	1		1 (58*)			1 (58)		1 (58)		
92	Soodevahe	settle-ment	Neo, IA	TÜ 2536	1		1 (740*)							
93	Sope	burial site	Neo	AI 3175	41		41							

No	Site name	Site type	Site date	Cat. No.	Sum	Ammuni-tion stones	Curing stones	Grain grinding stones	Hammer-stones	Playing pebbles	Polishers/ grinders/ smoothers	Potboilers/hearth stones	Whet-stones	Other
94	Tallinn Old Town	settle-ment	MA, MP	AI 4061, AI 6226, AI 6332, AI 6452, AI 6426, AI 6699, TLM A 2, TLM A28	13		6 (AI 6699:11/162; 6426:90-91; TLM A28: 47-48;A2:46	3 (AI 4061: 3094,4050; 6332:1100)		12 (AI 66999:11/162; 6452:4; 6426:90-91; 4061:3094,4050; 6332:1423; 6226:19,29; TLM A2:46; A28:47-48)				
95	Tallinn/ Kalamaja	settle-ment	MA, MP	AI 6442, AI 6894, AI 6965	4		2 (6894;6965:68)			4 (6442:11,20;6894; 6965:68)				
96	Tallinn/ Kivisilla	settle-ment	MA, MP	AI 6456	2		2 (63;72)			1 (72)				
97	Tallinn/ Pleekmäe/ Härjapea	settle-ment	MA, MP	AI 5937, AI 6004, AI 6790, AI 6953	13		9 (AI 5937: II 44,II 544*, II 593*,II 945*, II 1045;6004: III126; 6790; 6953 (2))			8 (6004:I 403,I 622, I 433*; II 90; III 126*;6790; 6953(2)				
98	Tallinn/ Roosikrantsi	settle-ment	MA, MP	AI 6109	1									1 (II/2 fire-striking stone)
99	Tallinn/St. Barbara's	burial site	MA, MP	AI 6415	3		3 (186,258*,673)			2 (258,673)				
59	Tallinn/St. Nicholas' church	church	MA, MP	TLM 17409 A 124	3		3 (124,564,567)			3 (124,564,567)				
100	Tallinn/ Tõnismäe	settle-ment	LIA, MA, MP	AI 6793, AI 6971	2		2 (6793:1; 6971:22)			2 (6793:1;6971:22)				
101	Tamula I	settle-ment and burial site	Meso	AI 3932, AI 3960	11		10 (3932:330; 3960:272*,273*, 283,284,384-388)			1 (3960:283)			1 (3960:241)	
102	Tamula II	settl-ement	Meso, LIA	AI 6470	1								1 (10)	
103	Tansi-Jaani (stone graves no 2,3,4)	burial site	RIA	AI 3898, AI 3899, AI 3900	9		1 (3900:42*)	4 (3898:7,12; 3899:49,68)	1 (3899:58)			5 (3898:7, 3899:40,58,68, 74)	1 (3899:6)	
104	Tarbja Kalamehe	burial site	RIA	Pd 848; 932	1			1 (499)						

No	Site name	Site type	Site date	Cat. No.	Sum	Ammuni-tion stones	Curing stones	Grain grinding stones	Hammer-stones	Playing pebbles	Polishers/ grinders/ smoothers	Potboilers/hearth stones	Whet-stones	Other
105	Tartu	hillfort	IA, MA	TM A 15, TM A 16, TM A 17	11		1 (A17:127)			3 (A16:306;A17:9,127)		4 (A15:II24,847; A16:282(2))	4 (A15: 886,1075; A16:44, 306)	1 (A15: II534 artefact frgm)
106	Tartu	settle-ment	IA, MA, MP	TM A 36; A 40; A 42	10	1 (A40: 1164)	5 (A36:161,533, 2111; A40: 680,1532)			4 (A40:1532;A42:291; A36:161,533)		3 (A40:697, 1164,4006)	1 (A42: 2042)	
107	Tartu/St. John's	church	MA, MP	TM A 47	9		4 (A47:65, 381(3))			4 (A47:74,381(3))			3 (A19: 105/2;A47: 385,386)	1 (A47: 402 artefact frgm)
108	Tartu/St. Mary's cemetery	burial site	MA	TM A 35	1		1 (544)			1 (544)				
109	Teilma	settle-ment	MA	TÜ 243	1					1 (4)				
110	Tilleoru Kantsimägi	hillfort	ViA, LIA	TÜ 1431	1					1 (59)			1 (59)	
111	Toodsi Liidva	settle-ment	Meso, Neo, IA	TÜ 1868	1		1 (52*)							
112	Tornimäe	settle-ment	ViA	AI 4338	1		1 (67)			1 (67)				
113	Uue-Kastre	hillfort	MA, MP	TÜ 1014	1	1 (58)								
114	Uugla	settle-ment	Neo, BA, LIA	AM A 1026	1		1 (20)			1 (20)		1 (20)	1 (20)	
115	Uugla I	burial site	LIA	AM A 500	1		1 (401)			1 (401)				1 (401 mould?)
116	Uugla III	burial site	LIA	AM A 1068	1		1 (48)			1 (48)				
117	Uugla stone setting	burial site	IA	AM A 501	1							1 (14)	1 (14)	
118	Uusvada	settle-ment	LIA	TÜ 116	4		3 (352*,353*, 1130*)	1 (300)	1 (300)					
119	Valjala	hillfort	LIA	AI 4300	6		3 (289,304*, 305*)			3 (414,749,780)		1 (289)		
120	Valma	settle-ment	Meso, Neo	AI 4022	6		4 (3513,3526, 3530,4584*)						3 (3530, 5549)	1 (2968 bead?)
121	Varbola Metsavare	field cairn	IA	AI 5083	1		1 (2)					1 (2)		
122	Vasla	settle-ment	MA	TÜ 203	1		1 (81*)			1 (81)				

No	Site name	Site type	Site date	Cat. No.	Sum	Ammuni-tion stones	Curing stones	Grain grinding stones	Hammer-stones	Playing pebbles	Polishers/ grinders/ smoothers	Potboilers/hearth stones	Whet-stones	Other
123	Viljandi	castle	MA	VM 10797	1		1 (134)							
124	Viljandi/ Pähklimägi/ Suusa-hüppemägi	settle-ment	LIA	VM 10847, VM 10740, VM 10741, VM 10877, VM 11083	6		5 (10847:984, 1251;10740:64; 10877:1135*; 11083:319*)			2 (10740:64*; 11083:319)		2 (10847:1251; 10741:272)	1 (11083: 319	
125	Viljandi/ Pikk 4	settle-ment	MA, MP		2		2 (2,3)							
126	Virunuka IV	burial site	RIA	AI 4262	1	1 (179)	1 (179)		1 (179)			1 (179)		
127	Võhma stone-cist grave	burial site	LBA, PRIA	AI 5751	2							2 (207,221)		
128	Võhma I	settle-ment	Meso, Neo	TÜ 600	1		1 (57)		1 (57)			1 (57)		1 (57 raw material)
129	Võllamägi	exe-cution place	MP	AI 6011	1		1 (132)			1 (132)				
130	Võmmorski	settle-ment	LIA	TÜ 202	1		1 (81)			1 (81)				
131	Väike-Rõsna	settle-ment	MA	TÜ 190	2		1*			1 (5)				
132	Värska I	settle-ment	MA	TÜ 191	1								1 (9)	
133	Ülpre *tarand*-grave	burial site	RIA	AI 3910	3			3 (5,15,17)						
Total					**587**	**26**	**273**	**73**	**39**	**156**	**19**	**108**	**87**	**30**

