

CHAPTER 14

URBAN INFRASTRUCTURE

This chapter examines the development of the infrastructure of the Roman town, taking the story on from the foundation of the Iron Age *oppidum* to the full development of the street-grid (the beginnings of which were touched on in Chapter 11, pp. 344–9) and the roads which connected this town to those beyond. It also discusses other aspects of infrastructure such as the supply of water, combining a mapping of the wells from the excavations with the road drains from the geophysical survey and the topography from the LiDAR to see how both water provision and wastewater management were handled.

THE DEVELOPMENT OF THE ‘ROMAN’ STREET-GRID

HISTORIOGRAPHY

Ever since Stair’s early plan the basic outline of the Roman street-grid has been clear: Silchester had a traditional Roman grid. There was, however, one area of concern: the main east–west road was a puzzle as it came in from the West Gate, passed to the north of the Forum, but then appeared to run directly towards a solid stretch of the Town Wall to the east. Maclauchlan (1851, 230) was exercised by this and eighteenth-century cartographers made plans with streets askew to try to rectify this anomaly. Joyce contributed to the debate by first discovering the Amphitheatre Gate, not too far from where the main east–west road might have intersected with the Town Wall; then a few years later he finally discovered the main East Gate or *Porta Orientalis Londinensis* (Joyce 1881b, 345–6), though not quite where everyone was expecting it. However, it awaited the Antiquaries’ later seasons to finally flesh out the outline of the road network in this area, where straight Roman roads curved and went off at angles.

During the twentieth century, Cotton discovered that the streets ran under the Town Bank and Wall, and were thus earlier. Pursuing this line of enquiry she set out to investigate whether the roads originally continued further by examining Rye Meadow (LP 6667, Exteriors 9 and 13, FIGS 6.26 and 6.38). Confirmation came from digging successive trenches following the course of an east–west street to a crossroads where a new street, slightly off-grid, continued right out to the Outer Earthwork (Sandy’s Lands). Boon, inspired by this, went further to imagine the grid might have extended out to the north-east and south-west as well (Boon 1974, foldout plan); but no subsequent work has provided any supporting evidence for this to the north-east, though one of the insulae does seem to have originally projected out to the south-west, just touching the edge of the Rampier Copse enclosure (see Exterior 21, FIGS 6.62–64).

Having established the extent of the grid, the question then became ‘when was it established and how?’ Most of the discussions implicitly imagined the grid was predominantly laid out at one date as one action. Haverfield, seeing a unified town plan, hazarded its origin might have been under Agricola (Haverfield 1894). Cotton also envisaged it as being ‘obviously the work of a surveyor who planned it as a whole’ (Cotton 1947, 135), so she sought to find a single date from the evidence. She concurred with Haverfield that the influence of Agricola or his immediate successors and their intensive Romanisation agenda must have been at play, and material culture suggested it was all laid out in A.D. 90–120 (Cotton 1947, 137). This was taken up in the broader literature. Liversidge similarly associated this major endeavour with historic events or personages, thus: ‘after Hadrian’s visit in AD 122, if not earlier, Silchester, like so many

other towns, seems to have taken stock of its situation and a proper town-plan was devised with insulae bounded by a grid of new streets' (Liversidge 1968, 35). For Boon the Hadrianic date was too late for his concept of *Calleva*. He imagined the core of the grid as being essentially Flavian and post-Cogidubnian, signifying the incorporation of the town as a formal *civitas* into the Roman province; Cotton's outlying later streets to him represented a later extension. He used his Trenches H and K south of the town to justify his earlier dating (Boon 1969, 9, 12, 39; 1974, 53, 91).

Fulford has aired a wide variety of historical explanations over his years studying the town. Originally he accepted the very late Flavian date for the street-grid (Fulford 1984, 81; 1993, 17). Later, when the Insula IX excavations were suggesting that the main north-south road was probably earlier, he considered the new grid might have its origin in a Neronian re-planning associated with the investment seen in the brickworks and tilery, as evidenced by the Neronian stamped tiles, and a possible palace (Fulford 2003, 102). Later still, while he was talking-up some burnt deposits in Insula IX, considering they might be related to a Boudican destruction of the town, he thought the destruction could have required the whole town to have been entirely re-planned (Fulford and Clarke 2009b). Nonetheless, in addition to the speculation on the causation behind the development of the grid, he has also provided additional firm evidence from his excavations of the Iron Age lanes and Roman streets from the Basilica and Insula IX sites, as well as at the North Gate, as we shall see.

METROLOGY

The notion of a layout-event, even if restricted to just an inner core of the later network, incorporates the connotation of there having been a master plan behind the grid. Hence, a series of articles throughout the twentieth century explored what this might have been and how it had been measured, since it is obviously a less-than-perfect uniform grid. Haverfield, in his overall survey of Roman town-planning, perceived that many town insulae were the size of one *iugerum* (120 x 240 Roman feet). At Silchester he imagined the original core block bounded by Insulae X, XXXI, XXXV and XIX to have been laid out in one go, based on three differently sized insulae, 384 x 390 ft (117 x 119 m), 384 x 267 ft (117 x 81 m), and 267 x 240 ft (81 x 73 m). However only in the last of these did the distance of 240 Roman feet appear and that without a conversion from Roman to Imperial measurements. Silchester was indeed a very imperfect example (Haverfield 1913, 79, 129).

Boon conducted his own analysis, concluding most of the insulae were based on rectangles either 119.5 x 119.5 m or 119.5 m x 79.7 m, the common multiple being 39.83 m, which Boon took to represent 120 x 0.3319 m, or 120 *pedes Drusiani* rather than the more commonly used *pes monetalis* (Boon 1974, 92–7) — the former being one-eighth longer than the latter according to Hyginus (*Corpus Agrimensorum Romanorum* V). An important part of Boon's discussion, however, was underscoring how unreliable much of the data was in this exercise: from the inaccuracies in the Antiquaries' excavation drawings and the Great Plan itself, down to the problems of knowing how long a *pes monetalis* or *pes Drusianus* was in the first place. This potential inaccuracy in all of the survey plans needed to be pointed out to explain away wide margins of error between his conception and the actual distances on the ground. Nonetheless, problems with the core data did not stop Philip Crummy entering the debate with his own conjectures focusing on British towns, though reverting to using the *pes monetalis*. He noted the recurring use of the three dimensions of 250, 275 and 400 *p.M.* (c. 74.0, 81.4 and 118.4 m) which he considered 'wholly convincing' that *pedes monetales* were the units used (Crummy 1982, 130). He returned to the theme twice more (Crummy 1985; 1993), partly due to the debate that had ensued about whether the *pes Drusianus* or *monetalis* was the appropriate measure to use. Walthew preferred the *pes monetalis* in the creation of property boundaries at Silchester (Walthew 1978, 339–41; see also Walthew 1981; 1987). Others also entered the fray with their own particular spin on the topic (Duncan-Jones 1980, 129; Millett 1982; Bridger 1984; Ford 1994). Ultimately precision in the plans was lacking. Furthermore uncertainty about the unit of original measurement makes any absolute conclusions difficult, although Crummy's conceptual illustration showing the broad division of the town into proportional blocks based on Boon's plan does demonstrate a clear sense of order (Crummy 1993,

fig. 6), even if his other plan with individual measurements shows a profound sense of imprecision in the original surveying (Crummy 1982, fig. 5). But had there been a single overall plan at all?

