

LONDON SOUTH OF THE THAMES.

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INTRODUCTION.

THE district now to be noticed extends from the Thames to the rising ground at New Cross, Camberwell and Brixton, constituting the north-east corner of Surrey. The general features of it are not such as to attract attention, whether viewed from the railways that pass over it or from the streets which now cover it; and there is nothing to suggest the fact that the surface of the ground is almost everywhere some feet below the level of high water in the river. Until the middle of the last century that was more evident; then much of the ground was still unbuilt upon, and consisted chiefly of market gardens intersected by watercourses, which served the purpose of sewers and discharged at low water by outlets through the embankment that kept out the tides.

STOW'S ACCOUNT AND EARLY MAPS.

The earlier maps of London do not include more than a narrow strip of the southern side of the river. Southwark had existed from early times, and Stow's *Survey of London* (1598) describes the extent of it at the end of the 16th century.¹ On the bank of the river there was, from

¹ Page 369, Ed. 1893, by Henry Morley.

the west, "a continual building of tenements about half a mile in length to the bridge"; and east of that was "St. Olave's Street (Tooley Street) having continual building on both the sides with lanes and alleys up to Battle bridge, to Horsedown, and towards Rotherhithe, some good half-mile in length from London bridge." From the bridge southward was "a continual street called Long Southwark builded on both sides with divers lanes and alleys up to St. Georges church and beyond it through Blackman Street." From St. Olave Street Bermondsey Street stretched south for almost half a mile with buildings on both sides; and Long Lane and Kentish Street are named as making up the whole of the borough. Agas' map, *Civitas Londinium*, of about the same date agrees with Stow's description. Faithorne's map (1658) shows houses along the river bank eastwards from London Bridge nearly as far as the present entrance to the Surrey Docks, with gardens on the land side extending to a watercourse 80 to 120 yds. off. To the south there is nothing but marsh on the east of Bermondsey Street, which is shown, as Stow describes it, built upon on both sides from Tooley Street to the abbey. Kent Street is built upon on both sides, and Blackman Street for about 400 yds. beyond St. George's Church, with gardens at the back of the houses. Along Bankside there are houses on the river bank with gardens reaching to a watercourse on the edge of the marsh, as far west as to Broad Wall, an embankment, then the boundary of St. Saviour's Parish. Nothing but marsh is shown on the map onwards to Lambeth Palace. Some houses to the south of Lambeth Church represent Lambeth High Street, and Lambeth Marsh is covered by a list of churches. Morgan's map (1677) extends along the river from Pageant Stairs, Rotherhithe, to 500 yds. south of Lambeth Church; and to Bermondsey Grange; and to the north of St. George's Fields. This map seems to have been soon reissued by Norden and Lea, and to have been copied for other maps, with additions, down to 1730. Rocque's map (1746) reaches farther, but much of the south of it

is filled up by title, references, etc. Horwood's fine map (1799) extends to the Surrey Canal and to the south of Kennington Oval. On this map, purporting to show every house, the principal roads towards Kennington and Walworth are more or less built upon as far as the map reaches, New Kent Road is partly built upon, and building seems to have begun here and there along Old Kent Road beyond Kent Street (now called Tabard Street) as far as Upper Grange Road. The rest of the ground in that direction, and away from the river bank, was then either marsh or market garden with a few scattered houses. On the south of Lambeth buildings extended no farther than to Lambeth Walk and Vauxhall Walk. The difference between Horwood's map and maps of forty years' later date is not so great as might be expected.

THE ORDNANCE MAP OF 1850.

In 1850 a large-scale skeleton map with numerous surface levels was made by the Ordnance Survey in connexion with the intended main drainage of the metropolis.¹ It gives complete information of the levels of the highways and of many other points at a time when much of the land on the south side of the Thames was still unbuilt upon and remained in much the same state that it was when Horwood's map was made. A study of the ground as shown by these surface levels, and comparison with the older maps, is interesting, and throws considerable light upon past circumstances connected with the district.

The area under notice is the highest of a series of similar tracts of land on the Thames estuary well below high-water level, from which the tides have been shut out by artificial banks. Lower down on the south side, Greenwich, Plumstead, Erith, Deptford, Stone

¹ There were two issues of the map, one on the scale of 5 ft. to a mile and another on the scale of 1 ft. to a mile. Both are now out of print.

and Swanscombe Marshes are enclosed almost continuously by an embankment which extends on to the Medway; while, on the north of the river, the Isle of Dogs, Plaistow Marshes, Barking Level, Rainham, West Thurrock and Tilbury Marshes, Canvey Island and the marshes adjoining it, are similarly enclosed.

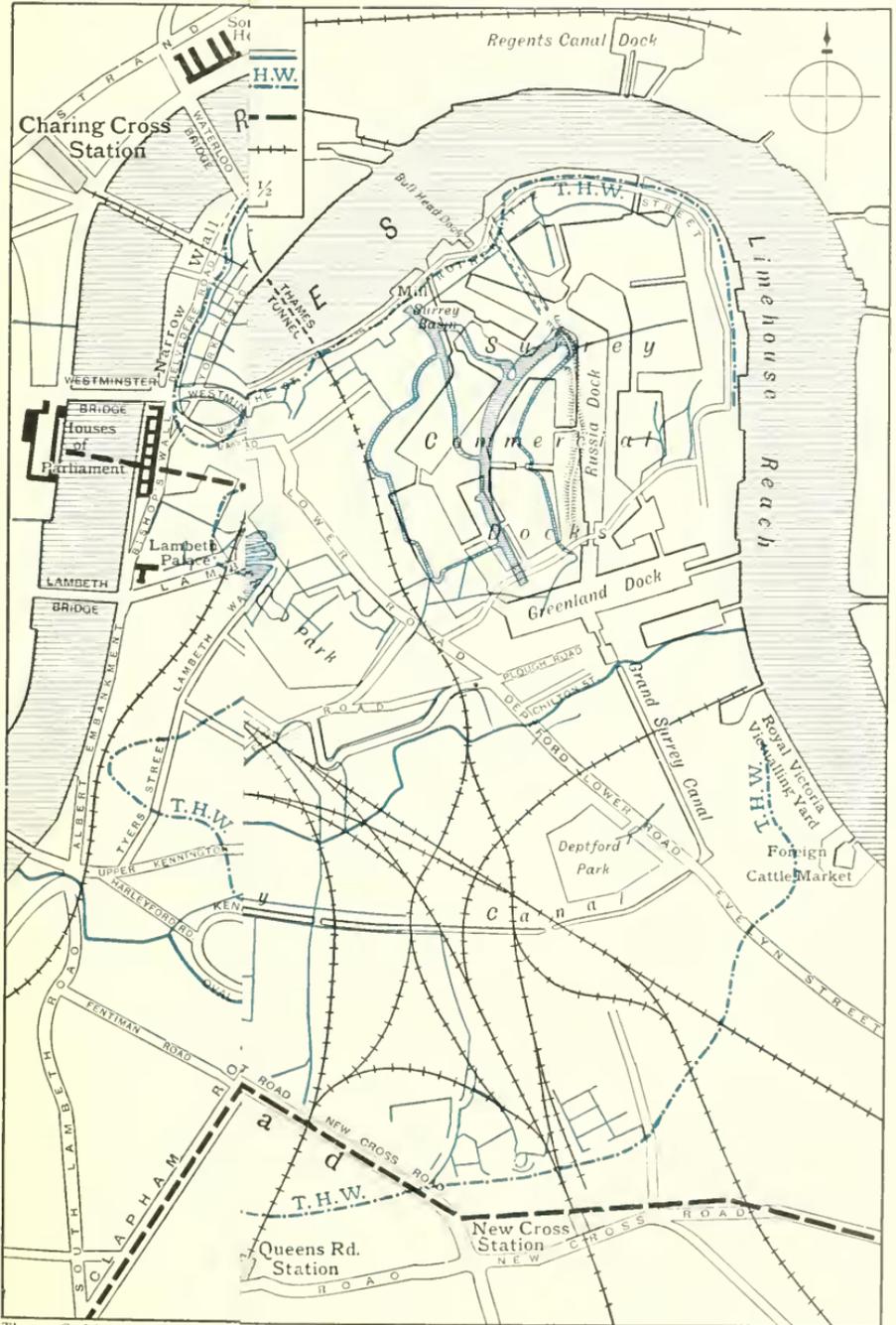
LEVELS OF TIDES: TRINITY HIGH-WATER LEVEL
CONTOUR.

In dealing with the level of the ground, Trinity High Water may be conveniently taken for reference. It is the level of ordinary spring tides, 12·5 ft. above Ordnance Datum, or mean sea level at Liverpool. Extraordinary spring tides in the Thames rise sometimes as much as 4 ft. higher.

The levels of the tides referred to Ordnance Datum are:—

High Spring Tides	+	13 ft. 9 ins.
Trinity High Water	+	12 ft. 6 ins.
Mean High Water	+	11 ft. 6 ins.
Mean Half Tide	+	2 ft. 6 ins.
Ordnance Datum		0·0.
Mean Low Water	-	6 ft. 3 ins.

If Trinity High Water (T. H. W.) be taken for comparison, and the level of it be followed round the low ground on the map of 1850, already referred to, the contour line will be found to run, as it is shown on the map (see opposite), from near the river at the Foreign Cattle Market at Deptford, to the north of the London, Brighton and South Coast Railway station at New Cross, and Queen's Road Station, Peckham. It then turns north-west and passes round Leyton Square, and southward again, and then westward to the north of Camberwell New Road where the railway crosses it, and it follows that road to Brixton Road. It then passes round the south side of Kennington Park, and the north side of Kennington Oval, to within 120 yds. of the river bank at the south end



of the Albert Embankment. From this point to Deptford, an embankment, some 7 miles long, kept out the tides, enclosing an area extending 4 miles in length, and as much as $2\frac{1}{2}$ miles in width, with an area of about 7 square miles, all of which, except a few patches and ground artificially raised, is still below T. H. W. level, and generally to the extent of 5 or 6 ft.

THE ENCLOSING EMBANKMENT.

The original embankment is now covered up, or is superseded by wharves, etc., but it is shown in places in old maps. The Albert Embankment and St. Thomas's Hospital stand in advance of what was formerly called Bishop's Wall, and later Bishop's Walk. Onwards from Stangate was Narrow Wall, shown on Morgan's map (1677) and on Rocque's map (1746), on the latter as a raised bank along the course of Belvedere Road as far as Belvedere Crescent.¹ Until the building of the County Hall, although Belvedere Road was above T. H. W. level, boards and clay were used to keep very high tides out of the areas of the houses. There is no trace of Narrow Wall onwards, but it is shown from Letts' Wharf on to Broad Wall in maps as late as 1815. From Broad Wall, which formerly separated St. Saviour's Parish from Lambeth, Upper Ground represents the embankment. It is not much above T. H. W. level, and very high tides are kept out by gates and stop-planks at the wharves, and by flights of steps as much as 4 ft. 6 ins. high at public landing places. Further on, Bankside, called on Agas' map The Bank, is 2 or 3 ft. above T. H. W. level, and extraordinary tides are kept out where there are no wharves by a wall or timber barriers. The narrow lanes leading down to courts lying a foot or more below T. H. W. level are crossed by a low ridge or ramp near the entrances from Bankside, which may mark the line of the old embankment.

¹ The remains of the Roman ship which were found on the site of the County Hall lay at low-water level about 30 yds. outside Narrow Wall, opposite Guildford Street, Belvedere Road.

Traces onwards to St. Saviour's Dock seem to have been destroyed by riverside premises. Beyond that, and on to Deptford, a strip of ground not more than 60 yds. wide, broadening at one place to 140 yds., alone separates high water in the river from T. H. W. level on the land side. Bermondsey Wall and Rotherhithe Wall are on the line of the old embankment. They are now 1 or 2 ft. above T. H. W. level, with a sharp fall landwards, and steps, ramps and stop-planks at public landings, and tide-boards and gates at the wharves, shut out high tides. The wharf-owners are bound to maintain and close these whenever necessary.

