

1 Enlightened Kings or Pragmatic Rulers? Ptolemaic Patronage of Scholarship and Sciences in Context

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The boom in technical knowledge, from medicine to mathematics, from mechanics to scholarship, is a well-known phenomenon of the Hellenistic period and is especially linked to the royal patronage of the Ptolemies.¹ Indeed, scholarship and science thrived in Ptolemaic Alexandria. The philologists (γραμματικοί) working in the Royal Library are the most renowned, but scholarship was by no means the only field developed during this period. Medicine experienced an even greater growth and some fundamental discoveries. Anatomy was studied, especially by Herophilus (ca. 320/30–260/50 BCE) and Erasistratus (ca. 330–255/50 BCE), with particular emphasis on the nerve system, the cardiovascular system, the lungs and the pulse.² Both doctors were able to advance their knowledge of anatomy because of dissection and, probably, vivisection. While Herophilus practised at Alexandria, Erasistratus had close contacts with Alexandrian science and perhaps even with the Ptolemies, though it remains uncertain whether he ever worked there.

This was also the golden age of mathematics and geometry: Euclid (*fl.* 300 BCE) is the first name that comes to mind, but the information that he worked at Alexandria comes from later and not completely reliable sources.³ However, the polymath Eratosthenes, who was also a mathematician and geographer,⁴ was certainly working there under Ptolemy III (246–222 BCE) and Ptolemy IV (222–204 BCE). Similarly, Apollonius of Perga (260–190 BCE) wrote his fundamental work on the conics at Alexandria (*Con. I Praef.* 1, p. 2.11–13 Heiberg) under Ptolemy III (*Eutoc. In Apoll. Con. 2*, p. 168.5–7 Heiberg).⁵ Even if he did not work there, Archimedes (287–212 BCE) travelled to and perhaps studied at Alexandria; through a lifelong correspondence he also exchanged ideas with Alexandrian mathematicians such as Eratosthenes and the astronomers Conon and Dositheus.⁶ In fact, a similar relationship with Alexandria might be true for Erasistratus, who, aside from his discoveries in anatomy, developed a model of the heart as a pump, in analogy with the pump of Ctesibius, a mechanical engineer and founder of pneumatics who worked at Alexandria under Ptolemy I (306–282 BCE) and Ptolemy II (282–246 BCE).⁷ Even scholars who might not have worked in Alexandria, such as Erasistratus and Archimedes, thus seem to have considered the Ptolemaic capital as the hub of the latest discoveries in their own fields and beyond.

The brief sketch opens a series of questions concerning the prestige of Alexandria in Hellenistic scientific development and the role of the Ptolemies in its pre-eminence. In fact, Ptolemaic patronage is very rarely seen against the larger background of the other Hellenistic kingdoms and of other scientists and intellectuals who conducted research in other parts of the Mediterranean world. Since Hellenistic science came to a halt in the second century BCE, it is also worth asking whether this drastic break may be connected, among others, to changes in royal patronage.

In order to attempt answering these questions, we must embrace a wider perspective. The present contribution is intended as a starting point for what needs to be a thorough, in-depth investigation of scientific and scholarly research beyond Alexandria, in the other Hellenistic kingdoms. In this necessarily brief survey, I will proceed by analysing different areas where ‘research-oriented’ patronage developed, in order to compare the evidence. In addition to mapping out centres of scientific research in the Mediterranean basin, this investigation will ask a further question. The common denominator of intellectual work is (or should be) the interest in knowledge ‘for its own sake’. Since scientific and scholarly work does not consist in producing artistic masterpieces (things that courts may use to enhance their esteem) nor in praising the patron, the latter has no direct, personal return by supporting these intellectuals as he would have, for example, with artists or poets. The analysis of ‘research-oriented’ patronage, hence, touches on the question of the value of culture per se and the role it plays in the definition of kingship.⁸

Two caveats should be kept in mind, however, when studying this material. First, the evidence is scanty, especially when looking beyond Alexandria. In addition, much of the evidence in this area is anecdotal and often much later than the time it refers to. Very little can be regarded as beyond doubt, yet this is all we have and it must be dealt with if we want to say anything on this period. There are at least two ways to navigate within less-than-reliable sources. First, sometimes we can discern different degrees of trustworthiness in the sources, with one anecdotal story backed up by a different set of evidence, which might be later but perhaps more grounded and trustworthy. The combination of evidence of different kinds but in basic agreement may provide a stronger basis for an inference. In addition, anecdotes, especially if there are many on a topic, can agree in their depiction of certain patterns. Such patterns are the topic of the present paper and they suggest interesting trends in the patronage of science and scholarship in the Hellenistic kingdoms.

Libraries

Libraries are a *condicio sine qua non* for intellectual work, and libraries played an important role in the Hellenistic kingdoms, starting with the Royal Library of Alexandria. Even if many details escape us, it was most likely founded by Ptolemy I (306–282 BCE) (Euseb. *Hist. Eccl.* 5.8.11), and Ptolemy II (282–246 BCE) might have developed it further.⁹ A second library in the Serapeum, the temple of

Serapis, was probably founded by Ptolemy III (246–222 BCE).¹⁰ The Royal Library was led by a head librarian, perhaps called προστάτης τῆς βιβλιοθήκης, who was appointed by the king and also served as royal tutor. Traditionally, the head librarians include Zenodotus of Ephesus, Apollonius Rhodius, Eratosthenes of Cyrene, Aristophanes of Byzantium, Apollonius Eidographos and Aristarchus of Samothrace.¹¹ Aside from the royal tutors *cum* head librarians, many other grammarians and philologists were active and paid by the king to work there. Among them were also court poets, like Alexander Aetolus, Callimachus and Apollonius Rhodius;¹² others, however, seem to have been ‘pure academics’, for example Aristophanes of Byzantium and Aristarchus of Samothrace. These scholars were probably hired because they had distinguished themselves by previous intellectual achievements (see below, pp. 5–6); once hired, they continued to be active. In fact, as far as we can tell, they produced most of their scholarship while tenured under the Ptolemies. An anecdote in Athenaeus (11.493c–494a) involving the grammarian Sosibius being made fun of by Ptolemy II when claiming his salary, confirms that these grammarians received a royal stipend (σύνταξις βασιλική).

The scholars who worked in the Royal Library between the third and second century BCE preserved and reorganised the past Greek literature by preparing editions, commentaries, lexica and so on. In doing so, they selected a list of authors ‘chosen’ for their merits, who then became the standard (and compulsory) reading for literary education; these are mainly the authors who eventually got transmitted to us.¹³ The Alexandrian scholars also founded philology as a ‘scientific’ discipline with rules and methods; even if not all their rules were sound, their innovative approach to literature cannot be underestimated.¹⁴ As a consequence of this philological activity, linguistics and grammar were developed as well, and many grammatical categories and concepts were advanced by Aristarchus and his colleagues.¹⁵ Parallel to the work on literary authors, the ‘philological’ study of Hippocrates also started at Alexandria with the preparation of lexica and commentaries.¹⁶

The Ptolemies gave these scholars the opportunity to ‘save’ the past Greek literature with their editions, commentaries and monographs, not only by paying them to study these texts, but, more importantly, by providing them with the tools to do so. Galen famously describes how rolls were acquired for the Library (*Comm. Hipp. Epidem. iii*, 606–607 = *CMG V*, 10.2.1, 79.7–80.6): Ptolemy III¹⁷ had issued an order that all books on ships arriving at Alexandria had to be taken and copied: the originals would be kept in the Library and only the copies returned to the owners. The same happened with the Athenian edition of the three tragedians: Ptolemy III had borrowed it from the Athenians giving a security of fifteen talents, with the agreement that he would copy it and send the original rolls back right away. But the king kept the originals and sent back copies to Athens. These anecdotes suggest that the Ptolemies’ aim was to collect *all* possible books arriving at Alexandria as well as *old and original* manuscripts, not simply copies – indeed, Galen comments that the story of the tragic edition from Athens further proves that Ptolemy III was extremely ‘keen to acquire every ancient book’.¹⁸ This picture

finds confirmation in the Homeric scholia of Didymus, which mention the presence in the Library of many Homeric editions, at least in the first century BCE–early first century CE, when Didymus was active there. Two different types of editions are mentioned. The first group consists of the individual editions (ἐκδόσεις κατ' ἄνδρα), namely editions prepared by specific scholars. Aside from the editions of Zenodotus, Aristophanes and Aristarchus, Didymus also recalls those of Rhianus of Crete, Antimachus, Sosigenes, Callistratus and Philemon. Then there are the 'city editions' (ἐκδόσεις κατὰ πόλεις), namely editions prepared by specific cities, or rather, copies coming from such cities. Among the latter, the scholia record those of Marseilles, Chios, Argos, Cyprus, Sinope, Crete and an 'Aeolid' one. This list in particular gives a sense of the geographic extensiveness of the Ptolemies' book hunt from the remotest parts of the Greek world – from Marseilles to Sinope on the Black Sea. Galen and the Homeric scholia thus suggest that the Royal Library was a collection with scientific and not merely intellectual purposes. While for an amateur intellectual it is enough to own a collection with each important author present, the Ptolemies sponsored a real 'research library', in which scholars could carry out their research in the best possible way by comparing different manuscripts of the same author and of the same work – an endeavour confirmed by the scholia to the Greek authors, Homer in particular.¹⁹

The idea of collecting all the past Greek literature at Alexandria had also a very important ideological goal, since it presented the Ptolemaic capital as the legitimate heir of ancient Greece, in particular of Athens and specifically of the Peripatos, where Aristotle had collected a wide personal library (Strabo 13.1.54; Ath. 1.3a). Yet the Royal Library also included works of non-Greek people, written in or translated into Greek, such as the Septuagint, Manetho, perhaps Berossus²⁰ and even Persians texts, if we trust Pliny when he says that Hermippus the 'Callimachean' (third century BCE) wrote a commentary on Zoroaster (Plin. *HN* 30.4).²¹ The combination of this evidence and scant anecdotal material suggests that the Ptolemies were not only trying to own the Greek past, but also aimed at embracing the cultures of people beyond their kingdom.

