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SOME REFLECTIONS ON WATER RIGHTS IN
INSCRIPTIONS FROM BEROIA IN IMPERIAL TIMES.
RESPONSE TO MICHELE FARAGUNA

The water management of ancient Greece is a topic drawing an ever-increasing academic interest. Hydraulic works, from the cosy bathtubs of the Mycenaean palaces to mechanical achievements like the Eupalinus tunnel in Samos, or the network of pipes exposed throughout the Athenian metro, have fuelled scientific discussion, several *ad hoc* congresses and numerous publications in the last years, especially among archaeologists and water systems specialists. Michele Faraguna's careful analysis of water rights in archaic and classical Greek cities has shown that the evidence on Greek water law is scattered and that no uniform set of rules seems to have existed, although we can derive some general principles on the basis of Plato's model. I would like to further extend some points raised in his paper, by focusing on three inscriptions relevant to water management from Beroia in Roman Macedonia,¹ a city rich in waters, and explore whether we can distinguish traces of evolution of Greek legal practice regarding water rights, on its crossroad with Roman law.

a) Public exploitation of water as a source of income

Raising somehow similar questions as the ones asked by Michele Faraguna on the possible commercial exploitation of the Acharnian aqueduct and of public water by contractors, exploitation of river water as a source of income for the city may be

¹ On archaeological remainings of water structures in Beroia, see Καϊάφα 2008, 286-292.

detected in the Edict² of the Proconsul Lucius Memmius Rufus addressed to the city of Beroia (dated in the 2nd c. AD). The Proconsul focuses on the poor finances of the local Γυμνάσιον,³ due probably to mismanagement of public funds or the poor exploitation of the city resources. Lucius Memmius Rufus, on an angry tone, decides to secure a permanent income for the Γυμνάσιον. A capital of 100.000 denarii is to be formed (A-B l. 10-39), producing an interest of 6.000 denarii (A-B l. 40). This amount would come partly from foundations bequeathed by citizens and mainly by the income from the exploitation of mechanical systems moved by water, called ὑδρομηχαναί. This term⁴ constitutes a unique epigraphic reference to machines operated by hydraulic power in Greece, attesting an unprecedented technological advancement. According to the editor's hypothesis,⁵ these were watermills, such as the ones that continued to abound in Beroia till the early 20th century, in the river *Tripotamos*.⁶

In references in the papyri to water works, the term μηχανή is rather associated with inventions related to lifting and pumping water, either for irrigation purposes or for industrial use, as the water-screw invented by Archimedes during a visit to Egypt,⁷ described by Vitruvius. In Beroia, where water sources for private irrigation of fields abound, public access to hydraulic machines generating an income insinuates a heavy usage destined for industrial purposes, such as milling, tanning or cloth production. In order to generate an income for the Γυμνάσιον, these machines must have been owned by the city, who was renting them to entrepreneurs or private parties. Both the river water as source of the hydraulic power and the pumping mechanisms are treated by the Proconsul as a *res publica*, thus confirming the Greek law precedent as set out by Michele Faraguna.

² The inscription with commentary is edited by Γουναροπούλου – Χατζόπουλος 1998, no 7. See also Νίγδελης – Σουρής 2005, 57-58, 64-72.

³ On the famous law regulating the Gymnasion of Beroia, see Gauthier – Hatzopoulos 1993.

⁴ The inscription was found in four parts. The word “ὑδρομηχανές” appears six times, three in full (A28: “ἀπό τῶν ὑδρομηχανῶν ἐνιαύσια πεπτω[κότα δηνάρια]...”, A50: “...ἐκ τῶν ὑδρομηχανῶν δη[νάρια---]...”, A85: “...ἀπό τῶν ὑδρομηχανῶν χεῖλια ἑπτακόσια εἴκοσι ...”) and three partially (B34-35: “... ἀπό (?) τῶν ὑδρομη[χανῶν]...”, Γ20: “[ὑδρομηχ(?)ανῶν]...”, Δ17: “...ὑδρομη[χαν---]...”).

⁵ Νίγδελης – Σουρής 2005, 64-66, see also Καϊάφα 2008, 289.

⁶ As many as 300 such mills are reported by the 17th century Ottoman traveler Evliya Çelebi in Beroia on the Tripotamos river in his narrative of travels *Seyahatnâme*. The river was previously named Bassilikos in Byzantine times and possibly Olganos in ancient times.

