(B)orders in ancient weaving and archaic Greek poetry

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This is a pre-copyedited, author-produced PDF of a chapter accepted for publication in G. Fanfani, M. Harlow and Marie-Louise Nosch (eds) Spinning Fates and the Song of the Loom. The Use of Textiles, Clothing and Cloth Production as Metaphor, Symbol and Narrative Device in Greek and Latin Literature, Ancient Textile Series 24, Oxbow Books, Oxford & Philadelphia 2016: 61-99, following peer-review. For images and reference please check the published version.

In this chapter we offer an investigation of textile terms where they are used for describing intellectual production or knowledge (epistêmē) in ancient texts. We focus on archaic Greek poetry as well as on selected philosophical works and experience from weaving experiments. The choice of the passages and the material to be discussed as well as the way the argument is built up reflect two different but – we believe – complementary approaches to the topic we explore throughout this chapter: one is guided by an interest in ancient mathematics and philosophy and the other draws on literary criticism. Both have a role to play when tracing and contextualizing the (somewhat elusive) technological significance of textile imagery for archaic poetry and prose as well as for philosophy. This study arises from a common interest in the question of how ancient textile production, and particularly weaving, might have affected the very early discourse on poetry-making and the question of how poetic composition or the composition of texts as a technē might resemble the order of nature. We therefore lay emphasis on the connection of art, technology, and nature that is encompassed by the ancient term technē and embraces weaving as well as forging, writing a poem or a philosophical dialogue. In all such cases, we see a concept of technē at work that refers to a notion of the genesis of cosmic order that has never been explicated. In some instances it is best explained by weaving. Despite the obvious difference in the subjects of our interest, we build our arguments on this shared foundation.

The passages we refer to are commonly perceived as metaphorical. We focus instead on the German philosopher Hans Blumenberg’s linking of metaphors and technology. Here, metaphors indicate a technological language prior to the era of proper technology.1 As the technological aspects of Blumenberg’s philosophy and history of science are not very well known even in Germany, we will provide a short introduction.

**Blumenberg’s itinerary from technology to metaphor and back again**

In the 1950s, Blumenberg published a series of articles concerning technology, investigating its influence on our image of man (Bild des Menschen) and the autonomy or powerlessness (Ohnmacht) of human beings facing the intrinsic logic of the world of machines.2 Blumenberg thus scrutinises the history of science in its changes avoiding to subscribe a history of inventions and inventors or technological problems. To Blumenberg, it is necessary to verify in every case the relation and exchange between idea and matter, or:

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1 We would like to express our gratitude to foundations and institutions supporting the research whose results are presented here. Ellen Harlizius-Klück’s investigations were supported by a Marie-Curie Research Fellowship (COFUND) of the Gerda Henkel Foundation which she conducted at the Danish National Research Foundation’s Centre for Textile Research (DNRF 64). Giovanni Fanfani would like to thank the Danish Council for Independent Research and FP7 Marie Curie Actions – COFUND (DFF – 1321-00158); he is especially grateful to Douglas Cairns for helpful comments on an earlier draft of this chapter.

2 The term ‘proper technology’ indicates that most scholars use the term technology as applying to the result of industrialization in the 19th century.

mind and technology. This project he later called “Geistesgeschichte der Technik”, which might be translated as “history of technological ideas” and thus reacts ironically to the usual way of writing histories of technology as well as to new sociological explanations of this history.

Blumenberg claims that an analysis of the backdrop for the origins of technology in terms of the historical development of ideas is lacking. He starts outlining this development by investigating technology or technē in ancient Greece. The result has been summarised thus: “For the Greeks, the notion of technē summed up those abilities and skills which follow nature on its own course of becoming and perfection, and, in following nature, offer it help. Technē promotes and sustains physis.” But technē also figures as the very beginning of things when the godly creator is called demiourgos (artificer, craftsman, Timaeus, 28a), or even phytiourgos (begetter, father, lit. gardener; Republic 597d) by Plato. Technē imitates physis since physis is made by technē.

To Blumenberg, it was the sophists that introduced the idea of thesis: the postulation of something not already given. They demonstrate how technē can be isolated and independent from nature as being and truth. They offered a training in tricks of speech without respect to justice, and trained know-how instead of know-what. It is the birth of the rhetorike technē and the framework for the category that is later called ‘metaphor’. From that moment onwards, philosophy takes as its task to separate itself from this type of speech that is not concerned with truth but with persuasion: “Plato’s rejection of the sophists’ technique had the implication of banning technology from the intellectual legitimacy of the European tradition.”

4 Blumenberg 2009, published posthumously. The manuscripts in the archive in Marbach are dated to 1966/67. Cf. Blumenberg 2015, 278. If not stated otherwise, translations are by the authors of this chapter. In some cases, we give the German original text in the notes.
5 In fact Blumenberg himself states that “the term ‘history of ideas’ does not sound good any more.” Blumenberg 2009, 51. Taking into account that the manuscripts were finished 1966 after the publication of The Copernican Turn (Die kopernikanische Wende, 1965) and at the same time as “The Legitimacy of the Modern Age” (Die Legitimität der Neuzeit, 1966), this might refer to the works of Thomas S. Kuhn who also investigated the Copernican revolution and the role of metaphors and paradigms in science (Kuhn 1957, 1962). For Blumenberg on Kuhn cf. Blumenberg 1996, 540-541; Blumenberg 1983, 467; Ingram 1993, esp. 23.
7 Campe 2000, 114.
8 On technological imagery drawn from arts and crafts in the Timaeus in the context of a comprehensive investigation of the Greek conception of the kosmos as an artefact, see Lloyd 1966, 277-285, who notes that “taòkoxon (plait) and opaìcov (weave) and their compounds are used to describe the joining together of soul and body (36e2), the interlacing of the veins (77e1) and so on”.
10 An excellent treatment of the archaic and early classical conception of technē, especially in relation to the emergence of the idea of poem/song “as verbal craftsmanship” in early 5th century choral lyric is Ford 2002, 93-157 (quote from p. 93), with further bibliography. See also Durante 1976, 170-179. On the interesting etymological connection between the root of Greek tekion ‘carpenter’ and technē, and Latin texio (‘weave, join, carpenter’) see Nagy 1996, 75, who concludes that “[T]hese and other such facts lead to the general conclusion that the metaphor of carpentry as songmaking in Indo-European languages is parallel to the metaphor of weaving.”
12 Metaphor is meant here in the sense of a figure of speech, as it was to be defined and used by early rhetoricians. To Blumenberg, there cannot be something like a definition of a metaphor, but only historical cases where we can find certain functions of language that are called metaphorical.
13 “… Platon’s Abweisung der Sophistik [implizierte] die Ausschließung der Technik aus der geistigen Legitimität der europäischen Tradition” (Blumenberg 2015, 197, emphasis by Blumenberg).
But this ban was not characteristic of antiquity. The final dissection of nature and technology, according to Blumenberg, is a result of the Christian concept of creation and might be exemplified by the case of weaving coloured garments: “A polemic against some textile refinements can be found with some patristic authors reasoning god would have created coloured sheep if he had wished men to wear coloured clothes.”

In early modern times, the foundation of pure reason followed this dissection of nature and technology and masked the historical and practical condition of theory. Blumenberg refers here to a most influential example: “Descartes obviously disavowed the historical background that provided him with decisive suggestions for the new idea of science, in order to establish the myth of an absolute beginning through reason assuring itself.”

At the famous Jesuit school La fleche, Descartes not only learned mathematics and philosophy but also fencing and tennis. On fencing, he later wrote a geometrical treatise; tennis provided him with metaphors for his theory of light. The value of such body technologies for science and philosophy remains however marginal, because, when they appear on paper they are perceived as rhetorical tropes and then belong to the realm of literary style. According to Blumenberg, Descartes aimed at a terminology where the presence and precision of given facts is captured by defined terms/concepts. Metaphors instead only have a meaning in functional transition; in metaphor, the human mind hurries ahead the execution of reasoning. To Descartes, only arithmetic and geometry provide reliable and evident knowledge.

Above, we quoted from a publication that does not deal with technology at first sight. In 1960, Blumenberg published a volume in the German series Archive for the History of Concepts entitled “Paradigms of metaphorology” dealing with so-called ‘absolute metaphors’ as devices for the development of concepts in the philosophical tradition. Absolute metaphors stand in for missing concepts in cases of logical awkwardness (logische ‘Verlegenheit’) and they resist attempts of finally making concepts out of them. They answer to questions like “What is truth?” “What is man?” “What is God?” “How is the world made?” To Blumenberg such metaphors force us to re-think the relation of imagination and logos. They show that imagination is not a reservoir of images that, element by element, dissolve into proper concepts in the course of history. Rather it is a catalytic domain that enriches the world of concepts without its basic stock ever being consumed. Also metaphorology is a historical project. Absolute metaphors change in the course of history and thus reflect changes in the approach to fundamental questions. Metaphors appear to be a technology to situate such questions. Campe, who develops in detail the connection

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16 Cf. Specht 1996, XVI.
17 Blumenberg 1960, 7.
18 Original title Archiv für Begriffsgeschichte.
19 Blumenberg 1960; cf. Campe 2000, 105. For Blumenberg’s position within the discourse of ‘historical poetics’ see now Maslov 2015, 137 n. 58.
21 Blumenberg 1960, 9.
22 Blumenberg 1960, 10: “Der Aufweis absoluter Metaphern müßte uns wohl überhaupt veranlassen, das Verhältnis von Phantasie und Logos neu zu durchdenken, und zwar in dem Sinne, den Bereich der Phantasie nicht nur als Substrat für Transformationen ins Begriffliche zu nehmen — wobei sozusagen Element für Element aufgearbeitet und umgewandelt werden könnte bis zum Aufbrauch des Bildervorrats —; sondern als eine katalytische Sphäre, an der sich zwar ständig die Begriffswelt bereichert, aber ohne diesen fundierenden Bestand dabei umzuwandeln und aufzuzehren.”
of technique and metaphor in Blumenberg’s work, concludes: “What is at stake in the exploration of metaphors in scientific texts is the impact of ‘the technical’ (das Technische) in science and in the text of philosophy.”

Blumenberg states: “Man is a technical being” (“Der Mensch ist ein technisches Wesen”). Until the 1960s, he claims man’s natural deficiency in environmental adaption as reason for this statement. Later Blumenberg withdraw from this reasoning and took ‘the technical’ as a human condition independent from the idea of deficiency. He then stressed the role of ‘life-world’ (a concept inherited from Husserl’s phenomenology) for the history of technology and explored the relation of life-world and technology in several case studies. Life-world here refers to the seemingly self-evident character of the reality at hand, leading to assumptions such as nature being opposed to technology or technology being applied science or, in our case, the easy availability and cheapness – and thus worthlessness – of textiles.

As we already heard, for the ancient Greeks the term technē, being at the root of our word technology, shows no opposition against nature and against the second assumption Blumenberg argues: “Technology can only be applied science because this science already originates in a technical understanding of being and truth.”

To question the third assumption by objecting to the tradition that treats weaving as mythical or metaphorical subject will be part of our chapter.

Textiles within the framework of technization

The worthlessness of textiles may be illustrated by the way in which Campe introduces a metaphor for Blumenberg’s notion of metaphorology. The integration of metaphorology and technology is underlined by a term Blumenberg used in explaining why a theory of metaphor could not result in a proper philosophical theory: Halbzeug. This evokes Heidegger’s Zeug and his philosophy of being at the beginning of the paradigms for a metaphorology: “What I will present here is a mere half-stuff [Halbzeug] and the perfection and seamlessness with which one can speak about ‘Being’ is in this discursive field, the field of philosophical metaphors, utterly unreachable.”

According to Campe, Halbzeug “is a terminus technicus used exclusively in industrial technology” referring to things created from raw materials which are later made into finished products: “It renders invisible the raw material out of which it is made without evoking the technical application, which only the finished product will demonstrate.”

Campe’s argument suggests that this was going on in Blumenberg’s mind. However, a footnote surprisingly concedes that half-stuff as well as Halbzeug was and is still used in paper manufacture and the origin of the word lies there. In fact the technical encyclopaedias until roughly the turn of the 20th century only know half-stuff as a term in paper production, be it manufactured or industrialised. The term denotes the disintegrated rags, the worthless

23 “In der Untersuchung der Metaphern im Text der Wissenschaft geht es um die Wirkung des Technischen in der Wissenschaft und im Text der Philosophie.” Campe 2009, 284, translation by the authors. The German article is an extended version of the former English one, published in 2000. Cf. Mende 2009, 28, n. 120.
24 Blumenberg 2015, 18.
25 See footnote 55 below on the ‘Primark-effect’.
27 Blumenberg 2015, 45.
28 ‘Technization’ translates the German word Technisierung (cf. the chapter Lebenswelt und Technisierung unter Aspekten der Phänomenologie, in Blumenberg 2015, 163-202; cf. also Campe 2000, 109). Where technology (German: Technik) refers to the product, technization refers to the process of becoming.
29 Blumenberg never gave a definition of what a metaphor or a metaphorology is.
32 For example cf. Krünitz 1807, 590-595 and 625-626, also online at http://www.kruenitz1.uni-trier.de/ where the encyclopedia is called one of the most important sources on the history of science in the time of change to industrialization. Similarly later Hartmann 1838, columns 975-985 and 1017-1023. Also Karmarsch & Heeren
Campe’s claim thus follows the notion of a decisive cut induced by the invention of industrial machines like the mechanical loom in 1825, which is exactly what Blumenberg rejects in his work. To him, the potential of industrial utilization is a late and secondary trait. “The characteristic of natural being, namely carrying the principle of its design and function in itself, is transposed consequentially to the field of the technical work.”\textsuperscript{33} In the word ‘transposed’ we may recognize the ‘transfer’ of the metaphor.

