Abstract

A chronology of the meteorological events described by Homer in the Odyssey following the Achaeans' conquest of Troy (ca. 1200 B.C.) is developed. Application of polar front theory to the voyages of six separate fleets as they sailed from Troy provides a unique test of the factual nature of a portion of the epic. Nothing beyond the limits of accepted meteorological theory occurred during the first 18 days following the departure from Troy. The Odyssey consistently shows a credible set of weather observations. Evidence suggests that the tragedies experienced by the Achaeans in the Odyssey may have been caused by a cyclonic storm crossing the area in the early summer. If the Achaeans' initial travels after the conquest of Troy are factual, the chronology developed in this study extends our knowledge of daily weather events to an earlier time than has previously been available and creates a new component in the global history of climate and weather. A description in the Odyssey of a possible microburst event is also presented.

1. Introduction

Meteorological records derived from historic voyages of exploration may provide valuable information on the specific character of weather during a particular year (e.g., Ludlum 1963; Burt 1990; Cerveny and Hobgood 1992). This may be important for understanding and classifying the daily weather of historical periods that occurred before the invention of meteorological instruments. Lamb (1985) noted that the judicious use of descriptive accounts of weather, such as tales of outstanding meteorological events and the general nature of particular seasons, may aid in development of an accurate and complete history of weather.

Unfortunately, two considerations limit the use of such data. First, daily observations for many interesting periods of early history are rare. Analyses of pre-Middle Age daily weather, such as Hellmann's (1916), in which meteorological information was extracted from 171 days of observations by Claudius Ptolemeus around A.D. 120, tend to be isolated studies. The accuracy of the Ptolemy chronology has been discussed by Brooks (1931) and Oliver (1990). Second, descriptions of meteorological events are frequently limited to single-source observations, which may not be reflective of the regional meteorology.

Homer's Odyssey, the saga of the Mediterranean travels of Odysseus and several other Achaeans after the fall of Troy, provides an interesting test of the ability to derive weather information from existing classical works. Of particular interest is the portion of the Odyssey that discusses the specific travels of six separate Achaean fleets following the conquest of Troy. Analysis of these ships' movements and each fleet's weather observations reveals a consistent regional meteorology.

As researchers now date the historical events chronicled by the ancient Greek poet to approximately 1200 B.C. (Zerefos and Zerefos 1978), extraction of daily weather data for this period may be particularly useful to atmospheric scientists, both as an extension of our knowledge of daily weather events to an earlier time than has previously been available and as a new component in a global reconstruction of climate and weather. Additionally, the application of meteorological knowledge to the Odyssey provides a unique test of the validity of a portion of this ancient epic.

This study is limited to the period of time chronicled in the Odyssey prior to Odysseus's landing on the Isle of the Lotus-Eaters. That period of time, in Homer's epic, comprises Odysseus's and five other groups of Achaeans' movements in an area of known geography (specifically, the Aegean Sea). After Odysseus's departure from the Aegean Sea, the geography of his travels, at most, becomes imaginary or, at least, employs place names that can not be conclusively linked to modern geography. Although Wolf and Wolf (1968) have produced one of the most well-known attempts to link Odysseus's post-Aegean Sea travels to known geography, evidence to support their claims is fragmentary and subject to debate.

Before a daily sequence of weather from Homer's Odyssey for this period of history is constructed, three important caveats must be made:

(a) The poems of Homer were not written at the supposed time of the fall of Troy. Many scholars date the poetry to a period possibly 600 years after the events described in the epic. Even if the assumption is made that the Odyssey describes real events, error may have entered the narrative over that period of time, and, indeed, even after that time. Unfortunately, there is no method available for quantifying the amount...
of error that may have entered into the *Odyssey* since its conception. This study will assume that the poem may be analyzed as if it is a historical document, and will test the soundness of its weather observations from a meteorological viewpoint given that assumption. This follows Bryson and Murray’s (1977) comment on the use of ancient stories in studying Mycenaean climate that “one should not dismiss this story ‘told in mythic guise’ as meter poetry. Schliemann, after all, did follow the myths of Homer to the sites of Troy and Mycenae.”

