

# From Water to Land to Brownfield: the Land-people Relation in the Eastern Thames

*Judith Watson*

## A Gateway to the world

The Thames River east of the City of London has been pivotal in the industrial and social development of England, yet it remains hidden from history. This hiding is by no means accidental but is part of a process of “othering” of both the area and its residents. Like other landscapes, the eastern Thames contains both human memories and an ecosystem that is functionally linked to the global ecosystem. It is in the Thames estuary that the earliest known human remains in Britain have been found. “Swanscombe Man” is the name given to the skeleton of a human who lived in the area during the Hoxnian interglacial of 250,000 to 200,000 years ago. By that time, the Thames had found its present course. The land bridge to the European continent disappeared at the end of the last glaciation. Quite independently of human activity, the coastline and estuaries of southern England are sinking. Today, the river is tidal from Teddington Lock above London. With the river descending eastwards, the estuary gradually opens out into the North Sea.

Historical materialism understands economic development as a process of social learning. In each period, the outcomes of technological development—of collective learning—are embodied in physical infrastructure that creates the conditions for development in the phase that follows. Echoing the terminology of Pierre Bourdieu, I have described this embodiment of learning outcomes elsewhere as “collective habitus.” In this paper, I make use of a “regulation theory” variant of historical materialism, as described by Alain Lipietz. There have been different versions of the regulationist approach with variant terminologies, but Lipietz describes the socio-economic formations of different stages within a mode of production as “development models.” The best known of these are “fordism” and “postfordism,” which are variants of the capitalist mode of production. Within a development model, a particular “regime of accumulation” governs economic processes, while the “mode of regulation” describes governance by the state and civil society. The “labor process model,” which Lipietz prefers to the earlier term “technological paradigm,” consists of “the general principles governing the labor process and the way it evolves.... not only how [it] is organized within firms but also the division of labor between firms.” Going beyond Lipietz’s formulation, I see a development model not only as a formulation in political economy but also as one in political ecology, a human/nature metabolic relationship.

Most writing in regulation theory deals with the most recent development models, and if the framework is extended back in time, there is less consensus about the dividing lines between development models. In the eastern Thames, historical periodization suggests the following stages:

- An economy of reclamation and intensive agriculture (Roman times to 15<sup>th</sup> century CE)
- A militarized high-skill economy (16<sup>th</sup> to 18<sup>th</sup> centuries)

- An import-processing low-skill economy (19<sup>th</sup> century to late 20<sup>th</sup> century)
- The non-economy of a “brownfield site” awaiting a “linear city” (21<sup>st</sup> century)

The area was always connected to Continental Europe, a “gateway.” Before the Romans conquered Britain in 43 CE, Colchester was the capital. The Romans built a road from Colchester to their new capital at London and another from the Channel ports at Richborough and Dover to London. Additional roads connected these two major roads to other points, some leading to fording points or ferries on the Thames. Since the sea level was several meters lower than today, it is likely that the Thames was fordable or bridgeable at points further downriver than London Bridge. Roman building materials were re-used in south Essex. For many centuries after, passenger traffic to the Continent went along the Roman road to Dover, while freight was shipped to and from London. The Saxon conquest of England also began in this area, and so did the Christianization of England, with its first outposts at Canterbury and Rochester, and a later center at Tilbury.

The definition of the area used in this paper coincides with the latest official definition. It can be summarized as “the north and south banks of the River Thames east of Central London.” The area’s western edge is at Tower Bridge, adjacent to the Tower of London, the eastern defense of what was the walled Roman City of London. From that point the area stretches 60 miles to the east, downstream along the river, running through the eastern suburbs of “Greater London” and beyond into Essex and Kent. The government discourse surrounding the Thames Gateway is relentlessly modernizing and yet continually drawn back into history. On both north and south banks, the boundary has been drawn to include the area “between the road and the river” with only a few modifications. The road forming the southern boundary is the A2/M2, now a modern highway, but still following the route of Watling Street, the Roman road from London to Dover. The road that defines a stretch of the northern boundary is the A12, the Roman road to Colchester.

This paper explores the processes of change in the area as landscape history, a succession of forms of human/nature metabolic relationship. Some periods are recounted in much more detail than others; the story of the deindustrialization of the London docks has been recounted elsewhere and will be summarized.

### **An Economy of Reclamation and Intensive Agriculture**

When a tidal river like the Thames is untouched by human activities, each incoming tide brings salt water up the estuary. As the tide ebbs, non-salty “fresh water” flows downstream from the river’s catchment. As the river nears the sea, its bed becomes shallower and wider, the width varying by the seasons and the amount of rainfall. Along the banks grows a wide band of “salt marsh” or “salting,” a landscape of low-growing plants adapted to salty conditions cut across by deep, irregular creeks with soft fine silt. The saltmarsh ecosystem is home to wildlife occupying a variety of niches: the salt-tolerant plants, micro-organisms, invertebrates including shellfish, and many species of wading birds. It can be exploited by humans, especially for shellfish.

At some point—it is not known when—human activity began to make a lasting alteration to the natural landscape of the Thames Estuary. Reclamation (“inning”) of the riverside marshes created new agricultural land. Embankments (“sea walls”) were built along both banks of the Thames from London downriver along the tidal tributaries of the Thames and north along the eastern Essex coast. The reclamation process had similarities to the complex systems of water management and irrigation practiced by ancient societies: the Sumerians, Egyptians, Indus Valley civilizations, and the Chinese. Prehistorians surmise that civilization began with the complex social organizations needed to administer these vital water management systems. Countries dependent on these hydraulic systems (“hydraulic civilizations”) developed autocratic systems of government that Marx described as the “Asiatic Mode of Production.” The combination of irrigation and flood control is typical of these systems as well as that of the Thames.