THE EVIDENCE FOR THE EVOLUTION OF THE GRID

The evidence that the grid was not a one-off re-orientation of the town arrived with Boon's dating of his excavated roads in the centre proving to be earlier than Cotton's dating (see above). Since then Fulford's work has provided more detailed evidence. The excavations at the Basilica revealed buildings on the 'Roman' axial alignment from Period 4, with its Tiberio-Claudian *terminus post quem* significantly earlier than Boon's Flavian origin myth, and this seems to be confirmed by the recent work in Insula IX which has shown that the main north-south street of the town was probably Claudian and much earlier than the east-west street (see pp. 344–9, FIGS 5.18 and 11.2) (Fulford and Clarke 2011b, 19). This means that some elements of the street-grid were much earlier than others. There might have been a one-off early core, but there might also have just been the north-south road on its own, which development then took off from, with the early core grid followed by later peripheral developments. Gradual expansion is how other towns are also now seen, for example, the evolving grid at Wroxeter (White *et al.* 2013, 173–9). The dating evidence for Silchester is listed below (in the order of discovery), and summarised on FIG. 14.1:

- (1) **An east-west road cutting the Public Baths** – the road on the north side of Insula

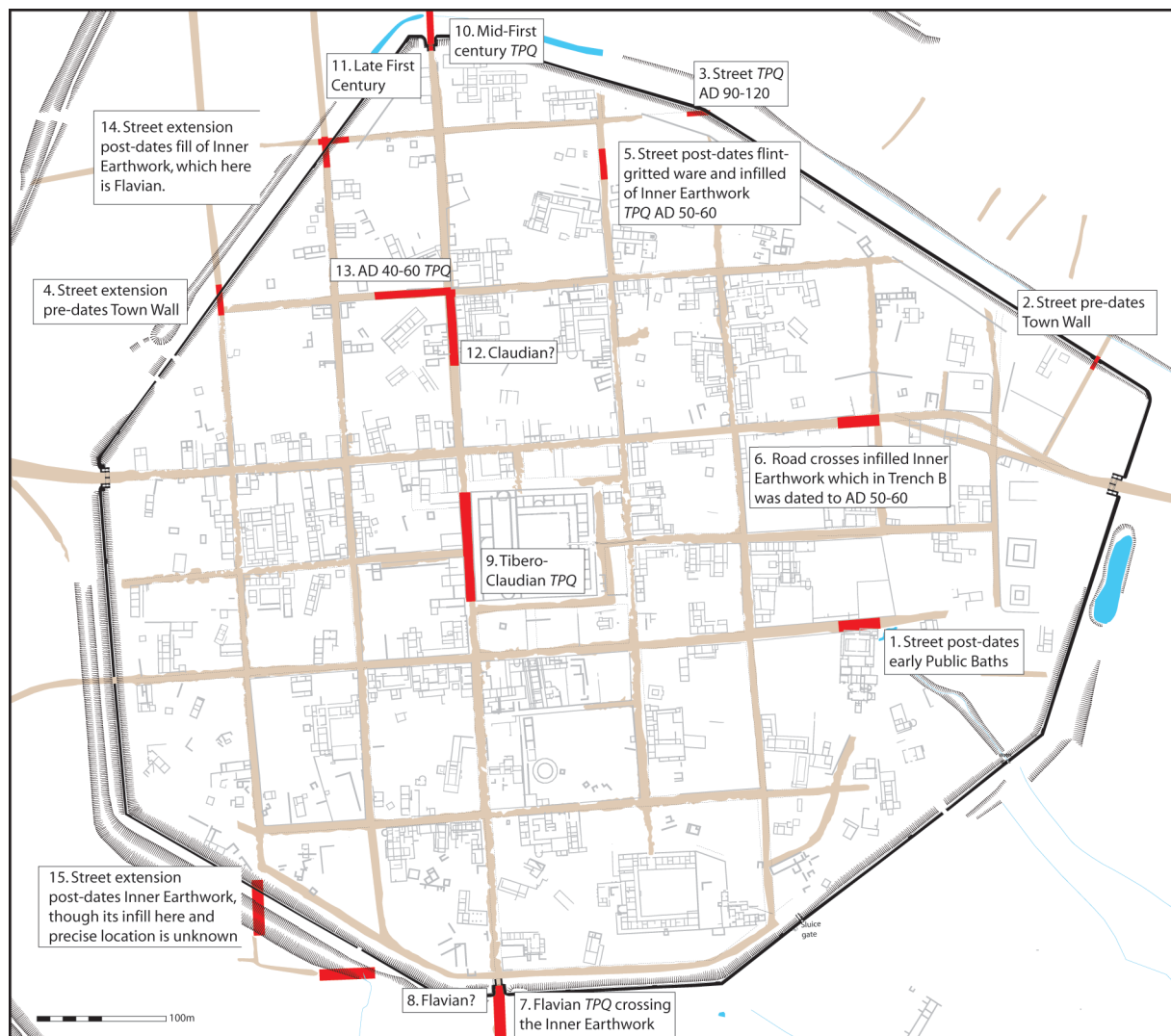


FIG. 14.1. Dating evidence for the Roman street-grid.

- XXXIII required the demolition of the portico of the Public Baths, so must post-date it. It is imagined to be Neronian but secure dating evidence is absent (FIG. 5.44; St John Hope and Fox 1905a, 346).
- (2) **The road through the Amphitheatre Gate** – Cotton observed that there was a road pre-dating the Town Rampart and Wall (pre-A.D. 180–200), but no dating evidence was obtained. If heading to the Amphitheatre it should logically post-date its construction in *c.* A.D. 55–77 (FIG. 5.24; Cotton 1947, 131, Site F).
 - (3) **An east–west road near the North Wall** – Cotton’s Site C excavated the point where an east–west road intersected the Town Wall. It found that the street went under the Town Rampart, but also sealed ‘Clay Floor II of Hut Ci’ which contained a coin of Domitian (A.D. 81–96). She gave this road a broad *terminus post quem* of A.D. 90–120, and a *terminus ante quem* of A.D. 180–200 (FIG. 5.9; Cotton 1947, 137, Site C).
 - (4) **The roads to the north-west in LP 6667 and 6472** – Cotton investigated these in a number of trenches, identifying them to be 4.88–5.03 m wide with a good camber, but more thinly metalled than the streets inside the Town Walls. There was little trace of side ditches, which the geophysics corroborate. Unfortunately no dating material was found, largely because there was little occupation material beside the road to get incorporated into the features (Cotton 1947, 135). Fulford was sceptical about Cotton’s discoveries: ‘In the narrow trenches she employed, the identification of a gravel street intersection in the context of a gravel subsoil may have been mistaken. Certainly recent area excavation around Rye House has produced no further evidence in support’ (Fulford 1993, 29); however, since a projection of Cotton’s road did not even pass through the area excavated at Rye House, Fulford’s evidence for rejection can be dismissed (FIG. 6.26). Projecting the east–west road out further, beyond the Outer Earthwork, a potential roadside ditch was revealed in the fluxgate gradiometry suggesting there is no need to doubt there was once an extension to the grid, creating a very large block around the newly discovered Later Iron Age or Early Roman burial enclosures (FIG. 6.40).
 - (5) **A secondary north–south road** – Boon’s Trench B cut across the Inner Earthwork and street; under the metalling he reported finding some scraps of flint-gritted ware, but ‘the underlying 12–18 inches of clean bank-gravel was devoid of finds, as was the surface below’ (FIG. 5.9; Boon 1969, 9).
 - (6) **The main east–west road** – when Boon’s ‘Trench K’ explored the relationship between the east–west road and the Inner Earthwork, he wondered if there had been an earlier entranceway there; there was not and the road carried straight over the ditch. When he cut down through the main east–west road (FIG. 5.19), Boon identified multiple layers of metalling, of which ‘the lowest two [were] well-separated from the others by dirty gravel and earth’ (Boon 1969, 10, pl. Vc). The infill of the north-east section of the Inner Earthwork dates to *c.* A.D. 50–60, so the grid extension east is likely to post-date that.
 - (7) **The main north–south road, crossing the southern Inner Earthwork** – Boon’s Trench H explored the road to Winchester crossing the Inner Earthwork south of the South Gate (FIG. 6.62). Here the street went over both the Inner Earthwork and also a black occupation layer containing a Dr. 36 Flavian cup. He concluded: ‘the occupation therefore again offers a Flavian *terminus post quem* for the construction of the street’ (Boon 1969, 12).
 - (8) **The main north–south road** – as the road exited through the South Gate it appeared to be Flavian. Metalling sealed six pre-Flavian gullies on the east side of the road. The metalling, with a drain in the middle, sealed assemblages of butt beaker, Silchester ware and Roman brick or tile; the latter was not hitherto known until Neronian contexts (FIG. 5.50; Fulford 1984, 37), though some was later found in pre-conquest Period 1–3 contexts in the Basilica excavation (Fulford and Timby 2000, 121).
 - (9) **The main north–south road near the Basilica** – while the Basilica excavation did not excavate any part of the Roman street-grid, the Period 4 building on its new alignment only makes sense if the north–south road had been constructed at a similar time, which would suggest a date with a Tiberio-Claudian *terminus post quem* (FIG. 5.31).