For Campe’s claim, that Blumenberg sees metaphor as a question of technology, it does not matter if we see half-stuff as a textile semi-paper-product belonging to a long history of paper manufacture or as an exclusively industrial term. But it matters for the approach presented here that takes textile terms seriously. Usually, textiles are taken for granted and not considered important for the way we make things today not to mention the way we think about this making. Some further cases might show how this affects our reading of textiles and textile production.

**Outsourcing textiles from intellectual history**

Pherecydes of Syros (6th century BCE) was one of the first to write down his ideas of the generation of the cosmos.\textsuperscript{34} In his account (fr. 68 Schibli = DK 7 B2 = KRS 53), the god Zas (Zeus) weaves fabric representing the cosmos for Chthonie as a geras, a matrimonial gift.\textsuperscript{35} Pherecydes, though writing his cosmology in prose, is not counted among the early cosmologists because weaving is taken as mythical content. Where the column drum of Anaximandros\textsuperscript{36} might be addressed as a rational idea and the first scientific explanation of the cosmos, the loom of Zeus is taken as a myth or not mentioned at all.\textsuperscript{37} However in Pherecydes, weaving refers to the production of the cosmos and might well provide the technological backdrop of the question of how the cosmos is made and what its inner construction is like. Pherecydes, Anaximandros, the Pythagoreans and the atomists answer the same question, only the technologies are different: weaving, architecture, arithmetic and a behaviour of tiny particles (atoms). In this chapter, we object to the tradition that considers weaving as a mythical or metaphorical answer to the question of the order of cosmic composition.

The Pythagorean answer to the inner structure of the cosmos, namely to call it a harmony of numbers, might illustrate another outsourcing strategy: the distinction between pure and applied science. This can be traced back to a quote from Plato’s *Statesman*, where knowledge is divided into disciplines such as arithmetic, which are “free from actions” (*psilai tôn praxeōn*) and “only provide insights” on one hand and, on the other hand, crafts such as carpentry, where the knowledge belongs to the action and together with it creates “bodily things” “that have not been there before” (258e). Unfortunately the young man named

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\textsuperscript{33} Blumenberg 2015, 29. In the original text: “Die Charakteristik des natürlichen Seins, daß es das Prinzip seiner Gestaltung und seiner Funktion in sich trägt, wird folgerichtig in den Bereich des technischen Werkes transponiert.”

\textsuperscript{34} For the tradition which makes Pherekydes the first Greek prose author see Schibli 1990, 2-4, who discusses the ancient sources (Theopompos *ap. D.L.* 1.116 and the *Suda*) also in relation to Anaximander’s prose book. Previous account of divine genealogies (e.g. Hesiod’s *Theogony*) were poetic ones.

\textsuperscript{35} We cannot deal at length with this example here. Cf. Schibli 1990, Harlizius-Klück 2004, 155-161; Scheid & Svenbro 1990, 63-67. Still today we refer to marriage as establishing a sort of fabric: ‘the holy bond of matrimony’.


\textsuperscript{37} See for example Algra 2001.
Socrates, to whom these words are directed in the dialogue, is not especially proficient in mathematics and meets his limits already when classifying squares according to the commensurability of the diagonal (266a). Therefore the interlocutor has to take a detour in order to exemplify the ideal of political knowledge to the young man: the paradigm of weaving. The statesman has to connect the brave and the tempered in fitting marriages, like the weaver connects threads to form a harmonious whole fabric.

Plato does not miss the chance to downsize the value of weaving. He says, you might as well, if nothing else is at hand, take “a quite minor example” (279a) like weaving, in order to correctly present what is to be recognized. He repeats this precaution doing his analysis of the presented example, saying: “No one in his right mind would ever consider the explanation of weaving for its own sake” (285d).

Descartes too, as already mentioned, is concerned with the distinction of proper reasoning and practical experience. Rule 10 of his famous rules for the direction of the mind states: “In order to acquire discernment we should exercise our intelligence by investigating what others have already discovered, and methodically survey even the most insignificant products of human skill, especially those which display or presuppose order”. Descartes prides himself of being born with an *ingenium* that finds evidence by its own means and needs no such detours. But he has to confess: “Still, since not all minds have such natural disposition to puzzle things out by their own exertions, the message of this Rule is that he must not take up the more difficult and arduous issues immediately, but must first tackle the simplest and least exalted arts, and especially those in which order prevails – such as weaving and carpet-making, or the more feminine arts of embroidery, in which threads are interwoven in an infinitely varied pattern. Number-games and any games involving arithmetic, and the like, belong here. It is surprising how much all these activities exercise our minds, provided of course we discovered them from ourselves and not from others.”

Scheid and Svenbro cannot be accused of having outsourced weaving from the scholarly discussion in *The craft of Zeus*. On the contrary: their impact on a serious investigation of weaving allusions in ancient texts cannot be underestimated. They call Plato’s weaving paradigm “the philosophical exegesis of ritual weaving” that is accompanied by or based on a myth expressed in a philosophical context. Myth here means a shared metaphor, a common knowledge, a figure of thought used by an entire civilization “without ever becoming fixed or dead”. Such a myth is thus generating stories and images, rituals and exegesis. Scheid and Svenbro conclude that “the fundamental gesture of weaving is this interlacing of the warp and the woof of which Plato spoke in The Statesman—an interweaving signifying the union of opposites”.

Scheid and Svenbro ground their investigation on “this clear gesture”: “To weave is to unite, to interlace, to bind: the act is so straightforward that it requires no explanation.” But already the statement that weaving thus is unlike sacrifice in which “to divide is to unite” shows the main problem of such an approach. Was it not Plato who called the shuttle an instrument of separation? And is there not a huge discussion about the translation of *kerkis* as shuttle in this passage, because it is not at all clear to us what using a *kerkis* (*kerkizein*) means?

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38 Descartes 1985, 35.
39 Scheid and Svenbro 1996. The French book is entitled *Le métier de Zeus* - with the double meaning of métier: craft and loom. Thus the title alludes to the fragment of Pherecydes mentioned earlier in this chapter.
41 Scheid & Svenbro 1996, 22.
46 Cratylus 436b.
We think that Plato actually far exceeds a mythographical exegesis and does not interpret the metaphor of a woven state. Instead, he describes a technological approach that he later addresses to the king as a valuable and necessary knowledge. Plato is interested in the genesis of the textile whereas Scheid and Svenbro concentrate on the product.

The guiding questions of our investigation follow the ideas outlined in this methodological introduction. To what question does the weaving allusion give an answer or provide a context or backdrop? What are the characteristics of the answer, not in terms of a common knowledge but in terms of the coeval technological knowledge? What happens to the allusion to weaving when we interpret it in terms of the principles of ancient weaving technology? And what is the idea behind intellectual production when it is compared with textile production?

**Differences in weaving technology**

A consequence of our diagnosis of textiles and weaving being taken for granted is to unsettle this assumption first and provide an overview of the specific technological and structural features of ancient weaving.  

We need to avoid discussing ancient sources with modern concepts and terms of textile technology in mind. The construction of a weave, at least since medieval times, differs considerably from that of antiquity. Furthermore, the general understanding of the development of weaving technology leads to the misconception that fabrics made on primitive devices must have been primitive themselves. However, the advantage of industrial looms is mainly an increase of speed and automation, and not necessarily an increase in complexity of the fabric produced.

Blümner, in his comprehensive overview of ancient crafts, argued that the weave shown on the loom behind Penelope on the Chiusi kyphos (fig. 1) could never have been woven on the depicted warp-weighted loom, which is far too primitive for such an elaborate work. The fabric must therefore have been embroidery. Such an explanation has a long tradition, in which patterned textiles, poikilia/poikilma, that are so frequently mentioned in ancient sources or depicted on vases, are conceived as embroidery. This makes them a superficial decoration. A deeper structural analysis is then obsolete and cannot contribute to the meaning of weaving metaphors.

However, in 1948, Wace presented a study that explains why in almost all cases where the verb poikíllō is used to specify a patterned textile, it must be translated, not by embroidery but weaving. The fact that needle and thread belong to the tools of the poikíltai (the persons who produce patterned fabrics) is no argument against weaving that is often done with needles or pointed instruments, especially tapestry. Gregory Nagy, when juxtaposing weaving and sewing imagery in archaic Greek poetry, states that “the second of the two is more complex than the first”. Therefore, in the language of poets, many and various fabrics of songs, each one already woven, become a single new continuous fabric “by being sewn together”.

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48 But we not only point to the differences. Still nowadays weaving has properties in common with the ancient technology, especially the dualistic character to which Scheid and Svenbro refer as opposites.

49 Skyphos, ca. 440 BCE, Chiusi, Museo Archaeologico Nazionale 1831. Fig. 1 shows a drawing from Furtwängler and Reichhold 1921, pl.142.

50 Cf. Blümner 1912, 158.


53 For a comprehensive discussion on this question cf. Droß-Krüpe and Paetz gen. Schieck 2015.

54 Cf. Nagy 1996, 65-66, with special reference to the poetics of *rhapsōidein* in the performance context of the rhapsodic contest. Nagy focuses on the rhapsodic *agon* at the Panathenaic festival in Athens: there the *rhapsōidoi* recited the Homeric epics in a fixed sequence, one taking up the narrative where the previous had left it (see also Nagy 2002, 42-46 with references to epigraphic and scholiographic sources, esp. Σ Pind. *N.*
times was far more complex than sewing and much better suited to integrate different types of fabric into a unified whole (see also fig. 8).

Weaving terms are usually approached on the basis of the garments we wear, the way we wear them and the way they are made today. Cloth is associated with a textile produced and traded in considerable length, then cut and sewn into shape. Such textiles have a neat outer side and rarely seen inner side. Their cut follows the shape of our body. We enter our clothes by putting head, legs and arms into holes and tubes. We buy our clothes already made to shape and do not see them being constructed. We also do not see the technology behind the production of the fabrics. It is common for modern consumers to see textile production as a simple, lowbrow, undemanding, insipid activity we do not have to do ourselves. The current trend is to buy lots of cheap clothes and discard them quickly.Acknowledging the complexity and effort of cloth production would give us an insight into the unfairness of the prices we usually pay.

In antiquity, garments were produced in almost every household; they were highly valuable and rarely cut and sewn. The most valuable ones were decorated while on the loom, woven into shape, and draped around the body. They had no inner and outer side and therefore designs could often be reversible. This might be the reason why painting and printing on fabrics is uncommon in antiquity, as preferred were those techniques with inverse, complementary or neat patterns on both sides. The shape of the garments does not follow the shape of the human body. It is not conceived as a second skin, and in draping such garments there are no holes or tubes to enter. In ancient times, textile production could be a task for highborn women and queens and even stand symbolically for the fabric of a whole polis like in the case of the peplos woven and offered to Athena Polias on the occasion of the Great Panathenaia of Athens. However, the most important difference between modern and ancient weaving is the way in which weaving begins. Fabrics from the warp-weighted loom in use in ancient Greece are made by first weaving a starting border: a band that carries the warp threads for the fabric and remains attached to the fabric. In Roman times, this way of making a warp was called ordior, and all words for order stem from this root.

Description of ancient weaving on a warp-weighted loom
In principle, weaving is the interlacing of two sets of yarn: a tensioned set of threads, set up first, constitutes the warp, while the threads introduced by interlacing constitute the weft. The device that provides the tension is the loom. The two principal possibilities of tensioning the warp used in antiquity are to stretch the threads by weight or to stretch them between two beams. In the latter case the beams might be placed parallel to the ground, which has advantages for implements like heddles. The preferred loom type used in Greece was the warp-weighted loom, the one we see on archaic vase paintings.

Before threads are attached to a loom to make a garment, many decisions have to be made to achieve the desired result: on yarn thickness, on quality and length, but also on details like the twist direction of yarn, the distribution of coloured threads, the number of threads

2.2). The so-called ‘Primark-effect’ proves this: where the proportion of household waste sent to landfill in the UK decreased nearly by a quarter within five years up to 2008, in that time textile waste has risen from 7% to 30% of total waste. Cf. House of Commons 2010, Vol I, 20; Vol II, Ev154 and n. 8.

Helen is weaving in the Iliad (3.125-27), Penelope in the Odyssey (2.94-95; 19.136-40). Girls from noble families start the weaving of the peplos for Athena at the Chalkeia in Athens (Burkert 1990, 40-59).


Cf. Skyphos from Chiusi (fig. 1), Plate from Cyprus, ca. 850-750 BCE, Collection of Antiquities, University of Bonn (Aspris 1996). Corinthian aryballos, ca. 600 BCE, Corinth Museum CP2038, and further examples collected in Hoffmann 1974, 297-307.
necessary to achieve certain patterns and complete pattern repetitions. The warp-weighted loom is set up with a defining feature that also allows and affords most constructive decisions to be made beforehand: the starting border. This is a band or cord that collects, orders, and distributes the later warp threads, which are fixed in the cord or band as a weft (figs 2 and 6).

**The starting border**
The starting border is a band with weft threads prolonged on one side and secured and ordered by chaining them in groups. Techniques for producing the band can vary. Sometimes the threads for the later warp are inserted into cords that later surround the fabric. Many archaeological textile finds have tablet-woven borders. The fact that these borders often shared the structure of the overall weave and were not sewn onto the fabric started the investigation of this technique by textile scholars at the turn of the 20th century. They concluded that the preparation tasks of sorting the wool, spinning threads of the right quality and spin direction, planning the integration of the tablet woven borders, and setting up the warp threads by producing a tablet woven starting border might have taken much more time than the weaving of the fabric itself.