There is some evidence of embankment along English inland waterways from the Iron Age, although there is little evidence for sea walls anywhere in Britain in the Roman period. The “centuriation,” Roman rectangular field patterns, in South Essex may have resulted from water management strategies. There is evidence of the way that inning took place along the Thames for the Saxon period and in the period immediately after the Norman conquest of 1066 that indicates this to be the case. Near the source of the Thames, a meadow in Cricklade is pastured in winter and mown for hay in summer in a way that possibly goes back to the foundation of the town by Alfred the Great in 890. For the Saxon period, there is also highly suggestive place-name evidence. Pieces of land marked off by the 90-degree corner where a tributary flows into a main river were known by the Anglo-Saxons as “hamms.” The word derives etymologically from the fact that the land is “hemmed in” by water on at least two sides. Places named “Ham,” “Hampton,” etc., are found along many English rivers, and their location allows the “ham” element to be distinguished from “ham” meaning a homestead. On the Thames west of London, for example, are Ham and Hampton, and in the eastern Thames are East Ham and West Ham (recorded in 958). These pieces of land would have been among the easiest places to begin reclamation using only hand tools. A diagram of inning near a tributary included in a recent text shows that an embankment along the main river and tributary are built to ensure that salt water from the tidal estuary is kept away from the new agricultural land. There is also evidence for water meadows in Germany from the 12<sup>th</sup> century.

By the 12<sup>th</sup> century, the whole estuary and the tidal stretches of the tributary streams were lined with sea walls. It was a piecemeal reclamation, but the final result was a large-scale alteration of the landscape. The areas protected by the sea walls could still be described as “flood meadow,” grassland that would be flooded in certain seasons by rainwater, if not by ingress of salt or fresh water following breaches of the sea wall. While the land is not always saturated, it is invariably known in the eastern Thames as “marsh.” The term “coastal grazing marsh” refers in England to such areas with “highly regulated water regimes.” After the construction of seawalls, a tidal area on the seaward side remains as saltmarsh.

It is possible that as early as the late Saxon period at the beginning of the feudal mode of production in England, the reclaimed land was deliberately irrigated in an early form of “water meadow.” It should be noted that a distinction is consistently made in traditional English agriculture between “pasture,” grassland on which animals graze, and

“meadow,” in which the grass is cut for hay. A watermeadow is a managed form of flood meadow that is deliberately submerged (or “floated”) with fresh water. Sluice gates are constructed so that fresh water from the non-tidal flow in the tributary can be passed over the land in a highly controlled manner. This is done infrequently, perhaps only for one two-day period a year in the early spring, and only a very shallow covering of fresh water, up to about five centimeters, lies on the land. Floating has the effect of irrigating the meadow and raising the temperature, ensuring that the grassland plants begin to grow vigorously early in the season. Floating “...warmed up the land for the ‘early bite,’ thereby allowing heavy stocking of sheep.” The covering of water brings in new nutrients in the form of silt, possibly also manures of organic origin. If the meadow remains waterlogged for too long, the plant ecology is changed in a way that is detrimental to agriculture.

In the resulting “sheep-corn system,” the pattern of the seasons is roughly as follows:

- Spring—the water meadow is floated, after which sheep are removed from the cropland and graze directly on the meadow; the cropland is sown.
- Summer—sheep are pastured on downland. Water meadows are cut for hay, of which they are more productive than other grassland.
- Autumn—sheep are folded onto cropland after harvest and onto the “aftermath” of the meadow.
- Winter—sheep continue on cropland, and their grazing is supplemented by hay.

Although the landscape was substantially altered by “inning,” it is not clear how much ecological damage was caused. Cook and Williamson contrast the traditional systems with modern intensive agriculture. “Marshland drainage and meadow irrigation made only a limited impact on the wider water environment and were, in this respect, in marked contrast to the present situation: the expensive flood defenses, river regulation, deep drainage and agro-chemical and sediment-loading of watercourses, which are the consequences of today’s enhanced agricultural production.” However, they go on to say that it is not possible to make a simple contrast between the “sustainable” methods of the past and the destructive ones of the present. It is now known that the construction of sea walls causes coastal erosion and the loss of beaches. The channel of the Thames was considerably narrowed. The tidal stretches of the Thames are the river’s “deposition zone,” where the silt that was picked up in the catchment headwaters is laid down. Channel narrowing and straightening may lead to the formation of sandbanks, and, in fact, this was a constant problem in the Thames from the Elizabethan period until modern dredging methods were adopted in the second half of the 20<sup>th</sup> century. The Thames sea walls were hard to maintain, as indicated by a famous breach at Dagenham in the 17<sup>th</sup> century that was repaired by Vermuyden.

Southern England, which had been incorporated into the trade routes of the Roman Empire, gradually became reincorporated into a wide-scale economy from the time of the Saxon settlement. The Vikings created a seaborne empire that eventually merged with the remnants of the Western Roman Empire to create a counterweight to the expanding Islamic empire. It is possible that the Vikings’ intense interest in acquiring land in eastern England was motivated by their involvement in sheep-rearing and wool production. The Anglo-Saxon Chronicle, an old historical record composed around 890,

recounts that in 851, 350 Viking ships sailed up the Thames to invade London. They encamped on the Isle of Sheppey and then overran Kent, extracting a promise of tribute (“Danegeld”). The Danes then came to control the whole eastern half of England, and from 1016 to 1035 a Danish king ruled the whole country.

England moved into the feudal mode of production from about 900 when the manorial system became generalized. The country was divided into manors—administrative units of lordship—to which the peasants, whether nominally free or slave, were effectively tied. In 1066, England was conquered by the Normans, the recent descendants of Vikings who had settled in Normandy, a landscape similar to southeast England. The Domesday Book of 1086—reporting on the extensive survey that the occupying power had carried out—shows that the economy of the eastern Thames at this time was not simply a subsistence one. Water mills and fisheries were spread densely along all the tidal and inland waterways of southeast England. A few villages, especially those on the Thames and its tributaries, had more than one mill or fishery and in the eastern Thames area, there were some remarkable concentrations. Lewisham had eleven mills and West Ham nine. Chatham had six fisheries, as did Swanscombe, while Lessness had three.

