

LIBER II

- 64 Persecutus ea quae de modulis dici fuit necessarium nunc ponam, quem modum quaeque aqua, ut principum commentariis comprehensum est, usque ad nostram curam habere uisa sit quantumque erogauerit; deinde quem ipsi scrupulosa inquisitione praeunte prouidentia optimi diligentissimique Neruae principis inuenerimus. fuerunt ergo in commentariis in uniuerso quinariarum decem duo milia septingentae quinquaginta quinque, in erogatione decem quattuor milia decem et octo: plus in distributione quam *in* accepto computabatur quinariis mille ducentis sexaginta tribus. huius rei admiratio, cum praecipuum officii opus in exploranda fide aquarum adque copia crederem, non mediocriter me conuertit ad scrutandum, quemadmodum amplius erogaretur, quam in patrimonio, ut ita dicam, esset. ante omnia itaque capita ductuum metiri aggressus sum, set longe, id est circiter quinariarum decem milibus, amplio rem quam in commentariis modum inueni, ut per singulas demonstrabo.
- 65 Appiae in commentariis adscriptus est modus quinariarum octingentarum *quadraginta* unius. cuius aquae ad caput inueniri mensura non potuit, quoniam ex duobus riuis constat. ad Gemellos tamen, qui locus est infra Spem ueterem, ubi iungitur cum ramo Augustae, inueni altitudinem aquae pedum quinque, latitudinem pedis unius dodrantis: fiunt areae pedes octo dodrans: centenariae uiginti duae et quadragenaria, quae efficiunt quinarias mille octingentas uiginti quinque: amplius quam commentarii habent, quinariis nongentis octoginta quattuor. erogabat quinarias septingentas quattuor: minus, quam in commentariis adscribitur, quinariis centum triginta septem: et adhuc minus, quam ad Gemellos mensura respondet, quinariis mille centum uiginti una. intercidit tamen aliquantum e ductus uitio, qui quom sit depressior, non facile manationes ostendit, quas esse ex eo adparet quod in plerisque urbis partibus probata aqua obseruatur, [id] quae ex

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64. Going on from what it has been necessary to say with regard to the *ajutages*, I will now give the discharge which each aqueduct was thought to have had, up to my term of office, according to the imperial records, and how much it did deliver; then the discharge, which I found by careful investigation, acting on the prudent suggestion of that best and most active ruler, Nerva (Trajanus).¹ There were, be it noted, in the aggregate twelve thousand seven hundred and fifty-five *quinariae* recorded, fourteen thousand and eighteen discharging water; that is, 1,263 more were reported as delivering water than had been received. Astonished at this, I felt it to be no small part of my duty to investigate, so as to arrive at reliable data concerning the aqueducts and their discharge, and to see how it could come about that more was being delivered than belonged, so to speak, to the estate. So, before doing anything else, I set about measuring the intakes of the conduits; but I found a much greater measure,—that is, one exceeding the recorded figures by about 10,000 *quinariae*,—as I shall show in detail.

65. Appia is credited in the records with 841 *quinariae*. This aqueduct could not be gauged at the intake, because it there consists of two channels; but at the Twins, which is below Spes Vetus, where it joins the branch of the Augusta, I found a depth of water of 5 feet, and a width of one foot plus $\frac{3}{4}$, making $8\frac{3}{4}$ square feet of area, twenty-two 100-pipes plus one 40-pipe, which makes 1,825 *quinariae*; more than the records have it by 984 *quinariae*. It was discharging 704 *quinariae*; less than credited in the records by 137 *quinariae*, and, furthermore, less than given by the gauging at the Twins by 1,121 *quinariae*. But a considerable quantity of water is lost through leaks in the conduit, which is not readily seen on account of the depth at which the conduit is located, but whose existence may be inferred from the circumstance that in many wards of the city excellent water is met

¹ Trajan is no doubt meant here. In Book I. Frontinus speaks of "Nerva Augustus;" in Book II. he says "Divus Nerva," the sainted Nerva; whence the argument that Book I. was begun under Nerva, and Book II. finished under Trajan.

ea manat. set et quasdam fistulas intra urbem inlicitas deprehendimus. extra urbem autem propter pressuram librae, quom sit infra terram ad caput pedibus quinquaginta, nullam accipit iniuriam.

