

The Warp and Woof of the Universe in Lucretius' *De Rerum Natura*

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"I see the World, a vital web, self-woven... / with Space for warp and Time for woof." So was the world envisioned by George Cram Cook,¹ novelist, poet, and founder of the Provincetown Players, who met his untimely death in Greece in 1924 and lies buried in the foreign quarter of the little cemetery overlooking the ruins of the Temple of Apollo at Delphi. Cook, himself an ardent admirer of the Classics, presents here an image which appears frequently in ancient literature — the image of the weaving of fabric on a loom as a metaphor for creation and creativity.² Lucretius in particular, in his great epic poem *De Rerum Natura*, seems to have been struck by the usefulness of the warp-weighted loom — a familiar part of every Roman's daily life — as a reference point for visualizing the universe as the fabric of Nature's design, woven together from the warp and woof of the atoms.

Much has been written on various important images which recur in Lucretius' poem — light and darkness, the honey on the rim of the cup, love and death, and so on; but aside from the sensitive notes in Smith's commentary, little attention has been paid to the persistent images in *De Rerum Natura* which are drawn from the art of weaving.³

¹Roderick Taliaferro: *A Story of Maximilian's Empire* (New York 1903), p. 469. For recent studies of Cook's work and influence, see Susan C. Kemper, "The Novels, Plays, and Poetry of George Cram Cook, Founder of the Provincetown Players" (Diss., Bowling Green State University, 1982) and Robert Sarlós, *Jig Cook and the Provincetown Players: Theatre in Ferment* (Amherst 1982).

²See J. M. Snyder, "The Web of Song: Weaving Imagery in Homer and the Lyric Poets," *Classical Journal* 76 (1981), pp. 193-96.

³W. E. Leonard and S. B. Smith, ed., *T. Lucreti Cari De Rerum Natura* (Madison 1965). As G. Townend notes: "... Lucretius draws on the whole range of his experience

Through the repeated use of words like *exordia* (literally “warp,” hence the derived meaning “beginning”), *textura*, and *texere*, to list but a few, Lucretius keeps the image of Nature’s cosmic loom before our eyes throughout the six books of his epic. A brief analysis of the occurrences of weaving imagery in the work will show that the loom helped to shape not only Lucretius’ conception of the world, but also his view of his role in weaving together the words to describe that world for his reader.

The use of the upright, warp-weighted loom for both domestic and industrial production of cloth in Greek and Roman society is well known and needs no elaboration here.⁴ These looms consisted of a tall vertical frame, from which the warp threads were suspended and held taut by weights attached at the bottom. The weaving began at the top as the shuttle was passed back and forth through the warp to create the weft (or woof); each strand of weft was then beaten up tightly against the strands above it with a comb in order to create a firm weave. Such looms must have been a common sight in Italian households in Lucretius’ day, and indeed, for generations before his time. Lucretius himself displays an intimate awareness of the mechanics of the loom when he names several of its working parts in his description of the origins of weaving:

Nexilis ante fuit vestis quam textile tegmen.
textile post ferrumst, quia ferro tela paratur,
nec ratione alia possunt tam levia gigni
insilia ac fusi radii scapique sonantes. (V. 1350-53)

Braided clothes existed before woven garments. Woven clothing came after iron, for iron was necessary for the making of the loom; otherwise the heddle rods [?] couldn’t be so smooth, nor the spindles and shuttles and rattling bobbins [?].⁵

to provide terms for the behaviour of natural objects, and particularly of the atoms. These utterly impersonal and purposeless little bodies...are continually described in language derived from men and their activities” (“Imagery in Lucretius,” ed. D. R. Dudley, *Lucretius: Studies in Latin Literature and Its Influence* [London 1965], p. 96). See also below, note 14.

