

Chapter 8: The Hellenistic Era

Introduction

The ancient Greek word for Greece is *Hellas*. The period after the Classical Age is referred to as the Hellenistic Age because it saw Greek civilization spread across the entire Middle East, thanks to the tactical genius and driving ambition of one man, Alexander the Great. Hellenistic history at its simplest is easy to summarize: a Macedonian king named Alexander conquered all of the lands of the Persian Empire during twelve years of almost non-stop campaigning. Shortly afterward, he died without naming an heir. His top generals fell to bickering and ultimately carved up Alexander's empire between themselves, founding several new dynasties in the process. Those dynasties would war and trade with each other for about three hundred years before being conquered by the Romans (the rise of Rome happened against the backdrop of the Hellenistic kingdoms). Thanks to the legacy of Alexander's conquests, Greek culture went from relative insignificance to become a major influence on the entire region.

Macedon and Philip II

The story starts in Macedon, a kingdom to the north of Greece. The Macedonians were warriors and traders. They lived in villages instead of poleis and, while they were recognized as Greeks because of their language and culture, they were also thought of as being a bit like country bumpkins by the more "civilized" Greeks of the south. Macedon was a kingdom ruled by a single monarch, but that monarch had to constantly deal with both his conniving relatives and his disloyal nobles, all of whom frequently conspired to get more power for themselves. Macedon was also bordered by nomadic peoples to the north, particularly the Thracians (from present-day Bulgaria), who repeatedly invaded and had to be repelled. The Macedonian army was comprised of free citizens who demanded payment after every campaign, payment that could only be secured by looting from defeated enemies. In short, Macedon bred some of the toughest and most wily fighters and political operators in Greece out of sheer necessity.

By the fifth century BCE, some of the larger villages of Macedon grew big enough to be considered cities, and elite Macedonians made efforts to civilize their country in the style of the southern Greeks. They competed in the Olympics and patronized the arts and literature. They

tended to stay out of the political affairs of the other Greeks, however; they did not invade the Greek peninsula itself in their constant wars, nor did they take sides in conflicts like the Peloponnesian War. This did nothing to improve the situation in Macedon itself, of course, which remained split between the royal family and the nobility. In 399 BCE, Macedon slid into an ongoing civil war, with the nobles openly rejecting the authority of the king and the country sliding into anarchy. The war lasted for forty years.

In 359 BCE, the Macedonian king, Philip II, re-unified the country. Philip was the classic Macedonian leader: shrewd, clever, skilled in battle, and quick to reward loyalty or punish sedition. He started a campaign across Macedonia and the surrounding areas to the north, defeating and usually killing his noble rivals as well as hostile tribes. When men joined with him, he rewarded them with looted wealth, and his army grew.

Philip was a tactical innovator as well. He found a way to secure the loyalty of his nobles by organizing them into elite cavalry units who swore loyalty to him, and he proudly led his troops personally into battle. He also reorganized the infantry into a new kind of phalanx that used longer spears than did traditional hoplites; these new spearmen would hold the enemy in place and then the cavalry would charge them, a tactic that proved effective against both barbarian tribes and traditional Greek phalanxes. Philip was the first Macedonian king to insist on the drilling and training of his infantry, and the combination of his updated phalanx and the cavalry proved unstoppable. Philip attacked neighboring Greek settlements and seized gold mines in the north of Greece, which paid his soldiers and paid to equip them as well. He hired mercenaries to supplement his Macedonian troops, ending up with the largest army Macedon had ever seen.



The expansion of Macedon under Philip II, from the small region marked in the red border to the larger blue region, along with the dependent regions surrounding it.

The Greek poleis were understandably worried about these developments. Under the leadership of Athens, they organized into a defensive league to resist Macedonian aggression. For about ten years, the Macedonians bribed potential Greek allies, threatened those that opposed them, and launched attacks in northern Greece while the larger poleis to the south prepared for war. In 338 BCE, following a full-scale Macedonian invasion, the Macedonian army crushed the coalition armies. The key point of the battle was when Philip's eighteen-year-old son Alexander led the noble cavalry unit in a charge that smashed the Greek forces.