Table 3. The archaeological and folkloric reused stone artefacts

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
Harju County									
1	Lagedi settlement site	archaeological	AI 4420	edge fragment of a sharp-butted stone axe	The axe was collected as a stray find, appr. 20 m from the O-shore of Pirita River, from the farmstead of Ristimäe, Lagedi site.	LN[29]	LIA/MA	Lang 1996,380; 210; AI catalogue	
2	Lagedi settlement site	archaeological	AM A 496	stone adze	The adze was found as a stray find by the Pirita River, Lagedi site.		LIA/MA	Lang 1996, 210; AM catalogue	Not available
3	Lehmja-Loo III settlement site	archaeological	AI 7027	shaft-hole stone axe; a large piece has been struck from the butt; cutting edge is quite undamaged	The stone axe was found as a stray find during field survey; later the area yielded pottery sherds and a grain grinding stone.	LN/EBA	MA	AI catalogue	
4	Lähtse Chapel Hill; village cemetery	archaeological	AI 4761:3	stone adze, the cutting edge has been quite damaged, otherwise intact		LN	MA	Lang 1996, 389	

[29] The abbreviations of periods as in Table 1.

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
5	Proosa settlement site	archaeological	TLM A 93:226	butt fragment of a shaft-hole stone axe or an ard-point, dolomite, very asymmetrical, the hole not in the middle of the axe	The stone axe was found from the 1985 excavation, close to one of the small buildings which could have served as garners or granaries (Deemant 1993, 4)	LN/EBA/ PRIA?	MA	Deemant 1986, 399; Deemant 1993, 4; Vedru 1995, 22	
6	Liivalaia St. 22 [Tallinn]	archaeological	AM A 280	stone axe	The axe was found from a sandy soil in the yard of the Liivalaia plot 22, Iron Age and a medieval settlement site.	LN/EBA	IA/MA/MP	AM catalogue	Not available
7	Rutu St. [Tallinn]	archaeological	AM A 518	fragment of a stone axe	The axe fragment was found in 1977 from the soil in one of the gardens in Rutu Street, medieval Old Town.	LN/EBA	MA/MP	AM catalogue	Not available
8	Vana-Kalamaja St. [Tallinn]	archaeological	AM A 1	flint dagger, made of imported (Cretaceous Scandinavian) flint	The dagger was found in 1889 from a garden in Vana-Kalamaja Street, near the Old Town.	LN/EBA	MA/MP	AM catalogue	 Photo: Aivar Kriiska
9	St. Barbara's cemetery [Tallinn]	archaeological	AI 5777: 1192	oval fire-striking stone	The item was found from the infill between two burial layers. The infill had probably been relocated from a 14th – 15th century settlement site in Tõnismägi.	RIA-PViA	MA	Sokolovski 1886; Ševeljov 1996	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
10	Toom-Kooli St. 21 [Tallinn]	archaeological	TLM A 2: 1009	stone adze; heavy scrapings on its surfaces; butt part is very short and might have been filed or ground short	The adze was found during excavation.	LN	MA/MP	TLM catalogue	
Hiiu County									
11	Suurepsi settlement site	archaeological/ folkloric	HKM 512	stone shaft-hole axe of sharp-butted type, the surfaces are well-polished, a large piece has been struck from the butt	The axe was found between two stone graves (Lõugas 1972), in a place where later a medieval settlement site was located (Kriiska 1997, 5). The axe was used by the finder as a net-sinker; in the course of pulling the axe along the seabed the surfaces have become extremely polished (www.muis.ee, visited October 17, 2018).	LN	MA	Lõugas 1972; Kriiska 1997, 5; www.muis.ee	 Photo: muis.ee
Ida-Viru County									
12	Asmeri stone grave [Repniku village]	archaeological	AI 2744	butt fragment of a stone shaft-hole axe	The axe was found from a large pile of stones together with bones and a bronze double spiral finger-ring. The finger-ring suggests that the finds may be from a stone grave dated to the Late Roman Iron Age, Middle Iron Age, Pre-Viking or Viking Age.	LN/EBA	RIA/MiP/P ViA/ViA	AI catalogue	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
13	Iisaku	archaeological	AI 4354 [marked as lost]	stone shaft-hole axe	The axe was found from a knoll in the field full of pieces of logs and coal, abundant pottery and animal bones (Moora 1964). Possibly an old (19th century?) farmhouse?	LN/EBA	MP	Moora 1964	Not available
14	Jäbara B *tarand*-grave	archaeological	AI 3172: 360	flint adze of light-coloured imported flint (Scandinavian Cretaceous flint?)	The adze was found from sand, 11 cm beneath the lower stone and cultural layer. The sand was brownish (probably mixed) (Schmiedehelm 1934, 14).	LN	RIA	Schmiedehelm 1934	
15	Jäbara B *tarand*-grave	archaeological	AI 3172:821	flint adze of light-coloured imported flint (Scandinavian Cretaceous flint?); the edge part is unused, the butt is damaged	The adze was found 3 cm beneath the cultural layer from brownish sand, under the large limestone slab at the bottom of the cultural layer (Schmiedehelm 1935, 4).	LN	RIA	Schimedehelm 1935	
16	Kukruse settlement site	archaeological	TÜ 1814	butt fragment of a sharp-oval stone axe; the tip of the butt has been broken	The axe was found during field survey to the Kukruse settlement site.	LN	LIA	Jonuks *et al.* 2017	
17	Neero [Purtse-Aho village]	archaeological	AI 3341	Karlova-type stone shaft-hole axe, large pieces have been struck off the sides	The axe was found between old oven stones with coal; according to old people there had been a dwelling house 80 years before the axe was found and donated to the museum in 1935.	LN	MP(?)	Tapner 1935	Not available

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
18	Papikivik; stone grave?	archaeological	AI 3393	stone shaft-hole axe, of simple Külasema-type; intact, limited damage to the surfaces	The axe was found from a gravel pit in Papikivik (Schmiedehelm 1936). Papikivik is a stone setting, considering the grave-goods (weapons, jewellery) probably from the 2nd half of the Iron Age.	LN	ViA/LIA	AI catalogue; Schmiedehelm 1936	 Photo: Jaana Ratas
Jõgeva County									
19	Soolisaare [Nõmavere]	folkloric	Lost	stone adze	The adze was kept by the owner as a thunderbolt and not donated even for 19 rubles.	Neo	MP	Bolz 1914b, 55	Not available
Järva county									
20	Kaera [Tammeküla village]	folkloric	Lost	stone adze	The adze was valued as a thunderbolt and used against different diseases.	Neo	MP	Bolz 1914b, no 29	Not available
21	Kangru [Viisu village]	folkloric	Lost	stone shaft-hole axe	The axe was found under an apple tree that had been split by lightning, the axe was broken into pieces and the pieces were given to family members, because they could be used to cure illnesses. A fragment of the axe had reached the farmstead of Ahjupära in Suure-Jaani parish, but the owner did not sell the item to Bolz even for a big sum of money.	LN/EBA	MP	Bolz 1914b, 63	Not available
22	Kipaku [Tammeküla village]	folkloric	Lost	stone adze	The adze was valued as a thunderbolt and used against different diseases.	Neo	MP	Bolz 1914b, no 28	Not available
23	Meosi [Retla village]	folkloric	Lost	stone shaft-hole axe, a battle-axe	The axe has been found while ploughing and was used as a whetstone for 30 years.	LN/EBA	MP	Bolz 1914b, no 27; Allik & Markus 1923, 1	Not available
24	Roosna [Müüsleri village], a stone grave?	archaeological	AM A 334:1	butt fragment of a stone shaft-hole axe of sharp-butted type	The fragment was found from the field of the Roosna farmstead while removing a small stone cairn; human bones were found as well.	LN	PRIA-ViA	AM catalogue	Not available

