

shivering on high dykes inland; they will be saved in punts, if the worst befall, but a hundred spades, wielded by practised hands, cannot stop that tiny rat hole. The trickle becomes a rush, the rush a roaring waterfall. The dyke top trembles—gives. The men make efforts, desperate dangerous, as of sappers in a wreck, with tiggots, huddles, sedge turf; but the bank will break, and slowly they draw off, sulen, but uncomplaining; beaten but not conquered. A new cry arises among them. Up, to save yonder sluice; that will save yonder lode; that again yonder farm; that again some other lode, some other farm, far back inland, but guess'd at instantly by men who have studied from their youth, as the necessity of their existence, the labyrinthine drainage of lands which are all below the water level, and where the inner lands in many cases are lower still than those outside.

"So they hurry away to the nearest farms; the teams are harnessed, the waggons filled, and drawn down and emptied; the beer cans go round cheerily, and the men work with a sort of savage joy at being able to do something, if not all, and stop the sluice on which so much depends. As for the outer land, it is gone past hope; through the breach pours a roaring salt cataract, digging out a hole on the inside of the bank, which remains as a deep sullen pond for years to come. Hundreds thousands of pounds are lost already, past all hope. Be it so then. At the next neap tide p rhaps they will be able to mend the dyke, and pump the water out; and be in again, beaten but not conquered, the same everlasting fight with wind and wave which their forefathers have waged for now 1300 years." (C. Kingsley).

From the time of the Norman Conquest till the reign of James the First, the fens remained as common land, the monasteries and religious houses having certain rights of pasturage and turbarry. After the dissolution of the monasteries by Henry VIII, these rights fell into the hands of numerous private individuals, and were the occasion of many disputes, the records of which exist in the annals of the law courts. Commissions were issued to settle the boundaries of the fens, and determine the rights of the Crown; and in Queen Elizabeth's reign a code of fen laws, for the regulation of the commoners, was issued, to which a fuller mention will be made hereafter. The attempts made by the Earl of Bedford to reclaim the great Bedford Level directed the attention of King James to the state of the other fens in Lincolnshire, and many efforts were made through the Court of Sewers to improve the drainage; but owing to the inability of this court to compel the payment of taxes necessary for carrying out the work, the various schemes fell through, and were otherwise postponed, owing to the unsettled state of the country during the civil wars. In the reign of Charles the First grants were made of these fens to certain undertakers, who in consideration of their having a portion of the land granted to them as their reward, undertook to reclaim the land; and to a certain extent succeeded; but in the lawless times that followed they found it impossible to preserve their possessions from the attacks of the dispossessed ten men, who cut the banks, pulled up the sluices, and threw down the dykes. And so the fens remained in a partial state of reclamation till the year 1762, when an Act was obtained for the improvement of the low lands on the Witham. Under the power of this Act the river was improved, and the Grand Sluice erected at Boston. This was followed by an Act for the better drainage and reclamation of Holland Fen and the Black Sluice district in 1765. The Act for the enclosure of the East and West Fens dates from 1801, and for Deeping Fen about the same time, steam power being applied in 1823.

The general principle on which the drainage of the fens is laid out is that of gravitation, large arterial drains being cut through the centre of the fens, protected by self-acting doors to exclude the tides, at their junction with the main river. These large drains are fed by a complete network of smaller sewers, which ramify throughout the whole of the level, and conduct the rainfall from the land to the

main drains, and through them to the sea. The water falling on the lands lying below the ordinary height of flood level was in the first instance lifted up by means of wheels worked by wind mills. The origin of the introduction of wind mills as applied to drainage is said to have arisen from the necessity that the engineers of the Bedford Level Commission found from time to time of employing some mechanical means of emptying the drains when requiring to be cleaned out. For this purpose, in the first instance, large scoops, so constructed as to be handled by a number of men, were used; but in 1687 the Corporation of the Bedford Level provided mills, consisting of a wheel with floats, very similar to the old breast wheel, to which motion was given by horses. In the year 1699 a person of the name of Green erected one of these mills at Slade to drain his land; and in 1703 another was erected by Silas Tytus. Both these were considered nuisances and ordered to be pulled down. Although from this it would appear that these mills were opposed to popular opinion, they made such advancement that they soon took their place as absolute necessities in the economy of drainage. In the year 1726 an Act was obtained for the effectual drainage of Haddenham Fen by the use of mills, and after this their use became general—(Baldwin Latham's Papers on the Fens.) Horse-power soon gave way to the wind, but the operations of this capricious element were found to be too uncertain, and a more expensive but effective substitute was found in steam. The largest engines in this district are those erected for the drainage of Deeping Fen in 1824, consisting of two engines of an aggregate power of 140 horses, and working two large scoop wheels, which lift the whole of the water from Deeping Fen, containing 25,000 acres. Numerous engines for the drainage of small tracts of land exist in different parts of the fens; those that have been in existence for some years work the old-fashioned scoop, but these are gradually giving way to the centrifugal pump.

This reference to the mechanical appliances that have been brought into action in the drainage of the fens would not be complete without a mention of the plan adopted for emptying the water from the Middle Level over the dam that was made to stay the tides at the fatal inundation that took place in 1861, by the blowing up of the Middle Level Sluice. In lieu of erecting steam pumps, Mr. Hawkshaw proposed that the principle of the syphon should be applied, and for this purpose 16 large bent tubes, each 150 feet long, and 3f. 6in. in diameter, are placed on the embankment: with the short leg in the drain, and the long one in the river. Three air-pumps are attached to the syphons, and are used to exhaust the air from the tubes, being worked by a ten-horse-power engine. These syphons have, up to the present time, been found to perform their work satisfactorily, and have no doubt answered the purpose for which they were applied admirably.

Further details of the works of drainage, and of the constitution of the various commissions who have the control over them, will be given in connection with the history of each fen. Suffice it here to say, in conclusion, that the reclamation of the fens, and their present wonderful fertile condition, is due to the ingenuity and perseverance of their inhabitants, aided by the skill of the most talented engineers who have lived during the last hundred years. Nearly every engineer of high standing has left his mark on some part of this great level. Smeaton, Telford, the Rennies, Cubitt, Brunel, Walker, Robert Stephenson, and Hawkshaw, have all been called at various times; and even now it is only by the constant and vigilant attention of skilled men that the fens are preserved. The rain and devastation, the long and costly litigation, and the ultimate heavy tax on the land, caused by the Middle Level inundation, is a sad instance of the serious consequences arising from neglect, and shows how dependent is the cultivation of the soil on the skill and attention of the engineer.

[To be continued.]

PAPERS ON THE FENS OF LINCOLNSHIRE, By W.H. Wheeler, Surveyor to the Corporation of Boston; Being a description of the Rivers Witham and Welland, and their Estuary; and an account of the reclamation and drainage of the Fens adjacent thereto.

[Continued from the Mercury of Aug. 30]

CHAPTER II.

The River Witham and the Fens Adjacent

The river Witham takes its rise at the village of South Witham, about ten miles north of Stamford; and after a circuitous course of about 68 miles empties itself into Boston Deep. The shape of the river may be compared to a horseshoe, the upper part of the shoe being at Lincoln, and the two ends respectively at South Witham and Fishtoft, the distance between the two points being about 28 miles. The three fen rivers—the Witham, the Welland, and the Glen—all rise in the same part of the county, the distance between the heads of the Witham and the Welland being about nine miles, and between the Witham and the Glen about two miles.