⁴See, for example, Grace M. Crowfoot, “Of the Warp-Weighted Loom,” *Annual of the British School at Athens* 37 (1936), pp. 36-47; Walter O. Moeller, “The Male Weavers at Pompeii,” *Technology and Culture* 10 (1969), pp. 561-66; Wesley Thompson, “Weaving: A Man’s Work,” *Classical World* 75 (1982), pp. 217-22. A comprehensive history of the warp-weighted loom in Nordic and European countries, with a brief chapter on classical antiquity, may be found in Marta Hoffmann, “The Warp-Weighted Loom,” *Studia Norvegica* 14 (1964), pp. 1-425. A helpful side-view diagram is available in John Peter Wild, “The Warp-Weighted Loom,” *Antiquity* 52 (1978), p. 59.

In many ways this passage raises more questions than it answers, for we cannot be sure whether the poet means that iron tools were used to plane the parts of the loom mentioned or whether some of the parts themselves were made of iron; nor can we be certain exactly which parts of the loom are named. Lucretius simply assumes that his reader requires no explanation of a piece of familiar household equipment. Indeed, most allusions to weaving in ancient literature make the same assumption, with the result that our knowledge of the mechanics of the craft must be based more on analogy with weaving in other cultures than on direct reports in Greek and Roman authors. The assumption of readers' familiarity with the operations of weaving led to frequent allusions, to which we should be alert; as Crowfoot observes, "weaving and spinning were such common features of daily life that poets and playwrights expected their hearers to pick up any witty or fanciful allusion — a pun, the merest hint — to any tool or operation connected with them."⁶

The prominence of weaving as a source of imagery for Lucretius may be seen at the outset of his presentation of the atomic theory in Book I. Immediately after the introduction, the poet announces:

principium cuius hinc nobis **exordia** sumet,
nullam rem e nilo gigni divinitus umquam. (I. 149-150)

Although *exordium* had by the first century B.C. already acquired its rhetorical sense of "beginning of a speech," its literal meaning had not been supplanted; in fact, Quintilian still uses the word in its literal as well as its rhetorical sense.⁷ Here, Lucretius' use of the plural, *exordia*, suggests that he is thinking primarily of the root meaning of the term: *exordium* is from *exordior*, "to lay the warp of," "to begin a web," and in the plural would thus seem best to be translated as "warp threads." Lucretius is not so much proclaiming that he is about to make a speech on atomic theory as that he is setting up the essential foundation on

⁵The translation of some of the terms is debatable: *insilia* is of uncertain derivation, but if it is connected with *insilio*, "to jump," it might refer to the heddle rod which had to be pulled out toward the weaver every other time the shuttle was passed through the warp strands; *scapus* is taken by the *Oxford Latin Dictionary* to refer to the heddle rod, but L. A. MacKay, "Notes on Lucretius," *American Journal of Philology* 77 (1956), p. 67, argues persuasively that it is the term for bobbin.

⁶Crowfoot (above, note 4), p. 38.

⁷*Oxford Latin Dictionary*, s.v. *exordior* and *ordior* (cf. also *Thesaurus Linguae Latinae*). For Quintilian's literal use of the term, see *Inst.* V. 10. 71. He explains (IV. 1. 1) that the beginning of a speech is called *exordium* in Latin and *prooemium* in Greek, and that he prefers the Greek term since it points more directly to the introductory nature of this portion of a speech. Lucretius' contemporary, the author of the *Rhetorica ad Herennium* (I. 3. 4), however, uses the term *exordium*.

which the atomic theory rests.

In the next section of Book I, Lucretius repeatedly uses weaving metaphors to elucidate the companion theory that nothing can be reduced to nothing. In his contrary-to-fact arguments in support of the hypothesis *nil ad nihilum*, he seems to be suggesting that the atoms themselves form the warp and woof out of which substances are woven:

denique res omnis eadem vis causaque vulgo
 conficeret, nisi materies aeterna teneret
 inter se **nexus** minus aut magis **indupedita**.
 tactus enim leti satis esset causa profecto,
 quippe ubi nulla forent aeterno corpore quorum
contextum vis deberet dissolvere quaeque.
 at nunc, inter se quia **nexus** principiorum
 dissimiles constant aeternaque materies est,
 incolumi remanent res corpore, dum satis acris
 vis obeat pro **textura** cuiusque reperta. (I. 238-247)

Lucretius once again calls to mind the image of the woven fabric later in Book I when, after establishing the existence of the void, he asserts that matter itself is absolutely solid, and that the atoms themselves can in no way be “unwoven” by external forces (*retexi*, I. 529). Although he has suggested earlier that *substances* can be “unwoven” once a sufficiently strong force penetrates their entwined atoms, he takes pains here to reiterate that the *corpora prima* themselves are not susceptible to any such unraveling process.

