

Domagoj Bužanić

## Epigrafska svjedočanstva o antičkoj vodoopskrbi hrvatskog Jadrana<sup>1</sup>

### Epigraphic evidence of ancient water supply in the Croatian Adriatic<sup>1</sup>

Domagoj Bužanić  
HR, 10000 Zagreb  
Odsjek za arheologiju  
Filozofski fakultet Sveučilišta u Zagrebu  
Ivana Lučića 3  
dbuzanic@ffzg.hr

UDK: 003.071“:628.1]“652“(497.5)(262.3)  
Pregledni članak  
Primljeno: 14. 9. 2020.  
Prihvaćeno: 29. 10. 2020.

Domagoj Bužanić  
Croatia, 10000 Zagreb  
Archaeology Department  
Faculty of Humanities and Social Sciences in Zagreb  
Ivana Lučića 3  
dbuzanic@ffzg.hr

UDC: 003.071“:628.1]“652“(497.5)(262.3)  
Review paper  
Received: 14 September 2020  
Accepted: 29 October 2020<sup>1</sup>

Briga o vodi jedno je od najvažnijih pitanja opskrbe svake zajednice. Tome svjedoče i brojni arheološki nalazi antičkih vodovoda, bunara, cisterni i fontana. Ovi primjeri vodoopskrbene infrastrukture revolucionarizirani su upravo u rimsko vrijeme, koje je na postojeća saznanja o upravljanju vodama dodalo niz tehnologija. Međutim, arheološki nalazi često nam ne govore sve što bismo htjeli saznati o ovom vrlo važnom gospodarskom polju. Kako bismo pokušali razmotriti i neke druge aspekte rada na antičkoj vodoopskrbi, specifično na prostoru hrvatskog Jadrana, cilj je ovoga rada sakupiti sačuvana antička epigrafska svjedočanstva o održavanju vodoopskrbene infrastrukture na tom području i staviti ih u kontekst već poznatih saznanja.

Caring for water is one of the most important aspects of supply for all communities. This is corroborated by numerous archaeological finds of ancient water lines, draw-wells, cisterns and fountains. Such examples of water supply infrastructure were revolutionised precisely in Roman times, when a number of technologies were added to the existing knowledge of water management. However, archaeological finds often do not tell us everything we would like to find out about this very important economic field. In an attempt to consider some further aspects of ancient water supply works, specifi-

---

1 Ovaj prilog nastao je u sklopu rada na znanstvenoistraživačkom projektu *Razumijevanje rimskih granica: primjer istočnog Jadrana* (IP-2018-01-4934), koji financira Hrvatska zaklada za znanost. Pojam “hrvatski Jadran” podrazumijeva: “...prostor obalnog mora od sredine Piranskog zaljeva (ušće rijeke Dragonje) na sjeverozapadu do Oštrog rta, točnije sredinom vanjskog dijela Bokotorskog zaljeva na jugoistoku s prekidom od 21,2 km duljine obale kod Neuma. Hrvatski Jadran, mimo mora uključuje i površine općina i gradova koje prema novom teritorijalnom ustroju kao jedinice lokalne uprave i samouprave izlaze izravno na Jadransko more” (Riđanović, Bićanić 1993, 91).

---

1 This paper has been created as part of the work on the scientific research project of *Razumijevanje rimskih granica: primjer istočnog Jadrana/Understanding Roman Borders. The Case of the Eastern Adriatic* (IP-2018-01-4934), funded by the Croatian Science Foundation. The term “Croatian Adriatic” implies: “... the coastal sea from the middle of the Piran Bay (the mouth of the Dragonja River) in the north-west to Oštri rt, more precisely along the centreline of the outer part of the Boka Kotorska Bay in the south-east, with a break of 21.2 km along the coast off Neum. In addition to the sea, the Croatian Adriatic includes the municipalities and cities which, according to the new territorial organisation as units of local government and self-government, have direct access to the Adriatic Sea” (Riđanović, Bićanić 1993, 91).

cally in the Croatian Adriatic, the aim of this paper is to collect the preserved ancient epigraphic evidence on water supply infrastructure maintenance in this area and put them in the context of already known information.

**Ključne riječi:** *voda, vodoopskrba, Dalmacija, Istra, antika*

**Key words:** water, water supply, Dalmatia, Istria, antiquity

## Uvod

Opskrba pitkom vodom nužnost je života bez koje ljudske zajednice ne mogu opstati. U svom osnovnom obliku ona se temeljila na prirodnom izvoru ili mjestima gdje se padaline prirodno nakupljaju. U slučaju presušivanja ovih izvora ili njihova onečišćenja sigurnost zajednica koje su o njima ovisile bila je ozbiljno ugrožena. Upravo iz tog razloga paralelno korištenje više izvora vode nametalo se kao svojevrsan uvjet opstanka. Stoga su se gradovi, koji svojim stanovnicima moraju osigurati nesmetanu opskrbu, zatim velika radionička središta, čak i propagandni pothvati državnih i lokalnih uglednika, morali oslanjati na razvoj i obnovu za to potrebne infrastrukture. Ona obuhvaća uređenje postojećih prirodnih izvora na površini, izgradnju bunara, vodovoda i kanala, fontana, nimfeja te raznih tipova cisterna i spremnika vode. Samim time, prirodno je pretpostaviti da bi veći građevinski pothvati, naročito izgradnja termi, vila i manufaktura te naseljavanje novog stanovništva u antički grad, posredno nalagali i dodatne radove na vodoopskrbnoj infrastrukturi. Međutim, ovaj rad koncentrira se na ono što smatramo neposrednim epigrafskim potvrdama razvoju vodoopskrbe nekog lokaliteta, odnosno zajednice. Barem dio radova na vodoopskrbnoj infrastrukturi popraćen je i natpisima koji ih komemoriraju. Iako dio takvih natpisa ponekad dovoljno ne opisuje prirodu provedenih radova kojima svjedoče, postoje i oni koji nam o tome otkrivaju više. Cilj je ovoga rada upravo kroz pregled nama poznatih epigrafskih svjedočanstava te vrste dobiti potpuniji uvid u različite elemente istraživanja antičke vodoopskrbe na lokalitetima hrvatskog Jadrana. Istraživanjima koja su provedena pokušalo se odgovoriti na pitanje otkrivaju li antički natpisi koji svjedoče izgradnji vodovodne infrastrukture neke činjenice koje nam drugi arheološki nalazi ne mogu otkriti. Analizirajući tako sadržaje, okolnosti te mjesto pronalaska svakog pojedinog natpisa, kao najvažniju činjenicu mogli smo zapaziti da neki od natpisa ukazuju na nekadašnje vodovodne sustave čiji ostaci do danas nisu pronađeni. Samim time oni su za znanost još uvijek nepoznati. Sljedeća je činjenica da pojedini natpisi mogu dati uvid u detalje izvođenja radova i u njihove rezultate, ali isto tako dati podatke o izvoru financiranja, odnosno donatorima. Nije zanemariva ni činjenica da nam epigrafski nalazi pomažu pri relativnom ili apsolutnom datiranju lokaliteta. Osim navedenih činjenica, natpisi nas mogu navesti da shvatimo motive koji su potaknuli radove na vodovodnoj infrastrukturi nekog prostora.

Velik dio ovdje spomenute rimske epigrafske baštine sakupio je i kratko komentirao Boris Ilakovac 1982. godine pri svojoj iznimno vrijednoj objavi istraživanja rimskih akvedukata sjeverne Dalmacije.<sup>2</sup> Miroslav Glavičić je 2003. godine objavio rad o epigrafskim podacima o korištenju vode u Liburniji, u kojem

## Introduction

Supply of potable water is a necessity of life, without which human communities cannot survive. In its basic form, it was based on natural sources or places where precipitation naturally accumulated. When such sources dried up or became polluted, the safety of the communities that depended on them was seriously compromised. For this very reason, the parallel use of multiple water sources imposed itself as a sort of prerequisite for survival. Therefore, cities, required to provide their residents with uninterrupted supply, followed by large workshop centres, and even propaganda ventures of state and local dignitaries, had to rely on the development and reconstruction of essential infrastructure. This includes the development of existing surface natural sources, the construction of draw-wells, aqueducts and canals, fountains, nymphaea and various types of cisterns and water reservoirs. Therefore, it is natural to assume that large-scale building projects, especially the construction of *thermae*, villas and manufactories, and the settlement of new people in ancient cities, would indirectly require additional works on water supply infrastructure. However, this paper is focused on what we consider to be direct epigraphic confirmations of the development of water supply in a locality, i.e. community. At least some works on water supply infrastructure are accompanied by inscriptions commemorating them. Although a part of such inscriptions sometimes does not sufficiently describe the nature of the works they relate, there are also those that reveal more. The aim of this paper is to gain a more complete insight into various elements of the research of ancient water supply in the localities of the Croatian Adriatic through a survey of known epigraphic testimonies of this type. The research was conducted in an attempt to answer whether ancient inscriptions that testify to the construction of water supply infrastructure reveal some facts that other archaeological finds cannot unveil. Having analysed the contents, circumstances and find-spots of each individual inscription, we were able to identify the most important fact, viz. that some inscriptions indicate water systems of yore, whose remains have not yet been discovered. Consequently, they are still unknown to science. The next fact is that individual inscriptions can provide the details of the works and their results, as well as information on the sources of funding or donors. Not to be overlooked is the fact that epigraphic finds can help in relative or absolute dating of sites. In addition to the above facts, inscriptions can lead us to understand the motives that prompted the works on water supply infrastructure in a given locality.

A large part of the Roman epigraphic heritage mentioned here was collected and briefly commented on by Boris Ilakovac in 1982 in his extremely valuable publication of research into

2 Ilakovac 1982.

je također komentirao dio ovdje korištenih natpisa.<sup>3</sup> Kako je od objave ovih dvaju radova prošlo četrdesetak, odnosno gotovo 20 godina, ovom prilikom objedinili smo nama poznate natpise ove vrste i istraživanja na polju antičke vodoopskrbe. Objedinjeni uvid u novo stanje istraživanja vodoopskrbe i infrastrukture predstavlja temelj za daljnji rad na ovom polju arheološke znanosti. Prije daljnjeg izlaganja teme želja mi je ovdje izraziti zahvalnost uredništvu i naglasiti kako mi je velika čast ovim radom sudjelovati u proslavi 200. godišnjice Arheološkog muzeja u Splitu.

## Rasprava

Kao što je već rečeno, dostupnost vode životni je uvjet, a tekovine antičke civilizacije u upravljanju vodom ipak možemo očekivati ponajprije u gradovima te u sklopu velikih imanja. U stvarnosti su antičke ruralne zajednice najvjerojatnije još uvijek ovisile o bunarima, tamo gdje je to uopće moguće, kao i o skupljanju vode na površinskim izvorima, što je bio i najraniji način vodoopskrbe. Koliko je dostupnost prirodnih izvora vode bila bitna za neke zajednice antičkog svijeta, svjedoči i terminacijski natpis nađen u šumi Begovača na Velebitu.<sup>4</sup> On je, čini se, rezultat dogovora po kojem je, unatoč postojanju granice između dviju zajednica, definiran i poseban pristup živoj vodi.<sup>5</sup> Iako se ovdje radi o terminacijskom natpisu, koji ne svjedoči o građevinskim radovima ili popravku infrastrukture, natpis je od izvanredne važnosti. On svjedoči o potrebi za ugovaranjem i dopuštanjem posebnog pristupa vodi, što pokazuje važnost koju je to određeno vrelo imalo u vodoopskrbi tih ljudi. Taj nas natpis navodi i na razmišljanje o tome da je za tamošnje ruralne zajednice voda bila ograničeno dostupna.<sup>6</sup>

the Roman aqueducts of northern Dalmatia.<sup>2</sup> In 2003, Miroslav Glavičić published a paper on epigraphic data concerning water use in Liburnia, in which he also provided commentary on some of the inscriptions from this essay.<sup>3</sup> Since forty and, in the latter case, almost twenty years have passed since the publication of these two papers, we have combined the known inscriptions of this type and researches in the field of ancient water supply. This unified insight into the new state of water supply and infrastructure research is the basis for further work in this field of archaeological science. Before further presenting the topic, I would like to express my gratitude to the editorial board and emphasise that it is a great honour for me to participate in the celebration of the 200th anniversary of the Archaeological Museum in Split.

