

Governing the Emergency: Political Organisation and Social Cohesion in a City Under Siege in Philo of Byzantium's Μηχανική Σύνταξις

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Abstract: This paper analyses Philo of Byzantium's reflections on the liveability of cities under siege, focusing on Μηχανική Σύνταξις as a key text in Hellenistic siegecraft manuals. Through an examination of the sections dedicated to defence, supply, and community management, the article proposes to interpret Philo's work as an integrated model of urban emergency governance. The resistance of the polis is outlined not only as a military problem, but also as a political, economic and social issue, based on preventive preparation, rational resource management, and civic cohesion. In dialogue with the theoretical tradition and historiographical evidence on sieges, the contribution highlights how Philo anticipates a concept of "urban resilience" in which liveability, social order, and the legitimacy of public authority are structurally interdependent elements.

Keywords: Philo of Byzantium; siege; urban liveability; supply; resilience of the polis; poliorcetics.

^{ES} Gobernar la emergencia: organización política y cohesión social en una ciudad sitiada en la Μηχανική Σύνταξις de Filón de Bizancio

Resumen: El artículo analiza la reflexión de Filón de Bizancio sobre la habitabilidad de la ciudad en condiciones de asedio, centrándose en la Μηχανική Σύνταξις como texto clave de la manualística poliorcética helenística. A través del examen de las secciones dedicadas a la defensa, el abastecimiento y la gestión de la comunidad, el artículo propone interpretar la obra de Filón como un modelo integrado de gobierno de la emergencia urbana. La resistencia de la polis se perfila no solo como un problema militar, sino como una cuestión política, económica y social, basada en la preparación preventiva, la gestión racional de los recursos y la cohesión cívica. En diálogo con la tradición teórica y con los testimonios historiográficos sobre los asedios, la contribución destaca cómo Filón se anticipa a una concepción de "resiliencia urbana" en la que la habitabilidad, el orden social y la legitimación de la autoridad pública son elementos estructuralmente interdependientes.

Palabras clave: Filón de Bizancio; asedio; habitabilidad urbana; abastecimiento; resiliencia de la polis; poliorcética.

Sumario: 1. Introduction. 2. Hunger as a weapon. 3. Supply, domestic production, and storage. 4. Social order and collective participation. 5. Care, recognition, and civic memory. 6. Conclusions. 7. Bibliography.

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1. Introduction

Investigating the liveability of a city at peace is, in itself, particularly complex due to its dependence on numerous factors.¹ Even more complex is the assessment of the quality of life in a city under siege, where talking about liveability and well-being certainly sounds like an oxymoron. In fact, however, it is a particularly compelling topic, especially with regard to the Hellenistic period. This is demonstrated by the interest in the subject shown by certain authors of manuals who, among other topics vital to the defence of a city, went to great lengths to develop useful advice for *poleis* to make them liveable and self-sufficient even in times of conflict. Indeed, the continuous recourse to war that characterised the history of the Greek world since the end of the Classical period and throughout the early Hellenistic period triggered the search for strategies of resistance and resilience that involved not only hoplites but the entire community, as a result of the evolution of warfare that saw the transfer of combat from the open field to the walls of a city.² In a sense, this situation reflects a conception already expressed by Plato in *Laws* (626a), where he suggests that what is commonly called “peace” is merely a name, since cities are by nature in a condition of perpetual, albeit informal, war with one another. In this perspective, institutions, laws, and civic organisation were ultimately conceived with an eye to war. This view helps explain the growing attention devoted in later centuries to the problem of safeguarding the *polis* and its inhabitants in times of conflict. At the heart of the issue of welfare, which was strongly influenced by contingent factors, was, among other things, the question of supply, in relation to which the participation and synergy of the community became fundamental in ensuring that all *politai* had access to food – a factor that strongly influenced their capacity for resistance. Alongside supply, other interesting factors, as we shall see, are not overlooked in the work under investigation, such as the care of the wounded, the burial of the dead, and the recognition of the value of the soldier in the field. Taken together, all these aspects pertain to the psychological sphere of the citizen, whose care in times of crisis cannot be neglected in order to ensure the continuous and adequate defence of the city. In developing their theories, authors of manuals could rely on contemporary experience, but it may be assumed that they depended even more heavily on historiographical sources. This is especially the case with reference to the western area, where the art of besieging cities by the Carthaginians had already established itself since the late 5th century BC. It should be added that it is precisely since the time of Philo, i.e. since the creation of the first manuals on siege warfare and the management of war, that in collective imagination the Greek city increasingly took the form of a walled city. Walls became the most important urban symbol, the most visible monument of the city, the main element of the urban landscape and, in some cases, of Hellenistic royalty; they conveyed new meanings and significance to the *polis*, now identified with the *asty* and its urban structures. In this context, in a society that was still warlike and militarily structured, siege took on not only a military significance but also a social one. It was not just a war between armies: siege called into question the survival of all the social components of the *polis*.³

As is well known, military manuals became established in the late 4th century BC, at a time when siege warfare was a constant feature of inter-state relations, which in turn encouraged the development of a wealth of works on military art aimed at systematising techniques for attacking and defending cities.⁴ As mentioned, siege warfare was not only a military problem; it radically challenged the *polis* as a political, social, and economic entity. Prolonged blockades interrupted supply flows, suspended productive and cultural activities, and accentuated internal tensions, thus

¹ For an examination of these factors in relation to demographic structures and residential patterns, see Caliò 2013, 19–22.

² On this topic, see most recently the analysis in Santagati 2021, with earlier bibliography.

³ For a discussion of the transformation of the *polis* into a walled city, see Caliò 2021.

⁴ Over the last two decades in particular, the theme of war in the ancient world has assumed a central role in historiographical debate, thereby stimulating an extensive and diversified scholarly production. Among the countless studies on the subject, we limit ourselves here to citing Bradford 2006; Sabin – Van Wees – Whitby 2007; Giacomello, Badialetti 2009; Martel 2012; Franchi – Proietti 2015; Blome 2020; Santagati 2021, with extensive previous bibliography.

exposing the community to phenomena of disintegration such as panic, crime, and sedition.⁵ In this context, the ability to resist did not depend solely on the strength of defensive structures,⁶ but also on the possibility of guaranteeing minimum conditions of liveability for the population: access to essential resources, maintenance of order, social cohesion, and psychological resilience.⁷ The siege was therefore a total crisis, in which both the military apparatus and civic structures were put to the test simultaneously.