The Witham, springing at Thistleton and South Witham, thence flows almost due north, past Colsterworth, Great and Little Ponton, to Grantham at each of which places it receives tributary streams. It then continues its northerly course past the beautiful grounds of Belton and Syston, whence it takes a westerly direction to Leag Bennington, receiving on its way the Honington Brook, and a stream one head of which rises in the vale of Belvoir and the other at Denton, and both united join the Witham at Hougham; whence it turns again north, and passes Claypole, Barnaby, Beckingham, Stapleford, Thurlby, and Hykeham. At the latter place another tributary joins it, having its rise near Cayhorpe and Fulbeck; and also at Welbourne, and continues through a wide sandy valley to Lincoln. Here its direction is changed eastward for about eight miles; and after receiving at this point another considerable stream (the Fossdyke) turns south-east, and continues in that direction till it discharges its contents into Boston Haven. At Bardney, Stixwold, and Dogdike it receives additions from small streams; and at Tattershall the Bain discharges its waters, after a course of about 25 miles, having its rise at Ludford, and passing Horncastle and Scrivelsby on its way.

The length of the Witham, as already stated, is 68 miles. The total area of land drained by this river is about 680,392 acres, of which 414,988 acres are high lands, and 265,404 fens, or lands drained by artificial cuts. The history of the Witham may be traced back to very early times. There is reason for believing that during the time of the Romans, who had a station at Lincoln, and long afterwards the Witham admitted ships of considerable size to sail thither, as remains of them have been discovered deeply buried by the accumulation of the deposit left by the waters. Dugdale mentions that large ribs of ships had, within memory, been there dug up, and this receives further confirmation from the following circumstances:—On digging for a foundation to build a house, at the upper end of the main street in Lincoln, a boat was discovered, which, by a chain and lock, was fastened to a post. (Chapman's Facts and Remarks.) This spot being many yards higher than the middle of that valley, through which the Witham runs, it is inferred that the boat had been moored at the side of the river and sunk and silted there, and that the channel must there have been both broad and deep.

In William the Conqueror's time Lincoln was one of the most important cities in England, and Leland tells us that men flocked there both by land and water; and in Henry the First's reign we are informed that Lincoln possessed a very large share of the import and export trade of the kingdom. In Edward the Third's reign it was made a staple for wool, leather, and lead. The Witham was the only source by which this trade could have been carried on, and must therefore have been in a condition navigable for ships of a size competent to cross the seas to foreign parts. It is even asserted that the bed of the river was considerably lower than it is now, and that the tide ran quite up to the city, and raised the water at the Swan-pool two or three feet. In 1743 it had so far deteriorated that spring tides only rose two feet six inches at the mouth of the river Bane.

The Witham, besides being a great highway to one of the most populous cities in England at that time, received additional importance from its valuable fisheries. Camden says that it was famous for its pike, hence the old saying, "Witham pike, England hath none the like." Another writer informs us that, owing to the abundance and quality of fish found in the fen rivers, the monks and holy men were led to choose situations near their banks for the erec-

tion of their religious houses. In the year 1115 a stream was granted by William de Gaunt in the year 1115 to the Abbey of Bardney; and in the year 1162 a fishery on the Witham, near Dogdike, was given to the monks of Kirkstead by William de Kyme.

The religious establishments on the banks of the Witham were more numerous perhaps than those of any other river in Britain within the same compass. Twelve of these houses were erected within twenty miles, viz., at Monk's-house, Barlings, Bardney, Topholme, Stixwold, Kirkstead, and Tattershall on the eastern side, and Kyme, Catley, Mere, Nocton, and Haverholme on the western. The holy residents of these establishments did not always behave in a manner that was to be expected from their calling. They did not follow out the golden rule of "doing to others as they would that others should do to them," for in the reign of Edward the First the holy nuns of Stixwold were accused of making an encroachment on the river, which operated to the serious injury of the country, and they were ordered to remove it.

The gradual extension of the population which gathered round these monasteries caused attention to be paid to the condition of the low lands on either side of the river between Lincoln and Boston, which were overflowed all the winter, necessitating constant attention to the river; the descent of the stream from Lincoln to the sea being so little that the water having a slow passage could not keep it wide and deep enough either for navigation or draining of the adjacent marshes without the frequent helps of digging and clearing the same. The earliest mention that is made of legislative interference for the management of this river was in Edward the Third's reign, when a presentment was made in the Court of King's Bench that, owing to the default of the town of Coningsby, the channel of the river in Wildmoor was bending and defective, and consequently the marshes of Wildmoor and Bolingbroke were overflowed and drowned.

In 1342 (16 Edw. III.) a petition was presented to the King, stating that the "Ea of Kyme," betwixt Doochyke and Brent Fen, was so obstructed by mud, &c., that ships laden with wine, wool, and other merchandise could not pass as they used to do. Towards the latter end of this reign the river was cleansed and widened by royal patent. In Richard the Second's reign a commission was appointed for the view and repair of those banks and sewers betwixt Hildike and Bolingbroke, and betwixt the river Witham and the sea, and to do all things therein according to the law and custom of this realm and according to the custom of Romney Marsh; and also to take so many diggers and labourers, upon competent salaries, in regard of the then urgent necessity as should be sufficient to accomplish that work. (Dugdale.) Several other commissions were issued in subsequent reigns for the like purpose, and in Henry the Seventh's reign (1500) a Council was held to settle the best means to be taken to improve the river, at which they determined to send to Flanders for some experienced person to advise them. May Hake was the chosen engineer, and under his advice it was determined that a sluice should be erected across the river at Boston. A new commission was appointed, which was instructed to ascertain the number of acres; order statute duty to be performed till the work was finished; levy contributions; send ships to Calais for Hake and his companions skilled in embanking and draining, and for materials for the work; appoint proper officers for directing and expediting the same, and whatever else might fall under the necessary management of the concern. The sum of 1000*l.* was borrowed for carrying out the work until such time as it could be levied by the Commissioners of Sewers according to the law of Romney Marsh. Hake was to be paid for his services at the rate of 4*s.* per week, with a gratuity of 50*l.* on the successful completion of the work. The stonemasons and stone-hewers, fourteen of whom he agreed to bring with him, were to have 4*s.* per week.

The sluice was accordingly erected. The situation appears to have been under or near the old wooden bridge over the Witham at Boston, as mention is subsequently made of a sluice there. It does not seem to have answered the expectation of the promoters, for towards the end of the 16th century the state of the river was worse than ever. The exact principle on which the sluice was constructed does not appear, but that it was not intended to exclude the tidal waters may be gathered from the fact that in the year 1700 spring tides are stated to have risen ten feet at a distance of five miles above Boston, and from a remark in a paper of one Dr. Browne, written about the year 1560, "That the sluice was not according to the first meaning and determination, but should have been made with a pair of fludd gates, that the fludd should have no further course than the bridge, but so to have returned back again; and

shivering on high dykes inland; they will be saved in punts, if the worst befall, but a hundred snakes, wielded by practised

the fresh water following the salt, which should continue fresh above the bridge, to have had at all times fresh water for the commodity of the town during the time of the flood. And also for to have scoured the haven daily both above the sluice and to the seaward."