(b) Even if one assumes that the *Odyssey* may describe historical events, the saga was not intended as a meteorological logbook. The adventures associated with the return of the various Achaeans from Troy are interspersed throughout the *Odyssey*, particularly Books III, IV, and IX. This is apparently one reason why a clear chronology of all returning Achaeans mentioned in the *Odyssey* had not been produced prior to this study. The meteorological interrelations between the various Achaeans’ travels therefore has remained unnoticed by previous researchers [with the exception of Stanford’s (1958) comment regarding Ajax and Agamemnon; see section 2f].

(c) The body of science existing during Homer’s time did not acknowledge weather movement. Winds and storms were the products of the gods’ anger or favor and were specifically directed to individuals based on their interactions with the gods. Consequently, Homer could not have tailored events in the *Odyssey* to paradigms in modern meteorology such as polar front theory. Meteorology may therefore provide an independent test of the reality of this portion of the *Odyssey*. Although the Homeric tales had long been thought to be fiction, archaeological evidence uncovered in present-day Turkey by Schliemann supports the existence of ancient Troy and matches, to some extent, Homer’s descriptions (Wace and Stubbings 1962). But if the weather events described by Homer during the Achaeans’ return from Troy follow meteorological paradigms, an argument may be proposed for accepting the validity of some of the events that occurred after the fall of Troy as put forth by Homer.

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2. A chronology of events

Homer’s *Odyssey* recounts the Achaeans’ attempted return from Troy from the perspective of three different fleet commanders: specifically Nestor, Meneláus, and Odysseus. Additionally, in Book III, Nestor recounts the fate of Diomédès of Argos and, in Book IV, Meneláus relates the tragedies of Agamemnon and Ajax as told to him by Pròteus of Egypt. From this information, a chronology may be constructed (Table 1). Because of the nonmeteorological nature of the source material, portions of the reconstruction must be made by conjecture and logic rather than by direct evidence.

The translation by Mandelbaum (1990) is used for English passages (cited in italics by Roman numeral for book and Arabic numeral for line number) from the *Odyssey*, while Stanford’s (1959) classical Greek edition is used for the original Greek. Spellings used in this study conform to those of Stanford.

a. Day 1

The first day’s journey is best related by Nestor of Pylos in Book III. He stated that, initially, half of the Achaeans stayed at Troy with Agamemnon to conduct rites to appease the goddess Athena. After an argument, the other half, including Nestor, Meneláus, Odysseus, and Diomédês, “at daybreak launched our ships across the glowing sea” (III, 153) and landed at the nearby island of Ténedos (Fig. 1). A debate followed at Ténedos regarding whether to return to Troy or continue to Greece. Nestor and Diomédês convinced their respective fleets to proceed to Lesbos. The weather conditions during the trip to Lesbos were calm and uneventful—“a clement god had smoothed the sea’s rough surface” (III, 158).

However, the “wise and crafty” Odysseus returned to Troy (III, 163). Ostensibly, his return was to aid Agamemnon in conducting appeasement rites. If we assume that the decisions of these sailors of small, square-sailed sailing vessels were strongly influenced by sailing conditions, a more pragmatic reason for Odysseus’s return may relate to the generally weak or
Fig. 1. Map identifying major cities and geographic features associated with descriptions of travels made in Homer's *Odyssey*.

calm winds noted by Nestor. The southerly route to Lesbos would not be favored unless northerly or northeasterly winds were present. An argument may be advanced that the "crafty" sailor anticipated a faster voyage than that of his colleagues by traveling back north and then proceeding westward along the Thracean coast. This would be sound reasoning if the weak winds of day 1 were to continue. His subsequent travel to Ismarus on the Thracean coast (Fig. 2) supports this hypothesis.

b. Day 2

Homer implies that the winds began to increase by day 2 when he states that Menelaus of Lacedaemon overtook Nestor and Diomèdes at the island of Lesbos, although Menelæus started later than his two fellow Achæans in leaving Tenedos. Simultaneously, Odysseus noted that "the wind that carried me from Ilion [Troy] brought me to Ismarus, the Ciconès" (IX, 39–40). Such a wind would have to be easterly or southeasterly given Ismarus’s location on the Thracean coast.