Even if the most famous, the Alexandrian library was not the only one founded by Hellenistic kings. King Eumenes II (197–159 BCE) founded a library at Pergamum in the first half of the second century BCE (Strabo 13.4.2). This library might have been part of the royal palaces,²² yet according to Vitruvius (*Arch.* 7, *Proem.* 4) it was put together by the Attalids 'for general perusal' (*ad communem delectationem*). If this is true, this library worked on a completely different model, closer to the public libraries founded later on by the Roman emperors, which were political 'gifts' of the emperor to citizens.²³ This model of a 'public' royal library was very different from the Alexandrian Library, which, as far as we know, was a private institution, closed to all 'outsiders' except to those elected by the kings. Whether or not the Attalid library was open to the public, it was, like the Alexandrian model, actively engaged in research: Crates and his school are prime examples of that.²⁴ We also know the name of a head librarian from the first century BCE: the Stoic Athenodorus Cordylion, who apparently excised unfitting statements from the books of other Stoics (D.L. 7.34). In addition, the Attalids also embarked on a

book hunt, as Strabo reports when telling the story of the Library of Aristotle:²⁵ the heirs of Neleus hid the books in an underground tunnel when they heard ‘of the zeal (τὴν σπουδὴν) with which the Attalid kings. . . were searching for books to establish the Library at Pergamum’ (Strabo 13.1.54).²⁶

While we know little about the library of Pella at the court of the Antigonids, except that it might have been brought to Rome after the battle of Pydna in 168 BCE (Isid. *Et.* 6.5.1), something more can be gathered for the Seleucids. An entry in *Suda* (ε 3801) tells that Antiochus III the Great (222–187 BCE) entrusted to the poet Euphron of Chalcis, who had joined his retinue, the management of a ‘public’ library ‘there’ (τῆς ἐκεῖσε δημοσίας βιβλιοθήκης), without specifying the location. However, since Antioch became the most important of the Syrian τετράπολεις and one of, if not the main capital,²⁷ and underwent considerable development by Antiochus III, it seems the most likely candidate for hosting a library.²⁸ Another library with an attached museum was founded in Antioch by either Antiochus IX Philopator Cyzicenus (115–95 BCE) or Antiochus X Eusebes Philopator (95–83 BCE); the uncertainty is due to our source, Malalas (*Chron.* 10.10, p. 179 Thurn), who only speaks of Antiochus Philopator.²⁹ Malalas also mentions that it was situated in the agora. More importantly, he adds that the library was not the king’s own initiative, but built thanks to a certain Maron of Antioch, who left money in his will for its establishment. Unlike those of the Attalids and the Ptolemies, then, this library was not a royal enterprise but that of another person, the king simply following Maron’s plan.³⁰

The evidence is much more fragmentary for these libraries outside Egypt. Yet some elements seem to emerge. While at Pergamum research was carried out in the library, the Seleucid kingdom offers a different picture. Even if the Syrian kings might have had some interest in scholarship (the scholar-poets Euphron and Aratus worked for them; for the latter see below, pp. 6–7), nothing at their court compares to the scholarly work carried out in Alexandria and Pergamum. On the other hand, the libraries at Pergamum and Antioch share some similarities against the Royal Library at Alexandria. First, they seem to have been founded later (between the second half of the third and the first half of the second century BCE), on the model of and in competition with the Library of Alexandria (established in the early third century BCE). Second, if we may trust the *Suda* on Antiochus III’s library and Varro on the library at Pergamum, it seems that the Seleucids and the Attalids opened their libraries to their people, thus choosing a ‘public’ model of culture as opposed to that of the Ptolemies. The idea of a public library was a politically astute model, probably of more use than a purely research-oriented library, such as that in Alexandria. In fact, a library which the king ‘donated’ to his people could be seen as a generous gesture by a benevolent monarch – smart politics in a time when power was always capricious.

Recruitment and retention of scholars

Bright intellectuals were noticed by the Ptolemies and recruited as scholars in their library; here too we rely on anecdotes, which are the only sources for this early

period. Yet these anecdotes seem to agree on a fairly coherent picture of Ptolemaic patronage. Callimachus was ‘introduced’ to Ptolemy II after distinguishing himself as a teacher in Alexandria (*Suda* κ 227).³¹ A similar story is told by Vitruvius (*Arch.* 7 *praef.* 4–7) about Aristophanes’ appointment as head librarian. Ptolemy V (205–180 BCE) was looking for another judge for a poetry contest, and the scholars at the Library suggested Aristophanes as someone who used to read every book with much attention. When the contest took place, Aristophanes objected to the choice of all the other six colleagues, showing that the winner had recited another person’s composition and that in fact all the contestants except one recited other people’s poems. Relying on his memory, he pulled out from the library shelves all these poems and proved all but one of the contestants to be thieves. Because of his amazing knowledge of poetry, the king appointed him as head librarian.

Not only were the Ptolemies eager to attract the best scholars from all over the world, they were also very possessive patrons. The same Aristophanes apparently tried to flee from Alexandria and move to the service of king Eumenes II. Ptolemy V did not take kindly to his head librarian’s initiative to switch patron and so put Aristophanes ‘in prison for some time’ (*Suda* α 3936).³² If this anecdote does not suggest academic freedom to have been much appreciated at the time, it does reveal a very important feature of the Ptolemies’ patronage. On the surface, the work of Zenodotus, Aristophanes of Byzantium and Aristarchus is a purely intellectual pursuit without any political agenda. Yet, when a rival research library was developed at Pergamum, it became an issue for them to retain their intellectuals. For the first time an ‘academic’ becomes strictly attached to a king (who gives him resources and a salary) so that he cannot simply leave – his intellectual work is the property of the king who has given him the means to pursue it.³³

The competition between the Ptolemies and the Attalids is attested in many other sources. The most famous story in this regard comes from Pliny, about the invention of parchment at Pergamum under Eumenes II after the Ptolemies had blocked the export of papyrus because of the competition between the two libraries (*NH* 13.70: *aemulatione circa bibliothecas*).³⁴ Galen also explicitly mentions the competition between the kings of Pergamum and Alexandria in the acquisition of old books, and so does Vitruvius.³⁵ This might be mere anecdotal evidence, but all these sources seem to regard the proliferation of similar cultural institutions in these two Hellenistic kingdoms more as a struggle for cultural (and political) pre-eminence than arising from pure love for intellectual pursuits.

Even though the pre-eminence of Alexandria and Pergamum in the field of scholarly work is beyond doubt, some rivalry in attracting renowned intellectuals might have been at play in the visits the poet Aratus of Soli paid to both the Antigonid and the Seleucid courts. In 276 BCE, Aratus went to the court of Antigonos II Gonatas (277–239 BCE) at Pella, where he composed the *Phaenomena* (*Suda* α 3745; *Vitae* 1, 3, 4) and prepared a recension (διόρθωσις) of the *Odyssey*. He was consequently invited by Antiochus I (281–261 BCE) to the Seleucid court in order to do a recension of the *Iliad* ‘as it had been corrupted by many’ (*Vita* 1).³⁶ We do not know much about his stay in Syria and whether he ever accomplished this task (Aratus’ Homeric editions are never mentioned in the scholia). Still, if

true, Antiochus' recruitment of Aratus is very similar to those of the Ptolemies discussed above (p. 6): on the basis of his previous intellectual achievements (at Pella), Aratus attracts the attention of a king who 'hires' him at his court just as the Ptolemies did with Callimachus and Aristophanes. Yet Aratus eventually left the Seleucid court and went back to Pella where he died (*Suda* α 3745).³⁷ This may indicate that the Seleucid kingdom was not intellectually attractive enough compared to the court of Antigonos II. And while Antiochus I seems to have been less possessive of Aratus than Ptolemy V of Aristophanes, the story might also suggest that the Seleucids were less keen to invest in scholars than their peers in Alexandria.

On the other hand, philosophers seem to have been much sought-after by all the Hellenistic courts. Antigonos II invited the Stoic Zeno, whose lectures he attended in Athens, to join his court at Pella; Zeno declined, and sent his pupils Persaeus and Philonides of Thebes in his stead (D.L. 7.6–9). The story reminds us of Ptolemy I courting Theophrastus (D.L. 5.37);³⁸ even though Theophrastus declined, Ptolemy I did manage to get Peripatetic scholars at his court: Straton of Lampsacus, who for some time came to be the royal tutor of the future Ptolemy II (D.L. 5.58), and Demetrius of Phalerum. The latter was a pupil of Theophrastus and former ruler of Athens (317–307 BCE), who joined the Ptolemaic court after he went to Thebes following his exile from Athens (D.S. 20.45.4; D.L. 5.78); at Alexandria he became a close advisor of Ptolemy I (Plut. *de exil.* 601f; Ael. *VH* 3.17) and dedicated himself to literary studies.³⁹ The Attalids Eumenes I (273–241 BCE) and Attalus I (241–197 BCE) sponsored the Peripatetic Lycon, whom Antiochus (probably Antiochus II, 261–246 BCE) also tried to attract to his court without success (D.L. 5.67–68). While Lycon did not join the Seleucid court, some Epicurean philosophers did. Philonides of Laodicea settled there, as an Herculaneum papyrus informs us (*P.Herc.* 1044);⁴⁰ he was befriended by Antiochus IV (175–164 BCE) and even converted Demetrius I (162–150 BCE) to Epicureanism (*P.Herc.* 1044, fr. 30).⁴¹ Philonides also had some diplomatic roles under those kings (*SGDI* II 2677 = *OGIS* 241; *IG* II² 1236).⁴² The Epicurean Diogenes of Seleucia, on the other hand, joined the Seleucid court of Alexander I Balas (150–145 BCE) and was welcomed there despite the king favouring Stoic doctrines and Diogenes himself being a difficult character (Ath. 5.211a–c). The philosopher was, however, killed by the succeeding Antiochus VI Epiphanes (145–141 BCE), who was not similarly patient with Diogenes' harsh manners (Ath. 5.211d).⁴³ Doubts have been raised about another story told by Athenaeus (12.547a–b) concerning a certain Phantias who was ordered by king Antiochus (we do not know which one) to expel philosophers from the kingdom.⁴⁴