A walk along Bermondsey Wall at the time of high-water spring tides, which occurs at about 2 o'clock, will plainly show the general level of the district compared with high water in the river. On the one hand will be seen the tide standing 3 or 4 ft. above the level of the road, kept out by ramps, barriers and gates, and on the other, thickly-populated streets and courts lying 4, 5, and 6 ft. below the road level.

Rotherhithe Street, still locally known as The Wall, continues at the level of a foot or two above T. H. W. to beyond the Surrey Dock entrance. The road then bends inland round Bull's Head Dock and back again to the river. Where this bend begins the road is $2\frac{1}{2}$ ft. above T. H. W. level, and the ground on the land side drops quickly to 5 ft. below it. Just beyond, the road drops, and in a short distance is little, if at all, higher than the ground adjoining, *i.e.*, 5 or 6 ft. below T. H. W. level, the tide being kept out at the wharves. Onwards, as far as the entrance to the new dock on the site of the old Greenland Dock, there is a narrow strip of ground, 5 and 6 ft. below T. H. W. level, between the wharves keeping out the tides and the docks. The low level of the streets is plainly to be seen at the approaches to the piers and landing places, where there is a sharp rise of 8 or 10 ft. to the river bank. On the land side of the low ground the docks cover nearly 400 acres, formerly 5 or 6 ft. below T. H. W. level, and now, when not covered with water, nearly as much above it. Round

the south of the new Greenland Dock, and between it and the Thames Junction Railway,¹ Plough Road, Chilton Street, and other streets lie at the old marsh level, 5 to 8 ft. below T. H. W., and on the south of the railway the same low level extends to the Royal Victualling Yard, and T. H. W. level is not reached, except along the river bank, where the tide is kept out by the wharves.

DRAINAGE AND FORMER STATE OF THE ENCLOSED AREA.

The greater part of the land enclosed from the river was drained by a stream discharging into Limehouse Reach, and anciently called Earl's Shuice,² and in later times Black Ditch. It flowed through ground as much as 8 ft. below T. H. W., or 2 ft. above half-tide level, on the south of Greenland Dock, constituting the boundary between Camberwell and Rotherhithe, and lower down between Surrey and Kent. It drained the marshes on the south and some of those on the north of it, the rest draining towards Rotherhithe. On the south of Bermondsey Station a watercourse joined, coming from the north by St. James' Road, Blue Anchor Road, and Galley Wall Road. This was joined by another stream draining ground on the west of Bermondsey, flowing along Willow Walk and Lynton Road. The main stream continued upwards on the south of Rolls Road through ground which, in 1850, was 7 ft. below T.H.W. level, and was joined in less than a mile by another tributary, near St. Thomas Watering, which will be noticed presently. The main stream, after following the boundary between Bermondsey and St. George the Martyr on the

¹ In describing the positions of things it is often convenient to refer to existing streets, buildings, etc., though they may be of much later date. It is also necessary for reference to recent maps to use the present street names, though those until lately in use are often better known, and more significant.

² Probably from the Earl of Gloucester, who had half the manor from Henry III.

north-east side of Old Kent Road, crossed the latter road where it is joined by Great Dover Street. The parish boundary marks the place, and the ancient bridge over the stream is said still to exist, buried under the road. It was exposed in sewerage works in 1847, a pointed arch of stone with six ribs, dating from the middle of the 15th century. The span was 9 ft., the width 20 ft., and the height to the crown of the arch 6 ft. The tide is said to have formerly reached as far as this. Close by, on the west, was the Lock, a hospital for lepers, dating from the middle of the 12th century, which gave its name to the bridge and stream, and to Lock Fields on the south of it. The stream, bending westward, was joined near Theobald Street by a tributary from the direction of St. Thomas Watering, following the boundary between St. George the Martyr and Newington. The Lock stream is shown on old maps slanting across New Kent Road between Harper Street and Falmouth Road, where the tramway rails are 4 ft. below T. H. W. level. It crossed Newington Butts midway between the Elephant and Castle and old Newington Church. In 1823, piles with rings were found in a sewer excavation, and an old parishioner who had died not many years before remembered when boats used to come up the stream as far.¹ St. George's Fields, which seem to have stood above high water from early times, lie on the north, and the Lock stream followed the boundary between St. George's and Lambeth Parishes along the north of Brook Street and round the west of Bethlehem Hospital. It is so shown on Rocque's Map (1746), and low surface-levels, 3 or 4 ft. below T. H. W. level, appear on the map of 1850 along the course of it in courts to the north of Brook Street, which have now disappeared. In East Place, at the south-east of West Square, the surface is still 4 ft. below T. H. W. level. Low surface-levels, 3 and 4 ft. below T. H. W., follow the course of the stream along Tower Street and across Waterloo Road. Rocque's map shows it issuing from a pond on

¹ Brayley's *Hist. of Surrey*, Vol. III, p. 405.

the south of Webber Street, not half a mile from the river, the site of which, in 1850, was 3 ft. 6 ins. below T. H. W. level, while Morgan's earlier map (1677) shows a drain on to Broad Wall. From this the marshes drained northward, but there seems to have been no definite parting of the flow in opposite directions.

Near the west end of Bethlehem Hospital a stream joined the Lock stream, draining the marsh from beyond the South Western Railway. Rocque's map shows a drain reaching across Lambeth Palace gardens to Bishop's Wall or Walk. It is said that the Archbishop's garden was once watered by channels from the river, and it has been doubted, but the garden is now below high tides, and water could have been admitted in that way at high tides and have flowed away to the Lock stream and Limehouse Reach.

A stream from as far south as Upper Kennington Lane is shown on the old maps joining the Lock stream to the west of Newington Butts. It originated within half a mile of the river, where the surface-level in 1850 was 3 ft. below T. H. W. Allen¹ gives a copy of an old plan of the site of Kennington Palace, on the north of Upper Kennington Lane, near Kennington Cross. It shows the remains of an old building called the Long Barn, where the surface, in 1850, was at least 2 ft. below T. H. W. level. According to Camden neither name nor ruins remained in 1607; and so low a site for a palace dating from Saxon times seems unlikely. A tributary to this stream seems to have come from New Street, near Kennington Station, and probably drained the marsh as far as the lake in the old Surrey Gardens.

The tributary that joined the Lock stream near St. Thomas Watering is now marked by the parish boundary between St. George's and Camberwell, which crosses the Old Kent Road 40 yds. north of Albany Street, near St. Thomas Street. Here was the Waterynge of Seint Thomas of the Prologue to the Canterbury Tales, and the boundary of the Liberty of the City of

¹ *Hist. of Lambeth*, p. 260.

London. It was in 1675 a rill crossed by a wooden bridge,¹ and until the early part of the last century it was an open stream on each side of the road. The stream is shown on maps as late as the middle of the last century along the parish boundary on the north of Albany Street, through ground 4 and 5 ft. below T. H. W., with branches draining the marsh to the north and south. At Walworth Road the older maps show the joining of two branches; one seems to have come from the direction of a pond which became the lake in the old Surrey Gardens, to the north of Lorrimore Square, where the ground was 4 ft. below T. H. W. level in 1850. The other branch appears to have come from the south of Kennington Park, communicating probably with a drain which ran along the parish boundary between Kennington and Lambeth, on the east side of Warham Road, where the surface-levels, in 1850, were 4 ft. below T. H. W.

The St. Thomas Watering stream appears to have been the lower part of the original Effra. This stream, rising in the high ground of Tulse Hill and Dulwich, after flowing along the east side of Brixton Road, is shown on old maps, and until the middle of the last century could be seen as an open watercourse turning at right angles westwards along the south side of St. Mark's Churchyard, and round the south of Kennington Oval to the river at Vauxhall. The stream is now covered up, but until the middle of the last century it was open for most of its course, and brought down a good deal of land water. Between the right-angled turn at Brixton Road and Vauxhall the watercourse was as much as 8 and 9 ft. deep, through ground as much as 4 ft. above T. H. W. level, that is, just above the highest tides. In 1850 the bed of the stream at the right-angled turn was 3 ft. below T. H. W. level, and the surface of the ground not far off to the east was as low, and lower onwards towards the St. Thomas Watering stream. An artificial channel

¹ Ogilby, *Britannia*, Pl. 20.

to the river was evidently made to divert the waters of the Effra from the marshes when the tides were shut out by the river embankment.

It has been mentioned that ground below T. H. W. level reached, in 1850, to within 120 yds. of the river at the south end of the Albert Embankment, but the levels show that the T. H. W. contour turned north-eastward to Walcot Square on the east side of Kennington Road, and then bent back to Lambeth Palace grounds. This seems to mark an eyot above marsh level which afforded a site for Lambeth Palace, the Church, and Church Street. To the north of Lambeth Palace Gardens, land above marsh level from early times extended from Stangate as far as Waterloo Road, affording a site for the street called on early maps Lambeth Marsh, and now Upper Marsh and Lower Marsh. Morgan's map (1677) shows this street as reached from the river by Stangate Street, and connected with Church Street only by a lane along Hercules Road, and with Southwark by a road across the marsh, now Webber Street, and a track across St. George's Fields. This map shows no track from Narrow Wall into the marsh between Stangate and Broad Wall. The marsh lapped round the promontory on which the street then called Lambeth Marsh stood into a bay between it and Narrow Wall, extending south-westward across Westminster Bridge Road. Many low surface-levels appear on the map of 1850, and some remained until the late extensions of Waterloo Station covered them up. Between York Street and Addington Street ground 4 ft. below T. H. W. was to be seen in Sapphire Row, and the playground around and under the school close by preserves that level, which is also to be seen in the areas of adjoining houses. A bit of the old ground level remained in front of an old house in Meopham Street, destroyed in 1912, and other surface-levels 4 ft. below T. H. W., now covered by Waterloo Station, appear on the map of 1850. On the Stangate side of Westminster Bridge Road blocks of working-class dwellings now cover ground which, in 1850, was 2 ft. below T. H. W., but the old level can still be seen

in Boniface Street and in the areas of houses adjoining. The areas in York Road also preserve the old marsh level, and in Princes Buildings, on the west side of that street, the surface remains 4 ft. 6 in. below T. H. W. level.

This part of the marsh drained to a tidal outlet at Cuper Stairs, situated just to the east of Waterloo Bridge, to which and to an outlet at Old Barge House, on the west of Broad Wall, drained all the marsh to the north of St. George's Fields that did not drain by the Lock stream. Morgan's map shows all the marsh from Stangate to Broad Wall, and from the river to St. George's Fields, as intersected by many drains. Rocque's map, made just before Westminster Bridge was opened in 1750, shows the marsh in much the same condition as in Morgan's map—marsh and garden ground intersected by drains. Westminster Bridge Road, with a drain on each side, extended to Lower Marsh and there joined a lane by Hercules Road to Church Street, Lambeth, and onwards to Newington there was a track between two drains, with no building but the "Dog and Duck" on it. Vine Street, in continuation of College Street from Narrow Wall, had a few houses for 200 yds., and then, under the present Waterloo Station, it turned in the direction of Exton Street and crossed the marsh to join another track in the line of Cornwall Road. On the east side of the latter was a solitary house, from which a footway on the line of Roupell Street crossed the marsh to Broad Wall. The path was called Half-penny Hatch from the toll paid for the use of it, and where it joined Broad Wall the Old Hatch public-house and Hatch Row on the south of the street are still reminders of the old path across the marsh. Much of the old marsh level has been covered up by the raised roads leading to Waterloo and Blackfriars Bridges, and the streets adjoining, and more recently by railways, but a good deal of the old level remains. Many streets and courts on both sides of Stamford Street are 2 and 3 ft., and some 4 ft., below T. H. W. level, and the old surface-level appears in the areas of the houses in Stamford Street.