⁷ Oleson 2000, 242. The pumping installation was termed μηχανοστάσιον in the papyri, Oleson 2000, 248, whereas the terms μηχανή ἀντλοῦσα and μηχανικά ὄργανα are also attested. This device, which Strabo (16.1.15) describes as lifting water to the Hanging Gardens of Babylon, spread throughout the Mediterranean as a device facilitating irrigation for culture, industrial use and mining. Pappus of Alexandria (VII 2), a fourth century A.D. mathematician, includes among the most useful practitioners with respect to human needs the μηχανοποιοὶ who design ἀντληματικά ὄργανα to raise water from great depth.

b) *Ownership of water source*

The first principle put forward by Michele Faraguna, that of ownership of water resources as going hand in hand with the ownership of the land, as well as the second principle, that of public ownership of aqueducts, are indirectly attested in a dedication from Beroia, dated in the late 1st/early 2nd c. AD. Claudia Ammia,⁸ owner of a large estate, in memory of her deceased son, had channelled water “*from her own lands*” and financed the building of an aqueduct and water reservoir.

EKM 1. Beroia 40⁹

[— —] Κλ(αυδία) Πειερί[ω]-
 νος θυγάτηρ Ἀμμία μετὰ τῶν τέκνων
 Κλαυδί[ων] Λ[ου]κίας, Πειερίωνος, Ἀμύν-
 του εἰς μ[νήμ]ην Κλ(αυδίου) Ἀερό[π]ου τοῦ υἱοῦ τὸ
 ὕδωρ εἰσή[νεγκεν] ἐκ τῶν αὐτῆς χωρίων τό τε ὑ-
 δραγωγίον καὶ τὸ ἐκτοχεῖον ἰδίοις ἀνα-
 λώμασι κατασκευάσασα ἀνέθηκε[ν].

Throughout the centuries, a number of benefactors, including women in the Roman period, are honoured¹⁰ by Greek cities for constructing or repairing different water-structures. An aqueduct, characteristic in the early Empire of the urban expansion and economic growth of cities under the *pax romana*, would have been one of the most onerous constructions. Aqueducts permitted to provide fresh water from distant water-sources, sometimes reaching close to 50 km long as in Mytilene¹¹ and Nicopolis,¹² acting also as symbols of achievement of Roman engineering, combined with the new imperial conception of public space as extending far beyond previous Greek city frontiers.

Claudia Ammia is a member of the wealthy family of the Claudii Pieriones established in Beroia. The private ownership of the water springs in the χωρία owned by her is in accordance both to Greek legal practice and to the general principle of Roman

⁸ Καϊάφα 2008, 289-290. On Claudia Ammia, see Tatakis 1988, 191, 457.

⁹ Γουναροπούλου-Χατζόπουλος 1998, no 40, 140-141.

¹⁰ See for example Ephesos 285 (dedication by Claudius Aristion and wife of a Nymphaeum of Trajan), IG VII 3099 (unknown benefactor, Boiotia — Lebadeia), Ephesos 1335 (honorary inscription for Gaius Laecanius Bassus, former proconsul, AD 80/81), IvO 610 (Elis, Olympia — 147-150 AD, dedication by Regilla, wife of Herodes Atticus), Didyma 523 (inscription for Antigonos Apolloniou and his son Antigonos Antigonou, early imperial), Panamara 226 (honorary inscription by *demos*, *boulai*, and *gerousia* for Marcus Sempronius Clemens, *hiereus*).

¹¹ On the aqueduct of Mytilene see Lolos 1997, Kourtzellis – Pappa – Kakes 2016.

¹² On the aqueduct of Nicopolis see Doukellis – Dufaure-Fouache 1995, p. 231: “*En ce sens, l’aqueduc incarne les nouveaux rapports géopolitiques qui unifient des territoires d’anciennes cités dans l’espace extra-urbain et orientent la mise en valeur au profit du nouveau centre politique de l’Épire méridionale. En même temps, il est la preuve de l’éclatement des frontières entre les cités grecques, éclatement qui va dans le sens d’autres pratiques de la part du pouvoir centralisé de Rome.*” On the water distribution system of Nicopolis, see also Παυλίδης – Κόρκου 2016.