## Discussion

As already mentioned, the availability of water is a necessity of life, while the achievements of ancient civilisations in water management are mainly limited to cities and large estates. In reality, ancient rural communities most likely still depended on draw-wells, wherever possible, as well as on collecting water from surface springs, which is also the earliest method of water supply. The importance of the availability of natural water sources for some communities of the ancient world is evidenced by the boundary inscription discovered in the forest of Begovača on Velebit.<sup>4</sup> It seems to be the result of an agreement that, despite the existence of a border between the two communities, also had a clause on access to spring water.<sup>5</sup> Although this is a boundary inscription, which does not testify to construction works or repairs of infrastructure, it is of exceptional importance. It demonstrates the need to agree and allow special access to water, which shows the significance that this particular spring had in the water supply of these people. This inscription also leads us to think that water quantities were limited for the local rural communities.<sup>6</sup>

3 Glavičić 2003, str. 83–89.

4 *Ex conventione finis / inter Ortoplinos et Pare / ntinis aditus ad aqvam / vivam Ortoplinis passus / D latus I*; natpis, koji se nalazi u šumi Begovača iznad Kosinjskog Bakovca, datiran je u 2. stoljeće; uklesan je u živu stijenu i stoji kao podsjetnik dogovora između dviju etničkih zajednica. Slijedom dogovora Ortoplini su imali pravo prolaska kroz područje Parentina, kao i pristup izvoru (CIL 03, 15053; ILS 5953; HD032922; EDCS-30200440).

5 Wilkes 1976, str. 258–259, br. 2; Ilakovac 1978, str. 373–376; Ilakovac 1982, str. 22, 26; Rendić-Miočević 1968, str. 65; Glavičić 2003, str. 86–87; Glavaš 2018, str. 31. Čini se da u Dalmaciji postoje i drugi sačuvani terminacijski natpisi na živim stijenama (Babić 1996).

6 Potreba za pristupom vodi u industrijske svrhe vjerojatno je posvjedočena i vrlo fragmentiranim natpisom na brončanoj pločici pronađenoj na području Tepljuha, koja je interpretirana kao uredba o korištenju vode za gospodarsku zgradu: -----]asi[---] / [---]is esto[---] / [---]jensem pu[---] / [---]es pagani prom[---] / [---] ordinaria erit co[---] / [---] cu]rsum molis molit [---] / [---]jutendae aquae promo[---] / [---] or]dinem utendae aquae [---] / [---] p]agi quandoque concili[um ---] / [---] flu]minis aut ad villam fa[---] / [---] d]enuntiatum [e]rit qui [---] / [---] a]b hora secunda in [---] / [---] ut videbit[ur] ----- (CIL 03, 14969; ILJug 2959; Ilakovac 1982, str. 26–27; Zaninović 1985, str. 72; Glavaš 2012, str. 94; HD035318; EDCS-30200387).

2 Ilakovac 1982.

3 Glavičić 2003, pp. 83–89.

4 *Ex conventione finis / inter Ortoplinos et Pare / ntinis aditus ad aqvam / vivam Ortoplinis passus / D latus I*; the inscription, located in the forest of Begovača above Kosinjski Bakovac, is dated to the second century; it is carved into the bed-rock and stands as a reminder of an agreement between two ethnic communities. According to the agreement, the Ortoplini had the right of way through the Parentini area, as well as of access to the source (CIL 03, 15053; ILS 5953; HD032922; EDCS-30200440).

5 Wilkes 1976, pp. 258–259, No. 2; Ilakovac 1978, pp. 373–376; Ilakovac 1982, p. 22, 26; Rendić-Miočević 1968, p. 65; Glavičić 2003, pp. 86–87; Glavaš 2018, p. 31. It seems that there also exist other preserved boundary inscriptions on bed-rocks in Dalmatia (Babić 1996).

6 The need for access to water for industrial purposes is probably commemorated on a very fragmented inscription on a bronze

Imajući to u vidu, možemo bolje razumjeti svu važnost i veličinu antičke urbane vodoopskrbe. Prva pokretačka snaga svih infrastrukturnih radova na polju gospodarenja vodama jest sigurnost opskrbe, odnosno stalan dotok vode. Međutim, prisjećajući se brojnih terma i fontana u gradovima, svjesni smo da je na njihovu potrošnju vode uvelike utjecao rimski društveni život, kao i potreba za ugledom određenih pojedina ili neke zajednice. Stoga istraživači smatraju da je razvoj vodnoga gospodarstva pojedinačnih gradova ovisio upravo o njima i lokalnim uglednicima više nego što je bio posljedica rimske državne i carske politike.<sup>7</sup> Prema svemu sudeći, običaj nije nalagao da car sudjeluje u financiranju i diktiranju ovakvih pothvata u provincijama, iako bi ga na to, čini se, natjerali eventualno politička nužnost ili osobna želja te nagovor bliskih mu pojedinaca.

Na prostoru hrvatskog Jadrana zasluge za gradnju vodoopskrbnih objekata pripisuju se carevima na dvama dosad nađenim natpisima.<sup>8</sup> Oba natpisa govore o radovima na akveduktima, pa pomoć cara za njihovu izgradnju, kao zasigurno najskupljeg i najvažnijeg dijela vodoopskrbne infrastrukture, ne čudi.

Jedan takav natpis<sup>9</sup> s otoka Krka, datiran u 94. godinu, pripisuje caru Domicijanu veliku ulogu u gradnji akvedukta za *Fulfinum*.<sup>10</sup> Natpis je podignuo Lucije Sestije Dekster, veteran treće pretorijanske kohorte. Prema vrlo zanimljivu tekstu ovoga natpisa, koji izričito spominje spajanje novih izvora i njihovo provođenje u grad, možda se može pretpostaviti da je neki oblik akvedukta već postojao na otoku. D. Rendić-Miočević, koji je natpis prvi i objavio, smatrao je da je takav vodovod (s imenom *aqua Flavia Augusta*) postojao na otoku prije 94. godine, ali da je taj stariji provodio vodu u *Curicum*. Prema D.

With this in mind, we can better understand the importance and magnitude of the ancient urban water supply *in toto*. The primary driving force of all infrastructure works in the field of water management is security of supply, i.e. constant water inflow. However, recalling the numerous thermae and fountains in the cities, we are aware that their water consumption was greatly influenced by Roman social life, as well as the desire for reputation of certain individuals or a community. Therefore, researchers believe that the development of water management in individual cities highly depended on them and local dignitaries, more so than it was a consequence of Roman state and imperial policies.<sup>7</sup> By all accounts, the custom did not require the emperor to participate in the funding and prescribing such ventures in the provinces, although he would seemingly be driven to do so by political necessity or personal desire or inducements on the part of individuals close to him.

In the area of the Croatian Adriatic, the credit for the construction of water supply facilities is attributed to emperors on two inscriptions discovered to date.<sup>8</sup> Both inscriptions refer to works on aqueducts, so the aid provided by the emperor for their construction, as certainly the most expensive and most important parts of the water supply infrastructure, is not surprising.

One such inscription<sup>9</sup> from the island of Krk, dated to AD

---

plaque, discovered in the area of Tepljuh, interpreted as a regulation on the use of water for an out-building: -----]asi[---] / [---]is esto[---] / [---]jensem pu[---] / [---]es pagani prom[---] / [---] ordinaria erit co[---] / [---] cu]rsum molis molit [---] / [---]utendae aquae promo[---] / [---] or]dinem utendae aquae [---] / [---] p]agi quandoque concilium [---] / [---] flum]inis aut ad villam fa[---] / [---] d]enuntiatum [e]rit qui [---] / [---] a]b hora secunda in [---] / [---] ut videbit[ur] ----- (CIL 03, 14969; ILJug 2959; Ilakovac 1982, pp. 26–27; Zaninović 1985, p. 72; Glavaš 2012, p. 94; HD035318; EDCS-30200387).

7 Eck 2007; čini se da jedan salonitanski natpis otkriva kako je Salona za brigu o vodi imala predviđenu i službenu javnu funkciju – *curator aquarum*: ] / iun[i]ori c(larissimo) v(iro) / cu[r]atori / [ope]rum / [publ]icorum / [cur]atori / [aqua]e et / [cur]atori / [Min]ucia / [r(es) p(ublica)] S(alonitanorum) (Betz, 1957, str. 85–87; ILJug-02, 00677; HD018004; EDCS-13400246; Ilakovac 1982, str. 27).

8 Horster 2001.

9 [I]mp(erator) Caesar divi f[il(ius) Domitia]/[nus] Aug[ustus] p(ontifex) m(aximus) tribuniciae / [p]otestatis [[XIII?]] imp(erator) [[XXII?]] consul [[XVI?]] / censor perp(etuus) p(ater) p(atriciae) / aquam Flaviam Augustam novis / fontibus collectis Flavio Fulfi/no induxit L(ucius) Sestius Dexter / veteranus coh(ortis) III praetoriae / de sua pecunia faciendum cu/ravit. Ovaj natpis datiran je između 85. i 96. godine. Nalazi se na ploči izrađenoj od vapnenca s višestruko profiliranim poljem i trapezoidnim ručkama. Spomenik je oštećen u dnu i gornjem lijevom kutu, a dijelovi natpisa s imenom cara i podacima o njegovu obnašanju državnčkih funkcija još u antičko vrijeme otučeni su. Natpis je pronađen uzidan u vanjski zid ranokršćanske bazilike vjerojatno iz 5. st. na lokalitetu Sepen kraj Omišlja na otoku Krku, gdje se smješta i antički Fulfinum (Rendić-Miočević, 1974, str. 47–55; Ilakovac 1982, str. 25–26; EDCS-57100085; HD057403).

10 Natpis je žrtva provedbe procesa *damnatio memoriae*, ali je uspješno rekonstruiran zahvaljujući radu D. Rendić-Miočevića (Rendić-Miočević 1974).

7 Eck 2007; one Salonitan inscription seems to reveal that Salona had an organised official public function for water care purposes – a *curator aquarum*: ] / iun[i]ori c(larissimo) v(iro) / cu[r]atori / [ope]rum / [publ]icorum / [cur]atori / [aqua]e et / [cur]atori / [Min]ucia / [r(es) p(ublica)] S(alonitanorum) (Betz, 1957, pp. 85–87; ILJug-02, 00677; HD018004; EDCS-13400246; Ilakovac 1982, p. 27).

8 Horster 2001.

9 [I]mp(erator) Caesar divi f[il(ius) Domitia]/[nus] Aug[ustus] p(ontifex) m(aximus) tribuniciae / [p]otestatis [[XIII?]] imp(erator) [[XXII?]] consul [[XVI?]] / censor perp(etuus) p(ater) p(atriciae) / aquam Flaviam Augustam novis / fontibus collectis Flavio Fulfi/no induxit L(ucius) Sestius Dexter / veteranus coh(ortis) III praetoriae / de sua pecunia faciendum cu/ravit. This inscription is dated to the period between AD 85 and AD 96. It is carved on a limestone slab with a multi-profile field and trapezoidal handles. The monument is damaged at the bottom and in the upper left corner, and parts of the inscription with the name of the emperor and information about his performance of state functions were erased as early as ancient times. The inscription was discovered embedded in the outer wall of an early Christian basilica, probably from the fifth century, at the site of Sepen near Omišalj on the island of Krk, the location of ancient *Fulfinum* (Rendić-Miočević, 1974, pp. 47–55; Ilakovac 1982, pp. 25–26;

Rendić-Miočeviću građevinska intervencija o kojoj svjedoči ovaj natpis provela je vodu s tog akvedukta i u *Fulfinum*.<sup>11</sup> Za pretpostavku o napajanju obaju gradova jednim akveduktom ipak još uvijek nema čvrsta temelja, kao ni za tezu o postojanju ranijeg vodovoda na otoku. Međutim, valja podsjetiti da na otoku Krku dosad nisu pronađeni materijalni tragovi antičkog akvedukta. Upravo je otok Krk slučaj kod kojeg nas tek natpisi obavještavaju o nekadašnjim vodovodnim sustavima jer njihovi ostaci do danas nisu pronađeni. Ta nam situacija, nažalost, uskraćuje priliku za bolje razumijevanje građevinskih radova komemoriranih ovim natpisom.<sup>12</sup> Stoga nije moguće raspravljati o trasi, konstrukciji ili izvorima s kojih se antički vodovod (ili vodovodi) otoka Krka napajao. Unatoč tome svakako treba osvijestiti činjenicu da ni jedan grad, pa tako ni *Fulfinum* niti *Curicum*, ne bi postojao bez osigurane opskrbe vodom. Podsjećamo također da gospodarenje vodom nije moralo nužno ovisiti o vodovodu koji je dovodio vodu s udaljenih izvora. Opskrba vodom već se u svojoj ranijoj fazi mogla temeljiti i na jednostavnijim tehnikama skupljanja i čuvanja vode. Pri tome mislimo na cisterne za skupljanje padalina u kombinaciji sa skupljanjem vode na prirodnim izvorima ili uz pomoć bunara.