**Setting up the loom**
The warp-weighted loom has two uprights with an upper horizontal cloth beam and a lower horizontal rod used for shedding. Once the starting border has the length that is required for the width of the later fabric, it will be attached to the upper beam of the loom. The weft threads of the band now serve as warp threads and are distributed and attached to the *kairos* and the *kanōn*es: the heddle rods.

In a tabby, one set of threads is laid in front of the lower rod (or *kairos*), the other half behind. Attaching loom weights provides the warp tension and leaning the loom against a wall at a slight angle produces a natural shed: the interval where the weft is introduced. A heddle rod to which the other half of the warp threads is tied, provides the countershed. In this form (with one heddle-rod) the loom is prepared for weaving tabby, but additional heddles make it possible to weave twills and satins.

**Weaving**
The range of possible techniques on the loom is wide, from simple tabby and twill to damask twills and other compound weaves like taqueté, but also tablet weaving, tapestry, flying needle, and brocades. In a tabby weave, the weft threads go over and under every second warp thread and the opposite way in the next row. It is the simplest form of a weave where every other warp thread is either attached to the single heddle rod (*kanōn*) or hanging in front of the bottom rod (*kairos*). Tabby therefore requires the threads to divide into odd and even numbered ones. The differentiation of odd and even, the division into back and front – this dualistic or dyadic principle of distinction is at the heart of the weaving process. To construct the weave, a weft thread is inserted into the shed that is formed by the distance of the *kairos* to the warp threads hanging vertically. Then the vertical threads are lifted towards the weaver by pulling the *kanōn* far enough to form the countershed where the next weft is inserted. Only this technique of alternation can produce a fabric, and the alternation of lifting and not-lifting the warp threads is as constitutive for the fabric as the alternation of thesis and arsis for poetry.

Regular alternation - + - + - + - +, a structure that gives tabby, is the basic but not the only method of generating fabrics. Several variations are possible like twills + + - + + - + + - ++

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61 Cf. Schinnerer 1895 as one of the first who published on sprang, tablet weaving, and nålebinding in archaeological finds.
- where the rule for the next row shifts by one thread: - + + - + + - + + - + +.\textsuperscript{62} Twill weave has weft threads going over more than one warp thread with a translation of one or more threads in every row. Twill can also be made in several number combinations by changing the direction of translation like in diamond twill.

Weaves can be open, with a considerable and balanced distance of threads in warp and weft direction, or have threads packed closely with only warp or weft threads visible (warp- or weft-faced fabrics). Tapestry is a weft-faced technique where weft threads do not reach over the whole width of the fabric but only as far as the colour is needed for the motif.

**Patterning a fabric**

Patterns on a fabric can already result from how threads cross, even if these threads do not differ in colour. Damask weaves use the change of two twill weave structures to achieve images that are visible because of different shades and shadows created by the change of structure. Furthermore, carefully planned weave structures can be combined with different colour distributions and interweave to create a visual pattern that is difficult for laymen to predict and appears like a wonder to see.\textsuperscript{63}

Figured motifs on bands can be made by double-face tablet weaving (fig. 2). One of the less demanding techniques for inserting pictures in a weave on the loom is supplementary weft patterning\textsuperscript{64} which uses an additional coloured weft thread that only shows where the design is meant to be but otherwise runs on the reverse side of the fabric. The fabric then shows complementary pictures on both sides.

Tapestry remains are rare among textile finds in Greece, but the few we have demonstrate a highly developed craft.\textsuperscript{65} Literary sources often mention figurative weaves\textsuperscript{66} and vase paintings show figured garments (see figs. 1, 3, 4 and 7), the depiction of Penelope’s web on the skyphos from Chiusi is among the most famous. In Homer’s works, patterned cloaks called diplax\textsuperscript{67} are mentioned, a word that is sometimes translated as ‘double weave’. Double weave is made out of two warp and weft systems on one loom, producing two fabrics that exchange in order to produce a pattern (see fig. 2). It also has then the reverse pattern on the reverse side of the fabric as with supplementary weft patterning and double-faced tablet weave, a reversion that seems to be a favoured style in archaic times.\textsuperscript{68}

**Composing a fabric**

The warp-weighted loom is a very flexible device. The weaves that are produced can be rearranged when in progress: it is possible to detach and rearrange the weights at any time, to change the direction of the warp, to change the heddles and the rhythm of warp-lifts, and to combine different types of weave.\textsuperscript{69} Such a combination of different bands within one weave is unusual to us today. However, it may explain a literary epigram where several girls

\textsuperscript{62} For the similarity of weaving structures and meter in poetry cf. Nosch 2014, 94.

\textsuperscript{63} Cf. Harlizius-Klück 2015b on the meander pattern depicted on a funeral plate by Exekias, figs. 45.5-45.9.

\textsuperscript{64} Cf. Barber 139-40, 359 (footnote).

\textsuperscript{65} For example the extraordinary tapestry from the tombs of Vergina, dated to the 4th century BCE, cf. Spantidaki 2014, 37-38; or the trousers from Sampula, cf. Wagner et al. 2009.

\textsuperscript{66} Cf. Homer, Iliad 3.125-27; Ovid, Metamorphoses 6.53-82.

\textsuperscript{67} Iliad 3.126; 10.133; 22.441; Odyssey 19.226; 19.242.

\textsuperscript{68} The effect of reverse design that comes naturally with this weaving technique also came up in bilingual vase painting where the black figured and the red figured technology meet on one vase. For these vases the question has been posed how it was possible to design the same motif in reverse on both sides as the artists can never see both sides at once (cf. Cohen 2006, 29). This pottery technique is difficult to master and only occurs within a limited time span. In weaving, however, the reverse double depiction is an immediate result of the weaving technology and produced in one go (cf. Harlizius-Klück 2016, forthcoming).

\textsuperscript{69} This was crucial especially for Ellen Harlizius-Klück’s reconstruction for the Chiusi fabric (cf. fig. 2), where the weft threads of the short and narrow starting band are also the warp threads of the figured band, but in respect to the whole weave, they run again in weft direction. Cf. Harlizius-Klück 2015a.
weave hems for a fabric - and these are probably starting borders or vertical continuations on the selvedge. The poem, by Antipater of Sidon (AP 6.287), reads:

Artemis, fairest of virgins, sovereign lady of women
We three wove (hyphēnameatha) this border (pezan) for thee.
Bitie wrought (kame) the dancing girls
And the crooked stream of winding Maeander.
Blonde Antianira devised the decoration (kosmos)
That lies on the left side of the river,
And Bition that on the right,
Measuring a span and a palm.\(^\text{70}\)

**Principles of ancient weaving**

From the description of weaving on a warp-weighted loom we wish to stress three main concepts: 1) the ordered beginning or ordering border, 2) the dyadic structure and 3) the (ordered) composition of elements.

**The ruling border or (b)order as beginning**

The starting band or border is the most distinct feature of this type of weaving and probably evoked analogies of weaving with plotting and planning.\(^\text{71}\) It provides the preliminary operation of ordering a textile by a band that predicts the measure, and often the quality, density, and the numbers of warp threads for the whole weave. Consideration for fitting patterns therefore begins with the starting border. At this stage two main choices must be correct: the distribution of colours and the divisibility of the total number of warp threads. If the latter were a prime number, no pattern repeat would ever fit. Knowledge of divisibility rules and number features such as odd, even, prime, relatively prime and knowledge of least common multiples and greatest common divisors was necessary to weave the elaborate patterns we see in the visual representations.

**Dyadic structure**

Another concept implied in the starting border is the dyadic structure that not only applies to the difference of warp and weft, but also of odd and even numbered warp threads.\(^\text{72}\) This enables an easy distribution of the threads on the heddle rods – the kairos and kanōn. In the case of complex textiles, this pre-order by the band might involve arithmetical classifications that are much more complex.\(^\text{73}\)

The dyadic arithmetic that is grounded on just these features of odd and even and handed down to us in Euclid’s *Elements*\(^\text{74}\) is traced back to the Pythagoreans, who thought that the universe was fitted together (ararisko) by harmonies of integers.\(^\text{75}\) Becker, in his investigations of Pythagorean arithmetic, repeatedly stressed that the concept of number in ancient Greece resembled a pattern, a structure of elements, a texture, and that this textural aspect was the basis of the Pythagorean idea of the relationship or even kinship of things and numbers.

“What is called ‘number’ (*arithmos*) here obviously is a ‘counted number’, i.e. something counted or countable, to be precise: a multitude or texture of discrete (not continuous) sort that may be described by one or more numbers. […] One should remember the etymology of the word ‘*arithmos*’ that stems from ‘*ararisko*’, ‘I join’,

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\(^\text{70}\) Text and translation: W.R. Paton 1916 (Loeb).

\(^\text{71}\) Cf. Nosch 2014, 93.

\(^\text{72}\) Cf. Tegle find in Rosenfeld 1958, 12; also Hoffmann 1974, fig. 69, p. 153.

\(^\text{73}\) Cf. Rosenfeld 1958, 149-171.

\(^\text{74}\) Books VII and IX of the *Elements* contain parts of an ancient arithmetic that is called theory of even and odd. Cf. Heath 1908; see also Harlizius-Klück 2004, 47-64.

and indeed in its original sense means ‘fugue’ (‘Gefüge’). A sense for this tangible patterned character, for this structure of the primordial number that is not applicable to anything and everything, but sticks to certain objects, is still alive in Aristotle. How much more with the Pythagoreans and also Plato! Beginning with this tangible, primordial, if you like primitive number concept, the Pythagorean thesis is much more understandable. ‘Number’ denotes something like a particular arithmetically describable structure inherent in things and constituting their proper nature. However, this ‘structure’ according to the Pythagoreans is not an arrangement of something else which is a proper reality, but an autonomous framework that carries the things or, so to say, keeps them together from inside.76

And Becker goes on saying that “mathematical structures thus only become particularly mathematical ones insofar as this structure of things is prescinded, isolated, and detached from its original context as soon as the observing person is mathematician; a detachment that is explicitly called ἀφαίρεσις, abstractio.”77

Dyadic arithmetic was not part of the common everyday practice of architecture, astronomy, nor mercantile counting. The concrete value of integers is absent, and arguments concerning geometrical magnitudes “are expressed in the language of ratio and proportion, without assuming any numerical values”.78 To distinguish numbers as odd or even and explore the properties that are generated by combining them79 is not a very demanding task for a mathematician, but finding numbers of threads that satisfy such required conditions is exactly what the weaver does when s/he plans the pattern. Textile craft is hardly ever considered in the works of historians of mathematics80 and other crafts that require such a type of arithmetic are not at hand. Therefore historians instead argue that dyadic arithmetic was an invention serving as argument in philosophy and providing a logical classification method.81

Mathematically it is possible and satisfying to attribute such abstract features as odd or even to a “concern with the generality of proof”.82 However, we propose to relate this way of thinking about numbers to a practice that is itself concerned with generality, though not with the generality of mathematics, but rather the practice of setting up a loom for weaving patterns. Some mathematical terms still show that threads and loom parts were connected to practices of measuring and ruling. The word ‘line’ shows its origin from the ‘linen’ thread via Greek linon and Latin linum. Radius was the Latin word for the shuttle, later also denoting the compasses. The weaver is constructing figures with radius and regula, just like the geometrician with compass and straightedge. Regula, the ruler or straightedge, kanōn in Greek, denotes the heddle-rod that controls the regular repeat of the pattern.

Ordered composition of elements

Woven ornaments are not just a question of filling frames, but a question of ordering the elements or atoms of the weave, namely the threads. Every geometric motif has to be transformed into a ratio of thread numbers that are positive integers. The tools for the construction of repeats fitting into the frame provided by the starting border are the least common multiple, the greatest common divisor, and especially all theorems on divisibility

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78 Saito 2009, 804.
80 This is changing since ethnomathematics established itself and the analysis of Peruvian khipus showed that, at least in some non-European societies, textile structures are strongly connected to mathematics. See Urton 1997 and Brezine 2009.
82 Saito 2009, 805.
that we find in dyadic arithmetic. The so-called Euclidean algorithm is the way in which weavers would test the repeatability of a pattern in a fabric to weave. Because of the structure of weaves, geometrical problems have to be solved by arithmetical consideration, and the separation of proportion theory into a geometrical and an arithmetical one might have its origin here. Woven geometry is, so to speak, a tacit visual algebra.

**Figured friezes and doubled squares**

When we see complex fabrics like the ones on the François Vase (fig 3, 4 and 7) we now know that the woven parts need not be sewn together but can be integrated on the loom. The krater shows not only plain fabrics and figured friezes as fabric decoration, but also patterns based on a repeating diagram with a square in a square (fig. 4). The basic outline of this diagram (fig. 5) can be easily explained as a depiction of broken diamond twill, a pattern that is not difficult to weave and the frequency of its occurrence on vase paintings would testify to this. What makes this diagram interesting for our discussion is not the question how it was made, but the fact that it poses special problems for the practices of counting and measuring and hence for the development of ancient mathematics. It is the diagram which Plato used in his famous ‘lesson on geometry’ and which underlies the important proof of the incommensurability of side and diagonal in a square (a proof which is deemed to be at the beginning of deductive mathematics); the diagram that Plato/Socrates employs when he wants to test his interlocutor’s ability of philosophical thinking, for example in the *Statesman* dialogue, well-known for the central role played by the weaving paradigm. Incommensurability in this diagram means that the relation between the length of the diagonal in the square and the length of its side cannot be expressed by integers (whole positive numbers). But if weaving means to construct a diagram from a countable number of elements, namely the threads, why can such a diagram be woven?