These are all scattered anecdotes. Yet, just as in the case of the anecdotes involving the Ptolemies and the Attalids, these stories seem to draw a relatively coherent picture: even though the Seleucids tried to attract philosophers, they definitely seem to have been less tolerant towards intellectuals than their peers at the other Hellenistic courts, about whom we do not have reports of killings or expulsions. Moreover, in their hunt for philosophers, the Seleucids were less successful than the other Hellenistic rulers. Indeed, kings of three of the main kingdoms

(Egypt, Macedonia and Syria) all tried to attract scholars, especially philosophers, but with varying success. When a choice had to be made between two patrons, as in the case of Lycon and the poet-scholar Aratus, the Seleucids were apparently less attractive than the Attalids and the Antigonids. This also supports the impression that the Seleucids engaged in intellectual patronage with less intent and, consequently, with less success.⁴⁵

Research institutions and experiments

The Hellenistic kings also fostered ‘scientific research’, especially the Ptolemies who founded the Museum on the model of the *Mouseia* of Plato’s Academy and Aristotle’s Peripatos (Plut. *Non posse* 1095d).⁴⁶ Apart from Herondas (first half of the third century BCE), who mentions the Museum as one of the many wonderful attractions of Egypt (*Mim.* 1.26–31), and Timon of Phlius (ca. 320–230 BCE), who famously mocks the quarrelsome ‘pedants’ (βιβλιακοί) of the Museum (fr. 786 *SH*), Strabo is our main source. Even if he might have also relied on Aristonicus’ work *On the Museum* (Phot. *Bibl.* 161, 104b40–41), Strabo probably knew the Museum quite intimately, having lived in Alexandria for a long period (as he himself says at 2.3.5). Indeed, he was in Alexandria in the 20s,⁴⁷ within ten years of Ptolemaic rule coming to an end. Therefore, when in Book 17 he gives us the only description we have of this famous institution, we can be reasonably sure that what he says could not be drastically different from the original Ptolemaic institution:

the Museum, too, is part of the royal palaces; it has a covered walk and hall with seats and a large room where the learned men (φιλόλογων ἀνδρῶν) who are part of the Museum have meals in common. This group of people has shared funds (χρήματα κοινά) and a priest in charge of the Museum, once appointed by the kings and now by Caesar (Strabo 17.1.8).

The scholars of the Museum shared funds and meals. They also most likely taught in addition to carrying out research, as the model of the Peripatos would suggest. Both Timon’s βιβλιακοί and Strabo’s φιλόλογοι point to philologists and grammarians as members of the Museum. Indeed, the grammarians working in the Library were most likely also part of the Museum. However, this does not necessarily mean that there were no scientists in the Museum, as φιλόλογος did not mean only ‘philologist’ or ‘grammarian’, but also ‘learned’ and ‘educated’ in general, at least until the second century CE.⁴⁸

Many scientists were certainly active at Alexandria in the Hellenistic period: aside from the uncertain cases of Euclid and Erasthratus mentioned above (p. 1), the physicians Praxagoras and his pupil Herophilus worked at Alexandria between the third and second centuries BCE;⁴⁹ also the mathematicians Conon of Samos, Eratosthenes and Apollonius of Perga were all active there in the third century BCE.⁵⁰ Unfortunately, it is not possible to establish a secure connection with the Museum for any of them.⁵¹ Yet the lack of institutional links with the Museum does not exclude that the Ptolemies’ sponsorship of cultural activities in

general was a strong factor in attracting scientists and intellectuals there, even if they did not work within the Royal Palaces. In addition, and more importantly, we do have evidence that, even though they might have been working independently and outside of any institution of higher education, ideas and scientific terminology circulated beyond those who first employed them, and this led to interesting borrowings across disciplines. For example, at Alexandria physicians described human parts in mechanical terms and engineers named parts of their machines after the human body; Andreas of Carystus (ca. 275–217 BCE), personal physician of Ptolemy IV (222–204 BCE), invented a machine for reducing dislocated limbs that seems to be dependent upon Alexandrian mechanical technology, which we know from Philo (late third century – early second century BCE);⁵² and we have already mentioned the links between Erasistratus and Ctesibius' pump. There are also clear terminological borrowings between medicine and grammar as well as between philology and geography.⁵³

Even in the absence of firm evidence connecting scientists working at Alexandria and at the Museum, royal patronage for the sciences is explicitly attested at least in one case: the anatomical discoveries of Herophilus. Galen tells us that both Herophilus⁵⁴ and Erasistratus⁵⁵ practised human dissections, but does not mention vivisection. In contrast, Celsus clearly speaks of human vivisection in a reference to Hellenistic medicine:

[According to the 'rationalist' physicians] it is therefore necessary to dissect the bodies of the dead and to examine their viscera and intestines. Herophilus and Erasistratus, they say, did this in the best way by far when they cut open men who were alive, criminals out of prison, received from the kings (*qui nocentes homines a regibus ex carcere acceptos vivos incidierint*)

(Celsus, *Med.*, Praef. 23; transl. Von Staden 1989:187 fr. 63a).

According to Celsus, the king provided criminals for the experiments of Herophilus and Erasistratus.⁵⁶ Herophilus is securely connected with Alexandria, so the kings in his case were the Ptolemies. Erasistratus' connection with Alexandria is less certain, yet many scholars believe he must have worked at Alexandria, this being the only place for which such experiments are attested (with Herophilus).⁵⁷ The only other candidate would be the Seleucid court in Syria where Erasistratus' family came from (see below, p. 10),⁵⁸ but no evidence exists that the Seleucids supported anatomical research and potentially questionable research practices. Leaving aside the uncertain evidence about Erasistratus, Herophilus certainly did work in Alexandria, and he could carry out his ethically dubious research thanks to royal protection and provision of 'material'. This is what Von Staden aptly calls 'indirect patronage'.⁵⁹

Experiments and interest in medicine and pharmacology are attested in other kingdoms as well, but these are isolated cases mostly connected to the specific interests of a king. The most famous case is Mithridates VI (ca. 120–63 BCE), king of Pontus, an intellectual who counted both philosophers and physicians among his friends (Orusius 6.4.6). Mithridates used to cut and cauterise his companions

(Plut. *Adul.* 58a), had a deep interest in toxicology and even discovered a poison antidote, which was then called *Mithridatum* (Plin. *HN* 25.3; Cels. *Med.* 5.23.3; Gal. *Antid.* 1.1 = 14.2 K.).⁶⁰ Another amateur scientist was Attalus III (138–133 BCE), who similarly enjoyed preparing drugs (Cels. *Med.* 5.19.11; 6.6.5b) and growing poisonous plants (Plut. *Demetr.* 20.3).⁶¹ Attalus also conducted pharmacological experiments on criminals condemned to death (Gal. *Antid.* 1.1 = 14.2 K.; *De simplic. medicam. temper. ac facultat.* 10.1 = 12.250–252 K.). This cruel practice in part parallels Herophilus' dissection (or even vivisection) of criminals, as both the Ptolemies and Attalus III seem to have used their (condemned) subjects as 'private property' for the sake of knowledge. Yet, while Attalus III conducted experiments himself (science was apparently a hobby to him), the Ptolemies allowed *real* scientists to carry out their experiments. If the dynamics are partly the same, the spirit and intent behind them differ: patronage in the latter case, personal satisfaction and (cruel) pastime in the former.

When we look at the Seleucid court, on the other hand, the evidence for 'scientific research' is much scantier. As for medicine, the only physicians for whom we have secure evidence are 'royal doctors', who are a constant (and necessary) presence in the Hellenistic courts.⁶² The most famous is Cleombrotus, personal physician of Seleucus I (305–281 BCE) and father of Erasistratus. Given his family connection with the Seleucids, scholars have suggested that Erasistratus too was at some point a court physician. The most important piece of evidence consists of a famous anecdote according to which he persuaded Seleucus I to give up his wife Stratonice to his son Antiochus I (281–261 BCE) in order to cure him. However, other sources have the same anecdote with other names, among which is Erasistratus' father Cleombrotus; the latter is, in fact, the most likely candidate for the story, as he was the court physician under Seleucus I.⁶³ On the other hand, Erasistratus is said to have prescribed a remedy against gout to a king Ptolemy, probably Ptolemy II (Cael. *Aur. Morb. Chron.* V 50, p. 938 Drabkin = fr. 267 Garofalo).⁶⁴ While this anecdote does not mean that he was the personal doctor of the Ptolemies⁶⁵ nor that he worked at Alexandria, it does suggest contact with the Ptolemaic court. Such contact is further supported by Erasistratus' anatomical discoveries, which are in line with Herophilus' research, as well as by his acquaintance with mechanical theories proposed at Alexandria. Moreover, in the passage quoted above (p. 9), Celsus seems to closely connect Erasistratus and Herophilus, pointing to Alexandria as their joint place of work. All these, however, have to remain mere clues, with none offering any definitive proof of Erasistratus' stay in Alexandria.⁶⁶

Aside from Cleombrotus, several names of royal physicians are attested at the Seleucid court. Metrodorus, personal physician of Antiochus I (281–261 BC), was honoured at Ilion for curing the king of a wound (*I. Ilion* 34 = *OGIS* 220, ca. 275–268/7 BCE; see Austin 2006, # 165).⁶⁷ Aristarchus was the physician of Berenice, the second wife of Antiochus II (261–246 BCE),⁶⁸ and helped her against Laodice, Antiochus II's first wife, during the dynastic struggle after the king's death in 246 BCE (Polyaen. 8.50).⁶⁹ Apollonphanes, personal physician of Antiochus III (222–187 BCE) and his φίλος, was an important player in court politics (Polyb. 5.56 and 58);⁷⁰ Craterus was πρῶτος φίλος ('first friend') and

ἀρχιατρός ('official doctor') of Antiochus VII (138–129 BCE) as well as τροφεύς ('educator') of the future Antiochus IX (115–95 BCE) (*I.Delos* 1547 = *OGIS* 256, 129/117 BCE).⁷¹