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
Lääne County									
25	Ehmja stone grave	archaeological	AM A 554: 390	flint arrowhead, probably of local Silurian flint, carefully retouched, the tip of the tang is widening	The arrowhead was found inside the stone layer, above the burial pit 5. According to Mandel (2003, 36) the burial pits were opened already in the prehistory, looted and refilled. Both cremations and inhumations were present. The majority of burials are the 11th–12th century cremations, probably in this time the earlier pits were looted.	LN?	ViA/LIA	Mandel 2003, 30–37	
26	Ehmja	folkloric	AM A 130	oval fire-striking stone	The stone has been used to cure several illnesses.	PRIA-PViA	MP	AM catalogue	Not available
27	Kirimäe settlement site	archaeological	In private collection	stone shaft-hole axe	The axe was found directly east from the cultural layer of a heritage protected settlement site.	LN/EBA	LIA/MA	Mandel 2009a	Not available
28	Lihula castle, town	archaeological	AM A 583: 103	butt fragment of a stone shaft-hole axe; heavy use-wear on its surfaces	The axe was found during excavations from the cultural layer, outside a 13th–14th century building.	LN	MA	Mandel 1990; Mandel pers. comm., 5.9.2018	
29	Uugla III stone grave	archaeological	AM A 1068:84	leaf-shaped flint arrowhead, probably of local Silurian flint	The arrowhead was found while clearing the stone layer in the central part of the grave together with a bronze spiral and a pottery sherd.	Neo	LIA	Mandel 2008; Mandel 2009b	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
Lääne-Viru county									
30	Iila *tarand*-grave	archaeological	AI 3358:267	stone adze, its edge has been ground and a large piece has been struck from its side, a large piece is missing from the butt as well	The adze was found from loose soil in the southern part of the 3rd *tarand*. There were three burials in the grave, all in the 2nd *tarand,* one of which a secondary burial from the Late Iron Age; part of the *tarand*-walls had been destroyed with the secondary burial.	LN/EBA	PRIA/LIA	Schmiedehelm 1936; Mägi 1995	
31	Metsiku burial site	archaeological	Lost	Külasema-type stone shaft-hole axe	The axe was found appr. 1.1 km SE from the mansion of Metsiku manor, from the group of round cobbles, together with a burial. A chain was attached to the axe. The bottom of the grave was of flat stone slabs. Two more burials without grave goods were located appr. 600 m away.	LN	Undated	Grewingk 1887	Not available
32	Ojaveski *tarand*-grave [Hõbeda village]	archaeological	AM A 349: 568	a fragment of a ground stone tool, possibly an axe	The axe was found during excavations.	LN/EBA	RIA	AM catalogue	
33	Pada I settlement site	archaeological	AI 5082: 388	an edge fragment of a stone shaft-hole axe; a piece has been struck from the cutting edge, but otherwise with no damage; an incised groove on one side	The axe was found during excavations, from the cultural layer.	LN/EBA	LIA	AI catalogue	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
34	Pada I settlement site	archaeological	AI 5082: 606	stone adze or an edge fragment of a shaft-hole axe reworked into an adze	The adze was found during excavations, from the cultural layer.	Neo	LIA	AI catalogue	
35	Pada I settlement site	archaeological	AI 5082: 911	an edge fragment of a stone shaft-hole axe, probably of Külasema-type, perfectly ground and polished; its surface is cracked showing traces of having been in fire; a large flake has been struck from the cutting edge	The fragment of the axe was found during excavation, from sooty soil in a trench-like depression together with a whetstone and 36 pottery sherds.	LN(?)	LIA	AI catalogue	
36	Pada I settlement site	archaeological	AI 5082: 340	an edge fragment of a stone axe (?)	The adze was found during excavation, from the cultural layer.	Neo	LIA	AI catalogue	
37	Pada underground cemetery	archaeological	AI 5366: 64	a butt fragment of a stone shaft-hole axe	The axe was found from the ploughing layer.	LN/EBA	LIA	AI catalogue	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
38	Pihlaka settlement site [Kunda village]	archaeological	RM A 48	Külasema-type stone shaft-hole axe; intact, no visible damage	The axe was found as a stray find from the field of Pihlaka farmstead in Kunda village, 200 – 300 m N of an offering stone named Urikivi. Hand-moulded Roman Iron Age and medieval wheel-thrown potter were found during survey trip (TÜ 1272).	LN	RIA/MA	RM catalogue	 Photo: Tõnno Jonuks
39	Tatruse village cemetery	archaeological	Lost	stone shaft-hole axe	The axe was found from a sand knoll together with other artefacts: buttons, coins, bones that derive from the Swedish period (Eessaar 1937) [17th c.]. Possible village cemetery.	LN/EBA	MP	Eessaar 1937	Not available
40	Topi settlement site	archaeological	TÜ 2416:1	half of a stone shaft-hole axe	The axe was found as a stray find. The survey trip to the site yielded Late Iron Age and medieval pottery and quartz flakes (TÜ 2416).	LN/EBA	LIA/MA	Johanson 2015	
41	Ulvi II *tarand*-grave	archaeological	AM A 235:80 (destroyed)	stone axe		LN/EBA	RIA	AM catalogue	Not available
42	Vinni	folkloric	AI 3551	stone shaft-hole axe; heavily damaged surfaces, traces of severe striking in butt and edge area	The axe was found in the 1830s and given to the museum 100 years later. It was considered a thunderbolt and grindings to cure strike (in Estonian *rabandus*) were struck from it.	LN/EBA	MP	AI catalogue	 Photo: Jaana Ratas

