ENVIRONS

The environs within which houses are situated are important both in themselves and for the effect they have on the insides of the houses. This has long been obvious to those concerned with public health. The state of general cleanliness, the paving of the streets, the purity of the air, all were important. For instance foul air, a compound of decaying matter and the increasing discharges from coal burning fires, was noted as a major contributor to ill health, and particularly to the numerous chest infections which were the most serious of all causes of adult mortality in England from the later eighteenth century. Buchan had particularly stressed the dangers of foul air.' A century later, the cities were much larger and more crowded and the level of industrial pollution much greater, as Chadwick noted. [1]

The environs in Japan

When Morse travelled through Japan in the 1870s one of the first things to strike him was the absence of rubbish. Here was a very crowded country with huge cities and densely packed towns and villages, presumably generating huge amounts of waste. Yet it was, on the whole, spotless. The civilization he had left in Massachusetts was a very lightly settled and basically agricultural one, with small towns and farms, yet it was far dirtier. He began his speculations by an explicit comparison with the coast of America. There, in the coastal towns 'one sees in hundreds of regions along sea walls in our country, outhouses, refuse, and other abominations...' But as he approached Tokyo by rail in 1877 Morse noted 'a cove is crossed bordered by a long sea wall lined by simple dwellings, yet everything is neat and refined.' He then widened his reflections to encompass his many journeys through the Japanese countryside and long periods in the massive cities of Tokyo and elsewhere. 'It seems incredible when I recall that in country villages and city alike the houses of rich and poor are never rendered unsightly by garbage, ash piles, and rubbish; one never sees those large communal piles of ashes, clam shells, and the like that are often encountered in the outskirts of our quiet country villages.' [2] The Japanese 'in some mysterious way manage to bury, burn or utilize their waste and rubbish so that it is never in evidence. At all events, the egg-shells, tea-grounds, and all the waste of the house is spirited away so that one never sees it.'[3] The very occasional exceptions only went to prove the rule. In one village 'It was hot and sultry, and in our collecting we came across piles of garbage and refuse of the town, a most unusual

[1] Chadwick, Report, 110, 93, 115; Buchan, Domestic, 76,79, Black, Arithmetical, 52.

[2] Morse, i, p.42-3

[3] Morse, i, p.43

sight...The stench was dreadful, and I wondered at it, as Japanese towns are generally so clean.'[4]

Again he contrasted the situation with America. In his own sophisticated area of Cambridge, Massachusetts, within the precincts of the stately university of Harvard, 'In refined Cambridge, a short cut between the houses of two scholars led through a deep depression of the land. This land is so disfigured by a certain type of rubbish that for years it was facetiously called the "tin canyon".'[5]

The cleanliness and absence of public dirt could be found in all aspects Japanese life. Places of work were generally very clean. Morse expected to find fishing ports dirty, filled with unwanted bits of fish and hence innumerable flies. He remembered his American experience 'at Grand Manan where there was an intolerable nuisance of the flies in the village, due to the fish cleanings being scattered about.' Yet 'Enoshima is a fishing village, but the fishermen in cleaning their fish carefully remove all the offal, and do this every day. Then, too, everything they catch they eat, and so little is left to decompose...' Hence, he notes, there are no flies.[6] The boats were equally clean. 'The woodwork is of immaculate cleanliness and one always sees some of the crew scrubbing.'[7] Likewise, industrial plants were spotless. He visited a cotton factory. 'What amazed us beyond expression was the absence of all dirt and grease. Every girl looked clean and neat...Ruskin would have thought he was in the seventh heaven.'[8]

He visited a timber yard in a small town. 'The office has two stories in height and the rooms, as well as the sanitary arrangements, were immaculate in their cleanliness - and this in a common lumber yard![9] Another place which is usually dirty is the market - filled with discarded bits and pieces. Japanese markets seem to have been different. 'One may visit the market many times and meet with something never noticed before. One is at once impressed with the artistic way in which everything is displayed and the immaculate cleanliness of everything: the turnips and white radishes are literally white, not a