The way we have to look at such elaborately depicted patterns is determined by Socrates in the Republic as follows:

> Then, said I, we must use the blazonry of the heavens as patterns (τῇ περὶ τὸν οὐρανὸν ποικιλὰ παραδείγματα σχηματίζει) to aid in the study of those realities, just as one would do who chanced upon diagrams drawn with special care and elaboration by Daedalus or some other craftsman or painter. For anyone acquainted with geometry who saw such designs would admit the beauty of the workmanship, but would think it absurd to examine them seriously in the expectation of finding in them the absolute truth with regard to equals or doubles or any other ratio.

We think it is misleading to take this quote at face value. Plato’s *Statesman*, if we investigate the dialogue carefully, shows that the argument leading to the determination of the statesman’s knowledge builds upon the substitution of mathematics by weaving. In that dialogue Plato (respectively the Stranger as leader of the conversation) divides all sciences (epistēma) into two classes: pure and applied (258c). To him, the arithmetic of odd and even numbers or dyadic arithmetic is pure, and craft is applied science (258d-e). In the dialogue,

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83 Barber suggested that figured friezes were made in tapestry technique and this indicates that the whole fabric is tapestry. Cf. Barber 1992, 360-65 for a detailed discussion of figured cloth in ancient Greece. Ellen Harlizius-Klück’s experience, moreover, is that combination with tablet weaving and other band weaving techniques is possible and often also suitable for figurative weaves.

84 See the peplos of the dancing girl on the left of fig. 4.

85 Another famous example is the peplos of Athena on a bilingual amphora by Andokides, ca. 520-510 BCE, Collection of antiquities, Munich, 2301.

86 *Men.* 82a-85b.


88 *Statesman* 266a-b.

a nameless stranger from Elea is talking with a young man called Socrates and tries to describe the *epistēmē*, the science, knowledge, or art of a true statesman. It turns out that the statesman has to compose a state by “royal weaving” (310e) that connects the citizens harmoniously.

It is hardly ever noticed that weaving serves here as a replacement for a pure science that goes beyond the understanding of the young man who is involved in the dialectical conversation: Socrates (not the philosopher, who instead listens to this conversation without interrupting) is asked to classify living beings by comparing the number of their feet (two or four) to the ratio of diagonal and area of a two-foot-square or a four-foot-square (266a-b). The crucial point is to test Young Socrates’ knowledge of incommensurable quantities and the way in which they can be related. Doubled squares are the best examples for incommensurable relations: the ratio of side and diagonal cannot be expressed by a ratio of integers (which is incommensurability by definition). The Greeks called this ratio *alogos*, ‘unspeakable.’ The only possibility to describe it was to give a proportional equation: an *analogia*, which is the Greek mathematical term for such equations of ratios. The unspeakability of incommensurability can only be discussed by analogies and this mathematical knowledge on incommensurable quantities is what the young interlocutor fails to master.

The doubled square is used in the mathematical proof of incommensurability, which was handed down to us in the famous *Elements* of Euclid, written around 350 BCE. It is a proof that is based on the definition of odd and even numbers in dyadic arithmetic, Plato’s example of pure science. Hence, the diagram of the doubled square we see so frequently depicted as a fabric pattern is at the heart of the revolution in Greek mathematics, however no diagrams are presented in the ancient texts of Plato and probably also not in Euclid. The first mathematical diagrams we know are from Aristotle.

The diagram depicted on the aforementioned plate from Cyprus showing a patterned fabric on a warp-weighted loom is dated to ca. 850-750 BCE. As woven patterns, the depicted geometrical shapes are constructed by ratios of countable elements (the threads). If we take the date of the plate as *terminus ante quem*, this construction predates the arithmetical and logical reasoning and proofing of the geometrical properties by almost 500 years. For such reasons weaving can truly be addressed as an intellectual activity prefiguring concepts of mathematical order.

**Technology into words**

Turning into matters of early Greek literature, we set up to trace the ordering concept of the starting border as ‘embedded’ in key terms of archaic poetics. When looking at the semantics of such terms, their roots in textile technology seem to be reflected by two orders of factors: a) etymological derivation, with cases of popular etymology providing good evidence for the spread of certain conceptual associations, and b) the function they fulfil within the poem as both structural and performative principles.

In the scholarly debate to date, weaving imagery in ancient cosmogonies and the poetic exploitation of textile crafts as metaphors for the representation of man’s fate, human

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91 According to Heiberg, this proof is older and Euclid is not its author. It therefore does not occur in the English edition of Euclid’s text, but only in the introduction to book X by Heath; cf. Heath 1908, Vol. III, 2.
92 Cf. Szabó 1978, 94.
93 The oldest extant diagram stems from a manuscript found at Oxyrhynchus and was dated to 75-125 CE, cf. Turner 1987. Today the papyrus fragment is in the Museum of Archaeology and Anthropology, University of Pennsylvania, E2748.
cunning intelligence,96 and the process of song-making in archaic Greek literature, have been studied and interpreted either through a historical-anthropological approach, or with the tools of comparative linguistics. In a reference study on the topic, textile imagery has been traced back to the pervasiveness of the ‘myth of weaving’ as interlacement of opposites in Greek (and then Roman) culture.97 With a different focus, it has been considered a linguistic and literary inheritance from the wider Indo-European substrate, where, within a rich repertoire of craftsmanship metaphors, it seems possible to account for a special significance of weaving and spinning imagery to describe poetic composition and the making of fate by the gods.98 In a number of cases, in fact, a more attentive look at the material and technological facts at the root of textile metaphors featuring in archaic Greek literature provides satisfactorily explanations to obscure images,99 and it can help explaining the semantic stretch which generates figurative, abstract meanings from words originally designating realities and implements of weaving.100 As an instance of this, a number of adverbial expressions built on textile terms seem to point to the relevance of concepts of ancient textile technology in shaping and producing ideas of order and spatial/temporal relations.101

Onians’ rich discussion of πείρας (plur. πείρατα) – which in LSJ9 has the primary abstract meaning of ‘end’, ‘limit’, and a secondary material meaning of ‘tackle’, ‘rope’ – has outlined a major semantic value of the term, which is grounded on the materiality of textile crafts (binding, plaiting, spinning and weaving): the literal and concrete sense of ‘bond’ – and, depending on the context, ‘band’, ‘knot’, ‘rope’, ‘loop’, ‘boundary’, ‘edge’, ‘zone’, and even ‘weft threads’ – clearly emerges from a variety of passages that invite a literal, rather than

96 Cf. Nicole Guilleux’s chapter in this volume. See as well Berggren 2008, 1-5 on the pre-Platonic tradition of transformative intelligence or mētis that is “fundamental to every techne” and connects the female art of weaving to language and the construction of truth. On the weaving of mētis as a narrative device in the Odyssey, see Slaktin 1996, 234-238. For the particular associations of mētis, weaving and feminine poetics in the Odyssey see Clayton 2004, 21-35.

97 See the methodological remarks in the introductory chapter in Scheid & Svenbro 1996, 1-5 on their use of the concept of ‘myth’ (rather than ‘metaphor’) as a “figure of thought” (p. 2).


99 Onians 1951, 303-309 is able to explain the phrase, recurrent in Homer, that the fate of man (and many other kinds of issues), ‘lies on the knees of the gods’ (θάνον ἐν γονόν κατατείχα) by looking at the ancient method of spinning where part of the process was done on the knees while sitting; the phrase occurs at Il. 17.514, 20.435 and Od. 1.267, 400, 16.29.

100 In a book-length discussion of syllepsis in Pindar, Gallet 1990 has argued for the original identity of the abstract term καιρός (‘due measure’, ‘critical time’, ‘opportunity’) and the weaving implement κατάρος (which he identifies with the ‘chained spacing-cord’, according to the definition by Hoffman 1974, a device which keeps separated the even and odd threads of the warp and is located on the lower part of the warp-weighted loom), and applied this insight to a number of passages in epinician odes where καιρός conveys important statements of poetics: it emerges that the abstract term, which derives its conceptual domain from the function performed by the κατάρος, expresses the orderly interlacing of themes within the structure of the Pindaric poem. The semantic stretch from a material, textile related meaning to an abstract one for the term καιρός/καιρός was first proposed by Onians 1951, 343-348, who identified καιρός with the opening (‘shed’) produced by the heddles in the warp.

101 While expressions such as κατά μιτόν (lit. ‘thread by thread’, fig. ‘in due order’) point both to the subtlety of an argument and to the unbroken sequence of facts in a historical narration (cf. e.g. Pherecr. 156.7 PCG and Plb. 3.32.3, on which see Durante 1976, 174), the case of adverbial phrases built on kairos (e.g. ἐς καιρόν, κατά καιρόν, πρὸς καιρόν ‘at the right time’, see LSJ9 s.v. III b.) draws on the term’s traditional usage in the sense of ‘critical time, opportunity’, developing from the spatial sense of ‘due measure, proportion’ (see Ford 2002, 16-22 on kairos as a key concept of archaic poetics and aesthetics, indicating appropriateness).
an abstract or metaphorical, reading. The meaning of ‘weft threads’ is by Onians attributed to *peirata* in a passage whose literal meaning has troubled interpreters. In Pindar’s first *Pythian* (81-82), a gnomic sentence on epinician poetics opens the fifth strophe:

καρόν ει φθεγγαίο, πολλόν *πείρατα* συντανύσαις
ev βραχεί, μείων ἐπεται μόμος ἀνθρώ-
πων

If you should speak according to (the function of) the καίρος, keeping many weft-threads
in tension in a short length (of warp) [or (fig.) ‘with the texture of your speech tightly-woven’],
less criticism follows from men.

The occurrence of both *kairos* and *peirata*, and the fact that the latter is the object of the hapax *συντανύω* (“to stretch so as to join together”), which points allusively to the Homeric τανύω (in turn used in a description of weaving in *Il*. 23.761), invites a literal and ‘textile-based’ interpretation of these lines. This adds a subtler layer to the obvious figurative meaning of the gnome (“if you should speak to the point by combining the strands of many things in brief”).

When considering the attestations of the term, we propose to think of *peirar* as a starting border spanned out at the upper beam of a warp-weighted loom with the loops of warp threads integrated and the warp threads distributed alternately in front or behind the shed bar or *kairos* (fig. 6). This would in turn help explaining the similar semantic stretch of Latin *ora* as both ‘cord’ and ‘edge’. The starting border can be just such a cord that in the end of the weaving process surrounds the whole weave. In between, using the heddles in order to provide the shed for the weave, the warp ends that are part of the band as weft loops cross over again and again. The two systems of threads spread out from, and are alternately ordered and tensioned by, the starting band. (fig. 6).

In the remainder of this chapter we will argue (first) that the structural pattern of borders as an ordering principle invests early Greek views of an ordered *kosmos* surrounded by encircling bands/bonds; (second) that the poetic artefact is similarly conceived of as an ordered *kosmos* of words (though not necessarily in terms of textile imagery: cross-craft metaphors seem to play a role here); (third) that the poem, as mirror image of the physical *kosmos*, is in turn framed by borders, which take the shape of ring-structures; finally, that the semantics of a few key terms of archaic poetics, and their phenomenology and function are grounded in the technological principle of the starting border of the weave.

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102 Cf. Onians 1951, 310-17. In a monograph entirely devoted to the term, Bergren 1975, 153 proposes as the concrete meaning of *πείρατα* ‘boundary lines’, and ‘determinants’ as the abstract; for a detailed criticism of Onians’ investigation of *πείραρ* see Bergren 1975, 170-180.

103 This meaning of the verb is suggested by Bergren 1975, 153.

104 Translation in brackets: Race 1997 (Loeb) modified. Onians 1951, 338-340 discusses briefly the passage. Bergren 1975, 148-162 and Gallet 1990, 103-115 offer rich and thorough discussions of this gnome and of the implication of Pindar’s statement of poetics within the structure of *Pythian* 1. Interestingly, the weaving connotation of πολλόν *πείρατα* συντανύσαις εν βραχεί had already been noted by the scholiast (157b Drachmann): ἡ δὲ μεταφορὰ ἀπὸ τῶν δικτύων (“the metaphor is taken from the nets”).

105 That the meaning of ‘starting border’ can encompass occurrences, like the passage from the first *Pythian*, when *πείρατα* designate ‘weft threads’ is a consequence of an important technological principle of the starting border: this, being a border/band, always includes the weft threads.

From cosmology to poetics: earth-encircling bands and the ‘kosmos of words’

To investigate the role that weaving technology seems to play in providing a model for cosmological structure we need to recall πείρατα.\(^{107}\) In particular, we shall refer to occurrences of the term that attest to the significance of the idea of cosmological (and therefore physical) bonds and bands encircling the universe; \(^{108}\) to the same semantic constellation of πείρατα we would refer in turn the conception of the ‘binding’ of the gods. \(^{109}\)

When looking at different cosmological conceptions such as, among the Presocratic philosophers, Parmenides’ and the Atomists’ (Leucippus and Democritus), \(^{110}\) what strikes one is the recurrent image of something encircling and enveloping the cosmos – in a fashion which seems to suggest an analogy with the function of the ordering border in weaving. In the poem of Parmenides (28 B 8.26-31 DK = 298 KRS) we encounter again πείρατα, occurring twice in association with δεσμοι (‘bonds’) in a passage describing the conditions by which έον (lit. ‘what is’) is unchangeable: it is said to be “immovable in πείρατα of huge bonds” (άκινητον μεγάλον ἐν πείρασι δεσμῶν, 26) and held by “strong Necessity in bonds of the πείρατα which encloses it around” (κρατερὴ γὰρ ἄνάγκη πείρατος ἐν δεσμοῖσιν ἔχει, τὸ μὴ ἀμφότερον ἔργαλον, 30-31). \(^{111}\) The conception of the supreme power of Necessity, common to the Orphics and the Pythagoreans as well, is here associated with the idea of peirata binding the kosmos. It is thus tempting to establish a further relation, on the ground of textile terminology as a vehicle of cosmological realities, with Plato’s image of the spindle of Necessity (Ἀνάγκης ἀτράκτος, Rep. 616c).\(^{112}\)

\(^{107}\) The relationship between the two forms of the term is generally considered a diachronic one, πείρατα being the older (mainly Homeric) form.