- (10) **The main north–south road** – beyond the North Gate the road was sampled by the water main trench. Here the assemblage recovered indicated a mid-first-century *terminus post quem* (Fulford *et al.* 1997, 158).
- (11) **The main north–south road** – as it exited through the North Gate, a late first-century metalling is suggested. The earliest street surface (115) dated to the late first century and was flanked by roadside gullies (F42/F51) which dated to the late first or early second century (FIG. 5.6; Fulford *et al.* 1997, 91–2).
- (12) **The main north–south road** – within Insula IX interim statements state that in 2010 excavation at the junction of the east–west and north–south roads showed the former overlay Claudio-Neronian burnt material, though the north–south street lay directly on natural gravel. This correlated with other evidence that suggested possible early buildings were aligned on the north–south street (Interim Report, so subject to change) (FIG. 5.18; Fulford *et al.* 2011, 6).
- (13) **A secondary east–west road** – the road on the northern side of Insula IX is reported to seal material dating to A.D. 40–60 (Interim Report, so subject to change) (FIG. 5.18; Clarke *et al.* 2005, 3).
- (14) **Grid extension crossing Inner Earthwork** – an observation from this survey is that the grid to the north-west crosses the Inner Earthwork, which here had Claudio-Flavian primary fills and late Flavian/Trajanic settlement into the top (FIG. 6.40; see p. 308).
- (15) **Grid extension crossing Inner Earthwork** – the corner of the roads crossing the Inner Earthwork (wherever it precisely is) which then adjoins the Rampier Copse enclosure. Undated (FIG. 6.64).

Collectively the evidence could lead one to imagine a broadly three-phase development:

First, an early core was laid out, with the north–south road and the two or three east–west roads from north and south of the Forum area, perhaps just covering Insulae XIV, XVI, II, III, IV, V and VI to start with. This includes the area of Fulford’s hypothetical palatial building (see p. 435).

Secondly, the first additional rows of insulae to the north and south may have been added later. The new east–west roads to the north and south were a greater distance apart, making these insulae ‘taller’ in their north–south dimension. Dating evidence on the north side places this post-A.D. 40–60 (as judged by Insula IX evidence).

Thirdly, the second set of ‘taller’ insulae to the north are later still, being Flavian (as judged by the crossing of the infilled Inner Earthwork to the north-west and the dating from Cotton’s excavation).

Similarly, expansion east and west might have been progressive, as indicated by the Public Baths. These might have been constructed down near the stream and Inner Defences Ditch before the road was extended out east; hence when the line was projected, it required the building’s portico to be demolished and reconfigured.

This sequence of development is shown in FIGS 17.1–2, in a series of interpretative plans of the development of the town.

REVISIONS TO THE STREETS IN BOON’S 1974 PLAN

This section summarises the differences between the Boon 1974 plan and the results of this survey. The main changes are: reducing the projected extensions of the grid outside the walled area, adding more evidence for an intramural and intra-Inner-Earthwork street, and other smaller adaptations in the mid-eastern part of the town where Boon ‘straightened up’ a few buildings and roads which are genuinely askew relative to the main grid.

Outside the town:

- To the north-east, none of Boon’s imagined roads exists; several new roads on a south-west to north-east alignment are proposed (Exterior 10, FIGS 6.29–31).
- To the north-west, while Cotton showed that some of the grid continued out in this direction, the angles were not perfect (Boon adjusted some to make them 90 degrees,

while Cotton had showed them as being imperfect; she has been corroborated by the fluxgate gradiometry). The grid was not quite as extensive as Boon imagined as space was made around the Later Iron Age or Early Roman burial enclosures (Exteriors 9 and 13, FIGS 6.26–28 and 6.38–40).

- To the south-west, Boon's projection into the Rampier Copse enclosure is too extensive; although his projected east–west road and the north–south one running between Insulae XXB and XVIIIIB do exist, that to the west of Insula XXB does not (Exterior 21, FIGS 6.62–64).

Within the town:

- There are intermittent traces of a linear feature just inside the Town Wall Bank, which could be indicative of an intramural road. Boon represents one on the western side of Insulae XIII, XV and XXA. This is highly likely and not discounted by the fluxgate gradiometry, but since the roads generally only show in the fluxgate gradiometry by the presence of side ditches and buildings on either side, here if they do exist they are less than obvious, so they have been excluded from the interpretive image but might exist nonetheless (Interiors 8 and 12, FIGS 6.25–27 and 6.38–40). In Insula XX a south-eastern edge intramural road is suggested (Interior 12, FIGS 6.25–27). It is not quite so clear along the southern edge of Insulae XVIIIIB and XVIIIIA (Interior 15, FIGS 6.47–49). It seems clearer again round the southern side of the town (Interior 16, FIGS 6.50–52).
- I find no evidence to support the northern extension to the wall of the north–south road between Insulae XXVII and XXXVIA. Had there been one it should also have been picked up in Cotton's Site B, which it was not (Interior 3, FIGS 6.9–11).
- The north–south street between Insulae XXVII and XXXVIA is distinctly less straight than Boon represents it and is slightly twisted clockwise by a few degrees (Interior 6, FIGS 6.19–21).
- Boon's plan significantly rotated the Insula XXXVI temple enclosure to align with the grid. It and all the roads around it are genuinely askew (Interior 7, FIGS 6.22–24).
- Boon considered there was a north–south road between Insulae XVIII and XXIX. This would be directly on top of where the filled-in Inner Earthwork is now known to lie. It has not been included as it does not appear in the geophysical survey nor did the Antiquaries note solid evidence for it (Interior 10, FIGS 6.32–34).
- An additional possible east–west lane has been added just to the south of the modern churchyard (Interior 11, FIGS 6.35–37).
- In the south-east of the town, it looks as if there was a street running round just inside the Inner Earthwork Bank up to where the Public Baths were built (Interiors 14 and 17, FIGS 6.44–46 and 6.53–55).

STREET MAINTENANCE

The excavations within the town showed many repeated layers of metalling on the roads, suggesting successive phases of maintenance. These were probably more on a street-by-street basis than town-wide actions. Two sections across the streets flanking Insula IX showed that the main north–south street through the town had multiple layers of fine gravel, whereas some of the layers on the east–west road comprised larger nodules and soil. In both a significant heightening of the street level could be observed of about 0.3 m in the later third century (Fulford *et al.* 2006, 16). This correlates well with Boon's Trench K section which uncovered five street surfaces 'the lowest two well-separated from the others' (Boon 1969, 10); this could represent a comparable significant raising of the street in the mid-Roman period. Abandonment of the main east–west road through the town seems unlikely.

CONCLUSION AND FUTURE RESEARCH

The survey work has firmed up the presence and absence of many Roman streets, updating

Boon's 1974 plan. In the earlier chapter on Silchester's earliest phases, the evolution of the local Iron Age lanes in response to the new north–south Roman main road could be seen (p. 344); here too, we see that the Roman grid itself was not a one-phase creation, but a core area repeatedly extended. In many ways this is more likely. The coercive power necessary to demolish buildings across the entire Iron Age *oppidum* in order to lay out a new street system would have been phenomenal. Had the town been the focus of resistance to the invasion, or the centre of a rebellion on the fall of Cogidubnus (neither of which are attested), then such an action could have been envisaged with a massive population shift (slavery), destruction and re-foundation. But that is not the kind of narrative used for Silchester. It now seems only a core area was laid out with a new Roman-style grid under the period of the Cogidubnian kingdom, containing within it the timber building in the soon-to-be Forum area, and Fulford's hypothesised residential complex to the west. This was then repeatedly extended over the next couple of generations, providing plenty of time to rebuild older wooden structures in a new location should they be in the way (FIGS 17.1–2). Unfortunately for the Public Baths, they were built of stone resulting in the portico having to be sacrificed to the new conceptual layout.

