

The Bow: A Techno-Mythic Hermeneutic—Ancient Greece and the Mesolithic

James B. Harrod

Introduction

The purpose of this inquiry is to demonstrate (a) that the Greek bow and arrow mythology is a symbolic dramatization of the essential technology of the bow and arrow and, simultaneously, of human self-understanding and self-becoming, and (b) that a major aspect of Mesolithic self-understanding and religion may be reconstructed by the analogical use of that tool-mythology.

The following assumptions underlie and guide this demonstration.

The concept of *technē*, or technology, is meant to include a tool itself as such, which has a structure, dynamics, and utility or telos, and the invention, reproduction, and method or right way of using that tool.

A *technē* has an important impact upon a people's self-understanding. A *technē* is more than a resourceful response to an environmental need; it is more than the product of human ingenuity. It manifests the human self—a relation which relates itself to its own self—and its self-becoming; it manifests what it means to be human. The twofold nature of technology as system and relationship to itself reflects the twofold nature of human life and life itself, which, according to biological science (Eigen and Schuster), is guided by a twofold principle of self-organization and self-correction. Self-understanding-and-self-becoming involves both formation and ethics.

In "Man the Technician," Ortega y Gasset notes: "Man, in existing, has to make his existence. . . . 'My life' is pure task, a thing

inexorably to be made. It is not given to me as a present: I have to make it. Man, willy nilly, is self-made, autofabricated. The word is not unfitting. It emphasizes the fact that in the very root of his essence man finds himself called upon to be an engineer. Life means to him at once and primarily the effort to bring into existence . . . himself. In short, human life 'is' production" (115–16).

A. L. Kroeber (600) reports that, among the Chemehuevi of southern California, shamans dream-sing of their sacred mountain where they acquired their songs and powers from mythic beings. He gives this example: "A man 'dreams' of the time when the earth was still wet from the primeval flood . . . when the cane sprang up and Older Brother Puma instructed him in detail how to make each part of bow and arrow. This experience is the source of the dreamer's faculty to flake arrowheads."/1/

Because human self-becoming is a process of self-invention, the meaning of being human is, in a sense, manifested by or shown by a given *technē*. Conversely, because a given *technē* is born out of the dream depths of the creative imagination, it manifests the self and its processes of self-relating and self-understanding.

Technologies play a significant and meaningful role in religion, art, psychology, and philosophy. They are taken up as symbol, theme, and metaphor in mythologies around the world. Myths in which tools play a role, especially myths about the invention of a tool, disclose, at one and the same time, an understanding of the invention, production, nature, and use of the manifest tool and an understanding of the self as a kind of *technē*/2/ Technologies can be seen as ontological metaphors, i.e., metaphors for self-understanding, and as ontological paradigms, i.e., models for self-relating, which together comprise self-becoming.

There seems no reason not to apply the above stated techno-hermeneutical principles to prehistoric peoples. Scholars of prehistoric religion might use prehistoric technologies to reconstruct the religions, or at least the mythopoietic self-understandings, of pre-historic peoples. Thus, besides using the rituals of preliterate societies to reconstruct prehistoric religion—currently the standard method for doing this /3/—one may also use "techno-mythic" analogies and thereby give a voice to the mute artifacts of prehistory.

The argument of this paper is as follows. First, I will examine the essential *technē* of the bow and arrow, describe the bow technology of ancient Greece, summarize its role in ancient Greek religion, and articulate a hermeneutic of the bow as it finds expression in selected mythopoietic texts. Then I will briefly consider the significance of this hermeneutic for the ancient Greek self-understanding as a whole. Next, I will examine the bow as a case of Mesolithic technology and as represented in Mesolithic art. Finally, I will propose the hypothesis that

James B. Harrod (Ph.D., Syracuse) is presently N.E.H. Humanist-in-Residence in Maine State Government. This essay is adapted from a paper delivered in absentia at Valcamonica Symposium III, "Intellectual Expressions of Prehistoric Man: Art and Religion," July 1979, which was an excerpt from a longer manuscript "Mesolithic Religion: A Techno-Mythic Hypothesis from the Greek."

a major aspect of the Mesolithic mythological self-understanding, and, hence, of Mesolithic religion, is similar to that found in the ancient Greek hermeneutic of the bow and arrow—all of which is suggested by Mesolithic art.

The Essential *Technē* of the Bow

One may characterize the essence of a technology or tool in terms of its invention; the tool itself with its structure, dynamics, and utility; and its actual use or way of being used. Since its manner of invention is lost in prehistory, I shall consider the bow itself, or as such, and its way of being used.

According to its physical definition, the bow is a complex machine which stores potential energy, specifically, elastic energy (an energy of tension plus an energy of compression), and releases it into the kinetic energy of an arrow. The stretched or tensed bow is a tension of opposing forces, the stress vector being equal and opposite to the elastic vector which strives to restore the bow. A bow is a leaf spring, which, by definition, is a mechanical device which has the ability to tolerate large deformations (strain) without failure (flexibility) and to recover its original shape when the stress is removed (resiliency, elasticity). The potential energy of the bow is transferred into the kinetic, projectile energy of the arrow. The arrow is designed to be perfectly straight, yet flexible, since it must oscillate during the early stages of its flight.

The essence of the bow and arrow is a tacit hermeneutic; it may be seen as a description of the structure, dynamics, and telos of the self, or human nature: filled with potential energy, a balanced tension of opposites, tolerant of strain, flexible, resilient, providing kinetic energy, straight yet flexible, propelled toward a goal—the well-made bow of the self. Such a self-understanding, such an ontological metaphor of the self, which may seem obvious or trivial today, must have been a breathtaking insight, impossible until the actual invention of the bow itself.

This tacit hermeneutic has inspired cult, myth, and folklore across Europe and Asia, which speak of the bow and arrow as if they were alive, endowed with their own souls or spirits (Adler:2-3). Even contemporary archers refer to parts of the bow as “limb, belly, and back”; they speak of the “spine” of the arrow and experience it as a projection of self.