There seems to have been not much change in the marsh to the west of Broad Wall down to the end of the 18th century, when Horwood's map was made. Westminster Bridge Road, Lambeth Road, and Blackfriars Road were partly built upon, but the marsh, called Lambeth Marsh on old maps, remained much the same, intersected with broad and deep ditches crossed by narrow plank bridges and bordered by willows. There was more garden ground, with a few cottages and sheds here and there, and the change down to 1850 was not great.

Broad Wall was an embankment enclosing the Liberty of Paris Garden¹ from Lambeth Marsh. It was continued at right angles by Melancholy Walk, an embankment on the line of Surrey Row. There were drains on each side; that on the west of Broad Wall and on the south of Melancholy Walk drained to the outlet at the Old Barge House so much of the marsh as did not drain to the Lock stream, and the north side of St. George's Fields as far as Great Suffolk Street. The drain on the other side of Melancholy Walk flowed along the east side of Broad Wall, and inside the river bank to Falcon Stairs, serving the Liberty of Paris Garden.

Near Falcon Stairs was the outlet to the river, where stood the mills of Widdlete, held with the Liberty of Paris Garden and other lands of the Abbey of Bermondsey by the Knight Templars, and afterwards by the Knights of St. John. The mills were worked by tidal water stored in the ditches, and by land water from the marshes as far as Broad Wall and St. George's Fields, and nearly as far as Blackman Street and Borough High Street. Gale (1709) saw the tide entering at "The Falcon," filling the neighbouring ditches and overflowing at the upper end of Gravel Lane. About 100 yds. to the west of Borough High Street, Morgan's map shows a watercourse from the north of Southwark Street southward along the boundary of St. Saviour's Parish to within about 100 yds. of Mint

¹ Made Christchurch Parish in 1670.

Street, and then turning westward along the parish boundary to Bandyleg Walk, now Great Guildford Street, following that northwards, and on, after being joined by other drains, to Widflete. There was formerly a millpond in the angle between Holland Street and Green Walk, and a large mill existed on the river bank until 1791.¹

There was another outlet to the river on the west of Winchester House. Agas' *Civitas Londinium* (1591) shows a stream down a street which appears to be now Bank End, passing under a building, presumably a mill, to the river. Morgan's map and Visscher's view show the same stream. It is not clear where it came from; not far to the west the watercourse seems to have drained towards Widflete. Timber piles and planking were found in 1868 at the corner of Clink Street, at about 2 ft. below Ordnance Datum.²

Between the marshes draining to Widflete and the course of the Lock stream lay St. George's Fields, of which St. George's Circus, Borough Road, and London Road now form the centre. They seem to have been from early times above the level of the surrounding marshes, although nearly everywhere below T. H. W. level. Old maps show ponds and pools in them, but no drains from the surrounding watercourses penetrate far. They seem to have been occupied in Roman times. Roger Gale mentions,³ in 1709, that many Roman coins, *tesserae*, and bricks had been found in them; and Allen,⁴ that opposite Bethlehem Hospital a great quantity of Roman remains had been discovered at different times, and that, in 1810, pottery, remains of tessellated pavements, some small vases, and a few coins had been thrown up. It must, however, be noticed that, according to Strype,⁵ in 1716, many cartloads of Roman pottery were carried away from the foundations of St. Mary

¹ *Manning and Bray*, Vol. III, p. 539.

² *Jour. Brit. Arch. Assoc.*, Vol. XXV, p. 77.

³ *Antonini Itin.*, p. 65.

⁴ *Hist. of London*, Vol. I, p. 37.

⁵ Strype's *Stowe*, 1720 Edition.

Woolnoth Church, Lombard Street, to the roads about St. George's Fields.

As open common land the Fields seem to have been a popular resort, and a convenient place of assembly for various purposes. Shakespeare¹ makes York order his soldiers to meet him there; Henry VII encamped there in 1498; Charles II was met there by the Lord Mayor on his restoration; and the Fields were a place of refuge for homeless people after the Fire of London.² Lord George Gordon's rioters assembled there, and Wilkes' and other mobs met there at various times. The Windmill in St. George's Fields, where Falstaff and Shallow spent their merry night, must have been well known in Shakespeare's day, and the "Dog and Duck" was a notorious place of amusement until it was suppressed at the end of the 18th century. The Windmill was still standing, and the site is now occupied by Braby's Wheelworks, 80 yds. north-west of Newington Causeway. The "Dog and Duck" was at the north-west corner of Bethlehem Hospital.

A strip of ground above T. H. W. level connected St. George's Fields with London Bridge from early times, but excavations show that the original marsh surface lies below, the ground having been raised to the present level by refuse. Before that there seems to have been no ground above marsh level between St. George's Fields and Bermondsey.

There were many tidal outlets to the river on the east of London Bridge, and the connexions of the numerous drains with them and with one another are sometimes difficult to trace on the old maps. This part of the river bank was built upon when the earlier maps were made, and watercourses, which at first served for draining the marsh, came to be used to work tidal mills and to supply water for tanneries, etc. Water seems to have been sometimes diverted from one course to another, and so to have led to disputes and actions at law. As population

¹ *Henry VI*, Second Part, Act V, sc. 1.

² *Evelyn's Diary*, *Pepys' Diary*.

increased the drains became open sewers, and many so remained until the main drainage was carried out in the middle of the last century. The antiquity of many of the watercourses is shown by their being parish boundaries.

Between London Bridge and Horsleydown, Morgan's map shows three streams crossing Tooley Street—at Battle Bridge, at Morgan's Lane, and at Vine Street, the last entering the river at Pickle Herring Stairs. Faithorne shows one to the east of Battle Bridge, which seems to be that at Morgan's Lane. Agas shows the one crossed by Battle Bridge, built by the Abbey of Battle, and one crossed by a timber bridge—perhaps that at Vine Street. Both these enter the river under buildings presumably mills. The Battle Bridge stream seems to have been the outlet for drains from beyond Maze Pond and as far as High Street Southwark, about 130 yds. east of which a drain is shown on Morgan's map (1667) and on Rocque's map (1746), reaching on the former as nearly as far north as St. Thomas' Street. It also communicated with another drain along the north of Long Lane, where surface-levels, in 1850, were in many places 3 ft. below T. H. W. From the south of Long Lane the drainage was to Lock stream and Earl's Sluice.

Long Lane, at the parting of the drainage in opposite directions, leads to the ancient island in the marshes which received the name of Bermonds Eye, and on which the Priory was founded after the Norman Conquest. The site of the abbey and grange and the parish church is surrounded by a contour at T. H. W. level enclosing an oval more than one-third of a mile long and a quarter broad. The ground now rises as much as 5 ft. above T. H. W., and is surrounded on all sides by ground 3 and 4 ft. below that level. The early access to Bermondsey was from Tooley Street by Bermondsey Street, now for more than a quarter of a mile more than 2 ft. below T. H. W. level.

The stream flowing by Vine Street to Pickle Herring Stairs ran from the east side of Bermondsey Street past

the backs of the houses in Shand Street, where it was described at the beginning of the last century as an open sewer. It was cut through in Tooley Street in 1903, when a channel in the marsh clay of the Thames Valley was traced to 4 ft. below Ordnance Datum, filled up to 6 ft. above that datum by dark carbonaceous silt with abundant vegetable remains, in which were several fragments of Roman tiles. Over that was about 4 ft. of stratified made ground, containing fragments of pottery and objects of metal not older than Tudor times. Through the two latter deposits was the channel of the more modern stream, bounded at the sides by piles and planking and filled up with mud.¹ There seems to have been a watercourse of some width and depth, or possibly a breach in the bank, in Roman times. On the east of this stream, Horsleydown seems to have been above marsh level in early times. Faithorne's map (1658) shows it as an open space, across which an avenue of trees in continuation of Tooley Street ran to the north side of Artillery Yard in the line of Fair Street.

Drains from Crosby Row and between Long Lane and Snow Fields united in a stream which crossed Bermondsey Street near Market Street, where there was a stone bridge built in the time of Edward IV.² Continuing along Tanner Street, originally Five Foot Lane a path of that width between two watercourses, it discharged into St. Saviour's Dock at Dockhead. A watercourse, the name of which is preserved in Neckinger Road, flowed from Bermondsey Grange and the north of Spa Road, along Neckinger Road, Abbey Street, George's Row, and by Jacob's Island to St. Saviour's Mill on the east side of St. Saviour's Dock. It probably communicated also with the dock, as the stream was tidal formerly to the Grange, and it remained open until the middle of the last century.

About 250 yds. to the east of George's Row the drain began in St. James' Road, which has been mentioned as flowing southward to Galley Wall, and in less than half

¹ *Geolog. Mag.*, X, p. 456.

² Bell's *Hist. of Bermondsey*, p. 36.

a mile farther eastward was the mill stream which flowed down what is now West Lane from the curious mill pond called Seven Islands to a mill on the river bank east of Cherry Garden Pier. The mill pond, situated between what is now Southwark Park Road and Southwark Park, is said to have originated in an excavation made for ballast in the reign of Elizabeth, enclosed by a bank to hold the tidal water. As sediment collected, it was thrown up to form islands, and the channels around and between the islands were provided with penstocks so arranged that one channel could flush another, and each could be emptied in turn to work the mill on the ebb of the tide. Rocque's map shows more than seven long islands in 1746 divided by narrow channels covering an area about 330 yds. by 170 yds. Larger ponds were afterwards added on the east and south, Horwood's map shows them extending across what is now Southwark Park and as far south as the bend of Southwark Park Road. All these ponds were enclosed by a bank and were filled on the rising tide. Fish came in from the river, now and then a salmon; as late as about 1815 a 24-lb. salmon was caught in one of the ponds. The islands were rented for public and private pleasure gardens, until at last flushing into the river was prohibited, the mud accumulated, the water impounded grew less, and steam superseded water-power for working the mill. Part of the mill stream remained open until the latter part of the last century, and some of it was not filled up until 1902. Mill Pond Street, Mill Pond Row, and Mill Pond Bridge have only of late years been superseded by other names of less significance.

Notes of an old inhabitant's recollections, preserved by Canon Beck,¹ give other interesting particulars of the appearance of Rotherhithe and parts of Bermondsey in the early part of the last century. From Blue Anchor Road (now Southwark Park Road) eastward all was then open country; there were no hedges or other fences, but a complete network of ditches, communicating with each

¹ *Hist. of Rotherhithe*, Chap. XIII.

other and with the river, divided the fields and marked the boundary of property. They were readily supplied with water from the river in dry weather, but it could not be easily drawn off in wet, and large patches of boggy ground remained under water after much rain. Rolls Marshes, now passed over by Rolls Road, were always under water in the winter, sometimes scores of acres being covered. Along Blue Anchor Road (now Southwark Park Road) and Plough Road to the Greenland Dock, there were only two houses and no other buildings on the Rotherhithe side, and not many more on the other side. The Deptford Road had an unrailed ditch on each side of it; the only buildings on the eastern side were a public-house opposite the Workhouse, China Hall, and a few cottages adjoining it. On the western side, from near Paradise Row (now Union Street), to St. Helena Gardens (now St. Helena Road), were only the Workhouse and the Seven Houses. The only dock then was the Greenland Dock, of less than half the size that it now is. A footway, called from a toll paid to pass over it Halfpenny Hatch, led across the marshes from what is now Southwark Park Road to Deptford Lower Road at Orange Place, at the north-east corner of Southwark Park, and thence on to Greenland Dock. The name Halfpenny Hatch remained on the map as late as 1880, in Weston Street to the south-west of Bermondsey, probably indicating a similar path across the marsh from Bermondsey towards the Lock.