In the aftermath of the invasion, Philip set up a new league of Greek cities under his control and stationed troops throughout Greece. As of 338 BCE, Greece was no longer the collection of independent city-states it had been for over a thousand years; it was now united under an invader from the north. The Greeks deeply resented this occupation. They only

grudgingly accepted the Macedonians as fellow Greeks and had celebrated the independence of the Greek poleis as one of the defining characteristics of Greek civilization for centuries. Philip thus had his job cut out for him in managing his new conquest.

The more immediate problem facing Philip in the aftermath of the Greek conquest was that his men demanded more loot – the only way he could pay them was to find new places to invade and sack. Thus, Philip ruled Greece but he could not afford to sit idle with troops aching for more victories. Cleverly, having just defeated the Greek poleis, Philip began behaving like a Greek statesman and assuming a kind of symbolic leadership role for Greek culture itself, not just Greek politics. He began agitating for a Greek invasion of Persia under his leadership to “avenge” the Persian invasion of the prior century. All things considered, this was a far-fetched scheme; Persia was by far the “superpower” of its day, and since the end of the Persian War over a century earlier numerous Greeks had served Persian kings as mercenaries and merchants. Nevertheless, the idea of an invasion created an excuse for Macedonian and Greek imperialism and aggression under cultural pretext of revenge.

Unfortunately for Philip, he was murdered by one of his bodyguards in 336 BCE, just two years after conquering Greece. Family politics was to blame here, as his estranged wife Olympias likely ordered his murder, as well as the murder of his other wife and children. Alexander was the son of Olympias, and he ascended to the throne at the age of twenty.

Alexander the Great

Alexander was one of the historical figures who truly deserves the honorific “the Great.” He was a military genius and a courageous warrior, personally leading his armies in battle and fighting on despite being wounded on several occasions. He was a charismatic and inspirational leader who won the loyalty not only of his Macedonian countrymen, but the Greeks and, most remarkably, the people of the Persian Empire whom he conquered. He was also driven by incredible ambition; tutored by none other than Aristotle in his youth, he modeled himself on the legendary Greek hero Achilles, hoping to not only match but to surpass Achilles' prowess in battle. He became a legend in his own life - he was worshiped as a god by many of his subjects and even his Greek subjects came to venerate him as one of the greatest leaders of all time.

Alexander's conquests began almost immediately after seizing the throne. He first ruthlessly killed off his rivals and enemies in Macedon and Greece, executing nobles he suspected of treason, and then leading an army back through Macedon, crushing the Thracian tribes of the north who threatened to defect. Some of the Greek poleis rose up, hoping to end

Macedonian control almost as soon as it had begun, but Alexander returned to reconquer the rebellious Greek cities. In the case of the city of Thebes, for instance, Alexander let the Thebans know that, by rebelling, they had signed their own death warrant and he refused to accept their surrender, sacking the city and slaughtering thousands of its inhabitants as a warning to the rest of Greece.

By 334 BCE, two years after he became king, Alexander was thoroughly in control of Greece. He immediately embarked on his father's mission to attack Persia, leading a relatively small army (of about 45,000 men) into Persian territory - note how much smaller this army was than the Persian one had been a century earlier, when Xerxes had invaded with over 200,000 soldiers. He immediately engaged Persian forces and started winning battles, securing Anatolia and the rich Greek port cities in 333 BCE and Syria in 332 BCE. In almost every major battle, Alexander personally led the cavalry, a quality that inspired loyalty and confidence in his men.



A Roman mosaic depicting Alexander the Great in battle, possibly based on a Greek original.

His success against the Persians can be explained in part by the fact that the Persian technique of calling up their armies was too slow. Even though Alexander had arrived in Anatolia with only 45,000 men, against a potential Persian army of close to 300,000, far fewer troops were actually available to the Persians at any one time during the first years of Alexander's campaign. Instead, the first two years of the invasion consisted of Macedonian and

Greek forces engaging with smaller Persian armies, some of which even included Greek mercenaries. Alexander's forces succeeded in conquering Persian territory piecemeal, taking key fortresses and cities, seizing supplies, and fighting off Persian counter-attacks; even with its overall military superiority, the Persian Empire could not focus its full might against the Greeks until much of the western empire had already been lost. In addition, Alexander was happy to offer alliances and concessions to Persian subjects who surrendered, sometimes even honoring with lands and positions those who had fought against him and lost honorably. In sum, conquest by Alexander was not experienced as a disaster for most Persian subjects, merely a shift in rulership.

