NOTES AND DISCUSSIONS

A NOTE ON POLYBIUS' VOYAGE TO AFRICA IN 146 B.C.

Polybius' voyage along the north and west coasts of Libya was the first Roman expedition of discovery west of Cape Bon.[1] Previous Roman knowledge of this area had been pieced together from early Greek sources and scattered information surreptitiously derived from the Carthaginians.[2]

There are two basic questions involved in a study of the voyage: (1) what were Polybius' motives for making the voyage; and (2) how far down the coast of Africa did his expedition sail, according to the information which has survived?[3] Most modern commentators ignore the problem of motive, and in their discussion of the distance sailed fail to include some important geographic considerations.

All recent discussions about Polybius' motives are based on two passages: one from Pliny and the second a statement by Polybius himself in the *Histories*. Pliny writes (*HN* 5. 9 = Polybius 34. 15. 7): "When Scipio Aemilianus was in command in Africa Polybius the historian went round in a squadron furnished by the general for the purpose of exploring that continent. . . ." In the *Histories* (3. 59. 7–8) Polybius himself states that his motive for the voyage was his desire to "advance the reader's knowledge of areas which were formerly little known." It is interesting that he specifically states that his inquiries are made especially for the Greeks who, "relieved from the ambitions of a military or political career,"

1. The territory of Libya is defined by Polybius (3. 37. 2) as one of the three divisions of the earth, the other two being Asia and Europe. As the term was used by the Romans in later times, it meant the territory west of the kingdom of Numidia, and specifically that part of Africa now known as Morocco and the Spanish Sahara. All citations of Polybius in this paper are from W. R. Paton (trans.), *Polybius: "The Histories,"* Loeb Classical Library, 6 vols. (Cambridge, Mass., 1922–27).

2. Polybius stresses that the Carthaginians sought to impose absolute secrecy about these areas (3. 23. 2) and advances his estimate of their reasons. He had, as written sources, Herodotus' account of the gold bartering (4. 196); the Carthaginian *Periplus* of Hanno, of about 450 B.C.; and a Greek *Periplus* of about 350 B.C. (attributed to Scylax), which described the Libyan coast as far south as the island named Cerne. B. H. Warmington, *Carthage* (Baltimore, 1964), p. 76, states in his discussion of the reliability of the *Periplus* of Hanno:

> It is probable that what we have . . . is a report deliberately edited so that the places could not be identified by the competitors of Carthage. From everything we know about Carthaginian practice, the resolute determination to keep all knowledge of and access to the western markets from the Greeks, it is incredible that they would have allowed the publication of an accurate description for all to read.

D. Harden, "The Phoenicians on the West Coast of Africa," *Antiquity* 22 (1948): 147, gives a good map of the known settlements there.

3. The separate book on geography which Polybius wrote survives only in fragments which are included in other authors: these fragments have been placed in hypothetical order by Paton and are found in vol. 6 of the Loeb Polybius (Cambridge, Mass., 1927). A close reading of the *Histories* provides other clues. In his *Polybius* (Berkeley, 1972), F. W. Walbank emphasizes the idea that Polybius is writing primarily for a Greek audience (p. 5). He also believes that Polybius' journeys increased his interest in geography after 146, but he rejects P. Pédech, *La Méthode historique de Polybe* (Paris, 1964), pp. 515–97, who sees Polybius' intellectual development after 146 involved more and more in geographical research for its own sake. For Walbank, the composition of the *Numantine War* after 133 shows Polybius' political and historical interests as strong as ever (*Polybius*, pp. 116–17).

now have "ample means for inquiry and study" of such geographical problems (3. 59. 4).

Although the passage in Pliny seems to support the intellectual motivation behind the voyage, it may be doubted that Polybius was quite so single-minded. Following the destruction of Carthage in the early spring of 146 B.C., all of Libya, which had been forbidden territory, lay open to the Romans. Soldiers from Libya had formed part of Hannibal's army (Polyb. 3. 33. 15–16), and it must have seemed a wise move to Scipio Aemilianus to send a reconnaissance party to estimate the potential political or military opposition to Rome as well as to survey the economic possibilities of the region. In any case, in that same spring of 146, he placed a fleet of ships under the command of Polybius, and they sailed out toward the Pillars of Hercules.