While Odysseus was sailing toward Ismarus, a debate occurred between the three commanders on Lesbos as to the best route to use in crossing the Aegean Sea. Two possibilities were voiced. The first was a shorter, but more dangerous, direct route across the Aegean Sea to Geraestus, the most southerly point of Euboea (Fig. 1). A second, longer route involved traveling first east and south of Chios and then across the Aegean Sea via island hopping through the Cyclades. The second route would have been considered the safer of the two, as Achæans normally feared the dangers resulting from sea voyages, particularly those out of sight of land.

Why then were the commanders at Lesbos even considering the more dangerous northerly route? If Odysseus was correct in saying the wind carried him to Ismarus, the surface winds on day 2 would have been from the southeast and would have opposed the
normal southerly route along the coast of Asia Minor. The Achaeans at Lesbos would therefore have been faced with the prospect of a long and, with respect to the winds of day 2, unfavorable journey southward, or a more favorable but dangerous sail directly across the Aegean Sea. The debate would have centered on safety versus speed.

c. Day 3

The Achaeans at Lesbos decided to take the more dangerous northerly route directly across the Aegean Sea rather than the safer southerly route. According to Homer, “Then we asked Zeus to send an omen; he showed us a sign—commanded our ships to cleave the sea directly, head straight for Euboea—if we wished to flee most quickly from the threat of tragedy” (III, 169–174). To experienced sailors, such a sign might be the beginnings of a strong north or northeasterly wind, a favorable wind for a direct sea crossing. As the gods of the Achaeans were directly associated with nature, such a weather-oriented sign would not seem unreasonable. Indeed, Homer continued, “A shrill wind started up, the ships ran swiftly across the seaways rich with fish; that night we landed at Geraestus.”

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d. Day 4

Once the fleets of Nestor, Meneláus, and Diomédës reached Geraestus, their next landmark would have been a promontory southeast of Attica called Cape Súnium (Fig. 1). As the Achaeans neared this landfall, however, the helmsman of Meneláus was struck by the “gentle shafts of Phoebus Apollo” (III, 279–280), a Homeric euphemism for a sudden and painless death (Stanford 1958). Therefore, Meneláus, “although he was keen to journey on” (III, 279–280), a reasonable sentiment given the favorable winds, delayed at Súnium to bury his crew member.

Burial customs of the day as noted by Homer in the Iliad and the Odyssey could be quite elaborate (Wace and Stubbings 1963). In the Iliad (Fagles 1990), the funeral of Patroclus required the preparation of the body to be followed by a feast and military processions around the body (Iliad, XXIII, 6). Hector’s funeral consisted of lamentations and prothesis lasting nine days and nights (Iliad, XXIV, 784). In the Odyssey, Achilles’ funeral continued for 17 days and nights (XXIV, 63–64). Odysseus himself was delayed by funeral rites on day 4 (see below). While the helmsman was probably not of rank to deserve a long funeral and Meneláus was anxious to resume travel, a reasonable assumption is that Meneláus was delayed by at least a day.

Diomédës and Nestor, however, continued their travel southward, leaving Meneláus at Cape Súnium. Homer noted that, on day 4, the two fleets separated; Diomédës traveled into the Argolikos Kópios to his kingdom of Argos, while Nestor sailed south around Cape Malea to his homeland at Pylos (Fig. 1). Nestor commented that “the wind that favored me maintained its course: the god who sent it never sapped its force” (III, 183). Day 3’s northeasterly flow continued into day 4.