In 332 BCE, the Persian king, Darius III, tried to make peace with Alexander and (supposedly - there is reason to believe that this episode was invented by Greek propagandists afterwards) offered him his daughter in marriage, along with the entire western half of the Persian Empire. Alexander refused and marched into Egypt, where he was welcomed as a divine figure and liberator from Persia. Alexander made a point of visiting the key Egyptian temples and paying his respects to the Egyptian gods (he identified the chief Egyptian deity Amun-Ra with Zeus, father of the Greek gods), which certainly eased his acceptance by the Egyptians. In the meantime, Darius III succeeded in raising the entire strength of the Persian army, knowing that a final showdown was inevitable.

From Egypt, the Greek armies headed east, defeating the Persians at two more major battles, culminating in 330 BCE when they seized Persepolis, the Persian capital city. There, the Greek armies looted the entire palace complex before burning it to the ground; historians have concluded that Alexander ordered the burning to force the remaining Persians who were recalcitrant to his conquest to acknowledge its finality. The wealth of Persepolis and the surrounding Persian cities paid for the entire Greek army for years to come and inspired a renaissance of building back in Greece and Macedonia, paid for with Persian gold. Darius III fled to the east but was murdered by Persian nobles, who hoped to hold on to their own independence (this did not work - Alexander painstakingly hunted down the assassins over the next few years).