---

[4] Morse, ii, p.153

[5] Morse, i, p.42-3

[6] Morse, i, p.206

[7] Morse, ii, p.149

[8] Morse, ii, p.272

[9] Morse, ii, p.59

particle of dirt showing upon them...'[10] Likewise, as Geoffrey noticed half a century later, the parks were spotless. 'Consider, then; here was a park, which this Japanese family had visited as did a couple of hundred other Japanese every day of the week, yet you could find no scraps of papers thrown on the paths, nor see one person break off one blossom or branch to bear home; here was a pavilion where free tea might be had, with a couple of hundred china cups stored in a basket for use, but you would not see one cup dirty, or broken or carried away in some one's capacious sleeve.'[11]

The spic and span countryside and farming were just as remarkable as the town environs. This was noted by Alcock. He quoted Veitch (xxx) to the effect that 'There is one particularly striking feature in every Japanese farm; viz, the cleanliness and order everywhere prevalent. Each man seems to take a pride in keeping his land in perfect order and clear of everything in the shape of weeds.'[12] Alcock's own impression was the same. 'Nowhere in the world, perhaps, can the Japanese farmer be matched for the good order in which he keeps his farm. The fields are not only kept scrupulously free from weeds, but in other respects the order and neatness observable are most pleasing.'[13] A similar impression was made by Morse. 'One of the many delights in riding through the country are the beautiful hedges along the road, the clean-swept walks before the doors, and in the houses everything so neat and the various objects in perfect taste...'[14] For instance, 'The village of Fukouka I recall as a very beautiful place with its row of little gardens in the middle of a wide main street and the street cleanly swept.'[15]

Although Isabella Bird found some grubby villages,[16] on the whole even she was impressed by the astounding cleanliness. Of one village she wrote, 'It is a doll's street with small low houses, so finely matted, so exquisitely clean, so finically neat, so light and delicate, that even when I entered them with my boots I felt like a "bull in a china shop", as if my weight must smash through and destroy. The street is so painfully clean that I should no more think of walking over it in muddy boots than over a

[10] Morse, ii, p.79

[11] Geoffrey, Immigrant, p.164

[12] Alcock, Tycoon, 2, p.476

[13] Alcock, Tycoon, 1, p.319

[14] Morse, i, p.54

[15] Morse, ii, p.51

[16] Bird, Tracks, p.40

drawing-room carpet.' [17]

The effects of this general public cleanliness was increased by the purity of the air. As Morse commented, 'With the absence of chimneys and the almost universal use of charcoal for heating purposes, the cities have an atmosphere of remarkable clearness and purity...'[18] Hence 'The great sun-obscuring canopy of smoke and fumes that forever shroud some of our great cities is a feature happily unknown in Japan.'[19] The same point was made a few years later with an explicit contrast to England by Arnold. 'One happy consequence of this omnipresent employment of charcoal for domestic and culinary purposes is that Japanese cities, villages and abodes are perfectly free from smoke. The clear air is always unpolluted by those clouds of defacing and degrading black smuts which blot our rare sunshine in London, and help to create its horrible fogs.'[20]

The clean air and the generally spotless public environment, which is still characteristic of Japan, must have had immense public health advantages. In particular, the effects on the vermin (rat) population, on flies, on diseases of various kinds was probably very considerable, if invisible. The Japanese were far ahead of any other population in dealing with what might have been assumed to be an inevitable feed-back leading to high mortality, namely urban refuse. The facts and the effects are not in doubt. The puzzle is to explain how and why such amazing cleanliness was achieved.