Although Homer is not specific, if we continue the line of reasoning advanced concerning the southward movement along the Asia Minor coast by the fleets of Agamemnon and Ajax, they could have reached Chios...
by day 4 and begun island-hopping southeastward across the Cyclades. Such an island-hopping maneuver would be one of the safest routes across the Aegean Sea, as it would seldom put the sailors out of sight of land. The disadvantage of such a route is that it is much farther south than that taken by Nestor and his companions. It is likely that, for safety considerations (following the example of Nestor, Menelaus, and Diomédes), Agamemnon and Ajax would have traveled together along the coast of Asia Minor and through the eastern Cyclades. However, the southern nature of the Cyclades route would have forced the combined fleet to separate before completing travel to their respective cities. Agamemnon’s homeland lay in the Peloponnese, while Ajax’s city was north across from Euboea.

Meanwhile, by the end of the third day, Odysseus and his men had finished their pillage of Ismarus, but were surprised at next daybreak by a counterattack of surviving Cícones. He and his men were forced to flee by noon of day 4. Safely away from the Cícones, the Achaeans stopped so that someone could call out “thrice on each of [their] poor comrades” (IX, 65). One likely landfall for such a ceremony, given the northeasterly flow noted by Nestor, would be Thásos (Fig. 1). No archaeological evidence of such a landfall has been identified.

e. Day 5

During the course of this day, Diomédes and his crew would have traveled up through the Argolikós Kólpos and reached their homeland, while Nestor would still be journeying westward from Cape Maléa toward Pylos. At Cape Súnium, Meneláus would be completing the funeral rites for his helmsman and preparing to resume his voyage. Odysseus and his men, having completed the rites for their crew members killed in battle during day 3, would be progressing
westward along the coast of northern Greece. The last Achaeans to leave Troy, the fleets of Agamemnon and Ajax, would be journeying southward from Chios and would be island hopping through the eastern Cyclades.

**f. Day 6**

By day 6, it is probable that Nestor would have returned safely to his kingdom. The prevailing currents in the area would have aided a quick completion to his travel. With normal speeds of cold front movement, Nestor likely experienced the effects of the cold front passage that impacted the remaining four groups at sea later on day 6 while at anchor during the early morning along the southern coast, and consequently was not impacted by it. During the course of day 6, the cold front would have continued to progress eastward, leaving fair weather conditions in western Greece for Nestor to complete his voyage to Pylos.

After completing the funeral rites of his helmsman, Meneláus would have likely resumed his travel southward to Cape Maléa for eventual return to his capital of Sparte. However, as the king reached the “high mountain of Maleai” (III, 287), the most easterly of the three southerly promontories of the Peloponnese, a powerful storm enveloped Meneláus’s fleet. According to Homer, the god Zeus “poured shrill blasts and swollen combers, mountainous and vast” (III, 289–290) down on the Achaeans’ king’s ships. Meneláus’s fleet was split and separated in the storm.

Today, Cape Maléa is still known for its storminess; according to the *Sailing Directions for the Eastern Mediterranean* (Defense Mapping Agency 1992), “violent squalls occur frequently near Akra [Cape] Meléas, spilling over from the high mountains above.” Yet it is reasonable, given the movements of the other Achaeans, that Meneláus’s storm was only part of a larger cyclonic system. Homer chronicled that several other fleets also suffered from severe weather on day 6.

The fleets of Agamemnon and Ajax would have probably separated in the western Cyclades by Day 6 (Fig. 2). Ajax’s homeland of Lacadia lay to the north, across from the northwest tip of Euboea. Conversely, Agamemnon’s kingdom lay westward along the Argolikós Kólpos. Both fleets encountered severe weather. Homer recorded that “near Maléa’s promontory,” Agamemnon experienced “a storm wind” that “drove him . . . groaning heavily, off course” (IV, 514).

Scholars have questioned why Agamemnon would have been near Cape Maléa, as his homeland lay along the Argolikós Kólpos (Wace and Stublings 1963; Stanford 1958). If the Achaeans had taken the same route as Diomédés had earlier, he would have already passed his homeland before reaching Cape Maléa. This study suggests that a route taking Agamemnon through the Cyclades provides (a) a closer fit with Homer’s description and (b) to the Achaeans mind, a safer voyage than Nestor’s and Diomédés’ route. A southerly position near Cape Maléa is particularly realistic, as it is consistent with probable impediment by a strong northeasterly wind (as noted by Nestor) of the west-northwest travel of Agamemnon through the Cyclades.