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
43	Viru-Nigula settlement site	archaeological	Viru-Nigula museum	shaft-hole stone axe, could be a battle-axe, which has been hewn rectangular secondarily	The axe was found as a stray find. The survey trip to the site yielded hand-moulded and wheel-thrown pottery (TÜ 1271).	LN	LIA/MA	TÜ catalogue	
44	Võhma settlement site	archaeological	AI 5115	butt fragment of a sharp-butted axe; a large piece has been struck from the butt	The axe was found as a stray find from the field between Tõnurahva and Toomarahva farmsteads, 650 – 800 m S from Tallinn-Narva road.	LN	MA	Lavi 1981	
Põlva county									
45	Raiste *tarand*-grave	archaeological	AI 2254: 29	edge fragment of a straight-backed stone axe	The axe has been found from the stone grave in the field of Voitra farmstead in Raiste village.	LN	RIA?	Hausmann 1902; Laul 2001, 52	
46	Tiksipalo barrow field (17 barrows); settlement site	archaeological	TÜ 2276	stone adze, very porous material, ground surfaces, the cutting edge is not sharp, but this could be due to erosion	The adze was found between the barrows, 19 metres SE from the heritage protected barrow no 11064. Survey trip to the site yielded hand-moulded and wheel-thrown pottery sherds.	Meso	LIA/MA	Ervin 2015	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
Pärnu county									
47	Alta [Aesoo village]	folkloric	PäM 3 A 644 (Bo 197)	stone axe, with polished surfaces, but the cutting edge is severely damaged	The axe was found in ca 1860 under the tree that had been split by lightning	Neo	MP	Bolz 1914a, no 197; Kriiska 1999a, no 90; Laid 1924,76	
48	Aru [Oriküla village]	archaeological	AI 2574:4	stone shaft-hole axe	The axe was found from a pile of stones, an old foundation (Indreko 1925, 50), perhaps the remains of a farm house.	LN/EBA	MP	Indreko 1925, 50	Not available
49	Asinoja [Vihtra village]	folkloric	Lost	stone adze	The adze was found from the left bank of the Pärnu River and valued as magical thunderadze	Neo	MP	Bolz 1914b, no 20; Indreko 1925, 83	Not available
50	Eestpere/Pealtpere [Oore village]	folkloric	PäM 3 A 776 (Bo 447)	stone adze, wholly ground, sharp facets	The adze was found from the land of the Eestpere/Pealtpere farmstead, valued as a thunderadze.	Neo	MP	Bolz 1914a, no 447; Kriiska 1999a, no 74; Laid 1924,36	
51	Juhkama [Vainu village]	folkloric	Lost	stone shaft-hole axe	The axe was fround from the field on the right bank of the Pärnu River and was used as a net-sinker.	LN	MP	Bolz 1914a, no 61; Kriiska 1999a, no 58; Laid 1924, 57	Not available
52	Kargussaare [Kaansoo village]	folkloric	PäM 3 A 520 (Bo 23)	stone adze, the cutting edge has been severely damaged	The adze was found in 1897 in the depth of appr. 75 cm in sand in Kargusaare spruce forest, from the place where lightning had struck a tree. It was kept as a thunderadze.	Neo	MP	Bolz 1914a, no 23; Indreko 1925, 87	
53	Kella [Oore village]	folkloric	Lost	stone adze	The adze was put in the drinking water of cattle when they first drank after calving.	Neo	MP	Bolz 1914b, 42	Not available

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
54	Kurgja stray find	folkloric	PaM 3 A 506 (Bo 6)	stone adze, wholly polished, the cutting edge is intact, but pieces have been struck from the butt and one side, the butt part is heavily hewn	The adze was found from the field in Kurgja village, on the left bank of the Pärnu River in 1840 and valued as a thunderbolt; bought by Bolz in 1890 from the owner.	Neo	MP	Bolz 1914a, no 6; Indreko 1925, 71	
55	Kurgja stray find	folkloric	PäM 3 A 526 (Bo 29)	stone adze, slightly asymmetrical, wholly polished, but butt part has later eroded or damaged; the cutting edge is intact, with some notches	The adze was found in 1858 from the field in Kurgja village, on the left bank of the Pärnu River, named thunderadze by the finder.	Meso/Neo	MP	Bolz 1914a, no 29; Indreko 1925, 68	
56	Kurgja stray find	folkloric	PäM (Bo 29)	stone adze	The adze was found in 1858 from the field in Kurgja village, on the left bank of the Pärnu River, named thunderadze by the finder.	Neo	MP	Bolz 1914a, no 29a; Indreko 1925, 69	Not available
57	Kurgja stray find	folkloric	PäM 3 A 553 (Bo 63)	butt fragment of a stone shaft-hole axe (battle-axe), possibly a sharp-butted type; the fragment has a straight cutting surface.	The axe was found in 1891 from the field on the right bank of the Pärnu River and bought from the finder in 1901. The finder had used it for years to rub oil colours.	LN	MP	Bolz 1914a, no 63; Indreko 1925, 67	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
58	Linaoja [Jõesuu village]	folkloric	PäM 3 A 754 (Bo 406)	stone fluted adze, severely scraped surface	The adze was used as a grinding and whetstone.	Neo	MP	Bolz 1914a, no 406	
59	Linnu-Pealt [Rõusa village?]	folkloric	PäM 3 a 775 (Bo 444)	stone fluted adze, very asymmetrical, heavily reused, cutting edge blunted	The adze was found from the left bank of the Pärnu River and used as a whetstone by the finder.	Neo	MP	Bolz 1914a, no 444; Indreko 1925, 78	
60	Matiku [Malda village]	folkloric	AI 2490:25	stone fluted adze, the surfaces have been weathered	The adze was used for curing and obtained to museum in 1912.	Neo	MP	AI catalogue	
61	Mäeltmardi [Oore village]	folkloric	Lost	stone fluted adze	The adze was valued as a thunderadze but lost in 1890. The adze was put into the children's bathing water to cure them.	Neo	MP	Bolz 1914b, no 25, no 36; Kriiska 1999a, no 128; Laid 1924, 61	Not available
62	Mäeltmardi [Oore village]	folkloric	Lost	stone adze	The adze was put into the children's bathing water to cure them.	Neo	MP	Bolz 1914b, 37; Laid 1924, 61	Not available
63	Mäelttoa [Aesoo village]	folkloric	Lost	oval fire-striking stone	The item was valued as thunderadze and used in the children's bathing water for cure.	RIA-PViA	MP	Bolz 1914b, no 38; Kriiska 1999a, no 136; Laid 1924, 98	Not available
64	Mäelttoa [Aesoo village]	folkloric	Lost	stone fluted adze, from grey rock	The adze was found from the river and given to somebody to be used to press furuncles but got lost.	Neo	MP	Bolz 1914b, 85	Not available