There were certain advantages caused by the nature of Japanese agriculture and housing. One huge cause of filth, namely animal dung, was absent. For instance 'Horses were not used for transportation, and thus the city streets were not fouled.'[21] The villages likewise would be much cleaner. The consequent use of human excrement also relieved the Japanese of that source of pollution. The absence of coal burning took away the pall of soot. The small and low-level housing, combined with numerous wide avenues and parks, helped to keep the cities open and well ventilated. Yet it was obviously also the result of conscious planning.

The cities of Japan struck visitors as very pleasant places in which to live. As Alcock wrote, 'The capital itself, though spreading over a circuit of some twenty miles, with probably a couple of millions of

---

[17] Bird, Tracks, p.53

[18] Morse, Homes, p.2

[19] Morse, Homes, p.2

[20] Arnold, SEas, p.382

[21] Hanley, Living (xerox),p.189

inhabitants, can boast what no capital in Europe can - the most charming rides, beginning even in its centre, and extending in every direction over wooded hills, through smiling valleys and shady lanes, fringed with evergreens and magnificent timber.'[22] Some years later Mrs. Fraser echoed his impressions; 'Tokyo is enchanting - so far! It strikes me as a city of gardens, where streets and houses have grown up by accident - and are of no importance as compared with the flowers still.'[23] Particularly impressive was the absence of noise pollution. 'In Tokyo itself you may enjoy, if you wish, the peace of a country village.'[24] Even the worst parts, the very poorest slums in this huge city, were far pleasanter than their equivalents in the West. Morse on one occasion, accidentally wandered into some densely crowded streets in the massive city of Tokyo. The area looked 'squalid' to him and he was told that 'it was the lowest and poorest quarter of the city,' So he 'went slowly along and examined each alley in turn.' He reported that 'I heard no loud cries or shouting, saw no bleary-eyed drunkards or particularly dirty children and for a hundred children picked at random from what might be called slums, though slums they were not, I would venture that they were more polite and graceful in manner...than a hundred children picked at random from upper Fifth Avenue, New York.'[25] The charm and cleanliness was undoubtedly made easier by the height of the buildings: 'because buildings were usually no more than one and one-half stories high, density per square mile even in the largest cities was far less than in European and American cities, with their multi-storied tenements.'[26]

These natural advantages, however, probably only just about balanced the fact that Japan's population density as a whole was far higher than that of any Western or even Asian country. Packed so close together, we would have expected a build up of rubbish. The problem of how the Japanese kept their environs so spotless was one which intrigued Morse.

One part of the explanation he thought lay in practical necessity. The rising affluence of America had led to a throw-away culture, while in Japan everything was re-cycled. 'In our extravagant way of living in contrast to the simple life of the Japanese we have much waste to dispose of and it is truly waste.' The Japanese, however 'bury, burn or utilize their waste.' If we step back from Morse's account it is not so difficult to see an answer to the mystery. Firstly, as he noted, far less waste was produced. There were no egg shells because eggs were hardly eaten, there were no tins to throw into a tin alley, there were no

[22] Alcock, Tycoon, 1, p.128

[23] Fraser, Letters, 1, p.6

[24] Hearn, Kokoro, p.15

[25] Morse, ii, p.370

[26] Hanley, Living (xerox), p.189

bones, because meat was not eaten, every scrap of everything was consumed or re-cycled. But there was **some** waste as we have seen in the exceptional case cited by Morse of a stinking garbage heap in one town, incidentally in the area near Yokohama which he said had been adversely affected by the presence of arrogant and stupid foreigners. Thus there was clearly a conscious effort made by many towns and villages to clean up what refuse there was.