The Domesday Book also shows that manors were held by religious as well as secular powers. Canterbury Abbey owned many manors in Kent. The ancient abbey at Barking, which became a nunnery, owned manors all over Essex. Many new religious houses were established in the aftermath of the Conquest. The Cluniac order was brought to England by William de Warenne, an ally of William the Conqueror. Warenne’s Lewes Priory, located in the riverside marshes of the Sussex Ouse, served as the “mother house” for the other Cluniac houses in England: Castle Acre in Norfolk, Little Horkesley in Essex, and on the Thames, Bermondsey Abbey just to the southeast of London, and Pritlewell Abbey on the north bank of the estuary. The Cluniacs were followed by the Cistercians, who were well known for their development of sheep farming across Europe. Stratford Langthorne Abbey, on the Thames tributary, the Lea, was founded in 1135 and joined the Cistercian order in 1147. It was exporting wool to Italy as early as 1250. The Essex marshlands fetched the highest rents in the county. Cheese was produced from the milk of sheep grazed on the marshes, an activity that continued on Canvey Island until the 17<sup>th</sup> century. When Canterbury became a place of pilgrimage in the 1170s, hospitals run by the crusading orders were established at points along the old Roman road from London to Canterbury and at Tilbury, the ferry point on the Essex side.

By the 14<sup>th</sup> century, there was a complex physical infrastructure with the social organization to maintain and control it. The economy was integrated into long-distance trade patterns, with wool produced in England transformed in Flanders into textiles and garments and sold all over Europe and beyond. English merchants in return brought “spices,” which included salt and dyestuffs. Manufacturing and trading cities on the trade routes developed rapidly. London gained suburbs on its eastern side, the “Tower Hamlets,” where bread was produced for the city and cloth was “fulled” in water mills.

In times of crisis, city inhabitants could be mobilized en masse to side with one aristocratic ruler against another, and before long the emergent bourgeoisie was making demands in its own right. Flanders saw urban uprisings throughout the first half of the 14<sup>th</sup> century. By playing sections of the aristocracy off against each other, city elites won

the right to self-government, and populist city leaders emerged in Rome, Paris and London. After the upheaval of the Black Death, the aristocratic mode of regulation entered its long terminal phase. In Rome, still the ideological center of “Christendom,” the populist leader Rienzi, who had held control of the city in 1347, was able to seize power again in 1354. In France, the “Jacquerie” uprising of 1358 is best described not as a peasant revolt but as a mass uprising organized by the Paris city government as an intervention in the French succession crisis and the Hundred Years War.

The weaknesses of the hereditary principle—the keystone of aristocratic hegemony—were becoming apparent. In England, in particular, the ruling class turned to an alternative strategy of alliance with the bourgeoisie. Edward III’s sons, John of Gaunt and the “Black Prince,” made fortunes through simultaneous engagement in trade and warfare during the Hundred Years War by sponsoring “great companies” of mercenaries that looted the cities and countryside of France and northern Italy. At the same time, they turned a blind eye to the activities of the influential radical English theologian, John Wyclif, whose anti-theocratic views foreshadowed Protestantism. In 1376, the established power in Europe virtually crumbled when war between secular princes, fought out on Italian soil, caused a schism in the church. The northern Italian cities rose up simultaneously against a pope installed by mercenaries acting for foreign powers, while in the leading manufacturing city of Florence, a new aspect of bourgeois revolution appeared: the involvement of a nascent proletariat when the city elite lost control for several months to a guild formed by the unskilled laborers.

The eastern Thames in the 1370s not only had to respond to these European-wide political, military and ideological crises but also to natural disasters when storms caused breaches in the sea wall. While at war with France, the English rulers were increasingly uncomfortable with the fact that some of the most important monastic establishments in the eastern Thames were still under the direct control of “mother houses” in France. In 1295 and 1373, there were royal decrees to prevent any French prior from living within 20 miles of the coast or a navigable river. The motivation for these decrees was partly strategic—to cut off their capacity to act as an advance guard for an enemy power—and partly economic—to impede their capacity to benefit from the intensive stocking of sheep.

In 1373, the Cluniac settlements at Prittlewell on the Thames and Stansgate on the marshes of the river Blackwater were made “denizen” (subordinate) to the English crown. The most severe natural devastation occurred in 1377 when Barking Abbey reportedly lost a large part of its possessions along the Thames. The Cistercians at Stratford Langthorne Abbey were also severely affected and temporarily had to move away from the river marshes. John Leland, writing a century-and-a-half later, said that at one point Stratford Langthorne had to move temporarily to Burgested near Billericay because of flooding until “one of the Richards, king of England” took the ground and building under his protection and rebuilt it. Also in 1377, beacons were erected along the Thames to warn of possible arrivals of French ships, and in 1380, the town of Gravesend was burnt to the ground.

It was in this context of war, political crisis, and natural devastation that the Great Uprising (often misleadingly called the “Peasants Revolt”) began in the eastern Thames marshes in 1381. This was an attempted bourgeois revolution that recruited craftspeople and functionaries in Essex and Kent before spreading to other counties and

finally reaching London itself. It is clear that the revolutionaries planned to remove the heads of religious and secular power. They executed the Archbishop of Canterbury and burnt down the Thames-side palace of the effective secular ruler, John of Gaunt. Their demands and slogans reveal not only anti-aristocratic but even proto-socialist discourses. Nevertheless, they were quickly disarmed, apparently having no plan for exercising power other than to set up an aristocratic candidate of their own choosing. That candidate, the boy-king Richard II, refused to comply, and they also appear to have been betrayed by the double-dealing of powerful Londoners. In the following years, a severe repression hit not only England but much of Europe, directed at the followers of Wyclif, the “Lollards,” who dared to challenge the hegemony of the church.