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
65	Mäeoja [Aesoo village]	folkloric	PäM 3 A 521 (Bo 24)	an edge fragment of a stone adze, the edge fragment has been wholly ground	The adze was found by a large boulder that had been split by lightning. The adze was thought to have broken from the blow: the butt part was found in 1890, the edge part in 1908.	Neo	MP	Bolz 1914a, no 24; Kriiska 1999a, no 169; Laid 1924, 96	Not available
66	Pakupoisi [Riisa village]	folkloric	Lost	stone adze, ground, of grey rock	The adze was known as a thunderadze.	Neo	MP	Laid 1924, 74; Kriiska 1999a, 146	Not available
67	Pärniko [Tohera village]	folkloric	Lost	oval fire-striking stone	The owner of the farmstead had a thunderstone, had been in the farm for 60 years, but was lost already 30 years before Bolz's inquiry.	RIA-PViA	MP	Bo 1914b, no 30; Indreko 1925, 144	Not available
68	Raiesmiku [Muraka village]	folkloric	Lost	edge fragment of a stone shaft-hole axe	The fragment was found under a spruce that had been split by lightning, it was named a thunderadze. The owner used the fragment to iron its bonnet.	LN/EBA	MP	Bolz 1914b, 74; Kriiska 1999a, 112; Laid 1924, 79	Not available
69	Rehe settlement site [Vahenurme village]	archaeological	Lost	stone axe; the axe was destroyed when the finder tried to fall trees with it	The axe was found 100 m S from Rehe farmstead. Late Iron Age settlement site is located appr. 100 m SW from the farmstead, the axe was gathered from the border of the settlement site.	LN/EBA	LIA/MA	Mandel 1974	Not available
70	Reiu	folkloric	PaM 3 A 507 (Bo 7)	grinding stone, egg-shaped, both ends heavily damaged	The grinding stone was found in 1860, kept as a thunderbolt and used to cure erysipelas; bought by Bolz in 1891 from the finder.	EBA-LIA	MP	Bolz 1914a, no 7	
71	Rusevere (Kubja) [Aesoo village]	folkloric	PäM 3 A 531 (Bo 34)	stone adze, wholly ground, cutting edge undamaged, only small notches; a piece has been struck from the butt	The adze was found under the roots of a birch that had been split by lightning in Rusevere (Kubja) farmstead.	Neo	MP	Bolz 1914a, no 43; Kriiska 1999a, no 85; Laid 1924, 49	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
72	Saarmakose [Aesoo village]	folkloric	Lost	stone adze	The adze was named a thunderbolt.	Neo	MP	Bolz 1914b, 79; Kriiska 1999a, 118; Laid 1924, 77	Not available
73	Sorja [Uulu village]	folkloric	AM A 155	butt fragment of a stone shaft-hole axe, with damaged and scraped surfaces	The axe was found from the land of Sorja farmstead, appr. 500 m from the Reiu River. According to Jung (1898, 65) the axe was valued as a thunderbolt and grindings had been scraped from it that were supposed to help against illnesses.	EBA	MP	Jung 1898, 65; Parmas 1923, 35	
74	Urtsiku [Aesoo village]	folkloric	PäM 3 A 643 (Bo 196)	stone adze, wholly ground, with sharp facets	The adze was found under the tree that had been split by lightning.	Neo	MP	Bolz 1914a, no 196; Kriiska 1999a, no 84; Laid 1924, 75	
75	Uuetoa [Tagassaare village]	folkloric	PäM 3 A 519 (Bo 22)	oval fire-striking stone, quartzite, striking-marks in one end	The stone was found in front of the house of the Uuetoa farmstead in 1872 when it fell down during a serious thunderstorm. It was valued as a thunderbolt.	PRIA-PViA	MP	Bolz 1914a, no 22	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
76	Ülejõe [Vihtra village]	folkloric	PäM 3 A 515 (Bo 18)	stone adze, with heavily damaged surfaces	The adze was found in 1836 from the land of Vihtra-Ülejõe farmstead on the left bank of the Pärnu River under the roots of a birch that had been struck by lightning. It used to be intact but was crushed by the finder to share the pieces of miraculous thunderbolt with others.	Neo	MP	Bolz 1914a, no 18; Indreko 1925, 17	
Rapla county									
77	Avaste Chapel Hill, a village cemetery?	archaeological	AI 3861	half of a shaft-hole stone axe of uralite porphyry; severe damage in butt and edge part	The axe was found from a probable burial site in Avaste village, from the field of Sooääre farmstead. According to a record (Kiku 1939) limestone slab with letters and numbers, bones, 11 coins, a knife, a cannon ball and coffin nails were found. In addition iron nails, bronze and iron plaques, a bronze ring and 2 knives and melted bronze pieces have been collected from the land of the same farmstead (AI 3835).	LN/EBA	MA	AI catalogue (axe); Kiku 1939 (Chapel Hill)	
78	Ilmandu-Sepa [Kesu village]	folkloric	Lost	stone shaft-hole axe	The axe had been stuck between the logs of the outer corner of the dwelling house of Sepa farmstead.	LN/EBA	MP	Tiitsmaa 1923b, 5; Illison 1932, 7	Not available
79	Konuvere hillfort	archaeological	AI 4571: 67	stone adze, pieces have been struck from its edge and butt; the butt has a slanting facet; perhaps wear from secondary use	The adze has been found from the territory of hillfort during excavations.	Neo	LIA	Tõnisson 2008, 265	
80	Tiinuse [Teenuse village]	folkloric	AI 2671:25 (marked as lost)	stone adze with narrow butt, of black stone	The axe was found from Tiinuse, Kullamaa parish, and was known as a thunderstone. According to Tiitsmaa (1923a, 2) the adze was brought to Tiinuse from further away as a curing item.	Neo	MP	AI catalogue; Tiitsmaa 1923a, 2	Not available

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
81	Tiinuse [Teenuse village]	folkloric	AI 2671:27	stone shaft-hole axe	The axe was kept as a curing item for several generations in the Põllu farmstead in Altküla village.	LN/EBA	MP	Uustalu 1932, 2	 Photo: Jaana Ratas
82	Veske [Kohtru village]	folkloric	Lost	stone shaft-hole axe	The axe was found under the roots of a tree in 1890. Women had used it to cure swellings.	LN	MP	Tiitsmaa 1923b, 11; Illisson 1932, 8	Not available
Saare county									
83	Ardla Grave Hill; inhumation cemetery	archaeological	AI 2490:30	stone adze, intact, wholly ground, a few small pieces struck from the surface	The stone adze was found from the pasture of Ardla village, 0.5 km O from Tornimäe Orthodox church. The Grave Hill is more than a 100 m long and excavated through by gravel diggers. Lot of things have been found: fingerrings, brooches, spearheads, especially weapons; almost everybody in the village have found something and reused the metal (Tiitsmaa 1924c, 100–101).	Neo	LIA	Tiitsmaa 1924c, 100-101	
84	Kaarma cemetery	archaeological	SM 10174:2	stone shaft-hole axe, five-cornered Bronze Age type		EBA	Undated	SM catalogue	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
85	Kaarma battlefield	archaeological	AI K 91:32	stone shaft-hole axe of Karlova-type, uralite porphyry, large pieces struck from the edge part	The axe was found from the so-called Kaarma battlefield, between Kaarma hillfort, Kaarma manor and Uduvere village, a 3x2 km large area. Through years axes, spearheads, bracelets, breastpins, brooches and other jewellery have been found; could be a Late Iron Age inhumation cemetery.	LN	Undated (LIA?)	Leinbock 1924a, 13; Jaanits 1973, 62, Abb. 14	 Photo: Jaana Ratas
86	Kaarma battlefield	archaeological	AI K 91:6 [marked as lost]	stone shaft-hole axe of Karlova type	The axe was found from the so-called Kaarma battlefield, NE from the hillfort. Through years axes, spearheads, bracelets, breastpins, brooches and other jewellery have been found; could be a Late Iron Age inhumation cemetery.	LN	Undated (LIA?)	Jaanits 1973, 62; Leinbock 1924a, 13-14	Not available
87	Kiriku (Tansi-Jaani grave no 3) [Valjala village]	archaeological	AI 3899:5	stone adze, fine-grained diabase, the cutting edge is damaged, the butt part has been broken, scraping traces on the surface; could have been reused as a whetstone	The adze was found from the depth of appr: 15 cm from the upper layer; only a thin layer of small stones and earth was covering it.	Neo	RIA	Schmiedehelm 1941	
88	Koimla burial site	archaeological	AI K 91: 9 (SM 13 A 13 (Kur 3))	shaft-hole stone axe; the surface is cracked, pieces have been struck around the shaft-hole and butt	The axe was found while removing a grave (Germ. *beim Abtragen eines Kalm*); perhaps a stone grave	LN	Undated (PRIA-ViA (?)	Moora 1924, 58	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
89	Kõruse Burial Hill, underground cemetery	archaeological	AI 3822: 7 (Toll coll. no 27	a fingernail-shaped adze, with very smooth surfaces, use-wear on cutting edge	The adzes were found from a possible burial site, which has yielded finds from the prehistoric period as well as burnt and unburnt bones. There is a settlement site appr. 200 m WSW from the burial site. Moora (1922, 15) is not certain about the find place of the adzes.	Neo	LIA	Lang 1993a; Moora 1924, 59	
90	Kõruse Burial Hill, underground cemetery	archaeological	Koorti coll. no 3	intact and well-ground	The adzes were found from a possible burial site, which has yielded finds from the prehistoric period as well as burnt and unburnt bones. There is a settlement site appr. 200 m WSW from the burial site. Moora (1922, 15) is not certain about the find place of the adzes.	Neo	LIA	Lang 1993a; Moora 1924, 59	Not available
91	Männiku [Muhu island, Lepiku village]	folkloric	Lost	stone adze; according to Grewingk (1871, 52) with sharp edge, appr. 4.5x5.7x1.3 cm, of fine-grained greenstone (uralite porphyry?)	The adze was found from the land of Männiku farmstead. According to Tiitsmaa (1922, 7) old people remember that thunderbolts were kept in the farmstead. One adze was given to the museum (the current location unknown), but additional 4 thunderbolts were kept at the farm.	Neo	MP	Tiitsmaa 1922, 7; Grewingk 1871, 52	Not available
92	Nurme Chapel Hill	archaeological	Lost	stone adze	The adze was found from the Chapel Hill, from the depth of appr. 65 cm together with human bones. The site is dated to the Iron Age by Leinbock (1924, 41). Another skeleton was near with an iron knife.	Meso-Neo	MA(?)	Leinbock 1924b, 41	Not available
93	Nõmme [Undva village]	folkloric	AI 3822: 12	stone adze, broken into half	The stone adze was found as a stray find, and collected from the finder. The adze was used to cure children – the adze was soaked in boiling water which acquired the healing power through it.	Neo	MP	AI catalogue	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
94	Piila stone grave	archaeological	SM A 1468:37	edge fragment of a shaft-hole stone axe	The axe fragment was found between the stones from the preserved part of the 10th–11th century grave.	Neo	LIA	Mägi 1997	
95	Reo cemetery	archaeological	SM 7804 A 689	stone shaft-hole axe of Karlova type	The axe was found from the depth of 1.7 m at Reo cemetery	LN	Undated		
96	Rootsiküla stone grave	archaeological	Lost		The axe was found from a stone grave on the border of Rootsiküla village.	LN/EBA?	Undated	Moora 1924, 60	Not available
97	Rootsivere Cairn [Muhu island]	archaeological	AI K 91:12	stone age shaft-hole axe of Karlova type	The axe was found under a stone cairn together with burnt earth and ashes. No certain finds have been gathered, but according to Tiitsmaa (1924b, 139) there might be Iron Age graves in the area.	LN	Undated (PRIA-ViA (?)	Tiitsmaa 1924b, 131, 139; Jaanits 1973, 60	
98	Saluküla burial site (Hill of the Dead/*Surnu mägi*) [Salu village]	archaeological	AI 2485:14	stone shaft-hole axe of Karlova type, intact, with polished surfaces	The axe has been found from the depth of appr. 30 cm in a gravel hill. The same gravel hill has yielded unburnt bones, beads, fingerrings, a chain (Laur 1924, 11).	LN	LiA(?)	Laur 1924, 9, 11	Not available