From this time the river continued to decay, owing to the decline of the trade and commerce of Boston, by the withdrawal of certain merchants. And it seems probable that in consequence of the trade being lost the motives to labour for the security of a country, which could not vend its staple commodity, must have been few and feeble.

The suppression of the religious houses by Henry VIII. also tended very seriously to injure the drainage by the river, for their spiritual tenants were assiduous in preserving their property, and improving their lands by attending to the work of sewers, and it cannot be doubted that these would be neglected, and the drainage suffer when the King seized upon their revenues and banished the proprietors.

The fens adjacent to the Witham were, no doubt, included in the various schemes which were carried out in the reign of Charles the First, and attention directed to the state of the river, but no particular mention of this is made in Dugdale and other ancient writers on the subject. The attempts made for the reclamation of the East and West and Wildmoor Fens will be detailed hereafter in a chapter devoted to their special history.

In the year 1720 the North Forty-foot Drain was constructed by Earl Fitzwilliam for the drainage of a tract of land belonging to him, lying to the north of Kyme Eau. Having made repeated applications, without success, to the Court of Sewers to drain his lands, he determined to undertake the work himself, and for that purpose cut the North Forty-foot, which, passing under Kyme Eau, discharged its waters at a new sluice erected a little above Boston bridge, and by this means withdrew from the Witham a great quantity of water which used to find its way into the river at the sluice at Langrick, much to the detriment of the channel above Boston, and very little to his own benefit, for it appears that so ineffectual was the new drainage that one of the tenants cut his own banks to rid himself of the water, and let it flow into Holland Fen.

About the beginning of the 18th century numerous breaches are reported as existing in the banks from neglect, through which the waters ran in and out of the fens; and the lands continued in a drowned state, and the navigation completely lost, till the year 1761. The means and powers at the disposal of the Court of Sewers, the body having the control over these fens, being found quite inadequate to carry out any general measure for their improvement the proprietors most largely interested in the state of the land met together, and determined to apply to Parliament to supersede the Court of Sewers so far as this district was concerned, and to sanction the appointment of a new commission vested with considerable powers for levying taxes and performing works and all other things for draining and reclaiming the fen and restoring the navigation. Mr. Langley Edwards being appointed engineer, under his advice a scheme for the improvement of the river was settled, and in the second year of the reign of George the Third was passed "An Act for draining and preserving certain low lands, lying on both sides of the river Witham, in the county of Lincoln, and for restoring and maintaining the navigation of the said river from the High-bridge, in the city of Lincoln, through the borough of Boston to the sea." (2 George III., c. xxxii.) The preamble to this Act recites, that whereas the river Witham, in the county of Lincoln, was formerly navigable for lighters, barges, boats, and other vessels from the sea through Boston to the High-bridge, in the city of Lincoln; but by the sand and silt brought in by the tide the outfall thereof into the sea hath, for many years last past, been greatly hindered and obstructed, and is now in a great measure stopped up, lost, and destroyed, and thereby great part of the low lands and fens lying on both sides of the said river (and which contain together about one hundred thousand acres) are frequently overflowed and rendered useless and unprofitable, to the great loss of the respective owners thereof, the decay of trade and commerce, and the depopulation of the country; and whereas, in the judgment and opinion of experienced engineers and persons of known skill and ability, the navigation of the said river Witham, and the outfall thereof into the sea, are capable of being restored and maintained, and the said low lands and fens of being drained, cultivated, & improved, and that the same could not be done without the authority of Parliament.

The district included in the Witham commission is that tract of land lying on either side of the river, extending from Lincoln on the north to the town of Boston on the

main drains, and through them to the sea. The water

south, stretching eastward as far as the higher grounds in Freiston, Butterwick, Benington, Leake, Wrangle, and Friskney, and bounded on the west by the Cardyke, the old Catchwater drain of the Romans, which separated the high lands from the fens. The East Fen was not included in the first Act, but was added in the year 1801. (41 George III., cap 135.)

For the purposes of the Act the level was divided into six districts. The first, comprising the fens on the south-west side of the Witham, extending from Lincoln to Dogdyke; the second, Holland Fen and the adjoining lands, bounded by Dogdyke and Kyme Eau on the north, the Witham on the east, and south and west by Swineshead, Heckington, and Brothertoft; the third district comprised the fens on the north-east side of the Witham, stretching from Lincoln to Tattershall; the fourth district, the Wildmoor and West and East Fens; the fifth district, fens in Anwick, North Kyme, Great Hale, Little Hale, Heckington, Ewerby, Howell, and Swineshead.

The General Commission was to consist of 37 members, 31 of whom were to be elected by the several districts in the following proportions:—The first were entitled to send 7 representatives, the second 6, the third 5, the fourth 3, the fifth 2, and the sixth 3. Each member elected must have qualified for the office by taking a prescribed oath, and must have been in possession of land of the value of 100*l.* per annum, or personal property of the value of 2000*l.*, or be heir apparent to landed property of the value of 200*l.* per annum. The remaining six members consisted of the Mayors of Boston and Lincoln for the time being, and two commissioners elected by the city of Lincoln, and two by the borough of Boston. The Commissioners were to be elected every three years, but in default of such election taking place the old Commissioners were to remain in office. An annual meeting was to be held every year on the first Monday in July, at either Lincoln, Boston, or Skefford. Each district had also its own commission for the management of the interior drainage works in their respective neighbourhood, the number of members being regulated by the number of parishes in each district, each parish electing one representative; and the qualification for a vote being the ownership of land liable to taxation of the value of 5*l.*, or an occupation of 50*l.* These Commissioners elected from amongst themselves certain members, as before stated, to represent them at the Board of the General Commission, who had the control of all the arterial drains and outfall sluices, and a general supervision over the whole level.

A Navigation Commission was also appointed, separate from the Drainage Trust, consisting of the Mayor of Lincoln and four other members elected by the burgesses, the Mayor of Boston and four members elected by the Corporation, and ten members elected by the General Drainage Commissioners. The functions of this body were the restoration of the navigation, and for this purpose they had power to erect locks, make cuts, and clean out the rivers; and were to pay the extra expenses in providing a lock at the new sluice to be erected at Boston. To enable them to execute these works they were authorised to take tolls (not exceeding 1*s.* 6*d.* per ton) on all boats navigating the Witham, and to raise money on the security of the tolls.

In pursuance of the powers so granted, the Commissioners expended 6800*l.* in deepening the river and building the new locks and other works, and once more made it navigable for vessels, but of a different class to those that sailed up the river on the flood tide to Lincoln, when that city was in its palmy days as a mercantile town. The works for the improvement of the drainage sanctioned by this Act, and subsequently carried out, consisted of straightening the course of the river Witham by making a new cut from Boston to Chapel-hill, and cleansing, widening, and deepening the river from that place to Stamp-end, near Lincoln: the fishing weirs and other obstructions which had hitherto hindered the full course of the waters were removed, the sides of the river were embanked, and the water prevented flowing on the adjacent lands, while its discharge was effected by the cleansing and deepening of the Kyme Eau, Billingham Skirth, the Bane, and other tributaries and side drains. The new cut from Boston to Chapel-hill was laid out by the engineer in a direct line between those two places; but to oblige one large proprietor the channel was turned from its proper direction so as to run by Anton's Gowt; and to accommodate another, it was made to go off thence, at a sharp angle, towards Langrick. (*Chapman's Facts and Remarks*.) The dimensions of this cut, as set out in the Act, were 80 feet top and 50 feet bottom, the top diminishing to 68 feet at Chapel-hill, the depth being on an average 9 feet 6 inches.