Similarly at Pella, Philippus of Epirus (*Cels. Med.* 3.21.3) and Aristogenes of Cnidus or Thasos (*Suda* α 3910 and 3911) are specifically connected with Antigonus Gonatas.⁷² The Attalids, too, had their own royal physicians; we know of two of them, both connected with Eumenes II: Stratius, whom Eumenes sent on an embassy to Rome (Polyb. 30.2) and Menander of Pergamum (*IG²* 946 and *Suda* λ 311).⁷³ The title of 'royal physician' was also present at the Ptolemaic court. Among the many names attested,⁷⁴ the most important are Chrysippus, who was the personal physician of Ptolemy II and plotted against the king with his first wife Arsinoe (*Sch. Theocr.* 17.128; D.L. 7.186), Philippus (*P.Mich.* 1.55, 240 BCE) and his son Caphisophon of Cos (*OGIS* 42), personal physicians of Ptolemy III,⁷⁵ and the Herophilean Andreas of Carystus, personal physician and advisor to Ptolemy IV (Polyb. 5.81).⁷⁶

A royal doctor was thus a constant presence in the Hellenistic courts. All these doctors are mentioned in our sources as simply taking care of the health of the ruler and his entourage. They also often carry out important diplomatic missions for their kings or act as advisers, which points to the importance of their role within the court. Yet none of them is known for their scientific discoveries or writings. The only exception is Andreas of Carystus, who, even if not involved in cutting-edge anatomical research, did write about pharmacology. Whether or not the story of the prisoners handed out by the Ptolemies to Herophilus for vivisection is true, most of the important innovations in medicine between the third and second centuries BCE occurred at Alexandria. As a consequence, even a court physician under the Ptolemies might have felt that he could (or should?) embark on research of some sorts.

On the other hand, the Seleucids seem to have been much more concerned with supporting intellectuals who could be politically 'useful'. For example, we know of many ethnographers who were also officers of the Seleucids. The most famous one is Megasthenes, who lived under Seleucus I (305–281 BCE), was an envoy to the Indian king Chandragupta and wrote about India (*Clem. Strom.* 1.15.72.5; Strabo 2.1.9).⁷⁷ Other ethnographers, however, are attested under Seleucus I and Antiochus I (281–261 BCE): Patrocles, a general of Babylonia, who explored the region of the Caspian Sea (*D.S.* 19.100.5–6; *Plin. HN* 6.58; Strabo 2.1.6),⁷⁸ Demodamas, another commander, who crossed the river Syr-Daria (ancient Iaxartes) (*Plin. HN* 6.49) and wrote about India (Strabo 2.1.9),⁷⁹ and Daimachus, an envoy to the Indian king Bindusara and author of a work on India (Strabo 2.1.9).⁸⁰ These generals and envoys helped the kings to know their vast kingdom better. Berossus, who dedicated his *Babiloniaka* to Antiochus I (Tatianus *Ad Gr.* 36 = Euseb. *Praep. Ev.* 10.11.8), also belongs to this group of ethnographers/historians close to the court and 'useful' to the prince.⁸¹ We know of two other intellectuals who had power at the court of Antiochus III (222–187 BCE). One was the scholar-poet Hegesianax, who participated in embassies to Greece and Rome

(Polyb. 18.47.1–5, 50.3–4; Liv. 34.57.4–6); he was also a φίλος of the king, who gave him a pension for his intellectual work (Ath. 4.155a–b).⁸² Mnesiptolemus, on the other hand, wrote a *Historia*, now lost, which was supposedly more concerned with the deeds of the royal family than with real history, and so was ridiculed by comic poets (Ath. 10.432b–c).⁸³

As already noted, we do not have much information about the museum in Antioch founded by Antiochus Philopator (Malalas *Chron.* 10.10, p. 179 Thurn – see above, p. 5). The very name and the fact that he was linked to a library may suggest that it was created as a response to the famous, much earlier Ptolemaic institutions with the same names. Yet it was not built on the initiative of the king but of a wealthy Antiochene, and so can hardly be considered the result of a specific cultural policy of the Seleucids. At any rate, there is no further evidence of any research carried out in this museum until it was destroyed by a fire during the reign of Tiberius.

Similarly, there is no evidence that mathematicians or astronomers worked at the courts of other Hellenistic kings. In fact, the mathematician Apollonius (260–190 BCE) was from Perga in Seleucid Pamphylia, but studied in Alexandria (Pappus *Synt.* 7.35, II p. 678.10–12 Hultsch) and worked there under Ptolemy III (Eutocius *In Apoll. Con.* 2, p. 168.5–7 Heiberg). Even if he visited Pergamum, where he knew Eudemus (to whom he dedicated Books 1 and 3 of the *Conics*), he clearly favoured the Ptolemies over the Seleucids and the Attalids.⁸⁴

Therefore, aside from the personal hobbies of Mithridates VI and Attalus III, the evidence for scientific research sponsored by Hellenistic kings other than the Ptolemies is very scanty. These rulers, and especially the Seleucids, seem to have been more interested in ‘useful’ intellectuals such as royal doctors and royal ethnographers/historians. Also, philosophers seem to have been a rather common presence in all the Hellenistic courts, but they, too, could be useful: they were often employed as tutors for the young royals, as was later the case at Rome with Seneca for Nero.

The ruler and the scientists

Providing means and money is not the only ingredient of patronage. The relationship between scientist and patron can also reveal important characteristics of the patronage itself. A good source of information in this regard is the prefaces of technical texts dedicated to different Hellenistic kings. In the preface of his *Artillery*, Philo of Byzantium (end of third/beginning of second century BCE) states that the advancement in his field is due to his ‘scientifically-minded’ kings:

The Alexandrian craftsmen happened to achieve this [i.e. the right calibration of engines] first, as they received abundant subventions (μεγάλην . . . χορηγίαν) because they had encountered kings who were eager for glory and fond of craftsmanship (διὰ τὸ φιλοδόξων καὶ φιλοτέχνων ἐπιλιῆσθαι βασιλέων)

(Philo Byz. *Bel.* 50.24–26 Marsden).

Of course, the comment can be a pure *captatio benevolentiae*. The treatise is, however, not dedicated to the Ptolemies but rather to an otherwise unknown Ariston. Furthermore, the comment occurs in a passage where Philo is not specifically praising his patrons but is concerned with the progress of τέχνη; the Ptolemies are only mentioned in passing. The preface of a similar work by Biton on catapults and siege equipment and dedicated to king Attalus I (241–197 BCE) sounds very different:

I have set out, king Attalus, to write on the construction of an engine for throwing stones; and do not joke at me if other engines happen to fit in some other category different from this. Thanks to these engines I am convinced that you will easily repel those engines used in your enemies' attacks if you counterattack following the instructions described below

(Biton 1.1 Marsden).

Not only is this book specifically dedicated to the king, but Biton clearly explains the reason for such a dedication: the treatise will be useful to the king to defeat his enemies. This is not a purely theoretical, research-oriented treatise, but a manual for the king, just like the service of royal doctors or ethnographers giving an account of the territory to the Seleucid kings. If, in Philo's eyes, the Ptolemies are φιλόδοξοι and φιλότεχνοι, the Attalids seem more like φιλοπόλεμοι.

The practical aim of Biton in addressing his king can be interestingly compared to the non-practical attitude of another Alexandrian mathematician: Eratosthenes of Cyrene, who is one of the few Alexandrian mathematicians we can definitely connect to the Ptolemies. Eratosthenes became head librarian under Ptolemy III (246–222 BCE), who hired him from Athens; he worked in the Library under Ptolemy IV (222–204 BCE) and perhaps even Ptolemy V (204–180 BCE) (*Suda* ε 2898).⁸⁵ Even if he was mockingly nicknamed 'beta' because he was never the first in anything (*Suda* ε 2898), he was certainly proud of his achievements, as suggested by his epigram to Ptolemy III, which accompanied his proof for the doubling of the cube:

If you plan, of a small cube, its double to fashion,
Or – dear friend – any solid to change to another
In nature: it's yours. You can measure, as well:
Be it byre, or corn-pit, or the space of a deep,
Hollow well. As they run to converge, in between
The two rulers – seize the means by their boundary-ends.
Do not seek the impractical works of Archytas'
Cylinders; nor the three conic-cutting Menaechmics;
And not even that shape which is curved in the lines
That Divine Eudoxus constructed.
By these tablets, indeed, you may easily fashion –
With a small base to start with – even thousands of means.
O Ptolemy, happy! Father, as youthful as son:

You have given him all that is dear to the muses
 And to kings. In the future – O Zeus! – may you give him,
 From your hand, this, as well: a sceptre.
 May it all come to pass. And may he who looks, say:
 ‘Eratosthenes, of Cyrene, set up this dedication’.

(Eutoc. *In Arch. Sphaer. et. Cyl. II Prop. 1*,
 vol. 4:68.17–69.11 Mugler = Eratosth.,
 fr. 35 Powell; transl. Netz 2004:298)⁸⁶

The epigram well testifies to Eratosthenes’ pride in presenting his mathematical achievements to a king who appreciated them, whether or not he might have understood them.⁸⁷ As Fraser notes,⁸⁸ this scientific dedicatory epigram recalls the similar one by Hedylyus inscribed on the pedestal of Ctesibius’ *rhyton*, which had an automatically operating trumpet and was dedicated to Arsinoe Philadelphus in the temple of Arsinoe Zephyritis at Cape Zephyrion. Hedylyus praises Ctesibius’ mechanical wonder, inviting passers-by to ‘honour this clever invention of Ctesibius’ (l. 9) (Ath. 11.497d–e).⁸⁹ As Eratosthenes had no qualms in sending a very complicated mathematical problem to Ptolemy III and adding an epigram to celebrate it, so Ctesibius (first half of third century BCE) proudly dedicated one of his pump-toys in the temple of Arsinoe – and even found a poet to celebrate it.