But why re-orientate the town at all? There was already a nascent Later Iron Age co-axial road system on a different orientation, so why was an orientation on the cardinal points necessary? While a large number of Roman towns are so orientated, there are plenty of exceptions, such as *Verulamium* and Canterbury, where the angles of the Rivers Ver and Stour predominate over Roman convention. Rykwert has collated what we know of Roman augury and town foundation (Rykwert 1976, 45–50). While descriptions of cognitively dividing up space into quarters are common, explicit statements about the necessity of adherence to the cardinal points are less so. One exception is Varro describing the acts of an augur in defining a *templum*, where space is divided into four quarters, 'the left quarter, to the east; the right quarter, to the west; the front quarter, to the south; the back quarter, to the north' (Varro, *De lingua latina* 7.7, trans. R.G. Kent); though why it is important is not stated. Certainly, in the texts of the more practically orientated surveyors, the sources clearly state how cardinal orientation could be achieved, using a *sciotherum*, which comprised a standing brass rod in a circle, and plotting where the shadow hit the circle before and after noon. The cord joining these two points was the east–west *cardo*, and perpendicular to this was the *decumanus* (Rykwert 1976, 50). Ultimately the 'why' is a difficult question to answer, and the balance between it being due to a devotion to Roman augury or a sheer expression of will and a display of power by whoever was in charge over a population cannot be answered.

In terms of future research, dating the evolution of the street system is something that could be done without disturbing much of the rest of the stratigraphy on the site. Some judiciously placed excavations through the road gravels down to the Later Iron Age to Flavian material underneath would reveal to us: (a) the evolution of the street system; (b) the extent of the pre-Roman *oppidum* occupation; and (c) further inform us about the regimes of repair and maintenance of the road system (were finer grained gravels used on the main streets in contrast to the side streets, and were there town-wide re-metalling events?). A series of sondages through the roads would not disturb and destroy the complex urban archaeology that lies on either side, and could significantly enhance our spatial understanding of the site.

THE PROVISION AND DISPOSAL OF WATER

Boon (1974, 85–90) provides a good overview of the water supply and drainage on the site, so this section will restrict itself to several aspects where mapping the features onto the relative elevations provides evidence about supply and wastewater management.

WATER SUPPLY: WELLS, PUMPS AND PIPED WATER

The provision of water within Silchester was almost never a problem. The gravel terrace sits above Bagshot formation sands, which are themselves on top of London Clay. Wells cut through the relatively stable gravel into the sand would generally draw water unable to percolate further

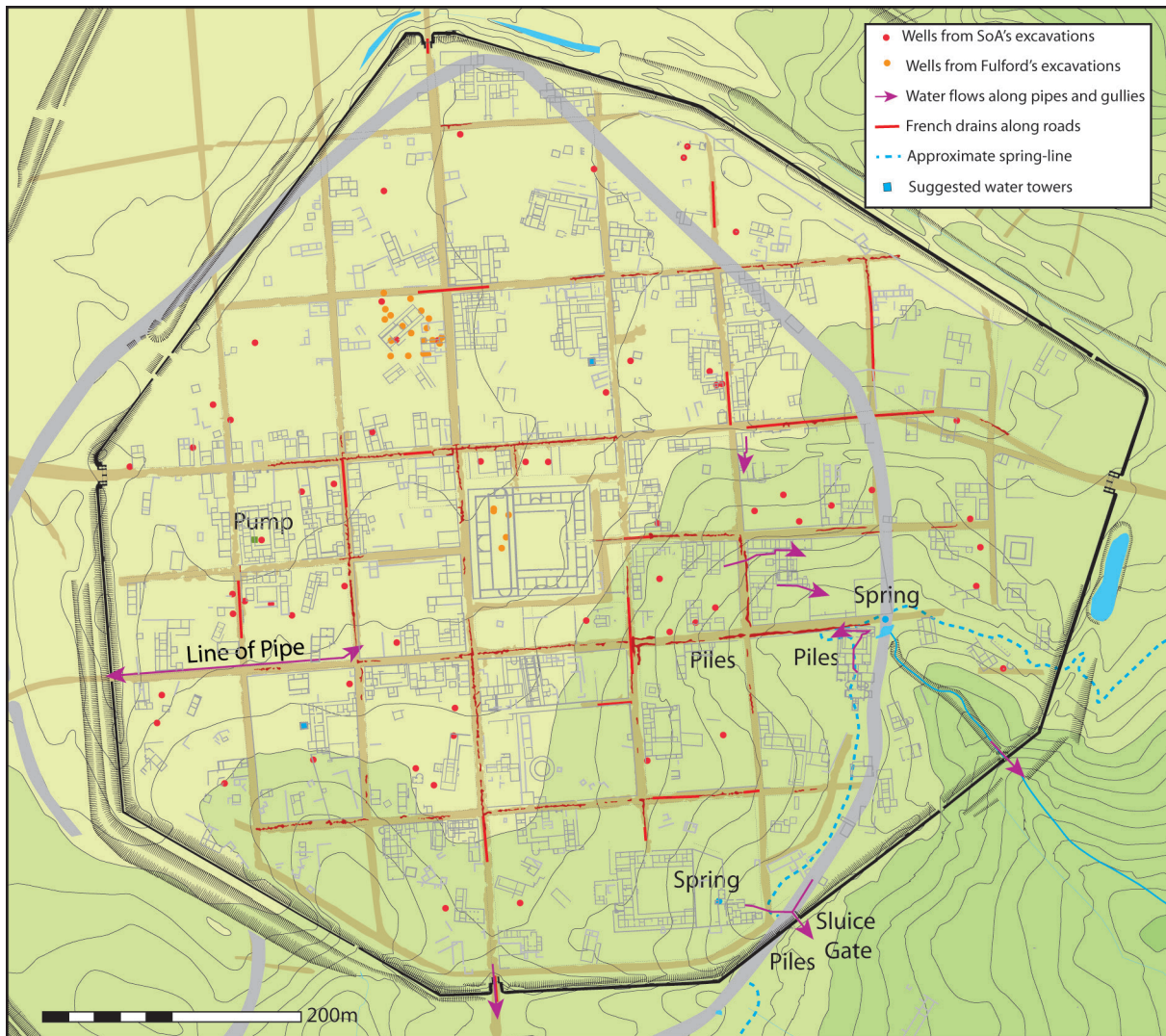


FIG. 14.2. Water supply and disposal within the town.

down through the clay, and in addition there were at least two springs within the walled circuit.

The main spring rose outside the Inner Defences but within the Town Wall, and to this day feeds the small brook which carved out a slight valley between the Forum and the Insula XXX temple complex. The Public Baths were built adjacent to this, presumably tapping into the water source (FIG. 5.44). A lesser-known spring was associated with the other main bathhouse, that of the *Mansio*. It was discovered welling up at the junction between Rooms 3 and 4, the latter having particularly thick walls as if it was intended to be a cistern (FIG. 5.50; Fox and St John Hope 1894, 231–2). Both of these springs are on more or less the same contour, low relative to the vast majority of the town which was situated on the higher ground. Elsewhere wells were, therefore, needed to dig down to the water table.

The wells were from 2.5 to 9.0 m deep. Sometimes these would be lined with re-used wine barrels, including silver fir thought to come from the Pyrenees (Williams 1977, 330). Sometimes oak frames would be used down to the sand, whereupon a sturdier flint lining was used. Whichever, a plentiful supply of sand-filtered water was available. Both Liversidge (1968, 50–1) and Boon (1974, 85–6) discuss the variety of structures used, and further details are provided in the Antiquaries' reports of many but by no means all of the 62 wells reported (e.g. St John Hope and Fox 1898a, 124). The number found by the Antiquaries represents a fraction of the original number present. To start with, they found hardly any in their first four seasons, and only then

started to recognise them. Secondly, the excavations within Insula IX have produced around 19 possible wells in addition to the three the Victorian plan showed in the area. The overall distribution on FIG. 14.2 will thus have only a very partial relationship to the actual distribution. One thing that is readily apparent is that the presence in larger, more Mediterranean towns of collective fountains at road junctions associated with shrines and local *vici* does not appear to be echoed by the distribution of wells clustering near street corners (Laurence 1994, 41). These water sources appear to be private rather than communal facilities in public spaces, with the vast majority appearing in courtyard areas, and none associated with temples.

The mechanism for raising water from the wells in most cases will have been buckets, but within House XIV.1, Pit J the remains of a pump were found. This was the stock of a wooden force-pump with leaden seals, assumed to be for pumping water out of the adjacent well into a storage tank, or from a tank at ground level to an overhead cistern for a bathhouse (St John Hope and Fox 1896, 233–4); the pump is discussed in Ditchfield (1897), Gowland (1901, 415), Liversidge (1968, 51), Boon (1974, 86–7), Oleson (1984, 266–8), and most recently has been comprehensively re-analysed by Stein (2012; 2014).