At the lower end of the cut was erected a "Grand Sluice" for stemming the tide, on a piece of ground called Harrison's Four Acres, between Fodowick's Gowt and Boston bridge; the floor whereof was three feet at least lower than the floor of the said gowt, and its capacity, or clear water way, was fifty feet wide, with three pairs of pointing doors to the sea-ward, to shut with the flow of the tides (a fourth opening being built by the Navigation Commissioners), and also pointing frames, provided with drops, or draw doors, on the land side, to be shut occasionally in order to retain fresh water in dry seasons for the use of cattle and the navigation. The tops of the draw doors being gauged to such a height as to retain the water of the river not higher, at ordinary seasons, than two feet below the medium surface of the lowest lands that drain therein. Act 2 Geo. III., chap. 32.

A new sluice, of 14 feet water way, was also made at Anton's Gowt for the discharge of the water from the West and Wildmoor Fens, having a pair of pointing doors towards the Witham to prevent the floods of that river backing on to the Fens. The sluice was connected with the former system of drainage by a new cut to the place where the old Anton's Gowt stood. The Commissioners were further empowered to build a bridge across the new cut, or river, at a point about half-way between Anton's Gowt and Boston, for the purpose of preserving the communication with the severed lands of Boston West and Holland Fen. This part of the Act was never carried out.

The site of the new sluice was the subject of much contention between the Commissioners and the town of Boston; the latter being anxious that it should be erected in the place of the old bridge; but the Commissioners, apprehensive that the town would gain great advantage from its erection in that situation, while it would be disadvantageous to the drainage, selected a spot about a quarter of a mile above the bridge, and the same distance to the east of the old river. The foundation-stone of the Grand Sluice was laid by Charles Amcotts, Esquire, on the 26th March, 1764; and it was opened by the engineer, Mr. Langley Edwards, on the 15th October, 1766, in the presence of a very large concourse of spectators, estimated as numbering ten thousand persons; amongst whom were many of the nobility and gentry from remote parts of the kingdom. The Sluice disappointed the expectation of many who had come to witness the opening ceremony, and one of the visitors relieved himself by composing the following verse:

"Boston, Boston, Boston!
Thou hast naught to boast on,
But a Grand Sluice, and a high steeple;
A proud conceited ignorant people,
And a coast where souls are lost on."

The General Commissioners expended in the erection of the sluice and the other drainage works the sum of 53,650*l.*, which was raised on mortgage; and for the defraying of which, and for current expenses, they were authorised to collect taxes not exceeding one shilling per acre on the first, second, third, and fourth districts, and sixpence per acre on the fifth and sixth. Half year lands were to pay only two-thirds of these amounts; and common lands one-half, so long as they remained in that condition, but as soon as they became improved lands they were to be subject to the full rate. The Commissioners were further empowered to inclose common lands to the extent of 800 acres in the West, 600 acres in the Wildmoor, and 1000 acres in Holland Fens, and to let the same on lease for 21 years, the rents being applied to the purposes of drainage. These works having been successfully carried out as designed by the promoters, proved of immediate advantage to the drainage of the fens bordering on the Witham, between Lincoln and Chapel-hill; but the East and West Fens still remained in a drowned state. A separate chapter will be devoted to the history of their reclamation. The waters of Holland Fen and of the districts adjoining were subsequently provided for by the drainage carried out by the Black Sluice Commissioners.

The river was made navigable for barges and small crafts as far as Lincoln, and it might have been thought that, having carried their scheme out to its completion, the General Commissioners would for the future simply have the duty of maintaining the works in good order, and that the drainage of the level would remain in a perfect condition; but within a very few years it became only too apparent that the warning which the Commissioners received at the time was too well founded, and that by obstructing the free passage of the tides, by the erection of the Grand Sluice across the river, a very serious error had been committed. For a short time the collecting the waters together and speedily discharging them through the remodelled drains into the Witham, and through the new

cut into the naven, had a beneficial effect in scouring out its bed and lowering the level of the water throughout the fens; but very shortly the consequences which invariably follow the erection of weirs or dams of any description across a tidal stream became apparent. The tidal stream, arrested in its progress by the sluice, became quiescent, and the silt and mud brought up and held in suspension, so long as the water was in motion, sunk by its own gravity directly stagnation took place, and gradually formed a deposit on the bed of the haven. Previous to the year 1800, in average winter seasons, the water never fell below nine feet six inches on the cill, and in floods rose considerably higher; while in summer time, there not being back water sufficient to remove the deposit, it accumulated to such a degree as completely to close the doors. (*Chapman's Facts and Remarks*.) A few years after the erection of the sluice from old records it appears to have risen to a height of ten feet on the cill, completely stopping all communication between the barges navigating the Witham and the vessels employed in exporting and importing coals and other commodities. The drainage also became defective. The most perfect system of interior drainage is useless unless it has a good outfall or discharge for its water. The outfall of the Witham being blocked up in summer, and being so much higher than formerly in winter, the low lands could not get rid of their waters by natural means, but had to resort to pumping, the power being supplied by windmills in the first instance, followed in later years by steam engines. All the low-lying districts on the Witham provided themselves with engines before or in the beginning of the present century; and these have continued to work up to the present time, at a very considerable power of the engines engaged in pumping the water which drains into the Witham above the Grand Sluice is not less than an aggregate of three hundred and fifty horse-power.

In certain situations, there is no doubt that sluices are necessary and highly advantageous. In fact they are absolutely required at the end of a canal or artificial cut discharging into a tidal stream, carrying deposit of any kind in its waters, where such a cut has no natural stream or back water. In such a case, if the tides are allowed a free course, a small quantity of deposit is left at the extreme point touched by the spring tides, which, unless washed away in course of a reasonable time by fresh water coming from lands above the influence of the tides, gradually accumulates and extends lower and lower down the stream, raising its bed in exact ratio as this process goes on, the scouring effect of the tides lessens, until at last the bed of the channel becomes dry land. To guard against this then it is necessary to erect at the point where the canal joins the tidal stream a sluice to prevent the ingress of the tides; but it is also equally necessary that this sluice should be placed so as to discharge into a stream having a free current of water continually passing through it, sufficient to prevent the deposit contained in its water from settling and raising its bed. Such a main artery should the Witham be, and would be were it not for the obstruction to the tidal stream caused by the Grand Sluice, which has not only injured it as the outfall for the several sluices discharging their contents into it, and for the lands draining immediately by it, but also for the navigation of the port of Boston. There is no doubt that if the tides had free course up the river, and ran through the town of Boston from three to four hours, as they did before the erection of the Grand Sluice, the strength of the returning ebbs would keep the bed of the river scoured out to its natural level; and consequently lower the water on the cills of all the sluices throughout the level, allowing the lands to drain by gravitation, and rendering unnecessary the use of steam power.

The amount of water brought down from the high lands by the Witham throughout a course of nearly forty miles, and by its tributaries is amply sufficient to remove the small deposit left at the head of the high spring tides, the only place where this would occur. It may be said, if the tides are sufficient to keep the river scoured out and deepened, how is it to be accounted for that the river was in the lost condition that it was before the erection of the sluice in 1751. The answer is obvious. The management of the river had been so completely neglected that its channel was full of weeds and obstructions of all kinds; the water was not confined within the regular channels; nor was the size of these channels efficiently regulated. Numerous breaches in the banks allowed the stream to wander over the fens, & so it became scattered and its power weakened; till ultimately, instead of scouring and deepening, it fed and added to the other obstructions in the river.