We can examine this in relation to one of the main areas where rubbish collects, namely the streets. Kaempfer had noted that with some exceptions the streets were well kept and clean. 'The ground is kept clean and neat, convenient ditches and outlets are contriv'd to carry the rain water off towards low fields, and strong dikes are cast up to keep off that, which comes down from higher places. This makes the road at all times good and pleasant, unless it be just rainy weather and the ground slimy.'[27] It was particularly easy to keep them clean in the countryside because there was a great demand for any rubbish dropped. 'The Inspectors for repairing the highway, are at no great trouble to get people to clean them; for whatever makes the roads dirty and nasty, is of some use to the neighbouring country people, so that they rather strive, who should first carry it away.'[28] In the towns there was more of a problem, yet even there the streets were conspicuously clean. 'In other respects, both country roads and streets in the city of Yeddo will bear advantageous comparison with the best kept of either in the West. No squalid misery of accumulations of filth encumber the well-cared-for streets, if a beggar here and there be excepted - a strange but pleasant contrast with every other Asiatic land I have visited, and not a few European cities.'[29] The contrast with China was particularly marked. 'In all these things the Japanese have greatly the advantage over other Eastern races, and notably over the Chinese, whose streets are an abomination to anyone possessing eyes to see, or a nose to smell with.'[30] The cleanliness was helped by the good paving. 'A fair amount of industry and business appeared in the shops, and along the wide streets, down the centre of which there is, in most cases, a fine flag pavement.'[31] Yet the most important thing was the care and responsibility people felt for road cleaning. The two major actions were watering and sweeping.

Particularly in a hot climate, where the roads were not tar macadamed, 'Roads should be kept watered

---

[27] Kaempfer, History, 2, p.293

[28] Kaempfer, History, 2, p.293

[29] Alcock, Tycoon, 1, p.120

[30]4 cock, Tycoon, 1, p.189

[31] Alcock, Tycoon, 1, p.82

in summer to lay the dust, and to prevent it from being blown into the houses.'[32] Morse noted how this was done in Japan. Soon after his arrival he noted the general cleanliness of the streets. 'The streets and smaller alleys are generally well watered. The people abutting a street may be seen sprinkling it with large bamboo dippers. In Tokyo men go along the streets having suspended on carrying-poles deep buckets of water. A plug is lifted out of a hole in the bottom of the bucket and a spreading stream of water pours out, the man in the meantime almost running to scatter the water over as wide an area as possible.'[33] Their job was made easier by the fact that they only had to deal with the middle third of the street. 'On inquiring it was learned that the city looks after the middle third of the road, the abutters on either side taking care of the other thirds.'[34] This responsibility of those abutting was taken immensely seriously.'It is amazing to see how honestly this work is performed by all...'[35] He gives various descriptions of the work. 'One sees little boys in the street scooping water with their hands from buckets and sprinkling the road, and among all classes one observes the natives either sprinkling the paths about the houses or sweeping them with long-handled brooms.'[36] At the end of each day, the streets were systematically cleaned. 'At about five o'clock in the afternoon everybody seemed to be engaged in sweeping the road in front of his shop and house, in many cases sprinkling before sweeping.' Morse felt that this was 'an excellent idea and a custom that would lead to a great improvement to some of our towns and cities if carried out.'[37] Later there would be those who were less enthusiastic about the watering, complaining that the public watering left 'pools of water in which one can soil one's footgear as effectually as on the rainiest day. But worse still is the watering done by private persons on the part of the road facing their dwellings. These merely ladle the water from their pails and sprinkle it in splashes, leaving in the middle of the street puddles for children to make mud-cakes in.'[38] The general effect, however, was no doubt to lay the dust and prevent micro-organisms being blown about.

As for any rubbish left lying about by accident, this was effectively disposed of by encouraging natural

[32] Lane-Claypon, Hygiene, p.77

[33] Morse, i, p.24 fig.18

[34] Morse, ii, p.125

[35] Morse, ii, p.125

[36] Morse, i, p.42

[37] Morse, i, p.350

[38] Inouye, Home, p.20

scavengers. The importance of crows as cleansers is particularly notable. Several times Morse observed that while in America the crows were so persecuted that they kept away from human habitations, in Japan they were treated with such gentleness that they were everywhere: 'even the black crows, which at home are the wariest of birds, here are so gently treated that they flock to the city by thousands.'[39] Later he noted that 'The crows are literally the scavengers of the streets, and are often seen disputing with a dog the possession of a bone or stealing crumbs from the children. Japanese artists have depicted a crow stealing a fish from a basket carried on the head of a street peddler.'[40]