Nije jasno zašto je *Fulfinum* dobio pomoć cara Domicijana za ovaj pothvat, ali je u tome ulogu mogao imati i Lucije Sestije Dekster. To više što osobne molbe caru za slične pothvate, kako nas izvještava Eck, nisu nepoznate.<sup>13</sup> Takva bi pretpostavka podrazumijevala da je Lucije Sestije Dekster bio osobno blizak caru te je mogao od njega tražiti da izgradi vodovod. D. Rendić-Miočević u ovom je veteranu vidio lokalnog uglednika s imetkom dovoljnim za financiranje barem manjeg dijela radova na infrastrukturi u obliku nimfeja ili česme te je bio komemoriran ovim natpisom.<sup>14</sup> Na kojoj je vrsti građevine izvorno stajao, vjerojatno nikada nećemo saznati.

Još jedan, doduše prilično fragmentiran, natpis<sup>15</sup> datiran je u 116. godinu, a izrijeком spominje cara Trajana te svjedoči o

94, attributes Emperor Domitian with a significant role in the construction of the aqueduct for *Fulfinum*.<sup>10</sup> The inscription was erected by Lucius Sestius Dexter, a veteran of the third Praetorian cohort. According to the quite interesting text of this inscription, which explicitly mentions collecting water from new springs and conveying it to the town, it may be assumed that some form of aqueduct already existed on the island. D. Rendić-Miočević, the first to publish the inscription, believed that such a water-works (known as *aqua Flavia Augusta*) has existed on the island before AD 94, but that the earlier one had conducted water to *Curicum*. According to D. Rendić-Miočević, the construction undertaking witnessed by this inscription also brought water from that aqueduct to *Fulfinum*.<sup>11</sup> There is still no solid foundation for the assumption of supply for both cities with one aqueduct, nor for the premiss of the existence of an earlier aqueduct on the island. Nevertheless, it should be noted that no material traces of an ancient aqueduct have been found on the island of Krk. The island of Krk is precisely the case where only the inscriptions provide information on former water supply systems, because their remains have not been found to this day. This, unfortunately, deprives us of the opportunity to better understand the construction works commemorated by this inscription.<sup>12</sup> Therefore, it is not possible to discuss the route, structure or sources from which the ancient aqueduct (or aqueducts) of the island of Krk was (or were) supplied. Nevertheless, one should certainly be aware of the fact that no town, including *Fulfinum* or *Curicum*, would exist without a secure water supply. Let us also note that water management did not necessarily depend on the water-works that supplied water from remote sources. Water supply could be based on simpler collection and storage techniques already in its earlier phase. By this we mean cisterns for collecting rainfall in combination with collecting water from natural springs or by means of draw-wells.

It is not clear why *Fulfinum* benefited from the aid of Emperor Domitian for this undertaking, but Lucius Sestius Dexter could also have had a role in it. This is all the more so because personal requests addressed to the emperor for simi-

11 Rendić-Miočević 1974, str. 53; Ilakovac 1982, str. 25–26; Glavičić 2003, str. 83.

12 Nedavno (19. studenog 2019.) u dnevnom je medijima objavljena vijest o pronalasku dijelova kasnoantičkog vodovodnog i kanalizacijskog sustava u gradu Krku. Iako se vjerojatno radi o gradskoj distribucijskoj mreži, nadamo se da će buduće objave baciti novo svjetlo na lokalnu antičku vodoopskrbu (<http://www.novilist.hr/Vijesti/Regija/Krk-Tijekom-radova-na-odvodnji-otkrivena-arheoloska-nalazista>, 10. 9. 2020.).

13 Eck 2007, str. 33–34.

14 Rendić-Miočević 1974, str. 53; Glavičić 2003, str. 84.

15 [---]A[---] / *Imp(erator) Nerva Traian[us ---] / pontif(ex) max(imus) trib(unicia) pot(estate) ---] / aquaeductum colon[i---] / in quod ante impen[derant? iussu?] / sacratissimi princ[ipi]s ---] / [-----?]. Ovaj kameni natpis vrlo je oštećen i pronađen je vjerojatno 1620. godine, kako navodi CIL. Natpis, koji je zahvaljujući carskim podacima bilo moguće datirati između 98. i 117. god., danas je nažalost izgubljen. (CIL 03, 02909; de Montauzan 1908, 412; Medini 1969, 56; B. Ilakovac 1982, 26; Horster 2001, str. 397; HD060140; EDCS-28400160)*

EDCS-57100085; HD057403).

10 The inscription had been subjected to the *damnatio memoriae* process, but was successfully reconstructed thanks to the efforts of D. Rendić-Miočević (Rendić-Miočević 1974).

11 Rendić-Miočević 1974, p. 53; Ilakovac 1982, pp. 25–26; Glavičić 2003, p. 83.

12 Recently (19 November 2019), the national dailies published the news about the discovery of parts of a late antique water supply and sewage system in the town of Krk. Although this is probably an urban distribution network, we hope that future publications will shed new light on the local ancient water supply (<http://www.novilist.hr/Vijesti/Regija/Krk-Tijekom-radova-na-odvodnji-otkrivena-arheoloska-nalazista>, 10/9/2020).

gradnji akvedukta u Zadru. Poznato nam je, međutim, da se *lader* opskrbljivao vodom uz pomoć dva traka vodovoda koji su vjerojatno bili izgrađeni u različito vrijeme, no iz natpisa nam nije poznato koji je od dva traka financirao car Trajan. Zadnja istraživanja sugeriraju da su se ova dva traka prije ulaska u Zadar spajala i zajedno ulazila u bedeme grada.<sup>16</sup> Duži trak vodu je zahvaćao na položaju Biba pokraj Vranskog jezera i bio je dug oko 40 km. Ovakav masivan projekt zasigurno je podrazumijevao golem trošak i ne bi bilo nerazumno pretpostaviti da upravo tog traka bez financijske potpore cara ne bi bilo. Ipak, zadnja istraživanja zaključila su da je natpis podignut nakon izgradnje kraćeg traka, koji je onda s položaja Botina, udaljenog oko 8 km, vodu usmjeravao na postojeći trak iz Bibe i dalje u Zadar.<sup>17</sup> Prihvatimo li noviju dataciju kraćeg vodovoda u Trajanovo vrijeme i time zaključimo da je car nužno povezan s njegovom izgradnjom, to ostavlja otvoreno pitanje je li Trajan uopće imao ulogu u izgradnji akvedukta s Bibe. Tu se mišljenja u novijoj literaturi razilaze.<sup>18</sup> Sada bi se opet trebalo zapitati zašto bi prvi vodovodni projekt antičkog Zadra vodu dobavljač s izvora udaljenog 40 km, a ne odmah s položaja Botina, koji mu je puno bliži i jasno je da je bio dovoljno dobar izvor vode. Odgovor bi mogao ležati u usporednom traku starijeg akvedukta, koji se s glavnog kanala odvajao već pri području današnje Vrane, a prema izračunima B. Ilakovca uzimao je najmanje 56 % kaptirane vode.<sup>19</sup> Iz tog je podatka očito da *lader* nije bio jedini potrošač i da je čak većina vode služila drugoj svrsi na nekom drugom mjestu.<sup>20</sup> Zbog te je činjenice moguće da je izgradnju ovog akvedukta financiralo više strana koje su pogodovala od njegova rada i da cijena izgradnje tog akvedukta, u slučaju da je izostala carska pomoć, možda ne bi pala samo na leđa građana antičkog Zadra. Naravno, to ne isključuje da je car ipak mogao financijski pomoći. Međutim, za tu tezu, kao i za dataciju izgradnje samog vodovoda, u ovom trenutku ne postoji čvrst oslonac jer je i natpis koji sugerira Trajanovu intervenciju u novijim istraživanjima povezan s izgradnjom kraćeg traka.

lar projects, as Eck has informed us, are not unknown.<sup>13</sup> Such an assumption would imply that Lucius Sestius Dexter was personally close to the emperor and could have asked him to build a water-works. D. Rendić-Miočević saw in this veteran a local dignitary with enough wealth to finance at least a small part of the infrastructure works in the form of a nymphaeum or a drinking fountain, and had therefore been commemorated with this inscription.<sup>14</sup> We will probably never know the kind of building it was originally placed on.

Another, albeit rather fragmented, inscription<sup>15</sup> dated to the year 116 explicitly mentions Emperor Trajan and testifies to the construction of an aqueduct in Zadar. It is known that *lader* was supplied with water by two aqueduct lines, probably built at different times, and the inscription does not clearly indicate which of the two strips had been funded by Emperor Trajan. Recent research suggests that these two lines were merged before entering Zadar and its town walls together.<sup>16</sup> The longer line was abstracting water at the location of Biba near Lake Vrana and was about 40 km long. Such a massive project certainly entailed a huge cost and it would not be unreasonable to assume that this very line would not have existed without the financial support of the emperor. However, according to the conclusions of recent research, the inscription was erected after the construction of the shorter lane, which directed water from the location of Botina, about eight kilometres away, to the existing line from Biba and further to Zadar.<sup>17</sup> If we accept the recent dating of the shorter aqueduct to the reign of Trajan and thus conclude that the emperor had to be connected with its construction, this leaves open the question of whether Trajan was involved in the construction of the aqueduct from Biba at all. Opinions in recent literature differ in this regard.<sup>18</sup> Here the question

16 Ilakovac 1982, str. 234–238.

17 Starija literatura natpis povezuje s akveduktom s Bibe (Alačević 1898; Jelić 1898; Medini 1969, str. 55–56), a novija ga datira nakon izgradnje onog s Botine (Ilakovac 1982, str. 236–238; Miletić 2017, str. 45–48).

18 B. Ilakovac smatra da su oba traka akvedukta izgrađena u doba cara Trajana, ali u dvjema fazama. Prva faza, prema Ilakovcu, podrazumijevala bi izgradnju traka akvedukta Biba-lader, a druga faza popravke na njemu i izgradnju novog traka iz Botine 116. god., kako bi se povećao volumen vode (Ilakovac 1982, str. 236–238). Alternativno mišljenje ponudio je Ž. Miletić, koji smatra da je akvedukt Biba-Jader izgrađen prije Trajanova vremena, a natpis povezuje s izgradnjom vodovoda Botina-Jader (Miletić 2017, str. 45–48).

19 Ilakovac 1982, str. 159–161, 238.

20 Ž. Miletić pretpostavio je da je ovaj krak bio namijenjen pakoštanskom području (Miletić 2017, str. 44–45), a B. Ilakovac smatrao je da je ova voda opskrbivala industrijska postrojenja na području Vrane (Ilakovac 1982, str. 238).

13 Eck 2007, pp. 33–34.

14 Rendić-Miočević 1974, p. 53; Glavičić 2003, p. 84.

15 [---]A[---] / Imp(erator) Nerva Traian[us ---] / pontif(ex) max(imus) tr[ib(unicia) pot(estate) ---] / aquaeductum colon[i---] / in quod ante impen[derant? iussu?] / sacratissimi princ[ipis ---] / [-----]?. This stone inscription is rather damaged. It was probably discovered in 1620, according to the CIL. The inscription, which can be dated to the period between AD 98 and AD 117 based on the information on the emperor, is unfortunately lost today. (CIL 03, 02909; de Montauzan 1908, 412; Medini 1969, 56; B. Ilakovac 1982, 26; Horster 2001, p. 397; HD060140; EDCS-28400160)

16 Ilakovac 1982, pp. 234–238.

17 Earlier literature associated the inscription with the aqueduct from Biba (Alačević 1898; Jelić 1898; Medini 1969, pp. 55–56), while recent literature has dated it to the period after the construction of the one from Botina (Ilakovac 1982, pp. 236–238; Miletić 2017, pp. 45–48).