66 Anioni ueteri adscriptus est in commentariis modus quinariarum mille quadragentarum quadraginta unius. ad caput inueni quattuor milia trecentas nonaginta octo praeter eum modum qui in proprium ductum Tiburtium deriuatur: amplius, quam in commentariis est, quinariis duobus milibus [octin]gentis quinquaginta septem. erogabantur antequam ad piscinam ueniret quinariae ducentae sexaginta duae. modus in piscina, qui per mensuras positas initur, efficit quinariarum duo milia trecentas sexaginta duas. intercidebant ergo inter caput et piscinam quinariae mille septingentae septuaginta quattuor. erogabat post piscinam quinarias mille trecentas quadraginta octo: amplius, quam in commentariis conceptionis modum significari diximus, quinariis *centum* sexaginta nouem: minus, quam recipi in ductum post piscinam posuimus, quinariis mille decem quattuor. summa quae inter caput et piscinam et post piscinam intercidebat: quinariae duo milia septingentae octoginta octo, quod errore mensurae fieri suspicarer, nisi inuenissem ubi auerterentur.

67 Marciae in commentariis adscriptus est modus quinariarum duum milium centum sexaginta duarum. ad caput mensus inueni quinarias quattuor milia sexcentas nonaginta: amplius, quam in commentariis est, quinariis duobus milibus quingentis uiginti octo. erogabantur antequam ad piscinam perueniret quinariae nonaginta quinque, et dabantur in adiutorium Tepulae quinariae nonaginta duae, item *in* Anionem quinariae centum sexaginta quattuor. summa quae erogabatur ante piscinam: quinariae trecentae quinquaginta una. modus qui in piscina mensuris positus initur cum eo qui circa piscinam ductus eodem canali in arcus excipitur, efficit quinarias duo milia nongentas quadraginta quattuor. summa quae aut erogatur ante piscinam aut *in* arcus recipitur: quinariarum tria milia ducentae nonaginta quinque: amplius, quam in conceptis commentariorum positum est, quinariis mille centum triginta tribus: minus, quam mensurae ad caput actae efficiunt, quinariis mille trecentis nonaginta quin-

with, which is the water that leaks from the conduits. But we have also found illicit pipes within the city. Outside the city, on the other hand, on account of the water level, which at the intake is fifty feet under ground, the conduit has suffered nothing unlawful.

66. Anio Vetus is credited in the records with the quantity, 1,441 *quinariae*. At the intake I found 4,398, exclusive of the quantity which is drawn into the conduit which belongs to them of Tivoli; more than is recorded by 2,957 *quinariae*. There were discharged, before reaching the settling reservoir, 262 *quinariae*; the quantity at the reservoir, determined from the gauges placed there, was 2,362 *quinariae*; so that 1,774 *quinariae* were lost between the intake and the reservoir. Downstream from the reservoir 1,348 *quinariae* were discharged; more than we have stated to be the capacity according to the records by 169¹ *quinariae*; less than we have shown was received into the conduit from the settling reservoir by 1,014 *quinariae*. The total that was lost between the intake and the reservoir and downstream from the reservoir amounted to 2,788² *quinariae*, which I should have ascribed to error in measurement, had I not found where it was diverted.