\(^{108}\) An instance of such a view emerges in the widely-spread image of Okeanos as a river surrounding the earth (evidences from Homer, Hesiod, the Orphic hymns and later authors are collected in Onians 1951, 315-317 and Kirk, Raven & Schofield 1983, 10-17). See e.g. Hom. II. 14.200-201 ἡμι γὰρ ὄρμην πολυφόρου πείρατα γαίῆς / Ἑκατόν τε, θεῶν γένασιν, καὶ μητέρα Τηθῶν (“For I am going to visit the bonds of the all-nurturing earth, and Oceanus, from whom the gods are sprung, and mother Tethys”), where Okeanos and his wife Tethys “are clearly conceived of as not as parts of the earth but as distinct beings encircling it” (Onians 1951, 316). Text and translation of Homer (here modified as to account for the material meaning of πείρατα) used in this chapter is taken from the Loeb edition: for the Iliad, translation by A.T. Murray, revised by W.F. Wyatt (1924 II. 1-12, 1925 II. 13-24); for the Odyssey, translation by A.T. Murray, revised by G.E. Dimock (1919 Od. 1-12, 1919 Od. 13-24).

\(^{109}\) Which Onians 1951, 331 sees as “a literal description of an actual process, their mode of imposing fate upon mortals, a religious belief and not a metaphor”: this seems to force the evidence, and we would rather endorse the more balanced view offered by Lloyd 1966, 192-193, who remarks that “[T]he spinning, weaving and binding of the fates is a fiction or a myth in the sense that it is imagery, even if it was anything but fictitious in the sense of false for the ancient Greeks who were convinced, or assumed, that this was indeed the way in which fate worked.” Onians proposes for the formulaic phrase (τονί οὐλόθροο πείρατ’ ἐφάπαξ (usually interpreted as “the ending/consummation of death is hung over someone”) a reading of peirata as ‘bonds’ or ‘bands’ of fate fastened upon someone, just like in the case of the peirata that bind Odysseus to the mast in Od. 12.51 (here the verb is another compound of ἐφάναι, ἐφάπαξ). While πείρατα is always qualified by a genitive often indicating ‘ruin’ or ‘misery’, these very words (οὐλόθροο and ἐφάπαξ) appear as objects in the formulaic Homeric phrase for the gods’ spinning of men’s fate (θεοὶ ἐπάλκοσκοιν): Onians points this out so as to suggest that πείρατα itself indicates a product of spinning, and that “the same fortunes which the gods spin for men, they also fasten upon them in the form of a cord or bond” (p. 335).

\(^{110}\) For a recent overview on the question of the relative chronology of Leucippus and Democritus, and their respective contribution to the atomic theory (in both ancient doxographic accounts and modern scholarship) see Graham 2008, 333-352.

\(^{111}\) Translation Onians 1951, 332 modified.

\(^{112}\) Here we are drawing on Onians 1951, 332, who does not include the Atomists in his discussion. Interestingly, the πείρατα of Parmenides’ 28 B 8.26-31 DK are taken as metaphors by Kirk, Raven & Schofield 1983, 253-254, who translate the term as ‘limit’ and note that “[T]he notion of limit Parmenides is employing here is obscure”. Tarán 1965, 115-118 discusses the occurrences of πείρατα/πείρατα in fragment 8 (13-15, 26-27, 30-31, 37-38, 42-43, 49) as being metaphorical rather than referring to a material reality. Mourelatos 1970, 26-29 and 32.9 sees in Parmenides’ use of πείρατα, which he interprets (after Onians) as referring to the ideas of ‘bond’,
In two different accounts of the Atomists’ conception of the formation of worlds through atomic conglomerates — where the isolated atoms form a vortex, become entangled, and make a spherical structure — it is reported that a membrane (ὑμήν) or, alternatively, a circular χιτῶν (‘cloak’) encloses the atomic congregation forming a kosmos.

Λευκίππος καὶ Δημόκριτος ἱμίνα’ κύκλῳ καὶ ὑμένα’ περιτείνουσι τῷ κόσμῳ διὰ τῶν ἁγκιστρειδῶν ἀτόμων συμπεπλεγμένον.

Leucippus and Democritus envelop the kosmos in a circular chitōn or membrane, which was formed by the hooked atoms becoming entangled.\(^\text{114}\) (Aetius 2.7.2 = 564 KRS)

The idea of kosmos as a structure ordered by encircling textiles finds application not only in regards to the complex and harmonious arrangement of elements that constitutes the physical world. Poetry is similarly conceived of as a kosmos epeōn (‘kosmos of words’), an elaborated verbal construction that is the result of highly-developed technical skills and that displays in its inner structure unity, coherence and proportion. Such a view of poetic ‘composition-and-performance’ as craft has been positioned within the archaic Greek view of poetic activity as mimesis: poetry-making is seen as an imitation of nature, human life and previous poetic models.\(^\text{115}\) A brief survey of the relevant passages and their contexts will help ground our discussion of a further aspect conveyed by the term and concept of kosmos in both cosmological accounts and archaic poetics.\(^\text{116}\)

Given that it is among 5th century BCE thinkers that we find the conception of kosmos as an orderly structured world,\(^\text{117}\) it is probably no coincidence that Parmenides and Democritus are among our sources for the kosmos epeōn phrase. When the unnamed goddess of Parmenides’ poem has completed her discourse on truth (ἐν τῷ σοι παύω πιστὸν λόγον ἠδὲ νόημα / ἀμφὶς ἀληθείας 28 B8.51 DK),\(^\text{118}\) she introduced her subsequent cosmological account as informed by δόξα βροτείας (‘mortal opinion’).

(…) δόξας δ’ ἀπό τούτων βροτείας μάνθανε κόσμον ἐμὸν ἐπέων ἀπατηλῶν ἀκούον.

henceforth learn the beliefs of mortal men, listening to the deceitful kosmos of my words (28 B8.51-52 DK)

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\(^{113}\) “band”, ‘bound(s)’ usually associated with the Fate and Ἀναγκη, a peculiar characteristic of “Parmenides’ polymorph deity”, and he concludes that (p. 28) “[It] is probably correct to visualize the polymorph deity as engaged in ‘binding’ with every occurrence of the word πεῖρας in the text.”

\(^{114}\) It is interesting to note that the final participle συμπεπλεγμένον has a clear textile connotation, deriving from συμπλέκω which means ‘to plait, interlace, weave together’.

\(^{115}\) The poetics of mimesis as reflecting the concrete ways and processes of archaic poetic composition and performance has been theorized by Gentili 1990, 50-60.

\(^{116}\) In surveying the few extant occurrences of kosmos epeōn, it will be apparent that the phrase aligns itself with formulations of archaic poetics that describe and conceptualize song in terms of craftsmanship; in this regard, no special association with weaving imagery emerges in the texts: in fact, it is the transferring of the idea of an ordered kosmos to the song/poem that interests us here.


\(^{118}\) “Here I end my trustworthy discourse and thought concerning truth”.

18
The analogy between this *kosmos*, that we interpret as referring to the ordered structure of Parmenides’ cosmological hexameters,¹¹⁹ and *kosmos* as the ordering of the physical world, is marked in the poem by the compound term *diakosmos* (l. 60). This word moreover indicates the balanced arrangement of the two fundamental cosmic forms (μορφαί l. 53), ‘light’ and ‘night’, from which all other things derive.

The verbal richness and unity of Homer’s poetry are referred to as *kosmos epeōn* in a statement by Democritus:

'Ὅμηρος φύσεως λαχῶν θεαζόσης ἐπέων
κόσμον ἐπετήνατο παντοίων

Homer, having been endowed with a nature that was sensitive to divine influence, built up a harmonious construction (*kosmos*) of words of every kind.¹²⁰ (68 B 21 DK = Dio Chrysost. *Orat.* 13.1)

The use of the verb *τεκταίνω* (‘to build’), a clear reference to the craft of carpenters, suggests that Democritus’ pronouncement on the orderly structure of Homeric poetry is in line with a further instance of the *kosmos epeōn*, one in which for the first time the difference between poetry and prose is explicitly stated.

Solon’s elegy *Salamis* (fr. 1-3 W.)² opens with a bold statement by the poet in the first person, who addresses his Athenian audience:

Αὐτός κήρυξ ἡλθὼν ἄρ’ ἰμερτής Σαλαμίνος
κόσμον ἐπέων ωθήν ἀντ’ ἄγορης θέμενος.

I have come in person as a herald from lovely Salamis, composing a song, a *kosmos epeōn*, instead of a speech.¹²¹

It has been suggested that with κόσμος ἐπέων Solon emphasizes the ordered and regular sequence of metrical units that characterizes the elegiac metre (as well as other stichic recited verses like hexameters).¹²² Because it points to facts of poetic structure in terms of regularity of orderly elements and metrical patterns, this explanation of the poetic ‘*kosmos* (made) of words’ has interesting implications for the argument that we are trying to build in this chapter. By pursuing the model of weaving in early accounts of the structure of both physical

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¹¹⁹ For Parmenides’ *kosmos epeōn* being ‘deceitful’ - *qua* a product of mortal opinion - see Kirk, Raven and Schofield 1983, 254; cf. also Mourelatos 1970, 226-227. Coxon 1986, 218 observes that “[T]he word (sc. κόσμος) is chosen for its aptness in relation to the διάκοσμος or ‘system’ which the ‘composition’ is to expound”.

¹²⁰ English translation: Brancacci 2007, 201, who places Democritus’ conception of the κόσμος ἐπέων in dialogue with Homer, Pindar, Parmenides and Solon (p. 203). Ford 2002, 169-170 has a fine discussion of this fragment, which he positions within what he calls Democritus’ ‘atomic poetics’, arguing that the reference to *kosmos epeōn* points here to the ability of Homer as “word-_constructor, not poem-maker” (170); this interpretation works well in the context of Democritus’ interests in matters of language, such as the construction of words through the combinations of syllables, or the explanation of Homeric ‘glosses’ (68 B 20a DK). However, for the present purposes we see Democritus’ *kosmos epeōn* in continuity with other instances of the phrase indicating the ordered structure of a poem.

¹²¹ The English translation of Solon is the most recent Loeb, by D.E. Gerber (1999).

¹²² Noussia 2001, 229-231 and Noussia-Fantuzzi 2010, 211-212, who provides a rich commentary to these lines and discusses at length the features of Solon’s *kosmos epeōn* which she understands as an “ordered sequence of words” (p. 212). Noussia points out that already in Homer we find *kosmos* in relation to the ordered structure of themes in a poetic performance: the adverbial phrase λίην κατὰ κόσμον “in exceedingly good order” (transl. Garvie 1994 *ad l.*) is referred to Demodocus’ song (and its complex arrangement of narratives) in *Odyssey* 8.489-491. Demodocus’ proto-kitharodic performance presents many interesting structural features: see the rich discussion in Nagy 2009, 313-349. In a chapter entitled ‘A *kosmos* of words’, Lewis 2006, 60-73 links κόσμος ἐπέων in Sol. 1-3 W.² to the ring structure of fr. 4 W.² in terms of patterns of thought.
and poetic kosmos, we look for concepts and patterns of ancient textile technology that are reflected at the level of structural features of archaic Greek poetry (arrangements of thematic sections, metrical patterns, performative sequences).

A fragment by Pindar (194 S-M), typically built on cross-craft imagery, offers an interesting variation on the kosmos epeōn phrase; the poet describes the meta poetic erection of a ‘building of song’:

κεκρότθηται χρυσέα κρησίς ἱεράιν ἀοιδαίς:
ἐὰν τειχίζομεν ὣ.den ποικίλον
κόσμον αὐθάνετα λόγων

A golden foundation has been wrought for holy songs.
Come, let us now construct a variegated (poikilon) kosmos of words (logōn) that is endowed with speech.\[^{124}\]

We have here a complex texture of images evoking architecture (τειχίζωμεν, κρησίς), the art of smith (κεκρότθηται), sound (αὐθάνετα) and the technique designated by the adjective poikilos, which is often applied to the textile craft in Pindar.\[^{125}\] The condition for composing a kosmos rests on the construction of the songs’ foundations, much like in the famous opening of Olympian 6,\[^{126}\] the beginning as a starting front of the poem bears a special relevance to archaic Greek poetics, in which it is possible to outline the traits of a ‘proemial function’ investing both the performative realization and the compositional structure of the poem/song.\[^{127}\] In this pattern of an ordering proem in poetry we recognize a declension of the weaving paradigm: at the level of ancient weaving technology, the beginning of the weave is the structural pattern ordering the whole of the fabric-to-be.