After separating from Agamemnon, Ajax would have been straining to travel northwest toward the Vorios Evíkos Kólpos, between Euboea and the Greek mainland. However, he was traveling at an even greater angle to the wind than Agamemnon, and consequently his progress would have been more slowed. He therefore could have still been in the Cyclades when he encountered the cold front. Homer chronicled that “Poseidon first had dashed his ships against the giant rocks of Gyrae” (IV, 500). According to Stanford (1958), the rocks of Gyrae had been variously identified on Mikonos (where the “grave of Ajax” is preserved), Tinos, or southeast of Euboea near the Capharean Promontory. All three possible sites are consistent with a possible cold front encounter during travel northwest through the western Cyclades. Stanford (1958) made the initial observation that Ajax and Agamemnon must have been caught in the same storm.

Finally, on day 6, Odysseus would likely have been voyaging along the coast of northern Greece (Fig. 2). One would expect that he would have preferred the northeast winds that had been present the previous three days, as those winds would have allowed him to safely travel within sight of land along the coast of northern Greece. However, Odysseus’s retelling of his voyage noted that “Bóreás [the north wind]—provoked by Zeus, who summons clouds—now swept against us: A ferocious tempest wrapped both land and sea; night scudded down from heaven. Wind struck our ships aslant; the sails were ripped and tattered—three and then four strips. In fear of death, we stowed our sails within the hold, then rowed and reached the coast” (IX, 67–71). A possible landfall consistent with northerly winds would be Euboea’s northeast coast.
It would therefore appear that a reasonable chronology of the six major Achaean fleets departing Troy produces a major cyclonic system passing through the Aegean Sea six days after the Achaeans’ departure from Troy. That system wrecked Ajax’s fleet against rocks in the central Aegean Sea, severely damaged Odysseus’s fleet in the northern Aegean Sea, and diverted both Meneláus’s and Agamemnon’s fleets in the southern Aegean Sea (Fig. 2). All of these fleets, according to Homer, experienced the wrath of the gods. Conversely, Nestor and Diomédes had arrived safely at their respective homelands as a result of the gods’ favor. A more mundane reason for their safe travel may have been simply that they concluded their journey before the cyclonic system’s passage.

### g. Days 7 and 8

Agamemnon survived the Cape Maléa storm and grounded along the coast of “what was once Thyestes’ land where now Aegisthus, son of Aegisthus, lived” (IV, 517). Debate has centered on this land’s actual location but some scholars suggest Kithera, the large

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**Table 1. Locations, events, and weather associated with each of Achaean commanders’ departure from Troy as interpreted from Homer’s Odyssey. Boxed regions indicate travel together.**