The proper use of the bow and arrow, i.e., the art of archery, is also a hermeneutic, and one which may be articulated by an archer in tune with his or her art./4/

The good archer must have knowledge and skill in such areas as (a) matching arrows to bow according to weight, and matching bow weight to the strength and skill of the archer, (b) stringing the bow, which

requires knowledge even more than strength, (c) sighting, by calculation as well as intuition or instinct, (d) holding and stretching the bow, which requires that one stand square, upright, head up, at right angles to the target, without hunching, and that one push the bow while pulling the bowstring—an act which reflects the nature of the bow itself as a tension of opposing forces and a combination of tensile and compressive elastic energies, (e) breathing, which should flow with evenness and without holding back the breath and (f) releasing the arrow, which the expert archer does by unlocking a back muscle, near the spine below the neck, and not by relaxing the fingers. In a sense, the release of an “inner bow” releases the outer bow.

The art of archery has a pervasive spirit. It is exhilarating. It is a mastery of space, a projection of self. Each bow and arrow, especially in ancient times, was as unique as its owner; it was an expression of his or her individuality. An archer must know his bow as well as he knows himself. The art has a ritually formal quality; its secret discipline is consistency. It is holistic; to shoot well an archer must harmonize a multitude of internal and external factors. It is a civilizing art involving order, centering, aesthetics, completeness, wholeness, right-feeling. Penetration of arrow into bow and release are tinged with sexual feelings.

The art or ethic of using the bow—balancing, standing upright, knowing that which is one’s own, centering and wholeness, harmony, penetration and release within—must be added to the essential hermeneutic of the bow.

In sum, the bow itself, characterized by energy, tension, resiliency, flexibility, and straightness, and the way of using the bow, the art of archery, characterized by uprightness and balance—the whole ensemble of bow *technē*—is a manifestation of human life, of self, in both its systemic and ethical aspects. The *technē* of the bow is a tacit hermeneutic for which the explicit ontological metaphor and ontological paradigm is the bowlike self and its invention and right use by the archerlike self.

Ancient Greek Bow Technology

In ancient times, the composite bow was common to Asia, the Near East, and eastern Europe, while the simple or self bow, composed of a single stave, was common to Africa, Oceania, and western Europe. Earliest depiction of the composite bow is from Mesopotamia, Accad dynasty, 24th century B.C. (Albright and Mendenhall; Burkitt; Emmeuau; Longman).

Greek art seems to depict both types of bows. Many vase paintings appear to show Artemis and Apollo with a simple bow and Herakles with a reflex compound bow. Especially interesting is a kalyx crater by the Niobid Painter, 455–450 B.C. which depicts both types on one vase

(Arias:plates 173–75). Bows described in detail in *The Iliad* and *The Odyssey* are reflex, composite bows; the belly is made of horn (mountain goat or antler), the back of sinew (especially oxen), and the core of wood. The bows are similar in form to those used by Scythians, Persians, and Lycians, and probably were introduced to Greece by one of those peoples (Balfour). Arrows were made from the sharp-rush and the reed, the Kretan reed being most suitable (Theophr. *Hist.Pl.* 4.11.10, 4.12.1–3; Ar. *Ran.* 256, *Ach.* 230; Pliny *HN* 16.65; and see any dictionary under *schoinos* or *kalamos*). Other materials probably were used as well. (A bow of cane or bamboo was used by the Indians in Xerxes' army, 480 B.C. [Hdt. 7.68].)

The Bow in Ancient Greek Religion

In ancient Greek religion, the bow is an attribute or emblem of Apollo, Artemis, and Herakles. Artemis is Toxia (She of the Bow), and in artistic representation the bow and arrow are part of her iconography. Apollo is Hekaergos (He Who Shoots from Afar). Homeric hymns celebrate the bow of Artemis and the hunting bow and musical bow (lyre) of Apollo. Plutarch (*Amat.* 757D) says that Herakles presides over the bow, with Apollo's aid. In the legend of Philoktetes, Herakles' bow brings victory over the Trojans.

The very invention of the bow is associated with the gods. Oppian credits the invention of the bow and arrow to Atalanta (*Cyn.* 2.26–27), who was a companion of Artemis as well as heroine of the hunt for the boar of Kalydon. Pliny (*HN.* 7.56.201–2) credits the invention to Perses (=the Persians) or to Skythes (=the Scythians), who was the son of Herakles, according to Herodotos (4.10). Diodorus Siculus credits the invention to the Kretan Kouretes, one of whom was called Herakles (4.14, 5.65; Strabo 10.480; Paus. 5.8.1).

The Ancient Greek Mythopoeitics of the Bow

In ancient Greek religion, the hermeneutic of the bow finds expression primarily in the mythologems of (a) Herakles and Skythes, (b) Odysseus, (c) Philoktetes, (d) Delphic and Pythian Apollo, and (e) Atalanta.

Herodotos (4.10) says that Herakles, searching for his chariot horses, which had disappeared while he was asleep, found a viper-maiden, who said she had them and would restore them to him if he had intercourse with her. He yielded, and she accomplished her word, but not until she had borne him three sons. Reaching manhood, the youngest of these, Skythes, by "stretching to the full"—the Greek word can also mean "stringing"—his father's bow,

was allowed to dwell in the land, and he became the father of the line of Scythian kings. Pliny (*HN.* 7.56.201–2) says that Skythes was the inventor of the bow. Diodorus (4.14, 5.65) says that Apollo bestowed the bow upon Herakles because of his great virtue (*aretē*).

Analytically and structurally the variants combine a series of themes (actions, functions): (a) having intercourse with a demonic being, a viper-maiden, (b) begetting a child, (c) getting back one's chariot horses, (d) stringing the bow, (e) stretching the bow, (f) dwelling in one's own land, (g) becoming a king, leader of the *aristoi*, (h) inventing the bow, (i) winning the bow as a gift of honor, and (j) possessing or achieving great *aretē*.

On the technological level, the Herodotos variant's "stretching" or "stringing" of the bow reflects the essence of the bow as a device for storing potential energy. To string a bow makes it ready for use; to stretch it "to the full" brings it to its full potential energy, its full readiness for use.