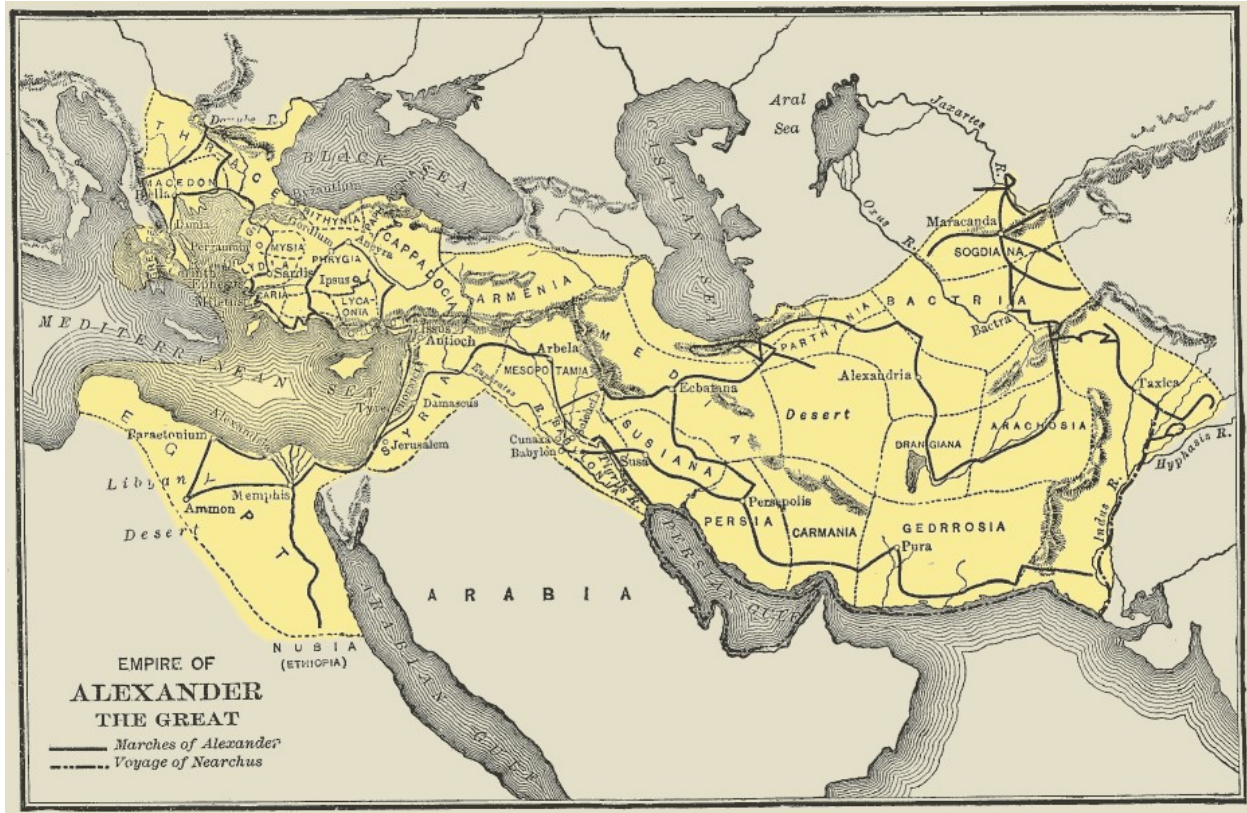
Alexander After the Conquest of Persia

Alexander paused his campaign to pay off his men and allow some of his troops to return to Greece. He then arranged for thousands of his Greek and Macedonian officers to marry Persian noblewomen in an effort to formally and permanently fuse together the Greek and Persian civilizations. His goal was not to devastate the empire, but to become the next "Great

King” to whom all other leaders had to defer. He maintained the Persian bureaucracy (such as the organization of the Satrapies) and enlisted thousands of Persian soldiers who joined his campaign as his armies moved even farther east. He also made a show of treating Darius's family with respect and honor; he wanted to win the Persians over rather than humiliate them. Alexander declared that the ancient city of Babylon would be his new capital. Even though he now ruled over the largest empire in the world, however, he was unsatisfied, and he set off to conquer lands his new Persian subjects told him about beyond the borders of the empire.

Alexander headed east again with his armies, defeating the tribesmen of present-day Afghanistan and then fighting a huge battle against an Indian king in the northern Indus River Valley in 327 BCE. He pressed on into India for several months, following the Indus south, but finally his loyal but exhausted troops refused to go on. Alexander had heard of Indian kingdoms even farther east (i.e. toward the Ganges River Valley, completely unknown to the Greeks before this point) and, being Alexander, he wanted to conquer them too. His men, however, were both weary and rich beyond their wildest dreams. Few of them could see the point of further conquests and wanted instead to return home and enjoy their hard-won loot. Some of his followers were now over 65 years old, having fought for Philip II and then Alexander in turn, and they concluded that it was high time to go home.

Alexander consulted an oracle that confirmed that disaster would strike if he crossed the next river, so after sulking in his tent for a week, he finally relented. To avoid the appearance of a retreat, however, he insisted that his armies fight their way down the Indus river valley and then across the southern part of the former Persian empire on their way back to Mesopotamia. Unfortunately, Alexander made a major tactical error when he reached the Indian Ocean, splitting his forces into a fleet and a land force that would travel west separately. The fleet survived unscathed, but the army had to cross the brutally difficult Makran desert (in the southern part of present-day Pakistan and Iran), which cost Alexander's forces more lives than had the entire Indian campaign.



Alexander's conquests - the dark black lines trace his route from Macedon in the far northwest through Egypt, across the Persian heartland, then to Afghanistan and India, and finally along the shores of the Indian Ocean and Persian Gulf back to Babylon.

The return journey was arduous, and it took years to get back to the heartland of Persia. In 323 BCE, his armies finally arrived in Babylon. Alexander was exhausted and plagued by injuries from the many battles he had fought, but Macedonian and Greek tradition required him to drink to excess with his generals. Some combination of his injuries, alcohol, and exhaustion finally caught up with him. Supposedly, while he lay on his deathbed, his generals asked who would follow him as Great King and he replied "the strongest," then died. The results were predictable: decades of fighting as each general tried to take over the huge empire Alexander had forged.