law, that private water resources belonged to the owner of the land of their location.¹³ In Roman law, water that was conveyed by means of an aqueduct also belonged to the person who had constructed the aqueduct,¹⁴ but if the construction was serving a public initiative, the water was considered to be a *res publica*, as well as the infrastructure of the aqueduct itself.¹⁵ The water channelled by Claudia Ammia is indeed considered a public commodity and so must have been the aqueduct and water reservoir she had financed, not though the *χωρία* where the water was originating from, which remained her own property.¹⁶ Whether the land on which the aqueduct was built would have to be bought, even forcibly in case of reluctance of the owners, as in the rule of Roman law, is a point on which the inscription leaves us in the dark. According to Roman practice, the land over which an aqueduct was constructed was bought to the owner,¹⁷ although in the early Empire, possibly in order to overcome the opposition of private landlords reluctant to give up their property, the State, for reasons of public interest, reserved its right to claim the property without the agreement of the owner.¹⁸ We may assume that the acquisition of private lands, forced or not, as in Roman practice, was a necessary condition for such a work of large scale serving public welfare.

c) *Right to draw water*

Limitations to the free right of access to water, of a different kind than those of classical times put forward by Michele Faraguna, are illustrated in an inscription discovered in Beroia in 1996 during works in a central street of the modern city. The inscription, dated in the fist half of the first century AD probably erected in the context of a dedication, offers valuable information¹⁹ regarding the administration of water works in a Greek city under the Roman Empire.²⁰ In the first line,

¹³ Bruun 2000 (b), 576–581.

¹⁴ D. 43.20.3.3: *Aqua, quae in rivo nascitur, tacite luci fit ab eo qui ducit.* (The water which originates in a brook is tacitly considered to be for the benefit of him who conducts it from thence.)

¹⁵ Maganzani 2012, 86.

¹⁶ Remainings of the Roman aqueduct have been identified at a distance of 1,5 km from the city of Beroia, approaching the city from the south, its construction following Vitruvius' norms. See Καϊάφα 2008, 290.

¹⁷ Frontinus, 124–125.

¹⁸ Maganzani 2012, 88. In the Spanish colony of Urso, in the *lex coloniae Genetivae Iuliae*, is mentioned the *ius ac potestas* of the community over the areas destined to the disposition of the majority of the decuriones, for the conduit of *aqua publica*, Lex. Urs. 99: "... *per eos agros aquam ducere i(us) p(otestas)que esto* ...".

¹⁹ The inscription contains a variety of terminology regarding public water installations, such as ἀμφοδικὰ ὕδατα, i.e., waters running ἀμφὶ τὴν ὁδόν, in gutters on both sides of the street, κύθρω, the ionian version of χύτρος, a term probably here signifying a water reservoir, πολύκρηνον (an hapax, synonym of πολύκρουνον), a fountain with multiple spouts, ἔξαγωγός, a piper serving the outflow of water surplus.

²⁰ On dedication of waterworks see MAMA VIII 437 (Aphrodisias), SEG 27.145 (Opous), IG IX 1.47 (Styris), Syll³ 813C (Delphi).

the remaining letters ANΘ probably belong to Ἀνθύπατος, identifying the Roman Proconsul and governor of Macedonia.²¹

EKM 1. Beroia 41— SEG 48.743

ἀπὸ τῆς Εὐιαστικῆς πύλης τὰ ἀμφοδικὰ ὕδα-
 τα σωλήσι καινοῖς καὶ τὴν πρὸς τῷ κύθρω μαρ-
 μαρίνην κρήνην σὺν τῷ λοιπῷ αὐτῆς κόσμῳ
 καὶ τὸ πολὺκρήνον τὸ ἐν τῇ ἀγορᾷ καὶ τ[ὸ π]ολ[ύκρη]-
 νον τὸ ἐν τῷ Ἀσκληπειί[ω] καὶ τὸν ἐν τῇ ἀγορᾷ ἐξαγωγ[γόν ἐ]-
 κ τῶν ἰδίων ἀποκατέστησεν [κ]αὶ τοὺς μερισμο[ύς ὡς ἦ] πόλι[ς αὐτῶ] ἐνέ-
 τυχε ἀνεμέτρησε, τὸ ἀπο[κεί]μενον ὕδωρ ἀνα[μετρ]ήσα[ς καὶ] ἐξ αὐ-
 τοῦ τὸ λεῖπον τοῖς βουλευτα[ῖ]ς ἀποδούς, ὧν τῆ<ν> ἀ[ν]αγραφ[ήν εἰ]ς τὸ
 vac. γραμματοφυλάκιον ἀπέθε[το].