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
99	Suuriku [Undva village]	folkloric	AI 3822: 17	stone shaft-hole axe, large fractures in butt and edge part	The axe was found from a cairn in the field, when thunder struck into it. The cairn is situated 100 m NNE from the Suuriku farmstead. The axe was used for curing.	LN/EBA	MP	Moora 1924, 61; AI catalogue	 Photo: Jaana Ratas
100	Tõnija Tuulingumägi *tarand*-grave	archaeological	SM 1466:519	stone adze	Stone adze was found during excavation at 4th–5th century *tarand*-grave.	Neo	RIA	Mägi-Lõugas 1997	 Photo: Tarvi Toome, AI
101	Uduvere burial site (Sand Hill/ *Liivamägi*)	archaeological	AI K 91:43	stone shaft-hole axe, probably a blank of a Karlova type axe, unpolished	The axe has been found from the Viking Age cemetery. Finds – fragments of swords, axes, jewellery, finger-rings, brooches, etc. have traces of burning.	LN	ViA	Tvauri 2012, 252	
102	Viira village cemetery (Pub Hill/ *Kõrtsimäg*) [Muhu island]	archaeological	AI 4299: 51	a fragment of an adze; the cutting edge has been rounded, perhaps reused in some utilitarian way	The adze was found from an old cellar pit from the S-slope of the hill. Also animal bones were found there. According to Kustin (1964, 17) the S-part of the hill is destroyed and without preserved burials, perhaps this area was not used for burying or the deceased were already removed.	Neo	MA	Kustin 1964; about the date of the cemetery: Mägi 2001a, 70–71	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
103	Võhma stone-cist grave	archaeological	AI 5751: 211	stone fluted adze, the cutting edge has been severely damaged and rounded	The axe was found from the layer of burnt stones directly next to the grave. The layer yielded grain grinding stones and pottery, dated later than the grave	Neo (?)	LBA/LIA	Lõugas, [s.a.]; Viljat 2016	
104	Võhma hillfort	archaeological	AI 5370	stone adze, possibly of sandstone	The adze was found from the lower layer of hillfort with pieces of coal	Neo (?)	PRIA/RIA	Lang 2007, 77–78	
Tartu county									
105	Alasoo settlement site	archaeological	AI 3916	stone sharp-butted stone axe, the surface has been eroded or not ground at all	The stone axe was found from the field of the farmstead while ploughing, on the western shore of Lake Vilajärv. Later settlement site is located between the farm dwellings and the lake (reg no 12765) (TÜ 624,TÜ 2581, AI 7130, TM A 195)	LN	LIA/MA/MP	Kriiska 1990; Karro 2013; Tvauri 2016	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
106	Assikvere stray find	folkoric	TM 74 A 7	stone shaft-hole axe; the cutting edge has been blunted; a large piece has been struck from the butt	The axe was found from the field near an old pine tree; the place was used to bury cattle that had been hit by lightning.	LN/EBA	MP	TM catalogue	 Photo: Eero Heinloo
107	Lilu settlement site	archaeological	TÜ 1640	a fragment of a stone shaft-hole axe	The stone axe was found while field survey together with hand-moulded as well as wheel-thrown pottery.	LN/EBA	LIA/MA	TÜ catalogue	
108	Nõo village cemetery (Chapel Hill/ *Kabelimägi*)	archaeological	AI 2439	flint spearhead, intact, well-worked out tang.	The spearhead has been found from the hill where also human bones and single artefacts have been found. The artefact has reached museum through several people, so the find place is uncertain.	Neo	MA	AI catalogue	 Photo: Tõnno Jonuks

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
109	Saareküla settlement site [Saare village]	archaeological	AI 2490: 17	the edge fragment of a shaft-hole stone axe of Külasema type, a few pieces have been struck from the cutting edge	The axe has been found as a stray find. The later settlement site was localised in 1994 on the lands of Hansu ja Tooma farmsteads (Vindi 1994).	Neo	MA	Vindi 1994	
110	Tartu hillfort	archaeological	TM A 14: 402	the butt fragment of a shaft-hole stone axe; very pecked and worn surfaces, one side has been ground off, very asymmetrical	The axe fragment was found during excavation of 1956, from the eroded soil of wall no 2.	LN/EBA	MA	Trummal 1964, 83	 Photo: Eero Heinloo
111	Tartu hillfort	archaeological	TM A 16: 304	willow-leaf-shaped flint arrowhead	The axe fragment was found during excavation of 1958.	Neo	MA	Trummal 1964, 83	 Photo: Eero Heinloo