Among the authors of manuals on siege warfare, Philo of Byzantium⁸ deserves special attention, as he devotes large parts of his *Μηχανική Σύνταξις* (probably composed in the late 3rd century BC) to the theme of the liveability of a city under siege.⁹ Active in the second half of the 3rd century BC, thus in the flourishing scientific and technical environment of the Hellenistic world, Philo worked in major centres such as Alexandria and Rhodes and was likely connected with the circle or school of the engineer Ctesibius.¹⁰ Chronologically, his activity falls between Ctesibius' and that of the Roman architect Vitruvius, who used Philo's works as a source. Although Philo does not explicitly cite his sources, which makes it difficult to accurately reconstruct the origins of his knowledge, it is nevertheless clear that his reflections draw on a substantial body of practical experience and technical traditions, transmitted in particular by earlier historiographical and mechanical works with which he must have been familiar. His presence in Alexandria—one of the foremost intellectual centres of the Hellenistic world—likely granted him access to a wide range of technical literature and scientific debates. At the same time, the influence of his own writings on later technical authors, such as Heron of Alexandria and Athenaeus Mechanicus, confirms the importance of his work within the tradition of ancient mechanics. Of the four sections of excerpts from the work that have come down to us, three are devoted to the defence of the besieged city; among these, the second section of the work, in particular, clearly highlights how the issue of well-being must be essentially addressed through two areas of interest: the ability to procure as well as rationally manage supplies so that no one, regardless of their social status, will suffer. Philo

⁵ The theme of war, as a total social fact (Bouthoul 1951; Galtung 2002, especially 940-944), in addition to having been the object of historiographical narration over the centuries (Momigliano 1966; Vial 1999; Payen 2012—particularly noteworthy in this context are Loreto 1995 and Loreto 2006, 170, which focus on the importance of historians in the military education of ancient statesmen and *strategoi*), has also provided a major stimulus for a wide variety of artistic expressions. These involved not only literary genres (Vela Tejada 2004; Hornblower 2007), but also iconographic representations (see the first six contributions in Amouretti *et alii* 2000. On visual arts and war, see Courtils 1999; Hannestad 2001; Lissarague 1983; Lissarague 1990; Lissarague 2004; Jacquemin 2005).

⁶ On fortifications of the late Classical and Hellenistic periods see, among others, Ober 1985; Tréziny 1986; Karlsson 1992; McNicoll 1997; Pimouquet Pédarros 2000; Sconfienza 2005; Fachard 2012; Coutsinas 2013; Maher 2017; Caliò – Gerogiannis – Kopsakeili 2020; Caliò 2021; Gerogiannis 2021; Santagati 2021.

⁷ In this study, the use of analytical categories developed in contemporary scholarship—such as *resilience*, *emergency governance*, and *crisis management*—does not imply attributing to ancient actors a conceptual awareness equivalent to that of the modern world. These notions are employed as interpretive tools to describe functional dynamics observable in the sources, according to a principle of heuristic analogy of historical equivalence, whereby phenomena belonging to different cultural and semantic contexts may be related when they perform comparable functions within their political and social systems. This methodological approach situates the present study within the broader historiographical debate on the use of modern analytical categories in the study of past societies, balancing the need for comparison with the risk of anachronism; accordingly, these categories are not meant to establish conceptual equivalence with ancient terminology, but rather to make analytically visible processes of adaptation, institutional responses to emergencies, and practices of crisis management. For the debate on the use of modern analytical categories in the study of past societies, see among others Bloch 1949; Skinner 1969; Loraux 1993.

⁸ On Philo of Byzantium see in particular Schöne 1893; Diels – Schramm 1920; Garlan 1974; Prager 1974; Lawrence 1979; Rance 2013; Whitehead 2016; Bellucci 2016; Santagati 2021 and 2023.

⁹ The first section of the *excerpta* focuses mainly on fortification techniques and the use of war machines; the two following sections progressively broaden the field of inquiry to address logistical, economic, and social issues, while the fourth section is the only one that was composed, *mutatis mutandis*, from the point of view of the besieger.

¹⁰ For a chronological overview of Philo, see most recently Santagati 2022, which also discusses earlier scholarship and provides a full bibliography.

appears to stand out from other manualists¹¹ for the breadth of his vision: defence is not limited to the definition of a set of technical solutions but is conceived as an overall strategy involving the entire community. The result is an urban model reorganised in response to an emergency, in which the city is conceived as a closed, self-sufficient, and rationally controlled organism. In this sense, the Μηχανική Σύνταξις can be interpreted as a crisis management plan *ante litteram*.

Far from being an isolated or self-referential elaboration, Philo's reflection is rooted both in his contemporary historical experience and in a continuous comparison with earlier historiographical and philosophical tradition; it implicitly dialogues with classical theoretical tradition, in particular with Aristotle.¹² According to the latter, the *polis* exists for the sake of living well (εὐδαιμονία), and every aspect of urban planning –from site selection to resource management– must contribute to this end. Although Aristotle does not directly address siege warfare, his conception of the city as a self-sufficient organism provides a fundamental normative framework for understanding the material and organisational needs of a *polis* in extreme conditions. In his political reflection, Aristotle clearly distinguishes between the private sphere of the citizen, represented by the *oikos*, and the public sphere of the city, which includes fortifications as an instrument for the protection of the common good and the entire *politeia*. Starting from this distinction, he identifies a series of essential requirements for the foundation of a new city, aimed at achieving the overall well-being of the civic community.