In England the monarchy took on an increasingly absolutist character. It used legislation against the foreign controlled religious establishments to take control of the lucrative production of wool. Lessness Abbey, which was located on the Kent bank of the Thames but also had important holdings in Essex, was sequestered in 1402. Then under Henry V, all remaining alien houses were dissolved. During all of this, the eastern Thames continued to be the scene of rebellions against royal rule. Sir John Oldcastle, the Lollard lord of Cooling Castle in the Thames estuary, attempted to mobilize an army against the king and was hung in 1414. The eastern Thames became a place of recreation when a royal palace was built at Greenwich in 1428. But in 1450, there was another mass rising that took direct aim at state power: the rebellion of “Jack Cade.” The rebels, coming from Kent, stormed London. Only just failing to take the Tower, they beheaded the Lord Treasurer and the Archbishop of Canterbury and placed their heads on poles kissing each other. Cade presented a long list of demands aimed at limiting royal autocracy but was arrested, and then his head was displayed on London Bridge. Then in 1497, an army from Cornwall marched on London and was defeated at Deptford Bridge.

Despite these political upheavals and the playing out of internal dissensions of the ruling class in the so-called Wars of the Roses, trade networks continued to expand. New products and technologies, including canal-building and the use of windmills, firearms, sugar, and paper, were absorbed from the more technologically advanced economies of Asia and Africa, and Europeans began to engage in transcontinental shipping and exploration.

### **A Militarized High-skill Economy**

From the beginning of his reign, Henry VIII aimed to build up England’s naval power. In 1512 and 1513, royal dockyards were established to construct warships at Woolwich and Deptford, and another dockyard was in operation at Erith from 1514 to 1521. By this time, an industrial district that housed shipbuilding and related trades such as blacksmithing and equipment supply stretched downriver as far as Blackwall. The Thames-side location for naval construction facilitated the defense of London and allowed newly built or repaired warships to be brought onto the Thames to be equipped from the ordnance store at the Tower of London. Later in the 16<sup>th</sup> century, further naval yards were established at Chatham and Sheerness. Elizabeth I rallied the troops at Tilbury in the Thames estuary and defeated the Spanish Armada. The naval victory was an important economic turning point and enabled London to take over the role previously held by Antwerp as Europe’s main trading center. New industries came to

London and the Thames. For example, London became Europe's main center for sugar refining, and a factory at Dartford was granted a monopoly for paper production.

During the English Revolution of the 1640s, new ideas circulated, including plans for regional government and free compulsory education. After the restoration, a knowledge economy arose, one no longer based on introducing technologies from elsewhere, but on innovation. The monarchy actively intervened to support production of new knowledge, with Charles II giving his support to the new Royal Society. Samuel Pepys took over management of the Navy and the royal dockyards, where he attempted to root out what he saw as corrupt practices among the workforce. The king was persuaded by Christopher Wren and others to fund an observatory at Greenwich to conduct research into the measurement of longitude at sea. As occurred much later with the development of radar in World War II, military requirements pushed the scientific research forward, since the ability to measure longitude held out the promise of military control of the seas. At nearby Woolwich, development of what was to become the Royal Arsenal began in 1671. This emergent high-skill maritime economy was further supported by the establishment of Europe's first technical schools in London and at Rochester, which passed on the new navigational and mathematical knowledge to young men who would become military or naval officers. These schools were subsequently emulated in France, Moscow and Prussia.

The stretch of riverside along the north bank from London eastwards towards Ratcliffe and Blackwall and the corresponding section on the south bank towards Deptford, Greenwich and Woolwich was a closely knit district of maritime industries. Spate describes it as a:

... labyrinth of rope-walks, breweries, small foundries, anchor forges, docks, sugar boileries, oil, colour and soap workers, coopers' and boat-builders' yards. Here, too, were the irregularly built homes and taverns for artisans, sailors, coal-heavers, and other waterside workers. South of the river, there was a similar area in Rotherhithe, joining up with Deptford along the river-wall.

After the "Glorious Revolution" of 1688, this stretch of river also became the knowledge production powerhouse of the mercantile economy. On the site of the former Greenwich palace arose Europe's largest charitable institution, the Greenwich Hospital, which provided shelter for those who had served in the Navy in buildings designed by Wren, Hawksmoor and Vanbrugh. The Woolwich arsenal gained a Royal Laboratory for experimentation and manufacture of ammunition, fuses and gunpowder, as well as a foundry, designed by Vanbrugh, to produce cannons. In order to cope with the rapid expansion of trade, in 1696 the Howland Great Dock in Rotherhithe was built.

Shipyard workers were "classic examples of the skilled artisan." The nature of the work made it impossible to introduce batch or production line methods or even much outsourcing of component manufacture. Yet, from Samuel Pepys onwards, the naval authorities constantly complained about the workers' practices in the royal dockyards. It was alleged that at the Chatham and Sheerness dockyards, the largest industrial enterprises in Kent, an unnecessarily high number of employees was maintained in order to provide support for government candidates at elections. There were strikes and mutinies in the Chatham and Woolwich yards from 1739.



This early trade union activity was accompanied by other forms of proletarian self-organization. The first recorded consumer co-operative societies were formed by the shipwrights of Woolwich and Chatham dockyards, when in about 1760 they set up their own flour mills and a bakery at Chatham. The employers responded by improving conditions. For example, a superannuation (retirement) scheme was introduced in the royal dockyards from 1764.

During the Napoleonic wars, these military dockyards were not only of prime strategic importance but were also a focus of radical agitation. In 1794, radicals in the London Corresponding Society began to recruit waterside workers and set up branches in Woolwich and Deptford. The Thames Ship Caulkers Union was founded in the same year. There was further agitation in north Kent, perhaps connected to the mutiny at Spithead and the Nore in 1797. The authorities' fear of this dissidence culminated in the case brought against a certain Colonel Despard, who was accused of having created a Jacobin paramilitary organization in order to prepare for an uprising. It was said that he had armed divisions in various parts of London, including Spitalfields and Blackwall, as well as other towns and cities, including Chatham. For E.P. Thompson, "the mutinies of the fleet remind us that a revolutionary organization in the Army was by no means inconceivable." Although the state responded by banning "combinations" (labor unions), the radical shipwright, John Gast, led a strike of shipworkers in 1802 and set up almshouses for their elderly and disabled members.