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\[^{123}\] A possible reason for the absence of epeōn here could be the fact that Pindar’s song is not made of ἔπεα (i.e. stichic verses), but rather of lyric unities and patterns.

\[^{124}\] The English translation: Race 1997 (Loeb) adapted. In particular, in the interpretation of the last line we diverge from Race as for the syntactical construction, and take the adjective αὐθάνετα as qualifying the kosmos of words as endowed with speech (for this meaning of the word see the Homeric passages collected in LSJ\[^{9}\] s.v.). We thank Douglas Cairns for suggesting this interpretation of the line to us. For a metaperformative reading of this fragment, as a selfreferential utterance on the beginning as a starting front of the poem bears a special relevance to archaic Greek poetics, in which it is possible to outline the traits of a ‘proemial function’ investing both the performative realization and the compositional structure of the poem/song.\[^{127}\] In this pattern of an ordering proem in poetry we recognize a declension of the weaving paradigm: at the level of ancient weaving technology, the beginning of the weave is the structural pattern ordering the whole of the fabric-to-be.

\[^{125}\] See e.g. another fragment, 179 S-M: ὑφαίνω δ’ Ἀμυθαονιδάσαιν ποικίλον / ἄνδημα (“I am weaving an elaborate (pattern woven) headband for the sons of Amythaon”), where ὑφαίνο seems in fact to replace πλάκιο (‘plait’), another favourite textile craft in Pindar’s repertoire of metaliterary metaphors (see Gallet 1990, 77-82): we would like to thank Douglas Cairns for pointing this out to us. Nagy 2009, 554-555 argues for systematic references to pattern weaving in the case of the series ποικίλος/ποικίλλειν/ποικίλλαμα. On poikilos see the remarks in Barber 1991, 359, and Wagner-Hasel 2000, 146-147, 162, 376.

\[^{126}\] “Let us set up golden columns to support the strong-walled porch of our abode and construct, as it were, a splendid palace; for when a work is begun (ἀρχημένου δ’ ἐργου), it is necessary to make its front shine from afar” (II. 1-4). On this opening, and in particular on the genitive absolute ἀρχημένου δ’ ἐργου see Hutchinson 2001, 377: “[The actual link is not with the order in which the builder would work but with the front as the beginning when one ‘reads’ or approaches the house”. Cf. Ford 2002, 124-125, who discusses both the incipit of Olympian 6 and fr. 194 S-M. Cf. Nagy 1990, 145 n. 45 on the semantics of kosmos; Nagy interprets Pindar fr. 194 S-M as depicting a chorus of Thebans that “is represented as if they were rebuilding the walls of Thebes, in that they are metaphorically ‘building the walls’ (τειχίζομεν) of the kosmos ‘arrangement’ of the words of their song (lines 2-3)” (p. 145).

\[^{127}\] See Aloni 1992 for a study of the ‘proemial function’ in archaic Greek poetry. Aloni notes that the main function of the archaic prooimion is to contextualize the song, making it suitable to the (cultic, sympotic, agonistic) occasion in which it was performed.
Poem as mirror-image of the kosmos: borders and ring-composition

Before attempting to explore further the textile technological matrix of some structural patterns of archaic Greek poetry and their functioning in context, we shall return for a moment to the correspondence of world and poem to which the concept of kosmos seems to point. Early hexametric poetry in particular offers an excellent opportunity for investigating how formal patterns in the arrangement of the epic material are thought to reflect the cosmic order. The poem discovers and reveals the kosmos, and the structure of the kosmos as it is described in the poem corresponds to the articulation of structural patterns framing and shaping the poem. A remarkable instance of this set of correspondences can be appreciated in the description of the river Okeanos in the Shield of Heracles, a poem which was ascribed to the Hesiodic corpus by ancient editors but was most probably not composed by the poet. Just as the river-god was thought to circumscribe the earth as an encircling bond – and as, in a similar fashion, the streams of Meander, woven in the starting border, surround the fabric in Antipater’s epigram – so the physical and civic kosmos depicted on Heracles’ shield in the poem is held together by the streams of Okeanos (Aspis 314-15):

Around the rim ran Ocean, and it looked as though it were in full flood. It held together the whole richly worked shield.

As it has been pointed out, the verb συνεῖς (‘held together’) emphasizes the fact that Okeanos provides a border to the scenes represented on the shield, and it alludes to the framing function (through ring composition) performed by the description of the river within the structure of the poem as a whole. This double layer of borders suggests that “there is a correspondence between the poetic pattern and the physical object described, for the whole account of the shield is enclosed by ring-composition”.

Here we would like to propose that the borders framing both the physical kosmos and the poetic ‘composition-and-

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128 The following discussion builds on the important insights that Thalmann 1983 has provided into the function of formal features of early hexameter poetry: the use of parataxis and the juxtaposition through polarity and analogy, typical features of the archaic style, are reinforced at the level of structural features through the use of patterns of ring composition, hysteron proteron, chiasmus, the use of framings as means for the ‘composer-in-performance’ to organize his thoughts and control his material as he creates and expand it through patterns. Such formal devices serve to help the audience to follow the poem throughout the performance; this is made possible by the fact that the structural patterns of hexameter poetry are not just artistic convention: rather, “they are particular manifestations of an entire way of thinking” that the poet shared with his audience (Thalmann 1983, 31). Thalmann provides structural analyses of single passages and whole poems (Iliad, Odyssey, Theogony, Works and Days, the Homeric Hymns, the Shield of Heracles) as built around recognizable patterns; these serve as the vehicle for important thematic concepts and motifs.

129 See Thalmann 1983, 32: “the sense of form exemplified by the shape of the physical world as the poetry depicts it is the same as that displayed by individual passages and indeed whole poems. There is a perfect correspondence between form and content”.

130 AP 6.287.


132 Thalmann 1983, 10, who comments on the pattern of thought that gave rise to both the cosmological view of Okeanos encircling the earth, and the invention and use of ring composition as a means of creating functional borders for the poem (or sections of it): “[S]urely the idea that the earth was surrounded by the stream of Ocean, ever turning back upon itself in a wide ring, sprang from the same source as the impulse to round off a poetic passage by recurring to the beginning at the end – a feeling for satisfying form”. A further picture of the kosmos on a shield is notoriously the narrative of the Shield of Achilles in Iliad 18, where we similarly have the river’s stream circumscribing and delimiting the earth and the narrative itself: see Nagy 2009, 269-270. Slater 1983 makes a different and strong case for the structure of ‘lyric narrative’ (in both epics and choral lyric) as complex forms of folk narrative that were then embedded into epic and lyric genres, and responded to functional and structural principles of verbal narration.
performance’ (and, we shall argue, also geometric motifs in pottery) are part of a broader pattern of thought which we see reflected (if not rooted) in ancient weaving technology.\textsuperscript{133}

\textit{From ‘bond’ to ‘thread’ through ‘rope’ in archaic Greek poetics}

The serpent-shaped Okeanos is represented by early sources as a bond or band encircling the earth, with the phrase \textit{πείρατα γαῖς} occurring twice in Homer in reference to the river-god and his consort Tethys.\textsuperscript{134} As it has emerged for the semantic spectrum of \textit{πείρατα/πείρατα},\textsuperscript{135} the notions of ‘cord’, ‘bond’, ‘band’, ‘rope’ and ‘thread’, have material, functional and conceptual affinities: like threads, ropes and cords wind up, unroll and intertwine.\textsuperscript{136} In addition to designating cosmological realities through the images of the earth-encircling bands and the binding of man’s fate, this semantic field bears importance as source material for some key terms of archaic poetics.\textsuperscript{137} The meaning of \textit{oimē} and \textit{οίμη} – the first commonly assumed to mean ‘pathway’ (but cf. Hom. \textit{II.} 11.24 where \textit{οίμη} is ‘strips’), the the second ‘heroic song’ – can be traced back to a common etymology and to a constellation of notions that encompasses ‘trail’, ‘bond’, ‘rope’ and, through a connection that emerges at the level of poetic usage, the notion of ‘thread’.\textsuperscript{138}

This interpretation of \textit{oimē} as related to the conceptual and technological domain of textile craft seems in turn to offer a good semantic and functional explanation for the notion of the compound term \textit{prooimion} (\textit{προοίμιον} ‘that which comes before the \textit{οιμέ}’), a fundamental concept in archaic Greek poetics and a structural and cross-generic component of poetic performance whose features and phenomenology invite comparison with the crucial starting border of weaving.

The semantics of another key term of early epic poetics, \textit{rhapsōidos} (‘he who sews/stitches together the song’), is similarly grounded in the materiality of the craft of \textit{rhaptein}, which encompassed a broader range of operations than just sewing with a thread: it involved the use of leather laces, sinews, reeds to interlace wickers or repair shoes.\textsuperscript{139} Drawing on the

\textsuperscript{133} In general, the methodology of Thalmann’s book is to test the relevance of structural patterns from smaller to larger scale in hexametric poetry. The opposite movement, from appreciation of structural patterns functioning for the whole poem to the testing of those same patterns (often, again, ring patterns) in smaller structures of the text, down to groups of two verses, or even a single verse, has been successfully applied to the analysis of choral lyric composition. Cairns 1997 has shown in a paper on form and meaning in Bacchylides 5 the union of tripartition and bipolarity in the poem; the functioning of ring patterns on both large and small scale throughout the poem contributes as well to an appreciation of its meaning. Curiously, Bacchylides 5 is indeed the ode where we have the metaphor of ‘weaving a song’ (\textit{γράφαναι οἴμοιν} 9-10; see also ode 19.8 for the same association), which might suggest the poet’s awareness of his analogical model.

\textsuperscript{134} \textit{II.} 14.200-201 = 14.301-302.

\textsuperscript{135} Onians 1951, 310-342.

\textsuperscript{136} See Durante 1976, 175-176 for an exhaustive discussion of evidences in Indo-European languages.

\textsuperscript{137} To the repertoire discussed here could be added the term \textit{humēn} (\textit{ούμῆν} ‘membrane’), that we have encountered in Democritus’ account of atomic conglomerates, and whose etymology has been proposed as a possible explanation for the key-concept of archaic poetics \textit{hymnos} (\textit{ ActionTypes}).

\textsuperscript{138} Pagliaro 1952, 34-40 is still a fundamental contribution to the history of the two words and their semantic development from the PIE root \textit{*seί-}, whose meaning can be traced back to the idea of ‘binding’ and which seems to produce both \textit{oimē} (‘bond, trail’) and \textit{oimōs} (‘strip’ as in \textit{II.} 11.24, and hence ‘pathway’); Durante 1976, 176-179 adds further evidences to Pagliaro’s insights (among which it is worth mentioning here the reconstructed root \textit{*ηιμ} to be found in \textit{ιμαίνω} (\textit{μείνω}) ‘the song of those who draw water with a rope’ in \textit{Call. Hec.} 66) and proposes for \textit{oimē} the meaning of ‘knotting’, ‘plot’ (‘intreccio’). Interestingly, a comparable semantic extension from the concrete (‘bond’, ‘rope’, and – through ‘trail – ‘thread’) to the abstract has been postulated for \textit{πειράτα/πειράτα} and for \textit{oimōs/oimē} (‘end’, ‘limit’ in the case of \textit{peirata}; ‘pathway (of song)’ in the case of \textit{oimōs/oimē}). For a recent discussion on \textit{oimōs/oimē} which draws on Pagliaro and Durante, see Nagy 2009, 230-232. For a different view on both the etymology and semantics of \textit{oimōs/oimē} in the context of a reassessment of the function and history of the term \textit{prooimion} see Maslov 2012, 198-203: the interesting insights provided and the questions raised by this article would deserve a more detailed discussion which is not within the scope of this chapter.

\textsuperscript{139} See Durante 1976, 178-179, who proposes to interpret the semantics of \textit{rhapsōidein} as complementary to the notion of \textit{oimē} and indicating “the operation that produces the condition of continuity of epic discourse”,

133 In general, the methodology of Thalmann’s book is to test the relevance of structural patterns from smaller to larger scale in hexametric poetry. The opposite movement, from appreciation of structural patterns functioning for the whole poem to the testing of those same patterns (often, again, ring patterns) in smaller structures of the text, down to groups of two verses, or even a single verse, has been successfully applied to the analysis of choral lyric composition. Cairns 1997 has shown in a paper on form and meaning in Bacchylides 5 the union of tripartition and bipolarity in the poem; the functioning of ring patterns on both large and small scale throughout the poem contributes as well to an appreciation of its meaning. Curiously, Bacchylides 5 is indeed the ode where we have the metaphor of “weaving a song” (\textit{γράφαναι οἴμοιν} 9-10; see also ode 19.8 for the same association), which might suggest the poet’s awareness of his analogical model.


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notions of ancient weaving technology outlined in the first part of this chapter, we suggest
the possibility that rhaptō (and thus the poetic rhapsōdein) might point to the technology of
pattern-connection within the (material and poetic) fabric rather than indicating the tailoring
of different pieces of woven fabric to produce a whole. The relevant technological idea at
work here seems to be the condition of orderly structure and continuity of the
threads/laces/ropes that enables such operations.