Unlike Plato,¹³ who in his models tends to favour isolated sites far from the sea in order to preserve the purity of philosophical government from external influences, Aristotle shows greater attention to the material and economic conditions of urban life. He states that the ideal city must be located taking into account both the land and the sea, in order to ensure a functional balance between defence, production, and trade.¹⁴ The *polis* must be able to maintain direct contact with the entire territory to ensure its protection; moreover, it must have easy routes for the transportation of agricultural products, wood, and all the resources that are necessary for the sustenance of the community.¹⁵ Finally, an essential element of urban well-being is the availability of water resources. The site of the city must be rich in spring water and equipped with storage systems, such as cisterns, which ensure supply even in the event of interruption of the aqueducts during a siege.¹⁶ Aristotelian urban planning is configured as a rational balance between security, economic functionality, and quality of civic life. Philo translates this vision into operational terms, showing how collective well-being is not only an ethical-political goal but also a functional condition for military resistance. In this way, he appears to accentuate the Aristotelian horizon, adapting it to the transformations of Hellenistic warfare.

2. Hunger as a weapon

One of the central themes of Μηχανική Σύνταξις is the awareness of the decisive role of hunger in siege warfare. According to historiographical sources, blocking supplies was often more

¹¹ On Hellenistic technical manuals, see the analysis in Santagati 2021 with discussion and bibliography.

¹² On philosophy and war see Calìo 2011; Calìo 2021, and the overall synthesis in Santagati 2021.

¹³ Pl. *Lg.* 4.704a-705b.

¹⁴ Arist. *Pol.* 7.1327a: τῆς δὲ πόλεως τὴν θέσιν εἰ χρὴ ποιεῖν κατ' εὐχὴν, πρὸς τε τὴν θάλατταν προσήκει κείσθαι καλῶς πρὸς τε τὴν χώραν.

¹⁵ This description seems to reflect a concrete model identifiable with the geopolitical and economic characteristics of Athens, which was endowed with a relatively extensive territory and a fortified port of primary importance as the Piraeus (see Calìo 2013). The well-being and security of the city, however, cannot be guaranteed solely by the presence of a defensive wall. Alongside a solid external fortification, Aristotle insists on the need to conceive the urban layout according to criteria that integrate utility, beauty, and defence. The arrangement of spaces should not respond exclusively to aesthetic or geometric regularity but also to strategic purposes: some areas of the polis should have an irregular layout, capable of hindering the advance and orientation of enemy troops in case of penetration, while others may follow Hippodamian principles, thus ensuring order and decorum. On this, see most recently Calìo 2021.

¹⁶ Arist. *Pol.* 7.1330b. On the use of water as a weapon in the event of a siege, see for example Hdt. 3.117.2-4 for the Persian case, and Th. 6.100.1 for the siege of Syracuse. On the latter, Santagati 2020a offers an extensive discussion of the relevant sources.

effective than direct assault in bringing a city to its knees, provoking betrayals, seditions, and ensuing surrender.¹⁷ In this regard, it is significant that in the only passage explicitly devoted to the situation of the besieged, Philo writes: κατὰ δὲ λιμὸν περιχαρὰ κώσας καὶ τόπον ἰσχυρὸν περιτειχίσας τινὰ τῇ πόλει καὶ φύλακας ἀσφαλεῖς ἐπ’ αὐτῷ κατασκευάσας, οἱ κωλύουσι μήτε κατὰ γῆν μήτε κατὰ θάλασσαν μηδὲν εἰσκομίζεσθαι.¹⁸ The expressions κατὰ λιμὸν or ἀπὸ λιμοῦ frequently appear in Greek historiography as causal explanations for the collapse of cities under siege. For instance, one may recall the fate of the Melii, who were besieged by the Athenians in 416 BC and whose suffering gave rise to the proverbial “Melian hunger”, an expression already echoed in a verse of Aristophanes’ *Birds*.¹⁹

Within this conceptual framework, Philo identifies the control of supply as the decisive condition for resistance and devotes considerable attention to strategies designed to prevent the destructive effects of famine, which he regards not merely as a physiological threat but also as a powerful instrument of political and psychological domination.²⁰ His response to this problem is articulated around two complementary principles: preventive accumulation and rational management of resources. The acquisition of provisions in peacetime, when prices are more favourable,²¹ and their controlled distribution during the siege constitute the material foundation of urban liveability and the prerequisite for prolonged resistance.

A fundamental feature of this system is the central role attributed to public authority, frequently indicated by the use of the term δημοσία. Philo repeatedly stresses that the organisation of supplies must be undertaken at the initiative of the *polis*, even though it must be implemented in cooperation with the wealthier citizens. As he explicitly states, ὁρθῶς δὲ ἔχει δημοσία καὶ κατὰ τὰς ἰδίας οἰκίας ἀποκεῖσθαι <καὶ> ἄλλα τῶν ἀσήπτων.²² The term δημοσία, meaning “at public expense”, indicates that responsibility for provisioning ultimately lies with civic institutions, even when private resources are mobilised. In this context, affluent citizens are assigned a specific role in procuring valuable foodstuffs, such as preserved meat or dried offal (παρὰ τοῖς εὐπόροις τῶν πολιτῶν κρέα κρεμαστὰ <ἢ> συγκείμενα ἐν οἴνηρᾳ τρυγία).²³ Philo further specifies that this collection should be formalised through a civic decree (συνάγειν δὲ ταῦτα δεῖ παρὰ τῶν μαγείρων καὶ τῶν ἰδιωτῶν ψηφίσματι περιβάλλοντας),²⁴ thereby legitimising institutional intervention in the acquisition of

¹⁷ Weakened by hunger in 404 BC, Athens sends peace requests to Sparta: X. *HG* 2.2.11. Apparently, Lysander had threatened with death anyone who brought grain into Athens: Isoc. 18.61.

¹⁸ Ph. 3.84: the city can be taken “by famine, by placing a palisade and fortifying some strong point around the city and stationing reliable guards there, who will prevent anything from entering by land or by sea”. All translations from original sources are by the author of this article.

¹⁹ Ar. Av. 186. On the dialogue between Athenians and Melians: Th. 5.85-113. See Canfora 1991 and 1992. The proverb appears in the collection of Zenobius 4.94. For other instances of surrender imposed by famine see Th. 2.71-78; 3.20 and 52 (Plataea); D.S. 14.111.1 (Rhegion); X. *HG* 5.3.26 (Olynthus); Liv. 24.34-39; Plb. 8.3.7 (Syracuse).