The Carthaginians had always been secretive about the territory west of Carthage itself. In the earliest treaty with Rome (ca. 509 B.C.), one of the provisions specified:

> The Romans and their allies are not to sail with long ships beyond the Fair Promontory unless forced by storm or by enemies: it is forbidden to anyone carried beyond it by force to buy or carry away anything beyond what is required for the repair of his ship or for sacrifice, and he must depart within five days.
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> [Polyb. 3. 22. 4–8]

The second (ca. 348 B.C.) and third (279 B.C.) treaties continued the policy of secrecy, and the Treaty of Zama did not contradict it, even though the Carthaginian holdings in the Iberian peninsula had now been ceded to Rome (Polyb. 3. 24. 1, 3. 25. 1, 15. 18). The northern and western coasts of the African continent remained *terra incognita* to the Romans.

The Carthaginian colonies along the Libyan coast were rather trading posts than cities. Usually located on offshore islands, on headlands, or on estuaries, they were small settlements of a few hundred people at most, trading unguents, glass, Attic juglets, and other goods for skins, elephant tusks, and gold.[4] Herodotus' description of the barter for gold (4. 196) is the only mention of gold in connection with Libya. Pseudo-Scylax lists the other trade goods, yet the real purpose of the market at Cerne—namely, gold—had been concealed from him (pseudo-Scylax 112 = *GGM*, 1: 91–92).[5]

Without Roman knowledge of the gold trade, the small Carthaginian colonies seemed economically unimportant and could easily be discounted as a threat to Rome, as the colonies along the Mediterranean coast of Libya had been.

F. W. Walbank suggests yet another motive for Polybius' expedition: "An Atlantic voyage may have been a welcome distraction from the embarrassment [for Polybius] of being in Achaea at the headquarters of a Roman general operating against the Confederation."[6] Distraction or not, Polybius seldom missed an

4. D. Harden, *The Phoenicians* (New York, 1962), p. 165; B. H. Warmington, *Carthage*, pp. 65–78.

5. The actual location of Cerne is still in doubt, but it is probably Herne Island, in the Bay of Rio de Oro, almost precisely on the Tropic of Cancer (23°30′ north latitude): M. Cary and E. H. Warmington, *The Ancient Explorers*[2] (London, 1959), pp. 63–66; J. Carcopino, *Le Maroc antique* (Paris, 1943), pp. 110–63; B. H. Warmington, *Carthage*, pp. 73–79.

6. F. W. Walbank, *A Historical Commentary on Polybius*, vol. 1 (Oxford, 1957), p. 5.

opportunity to communicate to the Greeks his conviction that Roman power could offer them unusual opportunities. He often appears to be acutely aware of the possibility that the most important Greek contributions might well be in the intellectual sphere. Scipio Aemilianus and the Roman senate might have equipped a fleet to gather military, political, and economic intelligence about their new territories, but it was Polybius, a Greek, who was chosen as the leader.

Necessary to an understanding of this new territory, Polybius believed, was a knowledge of its geography (3. 37. 10–11). By temperament and training he was a careful observer and a convincing exponent of the importance of physical geography in particular; his description and analysis of the site and relative situation of Byzantium are excellent examples of his skill (4. 38. 1, 4. 43. 1 ff.). Any attempt to determine the farthest possible point reached by his squadron should take into consideration not only the amount of time the voyage required, but also the physical characteristics of prevailing currents, wind directions, and the possibility of encountering fog banks as the ships sailed south along the African coast.

Since Polybius was present at the destruction of Carthage, which took place in the early spring of 146 B.C. (38. 21. 1 = Plut. *Reg. et imp. apophthegmata* [*Moralia* 200]) and was also present at the destruction of Corinth in the autumn of the same year (39. 2. 1 = Strabo 8. 6. 28), he had a maximum of six months, during which time he not only explored the northern and western coast of Africa and the coasts of Spain and Gaul, but also reported to the senate and arrived at Corinth.[7]

Until the Romans under Polybius reached the Pillars of Hercules, they were in waters very similar, in tides and currents, to those on which they were accustomed to sail; but their unfamiliarity with the coast (owing to the long-continued secretiveness of the Carthaginians) and the need to keep a sharp lookout for rocks and other concealed dangers would necessarily reduce the speed at which they could travel. Beyond the Pillars they were in completely unfamiliar territory, the ocean itself being very different.

Assuming that the expedition had been assigned war galleys, not merchant ships, the average mileage for a twenty-four-hour period, as estimated by Carpenter, was about eighty miles.[8] But the very purpose of the expedition itself—to obtain knowledge of the Carthaginian possessions now subject to Roman power—argues against a twenty-four-hour run. In addition, descriptions of sea voyages in Greek and Latin sources make it clear that at evening the ships were generally beached or anchored close to shore; no cautious captain sailed unfamiliar waters at night.[9] Because of the limited storage space in a galley, it was also necessary to replenish supplies of food and water at fairly frequent intervals.[10]

To estimate the time consumed by the voyage along the coast of Libya, three factors are of primary importance: distance, prevailing winds and currents, and the efficiency of the galley itself in the postulated circumstances. The distance from Carthage to the Straits of Gilbraltar is about 1,000 miles; then it is 30 miles

7. Ibid. Strabo is cited from the Loeb Classical Library translation by H. L. Jones, 8 vols. (Cambridge, Mass., 1917–32).