Eratosthenes’ peer-to-peer attitude towards his king finds a complementary parallel at Pella. In the letter reported by Diogenes Laertius, in which Antigonus II tried to invite Zeno (ca. 334–262 BCE) to join his court, the king addresses Zeno as follows:

King Antigonus to Zeno the philosopher, greetings. In fortune and glory I consider myself to be superior to you, but to come short in rational thinking, in education, and in the perfect happiness which you have acquired (λόγου δὲ καὶ παιδείας . . . καὶ τῆς τελείας εὐδαιμονίας ἣν σὺ κέκτησαι). Therefore I decided to ask you to visit me, convinced that you will not refuse the invitation. Try, then, by all means to join my company, understanding this, that you will not only be a teacher of myself alone but of all the Macedonians together . . . (D.L. 7.7).

The king speaks to the Stoic Zeno not as a superior but as a peer: while he is more powerful, Zeno is wiser and the king needs his help.⁹⁰ Both addresses, the one of Eratosthenes to Ptolemy and this one of Antigonus to Zeno, depict the same type of relationship between the intellectual and the patron: mutual respect. Antigonus offered patronage to the scholar for his own intellectual merits, which were considered as prestigious as the king’s position itself. Yet this royal invitation has a very practical aim: Zeno will be Antigonus’ teacher, and so the teacher of the Macedonians, because if the king is virtuous, the subjects will follow his example. Zeno’s role at the court as envisaged by Antigonus differs markedly from that of Eratosthenes sending a purely theoretical mathematical proof to his king, which was hardly useful for improving one’s kingdom, even if Eratosthenes too, most likely, served as a royal tutor.⁹¹

Supporting science and scholarship: Convenient political business – up to a point

Although the evidence is not definitive and is difficult to interpret, some patterns emerge. First, some common practices and trends among the Hellenistic kingdoms are evident. The Hellenistic rulers recruited intellectuals, especially philosophers and preferably for educational purposes. Antigonos Gonatas tried to invite Zeno, who declined the offer for himself but sent his pupils. Similarly, Ptolemy I invited two heavyweights, the poet Philitas of Cos (*Suda* φ 332) and the peripatetic Strato of Lampsacus (D.L. 5.58), to become teachers of his son, the future Ptolemy II (born in 309 BCE),⁹² while Demetrius of Phalerum also worked at the Ptolemaic court, but as a counsellor.⁹³ The Seleucids, too, had philosophers at their court. Using intellectuals to provide suitable education to future kings became a standard practice that continued into the Roman Empire. Hellenistic kings also hired physicians, attested among the Ptolemies, the Seleucids, the Antigonids and the Attalids. Royal doctors and royal tutors, then, seem to be a standard presence at the Hellenistic courts and remained so in the Roman Empire as well. Doctors and teachers furthermore received special benefits, at least in Egypt, where Ptolemy II granted exemption from the salt tax to some professional categories such as teachers, athletic coaches, artists of Dionysus and victors at the Alexandrian games (*P.Hal.* 1, ll. 260–265, ca. 256 BCE); doctors, too, were tax-exempted in Egypt.⁹⁴ At Rome, physicians and teachers received similar privileges. Julius Caesar gave citizenship to physicians and teachers of the liberal arts (Suet. *Iul.* 42.1) and Augustus granted tax exemptions to doctors out of gratitude to his physician Antonius Musa, who himself was promoted to the equestrian class (Dio Cass. 53.30.3).⁹⁵

The Ptolemies, on the other hand, were particularly active in promoting scholarship, with the result that scientific and technical knowledge flourished under their rule. They funded research institutions such as the Library, providing scholars with funds and the necessary tools (i.e. books) for carrying out their research (direct patronage); they also supplied physicians (Herophilus and possibly Erasistratus) with bodies (dead or alive) for the purposes of dissection (indirect patronage). Despite the gaps in our evidence, the Ptolemies seem indeed to stand out for their scientific patronage, both because they were the first to embark on such a project, and because they did so to a far greater extent than the other Hellenistic rulers. Only the Attalids seem to have attempted real competition, though limited to scholarship. We do not know of any cutting-edge anatomical research carried out in Pergamum, and the same applies to pure mathematics and astronomy – only the engineer Biton is connected with the Attalids, but his research was very much goal-oriented.

The question thus arising is why the Ptolemies adopted this policy. They did not inherit any tradition of patronage of non-utilitarian disciplines from their predecessors, the Egyptian pharaohs. In the field of medicine, pre-Ptolemaic Egypt had a strict professional hierarchy of physicians that culminated in the position of royal physician, for whom the specific title of ‘physician of the king’ had been

created. Other titles are also attested, among which are ‘chief of the physicians of the king’ and ‘inspector of the physicians of the king’.⁹⁶ Similarly, Egyptian scribes were part of the state bureaucracy and civil servants.⁹⁷ Physicians and scribes of ancient Egypt were thus court officials, closer to what we have seen in the Seleucid court than at Alexandria. On the other hand, Lang’s suggestion that the Alexandrian Library was ‘arguably itself an echo of the *pr ‘nh* (house of life), the scriptorium-repository commonly attached to Egyptian sanctuaries’,⁹⁸ is not supported by the available evidence. The fact of the Alexandrian Library being part of the royal palaces makes it a completely different institution from the temple libraries of Egypt. Rather, in a very Hellenocentric fashion, the Ptolemies seem to have pioneered a peculiar version of the Greek great philosophical schools, especially the Peripatos. Yet they did it not (or not only) because of their love of knowledge. Their patronage of science and scholarship seems rather another way of promoting themselves among other concurrent kingdoms born out of Alexander’s conquests.

In the long struggle to impose themselves as the true heirs of Alexander, the claim to Greekness was of paramount importance to the Ptolemies. Attracting intellectuals to one’s court was one way to prove these kings’ claim to be both Greek and the legitimate heirs of Alexander’s empire. Not only because these intellectuals were Greek or at least the result of Greek *paideia*, but also because theoretical thinking was a defining element of Greek identity, especially after the flourishing of philosophy in Athens. The Macedonian royal house, in fact, first promoted court patronage. Archelaus, king of Macedonia from 413 to 399 BCE, invited intellectuals like Euripides, Agathon and the painter Zeuxis to his court. Alexander himself had shown an appreciation for culture, scholarship and science, not least due to his closeness to Aristotle. As the Ptolemies fought for the body of Alexander (and ultimately got it, as Strabo 17.1.8 tells us) with the other Hellenistic kings, so they seem also to have fought to reincarnate Alexander’s mind and intellectual project. Fostering scholarship and research might have been seen as imperative to demonstrate their Greekness and so their claim to Alexander’s inheritance. The Ptolemies thus started using culture and intellectual pursuits to assert themselves. When the other Hellenistic kings realised that the fight for supremacy included the cultural arena, they tried to catch up with libraries, and the recruitment of intellectuals of their own. Even so, the Ptolemies still excelled at this enterprise; for example, mathematics and research-oriented medicine remained firmly anchored in Alexandria. Ptolemaic patronage nonetheless appears self-serving rather than ‘enlightened’, even if it eventually left an enduring legacy in science and scholarship.

This policy, however, did not last long and around 150–100 BCE Ptolemaic patronage declined, starting with the Library. According to *P.Oxy.* 1241, a spearman by the name of Cydas took over after Aristarchus. The last, secure mention of a head librarian comes from a dedicatory statue (*OGIS* 172, ca. 88 BCE) in honour of Onesandrus, son of Nausicrates and priest of Ptolemy IX (88–81 BCE), who is expressly said to be in charge of the Great Library (τεταγμένον δὲ | [ἐπὶ τῆς ἐν Α]λεξανδρείαι μεγάλης βιβλιοθήκης) but for whom no evidence of any scholarly activity exists.⁹⁹ Already around 150 BCE the Museum might have been taken care

of by an administrator rather than a scholar: an inscription from Delos (*I.Delos* 1525 = *OGIS* 104, ca. middle of the second century BCE) celebrates Chrysermus, as ἐπὶ τῶν ἰατρῶν ('in charge of the doctors' [or of medical tax?]) and ἐπιστάτης τοῦ Μουσείου ('supervisor of the Museum').

A general decrease in scholarship and scientific research also occurred in that period. The decline of the Library started as a consequence of the dynastic crisis in the middle of the second century BCE. After the death of Ptolemy VI Philometor in 145 BCE, his brother Ptolemy Physcon killed the son of Philometor (who may have briefly been king as Ptolemy VII) and became king as Ptolemy VIII Euergetes II,¹⁰⁰ exiling intellectuals tied to Ptolemy VI. Athenaeus (4.184b–c) remarks that under Ptolemy VIII many intellectuals left Alexandria and settled in islands and cities of the Mediterranean, and that this intellectual diaspora spread Alexandrian culture throughout the Mediterranean. Still, Didymus, Trypho and Theo continued the philological activity at Alexandria during the first century BCE and the first century CE. By collecting and organising the work done by the previous generation of philologists, these scholars had the great merit of saving much of the work done by their predecessors. Yet their scholarship was hardly ground-breaking or original. Similarly, progress in anatomical discovery seems to have stopped even earlier, by 250 BCE.¹⁰¹ The practice of vivisection, if it ever happened, was certainly completely discontinued; human dissection was also severely restricted, until it too disappeared.¹⁰² The empirical school, founded by Philinus of Cos (ca. 250 BCE) but especially strong in the second and first centuries BCE, and the Methodist school, which started in the first century BCE, were both against experiments on humans, claiming that there was no need to dissect human bodies to cure well. No doubt this change in medical philosophy would have impacted on the attitude towards dissection and vivisection. Yet the end to human dissection and vivisection, and, consequently, to anatomical discoveries, seems also due to the Ptolemies, who at a certain point withdrew their patronage because of the discomfort caused by the practice.¹⁰³ Alexandria then became a place where skeletons and not living bodies were used to learn anatomy,¹⁰⁴ and a place of pharmacology and Hippocratic exegesis.¹⁰⁵ Apollonius of Citium and Dioscurides Phacas, working in the first century BCE, are mostly known for their work as Hippocratic scholars. Both of them had connections with the Ptolemaic court. Dioscurides, whose most famous work was a lexicon on Hippocrates, was a counsellor of Ptolemy XII (80–58, 55–51 BCE) and of his children Ptolemy XIII (51–47 BCE) and Cleopatra VII (51–30 BCE);¹⁰⁶ Apollonius, too, dedicated his work on the Hippocratic treatise *On Joints*¹⁰⁷ to Ptolemy XII or his brother in Cyprus:

O king Ptolemy, I see that you are a friend of the art of medicine (φιλάτρος διακείμενόν σε), while you yourself see that we gladly accomplish your orders, I thought that it would be good that, among the inventions of the divine Hippocrates who wrote about the instruments to help [sick] human beings, I take up those written by him regarding dislocations. I necessarily also add those regarding the settling of the shoulder, which you ordered me to share with you at this moment

(Ap. Cit. *In Hipp. Art.*, *CMG* xi.1.1, p. 10.1–8).¹⁰⁸

The king was not only keen on medicine but specifically ordered a scholar to prepare for him a commentary on a very specific topic. This shift from pure research to scholarship on (past) research is in my view part of a larger phenomenon, in which the Ptolemies' interest in supporting active research declined. Scholarship on past scientific achievements reflects a conservative attitude towards knowledge, especially when it is focused on sciences such as medicine, which should look forward rather than backward. Scholarship (on both literary and medical texts) is by nature less bold and less dangerous than active research. The other Hellenistic kings had always been fond of scholars (and poets) but less enthusiastic of active scientists such as research-physicians, mathematicians or astronomers; the Ptolemies were now aligning themselves with them. Indeed, this time king Ptolemy is called a 'friend of medicine' (φιλάτρος), the only science that had always been popular at Hellenistic courts for its practical value; φιλάτρος as a laudatory title fits the new trend of Ptolemaic patronage, which had changed considerably compared to when Philo called his kings φιλόδοξοι and φιλότεχνοι.¹⁰⁹ That Alexandria was no longer the centre of innovation and science is testified by the fact that the astronomer Hipparchus, one of the most important scientists of the second century BCE who hailed from Bithynia, never settled in Alexandria (only one observation of his was made in Egypt's capital) but rather worked in Rhodes, the location of most of his observations.¹¹⁰

Conclusions

This overview highlighted two phases in the Hellenistic patronage of science and scholarship. A first phase (third–second centuries BCE) saw the development of high-level scholarship and research in medicine and mathematics supported by the Ptolemies. The other courts seem to follow their example, especially the Attalids, whom several ancient authors (e.g. Vitruvius, Galen, Pliny) compare to the Ptolemies for their thirst of books and their attempt to rival the Alexandrian library. The other dynasties, however, mainly support 'useful' intellectuals, especially physicians, philosophers hired to educate the royal house, or ethnographers who help the king to know his territories. This is especially evident with the Seleucids, who do not seem to have been eager to patronise pure research,¹¹¹ but who bestowed extraordinary importance to their royal physicians,¹¹² even giving them important diplomatic and political roles.¹¹³ Royal physicians were a constant presence in Hellenistic courts and were normally good practitioners, but none of them founded a school or was considered a real scientist of renown for anatomical discoveries. Herophilus, the most famous 'research-physician', was not a court doctor, and this was most likely the case for Erasistratus as well. The most research-oriented among the court doctors was Andreas of Carystus, not surprisingly at the Ptolemaic court, but his interest was in curing (aside from his instrument for treating fractures, he wrote on pharmacology) rather than anatomical discoveries and experiments. The court doctors of the Hellenistic kingdom were concerned with applied medicine, of greater use to the kings than experimental (and potentially problematic) research.¹¹⁴

The pre-eminence of the Ptolemies over the Seleucids, Antigonids and Attalids (albeit with some rivalry with the latter) did not last long. A second phase, since the middle of the second century BCE (or even earlier with medicine), saw the Ptolemies supporting scholarship on literary and medical authors rather than encouraging groundbreaking novel research. Their enlightened patronage lasted only for as long as the Hellenistic kingdoms still struggled for stability and esteem. Once these kingdoms were on more solid footing, their rulers became less interested in supporting original research, especially when it might be considered morally questionable. Greekness and alignment with the achievements of Greek culture became less important than strong administration and dynastic stability.¹¹⁵

The most lasting forms of patronage in the Hellenistic kingdoms aimed at protecting intellectuals that were of some practical use to the court, such as royal tutors and royal physicians. The personal link between king and intellectual was often designated by the title of ‘friend’, both in Hellenistic courts and at Rome. Indeed, Demetrius of Phalerum was among the friends of Ptolemy I (Plut. *de exil.* 601) and the architect Sostratus of Cnidus (early third century BCE) was a φίλος of Ptolemy III (Strabo 17.1.6).¹¹⁶ As far as our evidence goes, however, not many scholars or intellectuals under the Ptolemies could claim this title.¹¹⁷ On the contrary, several doctors in the Seleucid kingdom and later on in the Roman Empire prided themselves on being ‘friends’ of the monarch.¹¹⁸ Although friendship may involve a bond or an emotional link between two individuals, it becomes a risky term when the relationship is professional: φίλια/*amicitia* indicates gratitude to but also dependency on the ruler. The honour of being a friend of a monarch could potentially deprive scholars and scientists of their freedom as intellectuals.

While our information remains incomplete and anecdotal, it suggests that, during the Hellenistic period, science disconnected from practical application was not promoted by rulers unless of use in establishing esteem among competing kingdoms. Patronage of the pure sciences only lasted until such rulers had set their dynasties on a secure footing and had less need of prestige to compete with the other contenders for being the true heirs of Alexander. Even the most enlightened kings, the Ptolemies, reverted to supporting only unproblematic and practically useful intellectuals such as doctors, less-than-original scholars and educators. It is tempting to posit this trend as the reason why Roman emperors never supported science per se: by the time of its empire, Rome’s supremacy was already firmly established over the whole Mediterranean world, so that the emperors had no need to be involved in enlightened (and potentially problematic) patronage.

Notes

I would like to thank the anonymous referee for precious comments and suggestions. All translations are mine unless otherwise indicated.

- 1 On Alexandrian science, see Fraser 1972 (I):336–446 (a survey) and Russo 2004. On Alexandrian scholarship, see Fraser 1972 (I):447–79 (a survey) and Pfeiffer 1968: 87–233. More specific studies will be quoted in what follows.
- 2 See Longrigg 1988; on Herophilus, see Von Staden 1989; on Erasistratus, Garofalo 1988.

- 3 The notion that Euclid was at Alexandria under Ptolemy I derives from the famous anecdote in Proclus (*In Eucl.* 1.68.10–17 Friedlein) of King Ptolemy asking Euclid whether there was a shorter path to learn mathematics than the *Elements* (and Euclid's answer that there were no royal roads to mathematics). The more reliable Pappus (*Synt.* 7.35, II p. 678.10–12 Hultsch), on the other hand, tells that Apollonius of Perga spent a long time with the pupils of Euclid at Alexandria; this means that there was a Euclidean school at Alexandria, but not necessarily that Euclid lived there; see Acerbi 2007: 181–83.
- 4 As a mathematician, Eratosthenes wrote *On Means* (on the theory of proportion) and worked on prime numbers. He famously calculated the circumference of the earth as of 252,000 stadia (ca. 45,460 km) with a very good approximation (the actual value is 40,008 km). Cf. Fraser 1972 (I):409–15.
- 5 Cf. Fraser 1972 (I):415–22.
- 6 The prefaces of his treatises are addressed to Eratosthenes (*Method*) and Dositheus (several of them); in the *Praefatio* of the *Squaring of the Parabola*, dedicated to Dositheus, Archimedes also mentions Conon as a previous addressee (substituted by Dositheus when Conon died). Cf. Fraser 1972 (I):399–409.
- 7 See Lonie 1973:136–39; Von Staden 1996:91–95; Von Staden 1997:201–203.
- 8 A good survey on the 'political' role of poetry within the Hellenistic courts is in Strootman 2010. Starting from his premises, I will here focus more on 'scientific' and 'scholarly' research rather than poetry, ideally completing and continuing some of the points made in passing by Strootman.
- 9 On the Library of Alexandria, see Pfeiffer 1968:98–104; Fraser 1972 (I):305–12; 320–35; Bagnall 2002 (the best critical discussion on the Library, in my opinion); Johnstone 2014 (to be approached with many caveats, see below, n. 12 and 19).
- 10 Several plaques remembering the foundation of the temple (not of the library) by Ptolemy III have been found; see Fraser 1972 (I):27–28.
- 11 This is the standard list; see e.g. Fraser 1972 (I):330–33. However, both the order and dating of each librarian are very much debated; for a slightly different (and more correct, in my opinion) ordering, in which Apollonius Eidographos preceded Aristophanes of Byzantium, see Eichgrün 1961:15–35. The main sources for the head librarians are *P.Oxy.* 1241 (second century CE), the entries from the *Suda* (10th century) on the lives of these scholars (mostly derived from the *Onomatologos* by Hesychius of Miletus) and John Tzetzes' *Prolegomena* to his commentaries to Aristophanes (12th century; it is preserved in two versions both by Tzetzes: *Prooemium I* and *II*, edited by Koster 1975:22–31 and 31–38). Notwithstanding the questions that have been raised about *P.Oxy.* 1241 (most recently by Murray 2012), its testimony cannot simply be dismissed; in fact, the *Suda* and Tzetzes report similar data, though it is hard to combine them into a coherent reconstruction.
- 12 The strict connection between the scholarly work of these poets and their own poems (where they hint at and play with variant readings and textual problems in Homer) has been shown by Rengakos 1993, Rengakos 1994, and, more recently and in English, Rengakos 2001 and Rengakos 2002. This makes Johnstone's claim (2014:369–70) that Callimachus and Apollonius simply work with 'their collection' of books untenable.
- 13 See Pfeiffer 1968:203–208.
- 14 See Schironi 2018.
- 15 See Matthaïos 1999.
- 16 All the lexica are lost except that of Erotian (first century CE). On Hippocratic lexicography, see Von Staden 1992.
- 17 In the passage referred to, Galen only speaks of a king Ptolemy. However, just before (*Comm. Hipp. Epidem.* 3.603 = *CMG* V 10.2.1, 77.18), he clarifies that the king is Ptolemy Euergetes.
- 18 *CMG* V 10.2.1, 79.23–24: οὕτως ἐσπούδαζε περὶ τὴν <ἀπάντων> τῶν παλαιῶν βιβλίων κτῆσιν ὁ Πτολεμαῖος ἐκεῖνος. See also Joseph. *AJ* 12.12–13. We know that, during the reign of the Ptolemies, the collection was huge, even if the numbers given by Tzetzes

(*Prooem.* II.6–11 Koster), that is, 42,800 books in the external library (the one in the Serapeum), and 490,000 books in the Royal Library, are probably excessive; see Bagnall 2002:351–56.