The variants of Herodotos and Pliny together suggest that the stretching—and stringing—of the bow is the mythic equivalent of the invention of the bow. Both actions "make" the bow; both bring its essence into being. The variants are not so much concerned with the historical origin of the bow as with its essential and ontological origin.

The variants' ten themes can be woven together by rhetorical metaphors, that is, they are metaphorically the same. For example, *aretē* is like a bow. This is the basis of Diodorus's variant, which correlates Heraklean *aretē* (=goodness, virtue, excellence; esp. manhood, strength, valor, manly beauty, and dignity) with the bow itself. Both are forms of potential energy, the one human, the other mechanical. In other words, the bow is a "symbol" of *aretē*. Further correlations are implicit—all grounded in a hermeneutic of human self-becoming. The invention of the self is like the birth of the self is like establishing the rule of the self—the bow is like the child is like the leading principle; the stretching of the bow is like sexual intercourse; dwelling in one's own land is like receiving back the horses which empower one's motion, and so on. All are likenesses of self-becoming, of bringing into being the self's potential energy for becoming.

Many of the "bow" themes found in the Herakles-Skythes variants are found in the legend of Odysseus's homecoming to Ithaka. In book 21 of *The Odyssey*, Homer tells how Penelope sets a contest for the suitors: to win her as a bride, one must string "the great bow of godlike Odysseus," stretch it, and shoot an arrow through the eyes of twelve axe handles in a row. Odysseus alone accomplishes this. As Odysseus picks up his bow, a suitor declares: "This man is an admirer of bows, or one who steals them. Now either he has such things lying back away in

his own house, or else he is studying to make one, the way he turns it" (21.397–99; emphasis added). The "in one's own house" theme is like the "dwelling in one's own land" theme in the Herakles-Skythes variants; the "making of a bow" like the "invention of the bow." Homer's phrasing implies a reference to selfhood and self-becoming. The implication is clearer in the series of events by which the "identity" of Odysseus is established: (a) revelation of a scar, from a wound received during a boar hunt with his mother's brothers (parallel to the Meleager legend), (b) recognition of one's son, (c) stringing and successfully using one's own bow, and (d) knowledge of the olive tree bed. Homer also uses the contest as an occasion for one of his lovely similes, this one between a musician who strings his lyre and Odysseus stringing and plucking his bow, which gives forth "an excellent sound like the voice of a swallow" (21.404–12). This also emphasizes what every archer knows: that stringing the bow is more a matter of knowledge and skill than of strength.

Sophokles' drama *Philoktetes* tells us that the hero, who had been given the bow of Herakles from the god himself, rejected the love of the nymph Chryse, and she caused a viper to bite him when he tried to dig up a buried altar of Athena. His comrades set off for Troy and abandoned him on a desolate island to his festering sores. When they returned later for his bow—an oracle declared it would bring victory over the Greeks—he resisted them. Eventually, he yielded to their persuasion, forgave them, journeyed to Troy, was healed, and won "deathless *aretē*." Others say that the famous archer offended Apollo and was attacked by a water-snake, or offended Herakles and was variously bitten by a serpent or wounded by one of Herakles' own envenomed arrows (Dict. Cret. 2.14; Hyg. *Fab.* 102; Philostr. *I.* 17; Ser. V. *Aen.* 3.402).

On the technological level, the very plot of this legend is like an analogue for the flexibility and resiliency of the bow following its deformation. This is the inverse of the Herakles-Skythes legends, which are an analogue for the bow as a device for storing potential energy.

Just as the technological levels reflect inverse aspects of the essence of the bow, so the interpretation of the Philoktetes legend is the inverse of that of the Herakles-Skythes legend. While Herakles accepted intercourse with a maiden who was also a viper, Philoktetes rejected a nymph and was bitten by a viper. Herakles accepted a relationship with the earthly (serpent) feminine and thus begot the bow of his *aretē*. Philoktetes rejected a relationship with the divine feminine and thus was painfully bitten by a creature that hugs the earth; and, failing to uncover the wisdom harbored by the earth, his bow could not be used to win

deathless *aretē*. What was second nature for Herakles, Philoktetes had to learn the hard way.

By becoming flexible, by yielding to the humanity he shared with his fellow comrades, and by suffering injustice and forgiving—that is, by exercising so-called "feminine" virtues—all actions that he had at first stiffly resisted, Philoktetes finally achieved healing restoration and *aretē*. Philoktetes learned the lesson of the bow, which, in bending and then returning resiliently (resilience=figuratively, the ability quickly to recover strength, spirits, buoyancy, cheerfulness) to its original shape, can again become a source of great energy and power.

Both Homeric hymns to Apollo celebrate the bow and the lyre as joint attributes of the god. Through two technologies, each of which is the inverse of the other in function—one giving pleasure, the other pain and death—and each of which is in itself a tension of opposite forces or energies, the hymns evoke the *coincidentia oppositorum* of the Apollonian spirit.

In the Delian hymn, Apollo announces: "The lyre and the bent bow / are always going to be loved by me, / and I will reveal to mankind / the exact will of Zeus."

This he says immediately upon being born, and rightly so. It articulates the essence of the god who has just been born. The birth of the god is the birth of the bow and the lyre, and, conversely, the birth (invention, reproduction) of the bow and the lyre is the birth of the god (the divine aspect of the devotees' bowlike and lyrelike relationship to the sacredness of life). The declaration also implies that the Apollonian spirit presides over both culture (music) and society (a hunt economy, war and peace), and brings to both an Apollonian civility.

The dialectic gains a new variation in the Delphic hymn: Apollo appears making music with his lyre and also killing with bow and arrow the serpent Python at the spot where he then establishes the oracle of the Pythoness, the oracle of self-knowledge.