Rather more than half a mile down the river, where the South Metropolitan Gasworks wharf now is, was formerly King's Mill or Russell Mill, a tidal mill fed by a large area of marsh now almost entirely covered by the Surrey Docks. Rocque's map shows a bank extending southwards from near King and Queen Stairs to Swing Bridge Road, and on the west of it watercourses extending westward nearly to Deptford Road, draining about a quarter of a square mile of marshes to the mill. Some of the drains seem to have been banked to retain tidal water for working the mill without flooding the marsh outside. Horwood's map of

1799 shows a narrow mill pond more than half a mile long curving from the north end of Russia Dock round Centre Pond and Quebec Pond. Watercourses led into it and to the mill, draining the same area as before. Further alterations were made when the Surrey Docks originated, and they now cover the marsh which before drained to the mill.

The map of 1850 gives surface-levels on the south side of the docks as they existed at that date, as 6 or 7 ft. below T. H. W. level, and they are lower near Black Ditch.

On comparing the maps of Morgan (1677), Rocque (1746), and Horwood (1799), it appears that Morgan's map, as far as it extends, shows the watercourses draining the marsh more fully than Rocque's, and that in the latter map, the relative importance of some of them seem to have altered. In Horwood's map fewer watercourses appear; some perhaps, with the extension of building, may have been covered up, or narrowed to open sewers, while others may have been omitted in a map made for the purpose of showing the houses. It is clear that the courses of drains were altered from time to time as the marsh became garden ground and as building increased.

PARISH BOUNDARIES FOLLOWING OLD WATERCOURSES.

In describing the courses of old streams it has been mentioned that they are now sometimes marked by parish boundaries, and the extent to which parishes were bounded by watercourses deserves notice. The boundary between that part of the old parish of St. Saviour's which was formerly the Liberty of Paris Garden and is now Christchurch, and Lambeth Parish, followed the watercourse from the river along Broad Wall to Boundary Row; and thence the boundary between St. Saviour's and St. George the Martyr Parish followed old watercourses along Melancholy Walk and on nearly to Borough High Street. Southward from Boundary Row the Lock stream was the boundary

between St. George's and Lambeth, and St. George's and Newington, round the west and south of St. George's Fields to Newington Butts, and the latter boundary followed a tributary stream from the south, and then the Lock stream from Theobald Street to the Lock, a tributary of the Lock stream from beyond Long Lane, and then the Lock stream itself, was the boundary between St. George's and Bermondsey as far as the junction of St. Thomas Watering stream. Eastward from this it was the boundary between Camberwell and Bermondsey to Galley Wall, and beyond that the boundary between Camberwell and Rotherhithe, and between Surrey and Kent on to Limehouse Reach.

The St. Thomas Watering stream was the boundary between Walworth and Camberwell from Camberwell Road to near the Old Kent Road, where for 180 yds. it constituted the boundary of the southern end of the parish of St. George the Martyr to its junction with the Lock stream.¹

The northern boundary of Bermondsey followed watercourses shown on Morgan's map, from Newcomen Street, formerly King Street, along Snow Fields nearly to Bermondsey Street, and, after a break of 300 yds., again followed watercourses along Artillery Street, Church Street, and Tanner's Street, to the head of St. Saviour's Dock and on to the river. On the east Bermondsey was divided from Rotherhithe by the mill

¹ The curiously shaped parish of St. George the Martyr may be likened to an axe, of which the handle is represented by a narrow strip along Old Kent Road and Tabard Street, and the head by St. George's Fields. The former, more than a mile long, is nowhere more than $\frac{1}{4}$ mile wide, and towards the south end, and for nearly half a mile along Tabard Street, not more than 200 yds. wide. To this narrow strip, lying along the course of the Roman road from Watling Street to London Bridge, is attached by a narrow neck, that part of the parish which comprised St. George's Fields, measuring about $\frac{3}{4}$ mile by $\frac{1}{2}$ mile, formerly bounded by watercourses on the north, west, and south, and including all ground above marsh level in that direction. It would seem as if the parish was constituted by adding to the narrow strip bordering on the Roman road across the marsh, probably the only part occupied in early times, all the ground to the south of St. Saviour's Parish that was above the level of the marsh.

stream which entered the river at West Lane, and by a watercourse in continuation along Blue Anchor Road, now Southwark Park Road, nearly as far as the south end of Southwark Park.

CONDITION BEFORE THE RIVER WAS SHUT OUT.

Inferences may be drawn from the form of the ground as shown by the levels of 1850, as to the state of it before the embanking of the river. A tongue of land above T. H. W. level in continuation of the higher ground of Clapham must have reached to Vauxhall Station, and to the north of it must have been the upper entrance of a tidal channel rejoining the river in Limehouse Reach. On the north of this there was an eyot or shoal which afterwards afforded a site for Lambeth Palace and Church; and the ground on which the old street, formerly called Lambeth Marsh (now Upper and Lower Marsh), arose in early times may have been part of it, or another eyot. Between that and St. George's Fields must have been an opening through which the tides flowed from the main river near Waterloo Bridge to Limehouse Reach. In early maps only Narrow Wall separates the river from the marsh within. St. George's Fields and Bermondsey represent two other eyots, and Horsleydown perhaps another. All the rest of the area between Vauxhall and Limehouse Reach was covered at every ordinary high tide.

It is likely that the surface of the ground has been raised by silting since it was enclosed by the river embankment, and it certainly has been raised in many places by what is called made ground. In the records of well and other sections¹ the surface stratum is generally called "made ground," "soil," "alluvium,"

¹ The well sections are those in the Geological Survey Memoir, and the additional lists contributed to the *Transactions of the Croydon Natural History Society* by Mr. Whitaker, F.R.S., in 1885, 1894, 1901 and 1905. Of other sections, some are from published sources, and others have either been communicated to or seen by the Author.

“loam,” or “brick earth”; or it is not described at all, the first definite information often being the depth at which sand, ballast (a mixture of sand and gravel), gravel, or London clay was reached. There is little doubt that what is called “made ground” in the sections, often 5 or 6 ft., and in some sections 12 and 16 ft. thick, includes silt, and also alluvial deposits such as loam or brick earth and the marsh clay of the Thames Valley deposited on ground subject to flooding. If however the “made ground” of the sections be disregarded, and it be assumed that the bottom of the old half-tide channel between Vauxhall and Limehouse Reach could not have been lower than the top of the gravel, ballast or sand, something may be inferred as to the depth of it.

It appears that along the south-western edge of the area, from near the end of the Albert Embankment to Kennington Oval and Camberwell New Road, gravel rises 8 or 10 ft. above half-tide level, but at the Kennington Oval Station it is no higher than 4 ft. above that level. Eastward, along the course of the low-level sewer, gravel and sand reach $5\frac{1}{2}$ ft. above half-tide level at Wareham Street, and at Grosvenor Street gravel reaches $2\frac{1}{2}$ ft. above it, with 4 ft. of clay and gravel over it. Onwards, along the north side of the canal to Old Kent Road Bridge, gravel does not seem to rise much, if at all, above half-tide level, with a foot or two of clay over it, and peat in places. More to the north, at Kennington Station, in Kennington Park Road, the gravel is no higher than 2 ft. below half-tide level, with $11\frac{1}{2}$ ft. of so-called “made ground,” which some of it is probably not, over it. At Penrose Street, a little more than a quarter of a mile to the east, the gravel is 6 ft. above half-tide level, with a foot of “made ground” over it. In Wincott Street, on the east of Kennington Road, a sewer trench, in 1907, showed loamy sand and gravel up to 10 ft. above half-tide level, *i.e.*, up to T. H. W. level, with the old surface soil over it under 2 ft. of “made ground,” and in well sections at Lambeth Baths and Bethlehem Hospital, a quarter of a

mile to the north, where the margin of the St. George's Field eyot is touched, loamy sand is said to have reached the same level. Eastwards in the sewer trench in Wincott Street more "made ground" was soon met with, and in 50 yds. the top of the sandy gravel fell to 3 ft. 6 in. below half-tide level. It soon rose again, and at Kempsford Street was 5 ft. above that level. A branch of the Lock stream, shown on old maps, seems to have been here crossed. A little to the east, at Lambeth Workhouse Renfrew Road, a well section records¹ ballast up to 4 ft. above half-tide level, with 5 ft. of "made ground" over it, and more to the east, at the Elephant and Castle Station, the top of sand and gravel is at the same level, with 7½ ft. of "made ground" over it. On the north is the course of the Lock stream, beyond which the eyot marked by St. George's Fields rises above T. H. W. level. In the middle of it, at St. George's Circus, 4 ft. of loam, overlying gravel, reaches 8 ft. above half-tide level, and at the north end of Dantzig Street the loam begins to thin out, and the gravel reaches to 6 ft. above that level. The level of the gravel then begins to fall, and about half-way along Dantzig Street it is only a foot above half-tide level, rising to 3 ft. above it towards Southwark Bridge Road, and again falling as the old eyot is left. In Rockingham Street, on the east of Newington Causeway, the gravel is not much above half-tide level, and there the curious section to be presently referred to occurs. In New Kent Road, at Meadow Row, sandy clay reaches a foot or two above half-tide level with 5 ft. of "made ground" over, and in Falmouth Road, 200 yds. north of New Kent Road, loamy gravel, at about a foot below that level, is overlaid by 6 ft. of peat and "made ground." At Deveril Street, on the west of Great Dover Street, gravel is reached at half-tide level, 6 ft. beneath the surface, and on the east side of Tabard Street, at Westcott Street, sand and gravel reach more than 2 ft. above half-tide level, covered with 2 ft. of

¹ *Trans. Croydon Nat. Hist. Soc.*, 1905.

mould under 4 ft. of "made ground." At Grange Road, and at Horney Lane, on the south margin of the Bermondsey eyot, gravel and sand rise to above T. H. W. level, while at Bricklayer's Arms Station, a quarter of a mile to the south, gravel is no higher than a foot above half-tide level. Near St. James' Church, not far from the east end of the Bermondsey eyot, gravel rises to 5 ft. above half-tide level, and here the backwater channel, on the south of the eyot, may be considered to end, all more to the east belonging rather to the main river.

It would thus seem that for the greater part of the width the backwater had a gravelly or sandy bottom, 5 or 6 ft. below high-water level, and could have been crossed for some hours before and after low tide without serious difficulty by avoiding soft places and fording watercourses. With a channel more than a mile wide for the passage of the larger part of the tidal flow, the scour in the main river would have been less and the depth shallower, and would afford a favourable place of crossing for the British Watling Street by a ford.

Here also probably Aulus Plautius crossed in pursuit of the Britons in the Claudian invasion (A.D. 43). The place is described by Dio Cassius¹ as being near where the Thames emptied itself into the ocean, overflowing at high tide and forming a lake,² where the Britons, knowing the place well, easily crossed, but the Romans following them got into difficulties. On the north of the river the Romans encountered almost impassable marshes, as would be the case landing on Thorney Island, surrounded by the marshes through which the Westbourne and the Tyburn streams found their way into the Thames, and which stretched from Millbank to Whitehall, and as far inland as the Green Park.

It has already been stated that at Lambeth Baths and Bethlehem Hospital loamy sand reaches T. H. W. level. Half-way between that and Waterloo Station, at Oakley

¹ *Hist. of Rome*, Book 60, c. 20.

² πλημύροντος τε αὐτοῦ λιμνάζει.