18 B. Ilakovac believed that both lines of the aqueduct had been built in the time of Emperor Trajan, albeit in two phases. Phase one, according to Ilakovac, involved the construction of the Biba-lader aqueduct lines, while phase two consisted of repairs and the construction of a new line from Botina in AD 116, in order to increase

Velik problem predstavlja nedovoljno istražen akvedukt s Botine. Nadamo se da će budući arheološki radovi na trasi upravo ovog akvedukta pokazati koja je kronologija gradnje ispravna. Kako god bilo, iz natpisa se ne može saznati razlog zbog kojeg bi cara zanimalo ulaganje u vodoopskrbu Zadra. Moguće je pretpostaviti da se izgradnjom akvedukta samo dodatno osiguravala opskrba vodom za sve veće potrebe građana, ali nejasno je zašto bi u tom slučaju sam car sudjelovao u takvom projektu. Povećanje populacije i pritisak na opskrbu stalna su boljka gradskih zajednica duž Rimskog Carstva na vrhuncu moći i samom tom potrebom *lader* ne odskače od tadašnjih gradova. Pravi razlog u ovom trenutku možemo samo nagađati. Ideja koja se pojavljuje u starijoj literaturi, a potrebno ju je ovdje spomenuti, podrazumijeva da je područje Zadra osjetilo poseban pritisak na vodoopskrbu u sklopu priprema Trajanovih vojnih operacija. Time bi novi akvedukt dobio specifičnu ulogu u osiguravanju dovoljne količine vode za vojnike i logistiku koja je ovuda prolazila dalje u vojnu kampanju.<sup>21</sup>

Antički Zadar ležao je na obilnom izvoru podzemne pitke vode koja je zasigurno u vodoopskrbi stanovnika imala vrlo važnu ulogu, o čemu svjedoče i nalazi brojnih bunara.<sup>22</sup> Prije izgradnje vodovoda njihova bi uloga bila i veća. Prema nalazu natpisa<sup>23</sup> što spominje tek ime prokonzula Gneja Tamfila Vale, rimskoga namjesnika u Iliriku s kraja 1. stoljeća prije Krista, a koji je, čini se, stajao na ogradi bunara na samom forumu, vidljivo je da je lokalna politika pri gradskim infrastrukturnim radovima, kao što je u ovom slučaju izgradnja foruma, veliku važnost pridavala upravo obnovi bunara.<sup>24</sup> Bunar je, vjerojatno kao najvažnija točka koncentracije ljudi na forumu, ponio i namjesnikovo ime. Ulaskom tekuće vode u grad stanovnici bi ju, uz bunar, dobavljali i na fontanama, ali i gradskim nimfejima. A. Wilson smatra da se nimfeji od 1. stoljeća nakon Krista nisu koristili samo kao vodoopskrbni objekti nego su raskošnom izvedbom i bogatom ornamentikom služili donatoru kao propagandno sredstvo.<sup>25</sup>

Budući da je održavanje sustava vodoopskrbe javni interes, prirodno je da su u njemu sudjelovali i gradski magistrati. Natpis iz Cavtata<sup>26</sup> komemorira upravo takav slučaj obnove

arises again as to why the first water supply project of ancient Zadar abstracted water from a source 40 km away, rather than from the position of Botina, which was much closer and clearly a good enough source of water. The answer could lie in the parallel line of the earlier aqueduct, which branched off from the trunk line in the area of present-day Vrana already, and according to B. Ilakovac's calculations intercepted at least 56 % of tapped water.<sup>19</sup> This information makes it obvious that *lader* was not the only consumer and that most of the water served another purpose elsewhere.<sup>20</sup> Due to this fact, it is possible that the construction of this aqueduct was funded by a number of parties that benefited from its operation and that the cost of building this aqueduct, in the case of absence of imperial aid, perhaps would not have been borne solely by the citizens of ancient Zadar. Of course, this does not exclude the possibility that the emperor could have helped financially after all. However, there is no solid evidential support in favour of this argument, as well as the dating of the construction of the aqueduct itself, because even the inscription suggesting Trajan's involvement has been associated with the construction of the shorter line in recent research. The underresearched aqueduct from Botina presents a major issue. We hope that future archaeological works on the route of this very aqueduct will reveal the correct chronology of construction. In any case, the inscription does not allow for an identification of the reason why the emperor would have been interested in investing in the water supply of Zadar. It can be assumed that the construction of the aqueduct merely provided additional water supply for the growing needs of the citizens, but it is unclear why the emperor himself would take part in such a project in that case. Population growth and demand were a constant weakness of urban communities throughout the Roman Empire at the height of its power, and this very need made *lader* no different from the other cities at the time. The real reason can only be a matter of guesswork at this point. An idea from older literature, which should be mentioned here, implied that the area of Zadar had had an exceptional water demand as part of the preparations for Trajan's military operations. This would give the new aqueduct a specific role in providing enough water for the soldiers and logistics that passed through here further into the areas of military campaigns.<sup>21</sup>

21 Medini 1969, str. 56.

22 Fadić 2003.

23 *Cn(aeus) Tamphilus Vala proco(n)s(ul)*. Spomenik je pronađen 1984. kraj Nadbiskupske palače u Zadru. Bio je dijelom nekadašnje krunne rimskoga zdenca s natpisom, odnosno njegova čeona stranica, izrađena od mramora. Na njemu je navedeno ime namjesnika provincije. Ispod natpisa stranica je ukrašena lijepom imitacijom pletene ograde. Natpis je vjerojatno postavljen nakon radova na forumu antičkog Zadra, koji se datiraju u 27. – 25. god. pr. Kr. Danas se čuva u Arheološkome muzeju u Zadru (Cambi 2014, str. 24–25., br. 37; Fadić 1986; 1999; 2003; Vežić 2016; HD004544; EDCS-07600348; Lupa 24143).

24 Fadić 1986; 1999; 2003; Vežić 2016.

25 Wilson 2008, str. 306–307.

26 *P(ublius) Vibius P(ubli) f(ilius) Urbicus / P(ublius) Anulenus Bassus /*

the volume of water (Ilakovac 1982, pp. 236–238). Ž. Miletić offers an alternative opinion. He believes that the Biba-Jader aqueduct was built before Trajan's time, and associates the inscription with the construction of the Botina-Jader water-works (Miletić 2017, pp. 45–48).

19 Ilakovac 1982, pp. 159–161, 238.

20 Ž. Miletić assumed that this branch had been intended for the area of Pakoštane (Miletić 2017, pp. 44–45), while B. Ilakovac believed that this water supplied industrial facilities in the area of Vrana (Ilakovac 1982, p. 238).

21 Medini 1969, p. 56.



gradske cisterne. Obnovu su proveli duumviri Publije Vibije Urbik i Publije Anulen Baso. Natpis izričito spominje da su radovi plaćeni javnim novcem. To, međutim, ne treba čuditi, s obzirom na to da su cisterne neophodan dio u osiguravanju od suše ili prestanka opskrbe tijekom kvara na vodovodu. Na teritoriju antičkog Cavtata zasad je, uz vodovod, poznata tek jedna prilično velika cisterna, ali ju je u ovom trenutku nemoguće povezati s natpisom.<sup>27</sup>

Svoj je doprinos razvoju gradske vodoopskrbe antičke Pule natpisom komemorirao i Lucije Menacije Prisk.<sup>28</sup> Spomenik je datiran u 2. stoljeće te donosi nešto više podataka pa je tako Lucije Menacije Prisk, uz druge počasti i titule, nazvan i patronom kolonije. Taj je naslov nesumnjivo zaslužio jer je donirao 400 000 sestercija za izgradnju i održavanje vodovoda.<sup>29</sup> Koliki su bili razmjeri izgradnje koju je financirao L. M. Prisk, nije nam poznato, što je djelomično posljedica dosadašnjeg manjka saznanja o načinu funkcioniranja opskrbe vodom u Puli prije i poslije Priskove donacije. Čini se da mu natpis pripisuje dovođenje vode u gornji i donji dio grada. Ipak, radovi koji se komemoriraju ovim natpisom vjerojatno su tek nadogradnja postojećeg sustava. To je dio istraživača već pretpostavio, što zbog mišljenja da se radi o premaloj svoti novca za opsežne radove, a što zbog samog natpisa, koji je neke naveo na zaključak da se spomenuta *aqua Augusta* odnosi na neki raniji sustav vodoopskrbe.<sup>30</sup> U nedostatku boljih podataka i s obzirom na navedeno, može se pretpostaviti da je voda iz gornjeg dijela grada u donji dio bila provođena i prije vremena Lucija Menacije Priska.<sup>31</sup> Čini se da problem toj interpretaciji predstavlja

Ancient Zadar was located above a plentiful source of underground drinking water, which certainly played a very important role in the water supply of the inhabitants, as evidenced by a number of discovered draw-wells.<sup>22</sup> Their role must have been even greater before the construction of the water-works. According to the discovered inscription<sup>23</sup> which mentions only the name of the proconsul Gnaeus Tamphilus Vala, a Roman governor in Illyricum from the end of the first century BC, which seems to have been placed on the wall of the draw-well on the very forum, it is evident that local policy attached great importance to the reconstruction of draw-wells as part of the town's infrastructure works, such as the construction of the forum in this case.<sup>24</sup> The draw-well, probably the most important point of concentration of people on the forum, also bore the governor's name. The inhabitants were probably also supplying themselves from other sources of running water in the town, the fountains and nymphaea, in addition to the draw-well. Wilson believes that nymphaea from the first century AD were not only used as water supply facilities but also served the donor as a propaganda tool with their lavish design and rich ornamentation.<sup>25</sup>

Since the maintenance of the water supply system was in the public interest, it is natural that town magistrates also took part in it. An inscription from Cavtat<sup>26</sup> commemorates precisely such a case of the reconstruction of the town cistern. The reconstruction was carried out by the duumviri Publius Vibius Urbicus and Publius Anulenus Bassus. The inscription explicitly mentions that the works were funded with public money. This, however, should come as no surprise, given that cisterns are essential in defence against drought or outages in supply due to water-works failures. In addition to

---

*Ilvir(i) i(ure) d(icundo) / cisternam ex p(ecunia) p(ublica) reficien/dam curaverunt.* Natpis pronađen u Cavtatu komemorira radove na obnovi cisterne i široko je datiran u 1. – 2. st. Nažalost, do danas nije sa sigurnošću utvrđeno na koju se cisternu odnosi, a, koliko je nama poznato, okolnosti nalaza još nisu rasvijetljene. Natpis nam je poznat iz CIL-a, a mjesto gdje se danas čuva nam je nepoznato (CIL 03, 1750; ILS 5737; Glavičić 2008, str. 49; Šegvić 1998, str. 12, br. 10; Kovačić 2012, str. 109; HD053306; EDCS-27400585).

27 Kovačić 2012, str. 109–113.

28 *L(ucius) Menacius L(uci) f(ilius) Vel(ina) / Priscus / equo pub(lico) praef(ectus) fabrum aed(ilis) / Ilvir Ilvir quinq(uennalis) trib(unus) mil(itum) / flamen Augustor(um) patron(us) colon(iae) / aquam Aug(ustam) in superiorem partem coloniae et in inferiorem / <N> pensa sua perduxit et in tutelam / eius dedit HS CCCC(milibus).* Ovaj natpis s višestruko profiliranim poljem pronađen je sredinom 19. stoljeća ispred Dvojnih vrata u Puli. Nakon toga postavljen je *sub divo* nad tim istim Dvojnim vratima. S obzirom na način pohrane vrlo je dobro očuvan. Izvorno mjesto postavljanja ovog natpisa nije poznato, a datiran je u 2. st. (CIL 05, 00047; ILS 5755; InscrIt, 10, 1, 0070; Gnirs 1924, str. 131.; Ilakovac 1982, str. 24–25; Girardi-Jurkić 2003, str. 13; Matijašić 2018, str. 70; Krizmanić 2018, str. 224, EDCS-04200047).

29 Gnirs 1924, str. 131; Ilakovac 1982, str. 24–25; Girardi-Jurkić 2003, str. 13; Matijašić 2018, str. 70.

30 Gnirs 1924, str. 131–132; Ilakovac 1982, str. 24–25; Girardi-Jurkić 2003, str. 14–16.

31 S kojeg izvora je cisterna na vrhu brežuljka dobivala vodu, još nije posve jasno i arheološki dokazano iako postoje različita mišljenja

22 Fadić 2003.

23 *Cn(aeus) Tamphilus Vala proco(n)s(ul).* The monument was found in 1984 near the Archbishop's Palace in Zadar. It was part of a former Roman well-head with an inscription, that is, its front side, made of marble. The name of the governor of the province is carved on it. Below the inscription, the side is decorated with a fine imitation of a wicker fence. The inscription was probably placed after the works on the forum in ancient Zadar, dated to 27–25 BC. Today it is kept in the Archaeological Museum in Zadar (Cambi 2014, pp. 24–25, No. 37; Fadić 1986; 1999; 2003; Vežić 2016; HD004544; EDCS-07600348; Lupa 24143).