8. R. Carpenter, *Beyond the Pillars of Hercules* (New York, 1966), p. 87.

9. E. C. Semple, *The Geography of the Mediterranean Region* (New York, 1933), pp. 585–88.

10. T. C. Lethbridge, "Shipbuilding," in *A History of Technology*, edited by C. Singer (Oxford, 1956), 2:570.

through the Straits, 630 miles more from Cape Spartel (at the western entrance to the Straits) to Cape Juby, just south of the Wadi Dra'a (the ancient Lixus River). From Cape Juby to the mouth of the Senegal River (the ancient Bambutis) is another 1,000 miles. The total distance involved, therefore, for the outward journey, and the return to the western entrance to the Straits, is approximately 2,300 miles, if the expedition sailed south only as far as the Wadi Dra'a—or approximately 4,300 miles if it reached the Senegal.

Roman galleys, like all ancient shipping, usually kept within sight of the shore. For this reason, an examination of the *Sailing Directions* for these coasts, issued by the Hydrographic Office of the United States Navy, and of the British Admiralty's *Africa Pilot* of 1890, is illuminating: their descriptions of the coastal currents and winds are particularly important, since a galley with its relatively undeveloped sails cannot beat to windward.[11] One can assume that Polybius and his captains tried to obtain information about local maritime conditions when they conducted their investigations into the economic and political situation in the Carthaginian ports they visited. Perhaps they persuaded (or impressed) knowledgeable natives to act as pilots from one port to the next, as Hanno had done on his earlier voyage into unknown territory.[12]

Along the North African coast the current generally sets from an easterly direction,[13] at an average speed of one knot. The prevailing winds, from March to October, are the northeast trade winds. Close to shore the sea breezes begin about 9:00 A.M. and last until sunset, shifting in direction throughout the day; their influence is strong locally but extends only a short distance from shore.[14] The coast is "relatively free of danger,"[15] although near the two rocky patches called the Écueils des Sorelles (between Cap Matifou and Cap Serrat) there are strong currents and occasional tide rips.[16]

Aside from this avoidable danger, the galley would have had a relatively fast voyage between ports, wind and current operating in conjunction to allow the galley to run before the wind. If the wind changed to the north or northwest, and the current set to the southeast with considerable strength (a not infrequent occurrence in the spring),[17] the rowers would give the galley an advantage over a ship dependent on sails alone to keep its course, but the mileage for that day's voyage would be drastically curtailed.[18] Nevertheless, the thousand-mile journey

11. U.S., Navy, Hydrographic Office, no. 134, *Sailing Directions for the West Coasts of Spain, Portugal and NW Africa and Off-lying Istands*, 6th ed. (Washington, D.C., 1952); U.S., Navy, Hydrographic Office, no. 151, *Sailing Directions for the Mediterranean*, vol. 1, 4th ed. (Washington D.C., 1952); Great Britain, The Admiralty, Hydrographic Office, *The Africa Pilot* or *Sailing Directions for the West Coast of Africa from Cape Spartel to the River Cameroon*, 5th ed. (London, 1890); Lethbridge, "Shipbuilding," p. 575. Hereafter the publications of the U.S. Navy Hydrographic Office will be abbreviated as HO, no. 134 and HO, no. 151. Because the ancient names for many of the capes or rock groups are unfamiliar or unknown, we have considered it better to use the modern names in the paper, inserting the ancient names in parentheses where necessary.

12. Hanno 8 (*GGM*, 1:6), translated in Harden, *The Phoenicians*, p. 174.

13. By common usage, both currents and winds are called by the direction from which they come: thus an easterly current flows from the east, and a sea breeze blows from the sea toward the land.

14. HO, no. 151, pp. 32, 177, 26.

15. Ibid., p. 186.

16. Ibid., p. 32.

17. Ibid.

18. Carpenter, *Pillars of Hercules*, p. 87, estimates that a ship could travel 48 miles in 24 hours

to the Straits could probably be accomplished in twenty-five days, allowing for time spent in port, and for some adverse weather.