<table>
<thead>
<tr>
<th>Day</th>
<th>Nestor</th>
<th>Diomédes</th>
<th>Meneláus</th>
<th>Odysseus</th>
<th>Agamemnon</th>
<th>Ajax</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tenedos</td>
<td>Tenedos</td>
<td>Tenedos</td>
<td>Tenedos</td>
<td>Troy</td>
<td>Troy</td>
</tr>
<tr>
<td><strong>Weather:</strong></td>
<td><strong>Calm</strong></td>
<td><strong>Calm</strong></td>
<td><strong>Calm</strong></td>
<td><strong>Calm</strong></td>
<td><strong>Calm?</strong></td>
<td><strong>Calm?</strong></td>
</tr>
<tr>
<td>2</td>
<td>Lesbos</td>
<td>Lesbos</td>
<td>to Lesbos</td>
<td>to Ismarus</td>
<td>Troy/Tenedos</td>
<td>Troy/Tenedos</td>
</tr>
<tr>
<td><strong>Weather:</strong></td>
<td><strong>Unknown</strong></td>
<td><strong>Unknown</strong></td>
<td><strong>Unknown</strong></td>
<td><strong>SE wind</strong></td>
<td><strong>Unknown</strong></td>
<td><strong>Unknown</strong></td>
</tr>
<tr>
<td>3</td>
<td>Aegean</td>
<td>Aegean</td>
<td>Aegean</td>
<td>Battle #1</td>
<td>Lesbos?</td>
<td>Lesbos?</td>
</tr>
<tr>
<td><strong>Weather:</strong></td>
<td><strong>NE wind</strong></td>
<td><strong>NE wind</strong></td>
<td><strong>NE wind</strong></td>
<td><strong>Unknown</strong></td>
<td><strong>Unknown</strong></td>
<td><strong>Unknown</strong></td>
</tr>
<tr>
<td>4</td>
<td>to Cape Maléa</td>
<td>to Argos</td>
<td>Súnium (burial)</td>
<td>Battle #2</td>
<td>Chios?</td>
<td>Chios?</td>
</tr>
<tr>
<td><strong>Weather:</strong></td>
<td><strong>NE wind</strong></td>
<td><strong>NE wind</strong></td>
<td><strong>NE wind</strong></td>
<td><strong>Unknown</strong></td>
<td><strong>Unknown</strong></td>
<td><strong>Unknown</strong></td>
</tr>
<tr>
<td>5</td>
<td>To Pylos</td>
<td>Argos</td>
<td>Súnium (burial)</td>
<td>South from Ismarus</td>
<td>Cyclades?</td>
<td>Cyclades?</td>
</tr>
<tr>
<td><strong>Weather:</strong></td>
<td><strong>NE wind</strong></td>
<td><strong>NE wind</strong></td>
<td><strong>NE wind</strong></td>
<td><strong>Unknown</strong></td>
<td><strong>Unknown</strong></td>
<td><strong>Unknown</strong></td>
</tr>
<tr>
<td>6</td>
<td>Pylos</td>
<td>To Cape Maléa</td>
<td>South from Ismarus</td>
<td>Near Cape Maléa</td>
<td>Rocks of Gyrae*</td>
<td></td>
</tr>
<tr>
<td><strong>Weather:</strong></td>
<td><strong>Unknown</strong></td>
<td>Storm</td>
<td>Storm</td>
<td>Storm</td>
<td>Storm</td>
<td></td>
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<tr>
<td>7</td>
<td>1/2 fleet to Crete; 5 ships at sea</td>
<td>Storm repair</td>
<td>Aegisthus’s land</td>
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<td></td>
<td></td>
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<tr>
<td><strong>Weather:</strong></td>
<td><strong>N wind</strong></td>
<td><strong>N wind</strong></td>
<td><strong>N wind</strong></td>
<td></td>
<td></td>
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<tr>
<td>8</td>
<td>5 ships to Egypt</td>
<td>Repair</td>
<td>Nauplia (port of Argos)?</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Weather:</strong></td>
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<td><strong>N wind</strong></td>
<td><em>“Fair wind”</em></td>
<td></td>
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<tr>
<td>9</td>
<td>to Egypt</td>
<td>Cape Maléa Strong currents/</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Weather:</strong></td>
<td><strong>N wind</strong></td>
<td><strong>N wind</strong></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>10–18</td>
<td>to Egypt</td>
<td>Mediterranean Sea</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weather:</strong></td>
<td><strong>N winds</strong></td>
<td><strong>N winds</strong></td>
<td></td>
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</tr>
</tbody>
</table>

*Either Mikonos (where the “grave of Ajax” is), Tinos, or SE of Euboea near the Capharean Promontory.*
island south of Cape Maléa (Wace and Stubbings 1963, p. 292). Certainly, an ancient Achæan ship battling westward near Cape Maléa under strong northwesterly winds might reasonably run aground on Kithera. If Agamemnon’s ships had continued past Kithera, they would have likely experienced the same fate as Menélæus, discussed below.