Behind all this strict cleanliness lie powerful pressures which I will discuss more fully later.(see ch.36) One was cultural. The outside world was considered to be dirty and polluting, in contrast to the cleanliness of the house. The earth itself was dirty. It was therefore necessary to protect people from this pollution by keeping away from the dirt as much as possible by wearing shoes or, in the case of the particularly vulnerable younger children by keeping them off the ground altogether. As we shall see, infants were never put on the ground outside, they were carried all the time. Even older children had to be protected from the polluting dirt of the ground. Morse noted that 'Children of the poorest classes play in front of the house, but instead of enjoying their fun on the ground a straw matting is spread for them'.[41] One side-effect of this belief in the danger of 'dirt' was an attempt to keep everything as spotlessly clean as possible, as we have seen in relation to streets, markets, boats and elsewhere.

The machinery for putting this into practice lay partly within the individual, but also in the strict and highly organized system of local government which, for instance, Kaempfer so brilliantly describes for Nagasaki, with its spies, committees, executive officers and so on. This system was parallelled in every Japanese city. 'The inhabitants of every street are divided into **Goningumi**, that is Companies, or Corporations of five men, whereof there are ten or fifteen, more or less, in every street.'[42] Anyone who let their part of the street become dirty would be held responsible, shamed and punished. Minute regulations led to immense discipline. As Hanley summarizes the situation, 'The strong administrative power of the various levels of government enabled authorities to maintain well-regulated communities, with well-maintained streets, bridges and water supply systems.'[43] The degree of regulation which we have seen shown in trying to control cholera was replicated a million times over in the everyday life of

[39] Morse, i, p.264

[40] Morse, ii, p.80-1

[41] Morse, i, p.42

[42] Kaempfer, History,2, p.111

[43] Hanley, Living (xerox), p.191

the Japanese. Once we have noted the enormously high value placed on cleanliness, in keeping matter in its right place, and combine this with the powerful system of control, it is less surprising that Japan was so clean in its public sphere.

Death was particularly polluting and special attention was paid to keeping the 'dirt' it generates at bay. 'In Japan, if someone dies, the house is locked and a notice is hung on the door that there is a corpse in the house. This is done to warn people not to enter, for touching a corpse makes one unclean, and this idea is often extended to the point that one would prefer to avoid entering the house in which there is one.'[44] The corpse is soon disposed of. 'Corpses usually remain three or four days above ground; however, in cases of death through contagious disease they are buried very quickly in Japan, although never within twenty-four hours.'[45] When cholera threatened Japan, extra rapid and hygienic methods were re-invigorated, namely cremation. This had been an old practice, for 'Cremation followed Buddhism into Japan about A.D.700, but never entirely superseded the older Shinto custom of disposing of the dead by interment.'[46] Cremation was widely used during the cholera epidemics. Morse visited a crematorium, which he praised as a good sanitary device: 'with all the other sensible and sanitary features characterizing the Japanese the custom of cremation is one.'[47] He was also impressed by its hygiene. 'The simplicity and cleanliness of the appliances used in reducing the body to ashes interested us greatly.'[48] If the body was buried, the graveyard was carefully tended. 'Graves are cleaned yearly, whitewashed and, if necessary, plastered; the grave markers are cleaned and the inscriptions painted; constant care is taken that the shrubs and flowers that usually ornament these places are well cared for. It is really touching to see with what concern the Japanese care for all this.'[49]

It is not surprising, given all this care and attention to public tidiness and cleanliness, that the Utopian sanitary city of **Hygenia** should be modelled on a Japanese city.[50] Nor is it surprising that visiting