²⁰ Ph. 2.33: “let no one have anything terrible to suffer from hunger”.

²¹ Ph. 2.30: ἀγοράζειν δὲ δεῖ ὅταν εὐωνότατος (“one must buy when prices are lowest”). On spikes in grain prices during sieges see, for example, D.S. 14.111.1 on the siege of Rhegion by Dionysius I; X. *An.* 1.5.6 on Cyrus’ men during the retreat. For price fluctuations in crisis situations see above all Finley 1973. A fundamental contribution to the functioning of price-formation mechanisms, especially for the 2nd century BC, is provided by Garnsey – Gallant – Rathbone 1984. Further insights on economic policies adopted to face crises and on food market dynamics are found in Archibald *et alii* 2001. Most recently, Konijnendijk 2023 has highlighted the link between armed conflict and economy.

²² Ph. 2.1: “it is appropriate that, at public expense, non-perishable goods be stored even in private homes”.

²³ Ph. 2.2: “among wealthy citizens, meats hung up or placed in wine lees, others salted”.

²⁴ Ph. 2.5: “these must be collected from butchers and private individuals by decree”. On the profession of butcher, which is attested from the 5th century BC, see Berthiaume 1982; van Andringa 2007. A problematic element concerns the use of the participle περιβάλλοντας, which, as noted by Whitehead 2016, generally has a concrete meaning (“to surround, to wrap”). Its abstract use (“to include, to establish”) is therefore unusual in this context. Rigsby 2019 considers the transmitted term a scribal error and proposes περιλαμβάνω instead, reconstructing the aorist περιλαβόντας. While the observation on the pronoun ταῦτα seems persuasive, the emendation remains hypothetical. The difficulty may reflect not corruption, but rather Philo’s marked stylistic choice, which is consistent with his linguistic profile.

essential supplies. The participation of wealthy citizens thus appears less as a voluntary act of generosity than as a civic obligation regulated by political authority.

Epigraphic evidence suggests that such mechanisms were not purely theoretical. Inscriptions relating to public subscriptions document forms of collective mobilisation, often formally described as “voluntary”, through which citizens and residents contributed to the provisioning of the city in times of crisis. These measures were frequently accompanied by honorary decrees,²⁵ which acknowledged individuals who ensured the arrival of essential foodstuffs, particularly grain. A fourth-century BC Athenian decree honouring a benefactor from Salamis in Cyprus for importing grain from Egypt illustrates how food supply could be regarded as a strategic matter of urban security, while also demonstrating that the practices envisaged by Philo corresponded, at least in part, to forms of collective organisation already attested in the Greek world.²⁶

A comparable concern for the management of resources during periods of scarcity appears in the *Oeconomica* attributed to Aristotle, which records several measures adopted by *poleis* facing food crises. Particularly relevant are the examples of Clazomenae and Selibria. In the case of Clazomenae, Aristotle reports that during a severe shortage of food and money, the city required citizens possessing oil stocks to lend them to the state at interest, allowing the oil to be exchanged for grain, which was needed for the survival of the community.²⁷ Although an exceptional measure, this episode illustrates a strong form of public intervention and the temporary subordination of private resources to the collective interest. Similarly, at Selibria a decree prohibited the export of grain during a famine and required each citizen to maintain an annual supply,²⁸ while surplus stocks could be requisitioned at a price fixed by the state. In both cases the emergency legitimised a suspension of ordinary market dynamics and a redefinition of the relationship between public and private in favour of the survival of the *polis*.

Compared with Aristotle's descriptive account of such practices, Philo goes a step further by integrating them into a systematic model of siege governance. In his work, provisioning is no longer a contingent response to famine but an integral component of a preventive strategy that encompasses the planning of reserves, their conservation and distribution, and the institutional framework governing private contributions. Through this synthesis, Philo transforms a series of episodic solutions known from historiographical and philosophical tradition into a coherent paradigm of urban emergency management, in which the liveability of the city and its capacity to withstand siege are closely intertwined. The recurrent use of δημοσίᾳ underscores the responsibility of the *polis* in assuming the economic burdens required for collective survival, a principle that extends beyond food supply to other essential resources, including amphorae, war machines distributed throughout the neighbourhoods, and weapons for those citizens who lack the means to equip themselves independently.

In this way, Philo outlines a model in which the organisation and control of resources constitute a central instrument of urban defence: the endurance of the besieged city ultimately depends on the coordinated cooperation between civic institutions and citizens under the leadership of the *polis* so that τις οὐθὲν ἀπὸ λιμοῦ πάθοι ἂν δεινόν.²⁹

²⁵ Among the κηρύγματα to be issued by a city in wartime, Aeneas Tacticus recommends measures to keep the city supplied: 10.3 and 10.12.

²⁶ See, for example, *IG* II² 367; on this, see especially Oliver 2007 and De Martinis 2021. The analysis of epigraphic evidence from individual Hellenistic cities has proved invaluable for studying supply issues: see Garlan 1974, 372; Garnsey 1988, 81-84; Fantasia 1989; Migeotte 1991; 1997; 1998; 2014; Whitehead 2016, 241-242.

²⁷ Arist. *Oec.* 1348b.

²⁸ Arist. *Oec.* 1349a: ὑπολειπόμενον ἕκαστον ἐνιαυτοῦ τροφήν: εἶτα ἐξαγωγὴν ἔδωκαν τῷ βουλομένῳ, τάξαντες τιμὴν ἣν ἐδόκει καλῶς ἔχειν αὐτοῖς.

²⁹ Ph. 2.33. From an architectural perspective, Hellenistic cities included large public granaries (e.g. Morgantina in Sicily) or cisterns (e.g. Stratos, Byllis). Located within *agorai* and public spaces, these structures made public management of water and food storage tangible and visible. At Kamiros (Rhodes), the great cistern beneath the *stoa* of the *acropolis* sanctuary was refurbished thanks to the benefaction of Philostephanos Plarios, who restored water and defensive structures for the *asphaleia* of the *polis* (Caliò 2024).