On the voyage through the Straits, there are dangers from several sources: tidal races, rocks, and a westerly current setting into the Mediterranean, plus a tidal current, which opposes the east or northeast wind. The Hydrographic Office *Sailing Directions*[19] state that the tidal races ". . . form without warning, the sea becoming like boiling water—short, irregular and deep. These races are dangerous for open boats and even for small vessels, and the wind, which contributes to form them, always augments their violent character." Rocks are numerous, especially near Cape Spartel, where many jut, dark-colored and pointed, out of the water. In the main body of the Straits, where a captain might prefer to sail in order to avoid the rocky coast, the east-going current plus the tidal current at some hours of the day reaches a speed of five to six knots, so that a small westbound ship would have difficulty making headway. Even with a favoring wind, it would probably take three days to clear the Straits, and an additional two days to visit the Carthaginian cities of Ceuta, Tingis, and Lixus clustered near the Straits—or five days in all.

From the Straits of Gibraltar to the Canary Islands, the current within one hundred miles of the shore flows westward, following the bends of the shoreline, and the prevailing winds are from the north or northeast. The coast itself is generally barren now (not necessarily so in the time of Polybius) and consists of a low and dangerous shore line backed by low sand hills, a coastal morphology much feared by seamen in the ancient world.[20] On these Atlantic coasts, the tide has a mean range of about 6 feet, and a spring range between $9\frac{1}{2}$ feet at Casablanca and $8\frac{1}{2}$ feet at Agadir, very different from the almost tideless Mediterranean.[21] Between Cape Spartel and Cape Juby an additional danger is present:

> A heavy ground swell usually sets in along the Atlantic coast of Morocco. As it is not caused by local storms or weather conditions, its occurrence cannot be predicted. When the swell is running it is impossible to handle cargo between ship and lighters in the roadsteads, to beach small craft or take them across a bar. . . . Local pilots and coastwise captains report that only about 6 days per month can be counted on as being free from this swell, which is said to attain a height of 50 feet from trough to crest, and to break on the coast for several days at a time.[22]

The galley's design, its low bow and high stern compared with modern ships, permitted Roman vessels to run well before the wind, but it was a definite disadvantage to rowers trying to force their ship to punch into a head sea or through a heavy ground swell, with the sail useless because it could not be used to beat against the wind.[23]

The same combination of current and wind which sped the southbound ship

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against a 2-knot head-current: with a favoring 1-knot current astern, it could sail 120 miles in 24 hours.

19. HO, no. 151, p. 21.

20. *Africa Pilot*, p. 18; HO, no. 134, p. 210. Semple, *Geography of the Mediterranean Region*, p. 591, discusses these fears in some detail.

21. HO, no. 134, pp. 216–28.

22. Ibid., p. 210.

23. Lethbridge, "Shipbuilding," p. 575.

would make the return journey time-consuming and difficult. In addition, the sea breeze along the coast causes the northeast trade winds, which ordinarily are found in this latitude (Cape Spartel to Wadi Dra'a), to shift north or northwest along the coast only, so that there is danger of ships being driven ashore.[24]

Modern discussions about the limits of the voyage may be divided into two groups. The first favors the River Bambutis (modern Senegal) as the farthest point reached; the second believes that the expedition sailed only to the River Lixus (modern Wadi Dra'a).[25] In ideal conditions, the journey down the coast to the Wadi Dra'a would take a minimum of fourteen days, allowing for nights ashore and for the reconnaissance of the Carthaginian ports. From Wadi Dra'a to the Senegal River stretches the inhospitable coast of the Sahara desert, almost a thousand miles characterized by heavy breakers, a complete absence of harbors, and a lack of water to provision the ships.[26]

From Wadi Nun, five miles northeast of the ancient Lixus, the coastal currents and swell are described by the *Africa Pilot* as follows:

> From Wadi Nun the coast curves outward, and the current, which hitherto has nearly followed the direction of the shore, here strikes it obliquely, rendering this the most dangerous part of the coast between Capes Spartel and Bojador, and fully accounting for the numerous wrecks which have occurred here. . . . The swell too is almost invariably from the NW, and therefore sets directly into the bight so that it is almost impossible for a sailing vessel embayed there to work off.[27]

In this instance, oars would give a galley some advantages over a ship dependent on sails alone; yet it should be emphasized again that the speed of the ships would be at least halved by the combination of adverse winds and current.