The "bow" is at the heart of the Apollonian spirit, which takes into its account or life-vision, at one and the same time, (a) making music, (b) knowing one's self and the will of god, (c) hunting and killing animals for food, i.e., life, and (d) distinguishing between murder, justifiable homicide, and killing in war. The slaying of Python and the recognition of the Pythoness expresses a mythic self-understanding which differentiates and encompasses these seemingly opposite sides of life and living. The hunting bow and the musical bow are equiprimordial; each plays an integral role in a self-knowledge that is attuned to life.

Bow and lyre are symbols of a tension or harmony of opposite or complementary energies, which, when released, can speed the arrow or the song to their target, killing for the food of life, or creating music to nourish the soul of life. And just as the lyre can create music or noise,

depending upon how it is tuned, so the bow can nourish human beings or slay them, depending upon how the archer is attuned to himself. Similarly, the forces of culture or society may be attuned to the enhancement or the destruction of human relationships and human life.

The philosopher Herakleitos—coincidentally a devotee of Artemis Ephesia—speaking of those who are lost to their *aretē*, says that “they do not understand how being at variance with itself, it [the One] agrees with itself; it is a stretched-back harmony like the bow and the lyre” (Frg. 51, Hippol. *Haer.* 9.9.1; Pl. *Symp.* 187a).

Herakleitos correlates the bow’s ontological tension, as well as the tension between the bow and the lyre, with *aretē*, with the Apollonian virtues of justice, beauty, temperance, wisdom (=self-knowledge); he correlates the well-tuned bow and lyre to “the One,” that is, to selfhood and self-becoming.

In its Delian, Delphic, and Herakleitian variations, the bow of the Apollonian god is the bow of that self-relationship—that tension of wholeness, that harmonious energy or virtue—which comes to maturity attuned to “the exact will of Zeus,” that is, to that creative justice which is decisive for the destiny and well-being of humanity.

It is the bow of that Apollonian *aretē* which involves both the killing of Python, the male serpent of the deluge, and the founding of the sanctuary of the Pythia. The harkening to the oracle, spoken by the inspiring feminine from out of the depths, balances “the One,” the Self, which can be both at variance with itself and in agreement with itself and thus like the tension of the lyre and the bow, which are its concrete manifestations and which are the instruments and means for attuning oneself to, and creating the music and sustenance of, life.

One is reminded of Goethe’s Faust, who says “two souls, alas, dwell in my breast.” This tension at the very core of our being, a tension that is contained and embraced by “the One,” finds its harmony in creating and in the revelation of god’s creating.

The intercourse (dialogue) between the feminine and the masculine—metonymically, “the soul” and “the spirit”—in the Self, “the One,” gives birth to an individual’s “humanity.” In the act and event of self-knowledge, a person invents his or her “humanity,” a humanity that is like the wholeness and harmony of the bow and the lyre. The bow symbolizes that self-relationship, which is self-knowledge, self-birth, a revelation of humanness, and a winning of true *aretē*.

The attunement of bow and lyre to the music of life—this cleaving unto life—draws death into intimate union with life. The acceptance of the serpent is the possibility for drawing the bow of life. Herakleitos touches on this when he says, “The name of the bow [*biōs*] is Life [*bios*], although its work is death” (Frg. 48, *Eym. Gen.*). Who draws upon this bow, though drawing upon death, draws upon life.

Atalanta, the glorious daughter of Boiotian Schoineos, was taught “good archery” and other hunting arts by Artemis (Paus. 8.35; Opp. *Cyn.* 2.26–27; Ovid *Met.* 10.565f; Callim. *Dian.* 215–24). She participated in the hunt for the Kalydonian boar, which Artemis sent to ravage the fields of King Oineos of Kalydon because he failed to make sacrifice to her. Using bow and arrow, Atalanta was first to strike the boar, and Meleager, Oineos’s son, gave it the finishing blow with his spear. Having fallen in love with Atalanta, Meleager gave her the trophies of the hunt. Two maternal uncles, Toxeos (Bow-Man) and Plexippos, expressed outrage at this, and Meleager slew them. Their kin, with the aid of the Kouretes, made war on Kalydon, during which Meleager was slain (Ovid *Met.* 8.270–545; Hom. *Il.* 529–99; Paus. 8.45; Callim. *Dian.* 215–24; Opp. *Cyn.* 2.27). Another tale says that Schoineos set a marriage contest for swift-footed Atalanta: whoever beat her at a foot race would win her as a bride; those who lost, she would slay. Many suitors perished, until Hippomenes=Melanion, casting Aphrodite’s golden apples before Atalanta, won the race as she stepped aside to retrieve them (Ovid *Met.* 10.565f; Paus. 5.19). Oppian (*Cyn.* 2.26–27) says that Atalanta invented the bow and arrow (“winged death”). (The Kouretes also were credited with inventing the bow and arrow; they were closely associated with ephebe initiation rituals and weapon dances.)

The mythologem of Atalanta is rich and many-leveled. Suffice it to say that much of it deals with initiation into manhood and womanhood in terms of the psycho-social “balance” between independence and dependence in human relationships: Meleager, who is overly dependent upon his mother, perishes, while Atalanta, overly independent, yields to the bonds of love and marriage. But it is the bow and arrow motifs that demand attention.

Atalanta is the daughter of Schoineos (Rush-Man); she herself was called the Rush Maiden. Why? As I noted earlier, arrows were made from the sharp-rush and the reed. The name of Atalanta’s father refers us directly to the technology of the arrow. A well-made arrow combines the paradoxical characteristics of straightness and flexibility: thus, it reaches its target with the least resistance with the necessary and proper oscillation in the early stages of flight. This reminds one of Atalanta weaving to one side and then the other as she sped to the target of love.

The association of sharp-rushes and reeds with religious cult are quite clear in the dances performed by maidens wearing wreaths of

sharp-rushes or reeds for Artemis Karyatis and Apollo Karneia, and in the *kalathos* (reed, reed basket) dance performed in honor of Kalamine (Reed), a nymph of Artemis Koloene.

The name Atalanta is itself significant: *atalanta* = "balanced, equivalent in weight, equal to." This suggests critical factors in the art of archery—the balancing of arrow to bow and bow to archer; the balanced posture, upright and centered; and balanced breathing—which are all part of the overall harmony and balance involved in the art.