The true legacy of Hellenistic civilization was not Alexander's wars, as remarkable as they were, but their aftermath. During his campaigns, Alexander founded numerous new cities that were to be colonies for his victorious Greek soldiers, all of which were named Alexandria except for one that he named after his horse, Bucephalus. For almost 100 years, Greeks and Macedonians streamed to these colonies, which resulted in a tremendous growth of Greek

culture across the entire ancient world. They also came to settle in conquered Persian cities. Everywhere, Greeks became a new elite class, establishing Greek laws and Greek buildings and amenities. At the same time, the Greeks were always a small minority in the lands of the east, a fact that Alexander had certainly recognized. To deal with the situation, not only did he encourage inter-marriage, but he simply took over the Persian system of governance, with its royal road, its regional governors, and its huge and elaborate bureaucracy.

The Hellenistic Monarchies

The Macedonians could be united by powerful leaders, but their nobility tended to be selfish and jealous of power. Since he named no heir, Alexander almost guaranteed that his empire would collapse as his generals turned on each other. Indeed, within a year of his death the empire plunged into civil war; it took until 280 BCE for the fighting to cease and three major kingdoms to be established, founded by the generals Antigonus, Ptolemy, and Seleucus.

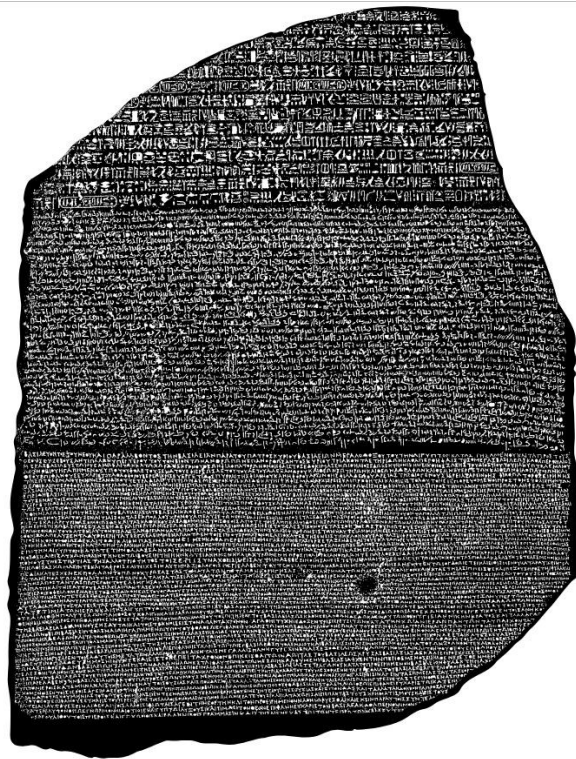


The major Hellenistic kingdoms (here Anglicized as “Seleukos” rather than “Seleucid” and “Ptolemaios” instead of “Ptolemaic.”) The Mauryan Empire was a loose confederacy of Indian princes that swiftly achieved independence from Greek influence following Alexander’s death.

The Antigonids ruled over Macedon and Greece. Despite controlling the Macedonian heartland and Greece itself, the Antigonids were the weakest of the Hellenistic monarchies. Both areas were depopulated by the wars; many thousands of soldiers and their families emigrated to the new military colonies established by Alexander, weakening Greece and, of

course, its tax base. Over time, the Antigonids had to fight to hold on to power in Greece alone and they ultimately saw many of the Greek poleis achieve independence from their rule.

The Ptolemies ruled over Egypt. The Ptolemies were very powerful and, perhaps more importantly, they had the benefit of ruling over a coherent, unified state that had ancient traditions of kingship. Once they cemented their control, the Ptolemies were able to simply act as pharaohs, despite remaining ethnically and linguistically Macedonian Greek. In their state, the top levels of rule and administration were Greek, but the bulk of the royal bureaucracy was Egyptian. There were long-term patterns of settlement and integration, but right up to the end the dynasty itself was fiercely proud of its Greek heritage, with Greek soldier colonies providing the backbone of the Ptolemaic military. Ptolemy had been a close friend and trusted general of Alexander, and he took Alexander's body to Egypt and buried it in a magnificent tomb in Alexandria, thereby asserting a direct connection between his regime and Alexander himself. In the end, the Ptolemies were the longest-lasting of the Hellenistic dynasties.