67. Marcia is credited in the records with the quantity, 2,162 *quinariae*. Gauging it at the intake, I found 4,690 *quinariae*; more than is in the records by 2,528 *quinariae*. There were discharged before Marcia reaches the settling reservoir 95 *quinariae*, and 92 *quinariae* are given to supplement Tepula, likewise 164 *quinariae* to Anio; the aggregate discharged before reaching the reservoir is 351 *quinariae*. The quantity at the catch basins computed from the gauges placed there, along with that which is conducted around the basins and is carried upon arches, is 2,944 *quinariae*. The aggregate of what is either discharged upstream from the reservoir or received on the arches is 3,295 *quinariae*; more than is set down in the schedule of the records by 1,133 *quinariae*; less than the gaugings taken at the intake by 1,395 *quinariae*. Eighteen hundred and forty *quinariae* were discharged after passing the reservoir; less than we have said was set down in the records by 227³ *quinariae*; less than is taken from the

¹ 1,441—262=1,179. And 1,348=1,179+169.

² 1,774+1,014=2,788.

³ 2,162—1,840—95=227.

que. erogabat post piscinam quinarias mille octingentas quadraginta: minus, quam in commentariis conceptionis *modum* significari diximus, quinariis ducentis uiginti septem: minus, quam ex piscina in arcus recipiuntur, [sunt] quinariis mille centum quattuor. summa utraque quae intercidebat aut inter caput et piscinam aut post piscinam: quinariarum duo milia ID, quas sicut in ceteris pluribus locis intercipi deprehendimus. non enim eas cessare manifestum est et ex hoc [eo] quod *ad* caput praeter eam mensuram, quam comprehendisse nos capacitate ductus posuimus, effunduntur amplius trecentae quinariae.

- 68 Tepulae in commentariis adscriptus est modus quinariarum quadringentarum. huius aquae fontes nulli sunt; uenis quibusdam constabat, quae interceptae sunt in Iulia. caput ergo eius obseruandum est a piscina Iuliae. ex ea enim primum accipit quinarias centum nonaginta, deinde statim ex Marcia quinarias nonaginta duas, praeterea ex Anione nouo ad hortos Epaphroditianos quinarias centum sexaginta tres. fiunt omnes quinariae quadringentae quadraginta quinque: amplius, quam in commentariis, quinariis quadraginta quinque, quae in erogatione conparent.
- 69 Iuliae in commentariis adscriptus est modus quinariarum sexcentarum quadraginta nouem. ad caput mensura iniri non potuit, quoniam ex pluribus acquisitionibus constat, set *ad* sextum ab urbe miliarium uniuersa in piscinam recipitur, ubi modus eius manifestis mensuris efficit quinarias mille ducentas sex: amplius quam in commentariis, quinariis quingentis quinquaginta septem. praeterea accipit prope urbem post hortos Pallantianos ex Claudia quinarias centum sexaginta duas. est omne Iuliae in acceptis: quinariae mille trecentae sexaginta octo. ex eo dat in Tepulam quinarias centum nonaginta, erogat suo nomine octingentas tres. fiunt quas erogat quinariae nongentae nonaginta tres: amplius, quam in commentariis habet, quinariis trecentis quadraginta quattuor: minus, quam in piscina habere posuimus, ducentis decem tribus, quas ipsas aput eos, qui sine beneficiis principis usurpabant, deprehendimus.
- 70 Virgini in commentariis adscriptus est modus quinariarum [sex] centarum quinquaginta duarum. huius mensuram ad caput

reservoir upon the arches by 1,104 *quinariae*. The aggregate of what was lost either between the intake and the reservoir or downstream from the reservoir was 2,499¹ *quinariae*, the diversion of which, as in case of the other aqueducts, we discovered at several places. For, that there is no lack of such is manifest also from the fact that at the intake, besides the volume that we found in the conduit, over 300 *quinariae* are wasted.

68. Tepula is credited in the records with 400 *quinariae*. This aqueduct has no springs to supply it; it consists only of some veins of water taken from Julia. Its intake is therefore to be set down as beginning with the Julian reservoir, for from this it first receives 190 *quinariae*; then immediately thereafter 92 *quinariae* from Marcia, and further from Anio Novus at the Epaphroditian Gardens 163 *quinariae*. This makes in all 445 *quinariae*; more than in the records by 45 *quinariae*; but they appear in its delivery.