On its technological level, the legend of the Kalydonian boar hunt encodes a conflict over the respective valuation of bow versus spear (or axe), with the gods (Artemis, Kouretes) favoring the bow. The superiority of the bow and arrow—one might say its greater sacred power—is a pervasive theme in Ovid's version of the legend: (a) the boar's bristles are "like spears"—so that a negative valuation of the boar equals a negative valuation of the spear; (b) the spear-wielding heroes fail to hit the boar—Ovid even has Diana deflect their attempts—while bow-shooting Atalanta is successful; (c) Ancaeus—who, in the penultimate scene, vaunts: "Boys, I'll teach you how to hunt / how far a manly blow outdoes a woman's . . . although Latona's daughter / cover that beast with a fine net of arrows . . . my good right hand'll cut the beast in two"—pays for this by being gored to death by the boar; and (d) Meleager himself, though finally spearing the boar to death, gives first credit to Atalanta and her bow, and brings on his own doom by slaying his uncle Toxeos (Bow-Man).

While the Herakles-Skythes, Apollo, and Philoktetes tales mythologize three essential characteristics of the bow, namely, its storage of potential energy, its tension of opposing forces, and its resiliency, the Atalanta tale mythologizes the remaining characteristic, namely, the kinetic energy of the arrow.

This is most evident in Ovid's version of Atalanta's marriage contest. Atalanta was as "swift as she was beautiful," and, when racing Hippomenes, "she flew past him as if feet were wings, . . . her speed was like a Scythian arrow's flight through air." She is the personification of kinetic energy and the swift speed of the arrow. She is the swiftness of life, fleeting and ephemeral, held but for a moment, only by love. She is that in life which cannot be held but by touching love to the ground. She is the dynamism of life, the energy, that moves one to live a life with purpose and meaning.

We have seen how the essential *technē* (bow as such, invention, and technique) of the bow—characterized by such things as potential energy, tension of opposing forces, deformation ("being bent out of shape" by "stress," so to speak), resiliency, dynamism, balance and uprightness—provides symbol, theme, and metaphor for a set of ancient Greek myths (Skythes, Apollo, Philoktetes, Atalanta), the hermeneutic

of which articulates the peculiar ancient Greek self-understanding of the bowl-like life.

Stratigraphy of the Gods

What is the role played by this self-understanding in the ancient Greek self-understanding as a whole? A brief answer to this question is given by the following chart, which lists eight major Greek gods that are associated with the invention of *technai* and the *technai* with which they are associated, as well as the epoch in which these *technai* were actually invented.

While not comprising the whole of ancient Greek technology, this list does comprise, broadly speaking, the whole field of *sacred* technology. The place of the bow in this list indicates the extent of its role in the sacred *technai* of ancient Greece, and, indirectly, the place of the bow in the spiritual self-understanding of ancient Greece.

Considering the prehistoric eras when the *technai* were actually invented, the chart becomes a stratigraphy of the gods, useful for reconstructing prehistoric religion from techno-mythic analogies. This is the subject of the final part of my inquiry.

GOD	TECHNAI	EPOCH
Herakles	rope bow (domesticated deer)	Mesolithic
Artemis	rope basketry nets bow resins hunting dog (domesticated deer)	Mesolithic
Apollo (Aristaios = A)	and lyre pits, snares, nooses, and nets (A) hunting dog (A)	Mesolithic
	shepherding (and A) cheese making (A)	Proto-Neolithic
	cattle herding (A) beekeeping (A) olive cultivating (A)	Neolithic
	viticulture (A)	Copper/Bronze
Hermes	fire sticks lyre divining pebbles	Mesolithic (Azilian)
	olive cultivating	Neolithic
	alphabet, astronomy musical scales weights and measures	
Demeter	cereal cultivating plow	Accramic Neolithic Copper/Bronze

GOD	TECHNAI	EPOCH
Athena	pottery spinning and weaving olive cultivating bridle, plow, yoke, and rake flute, trumpet chariot, ship numerology	Neolithic Copper/Bronze
Hephaistos	metal working	Copper/Bronze
Dionysos	viticulture fig cultivating	Copper/Bronze

Mesolithic Technology

Greek mythology speaks of the bow and arrow as invented by the gods; in the Euro-Mediterranean area, the bow and arrow was actually invented at the dawn of the Mesolithic by hunter-gatherer peoples who were in the process of adapting to a Post-Pleistocene environment.

The earliest evidence for the bow has been found at Maglemosian sites in northwest Europe (two elm bows, Holmegaard IV, 6–5,000 B.C., one elm bow from Zealand, c. 6,000 B.C.); earliest evidence for the arrow, at Ahrensburg sites (more than 100 pinewood shafts, Stellmoor, 9–8,000 B.C.).⁵ The bow was used not only in hunting, but also in carpentry (bow-drill), fire-making (fire bow), and music (musical bow). The hunting bow was “the earliest instrument we know of in which mechanical power was used” (Anati:140). It gave Mesolithic hunters a tremendous superiority over their spear-throwing contemporaries and predecessors.⁶

Besides the bow and arrow, Mesolithic inventions include: net and trap, fishhook, domesticated hunting dog. Earliest evidence for rope, basketry and matting, and adhesives (for attaching microliths to shafts) has led some to classify these as Mesolithic inventions, too. Archaeologists and prehistorians often refer to the Mesolithic as the period of the “microlithic revolution,” because finds of microlithic industries are typical of Mesolithic sites. This is a misleading characterization of the real Mesolithic revolution, since microlithic points are found at Paleolithic sites and since the real revolution in Mesolithic technology is exemplified by nonmicrolithic inventions. The microlith is merely a variant of Paleolithic blade technology; it remains a simple machine, an inclined plane in motion, designed to cut, pierce, and divide. The nonmicrolithic inventions are complex machines; they store potential energy and release kinetic energy or otherwise act in a manner that is manifestly autonomous and self-moving.