Various structures have been identified as water tanks (rather than just troughs), for example House XIX.2, Room 28 was a 5.8 m square structure with 0.9 m thick walls immediately adjacent to a richly furnished house. Another similarly interpreted was the isolated square building just south of House I.2 (St John Hope and Fox 1899a, 235). The thickness of the walls suggests the retention of weight which implies either the holding of water or that these were towers. While the first example is in an obvious position to collect rainwater from the roof of House XIX.2, that on the southern side of House I.2 is not.

AQUEDUCTS AND PIPES

Given the easy access to water on the site from wells, the necessity for an aqueduct was minimised, which was just as well as Silchester is on the high point of a gravel ridge. Nonetheless, that has not stopped references to the site having one (e.g. Stephens 1985, 201, 203; Douglas 2013, 108). These references derive from the discovery in 1896 of a deeply buried wooden pipe, evident from regular iron collars about 2.13 m apart; these had an internal diameter of 0.12 m. The collars stretched for a long distance from the Lesser West Gate to Insula III.

The Antiquaries were ambiguous about whether it was supplying water to the town or providing a means to release wastewater, since their measurements revealed it was ‘practically horizontal’, except at the eastern end (St John Hope 1897a, 424). Finally they concluded it supplied water, their logic being that if it had been conveying wastewater it would have been directed south down the slope rather than horizontally west.

To clarify which way it drained the depth measurements of the Antiquaries and a topographic model from the LiDAR have been combined. Discovered in Pit XVI.LL, the pipe was chased to the west and House XVI.3; along this stretch it was 6–7 ft deep (1.8–2.1 m). It was then followed further west to halfway along Insula XV where it presumably went under House XV.2, after which the Antiquaries only dug cross-sections at intervals ‘until it reached the foot of the bank lining the city wall, from whence it flowed tunnel-wise under the bank and wall into the ditch. It here terminated at about 18 feet from the wall against a rough mass of flint masonry’ (St John Hope 1897a, 423). Unfortunately they were unable to get permission to explore this masonry further.

FIG. 14.3 shows the geophysical survey, the Antiquaries’ plan and a section based on the LiDAR and the Antiquaries’ depth measurements (assuming the ground surface has not altered much since 1896). It shows that there is a very small rise in the pipe from the Town Wall running into the town, where it then takes a dip and a rise again before terminating. In the west its level appears to be at the same level as the base of the earlier Town Rampart Ditch.

Without any information on the brickwork where the pipe terminated in the ditch, it is difficult to be absolutely sure that the pipe terminated there, rather than the brickwork being a supporting structure carrying the pipe across the ditches; however, if the pipe did continue and carry on along the roadway, then it would be following a downhill trajectory as the roadway passed out

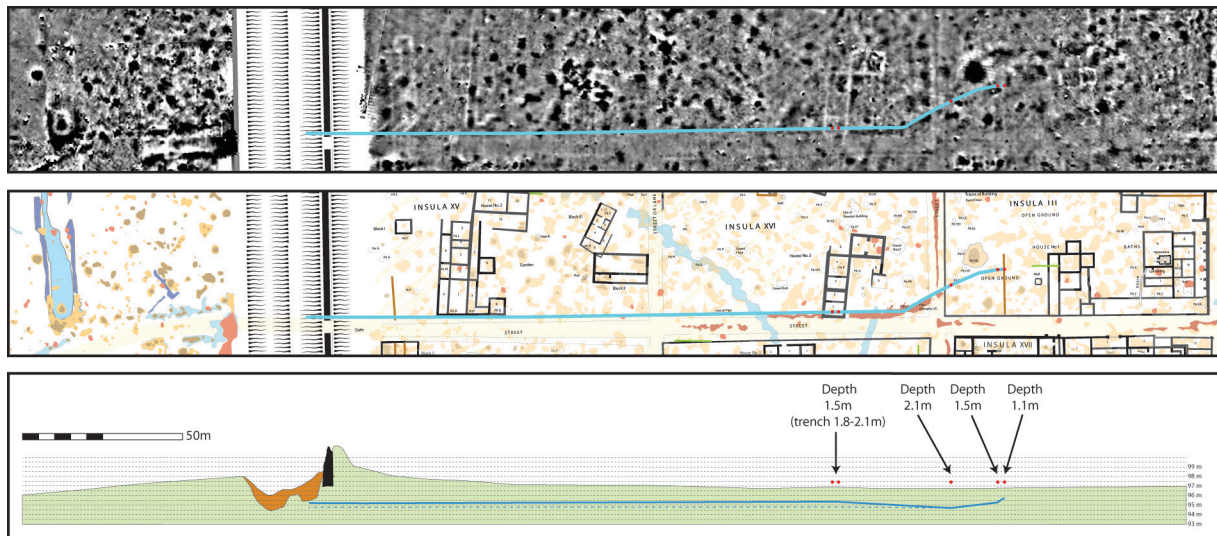


FIG. 14.3. The course and elevation of the iron-collar wooden water-pipe.

through the old Inner Earthwork and turned more south-west to head off towards Old Sarum. There is certainly a clear roadside ditch or linear that this pipe could have lain within, but it would very much be going down-hill.

Interpreting it as a water supply begs the question why would water be drawn from the Town Rampart Ditch. There is no trace in the geophysics of any linear conveying the pipe further west to collect water from any spring; and any spring would more than likely have been much lower as the spring-line on FIG. 14.2 indicates. It also makes the final dip in the pipe within Insula III very problematic.

The alternative is that it is for wastewater management. In the geophysics it is possible to see a large feature about 8 m in diameter, which is far larger than a normal well, adjacent to where the pipe terminates in Insula III. It could be that this was a sump collecting wastewater from the area, with the pipe used to pump out excess water into the Town Rampart Ditch (or earlier maybe the Inner Earthwork Ditch). This use of sumps for drainage within Insulae can be seen elsewhere in the town as in Block XXVIII.II where a drain emptied into the 4–5 m diameter Pit XXVIII.8 (St John Hope 1908, 201) (see FIGS 5.32–34, Interior 10). Drainage at Silchester is fairly good owing to the relatively thin soil over the gravel, but that is today without the hard surfaces and roof run-off to cope with that would have existed in its heyday as a town. Other mechanisms were put into place to help assist the removal of wastewater, but Insula III was quite plausibly relatively high status from the Late Iron Age through to the mid-Roman period, so might have received special attention, or required earlier attention if it had tiled roofs and paved surfaces while other buildings in the town had thatch and earthen floors which would have slowed run-off.

The argument for Insula III being a high-status block comes from the area in the Later Iron Age (Basilica excavation Period 3) being demarked by a large palisade around it, and on the basis of a hypothesis proposed by Fulford that there was a Claudio-Neronian building of some importance here, in the region of Insulae II, III and IX, perhaps spreading a bit into I and IV (Fulford 2008, 4–5). The evidence for this was threefold. First, he identified that there was a large number of pieces of carved stonework, such as architectural columns, occurring in early secondary contexts in these areas (e.g. from within the Basilica construction trenches, or some of his early buildings in Insula IX). This suggested to him an earlier monumental building somewhere in the vicinity. Secondly, the Antiquaries themselves when they went back chasing the pipeline into Insula III, observed that there was an underlying earlier important building that they had totally overlooked when first excavating in the Insula in 1891. ‘So far as the building could be traced it appears to contain at least two well-made drains built of tiles, as well as one or more hypocausts, and a

chamber with a tile floor' (St John Hope 1897a, 424). They speculated what kind of building might need water conducted to it from the Town Ditch and wondered if it might be a bathhouse, noting that later on there was another bathhouse constructed within the Insula in the south-east corner. Unfortunately bad weather meant they did not pursue excavation of this earlier building, nor draw a plan of their discoveries. Thirdly, Fulford pointed to the water pipe which he, like the Antiquaries and later Boon (1974, 88), associated with the building. To get around the fact that the Town Bank Ditch from which the Antiquaries thought the water was pumped now dates to the end of the second century, which is hardly the Claudio-Neronian period, Boon thought the supply must have come from a stream 150 m further out to the west; however, no geophysical evidence for a linear trench in this direction exists, and even if it did, it would require the water to have been pumped uphill (see FIG. 6.51: Exterior 17).