69. Julia is credited in the records with a measure of 649 *quinariae*. At the intake the gaugings could not be made, because the intake is composed of several tributaries. But at the sixth mile-stone from the city Julia is wholly taken into the settling reservoir, at which place its measure, according to the plainly visible gauges, amounts to 1,206 *quinariae*; more than set down in the records by 557 *quinariae*; besides this, it receives, near to the city, behind the Pallantian Gardens, from Claudia 162 *quinariae*, making the whole of the *quinariae* received by Julia 1,368. From this it discharges 190 into Tepula, and delivers on its own account 803 *quinariae*; from this we get a total of 993 *quinariae* which it delivers; more than it has in the records by 344 *quinariae*; less than we set it down as having in the reservoir by 213, which is precisely the amount we found was being used by those who had seized upon it without grant from the sovereign.

70. Virgo is credited in the records with a measure of 752 *quinariae*. The gauging could not be made at the intake, because Virgo is made up of several tributaries, and enters its channel with too slow a current. Near to the city, however, at the seventh mile-stone, on the land which now belongs to Cejonius Commodus, and where Virgo has a greater velocity, I made the gauging, and it amounted to 2,504

¹ 4,690—(1,840+351)=2,499.

inuenire non potui, quoniam ex pluribus acquisitionibus constat et lenior riuom intrat. prope urbem tamen ad miliarium septimum in agro qui nunc est Ceionii Commodi, ubi uelociorem † sam cursum habet, mensuram egi quae efficit quinariarum duo milia quingentas quattuor: amplius, quam in commentariis, quinariis mille [octin] gentis quinquaginta duabus. adprobatio nostra expeditissima est; erogat enim omnes quas mensura deprendimus, id est duo milia quingentas quattuor.

71 Alsietinae conceptionis modus nec in commentariis adscriptus est nec in re praesente certus inueniri potuit, cum ex lacu Alsietino et deinde circa Careias ex Sabatino * * quantum aquarii temperauerunt. Alsietina erogat quinarias trecentas nonaginta duas.

72 Claudia abundantior aliis maxime iniuriae exposita est. in commentariis habet non plus quinariis duobus milibus octingentis quinquaginta quinque, cum ad caput inuenerim quinariarum quattuor milia sexcentas septem: amplius, quam *in* commentariis, mille septingentis quinquaginta duabus. adeo autem nostra certior est mensura, ut ad septimum ab urbe miliarium in piscina, ubi indubitatae mensurae sunt, inueniamus quinarias tria milia trecentas decem duas: plus, quam in commentariis, quadringentis quinquaginta septem, quamuis et ex beneficiis ante piscinam eroget et plurimum subtrahi deprehenderimus ideoque minus inueniatur, quam re uera esse debeat, quinariis mille ducentis nonaginta quinque. et circa erogationem autem fraus adparet, quae neque ad commentariorum fidem neque ad eas quas ad caput egimus mensuras, neque ad illas saltem † ad piscinam post tot iniurias sunt, conuenit. solae enim quinariae mille septingentae quinquaginta erogantur: minus, quam commentariorum ratio dat, quinariis mille centum quinque: minus autem, quam mensurae ad caput factae demonstrauerunt, quinariis duobus milibus octingentis quinquaginta septem: minus etiam, quam in piscina inuenitur, quinariis mille quingentis sexaginta duabus. ideoque cum sincera in urbem proprio riuo perueniret, in urbe miscebatur cum Anione nouo, ut confusione facta et conceptio earum et erogatio esset obscurior. quod si qui forte me acquisitionum mensuris blandiri putant, admonendi sunt adeo Curtium et Caeruleum fontes aquae Claudiae

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