3. Supply, domestic production, and storage

Among the numerous suggestions made by Philo, the one he considers of foremost importance –as demonstrated by the breadth of his discussion– concerns the establishment of food reserves, with particular attention to economic dynamics. This approach reveals what we might call a systemic approach, in which supply loses its episodic character and becomes an integral part of defensive planning. Emblematic in this sense is the recommendation to purchase sufficient stocks of grain to cover at least one year when prices are most favourable.³⁰ Philo's thought is thus structured along two fundamental lines, a temporal and a quantitative one: on the one hand, the need to provide for supplies before a crisis occurs; on the other, the need to rationally manage available resources during the emergency phase.³¹ The management of large food stocks³² must include measures to prevent the deterioration of goods and, at the same time, the rationalisation of those goods for longer-lasting resistance. It is no coincidence, therefore, that after listing the commodities considered indispensable –dry barley, wheat ears, legumes, and millet–³³ as well as the ingredients necessary for the preparation of φάρμακα –hippace, bitter vetch, sesame, and poppies–³⁴ Philo dedicates ample space to a technical discussion of storage methods, implicitly pointing out that accumulation without adequate expertise risks turning into strategic failure. The information provided on the construction and treatment of storerooms/granaries³⁵ –which are to be built both underground and in the upper parts of houses– shows accurate empirical knowledge but at the same time reveals an almost absolute confidence in the effectiveness of standardised technical solutions that are supposed to be applicable to very different urban contexts. The coatings of granaries based on sludge, mud, and fibrous materials, as well as the requirements for ventilation and the orientation of openings, respond to a logic of environmental control that aims to neutralise factors of biological degradation; however, they presuppose a level of technical expertise and civic coordination that not all *po/eis* could realistically guarantee, especially while they were in a state of prolonged emergency. A similar ambivalence emerges in the complementary solutions that Philo suggests for the protection of grain, such as the use of vinegar, conyza or oregano.³⁶ On the one hand, these attest to the integration of medical knowledge and traditional practices, but on the other, they reflect a predominantly empirical knowledge that cannot always be verified in terms of uniform effectiveness. Here, Philo seems to move in a borderline area between pragmatic observation and prescriptive normativity, transforming local practices into generalised models. Particularly significant, on an ideological level, is the insistence on the spread of vegetable gardens within the fortified urban space.³⁷ The proposal for widespread food production –in private homes, on the *acropolis*, and near sanctuaries– implies a city called upon to profoundly reorganise its spatial and symbolic structure for the sake of survival. In this sense, urban agriculture is not only a pragmatic measure but becomes a device of resilience that redefines the boundaries between sacred space, civil space, and domestic space, while subordinating them to the needs of defence. The centrality attributed to φάρμακα, and in

³⁰ Ph. 2.30. A key testimony is Arist. *Ath.* 51.3 on the σιτοφύλακες, who were responsible for controlling prices, weights, and the fairness of bread sales (cf. Ampolo 1989; Fantasia 1989). On grain imports see Gallo 1984; Ampolo 1994; Bravo 1996; Galvagno 2008.

³¹ Urban liveability is therefore linked not only to the availability of food, but also to its proper management.

³² On nutrition in the ancient world see André 1981; Wilkins *et alii* 1995; Davidson 1997; Garnsey 1999; Dalby 2000; Garcia Soler 2001; Kron 2005; Papatthomas 2006; Kron 2008; Auberger 2010; Kron 2012; Erdkamp 2012; Chandezon 2015; Boterf 2017.

³³ Ph. 2.1.

³⁴ Ph. 2.31.

³⁵ The instructions concerning the construction of granaries, the materials to be used, and the methods for preventing deterioration and infestation reveal a high level of technical knowledge that is corroborated by archaeological evidence.

³⁶ Ph. 2.27 illustrates techniques for preserving grain and legumes using fenugreek, conyza, or oregano: “The greatest degree of preservation for flour, wheat, and legumes is achieved if, after grinding the fruit of fenugreek with stones, you place the aforementioned products within grain pits; or if you mix in fleabane (conyza) or oregano. In this way too, you can preserve legumes in grain pits”.

³⁷ Ph. 2.31.

particular to Epimenides' *φάρμακον*,³⁸ further highlights how Philo conceives of the nourishment of defenders in terms that are not merely quantitative but also qualitative and functional to the war effort. Moreover, the preparation of high-energy foods, inspired by Hippocratic medicine, shows a conception of nutrition as a determining factor in the physical and psychological balance of the defenders. However, even in this case, the complexity of the suggested preparations and the need for a constant supply of specific ingredients raise questions about the real applicability of such prescriptions in contexts of prolonged siege and increasing scarcity. Overall, Philo's discourse on the nutrition of defenders is part of a highly rationalised view of siege warfare, in which control of the body –through an energy-rich, balanced, and non-thirst-inducing diet–³⁹ becomes an essential component of military strategy. The influence of Hippocratic medicine⁴⁰ is evident in the emphasis placed on the balance of humours and the physical and mental well-being of soldiers; however, this approach tends to idealise the *polis*' ability to efficiently govern both bodies and resources. Elevated to a strategic factor of primary importance, nutritional preparation thus ends up reflecting a normative vision of the city at arms, rather than a realistic description of the conditions in which many Greek communities actually found themselves resisting.

Ultimately, Philo's reflections reveal how the organisation of food supply becomes a key component of siege strategy, projecting an ideal of the *polis* capable of rationally governing both resources and bodies in the pursuit of collective survival.