Once set, traps and nets activate themselves. The bow, put in tension with itself, automatically activates itself when released. Net and trap, fishhook and bait—these are devices of technological trickery. They use the prey to catch itself. A fish catches itself on the hook, and

in fighting the pole uses its own energy to defeat itself. The hunting dog is a device of irony: an animal designed to catch an animal for the sake of humans.

Mesolithic technology manifests complexity, reflexivity, irony, trickery, self-activation, and autonomy.⁷ As Anati (141–42) notes: “Both the bow and the trap imply sophisticated and highly refined abstract thought. They are the earliest ‘machines’ men ever created, and they show the extent of cultural development. This kind of invention must have radically changed man’s values.”

Techno-Hermeneutical Hypothesis

Anati (142) surmises that the sophisticated peoples of the Mesolithic age must have quickly abandoned Paleolithic rites and religious practices for new ethical and aesthetic values. Anati here makes an assumption similar to that of this inquiry: there is no reason not to apply techno-hermeneutical principles to prehistoric peoples; there is no reason not to assume that the self-understanding and religion of the Mesolithic was informed by Mesolithic technology.

While there were some alterations in economy and ecology from the Paleolithic to the Mesolithic, there was a revolutionary change in technology. This technological revolution is the most distinctive feature of the Mesolithic. The bow and arrow, along with the net and trap, were probably the most significant cultural creations of the age.

Thus, my hypothesis should be strengthened: while the bow and arrow played a limited role in the self-understanding and religion of ancient Greece, it played a dominant role in the self-understanding and religion of the Mesolithic, during which it was virtually the dominant cultural form.

Mesolithic Art and Technology

That this was the case for the Mesolithic self-understanding is confirmed by Mesolithic art.

The subjects and styles of Mesolithic art sharply contrast with those of Paleolithic art. Rather than the ponderous art of the Paleolithic, whether the fertility figurines or the cave art, which depicts the majesty and solemnity of the animal world, with the human figure rare and usually masked, we now see two radically new kinds of art: linear, schematic art, utilizing geometric patterns—nets and chequers are characteristic—and biomorphic designs (e.g., Maglemose art, perhaps influenced by the net, a Mesolithic invention, Clark, 1936), and an incredibly dynamic and graceful art in which human figures abound, with scenes of hunting, dance, and war as well as everyday and domestic life (e.g., Spanish Levant and North Saharan art, Sandars, Lhote). In Levantine art, animals are as diminutive as men and women. Levantine art introduces humorous scenes and scenes which border on caricature

and irony. The bow and arrow is everywhere in evidence; in some scenes harried archers fly about, shooting arrows in all directions. The artist's techniques also change from the Paleolithic to the Mesolithic: cave art gives way to rock art, and, in Malgemesse art, a drill technique of ornament is popular, a technique with no parallel in Paleolithic art and probably related to the invention of the bow-drill (Clark, 1936:179, 163).

Not only is the bow and arrow frequently depicted in Spanish Levant art, it pervades the very style and spirit of that art, as Sandars observes:

These attenuated warriors who run, or pause to strain a bow and launch an arrow, combine in their own bodies the qualities of the weapon. Hollow backs and threadlike waists have become bows, while arms have the slenderness and direction of well-armed arrows. . . . Here perhaps in the Civil figures we see the new dynamic of the bow and bowstring. The tension of taut animal sinew is transferred to an idealized human body drawn out from the hips as the bow is bent for stringing. These taut, vibrant figures are at the opposite pole to the ponderous, earthbound solidity of Upper Paleolithic sculpture and most of Upper Paleolithic drawing.

The quality that permeates this art more than others is the concentration on movement and on linear, not muscular, energy. It is an attempt to capture the look of speed itself, the bowstring tension of incredibly slender bodies, the flying gallop of animals and man. . . . The greatest achievement is the understanding of movement . . . and of transitory time. (92-93, 96-98)

Comparable scenes are found in the rock art of the North African Sahara, as at Tassili (Maringer and Bandi, figs. 158, 159; Lhote, fig. 42), and even the geometric art of the Maglemosians (Clark, 1936:figs. 57.10-11 and p. 157).

Clearly, Mesolithic art, especially in the Levant, is pervaded by the bow, in both its subject matter and its subjectivity.

The style and mood of Mesolithic art symbolizes characteristic features of the essence of the bow and arrow: tension, flexibility, linear energy, goal, speed, and dynamism.

Mesolithic art has a sense of space virtually lacking in Paleolithic art. Groups of subjects are represented in balanced configurations and interactions, perhaps reflecting the bow's mastery of space and the archer's art, which involves a harmonizing of many factors into a whole. There is also a new sense of time—depictions of series of events, time itself as fleeting and ephemeral, perhaps reflecting the arrow's speed, and a general increase in the "speed of everyday life."

The art seems generally imbued with a sense of the delightful and triumphant superiority of the bow and arrow over the spear and other ponderous Paleolithic inventions.

The Mesolithic artist of the Spanish Levant—and even of northwest Europe—is clearly aware of the hermeneutic of the bow: the artist depicts human beings shaped like bows. (The actual Mesolithic bow, a

man-sized self-bow, easily lent itself to such a metaphor.) Thus, Mesolithic art depicts the ontological metaphor of the bowlike self, which must have dominated the self-understanding of the age. The artist also depicts archers in balanced configurations of their likenesses, upright and at right angles, and in repeated patterns (esp. Sandars:figs. 29, 30)—ontological paradigms of human self-relationship.

Even the twofold content of Mesolithic art—on the one hand, lines, schemata, and geometric shapes, and, on the other, human beings in complex interactions and scenes of everyday living, often depicted with humor, caricature, and irony—seems to reflect not only the characteristics of the new Mesolithic technologies, namely, complexity, reflexivity, irony, trickery, self-activation, and autonomy, but also the twofold essence of technology in general as a manifestation of human life (self-becoming), which is both self-organizing and organized (structure, dynamics, telos) and self-responsible (inventing and right using).

Mesolithic Religion and Technology

If the bow plays a dominant role in Mesolithic self-understanding as expressed in Mesolithic art, there is no reason to assume it does not play a dominant role in Mesolithic self-understanding as expressed in Mesolithic religion.