### **An Import-processing Low-skill Economy**

Commerce had expanded at such a phenomenal rate that London's port facilities were hopelessly inadequate. Britain's first police force, the "marine police force," was established with the support of Jeremy Bentham, among others, to try to control rampant thieving from ships. Under considerable pressure from the merchants in the West India (slave and sugar) trade, the state decided to invest in the construction of new port facilities, the "wet docks." The first of these, the St. Katharine Docks designed by Thomas Telford, were an engineering miracle. Steam engines designed by James Watt and Matthew Boulton kept the water level in the basins about four feet above that of the tidal river. Further construction continued, and by the 1830s the docks reached from the eastern edge of London to the Isle of Dogs. The continued rapid expansion of trade was henceforward governed by the ideology of free trade rather than monopoly. This area was thus a key location for Britain's transition from the development model of mercantile capitalism to that of laissez-faire capitalism.

The area to the east of London, where industries had been located from the time of Domesday, now had the Bow pottery works and became a center for the printing of calico. Like the already established silk industry of East London—and typically of eastern Thames industry in the 19<sup>th</sup> century—this industry was based on the processing of imported raw materials. Another step was taken when the pioneering establishment of Britain's modern chemical industry was set up in the Thames marshes. In 1797 "two young Quakers of remarkable character," William Allen and Luke Howard, established a chemical laboratory and factory in the village of Plaistow near Stratford. The innovative nature of this industry is illustrated by the fact that six people associated with these partners became fellows of the Royal Society. One was Luke Howard, who established the classification of cloud formations that remains in use today, and another was his son

who worked on bringing quinine into use as a medicine. Alongside their wide scientific and social interests, these Quakers campaigned for social causes, for the abolition of the slave trade, and against capital punishment. They also gave financial aid to schools. Another new industry was the manufacture of portland cement, which was established at Dartford in 1834 immediately after its development as a product.

A vast industrial area was created on Thames-side, which played a key role in Britain's industrialization. The Port of London and its associated industries marched relentlessly eastwards as Britain became the world's predominant maritime and industrial power. Coal from the north of England was brought into the Port of London. The cities were now lit by gas, and making gas from coal yielded the by-product sulphurous tar, which could be used to make sulphuric acid. Sulphuric acid became one of the main industries that settled east of the Lea in the Thames-side areas of the West Ham and East Ham parishes. It was used in many industrial processes in an interlinking of chemical and related industries "in which one part was dependent on the others and almost every effort to prevent waste involved the manufacture of some new product." These industries were all to be found together on Thames-side, emitting their pollution downwind of the metropolis outside the jurisdiction of the metropolitan authorities and benefiting from practicable and cheap water transport.

The newly urbanized areas were built on flood plain land without the necessary infrastructure. A report in 1855 by the civil engineer, Alfred Dickens, to the West Ham Board of Health entitled "Sewerage, Drainage and Supply of Water and the Sanitary Condition of the Inhabitants of West Ham" was followed up two years later in an article by his brother, the novelist Charles Dickens. A leading campaigner on the London sewage issue, the more famous Dickens was particularly exercised by the fact that "noxious" industries were able to avoid the first health regulations by locating on the Essex marshes just outside the London metropolitan area. Whole new towns were growing up for workers in these industries "without drains, roads, gas or pavement." The land was seven feet below the high-water mark and relied on the protection of the sea walls. In hindsight, it is clear that this shrinkage of the riverside marshes was a long-term consequence of embanking. No longer managed as watermeadow, these lands now grew vegetable crops, notably potatoes, for the London market. Although a supply of clean drinking water had been provided following Alfred Dickens' report, members of the Board of Health appeared to care more about the established town of Stratford, where they lived, than about "colonies out in the marsh." Sewage ran in open ditches, malaria and other infectious diseases were rife, and the mortality rate was much higher than in the neighboring villages. Charles Dickens recommended that the sewage be pumped into a ditch where water flowed relatively freely into the Lea (and thence into the Thames) "until the great out-fall question is decided."

Dickens was referring to the dispute between the 19<sup>th</sup> century social reformer and sanitation advocate, Edwin Chadwick, and Joseph Bazalgette, the chief engineer at London's metropolitan board of works, as to how the great sewers planned for London should be constructed and how far down the river the effluent should be discharged. Bazalgette favored having the sewage discharged at Barking and Crossness, whereas others thought it should be a mile further downriver to minimize the chance that it would be washed back up. Disposal of sewage had become a major public health issue—and not only in the outposts of the metropolis.

In previous centuries, human manure had been a valuable resource that was removed from towns by night-soil collectors for use on the land. The traditional methods of disposal were difficult to maintain as the urban area expanded and the increasing popularity of the “water closet” in the 1830s and 1840s simply displaced the problem to the “end of the pipe.” Water supplies became contaminated, and there were regular outbreaks of cholera.

The authorities were hopelessly divided on how to respond, not only because they were averse to spending money on public works but also because of the division in scientific opinion as to whether cholera and other infections were air-borne or water-borne. Though the water-borne school of thought was beginning to win the upper hand, Charles Dickens’ vocabulary betrays a fear of “miasmas” and “bad air” as well as the moral contamination that might accompany physical filth. After a long battle, the sewage campaigners won out, and it was eventually decided to construct a system of great sewers. However, the question of the “location of the outfalls” that Dickens referred to held up construction.

After 1858, when the “Great Stink” of the Thames was enough to impede sittings of Parliament, construction of the new great sewers eventually began. Sewage from the northern half of London was pumped up 36 feet at Abbey Mills Pumping Station by massive steam engines before being dumped into the Thames at Barking Creek. Sewage from south of the river was pumped up 18 feet at Deptford to the outfall at Crossness.