... (he channelled?) *with new pipelines the waters in the gutters on both sides of the street from the Eviastiki gate and he rebuilt the marble fountain near the reservoir, along with the rest of the decoration, and the multiple fountain of the Asklepios sanctuary and the drain in the agora by his own funds; according to an official request of the city, he also re-evaluated the allotments of water and after re-calculating the water stored, he gave the remaining quantity to the βουλευταί, a list of which he deposited in the public archives.*

The verb ἐντυγχάνω (1.6-7) is a *terminus technicus* signifying the submission of a petition. It shows that an official demand was submitted by the city of Beroia to the Proconsul, resulting in an administrative procedure, which involved a calculation of water volumes, a new division of water rights (μερισμός) among the city's dignitaries and record keeping of the beneficiaries. How does this procedure fit with what is known about the Greek or Roman administration of public water?

The provision of water from public wells was a necessity for every Greek city worthy of this name, according to Pausanias.²² A system of distribution of public water may have existed in some Greek towns or sanctuaries,²³ as it is hinted by the Law of the Mysteries²⁴ of Andania from Messenia (92/91 BC),²⁵ where the *agoranomos* is, among other regulations regarding water use during the *panegyris*, responsible of securing “*that the water runs just as it is allotted and no one hinders those using it.*”

²¹ Cf. *IEph* 695.

²² Pausanias, 10.4.1.

²³ Bruun 2000(a), 564.

²⁴ Gawlinski 2012, 222-223.

²⁵ IG V,1 1390, l. 101-105: “... ἐχέτω δὲ ἐπιμέλειαν ὁ ἀγορανόμος καὶ περὶ τοῦ ὕδατος, ὅπως κατὰ τὸν τᾶς παναγύριος χρόνον μηδεὶς κακοποιεῖ μήτε/[τὸ β]ήλημα μήτε τοὺς ὀχετοὺς μήτε ἄν τι ἄλλο κατασκευασθεῖ ἐν τῷ ἱερῷ χάριν τοῦ ὕδατος, καὶ ὅπως, καθὼς ἂν μερισθεῖ, ρεῖ τὸ ὕδωρ καὶ μη/[θ]ε[ῖ]ς ἀποκωλύει τοὺς χρωμένους.” A testimony on μερισμός of water may be attested in a decree of Ephesos, Ephesos 145.

Evidence on sharing of water, by opening irrigation channels from perennial springs or aqueducts for a certain time during the day is attested from several areas of the Roman Empire, both in Africa and the Near East, but also from Dalmatia and Central Italy.²⁶ More relevant though to our case may be the Roman usage of official concession of public water to individuals.

Our principal source of knowledge on Roman legislation²⁷ on *cura aquarum* in the early Empire is the senator Sextus Julius Frontinus, author of the *De aquaeductu*, an official report to the Emperor of the state of the nine aqueducts of Rome at the turn of the 1st century AD. Latter, water legislation was included in the Digest (whose rules largely influenced modern water legislation), although there is no certainty that these rules reflect accurately earlier imperial law. According to Frontinus, concession of public water to individuals was a *beneficium*,²⁸ a personal imperial concession and privilege introduced under Augustus,²⁹ which had to be registered in the imperial archives. In Roman cities, access to public fountains was free, but those wishing to collect water had to bring portable receptacles of limited quantity. For larger quantities, a private conduit had to be connected to the public reservoir and, for such a permit an official water grant was needed. According to a *senatus consultum* mentioned by Frontinus, it was forbidden to any private party to draw water directly from the public conduits, but water had to be drawn only from the public reservoirs,³⁰ by pipes of fixed dimension. These were called *fistulae*, often bearing the name of the beneficiary of the water right and were running under public streets or private properties by right of servitude. Frontinus describes how, in case of such an application for a water grant, the appointed deputy, without discriminating according to the interest he may have in the parties, must carefully review the application and, after inspecting the location, allow the proper connection to the public reservoir of the lead pipes.³¹

This right to draw water was strictly personal, not to be inherited or sold,³² and remained in force as long as the same proprietors continued to hold the ground for which they received the grant of the water.³³ Later, as attested by Ulpian in the Digest, this concession became transmissible with the land.³⁴ But in Frontinus' time, "*As soon as any water-rights are vacated, this is announced, and entered in the records, which are consulted, in order that vacant water-rights may be given to applicants.*

²⁶ Bruun 2000(b), 580-581.