24 Fadić 1986; 1999; 2003; Vežić 2016.

25 Wilson 2008, pp. 306–307.

26 *P(ublius) Vibius P(ubli) f(ilius) Urbicus / P(ublius) Anulenus Bassus / Ilvir(i) i(ure) d(icundo) / cisternam ex p(ecunia) p(ublica) reficien/dam curaverunt.* The inscription discovered in Cavtat commemorates the reconstruction works on the cistern and is generally dated to the first–second century AD. Unfortunately, the cistern it refers to has not been determined with certainty. As far as we know, the circumstances of the discovery have not yet been clarified. The inscription is known from the CIL, and its current location is unknown (CIL 03, 1750; ILS 5737; Glavičić 2008, p. 49; Šegvić 1998, p. 12, No. 10; Kovačić 2012, p. 109; HD053306; EDCS-27400585).

sam natpis, koji izričito govori da je radovima voda dovedena u gornji i donji dio grada i time navodi na pomisao da su prije Priska stanovnici Pule, ovisno o mjestu življenja, koristili različite izvore ili čak da vode u nekom od ovih dvaju dijelova grada do tada nije ni bilo. Potonja je pomisao, naravno, malo vjerojatna. Već smo iznijeli mišljenje kako mogućnost da grad prosperira oslanjajući se na samo jedan izvor vode nije realna. Opskrba svih stanovnika na taj način dugoročno je neodrživa. Iz tog razloga puno je vjerojatnije da su za opskrbu korišteni i bunari i cisterne koji su se nalazili unutar grada, kao i tzv. Nimfej, izvor vode koji se nalazio u blizini morske obale.<sup>32</sup> To nas dovodi do mogućnosti da prije Priska u Puli nije postojao jedinstven sustav vodoopskrbe, odnosno vodovod, već da su oba dijela grada imala dovoljno izvora vode te im jedinstvena vodovodna mreža za oba dijela grada nije bila prijeko potrebna. Kao što je već navedeno, neki se istraživači nisu složili s tom idejom.<sup>33</sup> S obzirom na arheološke nalaze, danas se o antičkoj gradskoj vodovodnoj mreži Pule još uvijek ne zna dovoljno, odnosno nije poznato s kojeg se izvora napajala i na koji se način voda dovela u grad. Međutim, ostatak sustava omogućuje rekonstrukciju drugih njezinih dijelova. Prema tome, čini se da je glavna cisterna na vrhu brežuljka služila kao svojevrsan *castellum divisorium* i cijevima distribuirala vodu sekundarnim cisternama na padinama brežuljka. Osim što su bile distributivne namjene, te bi cisterne regulirale i hidrostatski tlak u cijevima.<sup>34</sup> U slici ovog sustava, podsjetimo se, nedostaje izvor vode za gradski vodovod. Voda je mogla biti dovedena s udaljenog izvora, kao što je provedeno u Zadru, ali potpuni nedostatak nalaza kanala ili nosača akvedukta u Puli i njezinoj okolici indicira da to ovdje nije slučaj. Uostalom, relativno velik izvor u podnožju brežuljka, tzv. Nimfej, bio je blizak gradu te je pomoću sustava za dizanje vode mogao poslužiti kao izvorište akvedukta koji bi vodu vodio na brežuljak i tako napajao gradsku mrežu cisterna.<sup>35</sup> Takvo rješenje bilo bi konstrukcijski jednostavnije i zasigurno jeftinije. Međutim, ni za to rješenje nema arheološke potvrde. Jedan od mogućih problema koje je potrebno razjasniti kod ove hipoteze je pretpostavljena konstrukcija akvedukta. Kada bi voda iz izvora već bila podignuta na potrebnu visinu da bude dovedena do cisterne na vrhu brežuljka, bilo bi očekivano da će se s te visine opskrbljivati i cisterne koje se nalaze na

the water-works, only one quite large cistern is known in the territory of ancient Cavtat, but it is impossible to associate it with the inscription for the time being.<sup>27</sup>

Lucius Menacius Priscus also commemorated his contribution to the development of the town water supply in ancient Pula with an inscription.<sup>28</sup> The monument is dated to the second century and contains some more information. For instance, in addition to his other titles, Lucius Menacius Priscus is also named patron of the colony. He undoubtedly deserved the honorific because he had donated 400,000 sesterces for the construction and maintenance of water-works.<sup>29</sup> We do not know the scope of the construction as funded by L. M. Priscus, which is partly due to the lack of knowledge about the functioning of the water supply in Pula before and after Priscus' donation. The inscription seems to credit him for the conveying of water to the upper and lower parts of the town. However, the works commemorated by this inscription were probably only an extension of the existing system. This has already been assumed by some researchers, partly due to the opinion that the sum of money is too small for extensive works, and in part due to the inscription itself, which has led some to the conclusion that the mentioned *aqua Augusta* refers to an earlier water supply system.<sup>30</sup> In the absence of better information and in view of the above, it can be assumed that the water from the upper part of the town was conveyed to the lower part even before the time of Lucius Menacius Priscus.<sup>31</sup> It seems that the issue with this interpretation is posed by the inscription itself, which explicitly states that the works conveyed water to the upper and lower parts of the town and thus suggests that the inhabitants of Pula, depending on the place of their abode, had been using various

27 Kovačić 2012, pp. 109–113.

28 *L(ucius) Menacius L(uci) f(ilius) Vel(ina) / Priscus / equo pub(lico) praef(ectus) fabrum aed(ilis) / Ilvir Ilvir quinq(uennalis) trib(unus) mil(itum) / flamen Augustor(um) patron(us) colon(iae) / aquam Aug(ustam) in superiorem partem coloniae et in inferiorem / <m=N>pena sua perduxit et in tutelam / eius dedit HS CCCC(milibus)*. This inscription with a multi-profile field was discovered in the mid-19th century in front of the Porta Gemina in Pula. After that, it was placed *sub divo* above the Porta Gemina. In the light of its location, it is quite well preserved. The original location of this inscription is unknown. It is dated to the second century AD (CIL 05, 00047; ILS 5755; InscrIt, 10, 1, 0070; Gnirs 1924, p. 131; Ilakovac 1982, pp. 24–25; Girardi-Jurkić 2003, p. 13; Matijašić 2018, p. 70; Krizmanić 2018, p. 224, EDCS-04200047).

29 Gnirs 1924, p. 131; Ilakovac 1982, pp. 24–25; Girardi-Jurkić 2003, p. 13; Matijašić 2018, p. 70.

30 Gnirs 1924, pp. 131–132; Ilakovac 1982, pp. 24–25; Girardi-Jurkić 2003, pp. 14–16.

31 The source from which the cistern at the top of a hillock was supplied with water is not yet evident and archaeologically proven, although there are divergent views (cf. Gnirs 1924, pp. 131–137; Ilakovac 1982, p. 25; Girardi-Jurkić 2003, p. 17; Matijašić 2018, p. 70; Krizmanić 2018, pp. 226–229).

(usp. Gnirs 1924, str. 131–137; Ilakovac 1982, str. 25; Girardi-Jurkić 2003, str. 17; Matijašić 2018, str. 70; Krizmanić 2018, str. 226–229).

32 Gnirs 1924, str. 131–137; De Franceschi 1934, str. 241; Girardi-Jurkić 2003, str. 14, 19–20.

33 Vidi bilj. 24.

34 Gnirs 1924, str. 131–137; Fischer 1996, str. 47–49; Girardi-Jurkić 2003, str. 17. Slična rješenja u gradskoj vodoopskrbi poznata su iz Rima i Pompeja (Wilson 2008, str. 302).

35 Matijašić 2018, str. 70. A. Krizmanić smatra da je voda dovedena na potrebnu visinu iznad nimfeja mehaničkim strojem te da je pomoću zakona spojenih posuda opskrbljivana centralna cisterna (Krizmanić 2018, str. 222–226).

putu između tzv. Nimfeja i brežuljka. Arheološka istraživanja zasad ipak pokazuju da su se te sekundarne cisterne na padinama brežuljka opskrbljivale s njegovog vrha. Dovođenje vode prvo na vrh brežuljka u glavnu cisternu, a onda natrag niz brežuljak u cisterne na padinama prema izvoru akvedukta stvara nepotrebne karike u lancu opskrbe. U takvu bi poretku slučaj kvara na cijevi između izvora i centralne cisterne ostavio bez vode sve sekundarne cisterne po cijelom gradu. Kada bi takvu konstrukciju sustava i pripisali nekoj vanjskoj nužnosti, ostaje pitanje bi li zatvaranje ovako bitnog prirodnog izvora, koji su stanovnici donjeg dijela grada zasigurno svakodnevno koristili, radi opskrbe zatvorene vodovodne mreže Priskov natpis tretirao kao dovođenje vode u donji dio grada. Uz to smatramo, u skladu s već spomenutim mišljenjem B. Ilakovca o relativno malim novčanim sredstvima, da bi oba već iznesena rješenja za napajanje mreže pretpostavljala veća sredstva od onih koja navodi naš natpis i, posljedično, isključivala mogućnost da je Lucije Menacije Prisk vodovod u 2. stoljeću izgradio iz temelja.<sup>36</sup> Treće moguće rješenje za opskrbu gradskog vodovoda neki je drugi izvor vode s područja grada. Kako smo već primijetili, u gradu su vjerojatno postojali bunari bliži centralnoj cisterni i moguće je da su neki od njih bili pogodni za napajanje vodovodne mreže. Takvo bi rješenje, također, nužno vezalo investiciju u sustav za kontinuirano dizanje velikih količina vode, ali bi zasigurno bilo konstrukcijski jednostavnije i jeftinije rješenje od dvaju već navedenih. U slučaju da je Lucije Menacije Prisk zaista izgradio nov sustav, smatramo da je posljednje rješenje najvjerojatnije kao izvor vode. Ipak, mišljenja smo da isticanje dovođenja vode u gornji i donji dio grada na natpisu ne mora nužno podrazumijevati da vodovodna mreža u Priskovo vrijeme nije postojala, nego može značiti da su radovima koje je financirao dodane nove grane cijevi i cisterne.<sup>37</sup>

Od svih nepoznanica koje smo do sada naveli u ovom radu najveću enigmu u kontekstu izgradnje vodoopskrbne infrastrukture predstavlja natpis s Garduna<sup>38</sup> (slika 1), odnosno antičkog vojnog logora *Tilurium*. Natpis obilježava izgradnju objekta koji je oko 150. godine izvršila osma dobrovoljačka

springs or even that there had been no water in one of these two parts of the town before Priscus. The latter suggestion is unlikely, of course. We have already expressed the opinion that the possibility for the prospering of the town by relying on only one source of water is not realistic. Supplying all residents in this way is untenable in the long run. For this reason, it is much more likely that draw-wells and cisterns within the town were used for supply, as well as the so-called Nymphaeum, a source of water near the sea-shore.<sup>32</sup> This brings us to the possibility that Pula had no integral water supply system, or water-works, before Priscus, but that both parts of the town had sufficient water sources and therefore an integral water network for both parts of the town was not essential. As already mentioned, some researchers did not agree with this idea.<sup>33</sup> Considering the archaeological finds, not enough is known about the ancient urban water supply network of Pula, i.e. the source of its supply and the manner the water was conveyed to the town are unknown. However, the rest of the system allows the reconstruction of its other parts. Therefore, it seems that the main cistern at the top of a hillock served as a kind of *castellum divisorium* and distributed water through pipes to secondary cisterns on the slopes of the hillock. Not only were such cisterns used for distribution purposes, but they also served to regulate the hydrostatic pressure in the pipes.<sup>34</sup> Let us recall that the concept of this system is missing the water source for the urban water-works. Water could have been conveyed from a remote source, like in Zadar, but the complete lack of finds related to canals or aqueduct supports in and around Pula indicates that it was not the case here. After all, a relatively large source at the foot of the hillock, the so-called Nymphaeum, was close to the town. With the help of a water-lifting system, it could have served as a source for an aqueduct that would have conveyed water to the hillock and thus supply the town's network of cisterns.<sup>35</sup> Such a solution would have been simpler in terms of design, and certainly more cost-effective. However, there is no archaeological confirmation for this solution either. One of the possible matters that needs to be clarified with respect to this hypothesis is the assumed construction of the aqueduct. If the water from the spring had already been lifted to the required height to be conveyed to the cistern at the top of the hillock, one would expect that the cisterns en route between the so-called

36 Ilakovac 1982, str. 25.

37 Na istočnoj strani brežuljka, a zapadno od malog teatra nalazila se cisterna koju je Gnirs identificirao kao Menacijevu cisternu, a ona je dalje vodom opskrbljivala jednu manju, lociranu južno od spomenutog teatra. Ta je manja cisterna korištena i za regulaciju tlaka vode koja je putovala do donjeg dijela grada (Gnirs 1924, str. 131–133).