Street, gravel is reached at 16 ft. below that level, with 17 ft. of loam, clay, and "made ground" over it. In an average section under the extension of Waterloo Station in 1905, gravel or ballast was reached at 18½ ft. below T. H. W. level, with 1½ ft. of sand, and then 12 ft. of peat over it; and on the other side of the Waterloo Road, at the Waterloo and City Railway, gravel was reached at 28 ft. below T. H. W. level, or 10 ft. below low-water level, with 4 ft. of peat and 21 ft. of peaty beds, sand, clay, and "made ground" over it, the peat being there 9 ft. below low-water level. The main course of the river seems to have been reached, and that is confirmed by sections to the north, where, in the Waterloo and City Railway, at Hatfield Street, and at Falcon Wharf, gravel lies at 20½ ft. and 21½ ft. below T. H. W. level, with "peat" and mud over it; and more to the east where, at Gambia Street Blackfriars Road, the gravel is about 27 ft. below T. H. W. level, with 4 ft. of "peat" upon it, and then 9 ft. of earthy peat with shelly sand and clay, 6 ft. of blue clay and 7 ft. of "made ground."¹ It is doubtful if these so-called peat deposits are true peat; it seems more probable that they consist of carbonaceous matter deposited in the water of stagnant pools. They can be traced for more than 2 miles eastward. At Barclay's Brewery in Southwark, the top of the gravel is 21 ft. below T. H. W. level, with 3 ft. of sand and clay, and then 3 ft. of so-called peat over it.² At Guy's Hospital, so-called peat 2 or 3 ft. thick rests on gravel at 12 ft. below T. H. W. level. At Bermondsey Street, Market Street, Long Lane, and Bermondsey Workhouse, "peat" is recorded as lying upon sand at 12 to 14 ft. below T. H. W. level, in the first-named place peat and trees having a thickness of about 8 ft. At the south approach to the Tower Bridge, 9 ft. of "peat" overlies sand on gravel at from 14 to 17 ft. below

¹ *Proc. Geolog. Assoc.*, Vol. I, p. 265. In the beds above the 4 ft. of peat, *neritina fluviatilis* was abundant.

² Whitaker, *Trans. Croydon Nat. Hist. Club*, 1886, p. 64.

T. H. W. level. Along the course of the low-level sewer from Bermondsey to Deptford, "peat" or peaty beds lie at 8 ft. below T. H. W. level near St. James' Church, and on the west of Southwark Park, and at Deptford Lower Road, near Deptford Station, a peat-bed $1\frac{1}{2}$ ft. thick lies at from 10 to 14 ft. below that level. To the east of this, in excavating the Surrey Docks, a bed was found with trees *in situ* about 14 ft. below Ordnance Datum, and beneath was silty clay full of mammalian remains.¹ There is here a land surface, or at any rate a surface not permanently covered by water, 26 ft. below T. H. W. or 8 ft. below low-water level, corresponding in level with the bottom of the peat near Waterloo Station and Blackfriars Road. As the land subsided, swamps may have been formed favourable for the growth of peat, and peaty deposits in water may have formed, and, with further subsidence, sand, silt and marsh clay would have been deposited over the peat.

To a time of greater elevation of the land must be attributed the remarkable section revealed, in 1908, in tunnelling for a storm-water sewer not far from the Elephant and Castle. Where Rockingham Street is joined by Meadow Row on the north of New Kent Road, a hollow in the London clay was traced to a depth of $49\frac{1}{2}$ ft. below O. D., and there,² on the London clay, lie first 16 ft. of gravel and sand, then 18 ft. of mud, and then 14 ft. of so-called peat. The London clay was not found for 120 yds. to the east of Meadow Row, where it is 16 ft. below O. D.; but the top of the gravel and sand was found 70 yds. east of Meadow Row at 38 ft. below O. D. with 16 ft. of mud and 20 ft. of peat over it, the top of the peat being 2 ft. below O. D. At Falmouth Road the peat was only $3\frac{1}{2}$ ft. thick, overlying dirty gravel at about O. D., below which is London clay at about 18 ft. below O. D. A hollow appears to have been eroded in the London clay

¹ *Science Gossip*, 1876, p. 20.

² Information kindly furnished by Mr. J. P. Harris, M.Inst.C.E.

to at least 43 ft. below the present low-water level, when the land must have stood higher, and as the land sank it was filled in with gravel and sand, then sand, and afterwards peat. The general level of the top of the London clay is hereabouts about 14 ft. below O. D. The hollow in it revealed here to a depth of $-49\frac{1}{2}$ is about 220 yds. long, and, judging from the steep side in Meadow Row, where the London clay rises from $-49\frac{1}{2}$ to -14 O. D. in 50 yds., the general direction of the greatest length must be about east and west. Where the present surface is lowest, 7 ft. below T. H. W. in 1850, and 2 ft. lower now, the "made ground" rests directly on the peat, and is not more than about 4 ft. thick.

EVIDENCE OF EMBANKING BY THE ROMANS.

An embankment to shut out the tides from the marshes between Deptford and Vauxhall would be 7 miles long and as much as 12 ft. high for a greater part of the length. From the nature of the work it must have been carried out as one undertaking, with the tidal flaps, gates, hatches or penstocks necessary to let off the land water at low tide, and to shut out the river as the tide rose. The skill and organisation required for such a work could not have been available before the Roman Conquest, and there are evidences in other parts of the country, and in the Thames estuary, that lands embanked from the tide were occupied by the Romans. In Lincolnshire, Roman interments, pottery, coins, etc., are found within the "Roman bank" which extends from Wainfleet to Boston and Spalding, and by the north of Holbeach to the Wash, a length of 60 or 70 miles.¹ The place names show that the "wall" or bank existed, and that the land within it was fit for occupation at the time of the Saxon settlement, and, as Dugdale points out, the towns now in being were extant in the days of Edward the Confessor.

¹ Dugdale's *Hist. of Imbanking and Draining*; Wheeler's *The Fens*.

There appears to be more direct proof that the Romans embanked Caldecot level in Monmouthshire, between Portskewett and the Usk. An inscribed stone was washed out of the sea bank near Goldcliff in 1878, considerably above the level of the reclaimed land within, and it is now in the Caerleon Museum. The inscription refers to a cohort of the centurion Statorius, and has been read to signify that a portion of the embankment was executed by that cohort.¹ The embankment is 12 miles long, striking out to Goldcliff, then a rocky island 50 ft. above the sea and nearly 4 miles from the shore as it then was, at high water. The tide rises as much as 10 ft. above the level of the land enclosed by the bank, and the great tidal range and the exposed situation testify to the boldness of the Romans in undertaking such works.²

Within the tidal embankments lower down the Thames there are evidences of Roman occupation. Roman interments, pottery and tiles have been found in the Higham and Cliffe marshes,³ and at Crossness, in the Plumstead marshes, the upper surface of a peat-bed 8 or 9 ft. below the surface of the marsh, and about 16 ft. below T. H. W. level, was found strewn all over with broken Roman pottery, including "Samian" ware and *mortaria*, with bricks and roofing tiles.⁴ Within the area now under notice, the Roman burial ground in Deveril Street, 200 yds. west of the south end of Tabard Street, affords stronger evidence. It was stated, in 1835,⁵ that almost every grave in the dissenter's burial ground there had brought to light sepulchral urns, upwards of 20 with calcined human bones having then been obtained, together with bottles of earthenware, glass lachrymatories,

¹ Monmouth and Caerleon Antiq. Assoc., 1882.

² Dugdale's *Hist. of Imbanking* (p. 16) quotes the complaint of Calgacus, as given by Tacitus (*Agric. Vita*, cap. 31), that the Britons were worn out "*in Sylvis et paludibus emuniendis*," and adds, "in clearing the woods and banking the fens if I mistake not." This complaint was as early as A.D. 84, and Tacitus wrote about A.D. 97.

³ *Arch. Cantiana*, Vol. XIII, p. 492.

⁴ *Proc. Geol. Assoc.*, Vol. XI, p. 220; *Arch. Jour.*, Vol. XLII, p. 273.

⁵ *Archæologia*, Vol. XXVI, p. 467.

and broken metallic mirrors. The urns were 6 ft. below the surface of the ground, which had been for many years previously a market garden, and were just below the loam overlying the gravel. In 1841 it was stated¹ that scarcely an interment took place without revealing remains of the Roman cemetery. The level of the ground was 4 ft. below T. H. W., so that the Roman interments were 10 ft. below that level. It is impossible to suppose that they took place at such a level in ground that was covered twice a day by several feet of tide. Near Trinity Church, about a quarter of a mile to the north, a Roman interment was found 12 ft. beneath the surface, at about the same level.

The Janus' head in marble mentioned by Bagford in a letter to Hearne,² said by Dr. Woodward to be unquestionably Roman, and dug up about 1690 near St. Thomas Watering with large flat bricks and other Roman remains, must have been in ground of which the surface was at least 4 ft. below T. H. W. level. According to Defoe,³ it was found in connexion with remains of a building, and a second head was found and left in quicksand. A mile and a half to the east of this, during the excavation for the foundations of the jute warehouses between Plough Road and the new dock, about 1867, an earthenware vase was found containing a large number of Roman coins of the reign of Hadrian. The vase (now in the Bermondsey Public Library) was 5 ft. below the surface of the ground, and about 11½ ft. below T. H. W. level, at the bottom of an alluvial deposit overlying 4 ft. of silty sand on gravel.

The levels of the tessellated pavements in Southwark are evidence to the same effect. Five are known, all within 370 yds. of London Bridge. That discovered in 1840, with foundations of walls on piles, under the south wing of the outer court of St. Thomas's Hospital bordering on High Street, lay 20 ft. below the level

¹ *Archæologia*, XXIX, p. 149.

² Preface to *Ieland's Collectanea*.

³ *Tour through Britain*, Vol. I, p. 234.

of High Street,¹ making it about 2 ft. below O. D., or 14 ft. 6 in. below T. H. W. level. Not 50 yds. off, on the other side of St. Thomas Street in the angle with High Street, a tessellated pavement was found in 1817 "at a depth of 10 ft."² The level was probably about 5 ft. above O. D., or 7 ft. 6 in. below T. H. W. The pavement on the south side of St. Saviour's Church, and that on the site of Cure's College, now covered by the railway on the north of Southwark Street, both discovered in 1820, must have been at about 8 ft. below T. H. W. level. The mosaic pavement seen by Dugdale, in 1658, in the fields at the back of Winchester House, at about 2 ft. below the level of the ground,³ must have been not far from T. H. W. level.

A section at Barclay and Perkins' Brewery has already been noticed (p. 136), in which 3 ft. of peat on 3 ft. of sand and clay overlay gravel at 21 ft. below T. H. W. level. A later excavation not far from it at the same place gives other details.⁴ On sand, about 15 ft. below T. H. W. level, was 4 ft. of peat, containing hazel nuts, sticks, and branches, which appeared to have been deposited in water. Fragments of "Samian" pottery, the pointed foot of an *amphora*, and parts of three or four worn and broken *mortaria* were found on the sand, and in the lower part of the peat up to 13½ ft. below T. H. W. level. Over the peat was 1½ ft. of bluish mud, and then 9½ ft. of "made ground," which contained in the lower part fragments of "Samian" pottery, apparently 1st-century ware, and higher up later Roman, and then mediæval pottery and old tobacco pipes.

¹ *Gent's Mag.*, 1840, Part I, p. 191. The level may be doubtful.

² Gwilt's map of Roman remains in Southwark. This map is entitled "A Map of part of Southwark showing the position of many Roman Antiquities discovered within the last 33 years, but more particularly those in December last and in January of the present year, laid down and drawn by G. Gwilt, May 25, 1819." The map was probably made for a paper read before the Society of Antiquaries at that time, but which was not printed. The tracing in my possession has some later additions.

³ *Hist. of Imbanking and Draining*, p. 65.

⁴ *Archæologia*, Vol. LXIII (1911—1912), p. 323.

Passing over other Roman remains in the north of Southwark, of which particulars are doubtful, a well sunk about 1860 at Guy's Hospital affords definite information. Gravel was reached at about 6 in. below O. D. On it was 2 or 3 ft. of so-called "peat," which, according to Dr. Odling, consisted chiefly of dark clay containing bones and wood, and in and on that, under 12 ft. of "made ground," lay fragments of Roman pottery, including "Samian" vases. The surface of the peat was about 11 ft. below T. H. W. level.¹ More recently, in the foundations of the Nurses' Home, not far off, more broken Roman pottery and fragments of large *amphora* were found at the same level.

It is recorded² that while making the South Eastern Railway, close to Joiner Street, now under London Bridge Station, Roman coins and fragments of red pottery were found at about 17 ft. from the surface. This would be about 2 ft. below O. D., or 14 or 15 ft. below T. H. W. level.