One of the most important artifacts of the Ptolemaic era: the Rosetta Stone, the object that enabled the translation of Egyptian hieroglyphics. Written during Ptolemaic rule, the stone consists of a single royal proclamation in two hieroglyphic alphabets as well as ancient Greek.

The Seleucids ruled over Mesopotamia and Persia. Despite the vast wealth of the Seleucid kingdom, it was the most difficult one to govern effectively. There was a relative scarcity of Greeks vis-à-vis the native populations, and it was thus also the most diverse. It proved impossible in the long term for the Seleucid kings to hold on to the entire expanse of territories originally conquered by Alexander. Seleucus himself gave his Indian territory back to Indian princes in 310 BCE in return for some elephants, and in 250 BCE a Persian clan, the Parthians, destroyed Seleucid control in the old Persian heartland, in the process founding a new Persian empire. Nevertheless, the Seleucid kingdom held on until its remnants were defeated by Pompey the Great of Rome (ally and then rival of Julius Caesar) in 69 BCE.

Each of the successor kingdoms was ruled by Greeks and Macedonians but the bureaucracies were staffed in large part by “natives” of the area. A complex relationship emerged between the cultures and languages of the kingdoms. Greek remained the language of state and the language of the elites, the Persian trade language of Aramaic was still used across most of the lands, and then a host of local tongues existed as the vernacular. The kings often did not speak a word of the local languages; as an example, Cleopatra VII (the famous Cleopatra who had affairs with both Julius Caesar and the Roman general Mark Antony) was the first Ptolemaic monarch to speak Egyptian.

All of the Hellenistic monarchs tried to rule in the style of Alexander, rewarding their inner circles with riches, founding new cities, and expanding trade routes to foreign lands. They also warred with one another, however, with the Ptolemies and the Seleucids emerging as particularly bitter rivals, frequently fighting over the territories that divided their empires. The kingdoms fielded large armies, many of which consisted of the descendants of Greek settlers who agreed to serve in the armies in return for permanent land-holdings in special military towns.

The Ptolemaic kingdom is particularly noteworthy: starting with Ptolemy himself, the existing Egyptian bureaucracy was expanded and its middle and upper ranks staffed entirely by Greeks (and Macedonians), who developed obsessively detailed records on every sheaf of wheat owed to the royal treasury. So much papyrus was used in keeping records that old copies had to be dumped unceremoniously in holes in the desert to make room for new ones - quite a lot of information about the Ptolemaic economy survived in these dumps to be discovered by archaeologists a few thousand years later. Likewise, the abundance of the Nile was carefully managed to produce the greatest yields in history, so large that even after numerous taxes were taken, Egyptian wheat was still the cheapest available everywhere from Spain to Mesopotamia (the same held true with papyrus, a royal monopoly used everywhere in the Hellenistic world).

Under the Ptolemies, Egypt was in many ways at its most prosperous in history, outstripping even the incredible bounty of the Old, Middle, and New Kingdoms centuries earlier.

Culture

One of the remarkable aspects of the Hellenistic era was the extent to which the people of Greece and the Middle East started exploring beyond the confines of the ancient world as they had known it. The Ptolemies supported trading posts along the Red Sea and as far south as present-day Eritrea and Ethiopia, trading for ivory and gold from the African interior. Explorers tried, but did not quite succeed, to circumnavigate Africa itself. In addition to accounts by explorers, the Greeks of the Hellenistic lands enjoyed histories and accounts of foreign lands written by the natives of those lands. Major histories of Mesopotamia, Persia, and Egypt were written during the Hellenistic period and translated into Greek. Ambassadors from the Hellenistic kingdoms in foreign lands sometimes wrote accounts of the customs of those lands (such as India). In short, it was a period when knowledge of the world greatly expanded.

The core of the Hellenistic kingdoms were the new cities founded by Alexander or, later, by the Hellenistic monarchs. The largest was Alexandria in Egypt, but there were equivalently grandiose cities in the other kingdoms. Both the new cities founded by Alexander and his successors and the old Greek settlements along the eastern coasts of the Mediterranean grew and prospered. The new cities were built on grid-pattern streets with various Greek amenities like public forums, theaters, and temples. Likewise, citizenship, which had been the basic unit of political currency in the ancient poleis, became instead a mark of elite membership that could be won in multiple cities at the same time; the important thing was either being descended by from Greek colonists or being a high-ranking “native” who was useful to the Hellenistic monarch.