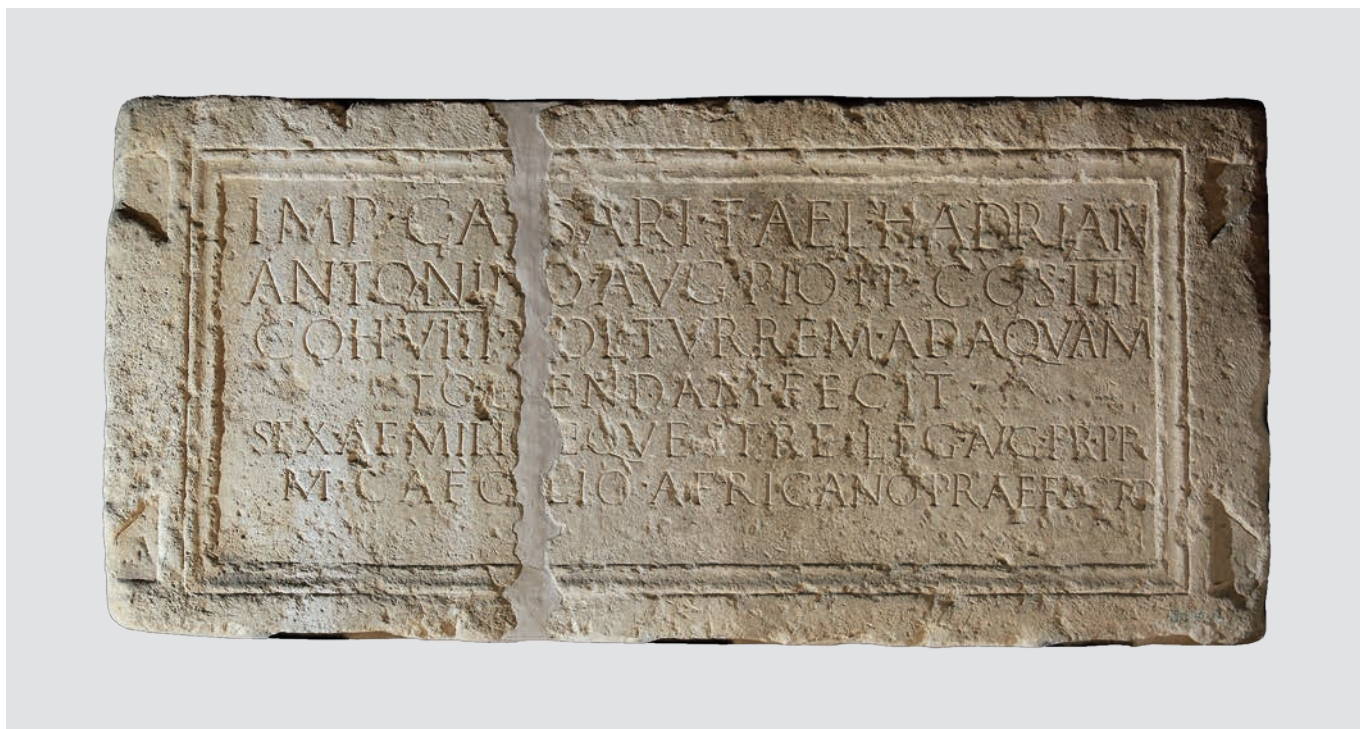
38 *Imp(eratori) Caesari T(ito) Ael(io) Hadriano / Antonino Aug(usto) Pio p(atri) p(atriciae) co(n)s(uli) IIII / coh(ors) VIII vol(untariorum) turrem ad aquam / tollendam fecit / Sex(to) Aemilio Equestre leg(ato) Aug(usti) pr(o) pr(aetore) / M(arco) Caec[ili]o Africano praefecto*. Natpis je pronađen 1927. godine na gardunskom lokalitetu Oglavak u kasnoantičkom grobu. Tip objekta koji natpis naziva *turrem ad aquam tollendam* još nam je uvijek nepoznat i nema analogija u Carstvu. Danas se čuva u Arheološkome muzeju u Splitu (inv. br. AMS A-5341) (Abramić 1940; Ilakovac 1982, str. 27–28; IJug 1948; EDCS-10100890; HD021069; Lupa 24488).

32 Gnirs 1924, pp. 131–137; De Franceschi 1934, p. 241; Girardi-Jurkić 2003, pp. 14, 19–20.

33 Cf. fn. 24.

34 Gnirs 1924, pp. 131–137; Fischer 1996, pp. 47–49; Girardi-Jurkić 2003, p. 17. Similar urban water supply solutions are known from Rome and Pompeii (Wilson 2008, p. 302).

35 Matijašić 2018, p. 70. A. Krizmanić believes that water was lifted to the required height above the nymphaeum with a mechanical machine and that the central cistern was supplied based on the law of connected vessels (Krizmanić 2018, pp. 222–226)



Slika 1.  
Natpis s Garduna (Arheološki muzej u Splitu, inv. broj AMS A-5341)

Figure 1.  
Inscription from Gardun (Archaeological Museum in Split,  
Inv. No. A 5341)

kohorta rimskih građana.<sup>39</sup> Taj objekt najčešće se u doslovnom prijevodu navodi kao toranj za podizanje vode. Nažalost, još uvijek nije poznat način na koji je vodom opskrbljivan logor na Gardunu pa je u ovom trenutku smještanje ovako općenito nazvanog objekta u neki sustav prilično teško.<sup>40</sup> Od vodoopskrbnih objekata s lokaliteta za sada je poznata samo antička cisterna za vodu maksimalnog kapaciteta oko 1044 m<sup>3</sup>, koja je između 1997. i 2001. godine u cijelosti istražena.<sup>41</sup>

Zanimljiv dio epigrafske baštine povezane s vodoopskrbnom infrastrukturom predstavljaju natpisi s posvetom nimfama i Silvanu. Jedan takav svjedoči o ulozi koju novi izvori imaju za lokalnu vodoopskrbu.<sup>42</sup> Nađen je na Rabu i govori da je Leo,

Nymphaeum and the hillock would also have been supplied. However, archaeological excavations have shown that these secondary cisterns on the slopes of the hillock were supplied from the top. Conveying water first to the top of the hillock into the main cistern, and then back down the hillock into the cisterns on the slopes towards the source of the aqueduct would have created unnecessary links in the supply chain. In such an arrangement, a failure of a pipe between the source and the central cistern would have left all the secondary cisterns throughout the town without water. If such a design of the system were put down to an external necessity, the question remains whether the closure of such an important natural spring, which the inhabitants of the lower part of the city must have used on a daily basis, in order to supply a closed water network, would have been regarded in Priscus' inscription as conveying water to the lower part of the town. In addition, and according to the mentioned opinion of B. Ilakovac on relatively meagre funds, we take it that both presented solutions for supplying the network would require heftier funds than those indicated in our inscription and, consequently, exclude the possibility that Lucius Menacius Priscus built the water-works in the second century from the ground up.<sup>36</sup> A third feasible option for the supply of the urban water-works is some other source of water from the town area. As we have

39 Abramić 1940, str. 228; Ilakovac 1982, str. 27–28.

40 Prema samom imenu i klasifikaciji objekta kao tornja čini se jasnim da mu je funkcija bila dovesti vodu u povišeni položaj za neku namjenu. Međutim, tu dolazimo do problema definicije. Jedno rješenje je da se voda mogla dizati hidrostatskim tlakom, a drugo rješenje je građevina u kojoj je postojala neka vrsta mehanizma za dizanje vode, a čija bi elementarna funkcija nalagala da objekt u kojem se nalazi podsjeća na toranj. Potonje rješenje u ovom trenutku smatramo vjerojatnijim. Koji mehanizam bi se koristio u takvom objektu, ovisi o visini na koju je vodu trebalo dignuti i količini vode koju je bilo potrebno dignuti (Wilson 2008, str. 350–355).

41 Sanader 2003, str. 40–54; radi se o jednoj od najvećih objavljenih antičkih cisterni u Hrvatskoj.

42 *Nymphis Aug(ustis) sacrum / C(aius) Raecius Leo aquam quam nul/lus antiquorum in civitate / fuisse meminerit inven/tam impendio ex volu/<nt>(ate) C(ai) Raeci Rufi c(larissimi) v(iri) patron(i) / [sui de]dicavit*

36 Ilakovac 1982, p. 25.

oslobođenik senatora Gaja Recija Rufa, izvršio posvetu nimfama za završen posao nalaženja vode, a koji je platio njegov patron. Čini se da je natpis bio postavljen iznad izvora koji je kaptiran, a posveta je obavljena šestog dana prije novembar-skih ida 173. godine.<sup>43</sup> O samim radovima iz natpisa ne znamo ništa, jedino što nam je poznato jest da je oslobođenik Leo smatrao potrebnim naglasiti da je voda neviđene kvalitete. Donator, senator Gaj Recije Ruf, prema mišljenju M. Glavičića, s Rabom je možda povezan porijeklom, što bi ga ohrabrilo na investiciju u lokalnu vodoopskrbu.<sup>44</sup> Natpis s područja Salone<sup>45</sup> (slika 2) komemorira izgradnju nekog objekta za koji je provedena voda.<sup>46</sup> S obzirom na to da je mjesto poklonjeno dekretom dekuriona, B. Ilakovac smatrao je da je natpis možda komemorirao izgradnju javne česme u koju je utjecala voda.<sup>47</sup> Za razliku od bunara, za opskrbu ove vrste objekta vodu je potrebno dovesti s drugog mjesta, što i sam natpis daje naslutiti. Međutim, s velikom vjerojatnošću možemo pretpostaviti da izvršeni radovi na provođenju vode nisu nužno podrazumijevali zatvaranje i iskorištavanje nekog novog izvora ili bunara oko Salone, već izravno priključivanje cijevima na već postojeći vodovod, što je poznata i zakonom uređena praksa u rimskoj

already noted, the town probably had draw-wells closer to the central cistern, and it is possible that some of them were adequate for water network supply. Such a solution would also have necessarily utilised the funds for a system that would continuously lift large quantities of water, but would certainly have been simpler and cheaper solution than the two mentioned ones. If Lucius Menci Priscus really did build a new system, we believe that the last solution is most likely as a source of water. Notwithstanding, we are of the opinion that emphasising the conveyance of water to the upper and lower parts of the town on the inscription does not necessarily mean that the water network did not exist in Priscus' time, but can indicate that new pipe branches and cisterns were added as parts of the works he funded.<sup>37</sup>

Among all the unknowns we have mentioned so far, the greatest enigma in the context of the construction of water supply infrastructure is the inscription from Gardun<sup>38</sup> (fig. 1), the ancient military camp of *Tilurium*. The inscription commemorates the construction of a structure, carried out by the eighth volunteer cohort of Roman citizens around AD 150.<sup>39</sup> This building is most often literally translated as a water tower. Unfortunately, the manner in which the camp at Gardun was supplied with water is still unknown, so it is quite difficult to localise such a generally named facility in a system.<sup>40</sup> The only currently known water supply facility from the site is an ancient cistern with a maximum capacity of about 1044 m<sup>3</sup>. It was fully investigated between 1997 and 2001.<sup>41</sup>

---

/ [Severo e]t Pompeiano Il co(n)s(ulibus) VI Idus / Nov(embres). Ovaj natpis pronađen je na položaju Kokošica na otoku Rabu. Kupljen je i odnesen u Veneciju kao dio kolekcije Nani. Nakon Venecije odlazi u Legnaro, a današnja lokacija nije poznata (CIL 03, 03116; ILS 3869; Bulić 1884, str. 118; Ilakovac 1982, str. 26; Glavičić 2003, str. 85; Calvelli *et al.* 2017, str. 281, br. 46; HD057997; EDCS-28400370).

43 Medini 1969, str. 49; Ilakovac 1982, str. 26; Glavičić 2003, str. 85.

44 Glavičić 2003, str. 85.

45 *Silvano Aug(usto) sacr(um) voto suscepto pro salute / Imp(eratoris) Caesaris Nervae Traiani Optimi Aug(usti) Ger(manici) Dac(ici) n(ostri) / Trophimus ser(vus) Amandianus dispens(ator) / a solo fecit et aquam induxit I(ocus) d(atus) d(ecreto) d(ecurionum)*. Radovi koje komemorira ovaj natpis, kao i javni prostor koji mu je za tu priliku dodijeljen, provedeni su za cara Trajana i datirani između 102. i 116. god. Na natpisu se, uz posvetu Silvanu, spominje provođenje vode za neku namjenu. Spomenik se danas čuva u Arheološkom muzeju u Splitu (inv. broj AMS A-831) (CIL 3 8684; Ilakovac 1982, str. 27; EDCS-28701349; HD051847; Lupa 24842).