Chadwick and his supporters understood that the sewage contained useful nutrients, and he was convinced that the projects could break even or run at a profit if the sewage could be sold and used for agricultural irrigation. His ally, John Bennet Lawes, set up various “sewage farms,” where sewage was used for irrigation. The best known of these was on his own estate at Rothamsted, but another was close to the outfall at Barking where steam engines pumped five tons of raw sewage per minute onto the fields.

At the same time that the Thames east of London was being polluted by sewage and the nutrients were being lost to the soil, artificial fertilizers, or “chemical manure,” was perhaps the most important chemical product in the eastern Thames. From 1857, waste products from gas production were used in what had been a rural setting below Barking Creek to manufacture ammonium sulphate, sulphuric acid and artificial fertilizer. The firm Burt, Boulton & Haywood landed timber at the newly opened Victoria Dock and produced a range of tar derivatives and treated timber to make railway sleepers and telegraph poles. By 1876, their Silvertown and Millwall works were using 12 million gallons of gas tar each year to manufacture creosote, naphtha, pitch, anthracene, disinfectant, insecticide and aniline dyes. The sulphuric acid produced in the many local factories was used by manufacturers of soap and telecommunications cables. In 1870, the availability of cheaper coal allowed the Gas Light and Coke Company to open Europe’s largest gas works in a part of the marshes named Beckton after the company’s director. From 1879, the gas works was itself making fertilizer.

The nutrients from the human manure did not have to be disregarded in such a way. In order to see how they could have been used, it is helpful to go back to the

concept of the water meadow. A recent study points out that water meadows were being extended in Germany at this period:

The meadow irrigation system was considered to be fairly sustainable because the fertilizing effect of the irrigation was believed to be high. At that time, [the Victorian period] the fertilizing effect of the rivers and streams should not be underestimated; bearing in mind that the water, used for irrigation, contained unfiltered sewage.

The author refers to the German agricultural expert, Karl Nikolas Fraas, who in 1865 advocated the spread of water meadow technology in order to make German conditions “parapotamic,” or closer to those of ancient Mesopotamia.

Peter Dickens has recently discussed the fact that in 1868, Karl Marx wrote to Engels praising a work by Fraas from 1847. A comment by Marx seems to indicate that he had also read some of Fraas’s later work. Peter Dickens puts Marx’s interest in Fraas in the context of his emergent ecological ideas. As John Bellamy Foster and Fred Magdoff have pointed out, Marx took a great interest in the related questions of soil nutrients and sewage disposal. He followed the arguments made by Justus van Liebig, who pointed out the ironies of the simultaneous pollution of the cities with excrement and the depletion of the natural fertility of the soil. Liebig in his *Chemical Letters* describes the nitrogen cycle and refers to the Nile and its silt, showing understanding of how irrigation can supply not only water but also nutrients. Marx was particularly concerned with the waste of sewage in London. In fact, it was the Scottish political economist James Anderson who raised the question of soil fertility from the start of the 19<sup>th</sup> century. Marx used Anderson to support his argument that fertility could be improved or degraded by human activity. In opposition to the views of Ricardo and Malthus, he saw the capacity of the land as resulting from a combination of human and natural inputs.

Mainstream Victorian scientists and public health campaigners were also convinced of the value of sewage, and they attempted to profit from it individually through the development of sewage farms. Their attempts failed in the end not because the nutrients in human manure were not valuable inputs to agriculture, but because they were diluted in such large quantities of water. As was seen in regard to water meadows, irrigation can be beneficial to agricultural land. But in England where the rainfall is naturally frequent, too much irrigation is more of a danger than too little. As Bellamy Foster and Magdoff point out, the question is still not resolved, and sewage in developed countries is a potentially valuable resource that could be put to use if the toxic materials (particularly heavy metals) were removed.

In the late 19<sup>th</sup> century, new large docks were built on the East Ham marshes and at Tilbury, and these brought more new industries such as sugar processing and margarine manufacture. The east of London saw new communities arrive: black people working as servants and in a wide variety of trades; Bengali sailors; Chinese people (in the Limehouse area where they were associated in the lurid imagination of the popular press with opium dens and other kinds of iniquity); Jewish refugees from Eastern Europe (whose presence was bewailed in much the same way that the presence of refugees in Britain is today).

It was in the eastern Thames during the 1890s that the main elements of Britain’s welfare state were first established, precipitated by two of the most important labor

disputes in British labor history. The gas manufacturing industry was, in the words of Eric Hobsbawm, “that relatively unusual thing in mid-nineteenth century Britain, a heavily capitalized continuous-process industry propelled almost entirely by specialized semi-skilled men ... and by laborers.” Although labor unions until then had been formed mainly by skilled craftspeople, the gas workers—led by Will Thorne of the Beckton works and supported by socialist activists including Eleanor Marx—won their demand for an eight-hour working day without a strike. The dock workers went on to a landmark strike, not only for the eight-hour day but also for an end to casual employment. Further development of co-operative societies and the founding of new educational establishments for the working class also took place in this period. Workers’ representatives won control of the West Ham council and the parliamentary seat. Thus the area played a key role in Britain’s turn toward the next step in the evolution of capitalism: the Fordist or welfare capitalism model.

In the 20<sup>th</sup> century, the eastern Thames economy was firmly established as a low-skill economy based on processing imported products. Fordist manufacturing arrived with the establishment of the Ford car factory at Dagenham in the 1920s, but much of the development of modern industry in the period between World War I and World War II went to the north and west of London rather than to the east. World War II brought extensive bomb damage, and there was a need to reconstruct both housing and industry. The postwar reconstruction of industry rapidly re-established the pre-war patterns. Housing reconstruction was a much more prominent issue, and radical solutions were adopted. Though the Abercrombie plan for London was built from a deep love of the land (Abercrombie was a founder of the Campaign to Protect Rural England, or CPRE), it was also based on the concentric circles model of city development, which did not acknowledge the Thames estuary. The Abercrombie plan led to the construction of a ring of new towns around the capital, including Basildon, which was close to the Thames.