²⁷ On Roman water legislation, see Weiß 1925, Eck 1987, Bruun 2000(b), Taylor 2000, 52-129, Καϊάφα 2008, 106-112, Maganzani 2012(a), 2012(b), Arnaoutoglou 2013.

²⁸ Frontinus, 105.

²⁹ Bruun 2000(b), 578.

³⁰ Frontinus, 106.

³¹ Frontinus, 105.

³² Frontinus, 107.

³³ Frontinus, 108.

³⁴ D. 43.20.1.43.

*These waters they formerly used to cut off immediately, in order that between times they might sell them either to the occupants of the land, or to outsiders even.*³⁵

Frontinus also informs us that when Marcus Agrippa was in charge of the water supply of Rome, he allotted the water first for public works and basins, and the remainder to private consumers.³⁶ The proconsul in Beroia must have proceeded to a similar allotment, calculating first the amount of water necessary for public use and dividing the rest (το λείπον) among the *bouleutai*. This must not be understood as a one-off distribution, but rather as a perpetual right of connection to the water reservoir for a certain quantity of water, a right *in personam* attributed to all the *bouleutai* whose names were registered in the public archives.

Following a general renovation of the city hydraulics,³⁷ which he personally financed, the Proconsul was asked by the city to review water rights, as the word ἀνεμέτρησε implies. This new allotment may have been made necessary due to the renovation of the pipes connected to the public container, or because previous beneficiaries of the privilege among the βουλευταί had died or been replaced. The new attribution of the privilege did not arise though out of individual requests, but from a petition by the city itself, in the best interest the local elite forming the council. These βουλευταί, at the time, may have formed a hereditary aristocracy, the lifestyle of which justified larger needs of water for private baths, gardens, fountains or irrigation purposes.³⁸ We do not hear though if, in exchange for the water grant, the βουλευταί had to pay a fee (*vectigal*), as in the case of other provincial communities, where this privilege was granted by local authorities.³⁹ The keeping of records of the names of the beneficiaries in the γραμματοφυλάκιον implies a procedure of control of legitimate access and of revision of such right, by submitting the list of said beneficiaries of the right of access to higher volumes of water to the city's public archive.

This inscription from Roman Beroia seem thus to preserve an official petition reproducing a procedure quite similar to the one described by Frontinus regarding access to water reservoirs, as a *beneficium* granted to individuals by official permission in Rome. The inscription may thus illustrate the operation of Roman water rights in a Greek city within a Roman *provincia*, where the Proconsul was acting as substitute for the imperial *permissio*, as part of his broad administrative duties. It is also a testimony to the quality of life enjoyed in Beroia in Roman times, including access

³⁵ Frontinus, 109: *Cum vacare aliquae coeperunt aquae, adnuntiatur et in commentarios redigitur, qui respiciuntur ut petitoribus ex vacuis dari possint. Has aquas statim intercipere solebant, ut medio tempore venderent aut possessoribus praediorum aut aliis etiam.*

³⁶ Frontinus, 98.

³⁷ On the hydraulic system of Beroia, including the distribution system of water by clay pipes under the main streets (*cardo, decumanus*), which coincide with streets of the modern city, see Καϊάφα 2008, 290.

³⁸ Bruun 2000(b), 586.

³⁹ CIL X 4842 (*Edictum Augusti de AquaeductuVenafrano*, for the Campanian town of Venafrum), CIL VIII 51 (Thysdrus in modern Tunisia).

to water on a large scale for the local elite, a personal privilege safeguarded by a legal framework of Roman provenance.

The three inscriptions from Roman Beroia examined show that water management in the Greek countryside has evolved in the first centuries AD along the lines set by Roman law and practice, which are though overlapping with these of the relevant previous Greek legal practice, as set out by Michele Faraguna. Access to water and exploitation of water resources, for personal or industrial use, were under close public scrutiny, in accordance also with the well known interest of the Romans to water management, which, overall, also raised water mechanics and aqueduct construction to new levels of achievement.

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