Near the river, between Hay's Wharf and Battle Bridge Lane, a note on Gwilt's map states that in April, 1819, there were found "Roman brass tags and pins, also many leather soles of shoes or sandals." At Magdalene Street schools, south of Tooley Street and east of Bermondsey Street, there were found in 1907 fragments of *patera*, vases, a tazza, cup-shaped vessel, etc. The level of the ground is about a foot above T. H. W., but the depth at which the objects were found is not stated.

In a sewer trench along High Street from York Street, now Bedale Street, to Union Street, broken remains of Roman pottery were found in 1832, usually it is said, at a depth of from 10 to 14 ft.³ This would make the level of them about 9 or 10 ft. below T. H. W.

¹ Dr. Odling, *Guy's Hospital Report*, 1860, p. 433; B. Latham, *Trans. Soc. Eng.*, 1864, p. 245.

² *Gent's Mag.*, 1845, Part I, p. 181.

³ W. Taylor, *Gent's Mag.*, 1832, Part I, p. 401.

In a shaft sunk in 1908 in High Street, near the south end of the London and County Bank, a rough pavement on sand was met with at a depth of 21 ft., which would be about 4½ ft. below O. D., or 17 ft. below T. H. W. level. On it lay fragments of red "Samian" pottery. Above the sand was black earth in which, chiefly near the bottom, fragments of "Samian" ware, of an *amphora*, of Upchurch ware, and coarser pottery were met with. At higher levels pottery of the 16th and 17th centuries was found.¹

To the west of this, on the south side of Southwark Street, between High Street and Southwark Square, an immense quantity of broken Roman and other pottery was found in 1865 over piles and puddled clay. The pile heads were 12 ft. below the street pavement, probably about 11 ft. below T. H. W. level.²

In a well sunk by Gwilt in 1814 near St. Saviour's Schools, Union Street, many Roman antiquities, bones of animals and boars' tusks were found at from 6 to 8 ft. beneath the surface to a depth of 16 ft., when the natural soil was reached, and a strong spring arose.³ The level of the surface was about a foot above T. H. W., so that the Roman remains lay from 5 or 7 ft. below T. H. W. to 15 ft. below that level. The spring probably arose from gravel or sand beneath the "made ground." In making a sewer along Union Street in 1819—1823, various lamps, lachrymatories(?), small glass vessels, fine coral ware, etc., were found at a depth not stated.⁴

Further to the south on the west side of High Street, a considerable collection of fragments of Roman pottery was found in excavating foundations for "The Grapes" tavern in 1885, at a depth stated to be 12 or 14 ft.,⁵ which would be about 11 ft. below T. H. W. level.

¹ N. F. Roberts, *Trans. Croydon Nat. Hist. Soc.*, 1909.

² *Jour. Brit. Arch. Assoc.*, XXII, p. 445.

³ W. Taylor, *Annals of St. Mary Overy*, p. 11.

⁴ Allen, Vol. I, p. 36.

⁵ *Proc. Arch. Assoc.*, Vol. XLII, p. 79.

On the east of High Street, about 50 yds. south of Bedale Street, at the entrance to King's Head Yard, and down the yard, many fragments of Roman domestic pottery, *mortaria*, *amphora*, Upchurch and "Samian" ware, tiles, bones, oyster shells, and Roman coins from Claudian to Justinian, were found in 1879—1881. They lay at from 10 to 15 ft. beneath the surface, the latter depth being about 10 ft. below T. H. W. level. Above the Roman remains were objects of a later date.¹

About 120 yds. further south, in Talbot Inn Yard, excavations reached sand at about 16 ft. beneath the pavement, which would be about 13½ ft. below T. H. W. level. Above the sand, up to the foundations of modern buildings, was about 9 ft. of black earth, containing much Roman pottery, some of which lay partly buried in the sand below, and also leather soles, probably Roman, and a Roman die.² On the same side of the street, southward to Newcomen Street, Gwilt's map notes that many Roman lamps (30 or 40) and other antiquities, including a Samian tazza, had been found.

In 1818, a tunnel for a sewer was driven along King Street, now Newcomen Street, for 250 yds. from High Street. The Roman remains brought to light are described³ as fragments of cinerary urns without number, "some of which, if entire, would have measured nearly 2 ft. in diameter,⁴ while others occur not above 2 ins.," fragments of *paterae*, glass vessels and lachrymatories, but few entire, and terra-cotta lamps, of which a considerable number were found, generally of a plain character. In a shaft sunk at about 26 yds. from High Street, it appeared that a body had been deposited. It was surrounded on all sides by Roman remains, urns and dishes of Samian ware, almost all broken, broken glass vessels, terra-cotta lamps, and soles of shoes and sandals. The interment seems to have been in soil already containing the Roman remains. The depth at

¹ This and other information was kindly given by the late Mr. R. E. Way.

² *Archæologia*, 1912, p. 326.

³ Quoted from the *New Times* of 9th January, 1819, in Taylor's *Annals of St. Mary Overy*, p. 10.

⁴ Probably *amphora*.

which these were found is not stated. The sewer was 15 ft. deep at High Street, which would be 12 ft. below T. H. W. level, and the Roman remains were found in the tunnel from that depth to perhaps 4 or 5 ft. higher.¹

Opposite Mermaid Court, 200 yds. further south, Gwilt's map notes the finding, in 1818, of many bones, stiles and shards. These are also described² as "a quantity of bones, Roman utensils, cinerary and other urns, *patere*, vessels of various ware, among which Samian abounded." In making a sewer in 1909 from High Street through Mermaid Court, numerous fragments of Romano-British and Gaulish pottery, probably of the 2nd century, and pointed leather soles, were found in black soil at a depth not stated.³ To the east of Mermaid Court, near Crosby Row, shoes, sandals, Roman pottery, etc., are marked on Gwilt's map as having been found in 1819. Further to the south, at the north end of Tabard Street, in excavation in connexion with a new street, fragments of Samian ware were found in 1882 at a depth of about 12 ft., which would be about 9 ft. below T. H. W. level. In the foundations of Trinity Church, many fragments of Roman pottery, one of a vase 4 ft. high (probably an *amphora*) were found,⁴ and in Trinity Street, besides the remains of a Roman interment, pottery, including a cup and a wine jar of good Roman type, were found at a depth of 12 ft., or 9½ ft. below T. H. W. level.

The circumstance that the vessels were always broken was plain to those who found them in past years, and who took it for granted that the pottery and glass were of a sepulchral character, and one of them tried to account for it on the untenable supposition that the vessels were purposely broken at the time of burial.⁵ The fragmentary condition is equally evident in all later

¹ The depth of this sewer and that in High Street have been obligingly furnished by Mr. Harrison, the Borough Engineer.

² *Annals of St. Mary Overy*, p. 11.

³ N. F. Roberts, F.G.S., *Trans. Croydon Nat. Hist. Soc.*, 1911, p. 44.

⁴ *Gent's Mag.*, 1825, Part II, p. 633. ⁵ *Ibid.*, 1833, Part I, p. 401.

finds, and though a few urns, said to be from Southwark, may be cinerary, with these possible exceptions the Roman remains consist of broken domestic pottery and glass, with bones and tusks of animals, oyster shells, lamps, soles of shoes, and sandals; and they are found in "made ground," generally a dark-coloured earth lying on the old marsh surface, and sometimes in peat-like matter deposited in stagnant water, at as much as 15 and 17 ft. below T. H. W. level. The Roman remains occur for a considerable thickness in the lower part of the "made ground," and it was long ago observed that objects of mediæval age lay higher up and then those of a later age. Recently the study of Roman pottery and potters' marks has shown that, while 1st-century ware prevails at lower levels, later Roman pottery occurs higher up. It thus appears that there is here a deposit of refuse begun in early Roman times and continued through mediæval times to a still later period. The large area over which it extends is remarkable, and it would seem that if the refuse deposit were all stripped off there would be very little of Southwark left above the level of the old marsh. Such an accumulation of refuse must have come from London rather than from the small suburb on the south of the river. It could only have originated within an embankment shutting out the tides, and refuse could only have come from London by a bridge. There are reasons for thinking that the embankment was an early work of the Romans. It is unlikely that they would rest satisfied with the British crossing by Watling Street, and a permanent road across the backwater was impossible until the tides were shut out. By A.D. 61 *Londinium* had become a place of considerable importance,¹ and if there was no bridge then, it may be supposed that it was not long before the Roman Watling Street with a ford and ferry at Stangate was superseded, as an access to *Londinium* from the south, by a bridge, with a direct road to it. The large

¹ *Copia negotiarum et commerciorum maxima celebra.* Tacitus, *Ann.* XIV, 33.

proportion of 1st-century ware among fragments from Southwark, notable in the Guildhall and British Museum Collections, is equally evident among those more recently found.

ROMAN ROADS ACROSS THE MARSH.

The Roman roads that crossed the low ground were : Watling Street, from Deptford to Stangate; a road connecting Watling Street with London Bridge; Stane Street (or Ermin Street), from Clapham to London Bridge.

Of the first of these no traces are known to remain. Bishop Gibson,¹ in 1695, said that a Roman highway was still visible in St. George's Fields; and Stukeley, in 1722,² says that "it went from Stangate ferry across St. George's Fields, so south of the Lock Hospital to Deptford and Blackheath: a small portion of the ancient way pointing to Westminster Abbey is now common road on this side the nearest turnpike." By the nearest turnpike he must mean the turnpike shown on old maps at the south end of Newington Causeway, about 70 yds. north of the Elephant and Castle, as neither Westminster Bridge nor the new roads through St. George's Fields then existed.³ According to Allen,⁴ in 1824, a portion of the Roman road from St. Thomas Watering to Stangate was discovered near Newington Church. In his *History of Lambeth*⁵ he seems to refer to the same as "a quantity of chalk carefully laid on faggots" thrown up a few yards north of Newington Church, which then stood on the west side of Newington Butts. Such a position is inconsistent with the course given by Stukeley, and it may have been a bit of Stane Street that was discovered.

To reach a ford at Stangate from Deptford in pre-Roman times, before the river was embanked, it

¹ *Camden's Britannia*, I, p. 240.

² *Itin. Cur.*, p. 119.

³ Westminster Bridge was completed in 1750.

⁴ *Hist. of London*, Vol. I, p. 37.

⁵ 1827, p. 324.

seems likely that St. George's Fields would have been made for from the nearest ground above high water. The contour at T. H. W. level suggests that this would have been from Leyton Square, or more to the west, rather than from New Cross. But it is not probable that a permanent road was made across a channel covered by several feet of tide twice a day, and if the Roman road was not laid out until after the tides were shut out, the advantage of a short crossing of land below high water would disappear. If, as there is some reason for thinking, Old Kent Road in part follows the course of the Roman road, it seems probable that, after crossing the Ravensbourne at Deptford, Watling Street kept on ground well above high water as far as New Cross Road, perhaps along the line of an old road now cut in two by the railway, and partly effaced, represented by Batavia Road and Achilles Street; and that the setters out of the road then made for St. George's Fields. New Cross Road and Old Kent Road, as far as Commercial Road, are both several feet above the ground on each side, and would thus appear to be on the causeway of the Roman road. The line of them prolonged would pass less than 100 yds. to the south-west of St. Thomas Watering, near which the Janus' head and other Roman remains were found, and passing over Lock Fields to the south of the Lock, it would cross Newington Causeway a little to the north of the turnpike marked on Rocque's map of 1746, "the nearest turnpike," on the London side of which Stukeley tells us that the Roman road was visible in 1722, pointing to Westminster Abbey. By its pointing to Westminster Abbey, a change of direction on reaching St. George's Fields is indicated, bringing the course of Watling Street near the front of Bethlehem Hospital, opposite to which, according to Allen,¹ a great quantity of Roman remains, tessellated pavement and pottery have been discovered at different times. Between that and ground above marsh level towards Stangate there

¹ *Hist. of London*, Vol. I, p. 37.

would have been but a short crossing of the low ground along the upper course of the Lock stream.