In the mid-1960s, an academic historian of ports, James Bird, wrote optimistically of the capacity of the eastern Thames to contribute to the national economy:

...the Port of London, which has always been the largest in the kingdom, has now spread far and wide, to every reach of the tidal river. Yet there is no lack of room for port expansion, particularly downstream. Golden opportunities await this national asset, for surely the nearest approach to a river of gold lies in the worth to the nation of the tidal Thames.

At this time it was already clear that the inner docks built in the early 1800s, were unable to cope with the volume of large shipping and would have to be closed. As Peter Ambrose later pointed out, “the British Empire, that anachronistic collection of captive raw-materials producers and markets, began to fall apart and London began to lose its share of world trade.” Bird’s assumption was that industry would shift downriver into a virtually unlimited supply of what he referred to as “former floodplain” land, which was no longer considered to be of any great agricultural value.

The land was treated as completely expendable; refuse from London would be used to “reclaim” the marshes. A lack of usable fresh water was, however, noted. The portside industries were predicted to expand alongside the port itself, especially at Tilbury. An account of the London economy in the same period similarly contained no inkling of any problem with the docks’ viability. The weaknesses apparent even at that stage were inherent to a low-skill economy dependent on imported raw materials.

Although electricity generation was well established and several large oil refineries were implanted in the area, the chemical industry failed to make the shift from using the by-products of gas manufacture from coal into modern petrochemicals.

### **Deindustrialization: From “Brownfield Site” to “Linear City”**

The dock closures of the early 1970s coincided with the international oil crisis. There was industrial decline all over London in 1966-74, but the highest job losses were in Newham, Southwark and Greenwich. Reforms had cut out the worst excesses of the casual employment system in the docks, but the dockers were threatened by the rapid march of containerization. Between 1966 and 1972, one-third of registered dockers' jobs were lost. Despite agreements to the contrary, “stuffing and stripping” (packing and unpacking) of containers could take place at depots far inland. Things came to a head in 1972 when dockers became aware that at the Chobham Farm yard in Stratford, workers not in their union were unpacking goods from containers. By historical accident, this coincided with the Conservative government's attempt to contain union militancy through the Industrial Relations Act, and a major confrontation was triggered. The dockers' leaders were jailed as “the Pentonville Five” then released after mass picketing of the prison, marking a spectacular defeat for the government's industrial policy.

Soon after this, a report prepared for the Greater London Council proposed that the Thames-side area downstream of the area affected by the dock closure could be used to solve the crisis. But little account was taken of this as wrangles between the public authorities over the Docklands redevelopment were spun out through the 1970s. At the beginning of the 1980s, a dramatic turn of policy by the Thatcher government turned the Docklands into a flagship for a model of undemocratic, private-sector led development. A key aim of the planners was to increase land prices in the Docklands. This initiative was a test bed for neoliberalism that aimed to attract large capital rather than small or medium-sized firms. In response, a movement to resist the Docklands redevelopment arose in which new ideas about “popular planning” were developed. Those opposed to the Docklands redevelopment pointed out that the needs of the existing residents had not been taken into account, even though they still tended to think of these residents as intrinsically unsuited to white collar work and incapable of adapting to the service economy.

The redevelopment of the inner docks attracted mainly large firms in the prestigious office developments. It was entirely a capitalist valorization of the land; no value at all was placed on the living resources, only on the land as capable of supporting buildings, although all sides agreed on the need to mix economic (“employment generating”) activities with housing. By the later 1980s, the Docklands was seen in the context of a wider area called the East Thames Corridor, which is more-or-less coterminous with the whole tidal river east of the City of London as defined in this paper. Studies showed that there were huge expanses of derelict former industrial land that could be developed if “constraints” were removed by marketing the area, improving transport links, eliminating bureaucracy, and offering inducements. When it was announced that the high-speed Channel Tunnel Rail Link would run through the area with stations at Ebbsfleet near Dartford and at Stratford, the area was euphoniously renamed the “Thames Gateway.”

Into the 1990s, the plans were still for economic regeneration through a combination of “endogenous growth” and the attraction of inward investment. The local authorities, mostly run by the Labour Party, unsympathetic to the Conservative national government, and critical of the Docklands precedent, were concerned that jobs should be created for local people with a mainly manual skills base. The mid-1990s saw the emergence of the idea of skills-led regeneration, which was based on the idea that the working-class communities of the eastern Thames were excluded by their low skill levels from the high-value-added economy.

The Strategy for the South East from the local authorities and the new Government Office for the South East used new ideas about sustainability to resist pressure from central government for new housing development, and for this reason its approval was held up for many years. A proposal to build a film studio on Rainham marshes set Friends of the Earth and local residents at loggerheads, which highlighted the lack of connection between socialist and ecological thinking. By this time, much of the marshland supposedly protected as Sites of Special Scientific Interest had already been eroded.

There had, however, been an unnoticed process of eco-modernization. Most of the large factories had their own combined-heat-and-power electricity generation. Paper was recycled on a large scale, as was steel (although the steel plant has now closed). A new Thames Chase Forest linked open spaces as a recreation resource for residents. A growing awareness of the significance of the lower Thames ecosystems was also evident in the Thames Strategy, which was formulated by the Department of the Environment in 1995, although the main focus of this was upriver from Greenwich. The lower Thames was strange territory to the authors of this document, who opined that “the River forms a barrier to transport movement,” that there was “a general lack of tree cover along the lower Thames giving the landscape a bleak and exposed aspect,” and that “dramatic lighting at night would help to create a sense of place.”

The plans of the New Labour Deputy Prime Minister, John Prescott, in the late 1990s swept away the previous emphasis on “employment generation” in favor of housing development, the aspiration being for a “linear city” of thousands of inhabitants. The Thames Gateway was where the housing needs of the southeast could be met without upsetting the residents of more affluent areas. Regional planning documents of the late 1990s explicitly stated that the Thames Gateway could be used as a source of brownfield land for housing development:

... house building in the area is no bad thing (even if it leads temporarily to increased commuting to London) so as to bring to the area the sort of workforce that would act as an attraction and catalyst to knowledge-based economic development.