A further instance of the contiguity, in textile technology as in the early Greek mind, of the
notions and crafts of weaving and sewing is offered by the term hymnos (ὀίμος ‘song in
praise of the gods, hymn’). The etymology of the word is dubious, a couple of stems
related to the idea of weaving (making ὄιμος derive from the same verbal root ύφο- from
which ύφαίνω originates) and sewing (from the verbal root *syH that produces ύμή
‘membrane’) respectively have been proposed. While the latter hypothesis is not ruled out
by etymologists, there seems to be phonological problems related to the first
reconstruction (hymnos linked to hyphainō). This leaves us with facts of poetic usage,
which should be regarded as no less significant than etymology for our purpose of tracing
and understanding the role of textile craft in shaping ideas of song-making. Bacchylides
hints twice at the ‘popular’ etymology which sees hymnos as connected to hyphainō: ύφάνας
ὀίμον ‘having woven a song of praise (an epinician ode)’ in 5.9-10, while in 19.8 the figura
etymologica is alluded to by the juxtaposition of the two words, which are syntactically
separated by punctuation (ὅμοιος ύφανε). Whatever the etymology of the term, when we
look back at what is possibly the first attestation of ὄιμος in Greek literature, namely the
iunctura οἰδῆς ὄιμος ‘hymnos of song’ (Od. 8.429, referred to the ‘proto-kitharodic’
performance by the bard Demodocos), the ‘materiality’ conveyed by the term seems to us to
emerge strongly and to suggest the meaning of ‘fabric (made) of song’.

The textile imagery that pervades the semantics and usage of terms like hymnos, rhapsōidos
and prooimion is especially explicit in passages where these words occur in association with
each other, in contexts where the poetics and performance practice of epic recitation is at
stake. These texts will ground our discussion of the ways in which textile imagery can reflect
weaving technology in the next and final section of this chapter.

In the opening lines of his second Nemean ode, Pindar describes the performance sequence
of the rhapsodic recitation with an emphasis on its beginning, characterized by the
introductory function of the prooimion:

δόθεν περ και Ὄμερίδαι
ραπτόν ἐπέων τῇ πόλλῃ ἀοίδοι
ἀρχονταί, Δίος ἐκ προοιμίου (...)

namely “assembling the poetic product by arranging the threads of narration”. Drawing on the historian
Philochorus (FGrHist 328 F 212), who interprets the origin of the name rhapsōdai as a reference to their
technique of composition, Gentili 1990, 7 discusses the semantics and meaning of the term rhapsōdai tracing
it back to the materiality of textile technology: “[I]t is obvious that ῥάπτειν is a concrete metaphor for
the process of composition, describing the operation by which the strands or web of discourse are woven together”.

145 See Garvie 1994, 322 (“a very odd phrase”). Interestingly, ὄιμος is varia lectio for ὀίμος in h.Herm. 451
ἀγλαὸς ὀίμος ἄοιδης. On ἄαοιδης ὄιμος see Cassola 1975, x and Nagy 2002, 70.
The passage is a precious source for our knowledge of rhapsodic practice, and it features an array of technical terms for epic performance. The ‘prooimion of Zeus’ seems to refer to the genre of rhapsodic prooimion, the hexameteric poem that introduced the recitation of epos by the epic singer or the sequence of heroic lays performed by competing rhapsodes in poetic contests. The corpus of the preserved Homeric Hymns (which we find referred to as prooimia in ancient sources) attest to this very tradition. The genitive Διός is both a generic and a functional marker: together with the verb ἄρχοντα (v. 3) it situates the prooimion within a literary tradition of formulaic openings, and at the same time anchors the introductory poem to the occasion of the performance (a festival in honour of a particular god); the formulaic phrase σε σε δ' ἐγὼ ἄρξάμενος “having started from you” is addressed to the god in the closing line of several Homeric Hymns (5, 9, 18, 21, 22), where it effects the transition from the prooimion to the oimē (i.e. the epic recitation) through a further formulation, μεταβήσομαι ἐς ἄλλον ἡμιν (“I will switch to another hymnos/to the rest of the hymnos”). Pindar’s paraphrastic definition of ῥαπσῶιδοι (ῥαπτόν εὔπτον ἄωδοι) became the object of a vast array of interpretations in ancient time as regards the nature of the ‘sewing together’ of Homeric epe on the part of the Homeridai (and in general the performers of epic poetry). The scholia associate rhapsodic poetics with the sewing in a sequence (ἐἰρμός καὶ ῥαβῆ) of scattered parts of Homeric poetry (Σ Pind. N. 2.1d), or with the practice of reciting parts of the Homeric poems in an ordered sequence, so as to perform the whole poem (Σ Pind. N. 2.1d). The scholiast then goes on to offer a poetic fragment, attributed to Hesiod by the Attidographer Philochorus (Hes. fr. 357 M.-W. = 297 Most):

ἐν Δήλῳ τότε πρῶτον ἔγω καὶ Ὄμηρος ἄωδοι
μέλπομεν, ἐν νεαροῖς ἡμῖν ῥάψαντες ἄωδην,
Φοῖβον Ἀπόλλωνα χρυσαφόρον, ὄν τέκε Λητώ

In Delos then for the first time Homer and I, singers,
sang, sewing our song in new hymnoi,
of Phebo Apollo with his golden sword, whom Leto bore.

Here again, the close association between the craft of poetic ῥαπτεῖν and hymnoi suggests taking ἡμῖν in the sense of ‘fabrics’ of song(s), or even ‘pattern connexions (of verses)’, the poetic product that Homer and Hesiod compose ῥάψαντες (‘sewing/weaving together the song’).

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146 See Aloni 1980 for a study of the history of the term in reference to the Homeric Hymns, their structure and performative function. The 5th century usage of prooimion and phroimion (its Attic form) in drama and prose is investigated by Maslow 2012.

147 ἄρχομαι + the genitive of the god appears in incipit in e.g. h.Hom. 25 and Hesiod’s Theogony (in Alcman PMG 29 we find ἐκ Διός ἄρχομαι); in a number of the shorter Homeric Hymns (11, 13, 16, 22, 26, 28, 31) and in h.Cer. ἄρχομαι introduces the infinitive ἄρχειν (‘to sing’) + the accusative of the god celebrated. On the different scope of the two types of opening see Càssola, who considers the shorter Homeric Hymns as extracts from longer prooimia.

148 The transitional formula μεταβήσομαι ἐς ἄλλον ἡμιν could be considered to belong in the domain of motion metaphor for poetic creation – a category in which oimē-oimós, when interpreted as instance of road-imagery (‘pathway’) may as well fall: see Thalmann 1984, 124.

149 A detailed discussion of the ancient scholarly interpretation of Pindar N.2.2 is offered by Nagy 1996, 66-69.

150 Thus drawing on the etymological derivation of ἡμῖν from the same verb-root as ὑμήν.
Starting borders in archaic Greek poetry: hymnos and prooimion in context

In what follows we will show how the pattern of an ordering beginning seems to have been transferred from weaving to poetic composition and performance, and how this pattern works in context. This in turn poses the question whether, in some specific cases, we are dealing with poetic metaphors, or whether textile terms are rather employed as technical terms.

The most consistent and sustained theory of a metaphor of textile crafts (weaving, threading, sewing/stitching) that invests the poetics of early Greek epic has been produced by Gregory Nagy and refined throughout a number of scholarly works: his is the first attempt to see the concept of the starting border in weaving as reflected (metaphorically, in his view) in the function and phenomenology of hymnos and prooimion in the case where the two terms are coextensive, i.e. in the rhapsodic performance, where the introductory hymnos/prooimion “refers to a notionally perfect beginning”. The character of ‘right’ or ‘absolute’ beginning of the hymnic performance as we have it in the Homeric Hymns is effected by two markers: a) the use of the verb ἅγγισθαι, “which signals the invocation of the god or goddess who presides over the occasion or performance”, and b) the transition to the rest of the performance, which the transitional formula (“metabasis” in Nagy’s words) μεταβήσομαι ἄλλον ἐς ῥυμὸν marks metonymically as a hymnos (“the hymnos can make reference to its own hymnic consequent”). The hymnos is thus a performative continuum which encompasses the prooimion as its start, and whose wholeness is marked by its beginnig: “the hymnos is not just a proem that introduces epic but also the sequencing principle that connects with epic, then extends into epic, and then finally becomes the same thing as epic itself”. The idea of a beginning which makes a whole out of what follows from it, is the feature that the poetics of rhapsodic performance receives from weaving technology, and in particular from the mechanism of the starting border: this intuition is grounded in the semantics and performance reality of the words hymnos, prooimion, oimē and rhapsōidos (all of which are rooted in the craft of fabric-making), and tested in the context of the poetics of the Panathenaic festival in Athens, where the rhapsodic recitation of Homeric poetry and the gigantic peplos woven for the statue of Athena are connected through the idea of hymnos and its divinely authorized beginning. It is worth quoting the core of Nagy’s argument in his own words:

[…] the general process of weaving as a metaphor is applied by epic to the specific activity of performing epic. The prime example I cited was the word oimē, which refers metaphorically to the ‘story-thread’ that begins the epic performance of the singer Demodoos in Odyssey viii 74. Such a beginning of epic, as we saw from the wording of Pindar’s Nemean 2 (line 3), is a prooimion, which is metaphorically the starting point of the threading, of the oimē. Comparable to this Greek prooimion is the Latin exordium ‘proemium’. Both words are applicable to the beginning of a song, a poem, or a speech.

152 Nagy 2009, 232, from which as well the next citations in the text are taken.
153 See Nagy 2009, 241 “[In other words, the concept of hymnos is the concept of maintaining the song as the notionally same song by way of successfully executing a metabasis form the initial subject to the next subject.”
154 Nagy 2002, 70.
155 See Nagy 2002, 79 “[H]ere I return to my thesis, that the idea of weaving, just like the idea of hymnos, is connected with the idea of beginnings. The essential point is the point of departure. Wherever you begin, you must have a continuum that follows […] The wholeness of the performance is authorized by the beginning. To repeat, arkhē is both beginning and authorization.”
156 The ritual implications of the starting of the weaving (the making of the starting border) for the peplos of Athena at the Kathakeia festival in Athens (on which Arist. Ath. 60.1-3) are discussed in Nagy 2002, 86-88 and 2009, 550, 568.
Nagy grounds the semantics of the compound *rhapsōidōs* in the performance context of the rhapsodic contest in the occasion of the Panathenaic festival in Athens; there, the competing bards recited pieces of Homeric epic in an orderly sequence, one picking up where the other had stopped.\(^{158}\) From the point of view of the performance structure of such a rhapsodic contest, the *hymnos/prooimion* represented the first rhapsody in the sequence of successive recitations of Homeric *epē*.\(^{159}\) Pursuing Nagy’s argument, one might go further and suggest that the threads that unfolded from the *hymnos/prooimion*, just like the warp which is governed by the starting border, developed different patterns and narrative motifs throughout the rhapsodies performed by the competing singers.\(^{160}\)

A characteristic feature of the rhapsodic *prooimion* as we have it preserved in the *Homeric Hymns* is its function of linking the recitation of epic poetry to the occasion of the performance. This implied to pay poetic omage to the god in whose honour the festival hosting the rhapsodic contest was celebrated: as a consequence, the thematic relation between the content of the *prooimion* (a hymnic address to a god) and the heroic lays narrated in the *oimē* was often very loose.

Looking for a sample of epic/rhapsodic poetry that might reflect in its structure the function of the starting border – *i.e.* providing the warp threads for the weave, as well as the sequencing principles for the patterns to be woven into the fabric – we would rather turn to the only preserved sequence *prooimion-oimē* in hexametric poetry, namely Hesiod’s *Theogony*.\(^{161}\) Here the threads of the poem’s warp, *i.e.* the themes of the divine genealogies which unfold throughout the *oimē*, are outlined as a poetic ‘program’ and embedded in the structure of the *prooimion*, a ‘hymn to the Muses’ (ll. 1-115) which bears strong formal

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\(^{157}\) Nagy 2009, 568-569.

\(^{158}\) On the so-called ‘Panathenaic Rule’, *i.e.* the regulation that imposed the recitation of Homeric *epē* in sequence at the rhapsodic contest during the Panathenaic festival see Nagy 2002, 9-20.

\(^{159}\) See Càssola 1975, xiii-xxi, who (xix) points out that the term *prooimion* could be used to denote both the beginning of a poem (which Càssola calls ‘esordio’) and a poem having an introductory function (the ‘proper’ *prooimion*, that featured an ‘esordio’ of its own – expressed by Greek ἄνυβολη; see the ἄμβολοι προοιμίων in Pind. P. 1.4).

\(^{160}\) In such a sequence of rhapsodies, we see the technology of *rhaptein* as encompassing the notion of ‘pattern connections’ within a pattern-woven fabric, rather than pointing to the craft of tayloring. For the hypothesis that rhapsodic contests featured ‘closing hymnos’ see Càssola 1975, xxi-xxii.