[To be continued.]

PAPERS on the FENS of LINCOLNSHIRE,
By W. H. Wheeler, Surveyor to the Corporation of Boston;
Being a description of the Rivers Witham and Welland,
and their Estuary; and an account of the reclamation
and drainage of the Fens adjacent thereto.

(Continued from the Mercury of Sept. 6.)

In the year 1802 Mr. Rennie was requested by the General Commissioners for Drainage and Navigation to report to them on the state of the Witham, with a view to suggesting some improvement. As no result followed this report it will only be necessary to say that amongst several minor works it recommended the erection of an additional sluice, and making a new cut from the Witham to Skirbeck Quarter. In the year 1807 Mr. Rennie made another report as to the state of the Witham, and suggested several improvements, including its deepening, so as to make the bed of the river from Boston to Washingtonborough on a level with the sill of the Grand Sluice, allowing the pen height of the water there to be reduced, without stopping the navigation, and the erection of a new lock and sluices at the latter place. Also a new cut from Horsley Deep to the parish of Fiskerton.

In April, 1807, at a meeting of the Commissioners, a series of resolutions were passed stating that whereas by the enclosure of the West and Wildmoor Fens their funds had been considerably increased, they proposed to improve the navigation of the Witham, on the plan proposed by Mr. Rennie; and that it was desirable that its management should be handed over to a company, if one could be formed for this purpose. In the following year an Act was obtained for effecting this and carrying out these works of improvement, which recited that the powers granted by the Act of 1791 were not sufficient to enable the Commissioners to execute all the works therein contemplated, and that several of them were then uncompleted; that in consequence much land was liable to injury from floods, and the commerce of the country greatly interrupted. It will be unnecessary to refer further to this, as the money authorised (70,000*l.*) was never raised, and the Act was entirely repealed by a subsequent one.

In the year 1811 Mr. Rennie was again called to advise the Commissioners, and he proposed an amended scheme on that of 1807 for the improvement of the river. It had long since been admitted that the drainage and navigation interfered with each other, and the object the Commissioners had in view was to make most beneficial to each, and so that the one should not injure the other. Mr. Rennie's report and recommendation having been adopted, an Act was obtained in the following session (52, Geo. III., cap. 108), by which the powers vested in the Commissioners of Navigation by the former Act were transferred to a Company of Proprietors, who were to undertake the whole management of the navigation and the works pertaining thereto. The tolls were fixed at three shillings per ton on all goods conveyed between Lincoln and Boston, or for shorter distances three halfpence per ton per mile. The duties of the proprietors of the navigation, and of the Drainage Commissioners, as to the maintenance of the different portions of the river and its embankments were set out, and the following new works, as recommended by Mr. Rennie, authorised:—The scouring out, widening and deepening, and embanking the Witham, from the Grand Sluice to Lincoln, the lower end to be finished to a fifty feet bottom, diminishing to thirty-six feet at Horsley Deep; whence a new cut, with a thirty feet bottom, was to be made to Washingtonborough; a new lock was to be made at the entrance of the new cut at Horsley Deep, with a rise of three feet, and another at Stamp-end, in Lincoln, with a rise of four feet. The sill of the former was to be level with the bed of the river, which at this point was to be six feet under the gauge mark of the Grand Sluice. The old locks across the river at Barlings and Kirkstead, and Stamp-end, were to be removed.

In order to provide for the flood waters from the west side of Lincoln, a weir twenty-eight feet in width was to be made in the east bank of the Witham, at the head of Bargate-drain, which together with the Sincil dyke, was to be scoured out and deepened, and a new cut made from the junction of the latter with the Witham, along the back of its south bank to Horsley Deep, to join the river below the new lock; and a delph or soak dyke cut parallel with the north bank of the river from Barlings Eau, as far upwards as should be found necessary to take the water lying on the north side of the navigation.

To carry out these works the Company of Proprietors were authorised to raise amongst themselves a sum of 120,000 in shares of 100*l.*, and to borrow, on the mortgage

of the tolls and dues, the sum of 60,000*l.* In consideration of the benefits to the drainage by the improvement of the river, and an agreement on the part of the Navigation Proprietors to advance and apply the sum of 30,000*l.* towards the execution of drainage works, the Commissioners were to contribute the sum of 14,000*l.* per annum out of their general funds; and a like sum of 14,000*l.* out of funds specially provided by this Act to the Company of Proprietors. To enable them to do this they were authorised to collect additional taxes on the first and third districts of one shilling and sixpence, one shilling, and sixpence per acre respectively, according to benefit received, and of threepence per acre on the fifth district.

In carrying out these works several antiquities were discovered. In making the excavation for the Horsley Deep Lock a canoe was found eight feet under the surface. It had been hollowed out of an oak tree, was thirty feet eight inches long, and measured three feet in the widest part. Other canoes were also dug up, one of which is deposited amongst the collection of antiquities in the British Museum. In connection with the navigation of the Witham, communication was effected with the towns of Sleaford and Horncastle by navigable canals, which were constructed under Acts granted in the 32d year of George the Third's reign,—the former by the widening and improving the Kyme Eau, which, from very early times, had been in a navigable condition, as before referred to; and the latter, by making a new cut to Tattershall, and extending the same into the Bane and rendering that river navigable as far as Horncastle, by means of the Fossdyke, an ancient canal first made by Henry the First, the Witham was out and deepened by Henry the First, the Witham was connected with the Trent and the vast system of water communication extending nearly all over England.

These works of improvement in the Witham did not meet with the general approval of the districts concerned in the drainage. The proprietors of lands on the west side of the Witham employed Mr. W. Chapman to advise them, and in a report dated Newcastle, Jan. 14, 1808, he states his most decided opinion that no improvement could be expected until the grand sluice was removed and the outfall improved by straightening and confirming the channel to deep water. These remarks appear to be well founded, and the works as carried out to have been of more advantage to the navigation than the drainage; for not long afterwards the fens adjoining the river found it necessary to employ steam power to supplant their old windmills, which were deemed not equal to the duty of pumping off the water with sufficient rapidity and regularity. In order to prevent this expenditure Mr. Rennie was instructed by the General Commissioners to report as to the best means of improving the outfall and lowering the water in the Witham sufficiently to allow of the drainage of the lowest lands by gravitation; and further as to the effect on the general interests of the trusts by the proposed pumping schemes.