4. Social order and collective participation

From Philo's perspective, the liveability of a besieged city is closely linked to its ability to preserve internal order and prevent social disintegration, which is inevitably exacerbated by forced cohabitation and scarcity of resources.⁴¹ For this reason, Philo attaches particular importance to the appointment of officials responsible for both the regulated distribution of supplies and the surveillance of common spaces, thus implicitly recognising that the stability of the *polis* depends not only on the strength of its defences, but also on the effectiveness of internal control and coordination mechanisms. In this context, resistance is conceived as a collective process involving the entire urban community, which is also reflected in historiographical accounts of sieges in the Greek world. Philo explicitly links the very possibility of resistance to the maintenance of minimum conditions of liveability; he therefore clarifies how the resistance-liveability binomial is deeply conditioned by the degree of social cohesion and the capacity for cooperation between the different components of the citizen body. This results in a concept of defence that is not limited to the mobilisation of wealthy citizens or armed combatants alone but is based on a principle of

³⁸ On the preparation of the *pharmakon*, see Ph. 2.31-40. The reference appears to be to the famous *φάρμακον* attributed to Epimenides, a figure traditionally regarded as a native of Crete and chronologically placed in the age of Solon, as well as counted among the sages of Greece. Epimenides is said to have been from Cnossos according to Diogenes Laertius (1.109), Theopompus (*FGrHist* 115 F 67a), and Pausanias (1.14.4), whereas he is said to have been from Phaistos according to Plutarch (*Sol.* 12.7; *Mor.* 409e) and Strabo (10.4.14). As for chronology, Plato (*Lg.* 642d-e) states that Epimenides came to Athens ten years before the Persian War. On Epimenides see also Arist. *Pol.* 1252a-b. According to a well-attested tradition, Epimenides was able to withstand hunger and thirst by consuming minimal quantities of a nourishing compound, thus becoming a symbol of extreme frugality (Plut. *Mor.* 157d-f). Connected with this tradition is also the claim, taken up by Philo, that a quantity equal to that of an olive was sufficient for daily sustenance. It is significant, however, that Philo does not merely reproduce the traditional recipe but proposes a reworking adapted to the context of siege warfare, replacing mallow and asphodel with a mixture based on boiled onion, sesame, poppy, and honey. This combination of ingredients reflects criteria of nutritional and energetic rationality –which involve the integration of the high caloric value of sesame and honey with the soothing effect attributed to poppy– and testifies to Philo's integration of legendary tradition with a pragmatic medical-dietetic body of knowledge. Colli 1978; Reggiani 2019; Tonelli 2021.

³⁹ Ph. 2-39-40.

⁴⁰ On the link between diet and medicine see Totelin 2009; Grant 2018.

⁴¹ Aeneas Tacticus had already addressed the problem of sedition or betrayal by citizens in a city under siege in chapter 11 of his work, while in chapter 14 he offers advice on how to maintain harmony among citizens.

graduated participation that is calibrated to the physical abilities and status of each individual. In this sense, the explicit inclusion of children, slaves, women, and girls among those called upon to contribute to defensive operations –including through forms of indirect support, such as throwing materials from the roofs of buildings– testifies to a vision of the besieged city as a space of total mobilisation.⁴² However, while this generalised mobilisation of the population strengthens the sense of belonging and transforms resistance into a shared experience, it also reveals the highly normative character of Philo's project, which tends to naturalise the subordination of individual needs to the collective survival of the *polis*. This representation is reflected in some historiographical accounts that document situations of total mobilisation in contexts of siege. Particularly significant is Diodorus' account of the Carthaginian siege of Selinous in 409 BC, where the entire city community, regardless of age, gender, and social position, was called upon to participate in the defence according to a clear division of tasks: men in their prime were directly engaged in combat, the elderly provided logistical and moral support, while women and children ensured the supply of food and ammunition, thus temporarily suspending the codes of conduct based on modesty and reserve that prevail in peacetime.⁴³ A comparison between Philo's precept and Diodorus' account allows us to grasp both the historical reality of these practices and their theoretical reworking. While historiographical sources convey the exceptional and dramatic nature of a mobilisation imposed by urgency, Philo tends to transform this contingent experience into a prescriptive model, in which the suspension of social hierarchies and traditional roles is normalised as a necessary condition for the survival of the *polis*. In this perspective, Philo examines a series of aspects that he considers crucial, in the belief that only by guaranteeing the well-being of the citizenry is it possible to ensure a more stable and lasting resistance.

It should be noted, however, that the ideal of a fully self-sufficient and cohesive *polis* under siege, as envisioned in Philo of Byzantium's *Μηχανική Σύνταξις*, does not always correspond to historical reality. Numerous examples illustrate how cities under military pressure often failed to maintain internal cohesion. In the most extreme cases, as reported by Thucydides, internal divisions escalated into full-scale civil strife (*stasis*), which considerably undermined the capacity for collective defence. At Corcyra in 427 BC, for instance, conflict between democratic and oligarchic factions led to widespread violence, mass executions, and the near-total breakdown of social order (Thuc. 3.70-72). In Sicily, Syracuse faced internal political tensions between democratic and oligarchic factions on the eve of the Athenian expedition to Sicily of 415 BC (Thuc. 6.35). Even in Argos, external threats triggered oligarchic attempts at coups, producing episodes of social fracture that interfered with the city's ability to respond effectively to military pressures (Thuc. 5.82-83).

These examples underscore that successful coordination of resources and maintenance of order and civic solidarity –which were central pillars of Philo's model– were not automatic outcomes of military necessity. Rather, they depended on pre-existing social cohesion, political stability, and effective leadership. In this sense, while Philo's treatise provides a systematic and comprehensive framework for urban resilience, it must be understood as a prescriptive ideal

⁴² Ph. 3.31: οἷ τε παῖδες καὶ αἱ δοῦλαι καὶ αἱ γυναῖκες καὶ αἱ παρθέναι τύπτωσιν ἀπὸ τῶν στεγῶν καὶ πάντες ὡς κατὰ τὴν πόλιν ἐνεργοί ("children, enslaved women, free women and maidens throw things from the rooftops, and all ought to be active for the city").