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
112	Lossi St 3/5 [Tartu]	archaeological	TM A 42: 996	edge fragment of a stone shaft-hole axe	The axe fragment was found from the eastern part of excavation 13, from the SE-corner, the upper part of a depression beside the wall. According to Metsallik (1992) there was a skintanners workshop in the E-part of the excavation 13, which can be dated to the 14th century. Co-finds of the excavation include mostly wheel-thrown pottery.	LN/EBA	MA	TM catalogue (axe); Metsallik 1992 (context)	 Photo: Arvi Haak, TM
113	Rüütli St [Tartu]	archaeological	TM A 50: 449	flint arrowhead	The item was found from the trench of Rüütli Street, from debris layer between walls. Accompanying finds: Late Medieval pottery , fragments of grapens, faiance, stove tiles, window-glass sherds. Debris layer was dated to the period after the Livonian War.	Neo	MP	Metsallik 1995, 32	 Photo: Arvi Haak, TM
114	Küüni St. [Tartu]	archaeological	TM A 40: 2683 [marked as lost]	fragment of a stone axe	The fragment was found from the NW-part of the excavation, from the upper part of the layer with wood debris.	LN/EBA	MA/MP	TM catalogue	Not available
115	Botanical Garden [Tartu]	archaeological	TM 2032 A 43: 131 [lost]	butt fragment of stone axe, fine-grained rock, ground surface	The fragment was found with grapen sherds, from the bottom of construction debris, in the depth of 160–180 cm.	LN/EBA	MA/MP		Not available
116	7th block [Tartu]	archaeological	TM A 45:1242 [lost]	fragment of a stone shaft-hole axe	The item was found from 13th–14th century black sooty layer under a wooden pavement in excavation IV.	LN/EBA	MA	Aun 1998, 113	Not available

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
117	Riia St. 2 [Tartu]	archaeological	TM A 221: 6963	butt fragment of a stone shaft-hole axe of Karlova type	The axe was found from mixed brown soil with pieces of brick, next to one and under another building. Wooden constructions of altogether three dwellings from the 17th–18th century were found.	Neo	MP	Silja Möllits (pers. comm.)	
118	Saint Jacob's cemetery [Tartu]	archaeological	TM A 222: 9	Russian-Karelian type fluted adze of metatuff	The axe was found from the 15th–16th century cemetery, under the left rib case of burial no 25 – a 30–40 years old woman, but its association with the burial is uncertain (Roog, pers. comm.)	Neo/EBA	MA/MP		
119	Ülikooli St. 14 [Tartu town]	archaeological	TM A 133: 4858	fragment of a stone shaft-hole axe, possibly of straight-backed type, fresh fracture mark on edge, possibly broken at shaft-hole, scraping marks on the surface; uralite porphyry	The axe was found between two walls from dark brown clay-sand layer, directly on the natural sand layer; fill layer between two stone buildings. Fill layer included finds from the prehistory until the 17th–18th century.	LN	MA/MP	Piirits 2014-2015	
Valga county									
120	Otepää hillfort	archaeological	AI 4036 II:15	slate arrowhead of Pyheensilta type, heavily scraped surfaces and the tip has been broken	The arrowhead was found during excavation of 1952, from the depth of 0.7 m.	LN	LIA/MA	Saadre 1952	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
121	Otepää hillfort	archaeological	AI 4036 II:20	fragment of a stone axe, the hole has been heavily pecked from both sides, the cutting edge rounded, scraped surfaces	The axe was found during excavation of 1952, near the O-corner of the wall, from the depth of 4.2 metres on the natural soil.	LN/EBA	LIA/MA	Saadre 1952	
Viljandi county									
122	Araka [Lätkalu village]	folkloric	PäM 3 A 556 (Bo 67)	stone adze	The adze was found after lightning had struck into the house, and burnt down the house and the nearby birch, while digging out the stump of the birch. Was valued as a thunderbolt.	Neo	MP	Bolz 1914a, no 67	
123	Karu stone-cist grave [Ämmuste village]	archaeological	lost		The axe was found from the supposed stone-cist grave. According to Viljat (2012) due to melioration works graves cannot be localised.	LN/EBA	LBA/PRIA	Viljat 2012, 3 (15); Laid, O. 1923	Not available
124	Karuskose [Sandra village]	folkloric	PäM 3 A 534 Bo 41	edge fragment of a stone adze	The adze was found in 1874 somewhere around the Kuusekäära River near Karuskose farmstead. It was valued as a thunderbolt and bought from the owner in 1899. Was intact and broken by the finders.	Neo	MP	Bolz 1914a, no 41; Laid 1924, 94; Kriiska 1999a, 148b	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
125	Kivisaare [Lalsi village]	folkloric	Bo 56	edge fragment of a stone axe	The axe was found in 1893 from the field of the farmstead. It had been broken by the lightning strike.	LN/EBA	MP	Bolz 1914a, no 56	Not available
126	Kuude burial site [Kuude village]	archaeological	ViM 4340 A 9	a fragment of a Karlova-type stone shaft-hole axe	The axe was found at the Kuude grave.	LN	LIA	VM catalogue	Not available
127	Laadametsa [Võlli village	folkloric	Lost	stone adze, from hard grey stone, carefully polished	The adze was found under the roots of a birch that had been split by lightning.	Neo	MP	Bolz 1914b, no 60	Not available
128	Larmi [Lalsi village]	folkloric	PäM 3 A 647 (Bo 201)	stone adze	The adze was found appr. 1804 and used to cure erysipelas for a 100 years, sold in 1904.	Neo	MP	Bolz 1914a, no 201	
129	Mardi-Haua [Vastemõisa village]	folkloric	Lost (Bo 38)	edge fragment of a stone axe of sharp-butted type	The item was found in 1825 under a stove cairn (in Estonian *ahjuvare*) in Mardi-Haua farmstead, on the right bank of the Saarjõgi River, the finders kept it as a toggle of the hell's door (in Estonian *põrgu ukse pöör*).	LN	MP	Bolz 1914a, no 38	Not available
130	Nedrevälja [Ivaski village]	folkloric	ERM A 564:958	stone shaft-hole axe; severely damaged surfaces	The axe was used as a bricklaying tool.	LN/EBA	MP	ERM catalogue	Not available
131	Pilistvere churchyard	folkloric	AI 600	butt fragment of a sharp-butted axe, smaller sherds struck off from the butt, fresh fracture on butt	The axe was found near Pilistvere churchyard. Farmers thought that it was a meteorite.	LN	MP		