From the distribution of architectural fragments, Fulford considered his hypothetical palace to have spread over perhaps 2.63 ha, comparing it to the 2.2 ha proto-Palace at Fishbourne. He also wondered if the Neronian tiles from the town might be associated with such a project. Unfortunately the fluxgate gradiometry did not give a clear indication of any deeper buildings within Insula III, even though much of the south-west quadrant was relatively clear. But the Antiquaries did note that their earlier building was sealed under a 'hard layer of deliberately deposited gravel' (St John Hope 1897a, 424), so its failure to show may be more a limitation of the technique.

In conclusion, the dating of the pipe is ambiguous but it most likely post-dates the Town Rampart Ditch (c. A.D. 180–200); also the direction of its flow is decidedly problematic, though an outflow draining a large sump into the Rampart Ditch is the most likely. If Fulford is correct, and this was a very high-status development area early on, then this effort might have been a very pragmatic solution to removing wastewater from this relatively flat area of the gravel plateau rather than the street drains which operated so well on the slopes elsewhere to which we now turn our attention.

WASTEWATER: CENTRAL GUTTERS AND DRAINS

The major buildings, such as the Forum with its large roofed area and paved surfaces, certainly generated sufficient run-off in the British weather to require special-purpose drains to be constructed. In the Forum's grandest phase (Period 6, FIG. 5.31) a large drain came out of its main entrance, c. 0.4 m wide, 1.0 m below the level of the ambulatory (Fox and St John Hope 1893a, 545). This flowed into a 0.6 m wide and c. 0.6 m deep trench down the street, eastwards, and continued running between Insulae V and VI. Here it was excavated, revealing it to be a trench about 1.0 m wide, and varying from 0.3 m deep in the west to 0.15 m in the east (St John Hope 1906, 154–5).

These street drains are a major phenomenon of Silchester. The roads were in the main made of layers of compacted gravel; cobbled surfaces were seemingly reserved for the wear and tear where the streets passed through the gates; indeed at the North Gate cobbles were only applied in the later Roman period (Boon 1974, 91–2; Fulford 1984; Fulford *et al.* 1997, 108; Fulford *et al.* 2006, 16). However, down the middle of many of the roads ran rumble or French drains, gullies which were not open but filled up with larger gravel or cobbles so that water could flow between, though over time sediment would build up and they would have to be re-dug and re-filled periodically. Many of these were recognised by the Antiquaries, such as the drain along the east–west road between Insulae VII and VIII which had 'traces of a central gutter pitched with flints' (Fox and St John Hope 1894, 210).

In 1958, when Boon excavated his Trench K, he examined the north–south street to see if there was an entranceway through the Inner Earthwork (which there was not). During the work he found a drain 0.8 m across and up to 1.8 m deep (Boon 1969, 10). Similarly Fulford found comparable drains while excavating the roadways through the North and South Gates. In the south there was a rumble drain c. 0.6–1.0 m wide. 'The mouth of the drain was formed by large fragments of ironstone and quern ... Although there was no independent dating evidence, the position of the mouth and the alignment of the drain strongly suggest that it respected the late

second-century rampart and thus post-dated its construction' (Fulford 1984, 50). At the North Gate he also found major gullies to drain the street and neighbouring properties after the Wall construction (Fulford *et al.* 1997, 104, 141). The extent of these drains was made clear in the Royal Commission's aerial photographic plot (Bewley and Fulford 1996, 388) and the fluxgate gradiometry has extended the known network even further, so it can now be seen to be covering almost all of the streets in the town, with evidence only really lacking from the extreme north-west on the highest and flattest part of the terrace. Curiously a section across the east–west street on the north side of Insula IX showed no trace of a central drain, though the aerial photographic plot suggested there should have been one along that line (Fulford *et al.* 2006, 16).

The dating of these street drains is problematic. Boon considered them to be third century from his Trench K (Boon 1974, 89), while Fulford's excavations at the Gates suggested they were later second century at the earliest. However, rumble drains collect sediment and gradually cease to be effective; so they need to be regularly emptied of their gravel and sediment fill and restocked with large gravel with air gaps for the water to percolate through. Hence Boon's dating may date the latest maintenance rather than the original construction. The sections through the roads bounding Insula IX will be instructive here when published.

Once the Town Wall had been built, it was essential to ensure water could flow through it and out of the town. It seems as if three strategies were developed: first, canalising the brook through a culvert under the Town Wall; secondly, channelling it through a central road drain through the South Gate; and thirdly, taking advantage of the infilled Inner Earthwork ditch which the Public Baths had drained into, and despite by the late second century it almost certainly being filled up, using its water-conducting properties to build the South-East Gate (aka the Sluice Gate) where the Town Wall crossed it. This gate therefore combined the function of pedestrian access above ground, and water outflow beneath, both from the open stone drain believed to come from the *Mansio* bathhouse, and the slower outflow through the infilled Inner Earthwork.

In the Late and post-Roman era drainage again became a problem. The Antiquaries observed that the 'Sluice Gate' had been blocked in antiquity with concrete and tiles (Fox and St John Hope 1894, 227–32), added to which the brook exiting through the defences must have got clogged frequently; both these occurrences would have led to a build-up of water in the south-east corner of the town. This is evident from the extensive build-up of deposits in this quarter. The Antiquaries noted that in the area of the Public Baths there had been a build-up of fine black sediment, similar to that which develops at the bottom of a pond, to a depth of 1.8 m, surrounding and engulfing the Baths (St John Hope and Fox 1905a, 363–4).

SEWERS AND CESSPITS

While rumble drains are good for alleviating storm water, they are unable to cope with raw sewage, though they could possibly cope with the liquid run-off from septic tanks or cesspits. While some recent works have imagined open roadside ditches at Silchester carrying away raw sewage (Fagan 2011, 199), there is no clear evidence for this, and the lack of regular provision of side drains was explicitly pointed out by Boon (1974, 89). Without a constant flow of running water, which a town on a plateau was never going to have, the drains carrying effluent would have clogged up immediately. Instead we must consider that Silchester operated with cesspits and the collection of night-soil and urine. The relationship between this and potential tanning operations is discussed later (p. 416).

THE ROMAN ROADS OUT OF THE TOWN

Tracing the Roman roads in the Antonine Itineraries was how the earliest antiquarians first engaged with Silchester, traversing the country, trying to make sense of the Roman placenames and distances between them. Amongst these itineraries *Calleva* appeared to have an importance second only to London in terms of the number of routes starting there or passing through it: *Iter VII* (Chichester to London), *Iter XIII* (Caerleon to Silchester via Gloucester), *Iter XIV* (Caerleon to Silchester via Bath), and *Iter XV* (Silchester to Exeter) (Rivet and Jackson 1970).

Connectivity with the rest of Roman Britain was provided by this road network, especially given that Silchester was not directly on any major rivers. In parts of northern Gaul it is starting to be appreciated that some roads had Iron Age origins. In the case of *Calleva* it would not be impossible that the roads to the other *oppida* of the Southern Kingdom or *Verulamium* had earlier origins.

This section reviews the discovery and actual evidence for these routes radiating out of Silchester, and evidence for their date. While all but the road to *Verulamium* have repeatedly appeared on Ordnance Survey maps, the actual evidence for them is not always quite so clear. The major roads are discussed here clockwise from the road east to London.

THE ROAD EAST TO LONDON (THE DEVIL'S HIGHWAY)

The road to London had been surveyed by the Sandhurst military surveyors (Narrien 1836; 1837; Ellis 1838), and evidence for it is perpetuated in modern roads and tracks, particularly within the wooded areas of Windsor Great Park and Swinley Forest (Kempthorne 1914–16, 25). In the immediate vicinity of Silchester cropmark and geophysical evidence shows the road coming up the hill, but it is only clear towards the top in the fluxgate gradiometry where it cut into the gravel rather than the clay, and where side ditches show well-filled with anthropogenic material. Nonetheless, its actual course appears to be *c.* 20 m south of where the OS places it (compare OS dotted line and geophysical interpretation in Exteriors 14 and 15, FIGS 41–46).

The road heads up the hill towards the Insula XXX Temple complex but then diverts north slightly to join up with the main east–west road through the town. Whether it had ever continued directly on through the temple area, and up to the front of the Forum is possible but a moot point. Fulford considers the co-alignment of the two roads to be evidence of it having initially run through the area and only later diverted to the north, explaining the necessity as being because of a possible rise in the amount of through-traffic from London to the South-West which needed to be diverted away from the Forum area (Bewley and Fulford 1996, 388; Fulford 1999, 164). The alternative is that the sanctuary or possible burial area was indeed early, and both the street from the Forum and the London road headed towards it, just as the roads around Cirencester focused on Tar Barrow Hill adjacent to where the town was to develop, swinging away only very close to the actual town to join the new town grid (Creighton 2006, 140–2, 147; Reece 2003). Ultimately without excavations within the gardens of the Old Manor House the different options cannot be resolved.