- 19 Johnstone 2014 proposes to discard the unreliable late evidence for the Library of Alexandria and use only ‘more secure primary sources’ (i.e. inscriptions, Hellenistic authors) to conclude (388–89) that the Library was not founded before the middle of second century BCE. While he correctly interprets the second century evidence (see below, pp. 16–17 and n. 99), Johnstone chooses to ignore ‘real’ evidence available for the earlier period. We can share doubts about *P.Oxy.* 1241 (yet see above, n. 11); however, the scholia to Homer, Aristophanes, Pindar and other literary authors, as well as papyri with fragments of ancient commentaries and editions, do prove that Zenodotus, Aristophanes and Aristarchus, to name just a few, did extensive work on Greek literature that would have only been possible in an extremely rich library. Even though these sources are late according to Johnstone’s criteria, scholarly consensus considers them reliable, so that Johnstone’s complete disregard is questionable.
- 20 Cf. Schironi 2013.
- 21 Cf. Fraser 1972 (I):330.
- 22 In the late nineteenth century the location of the Library was identified with remnants of some rooms within the temple of Athena. Such identification, however, has recently been challenged; see Coqueugniot 2013.
- 23 Cf. Bowie 2013:240.
- 24 On Crates and the other scholars of Pergamum, see Pfeiffer 1968:234–51; Broggiato 2001 and Broggiato 2014.
- 25 Aristotle’s library was inherited by Theophrastus, who then gave it to Neleus, who left it to his heirs. Strabo’s testimony and the destiny of Aristotle’s library have been much discussed; see e.g. Moraux 1973:3–31; Barnes 1997.
- 26 On the reliability of this story, see Barnes 1997:8. Interestingly, both Galen and Strabo use the same word to describe the keenness of the Ptolemies and the Attalids in acquiring books: *σπουδάζειν/σπουδή*.
- 27 The four cities were: Antioch, Seleucia Pieria, Apamea and Laodicea. The Seleucid kingdom also had an itinerant court, with several royal residences at Antioch, Seleucia-on-Tigris, Ecbatana, Susa, Sardis (see Sherwin-White and Kuhrt 1993:38, 135–36); the main capitals, however, were Antioch in Syria and Seleucia-on-Tigris in Mesopotamia.
- 28 See Downey 1961:92–94; Grainger 1997:89; Austin 2001:95.
- 29 Though writing in the sixth century CE, Malalas was a native of Antioch and lived there for a long time. He is considered a reasonably reliable source for this city; see Downey 1961:37–40.
- 30 Cf. Downey 1961:132–33, 185; Austin 2001:95. A Timoxenus *bibliophylax* at Sardis is mentioned in an inscription from Didyma of ca. 254/3 BCE; see Welles 1934:101; Austin 2006 # 173a. Even if Tzetzes uses *bibliophylax* to indicate the head librarian at Alexandria (*Prooem.* 1.4 Koster), in this case Timoxenus was most likely the keeper of the royal archive at Sardis; cf. Welles 1934:321–22; Grainger 1997:121 and 800.
- 31 Callimachus never became head librarian but worked there as a scholar; among his most important contributions are the *Pinakes*, a sort of bio-bibliographical catalogue of the authors preserved in the Library; see Pfeiffer 1968:123–40.
- 32 The lemma of *Suda* α 3936 is *Ἀριστόνυμος*, but these words belong to a previous entry on Aristophanes of Byzantium (*Suda* α 3933); see Adler, *ad Suda* α 3936; cf. also Pfeiffer 1968:172.
- 33 On the other hand, it is uncertain whether Apollodorus, after leaving Alexandria, ever worked at Pergamum as is generally assumed (see e.g. Pfeiffer 1968:253–54; Hansen 1971:422–23). Apollodorus dedicated his *Chronica* to Attalus II (159–138 BCE) (*GGM* I, p. 197.45–49), but there is no clear evidence of his working there. After leaving Alexandria, he may have moved back to Athens; see Münzel-Schwartz 1894:2856.

- 34 In Johannes Lydus (*Mens.* 1.28) this story becomes a competition between the two courts and the two leading scholars of the time (Aristarchus and Crates) to please Rome: king Ptolemy (i.e. Ptolemy VI, 180–145 BCE), advised by Aristarchus, sent papyrus to Rome, and king Attalus (i.e. Attalus II, 159–138 BCE) advised by Crates, sent parchment; the latter won the favour of the Romans.
- 35 Galen *In Hipp. Nat. Hom.* I 44 = *CMG* V.9.1, p. 55.6–10; *In Hipp. Nat. Hom.* II, *praef.* = *CMG* V.9.1, p. 57.12–16; Vitruvius *Arch.* 7 *praef.* 4. Yet Vitruvius seems to imply that Ptolemy decided to found a library after Attalus, which is hardly credible. Without mentioning the Attalids, Seneca in *De tranq. anim.* 9.4–5 rather disparagingly recalls the thirst for books of the Alexandrian kings, regarding it as display rather than due to any real interest in culture.
- 36 *Vita* 1, p. 8.19–24 Martin: ‘He made a recension of the *Odyssey* (τὴν Ὀδύσσειαν δὲ διώρθωσε) and this recension is called ‘Aratean’ just like the Aristarchean and the Aristophanean [recensions]. Some say that he went to Syria and lived with Antiochus and was deemed worthy by him [i.e. Antiochus] to prepare a recension of the *Iliad*, because [the poem] had been corrupted by many’. Cf. also *Vita* 3, p. 16.5–23 Martin; *Achill. Comm. Fr.*, p. 78.8–11 Maas.
- 37 Cf. Pfeiffer 1968:107 and 120; Grainger 1997:81. From *Vita* 1 (see above, n. 36) it seems that Aratus worked on the *Odyssey* at Pella and then moved to Antioch to work on the *Iliad*; however, since the wording of the text is ambiguous, it could also be understood as that Aratus was invited by Antiochus to do an edition of Homer (both the *Iliad* and the *Odyssey*) but completed only that of the *Odyssey*. In this case, he was invited to the court of the Seleucids only on the basis of his fame as a poet. Yet the invitation of Antiochus I sounds much more plausible if Aratus had already proved himself a good scholar with his edition of the *Odyssey* at Pella.
- 38 Cf. Fraser 1972 (I):315.
- 39 Cf. Fraser 1972 (I):114, 448, 736; Hölbl 2001:26.
- 40 Edited by Gallo 1980:23–166.
- 41 Cf. also frs. 9, 10, 20, 27, on which see Gallo 1980:115–16, 118, 143, 152, 154–56.
- 42 Cf. Gallo 1980:38–39; Grainger 1997:113; Gera 1999.
- 43 Cf. Grainger 1997:87.
- 44 Cf. Grainger 1997:112. On philosophers at the Seleucid court, see also Austin 2001:98–100.
- 45 Tellingly, Poseidonius of Apamea (ca. 135–51 BCE), though native of the Seleucid Empire, left Syria and went first to Athens and then to Rhodes, and never returned to his native land.
- 46 On the Museum, see Pfeiffer 1968:96–98, and Fraser 1972 (I):312–19.
- 47 Strabo’s stay in Alexandria is probably connected with the trip he took in Egypt with his friend Aelius Gallus, when the latter became *praefectus Egypti* in 25 BCE (Strabo 2.5.12).
- 48 See Kuch 1965, esp. 28–54 and 125–27.
- 49 For a list of physicians active in Ptolemaic Egypt and especially at Alexandria, see Peremans-Van’t Dack 1968:221–32.
- 50 For a list of scientists active in Ptolemaic Egypt and especially at Alexandria, see Peremans-Van’t Dack 1968:215–21. The presence of Aristarchus of Samos at the court of Ptolemy II (as claimed by Strootman 2010:35) is possible but not certain at all; see Fraser 1972 (I):396–97.
- 51 See Von Staden 1989:26–30, 458–60 (with reference to Herophilus) and Acerbi 2007:183–94 (on Euclid and other mathematicians).
- 52 See Von Staden 1998.
- 53 See Jacob 1998:30–34, and Boehm 2007.
- 54 *In Hipp. Nat. Hom.* II 6 = *CMG* V.9.1 p. 69.16–17; *Ut. Diss.* 5 = *CMG* V.2.1 p. 42. 26–29.