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
132	Põrgu (Jaagu) [Lätkalu village]	folkloric	PäM 3 A 544 (Bo 52)	stone adze	The adze was found in 1850 between the pieces of a boulder that had been split by lightning. Was kept and valued as a thunderadze.	Neo	MP	Bolz 1914a, no 52	
133	Risenbergi [Supsi village]	archaeological/ folkloric	Lost	stone shaft-hole axe	The axe was found from a gravel knoll together with bones. Possible burial site. The axe was used as a candle-holder.	LN/EBA	Undated/MP	Tiitsmaa 1924a, 5	Not available
134	Siimu-Nelka [Lalsi village]	folkloric	PäM 3 A 546 (Bo 54)	stone adze, fluted adze	The adze was found in 1890 from the field and kept as a thunderbolt, bought from the finder in 1900.	Neo	MP	Bolz 1914a, 54	
135	Siimu-Nelka [Lalsi village]	folkloric	PäM 3 A 547 (Bo 55)	stone adze, fluted adze	The adze was found in 1897 from the field and kept as a thunderbolt, bought from the finder in 1900.	Neo	MP	Bolz 1914a, 55	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
136	Siimusaar [Lalsi village]	folkloric	PäM 3 A 548 (Bo 57)	stone adze	The adze was found in a bunch of bushes, after lightning had struck the bunch. The adze was kept and valued as a thunderstone.	Neo	MP	Bolz 1914a, no 57	
137	Solu [Väike-Kõpu village]	folkloric	Lost (Bo 75)	stone shaft-hole axe	The axe was found in 1830 and used for three generations to castrate oxen.	LN/EBA	MP	Bolz 1914a, no 75	Not available
138	Tiido-Hanso [Vastemõisa village]	folkloric	Lost	stone adze	The adze was considered a thunderbolt by old people and used in a barn as a missing leg to support a chest and was later broken.	Meso/Neo	MP	Bolz 1914b, no 39	Not available
139	Toro-Killi [Odiste village]	folkloric		stone adze, of black stone, of small size (appr. 2,5x3,5 cm)	The axe was known as a thunderbolt.	Meso/Neo	MP	Anni 1921, 30	Not available
140	Vastemõisa	folkloric	PäM 3 A 593 (Bo 114)	oval fire-striking stone	The item was used as a net-sinker.	RIA-PViA	MP	Bolz 1914a, no 114	

No	Site	Archaeological/Folkloric	Cat.no	Artefact	Site description	Date (artefact)	Date (site)	Reference	Photo
Võru county									
141	Ala-Vagula settlement site [Juba village]	archaeological	AI 2490: 58	stone shaft-hole axe, a large fracture mark on the cutting edge, also on the side, pecked around the shaft-hole	The axe was found as a stray find. Later pottery, slag and bones (AI 6199) found from during field survey.	LN/EBA	LIA/MA	Kiristaja 1998	
142	Puutli settlement site	archaeological	AI 2490: 50	edge fragment of a stone shaft-hole axe, the surface partly eroded, flakes struck from the cutting edge; gneiss	The axe was found as a stray find. Later finds from the 16th – 17th century (TÜ 1573, TÜ 2105) were gathered during field survey.	LN/EBA	MP	Karopun 1922; Veldi 2007; Zadin 2012, 12–14 (7)	
Setu county									
143	Orstipalu village cemetery [Hargla village?]	archaeological	Lost	stone shaft-hole axe	The axe was found with bones from a sandy hillock; another skeleton with a brooch and a coin (1400) was found 3 m south. According to Liiv (1924, 6) the place is also known as a later offering site.	LN/EBA	MA	Liiv 1924	Not available

PUBLICATIONS

CURRICULUM VITAE

Name: Kristiina Johanson
Date of birth: 01.03.1980
Nationality: Estonian
Contact: kristiina.johanson@ut.ee
Jakobi 2, Tartu 51014, Estonia

Education:

2006–2018	University of Tartu, doctoral studies (archaeology)
2003–2006	University of Tartu, master studies (archaeology)
1998–2003	University of Tartu, bachelor studies (archaeology)
1986–1998	Võru I High School / Võru Kreutzwald Gymnasium

Career:

2010–…	University of Tartu, Institute of history and archaeology, department of archaeology; research fellow
2006–2007	University of Tartu, Institute of history and archaeology, department of archaeology; research fellow extraordinarius
2005–2006	University of Tartu, Institute of history and archaeology, department of archaeology; technician

Field of research: magical artefacts in archaeological material, reuse of Stone Age artefacts

Publications connected with the thesis:

1. Ventsel, A.; Remmel, A.; Altnurme, L.; Johanson, K.; Karo, R. & Raudsepp, M. Ilmumisel. Meaning-making in religious phenomena in the field of tension vernacular and institutional discourses. In: A. Kannike; V. Lang; K. Kuutma; K. Lindström; A. Riistan (Eds.). *Approaches of Culture Theory VII*. Tartu University Press, Tartu.
2. Jonuks, T. & Johanson, K. llmumisel. "Ehk nõiduseks tarwitatud" – maagilised esemed Eesti muuseumikogudes. In: Mäetagused, 2018.
3. Johanson, K. 2006. The contribution of stray finds for studying everyday practices – the example of stone axes. In: Estonian Journal of Archaeology, 10:2, 99–131.

ELULOOKIRJELDUS

Nimi: Kristiina Johanson
Sünniaeg: 01.03.1980
Kodakondsus: Eesti
Kontakt: kristiina.johanson@ut.ee
Jakobi 2, Tartu 51014, Estonia

Hariduskäik:

2006–2018	Tartu Ülikool, doktoriõpe (arheoloogia)
2003–2006	Tartu Ülikool, magistriõpe (arheoloogia)
1998–2003	Tartu Ülikool, bakalaureuseõpe (arheoloogia)
1986–1998	Võru I Keskkool / Võru Kreutzwaldi Gümnaasium

Teenistuskäik:

2010–…	Tartu Ülikool, Ajaloo ja arheoloogia instituut, Arheoloogia osakond; teadur
2006–2007	Tartu Ülikool, Ajaloo ja arheoloogia instituut, Arheoloogia osakond; erakorraline teadur
2005–2006	Tartu Ülikool, Ajaloo ja arheoloogia instituut, Arheoloogia osakond; tehnik

Peamised uurimisvaldkonnad: esemeline maagia arheoloogilises materjalis, kiviaegsete esemete taaskasutus

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1. Ventsel, A.; Remmel, A.; Altnurme, L.; Johanson, K.; Karo, R. & Raudsepp, M. Ilmumisel. Meaning-making in religious phenomena in the field of tension vernacular and institutional discourses. – A. Kannike; V. Lang; K. Kuutma; K. Lindström; A. Riistan (Toim.). *Approaches of Culture Theory VII*. Tartu University Press, Tartu.
2. Jonuks, T. & Johanson, K. llmumisel. "Ehk nõiduseks tarwitatud" – maagilised esemed Eesti muuseumikogudes. – Mäetagused, 2018.
3. Johanson, K. 2006. The contribution of stray finds for studying everyday practices – the example of stone axes. – Estonian Journal of Archaeology, 10:2, 99–131.

DISSERTATIONES ARCHAEOLOGIAE UNIVERSITATIS TARTUENSIS

1. **Heidi Luik.** Luu- ja sarvesemed Eesti arheoloogilises leiumaterjalis viikingiajast keskajani. Bone and antler artefacts among Estonian archaeological finds from the viking age until the middle ages. Tartu, 2005.
2. **Tõnno Jonuks.** Eesti muinasusund. Tartu, 2009.
3. **Gurly Vedru.** Põhja-Eesti arheoloogilised maastikud. Archaeological landscapes of North-Estonia. Tartu, 2011.
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7. **Pikne Kama.** Arheoloogiliste ja folkloorsete allikate kooskasutusvõimalused: inimjäänused märgaladel. Tartu, 2017, 259 p.