Homer’s meteorological observations concerning Agamemnon are vague, as he stated, “Yet here, too, he could hope for safe return: the gods made that wind change; it now blew fair; and glad, he disembarked on his own shore [presumably Nauplia, the port of Argos and Mycenae]” (IV, 518). It is difficult to reconcile a wind capable of carrying Agamemnon northward to Nauplia in the Bay of Argos with other observations. But even Homeric scholars acknowledge that, at this point in the saga, “the details are very uncertain” (Stanford 1958, p. 282).

Following the storm, three fleets survived: Agamemnon’s, which was likely aground on Kithera; Menélæus’s, which had been thrown off course to the southeast; and Odysseus’s, which had put in for repairs somewhere in the northern Aegean Sea. Homer stated that Odysseus’s men, battered by the storm, remained aground “two days, two nights—fatigued and tired, afraid” (IX, 75). Meanwhile, Menélæus stated that his fleet was split into two: “Half of the ships were thrust to Crete [and wrecked: all of those boats were battered on the reefs]... Meanwhile five other ships in that same fleet—dark-prowed—were thrust by wind and wave to Egypt” (III, 292). Given the distance, very consistent and strong northerly winds would be needed to force the fleet to Egypt.

h. Day 9

After repairing his ships, Odysseus again put to sail and headed southward toward Cape Maléa. Homer noted a favorable (northerly) wind took them southward to Maléa: “... [W]e stepped our masts and set white sails, then sat: the wind and helms kept up on our path. I would have reached my Ithaca intact, if, as I rounded Cape Maléa, combers and currents had not joined with Bórēas [north wind] and driven me off course, beyond [Kithera]” (IX, 80–81). It is important to note here that Homer does not specifically mention a storm but rather large waves and strong northerly winds. It is likely that Odysseus and his men did not experience a storm as they attempted to round Cape Maléa. Instead, the strong persistent northerly winds created a turbulent sea between Maléa and Kithera.

i. Days 10 to 18

Following the unsuccessful attempt to round Cape Maléa, Odysseus’s ships were for nine days “thrust by savage winds across the fish-rich sea. And on the tenth we reached the Lotus-Eaters’ land” (IX, 83–84). Even if the geography is now suspect, the passage does suggest a sustained period of strong northeasterly flow of the kind normally found in this region in summer, the so-called Etesian winds.

Menélæus, who had been cast aground in Egypt by the storm winds, verified the long blow: “Though I was eager to go home, the gods still held me there in Egypt” (IV, 351). Given that the Achæans closely associated their gods with weather, this passage implies that Menélæus did not have the southerly winds necessary for a return to Greece and is therefore consistent with the nine days of northerly winds experienced by Odysseus. Modern Egyptian climatologies show a strong tendency for Etesian winds, although climate reconstructions suggest that changes may have taken place in the past (Brooks 1931; Oliver 1990).

3. The time of year

Homer makes no mention of season associated with this portion of the Odyssey. The greatest likelihood is the early summer: specifically, the month of June. The rationale for this assertion involves two points:

(a) The typical sailing season for the early Greeks was “for a period of fifty days following the solstice” (Hesiod, Works and Days, p. 663, from West 1978). This is the time normally associated with the persistent north-northeast Etesian winds, associated with the development of low pressure over central Asia Minor. They have a duration generally between 25 and 60 days. The dominant wind throughout this portion of the Odyssey was northerly or northeasterly (days 3–4, 7–18).

(b) The Etesian winds of July and August are associated with dry conditions. Modern climatology indicates very little precipitation occurs in the Aegean Sea region during these months. Yet, the Odyssey chronicles a major frontal system traversing the region on day 6 with a second weaker frontal passage on day 2. This implies (a) the events of the Odyssey perhaps occurred near the beginning or end of the Etesian wind season, (b) the climate of the Aegean Sea region was different 3500 years ago (i.e., more storms during the Etesian period) from what it is today, or (c) the storm was an anomaly.