Old Kent Road, onwards from Commercial Road, turns more to the north, and its level drops after leaving the probable course of the Roman road. From the bridge over the Surrey Canal the surface of the road was, in 1850, 5 to 6 ft. below T. H. W. level, and but little higher than the land adjoining, as far as New Kent Road, except where the road has been raised to pass Upper Grange Road over the railway.

Part of the Roman road which branched from Watling Street to London Bridge is certainly represented by Tabard Street, formerly Kent Street, which from early times was the chief approach to London from the south. It is a narrow street, described by Strype, in 1720, as ill-built, with alleys and courts on both sides reached by dark and narrow entrances, very meanly built and dirty, and inhabited by broom-men and mumpers. Its reputation does not appear to have improved much, but it continued to be the approach to London from Kent until Great Dover Street was made early in the last century. The street remains much the same, though its name has been changed, a curious survival, contrasting with the wide Old Kent Road in the same straight line beyond. The boundary between St. George's Parish and Newington runs down the middle of the street, and Roman remains, fragments of urns, *ampullæ*, etc., have been found all along the west side of it.¹ A trial shaft by the side of the street reached "mould" at 5 ft. below road level. This is the level of the ground close by, and probably the mould is the old surface beneath the Roman ridge.

Tabard Street is well above T. H. W. level to the end, and then the road drops quickly from above T. H. W. level to 3 ft. below it, and the Old Kent Road in continuation was, in 1850, 4 ft. and 5 ft. below that level, and little, if at all, above the ground adjoining. It, however,

¹ Strype, Appendix, p. 23. Bagford's letter to Hearne, Feb. 1, 1714, in his Preface to *Leland's Collectanea*.

preserves the line of Tabard Street for about a quarter of a mile, and probably is on the line of the Roman road, and at the Deaf and Dumb Asylum Roman burials have been found. If prolonged, the line would join the course above suggested for Watling Street a little to the west of Old Kent Road and north of Albany Street, about where St. Thomas Watering stream would have been crossed by Watling Street. Near this the Janus' head and other remains already referred to were found, and it is difficult to think that a Roman building of importance stood in such a situation unless it was near a road, and perhaps, the junction of roads. All traces of the Roman road southward of the Lock have, however, been effaced. Causeways upon which they were carried across the marshes would have been exposed to the action of the tides, and to the wash of the Lock and St. Thomas Watering stream, if the river embankment along Limehouse Reach had gone to ruin, and it is quite conceivable that, by a breach of the bank in Lambeth Reach, as well as in Limehouse Reach, after Roman times, a backwater channel was re-opened through which the tides ran.

Some remains described hereabouts may be noticed, though they seem impossible to explain. A "causey," running through the marshes in the parish of Camberwell in a north-eastern direction from the Kent Road to the Thames at Rotherhithe, is said¹ to have been discovered in 1809 in digging the Grand Surrey Canal and the dock at Rotherhithe. It was found under the surface, 15 ft. broad, formed by a bed of squared chalk secured by oak piles; and about 250 yds. of it were broken up. Allen, referring presumably to the same causeway, says² that it was found in making the canal by St. Thomas Watering, from which, however, the canal is three-eighths of a mile distant. The position is uncertain, the direction perplexing, and the level of the ground is so low that the causeway must have been at least 7 or 8 ft. below T. H. W. level.

¹ Bray's *Hist. of Surrey*, p. 401.

² *Hist. of Lambeth*, p. 324.

Watling Street must have been crossed by the Sussex Stone Street near the Elephant and Castle. The course of the latter road is followed by the present road through Tooting, and by Clapham Road and Kennington Park Road in a straight line pointing to the south end of old London Bridge. The straight line is continued by the present road for more than half a mile after ground now below T. H. W. level is reached at Kennington Park, but onwards, across the course of the Lock stream, Newington Butts, Newington Causeway, Stonesend, and Blackman Street (now Borough High Street), lie out of the straight line. The older Borough High Street lies 50 or 60 yds. to the west of the straight line from Kennington to the end of old London Bridge. The names Stonesend and Newington Causeway do not appear to have any reference to the Roman road. Stonesend is mentioned by Ogilby in his *Britannia* as "the end of the pavement," presumably of the pavement of Southwark which then existed. There was a Stonesend also in Kent Street, and another in Bermondsey Street. Ogilby does not mention Newington Causeway, though a causeway not far off at Brixton is noticed, and the name does not appear on maps earlier than the middle of the 18th century. It would seem that near the course of the Lock stream the Roman road had been entirely washed away before the present road was established.

BREACHES IN THE BANKS.

Though land enclosed by Roman banks was occupied by Saxon settlers, it may be doubted if after the departure of the Romans there existed the organization necessary to maintain and repair the embankments and tidal outlets. There is evidence in Lincolnshire that after the Saxon settlement within the Roman bank, the tide again flowed over the fens, and land previously inhabited and cultivated was buried in silt. There is no evidence that such was the case in the south of London, but the names of Kennington, Newington, and

Walworth seem to indicate Saxon settlements, and Bermondsey must have been an island in the marshes, when it got its name. If the river embankment was repaired from time to time, there were probably periods during which it lay in ruins.

Dugdale tells us¹ that the ordinances for the preservation of embanked lands from being drowned were, like the common law, based on long usage and custom; and that, as early as 1242, 24 jurats, chosen in pursuance of ancient custom time out of mind for the conservation of the marsh and sea banks of Romney, distrained on those who had lands in the marsh and ought of right to repair the bank, and that, in 1248, ordinances were constituted by the King's Justice and others for Romney Marsh, according to which jurats were to appoint to every man the share of the bank he was to maintain in proportion to the acres subject to danger. These ordinances served as a model for other marshes, but disputes and difficulties arose, and the Patent Rolls contain many commissions *De Wallis et Fossatis* issued for various places. The Commissioners are to view, and to enquire who ought to repair the banks; to take orders for repairs; to distrain those who hold lands protected to do their contingency; to enquire by whose default breaches had happened; and to fine defaulters for non-repair, or to take lands into their own hands and re-imburse themselves out of the profits for the charges of repairing the breaches. They are sometimes directed to act according to the laws and customs of Romney Marsh.²

¹ *Hist. of Imbanking and Draining*, 1772, pp. 17, 18.

² Holinshed, in describing punishments appointed for malefactors, says (*Chronicle*, p. 186): "Such as having walls and banks near unto the sea, and do suffer the same to decay (after convenient admonition) whereby the water entereth and drowneth up the country, are by a certain ancient custom apprehended, condemned, and staked in the breach where they remain for ever a parcel of the foundation of the new wall that is to be made upon them, as I have heard reported." The Patent Rolls show that more than three centuries before his time a less summary process was followed.

Dugdale notices twenty commissions for the repair of the banks between Dartford Creek and Vauxhall in the Patent Rolls between 1295 and 1475, and the Calendars contain in that period some that he does not mention. After the latter date, commissions *De Walliis et Fossatis* no longer appear in the Calendars. Some commissions are for the whole length from Dartford to Vauxhall, others are for the view and repair of the part between Deptford and Bermondsey, or Deptford and London Bridge, or London Bridge and Vauxhall. Breaches in the bank are sometimes mentioned, but with little to show where they were or to distinguish one from another. Something, however, can be learned about them.

The *Annales de Bermondesia* record the inundation of the lands of the priory in 1208, and that in 1230 "the lands of the breach of Rotherhithe" were enclosed.¹ In 1294 the occurrence of a great breach at Rotherhithe and the flooding of the low ground of Bermondsey is recorded, and in the following year² the custody of the priory was given to David le Graund, who was to apply its revenues to stopping the breach in its land whereby the surrounding lands of the priory were submerged. About three years after there were breaches near Rotherhithe³ through the neglect of those who ought to repair, and a great part of the marshes became drowned. The King seized the lands and committed them to a trusty person, who should undertake the charge of repairing the bank and reimburse himself. In 1309² there was a commission touching a breach of the bank near Bermondsey, and the prior and convent were exempted from contributions for the King's use on account of losses sustained by the submersion of

¹ So in the table of contents. The words in the *Annales* are "*Bartholomens et Johannes de Courterai ceperunt includere terras breccæ de Retherhithe ex una parte et dominus Johannes de Rokeford capit ex altera parte.*" The sentence has the form of an agreement between men of Courtrai and an ecclesiastic.

² *Calendar of Patent Rolls.*

³ Dugdale, *Hist. of Imbanking, etc.*, p. 65.

their lands. In the same year there was a breach in Southwark³ on land which had pertained to the Knights Templars, but was then in the King's hands. In 1311² a commission was appointed, on representation by the Bishop of Bath and Wells and the Prior of Bermondsey, to report on the losses and expenses incurred by them through breaches of the banks in Bermondsey. It appears from a commission in 1313² that lands of those bound to repair the banks had been delivered to the bishop¹ and the prior to be held by them until they had been satisfied of the expenses they had incurred, and that certain persons had cut and carried away corn growing on land so assigned to the prior in Bermondsey, Rotherhithe, Camberwell and Peckham. In 1316 there was a complaint of the want of repair of the bank between London Bridge and the manor called Vauxhall, and of a wall on the soil of the Bishop of Winchester at Southwark.² In 1320 it was found that 13 perches of the bank at Rotherhithe was broken, and that Sir John Latimer was charged with the repair.³ In 1325 there was a commission touching a breach between Greenwich and Bermondsey.² In 1340 the prior and convent of Bermondsey, on account of the intolerable charges daily incumbent on them in keeping in repair the breach of Bermondsey, had licence to lease their manor of Woodford.² In 1353 there was a commission to view and repair the banks at the Stews and places adjacent, by breach whereof divers grounds and meadows lay totally drowned.³ In 1364 divers persons were found faulty in respect to those banks, one of whom was the Prior of St. John of Jerusalem, who had two mills there.³ In 1376 the *Annales de Bermondesia* record that the lands in the breach in Rotherhithe were freed from escheat and delivered to the prior and convent, and in 1416 that the breach of Bermondsey in the parish of Rotherhithe was enclosed.⁴

¹ Robert Burnel, Lord Treasurer and Chancellor.

² *Calendar of Patent Rolls.* ³ Dugdale, *Hist. of Imbanking, etc.*, p. 65.

⁴ *Robertus Brounchbury alias dictus Rykhurst cepit includere breccam de Bermondseye in parochia de Retherhithe.*

Thirteen breaches are thus mentioned between 1294 and 1416, and in less than two centuries of regular government it was necessary to issue more than twenty commissions to ensure the repair of the 7 miles of embankment.

There must have been many similar breaches from neglect in the centuries following the departure of the Romans; and without the authority necessary to ensure their repair, they probably remained open for long periods, getting wider as the tides ebbed and flowed through them. A breach in the bank near Vauxhall, or in Narrow Wall, and another in Limehouse Reach, would have reopened the backwater channel along the course of the Lock stream, and the disappearance of traces of the Roman roads is consistent with such a thing having taken place.

CANUTE'S DITCH.

It seems likely that when, in 1016, Canute passed his ships to the river above the bridge in his attack upon London, the marshes lay open to the tides. There have been many speculations on the course of what has been called Canute's Canal, based generally on the former existence of pools, now drained and filled up, along the lines of low level still existing. The entrance has been put at Greenland Dock, or at Rotherhithe, and the outlet at Vauxhall, or between Waterloo and Bankside, giving a length of about 4 miles.¹ Freeman calls it a deep ditch, and Besant, with the help of geometry, showed by how sharp a curve, and short a canal, ships 70 ft. long might pass round the end of the bridge.² The level of the ground and other circumstances seem to have been little considered in these speculations.

¹ A map showing different courses suggested is given in Allen's *Hist. of Lambeth*, p. 358.

² *Early London*, p. 188.