Of note is the fact that the Seleucid cities represented the first major experiment in what we now call the welfare state. Because of the obligations the first monarchs felt toward their specifically Greek subjects, things like education and garbage collection were funded by the state. Eventually, public services extended to include poor relief, which consisted of free food distributed within the cities to the poorest classes of permanent residents. This practice had nothing to do with charity; it was simply a means for keeping the peace in the growing cities.

There were major ongoing problems for the Hellenistic ruling class, however, the most important of which was the continued stratification between Greeks and their non-Greek subjects. Greeks in the Hellenistic kingdoms felt that they were the heirs to Alexander’s conquests and that they were thus justified in occupying most, if not all, of the positions of political power. Especially in places like Egypt and Mesopotamia that had enormous non-Greek

populations, resentment could easily turn into outright rebellion. Various works emerged among the subjects of the Hellenistic kingdoms predicting the downfall of their Greek rulers; Mesopotamian priests, Zoroastrians in Persia, and Egyptian religious leaders all wrote works of prophecy claiming that the Greeks were in league with evil forces and would eventually be deposed. The Jews also struggled with their Greek overlords, a problem exacerbated by the fact that they were ruled first by the Ptolemies and then by the Seleucids. While the Ptolemaic kingdom remained relatively stable until its takeover by the Romans in 30 BCE, both the Antigonid and Seleucid kingdoms lost ground over the years, ultimately ruling over a fraction of their former territories by the time the Romans began encroaching in the second century BCE.

Philosophy and Science

Hellenistic philosophy largely shifted away from the concerns of Greek philosophers of the Classical Age. Because philosophers were discouraged from studying politics, as had Socrates, Plato, and Aristotle, they turned instead to investigations of personal ethics, of how to live one's life to be happy, even if a larger kind of social justice remained elusive. All of the major schools of Hellenistic philosophy shared the same pursuit, albeit in different ways: to live in pleasure and tranquility. Three are of particular note: the Epicureans, Stoics, and Cynics.

The Epicureans, named after their founder Epicurus, believed that humans ought to turn their backs on the pointless drama of politics and social competition and retire to a kind of inner contemplation. Epicurus taught that even if gods existed, they clearly had no interest in human affairs and thus did not need to be feared. Death was final and total, representing release and peace, not an afterlife of torment or work, so there was no need to worry about it, either. In short, the Epicureans believed in a virtuous renunciation of earthly cares and an indulgence in pleasure. Pleasure was not about overindulgence, however (which led to suffering - think of indigestion and hangovers), but a refined enjoyment of food, drink, music, and sex, although one interesting aspect of this philosophy was the idea that sexual pleasure was fine, but emotional love was to be avoided since it was too likely to result in suffering. To this day, the word "epicurean" as it is used in English means someone who enjoys the finer things in life, especially in terms of good cooking!

The Cynics believed that social conventions were unfortunate byproducts of history that distracted people from the true source of virtue and happiness: nature. In turn, the only route to happiness was a more aggressive rejection of social life than that espoused by the Epicureans (who, again, were quite sedate). They advocated a combination of asceticism and naturalism, indulging in one's physical needs without regard to social convention. Practically speaking, this

involved deliberately flouting social mores, sometimes in confrontational or even disgusting ways: Diogenes, founder of the Cynics, notoriously masturbated and defecated in public. Most Cynics were slightly more restrained, but most took great pleasure in mocking people in positions of political authority, and they also belittled the members of other philosophical schools for their overly rigid systems of thought. One story had it that Alexander sought out Diogenes and found him lying in the street in a suburb of the polis of Corinth, asking him what he, the king, might do for him, the philosopher. The Cynic replied “stop standing in my sunbeam.”