Support for the first alternative is given by the Achæans’ actions. While the delay by Agamemnon was, ostensibly, to appease Athena, from a sailor’s more pragmatic viewpoint it may simply have been to wait for more favorable winds. Note that, while the Aegean Sea region may have experienced two cy-
clonic systems in the first six days following the departure from Troy, there followed 13 consecutive days after the storm on day 6 in which northerly or north-easterly flow dominated. One may speculate that the primary argument among the Achaeans as they prepared to depart Troy was whether to risk the dangers of variable weather (i.e., incur the favor or disfavor of the gods) by attempting an immediate crossing of the Aegean Sea or to wait a few days for the more predictable Etesian winds to build over the area. A possible conclusion is therefore that the Achaeans’ return from Troy took place in early summer.

4. Climate

This meteorological reconstruction may be applied to the accepted view of climate during the Homeric era. The classical scholar Rhys Carpenter proposed that the decline of Mycenaean culture resulted from a severe drought over the region (Carpenter 1966). Bryson et al. (1974) compared rainfall patterns over modern Greece with those hypothesized by Carpenter for ancient Mycenae to test the validity of the drought scenario. They concentrated their attention on winter rainfall maxima and concluded a circulation pattern could arise that would account for a long-term drought such as hypothesized by Carpenter.

Does this study’s weather reconstruction support the Carpenter theory of Mycenaean climate change? Unfortunately, if the early summer return from Troy is accepted, the weather reconstruction provides little support or repudiation of the Mycenaean drought theory. The scenario tested by Bryson et al. is based on the premise that Greek drought is the result of changes in winter precipitation. The proposed time of the return from Troy, early summer, is a normal period of dryness due to the predominate Etesian winds. While the Odyssey does suggest a cold frontal passage during the return from Troy, the record length of this chronology (18 days) is not enough to establish climatic trends, nor does it necessarily relate to an increase or decrease in wintertime precipitation events.

5. Conclusions

A reconstruction of the weather associated with the voyages of the Achaeans in Homer’s Odyssey reveals a realistic meteorology. No event that modern scientists would classify as “supernatural” or “miraculous” occurred during the 18 days following the departure from Troy. Rather, the Odyssey shows a remarkably credible set of weather observations. While this analysis does not answer the question of the Odyssey’s historical accuracy, it does show a consistency in descriptions of weather events and ship movements that is likely beyond coincidence.

Ancient civilizations consistently displayed a strong interest in observing the weather (Neumann 1989). It is amazing that, given the narrative restrictions of the media imposed on Homer, the Odyssey contains vivid and apparently accurate descriptions of weather. Even though the geography becomes controversial after Odysseus’s departure from the Aegean Sea, Homer’s weather descriptions remain reasonable. Indeed, it may be possible to interpret an episode near the saga’s end in the light of an only recently defined meteorological phenomenon, a microburst (Fujita 1985; Caracena et al. 1989):

That said, he [Poseidon] massed the clouds, and, as he gripped his trident, whipped the surge and urged all winds to blow at will... Eurus [the East Wind], Notus [the South Wind], and voracious Zephyr [the West Wind] and Böreás [the North Wind], who’s born in the bright ether, attacked together (V, 293–295)... The force of all winds crushes me (V, 304).

Is this the first recorded description of a microburst? Foulke and Foulke (1988) note that the mountains around the northern Mediterranean often create downdrafts dangerous to the sailors of square-sailed vessels.

Homer constructed his epic poetry of the fall of Troy for the people of his time. Yet his epic has continued to inspire people to the modern day. This study suggests that even 3000 years after its first telling, additional useful and interesting knowledge regarding the world of Homer’s day may still be uncovered from this classical epic.

References

Remote Sensing for Hydrology: Progress and Prospects

by Risto Kuittinen

A prerequisite for the assessment, rational development, and sound management of the world's freshwater resources is the availability of accurate and reliable hydrological and meteorological data. This report discusses the observational data requirements in operational hydrology and the ability of satellite- and aircraft-based remote sensing methods to meet these requirements either at present or in the future. It is hoped that the report will provide hydrologists and water resources personnel with a realistic view of the usefulness, the limitations, and the potential of remote sensing techniques in hydrology, and that it will assist in promoting the more widespread use of remote sensing methods.

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