46 Bulić 1884, str. 118; Ilakovac 1982, str. 27.

47 Ilakovac 1982, str. 27.; B. Ilakovac ovaj je objekt nazvao javnim zdenacem, ali u ovom radu naziv zdenac već se koristi kao istoznačnica bunaru, što smatramo ispravnijom upotrebom termina. Hrvatska enciklopedija navodi da je zdenac građevina za zahvaćanje i iskorištavanje podzemnih voda (zdenac. Hrvatska enciklopedija, mrežno izdanje. Leksikografski zavod Miroslav Krleža, 2020; pristupljeno 14. 10. 2020. <http://www.enciklopedija.hr/Natuknica.aspx?ID=67007>), dok pod pojmom česma navodi da se radi o arhitektonski oblikovanom objektu uporabne funkcije u koji pritječe voda. (česma. Hrvatska enciklopedija, mrežno izdanje. Leksikografski zavod Miroslav Krleža, 2020; pristupljeno 14. 10. 2020. <http://www.enciklopedija.hr/Natuknica.aspx?ID=69216>). Istu terminologiju B. Ilakovac koristi i u barem još jednom, kasnijem radu posvećenom vodoopskrbi, gdje istim terminom opisuje česmu u koju se ulijevala voda iz novaljskog vodovoda. Iz tog razloga vjerojatno je da je pod nazivom zdenac autor i ovdje podrazumijevao česmu, što smatramo logičnom pretpostavkom (Ilakovac 2008, str. 146., sl. 21).

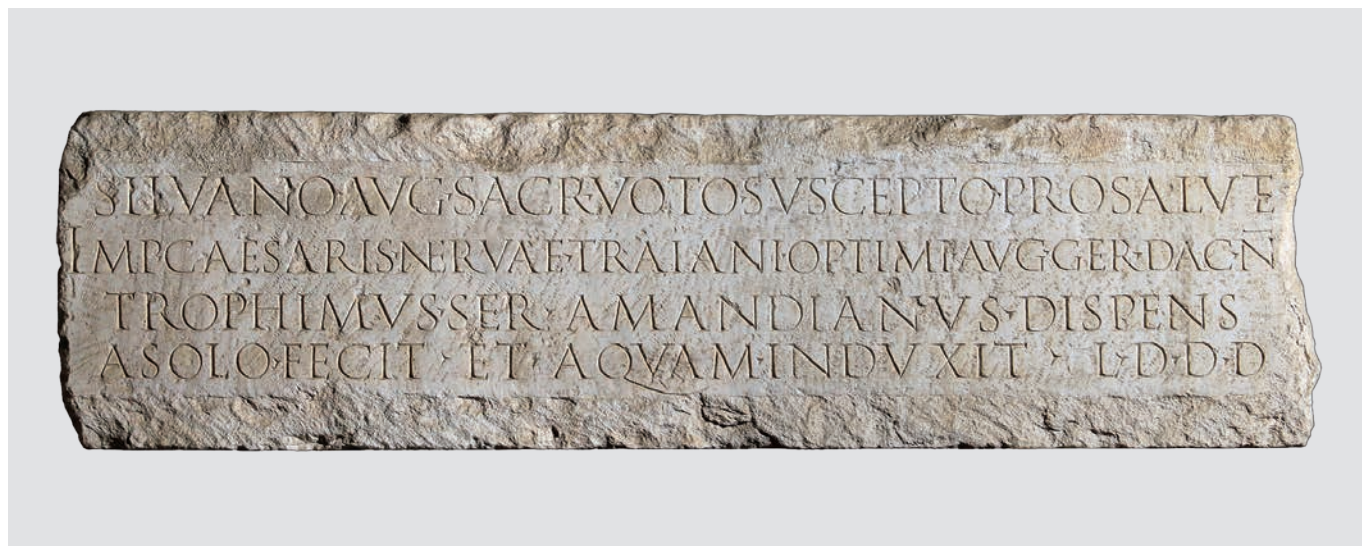
37 On the east side of the hillock, and to the west of the small theatre, there had been a cistern, identified by Gnirs as Menacius' cistern, which had further supplied water to a smaller one, located south of the said theatre. This smaller cistern controlled the pressure of water conveyed to the lower part of the town (Gnirs 1924, pp. 131–133).

38 *Imp(eratori) Caesari T(ito) Ael(io) Hadriano / Antonino Aug(usto) Pio p(atri) p(atriciae) co(n)s(uli) IIII / coh(ors) VIII vol(untariorum) turrem ad aquam / tollendam fecit / Sex(to) Aemilio Equestre leg(ato) Aug(usti) pr(o) pr(aetore) / M(arco) Caec[ili]o Africano praefecto*. The inscription was discovered in 1927 at the site of Oglavak site in Gardun in a late antique grave. The type of the structure that the inscription refers to as a *turrem ad aquam tollendam* is still unknown and has no analogies in the Empire. Today it is kept in the Archaeological Museum in Split (Inv. No. A 5341) (Abramić 1940; Ilakovac 1982, pp. 27–28; ILJug 1948; EDCS-10100890; HD021069; Lupa 24488).

39 Abramić 1940, p. 228; Ilakovac 1982, pp. 27–28.

40 The very name and classification of the building as a tower seem to make it clear that its function was to lift water to an elevated position for some purpose. However, herein lies the issue of definition. One solution is that the water could have been lifted by hydrostatic pressure, while the other solution was a building in which there was some sort of mechanism for lifting water, whose elementary function would have required that such a structure be in the form of a tower. We consider the latter solution more probable at this point. The type of mechanism used in such a facility depends on the height to which water is supposed to be lifted and the quantities of water required to be lifted (Wilson 2008, pp. 350–355).

41 Sanader 2003, pp. 40–54; this is one of the largest published an-



Slika 2.  
Natpis s područja Salone (Arheološki muzej u Splitu, inv. broj AMS A-831)

Figure 2.  
Inscription from the area of Salona (Archaeological Museum in Split, Inv. No. AMS A-831)

državi.<sup>48</sup> Nažalost, bliži kontekst nalaza nam u ovom trenutku nije poznat i ne možemo sa sigurnošću reći kako i gdje je priključak na salonitanski vodovod izveden.<sup>49</sup>

The inscriptions dedicated to the nymphs and Silvanus represent an interesting part of the epigraphic heritage associated with water supply infrastructure. One of them testifies to the role that new springs had in local water supply.<sup>42</sup> It was discovered on the island of Rab and reads that Leo, a freedman of senator Gaius Raecius Rufus, had made a dedication to the nymphs for the completed task of finding water, paid for by his patron. The inscription appears to have been placed above a tapped spring, and the dedication was made on the sixth day before the ides of November AD 173.<sup>43</sup> The inscription tells nothing about the very works, and the only thing we know is that the freedman Leo deemed it necessary to point out that the water was of unprecedented quality. According to M. Glavičić, the donor, senator Gaius Raecius Rufus, may have been connected with Rab by origin, which could have encouraged him to invest in local water supply.<sup>44</sup> One inscription from the area of Salona<sup>45</sup> (fig. 2) commemorates the constru-

cient cisterns in Croatia.

48 Wilson 2008, str. 302–303. O spajanju na vodovod za javne potrebe iz graditeljske perspektive govori Vitruvije (*De Arch.* VIII, 6, 1–2), a iz administrativne Frontin (*De Aq.* 103–106). Uz to, Frontin (*De Aq.*, 78) u svojem pregledu potrošnje vode iz akvedukata i neposredno spominje da je na vodovod u Rimu bilo spojeno 39 ornamentalnih fontana (lat. *munera*) i čak 591 javna česma (lat. *lacus*).

49 Posljednjih godina došlo je do značajnog iskoraka u istraživanju salonitanskog akvedukta i, posljedično, vodoopskrbe Salone. Za više informacija o zadnjim istraživanjima vidi: Marasović *et al.* 2016; Marasović, Margeta 2017.

42 *Nymphis Aug(ustis) sacrum / C(aius) Raecius Leo aquam quam nul/lus antiquorum in civitate / fuisse meminerit inven/tam impendio ex volu/<nt>(ate) C(ai) Raeci Rufi c(larissimi) v(iri) patron(i) / [sui de]dicavit / [Severo e]t Pompeiano Il co(n)s(ulibus) VI Idus / Nov(embres)*. This inscription was discovered at the location of Kokošica on the island of Rab. It was purchased and taken to Venice as part of the Nani collection. After Venice it was brought to Legnaro, while its present location is unknown (CIL 03, 03116; ILS 3869; Bulić 1884, p. 118; Ilakovac 1982, p. 26; Glavičić 2003, p. 85; Calvelli *et al.* 2017, p. 281, No. 46; HD057997; EDCS-28400370).

43 Medini 1969, p. 49; Ilakovac 1982, p. 26; Glavičić 2003, p. 85.

44 Glavičić 2003, p. 85.

45 *Silvano Aug(usto) sacr(um) voto suscepto pro salute / Imp(eratoris) Caesaris Nervae Traiani Optimi Aug(usti) Ger(manici) Dac(ici) n(ostr)i / Trophimus ser(vus) Amandianus dispens(ator) / a solo fecit et aquam*

## Zaključak

Stavljajući sačuvana antička epigrafska svjedočanstva o vodoopskrbi na lokalitetima hrvatskog Jadrana u kontekst dosadašnjih saznanja o vodoopskrbnoj infrastrukturi prostora s kojim ih se povezuje, došli smo do dodatnih informacija o opskrbi vodom priobalnog dijela Hrvatske u antičko doba.

Nakon što smo analizirali sve dostupne informacije s natpisa, povezali smo ih s nama poznatim saznanjima o rimskim vodoopskrbnim sustavima. Na taj način, tamo gdje je to bilo moguće, pokušali smo identificirati na koju su se vrstu radova natpisi mogli odnositi te ponuditi ideje kako i zašto su se proizvodili. Uz pomoć sačuvanog arheološkog materijala, pa tako i onog epigrafskog, usprkos kadikad nerazumljivoj kronologiji radova, pokušali smo razabrati rezultate tadašnjih ulaganja u infrastrukturu određenog lokaliteta. Vodoopskrba, odnosno prirodni izvori na površini, bunari, vodovodi i kanali, fontane, nimfeji i cisterne važan su dio materijalnog bogatstva povezanog s vodom. Oni otkrivaju osnove života zajednice i zasigurno su, barem neki od njih, bili vitalni dio svakog antičkog grada, dok natpisi koji su povezani s opskrbom vode ukazuju da je vodovodnih zahvata bilo mnogo više nego što je sačuvanih materijalnih ostataka vezanih za iskorištavanje vode.

Na primjerima nekih ovdje predstavljenih napisa bilo je lako uočiti da još uvijek postoje otvorena pitanja oko organizacije antičke vodoopskrbe, kao i činjenicu da je financiranje vodoopskrbe jedne zajednice, posebno većega grada, kompleksna tema. Natpisi koje smo analizirali u ovom radu pokazuju da su na hrvatskom Jadranu, baš kao i drugdje u Carstvu, a slijedom rasta populacije, ulaganja u vodoopskrbu vezana za prosperitet i da u stvarnosti nikad ne mogu prestati.

ction of a building to which water was conveyed.<sup>46</sup> Since the locale had been donated by decree of a decurion, B. Ilakovac thought that the inscription might have commemorated the construction of a public drinking fountain to which water had been conveyed.<sup>47</sup> Unlike draw-wells, this type of facility requires water conveyed from another location, as suggested by the inscription. However, we can assume with high probability that the works did not necessarily involve closing and exploiting a new spring or well around Salona, but direct pipe connexions to the existing water-works, a known and legally valid custom in the Roman state.<sup>48</sup> Unfortunately, a more detailed context of the finds is not known, and we cannot say with certainty how and where the connexion to the Salonitan water-works was made.<sup>49</sup>

---

*induxit l(ocus) d(atus) d(ecreto) d(ecurionum)*. The works, as well as the public space designated for it, commemorated by this inscription were carried out in the time of Emperor Trajan and are dated between AD 102 and AD 116. In addition to a dedication to Silvanus, the inscription mentions water conveyed for some purpose. Today, the monument is kept in the Archaeological Museum in Split (Inv. No. AMS A-831) (CIL 3 8684; Ilakovac 1982, p. 27; EDCS-28701349; HD051847; Lupa 24842).

46 Bulić 1884, p. 118; Ilakovac 1982, p. 27.

47 Ilakovac 1982, p. 27; B. Ilakovac designated this structure a public well, but in this paper the term well is used as a synonym for the draw-well, which we consider a more correct use of the term. Hrvatska enciklopedija (the Croatian Encyclopedia) defines a well as a structure for abstraction and exploitation of groundwater (zdenac. Hrvatska enciklopedija, online edition. Leksikografski zavod Miroslav Krleža [Miroslav Krleža Institute of Lexicography], 2020; accessed 14/10/2020 <http://www.enciklopedija.hr/Natuknica.aspx?ID=67007>), while the definition for the term drinking fountain reads that it is an architecturally designed structure with a utilitarian function into which water flows. (česma. Hrvatska enciklopedija, online edition. Leksikografski zavod Miroslav Krleža [Miroslav Krleža Institute of Lexicography], 2020; accessed 14/10/2020 <http://www.enciklopedija.hr/Natuknica.aspx?ID=69216>). B. Ilakovac used the same terminology in at least one other, later work, dedicated to water supply, where he used the same term to describe a fountain receiving water from the Novalja water-works. For this reason, it is probable that the author used the umbrella term well, that also included drinking fountains, which we consider a logical assumption (Ilakovac 2008, p. 146, Fig. 21).