Given the pattern of weaving imagery established in Book I, it is not surprising that the next occurrence of the word *exordia* in the poem refers not to Lucretius’ attempts to lay down the foundation of the Epicurean system but to the atoms themselves, the threads of existence:

Nunc age iam deinceps cunctarum **exordia** rerum
 qualia sint et quam longe distantia formis
 percipe, multigenis quam sint variata figuris. (II. 333-35)

Indeed, all the remaining instances of *exordia* in the poem refer either to the atoms themselves or to some kind of cosmic “beginnings” closely linked to the atoms.⁸

Although the poet uses a variety of names for the atoms, one of his favorite terms is *primordia*. Lucretius’ awareness of the component elements of the term is proven by his reference to the atoms in the same passage both as *ordia prima* (IV. 28) and as *primordia* (IV. 41) —

⁸Atoms: III. 31, 380; IV. 45, 114; V. 677. “Beginnings” of earth, sea, etc.: II. 1062; V. 331, 430, 471.

literally "first warp-threads." It is likely, then, that the extended metaphor of weaving is introduced into the poem not with *exordia* in I. 149, but with *primordia* in I. 55, when Lucretius first sets forth the concept of atoms, calling them *primordia*, then adding the synonymous terms *genitalia corpora*, *semina rerum*, and *corpora prima*.

In addition to providing Lucretius with a vocabulary for describing the atoms as *primordia* and *exordia*, the art of weaving seems also to have furnished the poet a convenient model for his conception of the "vertical universe." His discussions of atomic movements in Book II make clear that he thinks of the atoms as falling continually downward through empty space, except when they occasionally deviate from their paths through the mysterious forces of the atomic swerve (II. 216-93). The language Lucretius chooses in the section preceding the description of the swerve reveals the underlying image of the upright loom.

The atoms, Lucretius asserts, move continually downward in constant bombardment with other atoms; only those with *condenso conciliatu* (100; *condensere* is the term for beating up the weft) offer any resistance to such blows, since they are "intertwined by their own interwoven shapes" (*indupedita suis perplexis ipsa figuris*, 102).⁹ As an illustration of this motion, Lucretius tells us to look at the bombardment of tiny particles in a sunbeam (114-15) when the "shafts" (*radii*, the word for shuttles) of sunlight are "inserted" (*inserti*) into the dark places of a house. We may note that the language here closely resembles the terminology in Ovid's description of the weaving contest between Athena and Arachne, in which sharp shuttles are inserted in the weft:

inseritur medium radiis subtemen acutis. (*Met.* VI. 56)

Finally, Lucretius asserts that the atoms which fall downwards are being borne along by the force of their own weights (*ponderibus*, II. 88 and 218). In referring to the *pondera* of the atoms, Lucretius employs the same word that is used to describe the loom-weights attached to the ends of the warp strands.¹⁰ Although we cannot be certain, it is possible that Lucretius' extensive use of weaving metaphors here to describe the motions of the atoms derives directly from Epicurus himself, who employs the terms *περιπλοκή*, ("interlacing") and *πλεκτικός* ("entwined") with reference to atomic movement (*Ep. ad Hdt.* 43).

⁹On (*con*)densere, see Varro *Ling.* V. 113 (*densum a dentibus pectinis quibus feritur*); and cf. Lucr. VI. 482: *et quasi densendo subtexit caerulea nimbis*.

¹⁰See Sen. *Ep.* 90. 20 for the terms *pondera*, *radii*, etc. (in the context of a discussion of Posidonius' treatment of the art of weaving as a feature of the development of civilization).