THE ROAD SOUTH TO WINCHESTER AND CHICHESTER

In the Late Iron Age Chichester and Winchester were both part of the Southern Kingdom that *Calleva* started its life as part of, ruled by the Commian dynasty. Just as many roads in Northern Gaul are starting to be understood as Iron Age rather than Roman, it is not unlikely that there may have been a pre-Claudian route from Chichester to Silchester. A Roman road south was identified as early as Camden (1610, 272), and the description was elaborated upon in Gough's edition: 'A military road called Longbank and Grimesdyke, pitched with flints, runs from the south gate of the town to the north gate of Winchester' (Camden 1789, 142). Stukeley reaffirmed this description, though referring to Grimesditch (Stukeley 1776, 179); however, one wonders if both were not confusing the long linear earthworks which run south with the actual road.

The existence of the metalled road was positively confirmed a generation or so before Maclauchlan's survey, two miles south of Silchester at Latchmere Green. Maclauchlan reported a statement by John and Ambrose Ham that James Simpson, a 90-year-old sawyer, at Silchester, 'made a sawpit at the back of Moor's Farm, and in digging down, came upon a bed of large flints like a road. A. Ham heard his father speak of the same flints' (Maclauchlan 1851, 235 note 1). This was just to the west of the present road. The Antiquaries took a break from their wall-chasing to explore there in 1905 confirming the location; they excavated in Latchmere Green in the garden of William Ham, presumably a descendant (St John Hope 1906, 167).

While this road to Winchester was clearly established, a route to Chichester was always thought

likely but was more challenging in its discovery. Karslake made claim to have discovered it in his highly problematic excavation of a supposed earthwork and gateway to the south-east of the town but his results were not generally accepted and no supporting evidence can be pointed to (see p. 320, Karslake 1920).

The actual discovery came with the work of the Ordnance Survey in the late 1940s. First, an element of the Chichester–Silchester route was identified near Milland (W Sussex); after which Margary unravelled the entire length (Margary 1949). The road headed not directly for Silchester, but to the spur to the south, where it joined the Winchester road a little north of Latchmere Green. What was suspected to be the roadway was found slightly to the west of its marked position on current Ordnance Survey maps when an electricity cable was cut through it just south of Haines Farm (Brading 2011, 129–30).

THE ROAD SOUTH-WEST TO OLD SARUM (THE PORTWAY)

It is the precise direction of the road to Old Sarum which has perhaps created the greatest confusion. Established orthodoxy now traces it as heading out of the town through the Lesser West Gate; new LiDAR covering Pamber Forest now confirm that this is the case, but this was not how earlier antiquarians saw it, and as will be shown, there is good reason to believe that the final established route may not have been the original one.

The road from Old Sarum actually survives very well in the later medieval and modern landscape where it was called the Portway (Codrington 1903, 301). It is very visible in parts, but was not at all obvious before LiDAR any closer to Silchester than Hannington, 12.8 km to the west-south-west. Early antiquarians argued over the precise route (e.g. Lethievlhier 1770; Willis 1770, debating an imagined route first going west via Tadley). In his survey of the itineraries Colt Hoare suggested that the road left Silchester via the South Gate and claimed that he could see the road heading off in the woods just to the south of the town, though thereafter he could find no trace until near Hannington (Hoare 1821), but his identification of the roads was mistaken, marking up on his plan as roads the linear earthworks to the south of the town.

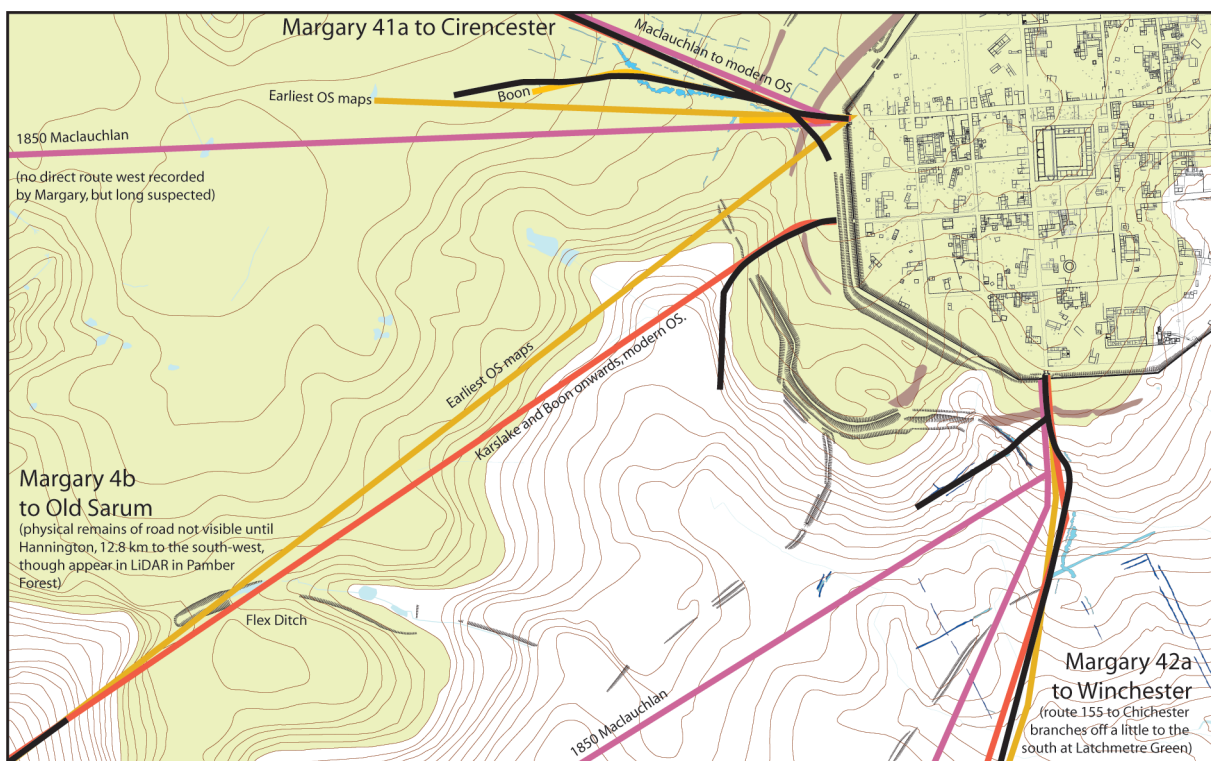


FIG. 14.4. Changing impressions of the route of the Roman roads to the west and south-west.



FIG. 14.5. Aerial photograph of a possible early road to Old Sarum from the South Gate: Historic England Archive SU6362/54 c. 1972 (© Crown copyright — HE).

When Maclauchlan conducted his survey of the embankments he also pondered the same question. Similarly he could find no trace of the road between Hannington and Silchester. To get around this, he went back to where the road was known and projected its line 12.8 km towards Silchester. He calculated that it headed directly for the South Gate and not the West or Lesser West Gate (see FIGS 3.6 and 14.4) (Maclauchlan 1851, 237). All the Victorian excavators concurred with Maclauchlan from Joyce (1881b, 345) through to the Antiquaries' final Great Plan in 1910 which again showed the Old Sarum road branching off from the South Gate. The Ordnance Survey, however, took a different view. The 1874, 1877 and 1896 editions all showed the road arriving at the West Gate, though it is not clear who was driving their interpretation. Then, after the discovery of the Lesser West Gate in 1911, the OS changed where they marked its position and showed it arriving there instead. The LiDAR in Pamber Forest confirm that this latter course was certainly the case for the majority of the road's existence as the roadside ditches, banks and camber are prominent in the data.