The *Africa Pilot* reports that north and south of Cape Nun there is an interesting phenomenon, apparently caused by the immense volume of fine sand blown off the desert: "For some distance both north and south of Cape Nun, as well as to seaward, the water has a red tinge, with a thick muddy appearance, so that the track of a vessel is visible for some time."[28] This is the sort of anomaly Polybius observed and consistently reported: compare his description of the behavior of the Euphrates River, which seemed strange to one accustomed to a Mediterranean climate: the river was lowest in winter, highest in summer, and decreased in volume toward the mouth (9. 43). Although the "red sea" may be a modern phenomenon, due to the accelerated drying-up of the Sahara in historical times, there is no doubt that the same strange juxtaposition of desert and fog existed then as now.[29]

24. W. Kendrew, *The Climates of the Continents*[3] (New York, 1942), p. 28; *Africa Pilot*, p. 16.

25. Commentators favoring the Bambutis are Harden, *The Phoenicians*, p. 177; Cary and Warmington, *The Ancient Explorers*, p. 68; B. H. Warmington, *Carthage*, p. 79; and Carpenter, *Pillars of Hercules*, p. 102. Advocates of the Lixus are Carcopino, *Le Maroc antique*, p. 158; and E. H. Bunbury, *A History of Ancient Geography*[2] (London, 1883; repr. New York, 1959), 2:42.

26. Kendrew, *Climates*, pp. 31–39; P. Meigs, *Geography of Coastal Deserts*, UNESCO Arid Zone Research, 28 (Paris, 1966), pp. 91–93.

27. *Africa Pilot*, pp. 92–93.

28. Ibid., p. 90.

29. Attempts to assess the changes which have taken place in the climate of the Sahara desert, and particularly its fringe areas, have been made most recently by C. Vita-Finzi, *The Mediterranean Valleys: Geological Changes in Historical Times* (New York, 1969); S. Huzayyin, "Changes in

Eratosthenes is quoted by Strabo (17. 3. 8) as saying that the air along the coast of the Sahara is thick and misty in the early morning and evening, an accurate description. Artemidorus of Ephesus, who voyaged along the Mediterranean coast and along the western coast of Africa in the first century B.C. disputes him, but neither Artemidorus nor Strabo cites Polybius in support of his statement.[30] Surely, if Polybius had gone very far down the coast past the Lixus, he could not have escaped all contact with the fogs, which are prevalent in the summer months and which move onshore in the early morning and evening hours; and he would have described the anomaly in his book on geography.[31]

If we estimate the time to reach the Senegal as twenty days, the head winds and currents which the ships would encounter on the return voyage would probably double the outgoing time allotment, so that the voyage from the Wadi Dra'a to the Senegal and back would by itself consume two months. From the Wadi Dra'a back to the western entrance to the Straits, the same adverse winds and currents would probably double the outgoing time of fourteen days, so that the return would take about a month. Considering these factors of time, currents and winds, and the comparative efficiency of the galley, as well as the negative evidence from Strabo's debate about fogs along the coast of the Sahara desert, the Wadi Dra'a seems the farthest possible point the expedition could have reached if it was still to have time to explore the Spanish and Gallic coasts before September.

At all events, with Polybius' return to the Straits, the journey had accomplished both his stated aim of investigation and exploration, and the unspoken objectives of surveying and assessing the economic, political, and military potential of the former Carthaginian coastal possessions. It is apparent that his report on the political and military situation contained nothing to alarm the Roman senate. In the general settlement which followed the destruction of Carthaginian power, that territory of Libya which was west of the Numidian kingdom was given to the kings of the house of Bogus and of Bocchus, "who were friends of the Romans," and whose descendants ruled what became known as the kingdom of Maurusia until Augustus Caesar gave it to Juba.[32]

MARIJEAN H. EICHEL
Virginia Commonwealth University

JOAN MARKLEY TODD
San José State University

Climate, Vegetation and Human Adjustment in the Saharo-Arabian Belt with Special Reference to Africa," in *Man's Role in Changing the Face of the Earth*, edited by W. L. Thomas, Jr. (Chicago, 1956), pp. 304–323; and R. Murphey, "The Decline of North Africa Since the Roman Occupation: Climatic or Human?" *Annals of the Association of American Geographers* 41 (1951): 116–32. The consensus is that the climate per se has not changed since the warming which followed the last glacial period in Europe, but that the destruction of forests and other vegetation by man and his flocks of animals has increased the aridity of the fringe areas in particular. Therefore, we can assume that the climatic conditions along the west coast of Africa have remained essentially the same since the time of Polybius.

30. Strabo 17. 3. 8–9. Strabo quotes from the lost Geography frequently; cf. Polyb. 34 in Paton.

31. Kendrew, *Climates*, pp. 23, 27–30; Meigs, *Geography of Coastal Deserts*, p. 91; HO, no. 134, p. 210.

32. Strabo 17. 3. 7.