Mr. Rennie, in two reports made in the year 1830, dated respectively the 9th of August and the 17th of September, admits that the state of drainage in the first district was defective, and that the chief impediments to the delivery of the waters arose from two causes—the first the obstructed state of the outfall of Boston Haven, between the Grand Sluice and Hobhole; and the second, to the Grand Sluice and the inadequacy of the interior drains to convey the downfall waters into the Witham. With respect to the first, he refers to the improvements already carried out by the Corporation of Boston, by straightening the river and making the new cut through Burton's Marsh, and by the removal of the old wooden bridge with its piers, and the erection in its place of the present iron structure; but he considered that the outfall was capable of very considerable further improvement, and proposed a plan, the particulars of which will be treated of more fully in a succeeding chapter, and he also recommended the making of a new cut through the Marshes from the Black Sluice to Bell's Reach, at a cost of 89,313*l.*

For a removal of the second cause of impediment from the confined state of the outlet of the river, and the water constantly obliged to be held up for the purposes of navigation, he proposed that a new sluice should be erected between the Grand Sluice and the iron bridge; from this a new cut should be made, in a direct line, to join the North Forty Foot, which was to be deepened and cleaned out to the Sleaford navigation, and from there the present line of the Dales Head Dyke should be enlarged, and deepened as far as Washingtonborough, the estimated cost being 52,573*l.*

It is hardly necessary to say that these recommendations were not carried out, but the Commissioners, at a meeting held in 1832, passed several resolutions stating

that it was their opinion that the steam engines proposed to be erected by the first and third districts would prove injurious to the banks of the river and the drainage of the other districts, and therefore they determined to oppose the powers sought to be obtained from Parliament by those parties.

The next event in the history of the Witham was the construction of the Great Northern Railway along its banks, and the iron road succeeded the river as the great highway from Boston to Lincoln. The rights of the proprietors were transferred to the Great Northern Railway Company by their Act of 1846, and they now hold the liabilities of their own heads, and have assumed the liabilities of a material original owners. These liabilities have since been a matter of considerable litigation. In the spring of 1862, owing to an unusually heavy rainfall, the river Witham became flooded above its ordinary height, and on the 23d March the bank of the South Delph gave way, the water pouring through the breach and inundating a large tract of land in the Boston Fen. An action was brought against the Great Northern Railway Company for compensation, the case (Cawdron v. Great Northern Railway Company) being tried at the following Lincoln Summer Assizes, and a verdict given for the plaintiff. A rule nisi was obtained to set aside this verdict, on the ground that the judge at the trial had not allowed the question to go to the jury as to whether the mischief had not been caused by default of the Witham Drainage Commissioners in not providing a proper outlet for the waters in the river below Horsley Deep, which had consequently backed up into the South Delph, and so caused the flooding. The rule was subsequently discharged by the Court of Exchequer, July 6, 1863, Baron Bramwell remarking, "I desire not to have it supposed that I discharge the rule because I am of opinion that the Great Northern Railway Company would have been liable if the banks were broken through the water being pent back upon them improperly by persons below; but the rule is discharged upon the ground that he took a different view on the part of the learned judge that he took a different view on the trial." (*Law Times Reports*). The state of these banks and of the river, the water in which at its upper end in heavy floods is often nearly on a level with their top, has been a source of anxiety to the General Commissioners.

On the 19th of March, 1861, a deputation from the commission waited on Mr. Hawkshaw, C.E., in London, to consult that gentleman with reference to the state of the drainage, the immediate object being the improvement of the condition of the east and west Fens, but Mr. Hawkshaw was also directed to turn his attention to a scheme for the general improvement of all the fens under the jurisdiction of the Witham Trust. The general scheme recommended by Mr. Hawkshaw was the old plan so often urged on the attention of the Commissioners, namely, the improvement of the outfall of the river by straightening the haven, and conducting the water in a confined channel to the sea, and so lowering the water throughout the whole level; a fuller account of which will be given in a subsequent chapter. But insuperable difficulties seem ever to have opposed themselves to a general scheme of this kind, and the Commissioners had to fall back on such measures as they could carry out themselves without the assistance of other trusts. Mr. Hawkshaw was therefore directed "to examine and report on the state of the drainage of the River Witham above the Grand Sluice, embracing the 1st, 3d, and 5th districts, with a view to any improvement that could be effected." Mr. Hawkshaw accordingly, in the autumn of 1862, caused a survey to be made of the river from the Grand Sluice to Lincoln. With the data thus obtained, and from facts gathered from other sources, he drew up his report, and laid before the Commissioners the works that he considered necessary for putting the upper part of the river in as efficient a state as possible under its present condition in connection with the state of Boston existence of the Grand Sluice, and the enable the Commissioners to lower the height of the water in the channel, and so improve the drainage of the lands, without hindering the navigation; and by strengthening the banks, remove all cause of apprehension as to their safety. The estimated cost of the works was 53,000*l.*, the advantage to be gained by the drainage, the lowering the level of the water in the Witham an average of two feet.

The Commissioners hesitated some time before adopting this scheme of interior improvement, but at last, finding that no general plan was likely to be successfully carried out, three years afterwards they obtained an Act "for the further improvement of the drainage and navigation by the River Witham," which received the Royal Assent on the 19th of June, 1865. Under the powers of this Act the Commissioners were authorised to execute the following

works:—To deepen and scour out the river from a point about six miles above Boston to Horsley Deep, so that the bottom should throughout this length be on a dead level; to deepen and scour and strengthen the banks of the Old Witham, Barling Eau, Billingday Skirth, and the several tributaries in connection with them; to alter and lower the sills of the several sluices of the above stream, and also those of the Sleaford and Horncastle navigation, and the sills of the several delphs belonging to the parishes of Timberland, Metheringham, Sixwold, Dunston, Branston, and Washingtonborough.

The Great Northern Railway Company, as the owners of the navigation, were authorised to scour out and deepen and strengthen the banks of the south Delph, and to lower the sill of Anton's Gowt and Horsley Deep Locks, and rebuild the latter, if necessary; and for this purpose they were empowered to raise the sum of 10,000*l.* by the creation of new capital to that extent. The General Commissioners were authorised to borrow a sum not exceeding 55,000*l.* on mortgage of new taxes, to be levied for the purposes of this Act, the extinction of the debt being provided for by the re-payment of thirty-five annual instalments. The lands in the first, third, and fifth districts are taxed for these special works in four classes, as arranged by the Act of 1812, with an additional annual payment of three shillings, two shillings and sixpence, two shillings, and one shilling per acre respectively. Another very necessary and important power was given to the Commissioners, namely, that of making bye-laws for the regulation of the fishery, and other incidental rights and privileges attaching to the river and the drainage.

It has been already mentioned that the Witham was, in olden times, renowned for the quantity and quality of its fish; and if its fishery were now placed under proper jurisdiction there is no doubt it would once again become a valuable property; but the general licence that has hitherto been accorded to poachers of all kinds, both to use and abuse the right of fishing, has almost totally destroyed the river as a means either of profitable production or recreation. The Commissioners now have power to make bye-laws, and appoint bailiffs to see that their orders are carried out; and these once made and promulgated, offenders against the rules will be liable to penalties. As the carrying out of stringent rules will be for the general benefit of all in any way interested in the pisciculture of the land, and of this district in particular, it is to be hoped that the Commissioners will lose no time in making and publishing their bye-laws.

There now only remains to close this long and tedious chapter a mention of the fact that the works authorised to be executed by the last Act are at this time being carried out by Mr. Hoborow, who has taken the contract, and who is at this time engaged in deepening the river by means of steam dredgers, the material excavated being deposited on the banks by a mud elevator, specially invented and constructed by the contractor for this work.

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[Continued from the Mercury of Sept. 13.]

CHAPTER III.

East, West, and Wildmore Fens

These fens form the Fourth District of the Witham Commission, and the account of their reclamation belongs properly to the last chapter; but it is considered that their history is of sufficient importance to deserve a separate notice.