The authority for the event is the *Anglo-Saxon Chronicle*, translated thus in the Rolls Series,¹ "Then came the ships to Greenwich in the Rogation days (May 7); and within a little space they went to London, and they there dug a great ditch on the south side, and dragged their ships to the west side of the bridge, and afterwards ditched the town without, so that no one could pass either in or out." The ships were, no doubt, like that found in a tumulus at Gokstad, and now in the Christiania Museum. It is the longest viking ship known, and is supposed to date from the 9th century. It is 78 ft. long over all, the beam 16½ ft., and the depth 4 ft.²

If Canute found the river embankment entire, and proceeded to cut through it, it is possible to follow generally what would have happened. He would have found a bank shutting out tides rising 7 or 8 ft. higher than the land within it, and after he had cut through it, the water, when the tide rose above the level of the marsh, would flow in, and continue to do so until the tide without rose and fell again to the level of the water within, which meanwhile would have spread over a large area and flooded the marsh to but a small depth. After a short pause it would begin to flow out again, at a less rate than it flowed in, and would continue to do so until the tide had fallen to low water, and risen again to above the level of the water within. This, with successive tides, would reach a level at which it would have been but little affected by the rise and fall of the tide, and the land would be flooded to an almost constant depth, and remain so as long as the opening in the bank was small compared with the area flooded.³ It may be said

¹ Thorpe, p. 122.

² Particulars and illustrations from *Scribner's Magazine*, Nov., 1887, are given in *The Royal Navy*, by Laird Clowes, Vol. I, p. 20.

³ When the Middle Level Sluice gave way in 1882, and a wide and deep breach in the bank above it led to the inundation of nine square miles of fen, although the tide in the Ouse rose 12 ft. above the level of the fen, the inundation was not more than 5 ft. deep, remaining at about half-tide level, and not altering more than 6 in. while the tide in the Ouse rose and fell 19 ft.

with some confidence that the effect of cutting through the embankment would have been to flood the marsh to a depth too shallow for Canute's ships, and deep enough to prevent the digging of a canal. The Chronicle says nothing of the flooding of some square miles of land, a more noticeable a thing than the digging of a great ditch.

It is more probable that during years of neglect the river embankments had been allowed to sink until high tides overtopped them, and they were breached, as such banks usually are, by tides flowing over them. As the breach or breaches widened by the scour of the water flowing in and out, the rise and fall within would approximate more and more with the tide outside, until the width gave the tides such a free flow that the flooded area was laid nearly dry at every tide. The marshes then would have drained, much as the old maps show, and the levels of 1850 indicate, the greater part to Limehouse Reach by the Lock stream and its tributaries. In that condition there would have been little difficulty in exploring and making a passage for the ships along the course of the Lock stream without much hindrance from the garrison of London. The condition of the marshes towards Limehouse Reach up to the end of the 18th century has been noticed, and the levels of 1850 show that, as the surface then was, ships drawing as much as 5 ft. of water could have passed at high water of an ordinary spring tide over all the ground not occupied by docks and wharves from Limehouse Reach as far as Old Kent Road; and that, if raised roads be disregarded, they could have passed round the south and west of St. George's Fields, and have reached the river embankment between Belvedere Road and Blackfriars Bridge without as much as 2 ft. of deepening being required anywhere. The draught of Canute's ships was probably less than 5 ft., and some allowance might be made for the raising of the surface in the marsh by silting in the eight and a half centuries between 1016 and 1850, and by so much the depth of water available at the former date for the ships

would be increased; but against that has to be set the possibly lower level of the tides at the former date. It is not necessary to suppose that the ships passed through in one tide; it was usual to run them aground, and any necessary deepening could have been effected in a few tides.

TRACES OF OLD BREACHES REMAINING.

Some traces of old breaches in the river embankment still remain. Belvedere Road, from Westminster Bridge Road to beyond Tenison Street, is on the line of Narrow Wall as it is shown on old maps, except at one place, where the maps show it bending round inland, following what is now Belvedere Crescent in, roughly, one-third of a circle, and rejoining the line of Belvedere Road in about 120 yds. That part of Belvedere Road along the chord of the arc dates from the beginning of the 19th century. A breach in Narrow Wall was, as is usual, stopped by enclosing it on the land side, and so avoiding the deep hole scoured out on the site of the original bank; and Belvedere Crescent preserves the line of this enclosing bank.

From the east of Waterloo Bridge, Narrow Wall is shown on old maps 30 or 40 yds. from the river until it approaches Letts' Wharf, where it bends inland, and is 60 or 80 yds. from the river until it joins Broad Wall, on the east of which the former line of the river embankment, about 40 yds. from the river, is resumed by Upper Ground Street. A breach in the bank seems here to have been closed in the same way as at Belvedere Crescent. A smaller bend in Upper Ground Street, a little further on, may mark another breach. St. Saviour's Dock probably originated in a breach at the outlet of an old watercourse. It must have been scoured out to a considerable depth by the tides for some distance from the river, so that the bank to enclose it had to be carried 300 yds. inland. Rather more than a mile farther down the river there are the traces of another breach at what is now called Bull's Head Dock.

Maps from 1677 and onwards show Rotherhithe Street here passing round a bay in the foreshore of the river open to the tide, and after 200 yds. returning to the line of its former course near the river. The bay has been enclosed and built over, but Rotherhithe Street still follows the course of the bank enclosing the breach.

There are two repaired breaches exactly similar, but larger, to be seen in the river embankment of Plumstead Marsh, one just to the west of Tripcockness, and another three-quarters of a mile lower down the river. Another, in which the outlet of a stream was involved, is to be seen half a mile to the east of Crossness sewage outfall works.

BANKS WITHIN THE RIVER EMBANKMENT.

There were banks dividing up the land enclosed by the river embankment, often the boundaries of manors, and called manor ways. There were formerly many in the marshes lower down the river, and some still remain. Daniel's Wall is mentioned several times in the Patent Rolls. There seems to be no clue to its position, but it was in Bermondsey, and it may be inferred that it was not part of the river embankment. The raised bank before mentioned, shown on Rocque's map of 1746 as running from near where the bridge now is between Greenland Dock and Russia Dock, and continued, planted with trees, to the river bank near King and Queen Stairs on the east of Bull's Head Dock, was such a bank. Later plans show it as bounding property, and in 1873 the site of the avenue, with a drain on each side, was occupied for some of its length by ironworks. "Gallie Wall, against Lowsie Mead," seems to have needed repair in 1620. Rocque's map of the neighbourhood of London (1744) gives the name Galley Wall to that part of the old road to Greenland Dock, formerly Manor Way and Manor Road, and lately renamed Galley Wall Road. The boundary between Bermondsey and Rotherhithe was along it, and it was probably a protection against the floods to which Rolls Marsh was subject. The name

Lowsie was preserved in Louces Road until towards the end of the last century, when it became Rolls Road. Broad Wall has been mentioned as enclosing the Liberty of Paris Garden, afterwards Christchurch Parish, from "The Marsh" on the west. A quarter of a mile to the east of it is Green Walk; old maps from 1677 onwards show it as Green Walk or Green Wall, running from the river bank southward by Burrell Street and Collingwood Street as far south as Charlotte Street. Bishop's Wall, Lambeth, likewise became Bishop's Walk. The change from Wall to Walk suggests that others of the many "walks" in South London may have been "walls" or banks. Melancholy Walk, continuing Broad Walk along the south boundary of the parish of Christchurch formerly Paris Garden, with a watercourse on each side, was no doubt a bank or "wall." Bandy Leg Walk, more to the east (now Great Guildford Street), Lambeth Walk, Walnut Tree Walk, Vauxhall Walk, and others, probably represent walls or banks. Such banks would be the only available walks in marsh land intersected by ditches and drains. Some "walks," if straight, may have been rope walks, particularly in Bermondsey and Rotherhithe; but, generally, they are not straight, and what are rope walks on old maps are now straight streets, such as Vienna Road and Farncombe Street, Bermondsey.

CHANGES BROUGHT ABOUT BY THE METROPOLITAN MAIN DRAINAGE.

A great change in the condition of the district was brought about in the middle of the last century by the construction of sewers 12 to 15 ft. below the level of the subsoil water in connexion with the low-level sewer having an outfall by pumping at Crossness. The ground soon became built over, only a few acres of market garden ground now remain, and a population larger than that of towns such as Southampton or Brighton now occupies land not more than a few feet above half-tide level.

A curious result of the lowering of the subsoil water was brought to notice near Rockingham Street, where the construction of the storm-water sewer in 1908 revealed a deep hollow in the London clay, in which about 16 ft. of sand and gravel is overlaid by thick beds of mud and peat, as already described (p. 137). In 1850 the level of the surface of the road in Uxbridge Place, Rockingham Street, and Paul's Passage was more than 7 ft. below T. H. W., lower than any ground to the westward, or within more than a mile to the eastward; but from levels taken in 1906 it appeared that near the angle in Rockingham Street, at the end of Meadow Row, the surface was more than 2 ft. lower than it was in 1850. The effects of the subsidence could plainly be seen in the houses that had not been rebuilt in Rockingham Street and streets and courts adjacent, and they could be traced further. The lowering of the road, as shown by surface-levels, extended 170 yds. westward from the angle in Rockingham Street and halfway up Meadow Row towards New Kent Road. Where the subsidence is greatest, there is now a thickness of 18 or 20 ft., from a few feet beneath the surface, of what is described as peat, on 14 ft. of mud over sand and gravel, and there can be little doubt that the subsidence was caused by the shrinkage of the peat as it dried in consequence of the lowering of the subsoil water.

To ascertain more accurately the extent of the subsided area, the amounts by which the Ordnance bench marks had sunk since 1850, courteously furnished by the Director-General of the Survey, have been made use of. Some of the bench marks have been destroyed in rebuilding houses, but from those that remain it appears that the sunk area lies almost wholly on the north of New Kent Road. It can be traced from Marshall Street, St. George's Road, to Lansdowne Place on the east of Tabard Street, extending as far north as the Sessions House. The southern limit lies a little to the south of Warner Street and New Kent Road, and crosses Newington Butts about 100 yds. south of

St. George's Road. The subsided area is thus more than three-quarters of a mile long, and considerably more than a quarter of a mile wide at the western end. A sinking of as much as a foot seems not to extend far from the angle in Rockingham Street, where it is more than 2 ft., and it soon decreases, more gradually towards the north and east than to the south. Beyond this area there has been no sinking of the bench marks.

The large area over which subsidence can be traced is remarkable. It shows, however, the extent of the peat deposit rather than that of the hollow in which it lies, as the mud and ballast would not shrink in drying like the peat. No trace of a hollow in the London clay in continuation of that seen in the sewer section is shown by borings and sections more to the eastward.

A deeper hollow of the same sort in the London clay was passed through in tunnelling under the Thames for the Waterloo and Baker Street Railway. The top of the London clay was traced under the south of the river to 52 ft. below O. D., and a boring at about one-third across the river proved it to be there 85 ft. below O. D., the hollow being filled with Thames gravel and ballast. It has been supposed that it is an old river channel, but it is remarkable that along the Waterloo and City Railway, where the top of the London clay was traced across the Thames from above Blackfriars Bridge to Waterloo Station, a short half-mile distant from the other section, the top of the London clay was nowhere lower than 30 ft. below O. D.

CONCLUSION.

In the changes that have taken place during the past century many traces and remains of antiquarian interest have been destroyed or hidden, often without any record having been kept of them, or care taken of objects found; and it is much the same still. Excavations for various purposes are constantly being made, but they seldom come under the eye of a

competent observer, and any objects of interest, if they are preserved, remain generally without any record of where, or in what position, they were found. The London County Council causes sections of their sewer trenches to be made, and objects of interest to be preserved, but these trenches are but a small part of the excavations always going on. Much might be learned from a more general observation of excavations in the superficial deposits, and of the position of objects found, which alone often gives them much value. In this particular area observation is particularly needed in Southwark, where the "made ground" over nearly a quarter of a square mile consists largely of refuse deposits of Roman and later times, lying on an old land surface as much as 12 or 14 ft. and more below high-water level.