However, Maclauchlan's projection of the line from Hannington to the South Gate was correct; it was an excellent piece of surveying confirmed on modern OS maps. The road line from Old Sarum does indeed make a minor divergence near Hannington which happens to be the highest elevation on the route between the two towns. However, nowhere along the projected line close

to Silchester within Pamber Forest reveals traces of an earlier road along this line in the LiDAR data. Nonetheless, close to Rampier Copse, there appears to be a road in just the right location, revealed in both the geophysics and in an aerial photograph. This leads west-south-west from the South Gate (Exterior 21, FIGS 6.62–64 and 14.5, NMR SJ6362/54 *c.* 1972). This opens the possibility that this was an earlier road, but when it came to paving the roadways and digging the ditches the alternative line was followed. It may be that the alignment of the road from the South Gate is coincidental, and this was always just a local lane running down to the brook below Rampier Copse. No trace of an earlier or alternative route was observed in the electricity cable watching-brief which crossed the Portway road-line just south of Tadley (Brading 2011, 111).

The possible earlier road-line has the curious position of coming in from the west-south-west, and being funnelled between the two linear earthworks making the whole complex look a little like an enormous banjo enclosure. Perhaps the ancient entrenchments prevented livestock coming along the roads and bypassing tolls into the town. The existence of dykes in relation to roads can be paralleled at Chichester where a major north–south linear (NS1) runs more-or-less parallel to the Roman road north of the town to Silchester. Dating of the earthwork is of course problematic, its association with the road suggests it is not pre-Roman, and there is an argument for the northern stretch of it being medieval (Magilton 2003, 158).

THE ROADS WEST TO *SPINIS* (ERMIN STREET) AND ON TO WANBOROUGH AND *CUNETIO*

The road to the west has similarly caused confusion and moved around a bit. Two itineraries suggested roads should lead west to *Spinis* (conventionally interpreted as Woodspeen, though archaeological evidence is slight), leading eventually to Bath (*Iter XIV*) and Cirencester (*Iter XIII*). Originally a direct route west was imagined, and this can be seen on the early Ordnance Survey maps. Perhaps encouraging this was the presence of a possible (though now doubtful) Roman milestone at the west end of Silchester Common. Its earliest record comes from its description in 1280 as the Hyneston acting as a medieval boundary marker (National Archives: C47/11/3/10). Stukeley referred to it, mentioning the myth that an imp had thrown it from Silchester's walls to where it now lay (Stukeley 1776, 179). Later writers suggested it was called the imp stone as it supposedly had the letters IMP carved on it (Narrien 1837), though neither investigation around the time of the Antiquaries' excavations when the stone was taken out and scrubbed, nor in 1954 when it was dug up by a 'roadman' and examined by unidentified individuals from the University of Reading, saw any traces of it according to NMR records (however, despite the lack of evidence, it made it into *Roman Inscriptions in Britain* as RIB 2221). That it did not appear in King Edward's charter of A.D. 909 granting a wood between Tadley and Silchester to the Bishop of Winchester which might conceivably have incorporated it as a boundary marker also suggests it was not present there at that date (MS Ref.: Sawyer 377: Grundy 1927, 172–7).

The idea of a route directly west also appealed to Maclauchlan because the linear nature of the Hampshire-Berkshire border along this line was suggestive of a road due west, complementing the one to the east towards London; though he himself admitted: 'be that as it may, there is not even a flint in the way side to lead to a supposition that the road was ever there' (Maclauchlan 1851, 238). The Sandhurst students sent out to survey it in the 1830s failed to find any trace of a road between Silchester and Newbury (Narrien 1837).

This imagined route was finally dismissed in the early twentieth century by Crawford who searched for it in vain crossing Greenham and Crookham Commons where it should have been visible, had it existed. Instead he investigated an earlier local antiquarian reference by Barfield and concluded the road ran as its line is now understood, a little to the north-west (Crawford 1921, 181–5; Barfield 1901, 14). Its discovery was confirmed when it was sighted in aerial photographs which showed the paddocks or enclosures either side of it as the road left Silchester heading west-north-west (FIG. 3.13); it was this series of photographs, along with that of the Inner Earthwork, that launched Boon's series of investigations in the 1950s. The road shows clearly in aerial photography, geophysics and LiDAR within the woods to the north-west. Its alignment appears to be later than the first to second century as it ignores and overrides a

cremation cemetery on a different alignment which produced Flavian to Hadrianic material (p. 375), so again there is a possibility that the earliest Roman road west may have followed a different line. Evidence from further afield, at the roadside-settlement at Thatcham (Berks.), suggests the road was in existence by the second century, though how much earlier is unclear (Pine 2010, 31).

Despite this new road towards the west-north-west, Boon still thought that a road due west might exist (Boon 1974, folding plan), though chose not to include it on all his reduced plans (Boon 1969, 23); some evidence suggestive of such a road does come from the geophysics here with a possible boundary ditch (Exteriors 12–13, FIGS 6.35–40).

THE ROAD NORTH TO DORCHESTER-ON-THAMES

This road has always been reasonably secure and is little contested. Like the London to Silchester road, it was surveyed by the Sandhurst students (Narrien 1837) and Maclauchlan himself observed a large dyke proceeding north from the North Gate towards Pangbourne and on to Dorchester-on-Thames (Maclauchlan 1851, 231, 239). The geophysics show the line to be slightly to the east of the position marked on the Ordnance Survey as it leaves the town, but otherwise corroborate it.

Branching off this was a local lane. As the road north leaves the town, a fork in it shows a separate droveway running north-east along a natural spur in the landscape. Either side of this were enclosures in a similar way to the evidence from the west of the town.

THE ROAD TO THE NORTH-EAST TOWARDS *VERULAMIUM*

Margary (1967) and others expected there to be a road from *Verulamium* to Silchester, and not unreasonably so, as both were major centres in the Late Iron Age and Roman periods. A road certainly heads south-west from *Verulamium* (Margary 163) and has been identified almost as far as the Thames crossing near Maidenhead, but then only fragments have been suggested from Wargrave towards Silchester (Margary 160cc).

As discussed under the section on linear earthworks, there is a possible feature on the LiDAR results which shows a raised bank heading off in approximately the right direction, curving past the Amphitheatre and then running north-east. This roadway *may* be the same as the one excavated by TVAS at Mortimer Hill Farm; this is on the right orientation, but perhaps a little too far to the west of the projected road-line. Here a Bronze Age settlement was found, crossed by the twin ditches of a Roman late first- to mid-second-century trackway which point back to this one, together with a small cremation cemetery of the same date (Taylor 2011). LiDAR data have not been inspected beyond the extent of the survey area to confirm this, but the direction is good, such a road should exist, though the alternative is that it could be another linear earthwork.

THE CONNECTIVITY OF SILCHESTER

In conclusion, this brief review of the roads around Silchester again emphasises how knowledge and ideas change, and how much remains unknown. Systematic LiDAR will eventually flesh out the gaps in our knowledge of the developed Roman road system. However, the evidence that the road to Old Sarum possibly originally exited from the South Gate, and that the road to the west possibly started off in a different direction to the later established line of Margary 41a, should be heeded as a warning that we do not know how long it took for the full Roman road network to evolve. As with the street-grid, it is probably a mistake to imagine it was all planned in one go early on; some roads will have evolved from Iron Age origins, others from the new political landscape.

CONCLUSION

In the development of the street-grid we have seen how the evidence is now clear that the street-grid was not a one-off plan, but a staged development. The details are as yet unclear, but a suggested outline both helps make sense of the differently sized insula blocks, and also sets up a

hypothesis to test in the future. The new plan provided here has abolished some streets and 'un-straightened' some of the streets which Boon 'improved' on his plan.

The site, rich with wells in addition to containing a spring-line in the south-east within the Town Walls, had no need for piped water or aqueducts, and the only known water-pipe coming into the town increasingly looks like an outflow from a water sump designed to drain the high-status insulae to the west of the Forum. Elsewhere the town benefited from a fairly comprehensive series of rumble drains or French drains cut into the middle of the orthogonal streets, though dating these is problematic as they required periodic re-cutting. The combined evidence from aerial photography and geophysics has extended this network to cover most of the town.

Beyond the Town Walls the roads to further afield in Roman Britain appear to have been subject to change and gradual development, like the interior street-grid. Only the roads north and south have been uncontentious, while roads west to Old Sarum and *Spinis* may have altered course over time, and the road from London is a little south of where the Ordnance Survey would have us believe.

When we examine Roman grids and Roman road networks we are keen to see a great plan, a grand design, when often decisions behind them may have been piecemeal and over generations. Boon and others had the urge to 'tidy' and 'straighten' irregular grids, but the Roman town was not as neatly ordered as we sometimes wish to paint it.