\(^{161}\) See Hamilton 1989, 11 “[T]he Theogony in fact is our best evidence for the function of the Homeric hymn as proem to a longer song.” For the ‘rhapsodic’ nature of the *Theogony* see Càssola 1975, xxi, who recognizes in the structure of the poem (as we have it) several ‘stitches’ indicating successive rhapsodies (*e.g.* the leave-off at ll. 963-964 ‘Farewell now to you …’ is followed by a new ‘esordio’ at ll. 965-968 ‘And now, sweet-voiced Olympian Muses, daughters of aegis-holding Zeus, sing of the tribe [φθόλον] of goddesses …’). Hamilton 1989, 15 further observes that the third invocation to the Muses (ll. 1021-1022), with which the *Theogony* concludes in medieval manuscripts, is the opening of the *Catalogue of Women* (see fr. 1 Most).
resemblances with the corpus of the extant *Homeric Hymns*. The structure of the *prooimion* is complex. We have a first shorter *hymnos* to the Heliconian Muses, introduced by the formulaic beginning Μοσάων Ἐλικονιάδων ἄρχωμεθ' ἀειδέιν (“Let us begin to sing from the Heliconian Muses”) and describing the Muses singing and dancing on Mount Helicon (1-21) and performing a *hymnos* for the gods (ὑμεῖσά 11). This is followed by Hesiod’s poetic investiture by the Muses (22-34), who command the poet to sing a *hymnos* (ὑμεῖν 33) on the subject of ‘the race of the blessed ones’ (μικάρων γένος 33). After a transitional line (35), a new *hymnos* begins much like the first (Μοσάων ἄρχωμεθα 36), and ends with a formulaic leave-off at l. 104 where the poets bids the Muses farewell (χαίρετε, τέκνα Διώς, δότε δ’ ιμερόσσαν ἀοιδήν “hail children of Zeus, and give me lovely song”). The second part of the *prooimion*, a *hymnos* to the Olympian Muses (36-103), contains a description of the Muses singing on Olympus about the *genos* of the gods (but beginning and ending with Zeus, ll. 47-49), then an account of the Muses’ birth, their journey to Olympus, and their gifts to kings and poets. In a long transitional passage which introduces to the *oimē* (104-115), Hesiod commands the Muses to sing of divine genealogies, providing a sequence of three main topics which will then be followed in the central rhapsody of the poem. It is beyond the scope of this chapter to discuss in detail the structure of this *prooimion*, where correspondences between the first, shortest *hymnos* (1-35) and the second one (36-103) not only regard formal features and recurring motifs, but invest broader thematic concerns of the poem as a whole. Relevant for the present discussion are three observation that arise from a reading of the proemial ‘*hymnos* to the Muses’ in Hesiod’s *Theogony*: a) the emphasis on beginning (this *prooimion* contains three beginnings), and the related fact that the poet feels the need to start from the Muses again when he turns to the ‘second’ *hymnos* after the account of his poetic initiation (at line 36); b) the metatheatrical motif of the choral dancing of the Muses as divine paradigm for human songs: much like the god providing the *archē* (‘beginning’ and ‘authorization’) in the *Homeric Hymn*, this is their function of providing ‘divine authorization’ in the proem of the *Theogony*, thus enabling Hesiod to *hymneîn* (‘celebrate by means of a *hymnos*’) the divine genealogies; c) the transition from the *prooimion* to the *oimē* is effected by means of an accurate description of the sequence of ‘figurative patterns’ that the starting border ‘governs’, and that constitute the condition for the continuity of the fabric (and of the main body of the *Theogony*).

In the first half of this chapter, it has been argued that the starting border is a crucial condition for weaving on a warp-weighted loom: in a similar fashion, the cross-generic *prooimion*...

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162 On the importance of this feature for the overall structure of the *Theogony* see Hamilton 1989, 3 “[T]he crucial fact about the form of the *Theogony*, one virtually ignored by critics, is that the poem is articulated by the outline of its content given at the end of the hymn with which it begins.”

163 Hesiod seems here to conflate two different rhapsodic formulaic beginnings: the type ἄρχομαι + genitive of the god(s), and the type ἄρχομαι + ἀειδέιν + accusative of the god(s); as West 1966, 151 observes, in *Theog.* l “the genitive is governed by ἄρχομαι (ἀειδέιν being complementary)”. On Hesiod’s use of the first person plural here as to include the Muses in his exortation, see Strauss Clay 2003, 51-52, who also remarks how the construction with the genitive “reveals that the Muses constitute the appropriate or even necessary starting-point for Hesiod’s song, but that they are not its object” (p. 53). The English translation of Hesiod’s *Theogony* is Most 2007 (Loeb) adapted.

164 The three themes are (quoting from Hamilton 1989, 14-15): “(1) the children of Gaia and Ouranos, Night and Pontos (106-107); (2) their children (111); (3) how they divided health and *timai* and first got Olympus”; Hamilton shows how these three topics are consistently developed in the structure of the *Theogony*.

165 See, among others, the rich discussion in Thalmann 1983, 134-152.

166 Strauss Clay 2003, 52-53 aptly remarks how the motif of beginning is especially in place in a poem which sets up to provide an account of cosmological beginnings: “[T]he proem of the song of beginnings, thus even as it makes its beginning, attempts to give and account of its beginning.”

167 See the remarks by West 1966, 151. For the possible juxtaposition of two successive ‘starting bands’ in weaving, see above n. xx.
fulfils a fundamental function in archaic Greek poetics, connecting the song to the occasion of its performance and providing a necessary (musical and poetic) introduction to the rhapsody (epic), the nomos (kitharody) or the choral song (melic).

The pattern of ‘embedded’ prooimia is still recognizable in a sample of choral lyric which features the motif of the ‘song that starts another song’ or describes the practical modalities of the performance. Alcman 14 PMG consists in an invocation to the Muse to ‘begin a new song (μέλος νεοχμόν) for girls to sing’. Pindar’s first Pythian ode begins with a proemial invocation to the lyre and the description of a performance by Apollo and the Muses, where the god strikes up with his lyre “instrumental preludes to chorus-leading prooimia.” The beginning of the second Nemean, as we have shown in the previous section, is a precious evidence for the reconstruction of the performance of Homeric poetry enacted by the rhapsodic guilds: the ode is indeed unique within the corpus of Pindar’s epinician odes in that it seems to show features typical of a prooimion: it is unusually short, and its closing lines, with the chorus inviting to lead-off (exarkhein) a song in honour of Zeus, resembles the transitional passages that close prooimia and lead into the ‘proper’ song.

The procession of gods painted on the main frieze of the François Vase (fig. 7) accompanies and celebrates the wedding of Peleus and Tethys. We choose here to draw attention to the prooimion that the Muses sing and dance on the occasion of this divine wedding in Pindar’s Nemean 5.22-26:

Πρόφρων δέ καὶ κείνος ¯ειδ᾽ ἐν Παλίῳ
Μοισάν ὁ κάλλιστος χορὸς, ἐν δὲ μέσαις
φόρμιγγ᾽ Ἀπόλλων ἐπτάγλωσσον
χρυσῶν πλάκτρω διώκων
ἀγέτο παντοῖον νόμον: αἱ δὲ πρῶτιστοι μὲν ὑμνή-
σαν Δίὸς ἄρχόμεναι σεμνὰν Θέτιν
Πηλέα θ·

Gladly did that fairest chorus of the Muses
sing for those men on Pelion, while in their midst
Apollo swept his seven-tongued lyre
with a golden plectrum,
and led them in tunes of all kind. And, after a prelude to Zeus, they first sang of august Thetis and Peleus (…)

Apollo and the Muses are here mirror images for the kitharodos accompanying the epinician chorus: Apollo plays a prelude on the lyre, and the Muses move to sing a hymnos beginning

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168 Aloni 1990, 119 observes that “the prooimion is not, and could not be, a literary genre with pre-determined formal and content-related features, that recur regularly. We are rather dealing with a function, or a necessity of the performance; as a consequence, all the elements characterizing it are to be placed at the level of pragmatics” (our translation).
169 Power 2010, 185-215 provide an excellent and exhaustive treatment of the terminology and phenomenology of the kitharodic prooimion and its connections with the rhapsodic prooimion.
170 On the prooimion as introductory feature of any act of speech, and as an established practice in oratory speech see Aloni 1980, Maslov 2012. On Plato’s recurrent puns on the kitharodic sequence prooimion-nomos (where nomos stands for both ‘song genre’ and ‘law’) see Power 2010, 189 who aptly quotes Timaeus 29d and Socrates’ address to Timaeus, who has started lecturing on cosmological theories: “[W]e have welcomed, then, your prooimion with wondrous admiration, but, following the sequence, begin to perform for us the nomos.”
171 See the remarks in Aloni 1990, 117-121; in the remainder of his essay (pp. 121-129), Aloni tackles the complex problem of the phenomenology of the prooimion and the ‘proemial function’ in Pindar’s epinician odes.
172 The translation of Alcman is by D. A. Campbell (Loeb).
from Zeus (ὁμνήσαν ἀρχόμεναι Διός l. 25), a prooimion introducing the narrative of Peleus’ heroic deeds. Much like in the prooimion of Hesiod’s Theogony, we have here a vivid representation of divinely authorized and authorizing singing.

As a last instance of textile-like patterns in poetry, the mirror image of the Muses singing and dancing within a poem or a song, and replicating their performance ad libitum, reminds us of the pattern-woven cloth that both the Muses and the Moira wear in the François Vase (fig. 3). The figured motif in the Moira’s cloth reduplicates the frieze’s picture in a virtually endless Chinese box. As the Muses provide the epic singer with οἶμας παντοίας (‘songs/threads of every sort’) and with poetic authority through their divine performance, so the Moirai/Fates provide men with the thread(s) of one’s destiny (fig. 7). We have tried to show that there is a convergence in the terminology, imagery and conceptual representation of these two sets of divinely given threads.

**Conclusion**

What we tried to show in our technological part is that weaving in antiquity is not a clear gesture nor a simple unification of opposites but a complex composition of woven and plaited parts integrated into a finished product by repeated gestures of turning the piece around or upside down. The scheme Karl Schlabow once made when reconstructing the Thorsberg mantle might demonstrate this complexity (fig. 8) and give an example of what archaic Greek poets had in mind and view when using weaving terms to describe poetic composition principles that not yet had their own terminology.

We assume that, starting with Pherecydes, weaving gives a possible answer to the question of how the order of the kosmos was and is produced and which generative principles are at work in the kosmos and thus in every technê. We have argued that specific features of ancient weaving like the starting-border or the repeated integration of bands into textiles (cf. fig. 8) can be recognised in the use of textile terms in ancient texts. Referring to textiles indicates a mode of invention or creation that differs considerably from the way in which poetry is perceived today, namely as a form of art including the concept of the artist creator who designs his work according to an idea in his mind. Such modern concept has influenced the understanding of both the history of Greek art as well as the history of technology.  

It is especially the discussion of formulae or prototypes in archaic poetry and geometric art where this still affects the argumentation that often starts to become polemic as soon as textiles are claimed to be the medium of memory and transfer throughout the Dark Ages. Homeric poetry has been consistently compared with Geometric pottery (especially Dipylon vases) on the ground of structural and compositional features, among which the framing function of rings bears a special relevance: “there is a circular composition also of scenes themselves (sc. in Homer), scenes framing scenes in concentric rings around centrepieces, exactly as central motifs are heavily framed by borders in Geometric paintings.” In turn, pictorial friezes and meander motifs of Geometric vases have been traced back to figured textiles with in-woven mytho-histories.

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174 The origins of modern art and modern technology have in common that they refer to the concept of invention, called disegno in the discourse of renaissance, cf. Blumenberg 2015, 27.

175 For example in the reaction on Bensons book on the origins of Greek art (1970) by Coldstream (1974) and Hoffman (1997). Hoffman’s book on imports from the Near East to Iron Age Crete deals with bronzes, faïence, glass, gold, ivory, lead, pottery, scarabs, and even stone. However textiles are only mentioned in a footnote referring to the thesis of a textile continuity behind pottery and not saying anything about possible imports. Cf. note 3 on page 155.

176 Whitman 1958, 98.

177 Drawing on textual, iconographical and archaeological evidences, enriched by her own expertise as a weaver (see p. 365 “[T]o a weaver, early Greek vases look like textiles from the start”), Barber 1991, 358-372
Discussing the idea of friezes in Greek geometric art, Benson argues that “the impetus to depict a procession is more likely to have come at least partly from specific contemporary interest such as epic poetry (…). At that point, it would have been recalled that such vases and perhaps such wall paintings once existed”. Benson does not refer to textiles here as there are only secondary sources (texts) but no objects available. However he repeatedly points out the possibility of the artists being influenced by patterned textiles and the frieze lends itself to the constructive principle of weaving progressing in rows.

The principles of weaving are recognizable in the structure of the archaic Greek poem through the ring-sequence of frames and narrative sections. The sequence of geometric borders and pictorial friezes on the François Vase and on the clothes of both the Moira and the Muses represents a further instance of such a pervasive pattern stemming from weaving technology. The ordering and connecting prooimion in poetry reflects in both its terminology and function the thought pattern of the starting border in weaving. The ‘proemial function’ has been shown to represent a key performative and compositional pattern of archaic song-making: a remarkable cross-generic trait, it creates the condition for the rhapsodic and kitharodic performance and is embedded in the structure of choral lyric odes.

We end our chapter with a passage from Euripides Ion, where translators are at pains to make sense of the juxtaposition of kerkis (shuttle) and logos (word) on the same level and, applying the results of our study to our translation, propose to accept that kerkis and logos might have the same value.

Not by shuttles nor by words has it ever been rumoured that godly children meant a share of blessing for mortals.

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rounds off a very convincing argument to ground her hypothesis that “[…] less-destructible arts – vases, terracottas, and later sculptured reliefs – were deriving their forms and concepts” from figured textiles.

Benson 1970, 55-56.

179 The two nouns are generally interpreted as pointing to the practice of singing while weaving, and making reference to ‘songs to the loom’ which accompanied textile activity. In the case of the expression ἐπὶ κερκίσιν, the plural of κερκίς is taken as a reference (via metonymy) to the loom and the expression translated as ‘stories at the/my loom’ (Kovacs, Tuck 2009) or simply ‘at the loom’ (Lee 1997), as paralleled to λόγοις, interpreted as ‘common talk’ (Tuck), ‘songs’ (Kovacs), or ‘telling of stories’ (Lee): drawing on other passages in Euripides that refer to in-woven mythical stories (Eur. Ion 196-200, Hec. 466-474, IT 221-224) Tuck argues for the possibility that “the retelling of such myths in the service of patterned textile production may have sometimes even related to the design motifs themselves”.

180 We print the text of L: Diggle (OCT) brings into his text Badham’s λόγων, while Kovacs (Loeb) puts λόγοις between cruces.
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