48 Wilson 2008, pp. 302–303. Vitruvius speaks of public connexions to the water-works from a construction perspective (*De Arch.* VIII, 6, 1–2), while an administrative point of view is covered by Frontin (*De Aq.* 103–106). In addition, in his review of water consumption from aqueducts, Frontin (*De Aq.*, 78) directly mentions that 39 ornamental fountains (*L. munera*) and as many as 591 public drinking fountains (*L. lacus*) were connected to the water-works in Rome.

49 Recent years have seen significant development in the research of the aqueduct of Salona and, consequently, the water supply of Salona. For more on latest research, see: Marasović *et al.* 2016; Marasović, Margeta 2017.

## Conclusion

Putting the preserved ancient epigraphic evidence of water supply in the Croatian Adriatic in the context of previous knowledge about water supply infrastructure in the area with which it is associated, we acquired additional information on water supply of the coastal part of Croatia in ancient times.

After analysing all the available information from the inscriptions, we associated it with the details we knew about Roman water supply systems. In this way, we tried where possible to identify the types of works the inscriptions could refer to and offer ideas on how and why they had been carried out. With the aid of preserved archaeological material, including epigraphic items, and despite the sometimes incomprehensible chronology of works, we attempted to recognise the results of the then infrastructure investments in particular localities. Water supply, that is, natural surface sources, drawwells, aqueducts and canals, fountains, nymphaea and cisterns, are important parts of material wealth associated with water. They reveal the basics of community life and were certainly, or at least some of them, vital parts of every ancient city, whereas inscriptions referring to water supply indicate that there were many more water-related works than preserved material remains associated with water use.

Some of the inscriptions presented here make it easy to see that there are still open questions about the organisation of ancient water supply, as well as the fact that funding the water supply of a community, especially a larger city, is a complex topic. The inscriptions analysed in this paper show that investments in water supply in the Croatian Adriatic, just like elsewhere in the Empire, and as a consequence of population growth, were connected to prosperity and that they can never be really stopped.

**Prijevod / Translation:** Denis Gracin



**Izvori / Ancient sources**

*De Arch.* – Vitruvije, Deset knjiga o arhitekturi, prijevod/ translated by: M. Lopac, V. Bedenko, Zagreb 1999.

*De Aq.* – Frontinus, *De Aquaeductu urbis Romae*, internetski izvor/internet source: LacusCurtius, [https://penelope.uchicago.edu/Thayer/E/Roman/Texts/Frontinus/De\\_Aquis/text\\*.html](https://penelope.uchicago.edu/Thayer/E/Roman/Texts/Frontinus/De_Aquis/text*.html), 14. 10. 2020.

**Internetski izvori / Internet sources**

Epigraphic Database Heidelberg – <https://edh-www.adw.uni-heidelberg.de/home>

Epigraphische Datenbank Claus-Slaby – <http://www.manfredclaus.de/>

LacusCurtius – <https://penelope.uchicago.edu/Thayer/E/Roman/home.html>

Novi list – <https://www.novolist.hr/>

Park prirode Velebit/Velebit Nature Park – <https://www.pp-velebit.hr/hr/>

Ubi Erat Lupa – <http://www.ubi-erat-lupa.org/>

**Literatura / Bibliography****Abramić 1940**

M. Abramić, *Historijski natpis iz Garduna*, Vjesnik za arheologiju i historiju dalmatinsku 51, Split 1940, 225–229.

**Alačević 1898**

G. Alačević, *L'antichissimo Acquedotto di Zara*, Bullettino di archeologia e storia dalmata 21, Split 1898, 1–12.

**Babić 1996**

I. Babić, *Dva međašna natpisa namjesnika Publija Kornelija Dolabele iz trogirke Zagore*, Arheološki radovi i rasprave 12, Zagreb 1996, 57–70.

**Brunšmid 1898**

J. Brunšmid, *Arheološke bilješke iz Dalmacije i Panonije: Međašnji kamen između Ortoplina i Parentina*, Vjesnik Arheološkog muzeja u Zagrebu 3, Zagreb 1898, 174–177.

**Bulić 1884**

F. Bulić, *Iscrizioni trovate nella basilica cristiana a Salona e sue adiacenze*, Bullettino di archeologia e storia dalmata 7, Split 1884.

**Calvelli et al. 2017**

L. Calvelli, F. Crema, F. Luciani, *The Nani Museum: Greek and Roman Inscriptions from Greece and Dalmatia*, in: D. Demicheli (ed.), *Illyrica Antiqua 2. In honorem Duje Rendić-Miočević*, Zagreb 2017, 265–290.

**Cambi 2014**

N. Cambi, *Roman sculpture from Illyricum (Dalmatia and Istria). Import and Local Production. A survey*, in: I.

Koncani Uhač (ed.), *Akten des XII. internationalen Kolloquiums über römische provinzielle Kunst*, Pula 2014, 14–39.

**De Francesci 1934**

C. De Francesci, *Il Ninfeo E L'acquedotto Romano Di Pola*, Atti e Memorie della Società Istriana di Archeologia e Storia Patria 46–47, Pula 1934, 227–251.

**Eck 2007**

W. Eck, *Roms Wassermanagement im Osten*, Kassel 2007.

**Fadić 1986**

I. Fadić, *Ime prokonzula Tamphila Vale na zdencu foruma Jadera*, Arheološki vestnik 37, Ljubljana 1986, 409–434.

**Fadić 1999**

I. Fadić, *Gneius Baebius Tamphilus Vála Numonianus – "Graditelj" foruma, patron ladera i prvi prokonzul Ilirika*, *Histria antiqua* 5, Pula 1999, 47–54.

**Fadić 2003**

I. Fadić, *Zdenci antičkog Zadra*, *Histria antiqua* 10, Pula 2003, 263–276.

**Fischer 1996**

G. Fischer, *Das römische Pola. Eine archäologische Stadtgeschichte*, München 1996.

**Girardi-Jurkić 2003**

V. Girardi-Jurkić, *Izvori i vodoopskrba antičke Pule*, *Histria antiqua* 10, Pula 2003, 11–21.

**Glavaš 2012**

I. Glavaš, *O municipalitetu*

*Magna*, *Opuscula Archaeologica* 36, 2012, 93–103.

**Glavaš 2018**

V. Glavaš, *The legends of rock: stories landscape and boundaries in the Central Velebit Mountain*, in: L. Mirošević, G. Zaro, M. Katić, D. Birt (eds.) *Landscape in Southeastern Europe*, Wien 2018, 15–33.

**Glavičić 2003**

M. Glavičić, *Epigrafski podaci o korištenju vode u Liburniji*, *Histria Antiqua* 10, Pula 2003, 83–89.

**Glavičić 2008**

M. Glavičić, *Epigrafska baština rimskodobnog Epidaura*, *Archaeologia Adriatica* 2, Zadar 2008, 43–62.

**Gnirs 1924**

A. Gnirs, *Beispiele der antiken Wasserversorgung aus dem istrichen Karstlande*, in: M. Abramić, V. Hoffiller (eds.), *Strena Buliciana*, Zagreb, Split 1924, 129–150.

**Horster 2001**

M. Horster, *Bauinschriften römischer Kaiser. Untersuchungen zur Inschriftenpraxis und Bautätigkeit in Städten des westlichen Imperium Romanum in der Zeit des Prinzipats*, *Historia Einzelschriften* 157, Stuttgart 2001.

**Ilakovac 1978**

B. Ilakovac, *Pisani kamen*, *Živa antika* 28, Skopje 1978, 373–376.

**Ilakovac 1982**

B. Ilakovac, *Rimski akvedukti na području sjeverne Dalmacije*, Zagreb 1982.

**Ilakovac 2008**

B. Ilakovac, *Roman aqueducts on the Island of Pag*, Vjesnik Arheološkog muzeja u Zagrebu 41, Zagreb 2008, 129–166.

**Jelić 1898**

L. Jelić, *Povijesno-topografske crtice o Biogradskom primorju*, Vjesnik Arheološkog muzeja u Zagrebu 3, Zagreb 1898, 33–126.

**Kovačić**

Lj. Kovačić, *Antički vodovod Vodovača-Cavtat*, Dubrovnik 2012.

**Krizmanić 2018**

A. Krizmanić, *Amfiteatar u Puli; Vodoopskrbni sustav*, Prostor: znanstveni časopis za arhitekturu i urbanizam 26/2 (56), Zagreb 2018, 218–231.

**Marasović et al. 2016**

K. Marasović, S. Perojević, J. Margeta, M. Katić, D. Bojanić, *Istraživanje salonitanskog akvedukta 2014. – 2015.*, Vjesnik za arheologiju i historiju dalmatinsku 109, Split 2016, 129–154.

**Marasović, Margeta 2017**

K. Marasović, J. Margeta, *Istraživanje antičkih vodnih zahvata na izvoru rijeke Jadro*, Vjesnik za arheologiju i historiju dalmatinsku 110 (2), Split 2017, 509–532.

**Matijašić 2018**

R. Matijašić, *Water Supply in Roman Istria*, in: E. Tamburrino (ed.), *Aquam ducere II, Proceedings of the Second International Summer School, Water and the City: Hydraulic Systems in the Roman Age (Feltre, 24th–28th*

*August 2015)*, Seren del Grappa 2018, 67–79.

**Medini 1969**

J. Medini, *Epigrafički podaci o munificencijama i ostalim javnim gradnjama iz antičke Liburnije*, Radovi Filozofskog Fakulteta u Zadru 6 (3), Zadar 1969, 45–75.

**Miletić 2017**

Ž. Miletić, *Rimski akvedukt Vrana-Zadar*, in: B. Došen (ed.), *Braća Vranjani i vransko područje tijekom povijesti*, Zadar 2017, 39–51.

**de Montauzan 1908**

G. de Montauzan, *Les Aqueducs antiques du Lyon*, Pariz 1908.

**Rendić-Miočević 1968**

D. Rendić-Miočević, *Novi Dolabelin "terminacijski" natpis iz okolice Jablanca*, Vjesnik Arheološkog muzeja u Zagrebu 3, Zagreb 1968, 63–73.

**Rendić-Miočević 1974**

D. Rendić-Miočević, *Novootkriveni Domicijanov natpis o fulfinskom vodovodu*, Vjesnik Arheološkog muzeja u Zagrebu 8, Zagreb 1974, 47–53.

**Riđanović, Bičanić 1993**

J. Riđanović, Z. Bičanić, *Hrvatski Jadran i novi teritorijalni ustroj (prostorni pojam, duljina i razvedenost hrvatske obale)*, Acta Geographica Croatica 28, Zagreb 1993, 85–97

**Sanader 2003**

M. Sanader, *Tilurium I. Istraživanja – Forschungen*. 1997. – 2001., Zagreb 2003.

**Šašel, Šašel 1986**

A. Šašel, J. Šašel, *Inscriptiones latinae quae in Iugoslavia inter annos MCMLXX et MCMLXXX repertae et editae sunt*, Situla 25, Ljubljana 1986.

**Šegvić 1998**

M. Šegvić, *Stanovništvo Konavala u rimsko doba*, in: V. Stipetić (ed.), *Konavle u prošlosti, sadašnjosti i budućnosti*, Zbornik radova sa znanstvenog skupa "Konavle u prošlosti, sadašnjosti i budućnosti" 1, Dubrovnik 1998, 9–30.

**Vežić 2016**

P. Vežić, *Zdenac prokonzula Tamphila Vaale na forumu u Zadru*, 2016, Diadora 30, Zadar 2016, 97–108.

**Wilkes 1976**

J. J. Wilkes, *The Boundary Stones in Roman Dalmatia, I. The Inscriptions*, Arheološki vestnik 25, Ljubljana 1976, 258–271.

**Wilson 2008**

A. I. Wilson, *Hydraulic Engineering and Water Supply*, in: J. P. Oleson, (ed.), *The Oxford Handbook of Engineering and Technology in the Classical World*, Oxford 2008, 285–318.

**Zaninović 1985**

M. Zaninović, *Prata legionis u Kosovom polju kraj Knina s osvrtom na teritorij Tilurija*, Opuscula archaeologica 10, Zagreb 1985, 63–79.