The East Fen was the last to be enclosed in this district, and the recollection of many persons now living dates back to the time when it afforded little benefit to the realm other than fish and fowl, with overmuch harbour to a rude and almost barbarous sort of lazy and beggarly people. The state of the fens before their reclamation has been described as presenting in the winter season, in some parts, the appearance of a chain of lakes, bordered by a thick crop of reeds; and in others, of one vast sheet of water, with mounds or islets dotted here and there, on which the few and scattered inhabitants erected their huts; and whose only way of access to one another, and of communication with the towns or villages near, was by means of small boats or canoes, which they paddled along with a pole, and also used in their fishing and fowling expeditions. Living thus isolated and apart from all the comforts and advantages of civilized life, deprived of the humanising effect of churches and religious instruction, and the kind care and soothing influence of a pastor, these people were in little better condition than the aborigines of New Zealand or Australia. Macaulay speaks of them as a half savage people, leading an amphibious life, sometimes rowing, sometimes wading from one firm mound to another, and known as "Breeding," a name which had succeeded the ancient "Girvil," and afterwards given place to that of "Fen Slodgers," by which appellation they were known up to the beginning of the present century.

These men were violently opposed to any attempts to alter the state of the fens, believing they had a kind of vested interest in the fishing and fowling, by which they gained their scanty subsistence. Although their condition was very miserable, they nevertheless enjoyed a sort of wild liberty amidst the watery wastes, which they were not disposed to give up. Though they might alternately burn and shiver with ague, and become prematurely bowed and twisted with rheumatism, still the fens were their native land, such as it was, and their only source of subsistence, precarious though it might be. The fens were their commons on which their geese grazed. They furnished them with food, though the finding thereof was full of adventure and hazard. What cared the fenners for the drowning of the land? Did not the water bring them fish, and the fish attract wild fowl, which they could snare and shoot? Thus the proposal to drain the fens and convert them into wholesome and fruitful lands, however important in a national point of view, as enlarging the resources and increasing the wealth of the country, had no attraction whatever in the eyes of the "slodgers." They muttered their discontent, and everywhere met the reclaimers with opposition, and frequently assembled to fill up the cuts which the labourers had dug, and to pull down the banks which they had constructed; and to such an extent was this carried that in some places the men had frequently to work under the protection of an armed guard. But their numbers were too few, and they were too widely scattered, to make any combined effort at resistance. (*Smiles' Lives of the Engineers*.) In addition to the opposition of the natives, other agencies were brought to bear against the fen drainers. Satirical poems and ballads were composed and sung with great applause in the fen towns, and their cause was even advocated by men of learning and social standing. Amongst others, Fuller in his history speaks of the attempted enclosure of the fens as a trespass on the divine prerogative for man to presume to give other bounds to the water than that which God had appointed; and he intimates that Providence had specially left this district for the production of fish and fowl, and of sedge, turf, and reeds.

In winter time the fens were almost entirely covered with water, poured on to them from the high lands, by which they were bordered; but in summer, when this had drained away and evaporated, the greater part of the land became covered with a coarse kind of grass, and afforded a feeding ground to the cattle of the farmers residing in the surrounding parishes, all of which had a right of common in these fens.

So early as the reign of Edward VI. a code of fen laws had been enacted for defining the rights and privileges of the commoners, and for the prevention of disputes and robbery. The first code, drawn up by the great inquest of the soke of Bolingbroke, held in 1548, was several times renewed, and together with additional laws, passed in Queen Elizabeth's reign, remained in force until the enclosure of the fens at the beginning of the present century. The code consisted of seventy-two articles, a short summary of which may be interesting, as affording an insight into a state of society now passed away for ever. One of the first rules related to the brands or marks which each person stocking the fens was required to place upon his cattle. Each parish had a separate mark, and no man was allowed to turn cattle out to common until they were marked with the town brand. No foreigner or person not having common right was allowed to fish or fowl at any time, or gather any turbary or fodder in the East Fen, without a licence from the approver, under a penalty of 20s. for each offence; a like penalty was also attached to the following offences:—Putting diseased cattle on the fens; disturbing the cattle by baiting or slaiting with savage dogs, or leaving any dead animal unburied for more than three days; for putting swine on the fen unrun, or geese which were not pinioned and foot-marked; for taking or leaving dogs there after sunset; for bringing up crane birds out of the East Fen. No person was allowed to gather wool who was not above twelve years of age, except impotent persons; no cattle were to be driven out of the fens except between sunrise and sunset; all cattle were to be "roided" out of the East Fen before St. Barnaby's day yearly; no reed thatch, reed star, or bolt was to be mown before it was two years' growth; each sheaf of thatch gathered or bound up was to be a yard in compass; wythes were only to be cut between Michaelmas and May-day.

By a law, passed in Queen Elizabeth's reign, every township in the parts of Holland claiming common in the West Fen was ordered to show to the Queen's steward at the next court-day its charter or title to such common right. No swan, crane, or geese, were allowed to be brought out those of ducks and geese, were allowed to be brought out of the fens. No fodder was to be mown in the East or West Fen before Midsummer-day annually. No person was allowed to use any sort of net or other engines to take or kill any fowl, commonly called moulting ducks, in any of the fens before Midsummer-day yearly. (*Thompson's History of Boston*.) A code of seventeen articles was also devised by the fishermen's jury, relative to the fish and fishing in the fens. The principal fish referred to were pike, eels, roach, and perch.

Camden, whose description of England was written before the enclosure of the fens, gives a quaint account of the feathered tribes frequenting these parts. The narrative says that at certain seasons of the year, not to mention fish, amazing flights of fowl are found all over this part of the country, not the common ones which were in great esteem in other places, such as teal, quails, woodcocks, pheasants, partridges, &c., but such as have no Latin names, the delicacies of tables and the food of heroes, fit for the palates of the great—puittes, godwits, knots, which I take to mean Canute's birds, for they are supposed to come hither from Denmark; dotterells, so called from their extravagant dotishness, which occasions these imitative birds to be caught by candle-light. If he only puts out his arm they put out a wing, and if his leg they do the same; in short, whatever the fowler does the bird does the same, till the net is drawn over it. Macaulay adds to this description by telling us that the marshes of Lincolnshire were covered during some months of every year by immense clouds of cranes. Nor must the mention of the fen nightingales or frogs be omitted, for they are said to have especially abounded.

The prophecies of the decay, which would fall upon the country, if the race of fen-men were deprived of their valuable pools for pike, fish, and wild fowl, have long since been exploded. The population has grown in numbers, in health, and in comfort, with the progress of drainage and reclamation. The fens are no longer the lurking places of disease, but are as salubrious as any other parts of England; dreary swamps are supplanted by pleasant pastures, and the haunts of pike and wild fowl have become the habitations of industrious farmers and husbandmen. But this result has only been arrived at by a vast amount of skill and labour, and the expenditure of large sums of money. It is the history of the various attempts which have been made to reclaim the East, West, and Wildmore Fens that will occupy the remainder of this chapter.

The early history of the West and Wildmore Fens is included in that of the Witham; such drainage as it had was provided under the direction of the Court of Sewers, by means of Anton's Gowt and another small sluice at Maud Foster, which was the outlet to a natural sewer or drain which ran from Cowbridge to the Scire-beck, near Pedder's or Peter's Bridge, before Maud Foster drain was removed from the high lands, and the religious establishments on the Witham, remained untouched till a much later period.