Originally an offshoot of the Cynics, the Stoics became philosophers of fate and rationality. Unlike the Epicureans, the Stoics believed that humans had an obligation to engage in politics, which formed part of a great divine plan, something linked to both fate and nature. As participants in the natural order, humans ought to learn to accept the trials and tribulations of life rationally, without succumbing to emotion (hence the contemporary meaning of the word “stoic”: someone who is indifferent in the face of pain or discomfort). The Stoics accepted the necessity of being part of a society and of fulfilling social obligations, but they warned against excesses of pride and greed. Instead, a Stoic was to do his duty in his social roles without the distraction of luxury or indulgence. They were one possible version of a philosophy that believes in the existence of fate, of accepting one's place in a larger scheme instead of resisting it, and they also celebrated the idea that the rational mind was always more powerful than emotional reactions.

What these three schools of philosophy had in common, despite their obvious differences, is that they all represented different approaches to accepting the (political) status quo. The Epicureans avoided politics, the Stoics supported existing political structures, and the Cynics mocked everything without offering positive suggestions for change. This was a far cry from the earnest inquiry of a Socrates, a Plato, or an Aristotle in trying to establish a virtuous form of politics. While Greek culture enjoyed a period of unprecedented influence during the Hellenistic period, its experiments in rational (let alone democratic) political analysis were not a major component of that influence.

While political theory did not enjoy a period of growth during the period, there were significant accomplishments in science and mathematics. The most important Hellenistic mathematicians were Euclid and Archimedes. Euclid was the inventor of the mathematical discipline of geometry. He was the first to use obvious starting points called axioms – for instance, the idea that two parallel lines will never intersect – to be able to deduce more complex principles called theorems. Euclid is one of those relatively few ancient thinkers who really “got it right” in the sense that none of his major claims were later proved to be inaccurate.

His work on geometry, the *Elements*, was still used as the standard textbook in many courses on mathematics well into the twentieth century CE, thousands of years after it was composed. Archimedes was also a geometrician, best remembered for his applications of geometry to engineering. He discovered the principle of using the displacement of water to calculate the specific gravity of objects, and he devised a number of complex war machines used against Roman forces when his home city of Syracuse, in Sicily, was under attack (including, according to some accounts, a giant mirror used to focus the sun's rays on Roman ships and set them on fire).

Hellenistic thinkers also made important discoveries in astronomy, most notably the fact that certain astronomers determined that the sun was the center of the solar system. Hellenistic astronomers also refined the calculations associated with the size of the Earth; one astronomer named Eratosthenes calculated the circumference of the Earth that was only off by 200 miles. Another astronomer named Hipparchus created the first star charts that included precise positions for stars over the course of the year, and to help keep track of their positions he created the first system of longitudes and latitudes.

Perhaps the most memorable achievement in scholarship during the period was the institutional form it took at the Library of Alexandria and its associated Museon, often considered to be the first research university in the western world. Funded directly by the Ptolemaic government, the Library collected and translated every scrap of available scholarship from the Hellenistic world and played host to scholars who based their own work on its archives. It housed lecture halls as well, representing the preeminent site of learning in the Hellenistic world as a whole. It was eventually destroyed, although to this day there are competing versions of who was to blame for its destruction (ranging from the forces of Julius Caesar during his involvement in an Egyptian civil war to either Christian or Muslim fanatics centuries later).

Thus, there were certainly important intellectual breakthroughs that occurred during the Hellenistic period. There were not, however, corresponding achievements in technology or engineering. That is not surprising in that the pace of technological change in the ancient world was *always* glacially slow by modern standards. Instead, what mattered at the time was the spread of ideas and knowledge, much of which had no immediate and practical consequences in the form of applied technology - this was as true of ancient Rome as it was of the Hellenistic kingdoms.

Conclusion

While Alexander the Great is a well-known figure from ancient history, the Hellenistic period as a whole is not. The reason for that relative neglect (in popular culture and in many history surveys, at least those at the pre-college level) is that the Hellenistic age is overshadowed by what was happening simultaneously to the west: the rise of Rome. In precisely the same period in which Alexander and his successors first conquered then ruled the territories of the former Persian Empire, Rome was in the process of evolving from a town in central Italy to the center of what would eventually be one of the greatest and longest-lasting empires in world history. That is the subject of the next few chapters.

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