Recent documents show that the knowledge-based development idea has been eclipsed by a new stress on sustainability:

In the Gateway, high design standards for homes will be the norm, with energy and water efficiency built in. We aspire to see Gateway housing leave a low-carbon footprint to help tackle global warming. There will be an emphasis on making sure there are enough affordable homes for those who have difficulty getting onto the

housing ladder, or finding decent rented accommodation. There will also be well-designed public places, where communities can come together.

Current plans are to build 160,000 houses before 2016.

Development in the 21<sup>st</sup> century is to be on a far greater scale than that of the 19<sup>th</sup> century. The ecological implications are different, but equally serious. Lost in all the talk of “brownfield sites” was the fact that a floodplain is just that—a plain subject to flooding. In the great floods of 1953, more than 300 people died in eastern England, with Canvey Island in the eastern Thames among the worst affected places.

Extensive flooding could occur again any time a tidal surge comes up the estuary, especially if there has also been heavy rainfall resulting in an above-average river flow. Spring and autumn bring high tide levels as well as rain.

Quite apart from the rising sea levels caused by global warming, southern England is steadily sinking, a result of the melting of the ice sheet at the end of the last Ice Age. London itself is protected by the Thames Barrier, which was completed in 1984. Until 1990, the barrier was closed to protect against flooding once or twice a year, but in the last few years the average number of closures has risen to four per year. The government’s Thames Gateway website discusses the flooding question in the following terms:

While the papers paint a bleak picture for the Thames Gateway when it comes to flood risk, the truth is that the Gateway already benefits from some of the highest levels of protection in the country and will continue to do so in future. But existing high standards doesn’t mean we’re being complacent, quite the opposite! [We tell you] what we’re doing to ensure the Gateway continues to have state of the art defenses ...

The “Thames Estuary 2010” project will recommend improved flood protection. While the details of the project have yet to be finalized, in anticipation of rising sea levels due to global warming, the government’s Environment Agency (an agency within the Department for Environment, Food, and Rural Affairs) is moving towards a policy of “managed realignment,” generally known as managed retreat, when sea defenses are abandoned and a coastline or estuary is allowed to return to its natural flood meadow condition. The government is aware that this policy is not popular; many people still believe that it is possible to build ever higher barriers to keep the waters out. While managed retreat is a principle in line with modern environmental ideas of river basin management, it is important to recognize that a main aim is to use the Thames flood plain to protect London. If severe floods do occur again, the imperative of saving London may mean that a decision is taken to sacrifice land in the estuary—even occupied land—to the waters.

The strategy for enhancing the green space in the Thames Gateway, published in 2004, promised to create a network of all the open spaces in the Thames Gateway. This, it said, would “deliver wide ranging environmental benefits such as shelter, pollution filtration and flood protection.” This, however, is a tall order, because although green space can in theory fulfill these functions, it can only do so if the proportion of green space is adequate compared to built land. Even then, housing built on very low-lying areas may be impossible to protect either by managed flooding of green spaces or by



building higher barriers. In effect, the flooding issue is swept under the carpet. The authors felt that “the tidal Thames already serves as a model for sustainable estuary management”—but this is only true because other estuaries have sustained even worse damage.

## **Conclusion**

The agricultural use of the land that arose in the medieval period was intensive but valorized the natural resources without depleting them. The silt of the river, including the nutrients in natural manures in the river water, were used in a form of water meadow system. Nevertheless, there may have been some lasting effects on the environment, since the narrowing and straightening of the river channel led to the formation of sandbanks that were a barrier to shipping. The economy of the area was integrated into the national and transnational economy and engaged in social and economic developments on that wider stage, which eventually led first to militarization and the emergence of a high-skill economy, and then to industrialization and a low-skill economy.

Industrialization brought “metabolic rift,” since the human manure that could have been used to improve the soil instead became a dangerous pollutant. At the same time, the area was a center for the production of artificial fertilizers. The pollution of the river was eventually reversed, but the effect of embankment on the land has been more serious, especially after the attempts to “reclaim” land using fill from household waste. However, recent proposals for “managed retreat” from the coastline may take some ecosystems back to their state more than a thousand years ago before the construction of sea walls.

Other recent proposals may result in irreversible ecological damage. Nevertheless, there are still at least two potential scenarios for the Thames Gateway. The current government scenario—heavily lobbied for by large home construction companies—is based on unlimited housing development and could lead not only to destruction of the natural environment but also to a situation in which thousands of residents are put at risk of flood disaster. Despite the mantra of “sustainable communities,” little account has been taken of the intrinsic problems of building on a river flood plain or of the lack of available drinking water in the area. Underlying this has been a failure to make links between people’s social and economic needs and the quality of natural habitat.

An alternative scenario for development would start from the existing basis of embedded generation and recycling. A prime example is the proposal to build a large wind farm in the open estuary. From a green socialist perspective, it is important to develop a new, critical view of valorization. The prime people to put value on the land are the existing residents, and it is they, ultimately, who need to develop their own vision. Residents of the area rightly feel that their needs have been neglected. It is also true that, compared to others in southeast England, they are still missing out on educational opportunities. A reworked version of skills-led regeneration would involve residents themselves defining what they felt they needed to learn rather than being led by the government’s “skills agenda” with its constant emphasis on employers’ skills needs. It would enhance democratic control over the development process, and in the process,

allow people to rediscover the rich history of an area so important on the national and even international stage.

In reality, the rhetoric about sustainable communities masks a lack of real consultation. There is little evidence of the “joined-up thinking,” the rationally integrated approach to policy-making that New Labour has supposedly adopted. Social welfare (“cohesion” or “inclusion”), economic development, education and skills, natural environment, and heritage are each addressed as separate and potentially conflicting questions. None can be understood without an examination of the different ways in which people over the centuries have made their livings on, from, and beside the river—their modes of metabolism not only with the land but with the flood and ebb of the water.