In Queen Elizabeth's reign some idea was entertained of making an attempt for the recovery of the East Fen, and a survey was made by order of the Queen, from which it was estimated to contain 5000 acres or thereabouts; and it was considered half of this, being the skirts, hills, and outrings, could conveniently be drained; but the other half, consisting of deep holes and pits, could not be recovered. Beyond the survey nothing further seems to have been attempted until the next reign, when, shortly after James the First's accession to the throne, a series of destructive floods burst the embankments of the fens on the East Coast, and swept over farms, homesteads, and villages, drowning large numbers of people and cattle. The King, on being informed of the great calamity which had befallen the inhabitants of the fens, principally through the decay of the old works of drainage and embankment, declared that, for the honor of his kingdom, he would not any longer suffer these countries to be abandoned to the will of the waters, nor to let them lie waste and unprofitable; and that if no one else would undertake their drainage, he himself would become their undertaker. A measure of taxation for the recovery of these lands, which was accordingly proposed to the Commons, was rejected, and the King restricted in his means, confined his attention to works on the Great Level of Cambridgeshire.

In the sixth year of King Charles the First a Court of Sewers was held at Boston, and Commissioners, specially appointed by the King, sat there to make enquiry into the state of this district. After hearing evidence on the subject, they recited that the whole of the fens, from the Witham to the coast, were drowned and surrounded lands most part of the year, and that these lands were capable of recovery, and they therefore decreed that a tax of ten shillings per acre should be levied for the repairs of the natural outfalls at Waynflete Haven, Black Gote, Symon Gote, Maud Foster Gote, New Gote, and Anton Gote, as also any other cuts or drains that should be found necessary to be made or enlarged. In default of payment of the tax, a bargain was to be made with Sir Anthony Thomas, who proposed to become the undertaker for the drainage for a certain quantity of the drowned land which was to become his property on his successfully completing the work. The tax not being paid, the fens were handed over to the undertakers, who, in September, 1631, commenced their works and made a New Cut or "great and navigable stream, three miles in length, from Cowbridge to the Haven, near Boston, and at the end of it the old Maud Foster Gowt was replaced by a very large gowt of stone gutters, and streams having their courses to the said main river, and over them were erected many bridges and other works, done with so much diligence that three years after the commencement, a decree was made by the Court of Sewers that, on a view of the late surrounded grounds, viz., East and West Fens, North Fen, Earles Fen, Armetre Fen, and Wildmore Fen, and other the drowned commons and adjacent surrounded grounds, lying on the north and north east of the river Witham, within the extent of the said commission, they adjudged the same to be so drained as that they were fit for arable, meadow, and pasture. And that out of three thousand acres of pits, deeps, and holes which formerly existed, there now only remained sixteen hundred and seventy-three acres. And they confirmed to Sir Anthony Thomas a grant of one-half of the commons land in the East Fen, and a third of the severals adjacent thereto; and also one-fourth of the West Fen and the surrounded grounds adjoining. Two thousand five hundred acres of the lands so granted were made liable to the maintenance of the works, and the rents were to be paid into the hands of the Mayor of Boston, to be employed for and about the repairs of the bridges, gotes, and drains, until they amounted to the sum of two thousand pounds, to the extent of which amount they were always answerable (*Dugdale*.) The total quantity acquired by the adventurers as recompense for their undertaking was altogether 16,300 acres, which brought them a rental of 8000*l.* a year. The amount expended in the drainage and reclamation was 30,000*l.*, and they subsequently spent 20,000*l.* in improving their lands and in constructing buildings.

houses, sowing corn, and rearing sheep. At the end of that time the commoners, "finding that done, which they themselves despised, made several clamours, which finding no relief in time of peace, they resolved to try if force and violence might compass that, which neither justice nor reason could give; and to that end, a little before Edgehill fight, in 1642, they being incensed by some then in faction, took arms, and in a riotous manner they fell upon the adventurers, broke the sluices, laid waste their lands, threw in their fences, spoiled their corn, demolished their houses, and forcibly retained possession of the land."

The Adventurers, finding that the Sheriff and other local authorities could not afford them protection, petitioned the Houses of Lords and Commons. With the former they were successful, but being opposed by the Commons, failed to obtain an Act from the latter. The Commons stated in their petition that Sir A. Thomas had not fairly obtained the decree from the Court of Sewers in the first instance; that he had not fulfilled his bargain, as the lands (particularly in the West and Wildmore Fens) were not improved by his works; further that he was already well paid for what he had done by his seven years' possession. Having heard both parties, the House of Commons ordered that the Sheriff and Justices of the Peace should prevent and suppress riots, if any should happen, but expressly declared that they did not intend thereby to prejudice the claim that they did not intend thereby to prejudice the claim of the commoners in the legal pursuits of their interest. Upon this parties commenced proceedings at common law against the Adventurers, in which they were successful.

For about one hundred and fifty years these fens continued to be very imperfectly drained by the sewers and sluices provided by Sir Anthony Thomas, and their state during this period, as shown by the following description, proves that his scheme was very deficient, and that the Commons were justified in the statements they made before the Houses of Parliament:—"The Fen called the West Fen is the place where the ruffs and reeves resort in great numbers, and many other sorts of water fowl which do not require the shelter of reeds and rushes migrate hither to breed, for this fen is bare, having been imperfectly drained by narrow canals which intersect it for many miles. Twenty parishes in the Soke of Bolingbroke have right of common on it, but an enclosure is now in agitation. The East Fen is quite in a state of nature, and exhibits a specimen of what the country was before the introduction of draining. It is a vast tract of morass, intermixed with numbers of lakes, from half a mile to two or three miles in circuit, communicating with each other by narrow reedy straits. They are very shallow, none above four or five feet deep, but abound with pike, perch, ruff, bream, tench, dace, eels, &c. The reeds which cover the fens are cut annually for thatching not only cottages, but many very good houses. The multitudes of stares that roost in these weeds in winter break down many by perching on them. A stock of reeds well harvested and stacked is worth two or three hundred pounds. The birds which inhabit the different Fens are very numerous. Besides the common wild duck, wild geese, garganies, pochards, shovellers, and teal breed here, pewits, gulls, and black terns abound: a few of the great terns or tickets are seen among them. The great crested grebes, called gaunts, are found on the East Fen. The lesser crested, the black and dusky, and the little grebe, cootes, water-hens, and spotted water-hens, water-rails, ruffs, red shanks, lapwings or wyes, red-breasted godwits, and whimbrels are inhabitants of these fens. The godwits breed near Washingborough, three miles east of Lincoln; the whimbrels only appear for a fortnight in May and then quit the country."—(*Camden*.)

The year 1799, being a very wet season, the whole of the three Fens, together with the lowlands and commons adjoining, were under water, except a small part in Wildmore and West Fen. The whole of the East Fen and the lower part of the West and Wildmore Fens were under water every winter, and the East Fen Deep, containing 2500 acres, and part of Wildmore Fen, containing 1500 acres, were always under water during summer.

In the year 1800 Mr. Rennie was directed by the Witham Commissioners to report on the drainage of the East, West, and Wildmore Fens, and after a survey made he delivered his report, bearing date April 7th, a second report being presented on the 1st of September. From those it appears that the drainage of the Wildmore and part of the West Fen was made through Anton's Gowt, by means of the sluice erected by the Witham Commissioners at the time the river was straightened, as detailed in the preceding chapter, the sill of which was two feet above the sill of the

might at a less amount of money than is paid for freights