Recent research by Marshack indicates that Mesolithic peoples, like their predecessors, had "a modern level of cognitive capacity and symbolic usage," "a storied understanding" of "time-factoring and time-factored" processes and comparisons of processes (including astronomical and seasonal cycles, human and animal development—sexuality, pregnancy, birth, maturation, and death—and thought and art processes), periodic ceremonies and rites, and mythologies that involve both masculine and feminine figures. Our discussion of Mesolithic art gives ample evidence of symbolic usage, storied understanding, time-factoring, and comparison of processes.

Unfortunately, archaeology and prehistory can tell us little about the specifics of Mesolithic religion—a few changes in burial rituals, a new hunt ritual centered on the deer, perhaps a fish cult or solar cult. Identities of deities and details of even one mythology remain unknown./8/

A Techno-Mythic Analogy

I now propose that we may reconstruct a major aspect of Mesolithic religious self-understanding—and give voice to the mute artifacts of archaeology—by using ancient Greek "bow" mythologies, if not as actual survivals of the Mesolithic—which they may well be—at least as techno-mythic analogies for Mesolithic mythological self-understanding.

The validity of using the "bow" mythologies of Apollo, Artemis, and Herakles as analogies is reinforced by the fact that both a Mesolithic

economy (hunter-gatherer) and a Mesolithic ecology (boar, deer, fish, fowl, honey, seacoast, and marsh) are distinctive features of the mythologies and cults of these deities.

Greek "bow" mythologies even provide intriguing analogies for specific details of Mesolithic art (see figures in Sandars, Lhote, Maringer, and Bandi): an archer stringing a bow (=Skythes, Odysseus); archers hunting a boar (=Kalydonian hunt); dancers with bows (=Kouretes, ancient Greek weapons dances); a graceful, dynamic, goddess-like woman, with bows or dancing (=Atalanta, Artemis); and a general mood of reverence accorded the bow, with implicit sense of superiority over the spear (=Atalanta and Kouretes vs. the tragedy of Meleager and his band).

The analogical use of Greek "bow" mythologies for Mesolithic religious self-understanding can be refined further: the "bow" mythologies of Apollo (Delian, Delphic) and Artemis (Atalanta) are more akin than those of Herakles (Skythes, Philoktetes) to the spirit of Mesolithic art, with its sense of tension, linear energy, speed, and dynamism.

This refinement is reinforced by the fact that in ancient Greek art Apollo and Artemis are represented using the Mesolithic simple bow, while Herakles is always represented with the Asian complex bow. This fact also suggests that our analogies are probably survivals.

Whether or not the Greek "bow" mythologies of Apollo and Artemis (Atalanta) are used as survivals or analogies for Mesolithic religious self-understanding, their hermeneutic may be used to help illumine a major aspect of the Mesolithic self-understanding as attested in Mesolithic art. It can help us understand an age like our own, when technology seems triumphant over all of life, but unlike our own, when technology was subservient to a liberating aesthetic and spiritual vision and not to the domination of an economic ideology.

Epilogue

Do we not understand, even more clearly, what Nietzsche meant when he said, speaking of that "magnificent tension of the spirit": "We good Europeans and free, very free spirits—we still feel it, and the whole need of the spirit and the whole tension of the bow. And perhaps also the arrow, the task—and who knows?—the goal."

ὄδε βίος βίος

NOTES

/1/ Canes and reeds have been used throughout the world to make bows and arrows.

/2/ On this point I am in agreement with Eliade, who states: "Contrary to what may be called 'cosmic symbols'—stars, waters, the seasons, vegetation, etc.—which reveal both the structures of the Universe and the human mode of being in the world, the symbolism of tools and weapons discloses specific existential situations" (463). By "specific existential situations" I understand "self-understanding" or "self-becoming" as opposed to being in the world or worldview.

/3/ The standard method for reconstructing prehistoric religions is that of "historical-cultural analogies" (Narr), by which he really means analogies taken from the religious rituals of contemporary primitive peoples who have economies or social structures assumed similar to that of the prehistoric people being examined.

The name "historical-cultural analogies" is a misnomer; Narr actually uses "socio-economic ritual analogies." I believe that the use of technology and mythology, whether as survivals or analogies, would give prehistorians of religion a tool more powerful than that of primitive ritual analogies.

Marshack gives an observation in complete accord with what I am proposing. Examining a fragment of cord from the Lascaux ritual pit, he observes: "By implication, the cord is of vast importance, telling us much about man, his cognition, and the nature of his early culture. [The rope was] a tool and not art, but it was used as part of the cultural complex involved in the 'artificiality' of art." An ibex-engraved oil lamp from La Mouthe raises the questions: "Did this oil from the animal body, which burned differently than wood and by a floating wick, and which probably savored somewhat of food or flesh have its 'story,' and was it, therefore, 'holy' in a way different than wood? [Such questions] were not included in the old, traditional archaeology, nor are they part of the newer sequential analyses, deductions, and documentations presented in this book. Nevertheless, they are related to these forms of evidence and must increasingly become part of the theorizing and research related to early man's intelligence and culture" (369–71).

/4/ I am indebted to LaForest G. Robbins of Waterville, Maine, for an archer's analysis of the art of archery.

/5/ Evidence for points—which may or may not have been used for arrows—date from Magdalenian IV (before 8,000 B.C. Hamburgian (13–10,000 B.C.), French or Spanish Solutarian (15,000 B.C.), North African Aterian (35,000 B.C.), and Upper Kenya Capsian (after 8,000 B.C.). Clark (1963:62) puts the probable date for the invention of the bow at about 15,000 B.C.

/6/ The medieval English yew bow could shoot about 250 to 300 yards, a special flight arrow 400 yards; the Turkish bow could shoot 400-500 yards (Burkitt:64).

/7/ Binford describes the contrast between Paleolithic and Mesolithic technologies as one between Pleistocene "implements" (spears, knives), which "translate or enhance energy exchanges" and Post-Pleistocene "facilities," which "prevent motion and/or energy transfer" (222). This is not sufficient. Mesolithic technologies do more than prevent motion; they are complex machines.