⁴³ Diod. 13.55.4-5: οἱ μὲν γὰρ ἀκμάζοντες ταῖς ἡλικίας ἐν τοῖς ὄπλοις ὄντες διεκινδύνευον, οἱ δὲ πρεσβύτεροι περὶ τε τὰς παρασκευὰς ἦσαν καὶ περιπορευόμενοι τὸ τεῖχος ἐδέοντο τῶν νέων μὴ περιιδεῖν αὐτοὺς ὑποχειρίου τοῖς πολεμίοις γινόμενος; γυναῖκες δὲ καὶ παῖδες τὰς τε τροφὰς καὶ βέλη τοῖς ὑπὲρ τῆς πατρίδος ἀγωνιζομένοις παρεκόμιζον, τὴν αἰδῶ καὶ τὴν ἐπὶ τῆς εἰρήνης αἰσχύνῃν παρ' οὐδὲν ἡγούμεναι. τοσαύτη κατάπληξις καθειστήκει, ὥστε τὸ μέγεθος τῆς περιστάσεως δεῖσθαι καὶ τῆς παρὰ τῶν γυναικῶν βοήθειας ("In truth, all the men who by age were in the full vigour of their strength put on their armour and rushed to face the danger; and while the elderly attended to the preparations and walked along the walls in their entire length, imploring the young not to leave them to the mercy of the enemy, the women and children ensured the supply of food and missiles to the men who were strenuously engaged in the defence of the city, setting aside those feelings of modesty and reserve that are customary in times of peace. Indeed, such consternation prevailed that in that dramatic moment the intervention of women was earnestly invoked").

reflecting the aspirations of a technically and administratively sophisticated author, rather than a faithful mirror of the diverse realities of Greek cities in times of crisis.

5. Care, recognition, and civic memory

A particularly important element in Philo's reflection concerns the ethical and symbolic dimension of urban defence, which he considers as an integral part of the overall resistance strategy. The care of the wounded, the organisation of a medical service financed by the community, the inclusion of foreigners engaged in defence, and the recognition of individual merit through honours and promotions are not marginal aspects, but fundamental tools for strengthening loyalty to institutions and ensuring community cohesion in times of crisis. The defence of the city is therefore not conceived as a disjointed set of technical or tactical measures, but as an integrated system in which material and immaterial elements contribute to the overall stability of the *polis*. In this perspective, alongside military preparation and the logistical management of resources, other practices, such as care, recognition, and memory, take on a central role. These are aimed at preserving a form of civic well-being even in emergency situations by performing an eminently political and symbolic function and by helping to consolidate the bond between citizens and institutions as well as legitimise the demand for active participation in collective defence.

The picture outlined by Philo is part of a well-established tradition of thought in the Greek world, which conceives of war as a communal undertaking in which the material and human costs must be shared. The implicit reference to similar practices documented by other sources –such as the famous speech for the fallen in the first year of the Peloponnesian War attributed to Pericles, which testifies to the existence in Athens of a policy of public support for those who sacrificed their lives for the city⁴⁴ allows us to interpret Philo's prescriptions not as an isolated innovation, but as the systematic development of a normative model of the *polis* at war. However, the question of their practical applicability in contexts marked by limited resources and social tensions remains open; this is an element that invites us to read Philo's project more as a regulative ideal than as a faithful representation of the practices that were actually adopted.

The exhortation to diligently care (ἐπιμελῶς θεραπεύειν) for wounded foreigners by providing everything necessary (πάντα τὰ δέοντα παρασκευάζοντας) reflects a high level of organisational attention that transcends mere logistics to take on political and moral significance. The instruction to provide medicines, bandages, accommodation, and food shows that, for Philo, war is not limited to armed conflict but includes a structured network of assistance. In cases where the wounded have no relatives, companions or servants (τοὺς θεραπεύοντας), they should be entrusted to the homes of citizens (εἰς τὰς τῶν πολιτῶν οἰκίας διδόναι), thus resorting to private hospitality as an extension of the collective commitment.⁴⁵ In all these cases, the management of the wounded is both a strategic and a moral act. This prescription, far from being a simple humanitarian gesture, has a clear political value: by extending the obligation of care beyond the boundaries of citizenship, Philo reshapes the concept of *xenia* in a civic and military sense, transforming it into a tool of integration functional to collective defence. Solidarity thus becomes a means of strengthening loyalty to the *polis* and containing the potential fractures generated by the war emergency.

This concept is accompanied by an insistence on the presence of specialised medical personnel equipped with adequate instruments and medicines and directly supported by the state in the supply of the necessary materials. The emphasis placed on the rapid recovery of the wounded and their return to service highlights a vision of medicine closely intertwined with military strategy: the protection of the soldier's body not only responds to the need for care, but is also part of a logic of optimising human resources. The *Mechanicus* highlights how the survival and rapid recovery of combatants are determining factors for the resistance of a besieged city, on a par with the solidity of the walls or the power of the artillery. Therefore, unlike many other treatise writers, who focus exclusively on the engineering and logistical aspects of siege warfare, Philo

⁴⁴ Th. 2.34.1; 2.35.1 and 2.46.1.

⁴⁵ Ph. 3.45.

also prescribes the presence of highly skilled physicians (χαριέστατοι), who are not only experts in the treatment of war wounds and the removal of projectiles (ἐμπείρους τραυμάτων και βελῶν ἐξαιρέσεως) but also possess the human qualities necessary to establish a relationship of trust with soldiers.⁴⁶

The explicit mention of removing darts and javelins reveals an awareness of the most common types of injuries one could sustain during Hellenistic sieges –which were mainly caused by projectile weapons– and presupposes sophisticated surgical knowledge: the ability to extract objects safely, basic anatomical skills, and the use of antiseptic remedies. The list of medical supplies –wax (κηρωτής), honey (μέλι), and bandages (σπληνία)– demonstrates a practical and functional approach. Wax was used to seal wounds and make compresses; honey was recognised since ancient times (Hippocrates, Galen) for its antiseptic properties and played a decisive role in preventing infections; bandages ensured the control of haemorrhage and the protection of damaged tissue. In this context, these materials become “ammunition for life”, an indirect means of defence capable of preserving the fighting strength of the garrison. Particularly significant is Philo’s observation on the psychological value of care: soldiers who heal quickly and are supported by the community face danger again with enthusiasm (προθύμως κινδυνεύοντες) as they are animated by gratitude and renewed motivation. In this way, medicine is not only a means of preserving strength but also a powerful tool for military cohesion and morale. The conclusion of this passage –i.e. the idea that these things also contribute to the salvation of the city– reaffirms a holistic view of defence: victory depends on an integrated system in which military engineering, health logistics, and human capital management work together synergistically. This approach anticipates concepts that are central to contemporary military doctrines, which consider war medicine to be an operational force multiplier.