Many other passages reveal how often Lucretius draws on the weaving process as a source for his descriptions. For example, in his proof that the atoms of the soul are very small, smooth, and round, he states that the lack of reduction in size or weight of a corpse as compared to the living body shows

quam tenui constet **textura** quamque loco se
contineat parvo, si possit **conglomerari**....(III. 209-10)¹¹

He goes on to argue that the atoms of the *anima* are “intertwined” among the veins, flesh, and sinews of the body (*nexam per venas viscera nervos*, III. 217; cf. III. 691).

The discussion of the *simulacra* in Book IV is similarly infused with images drawn from the art of weaving. Lucretius claims that sometimes the “films” emanating from the surface of objects are diffuse, like smoke, whereas other times they are more “woven together” and “beaten together” (*contexta...condensaque*, IV. 57). All of these *simulacra* can flit about quickly because they are endowed with such a “fine thread” (*subtili...filo*, IV. 88).

Woven fabrics also give Lucretius the occasion for a practical experiment which he describes in connection with his proof that the atoms do not themselves have color. He says that if you tear a bright purple cloth apart thread by thread (*filatim*, II. 831), you will notice that the color gradually fades away, so that you may conclude that the color would be lost altogether before the cloth was reduced to its component atoms.¹²

The pervasiveness of weaving imagery on a readily apparent level leads one to question whether Lucretius’ poem may not also contain more subtle examples, particularly in the light of the poet’s fondness for verbal play.¹³ Consider the wording of Lucretius’ favorite lines on the darkness of ignorance:

Hunc igitur terrorem animi tenebrasque necesses
non **radii** solis neque lucida **tela** diei
discutiant, sed naturae species ratioque.
(I. 146-48; II. 59-61; III. 91-93; and VI. 39-41)

¹¹Cf. Lucr. I. 360, *in lanae glomere*.

¹²Other passages containing weaving imagery not discussed in this paper: *contextae*: III. 695; *textura*: IV. 158, 196, 657; VI. 776, 1084; *textus / textum*: IV. 728, 743; V. 94; VI. 351, 997, 1054; *textilis*: II. 35; *subtexere*: V. 466; *nexus*: II. 405; VI. 958; *conectere*: II. 251, 478, 522, 700, 704, 712, 716; III. 691, 740; VI. 1010; *conexus*: I. 633; II. 726, 1020; III. 557; V. 438.

¹³See J. M. Snyder, *Puns and Poetry in Lucretius’ De Rerum Natura* (B. R. Grüner, Amsterdam 1980).

It is not unreasonable to suppose that Lucretius intends the reader to absorb the ambiguities inherent in *radii* and *tela*, whereby the rays of the sun are pictured as “shuttles” weaving out the “web” of day. The image is strengthened by the appearance in the very next line of the word *exordia* (149), as Lucretius lays down the “warp threads” of his treatise.¹⁴

The double level of images in the words *radii* and *tela* is further confirmed in the last occurrence of these same lines in the poem, where they are followed immediately by this line:

quo magis inceptum pergam **pertexere** dictis. (VI. 42)

Significantly, this line, in which Lucretius pictures himself as a weaver of words, echoes his introduction in Book I of the principle that all creation consists only of atoms and void:

Sed nunc ut repetam coeptum **pertexere** dictis,
 omnis, ut est igitur per se, natura duabus
 constitit in rebus; nam corpora sunt et inane,
 haec in quo sita sunt et qua diversa moventur. (418-21)

It is hardly surprising that Lucretius connects his own creativity as a poet with weaving, which in turn is connected with creation itself. That Lucretius sees words and the world as closely linked is shown in his repeated analogy with the *elementa*, a term he uses to refer both to the letters which make up the words of his poetry and to the atoms which combine to form the stuff of the universe.¹⁵

Lucretius as weaver demonstrates the complexity of nature's design, whereby apparent opposites, such as creation and destruction, are united in an interwoven whole. His intricate tapestry reveals the warp and woof of the atomic structure, and through his words we see before our eyes the vital web of the universe.¹⁶

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¹⁴David West, *The Imagery and Poetry of Lucretius* (Edinburgh 1969), pp. 80-82 discusses the underlying loom imagery of this passage and paraphrases its effect. He notes the twice repeated phrase, *radiisque retexens aetherius sol* (V. 267 and 389).

¹⁵See Snyder (above, note 13), pp. 31-45.

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