/8/ Studies of prehistoric religion have treated the Mesolithic as if it were an appendage or degeneration of the Upper Paleolithic (Mainage, Levy, Maringer, James, Leroi-Gourhan, Narr). Maringer posits a reindeer sacrifice, James, a sacred dance and sacred burials; both view these as merely continuations or survivals of Paleolithic religion. Clark typifies the prevailing view of Mesolithic religion. He has stated that "evidence of the religion of these small groups of hunters and fishers is slight" (1936:127), and in a recent summary of the latest research on the Mesolithic (1980), he gives no references at all for Mesolithic religion. An exception is Srejovic's speculations on the ideology of Lepenski Vir (117-24).

ABBREVIATIONS

Classical Texts are abbreviated according to *The Oxford Classical Dictionary*:

Ar. Ach.	Aristophanes, <i>Acharnenses</i>
Ran.	<i>Ranae</i>
Callim. Dian.	Callimachus, <i>Hymnus in Dianam</i>
Dict. Cret.	Dictys Cretensis
D.S.	Diodorus Siculus, <i>Bibliotheca Historica</i>
Etym. Gen.	<i>Etymologicum Genuinum</i>
Hdt.	Herodotus, <i>Historia</i>
Hyg. Fab.	Hyginus, <i>Fabulae</i>
Hippol. Haer.	Hippolytus, <i>Refutatio omnium Haeresium</i>
Hom. Il.	Homer, <i>Iliad</i>
Od.	<i>Odyssey</i>
Opp. Cyn.	Oppianus, <i>Cynegetica</i>
Ov. Met.	Ovid, <i>Metamorphoses</i>
Paus.	Pausanias, <i>Graeciae Descriptio</i>
Philostr. I.	Philostratus, <i>Imagines</i>
Pl. Symp.	Plato, <i>Symposium</i>
Pliny HN	Pliny, <i>Naturalis Historia</i>
Plut. Amat.	Plutarch, <i>Moralia: Amatorium</i>
Serv. V. Aen	Servius, <i>In Vergilii carmina commentarii—Aeneid</i>
Strabo	Strabo, <i>Geographica</i>
Theophr. Hist. Pl.	Theophrastus, <i>Historia Plantarum</i>

WORKS CONSULTED

- Adler, Bruno
1931 "Pfeil und Bogen in Kult und Sage." *Der Weltkreis* 7-8:1-13.
- Albright, W. F., and Mendenhall, George E.
1942 "The Creation of the Composite Bow in Canaanite Mythology." *Journal of Near Eastern Studies* 1:227-29.
- Anati, Emmanuel
1963 *Palestine Before the Hebrews*. New York: Knopf.
- Arias, P. E.
1965 *Greek Vase Painting*. New York: Abrams.
- Balfour, Henry
1921 "The Archer's Bow in the Homeric Poems." *The Journal of the Royal Anthropological Institute of Great Britain and Ireland* 51:289-309.
- Binford, Lewis
1968 "Methodological Considerations of the Archaeological Use of Ethnographic Data." In *Man the Hunter*, edited by R. Lee and I. DeVore. Chicago: Aldine.
- Burkitt, A. N.
1937 "The Bow and Arrow." *Mankind* 2:64.
- Clark, Grahame
1936 *The Mesolithic Settlement in Northern Europe*. Cambridge: Cambridge University Press.
1963 "Neolithic Bows from Somerset, England, and the Prehistory of Archery in Northwestern Europe." *Proceedings of the Prehistoric Society* 29:59-98.
1980 *Mesolithic Prelude*. Edinburgh: Edinburgh University Press.
- Eigen, Manfred, and Schuster, Peter
1977-78 "The Hypercycle: A Principle of Natural Self-Organization." *Die Naturwissenschaften* 64:541-65; 65:7-41, 341-69.

- Eliade, Mircea
1968 "Notes on the Symbolism of the Arrow." In *Religions in Antiquity*, edited by Jacob Neusner. Studies in the History of Religions, 14. Supplement to *Numen*. Leiden: E. J. Brill.
- Emeneau, Murray B.
1953 "The Composite Bow in India." *Proceedings of the American Philosophical Society* 97:77-87.
- James, E. O.
1957 *Prehistoric Religion: A Study in Prehistoric Archaeology*. New York: Praeger.
- Kroeber, A. L.
1925 *Handbook of the Indians of California*. Bureau of American Ethnology, Bulletin 78.
- Leroi-Gourhan, André
1964 *Les Religions de la Préhistoire: Paléolithique*. Paris: Presses Universitaires de France.
- Levy, G. Rachel
1948 *The Gate of Horn*. London: Faber and Faber.
- Lhote, Henri
1959 *The Search for the Tassili Frescoes*. New York: Dutton.
- Longman, C. J.
1894 "The Bows of the Ancient Assyrians and Egyptians." *The Journal of the Royal Anthropological Institute of Great Britain and Ireland* 24:49-57.
- Mainage, T. H.
1921 *Les Religions de la préhistoire: L'âge paléolithique*. N.p.
- Maringer, Johannes
1960 *The Gods of Prehistoric Man*. New York: Knopf.
- Maringer, J., and Bandi, H.-G.
1953 *Art in the Ice Age*. New York: Praeger.

- Marshack, Alexander
1972 *The Roots of Civilization*. New York: McGraw-Hill.
- Narr, Karl
1974 "Prehistoric Religion." *Encyclopaedia Britannica*. 15th ed., 14:984-89.
- Ortega y Gasset, José
1941 "Man the Technician." In *Toward a Philosophy of History*. New York: Norton.
- Sandars, Nancy
1968 *Prehistoric Art in Europe*. Baltimore: Penguin.
- Srejovic, Dragoslav
1972 *Europe's First Monumental Sculpture: New Discoveries at Lepenski Vir*. New York: Stein and Day.
- Westman, Heinz
1961 *The Springs of Creativity*. New York: Atheneum.