Immediately afterwards (3.46-47), Philo focuses on the appreciation of ἀγαθοὶ ἄνδρες, “good men”, in the sense of valiant and deserving men. The author prescribes that they be promoted (ἀναβιβάζειν), given command (ἡγεμονίαν διδόναι), and crowned (στεφανοῦν). A tangible sign of public honour, crowns are part of a widely attested tradition as a symbolic reward and political incentive, and as an act of civic and moral legitimisation.⁴⁷ The acknowledgement of the warriors’ value is not limited to their life: in the event of death, Philo prescribes solemn funerals at the expense of the state (θάπτειν ὡς λαμπρότατα δημοσίᾳ). This is in perfect harmony with Pericles’ Funeral Oration reported by Thucydides (2.35-46) and with the Athenian practice of keeping alive the memory of the fallen in collective memory. Particularly significant is the provision that requires care for the wives and children of the deceased, which is not to be provided on an occasional basis (πολυωρεῖν μὴ παρέργως). This reflects an extended conception of public gratitude: military merit does not belong only to the individual but projects its benefits and honour onto the entire family, thus strengthening the bonds between citizen (or ally) and *polis*. Finally, paragraph 48 of the same section explains the logic behind these practices: a fair and generous treatment of combatants and their families promotes εὖνοια, benevolence towards strategists and citizens, and predisposes soldiers to face danger in the best possible way (ἄριστα κινδυνεύσειαν). This is a principle deeply rooted in Greek military ethics: courage is not simply the absence of fear but arises from bonds of trust (φιλία) and gratitude (χάρις), as in Pericles’ speech in Thucydides, where those who fell in war are presented as models of dedication motivated by love for the city and their comrades. The content of these paragraphs, which possess great ideological and cultural value, is part of an ideological horizon shared by the Greek and, in part, Roman worlds: good leadership is also measured by the care of the weak and wounded, by the honour given to the valiant, and by the assumption of responsibility towards the families of the fallen, who become instruments of

⁴⁶ Ph. 3.72-73.

⁴⁷ References to the recognition of soldiers’ courage and valour in battle and their acknowledgement through awards and the bestowal of crowns recur frequently in ancient sources. See especially Hdt. 8.118.4; 8.124.2; Th. 2.46; X. Oec. 4.7-8; 4.15; An. 3.1.21; Cyr. 3.3.8; De. *De Cor*. There are also numerous epigraphic attestations of the conferral of honours and crowns for particular merits, especially in the Hellenistic period.

social cohesion, political legitimacy, and the consolidation of discipline. As a political community, the *polis* assumes the role of guarantor of the welfare and memory of those who contributed to its defence, thus integrating the ethics of war with those of citizenship. In other words, Philo combines organisational, ethical, and political precepts into a single coherent vision: caring for the wounded (including foreigners), rewarding the deserving, honouring the fallen and supporting their families is not only right, but also strategically advantageous. This is a notion that remained relevant across the centuries, from Classical Greek warfare to Roman reflection, and is based on the idea that military power and civic cohesion feed off each other.

Finally, it is particularly revealing that Philo suggests to build monumental structures –burial towers– in honour of those who distinguished themselves or fell for their country: δεῖ δὲ καὶ τῶν ἀγαθῶν ἀνδρῶν τοὺς τάφους καὶ πολυάνδρια πύργους κατασκευάζειν, ἵνα ἢ τε πόλις ἀσφαλεστέρα γίνηται καὶ οἱ μὲν δι’ ἀρετῆν <ἀριστεύσαντες>, οἱ δ’ ὑπὲρ τῆς πατρίδος τελευτήσαντες ἐν αὐτῇ τῇ πατρίδι καλῶς ᾧσι τεθαμμένοι.⁴⁸ The merging of defensive function, architectural monumentality, and funerary memory testifies to a deeply integrated conception of urban space, in which the city physically incorporates the memory of its heroes. Those monuments not only reinforce material security, but also inscribe individual sacrifice into the visible landscape of the *polis*, thus making memory an integral part of everyday experience and helping to consolidate a sense of historical continuity and identity. At the same time, they reveal the strongly ideological character of Philo’s design, which tends to represent the city at arms as a compact and supportive community capable of absorbing the trauma of war through a synthesis of technology, politics, and memory.

Ultimately, Philo frames care, honour, and collective memory as strategic resources through which the *polis* strengthens civic cohesion and transforms ethical values into instruments of military resilience.

6. Conclusions

Philo of Byzantium’s *Μηχανικὴ Σύνταξις* offers a reflection on urban emergency management that goes well beyond a purely technical treatise. In Philo’s perspective, military defence is inseparable from the liveability of the city: the ability of the *polis* to maintain order, cohesion, and minimal conditions of well-being during prolonged siege. Urban resistance thus depends not only on fortifications or war machines, but also on preventive planning, rational resource management, and the preservation of social cohesion. Philo outlines a model of resilience based on advance preparation, centralised administration of resources, collective civic participation, and public recognition of individual merit. These elements combine to form an integrated vision of the city in crisis, where technical, political, and symbolic dimensions are closely intertwined. At the same time, the work has a strong normative character. Philo’s prescriptions presuppose levels of coordination, discipline, and material availability that historical *poleis* may not always have possessed. The *Μηχανικὴ Σύνταξις* should therefore be read not only as a reflection of contemporary practices but also as a theoretical construction that proposes an ideal model of a resilient city. Despite this idealisation, Philo’s emphasis on the human dimension –care for bodies, morale, and collective cohesion– anticipates a broader understanding of urban security in which social bonds play a crucial role in sustaining resistance. In this sense, the treatise presents the *polis* as a complex organism whose survival depends as much on the quality of its social relationships as on the efficiency of its defensive structures.

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⁴⁸ Ph. 1.86: “It is also necessary to make provision for the burials of brave men and for towers that shall be used as common graves, so that the city may be more secure and those who distinguished themselves for their valour, along with those who died for their fatherland, may be honourably buried in their same native soil”.

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