- 55 *Plac. Hp. et Pl.* 7 = *CMG* V.4.1.2, pp. 440.20–442.13. Cf. also *Us. Part.* 8.13, vol. 2, p. 488.14–18 Helmreich.
- 56 The question whether Herophilus and Erasistratus practiced vivisection (in addition to dissection) is much debated. For example, Scarborough 1976 denies vivisection, but Longrigg 1988:460–62, Lloyd 1979:165 and n. 206, and Von Staden 1989:138–53 trust Celsus' testimony. See also Lang 2013:254–58 (who takes for granted that vivisection was also practised). It must be noted that dissection of corpses might have been practised even before the Hellenistic period by some Hippocratic doctors; however, the practice was controversial and so most often limited to animals, as for example with Aristotle; see Lloyd 1979:156–69.
- 57 So, among others, Lloyd 1975:174–75, and Longrigg 1988:472–74. On the other hand, Von Staden 1989: 142 remains uncommitted about Erasistratus' presence at Alexandria.
- 58 So Fraser 1969; cf. also Garofalo 1988:18 n. 131.
- 59 Von Staden 1989:28. On the connection between Hellenistic medicine and imperialism, see Flemming 2003, who also discusses the question of dissection and vivisection from an imperialistic point of view (Flemming 2003:451–57).
- 60 Cf. Marasco 1996:456–59.
- 61 It is interesting to note that the poet Nicander, author of *Theriaca* and *Alexipharmaca* (poems on poisons and antidotes), has been connected with the court of Pergamum under Attalus III; see Pasquali 1913 and especially Scarborough 2008, currently the best treatment of Attalus III's scientific activity.
- 62 On Hellenistic court physicians, see the good survey of Marasco 1996. On royal doctors at the Seleucid court in particular, see Matrocinque 1995; Marasco 1996:438–47; Austin 2001:97–98.
- 63 The anecdote is transmitted by many sources (listed and discussed in Garofalo 1988:19 n. 137); among which Plut. *Demetr.* 38 and *Suda.* ε 2896 (= fr. 1A Garofalo), where the healing is attributed to Erasistratus. Pliny links the anecdote once to Erasistratus (*NH* 29.5 = fr. 8 Garofalo) and another time to Cleombrotus (*NH* 7.123). The name switch proves that the attribution was doubtful; given the celebrity of Erasistratus, it seems more likely that Erasistratus at some point substituted his father; so Garofalo 1988:19–20; Matrocinque 1995:143–46; Marasco 1996:439–41; cf. also Grainger 1997:89 and 99; Austin 2001:97.
- 64 Cf. Garofalo 1988:21 and 159.
- 65 Cf. Marasco 1996:443–44. In both passages referred to in n. 63, Pliny adds that the doctor (either Erasistratus or Cleombrotus) was rewarded by a certain king Ptolemy. It is impossible to establish which Ptolemy is meant here; see Fraser 1969:527.
- 66 Fraser 1969, for example, suggests that Erasistratus was the doctor of the anecdote and that he worked at the Seleucid court, not at Alexandria. His very good discussion of all the evidence available and the problems it poses is definitely a caveat against being too certain of anything about Erasistratus.
- 67 Cf. Marasco 1996:441–42; Grainger 1997:106.
- 68 Berenice was the daughter of Ptolemy II.
- 69 Cf. Marasco 1996:444; Grainger 1997:81.
- 70 Apollophanes is also remembered in a couple of inscriptions; in one of them (Herzog 1983:64 = *SEG* 33.673, 220–187 BCE) Antiochus III praises him for his services to Seleucus II (246–225 BCE) and Seleucus III (225–222 BCE). Cf. Matrocinque 1995:147–49; Marasco 1996:444–46; Grainger 1997:80–81; Austin 2006 # 182.
- 71 Cf. Marasco 1996:446–47; Grainger 1997:100.
- 72 Cf. Marasco 1996:437–38.
- 73 Cf. Marasco 1996:447–48.
- 74 On court physicians at Alexandria, see Fraser 1972 (I):369–72; Marasco 1996:448–56.
- 75 Cf. Herzog 1983:61–64; Marasco 1996:449–51.

- 76 Cf. Von Staden 1989:472–77; Marasco 1996:451–52.
- 77 Cf. Grainger 1997:103.
- 78 He was also in charge of Bactria and Sogdiana at a certain point (Strabo 2.1.17). Cf. Grainger 1997:111.
- 79 Demodamas also proposed honours for Antiochus I at Miletus (*OGIS* 213, 299 BCE). Cf. Grainger 1997:86; Austin 2006 # 51 n. 1.
- 80 Cf. Grainger 1997:86.
- 81 On Seleucid ethnographers, see Kosmin 2013.
- 82 Cf. Grainger 1997:91.
- 83 Athenaeus mentions Mnesiptolemus' account of the deeds of a Seleucus, who can be either Seleucus II (246–225 BCE) or Seleucus III (225–222 BCE), respectively the father and brother of Antiochus III (222–187 BCE). Cf. also Grainger 1997:107.
- 84 Cf. Heath 1921 (2):128–30. Books 4–7 of the *Conics* are instead dedicated to a certain Attalus; cf. Heath 1921 (2):130–32. It has been claimed (e.g., Heath 1921 (2):126; Hansen 1971:406) that this Attalus was king Attalus I, but, in fact, there is no evidence that this is the case, since Apollonius never addresses him with any royal title. So also Fraser 1972 (I):417–18; Toomer 1990:xii.
- 85 See Fraser 1972 (I):331–32; but cf. also Eichgrün 1961:24–31.
- 86 On the epigram, see Pfeiffer 1968:155; Fraser 1972 (I):410–13. For the mathematical content of this proof, see Heath 1921(1):244–60.
- 87 An even more 'flattering' address to a ruler is Archimedes' address to Gelon in the *Arenarius* (vol. 2, 134.15–16 Mugler): '... I will attempt to prove to you through geometrical demonstrations, which you will follow, that ...'. But the case of Archimedes (287–232 BCE) is peculiar, because he came from a privileged family, acquainted with, if not related to, Hieron II (275–215 BCE) and his son Gelon (240–216 BCE); so, the tone might also be due to a peer attitude towards the king due to family connections rather than flattery. On mathematical prefaces, see Vitrac 2008.
- 88 Fraser 1972 (I):413.
- 89 On this epigram, cf. Fraser 1972 (I):571.
- 90 Zeno's courteous reply is reported in D.L. 7.8.
- 91 Probably of Ptolemy IV; see Pfeiffer 1968:154–55.
- 92 Cf. Fraser 1972 (II):308–309, 322, 427–28 and 556.
- 93 He was not 'in charge of the royal library' as reported by the letter of Aristetas (9) and Joseph. *AJ* 12.12; cf. Pfeiffer 1968:99–101.
- 94 See Clarysse-Thompson 2006:52–59, 124–25, 125–33 (teachers), 162–64 (doctors); Lang 2013:238 n. 122. In Ptolemaic Egypt there was also the *iatrikon*, a medical tax whose revenues were paid to physicians. That tax, however, was scrapped around the early or middle second century BCE (it is attested in papyri between 310 and 175 BCE); see Lang 2013:232–39. I could not find any evidence for tax exemptions to doctors and teachers in the Seleucid kingdom or any other Hellenistic kingdom.
- 95 On privileges for intellectuals in the Roman Empire, see Bowersock 1969:30–42, and Nutton 1971.
- 96 See Ghalioungui 1983:42–43; Nunn 1996:117–18; Halioua-Ziskind 2005:16–17.
- 97 See Lichtheim 1976:167.
- 98 Lang 2013:248.
- 99 See also Johnstone 2014:366–67, who, however, takes it as a proof that all the head librarians were officers – thus ignoring the scholars who were head librarians and royal tutors until 145 BCE, and who are attested beyond *P.Oxy.* 1241.
- 100 Cf. Hölbl 2001:194–95.
- 101 Cf. Nutton 2013:141.
- 102 Galen, for example, practiced only dissection on animals; see Lloyd 1979:165–67.
- 103 On the different causes for the end of vivisection and dissection in Alexandria, see Von Staden 1975:185–92; Von Staden 1982:81–86; Longrigg 1988:483–84; Von Staden 1989:148–51, 445–46.

- 104 Rufus (ca. 100 CE?) clearly says that vivisection is not practiced (*Corp. Hum. Part. Appell.* 9–10, p. 134.9–14 Daremberg-Ruelle). Galen’s description of Alexandria as a place where students of medicine could learn about the human body using human skeletons rather than simply reading books (*Anat. Adm.* I, 2.220.11–17 K.) strongly suggests that *only* skeletons and not corpses were used for anatomical studies; see Harris 1973:234.
- 105 On these developments in Alexandrian medicine, see Von Staden 1982:88–93.
- 106 See Von Staden 1989:519–22.
- 107 On this commentary/treatise, see Roselli 1998.
- 108 The king is addressed at the openings of all three books of this treatise. In the proem of Book 2, Apollonius again underscores the king’s interest in medicine (Ap. Cit. *In Hipp. Art.*, *CMG* xi.1.1, p. 38.11: φίλιατροῦντι σοι).
- 109 According to Von Staden 1982:91, ‘[t]his similar but not identical movement of two arch-rivals, Empiricists and Herophileans, from scientific research into philology, cannot be attributed to a diminution of royal patronage. On the contrary, there are indications that this development was encouraged, directly or indirectly, by at least some of the Ptolemies’. This is definitely true, but I would want to claim that the type of patronage changed; the Ptolemies did not any longer support groundbreaking (and risky) research such as anatomical experiments, but scholarship, which was learned but definitely less dangerous.
- 110 See Fraser 1972 (I):422–23.
- 111 So also Austin 2001:100–102, with many intelligent observations on the specific position of the Seleucid kingdom compared to the others. In particular, he very aptly notes that, unlike the Attalids with Pergamum and the Ptolemies with Alexandria, the Seleucids did not have a single capital to turn into the center of their patronage, even though Antioch was certainly preeminent, at least since 188 BCE after the treaty of Apamea.
- 112 As Marasco 1996:446 notes, it is telling that Euphoriou of Calcis, the other intellectual connected with the Seleucids, also showed an interest in medicine, as he composed a Hippocratic lexicon (fr. 175–176 van Groningen); according to van Groningen 1977:229, this Hippocratic lexicon is proof of the rivalry between Alexandria (where Hippocratic lexicography developed) and Antioch.
- 113 Marasco 1996:459–60 suggests that the extraordinary power given to physicians at the Seleucid court is also a continuation of the Achaemenid tradition, as physicians were also important political figures at the Persian court.
- 114 So also Marasco 1996:460–66.
- 115 For example, Sherwin-White and Kuhrt 1993:184–87 already observed that Greekness *per se* was not central to the Seleucids’ policy.
- 116 Cf. Fraser 1972 (I):102.
- 117 For a list of φίλοι (but also royal counselors with different titles) of the Ptolemies, see Peremans-Van’t Dack 1968:21–33; they also list Simmias (1968:32, # 14628), a geographer and explorer, friend of Ptolemy III; the grammarian and ethnographer Sosibius (1968:33 and 254–255, # 16885) might also have had the title of φίλος.
- 118 On the title of φίλοι, see Kortenbeutel 1941 and Herman 1980/1981; on the φίλοι in the Seleucid court, see Sherwin-White and Kuhrt 1993:132–33; Grainger 1997:805. On physicians as ‘friends of the emperor’, see Mattern 1999.

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