[44] Wittermans, Pompe (xerox), p.106

[45] Wittermans, Pompe (xerox), p.107

[46] Chamberlain, Things, p.108

[47] Morse, i, p.20

[48] Morse, ii, p.336

[49] Wittermans, Pompe (xerox), p.107

[50] Dubos, Adapting, p.354-55

doctors should feel that the West could and **should** learn from the Japanese. Pompe wrote that 'In many respects the Japanese are more advanced than we are, for in most cities in our country there do indeed exist quite a few hotbeds of filth and contamination, and no one at this time is so ignorant that he does not know that swamps, foul ditches, badly covered sewers, and dunghill are most harmful. Yet little is done to do away with them. And what about the slums in which so many people have to live - if we can call that living when almost all factors required for living are lacking? I hope that we may soon see in our civilized home country that hygienic rules are followed more faithfully than is the case at the present time.'[51]

The environment in England

It is extremely difficult to know how clean the external environment was in early modern England, for an impressive array of quotations and statistics could be assembled for or against the thesis of general cleanliness, or of any secular trend. We can merely note a number of the factors in the equation and one or two impressions of the outcome.

A number of those features which had benefited the Japanese were to the disadvantage of the English. One was the prevalence of domesticated livestock. The countryside was full of horses, sheep, cows and the animals whose dung when they were alive,and whose flesh, skin and bones when dead, would add enormously to the problem of environmental cleanliness. The cities were likewise full of animals. England, with perhaps the highest proportion of livestock to humans of any large population in Europe, was particularly plagued by this problem and it probably led to a considerable amount of environmental pollution. There is a great deal of evidence from local records and literary sources to support the impression of the difficulties caused by the keeping and eating of animals, as well as the keeping of domestic pets. For instance, Wilson describes the muck that was thrown into the London streets - gut, blood, offal from the slaughter-houses and other rubbish.[52] Likewise, Marshall writes how 'Into the uncovered and incredibly filthy Fleet Ditch went the offal of the catgut spinners, of the tripe-dressers, of the sausage-makers, a mass of decomposing refuse...' She quotes Pope in the early eighteenth century: '...Fleet-Ditch with disemboguing streams/ Rolls the large tribute of dead dogs to Thames/ The King of dykes! than whom no sluice of mud/ With deeper sable blots the silver flood.'[53] Many local records are full of orders for people to remove and to stop various kinds of pollution, (for instance a person was presented in Essex in about 1615 for making a stream putrid by putting in the skins of sheep.)[54][55]

[51] Wittermans, Pompe (xerox), p.94

[52] Wilson, Plague, p.30

[53] Marshall, People, p.168, Duciad, Bk.II

[54] ERO Q/SR 195/50

Another growing problem which affected England more than any other country was that of air pollution through the increasing use of coal as fuel. In the **Fumigufium of the Smoake of London**, John Evelyn in 1661 painted a gloomy picture of the 'hellish and dismal cloud of Sea-coale' over London, which was 'so universally mixed with the otherwise wholesome and excellent Aer, that her Inhabitants breathe nothing but an impure and thick Mist, accompanied with a fuliginous and filthy vapour, which renders them obnoxious to a thousand inconveniences, corrupting the Lungs, and disordering the entire habit of their Bodies; so that Catharrs, Phthisicks, Coughs, and Consumptions, rage more in this one City, than in the whole Earth besides.'[56] A dramatic instance of the effects of smoke became famous at about that time; in '...an autopsy on the centenarian "Old Parr", who had died of a "peripneumony" after a visit to London, Harvey stated that "the chief mischief (was) connected with the change of air, which through the whole course of (Parr's) life had been inhaled of perfect clarity", whereas the air to which he was exposed in London was polluted by smoke.'[57] This problem obviously increased rapidly over the next two hundred years. It directly contributed to the high level of lung disease. Efforts to keep clothes and houses clean were undermined by the thick layer of grime poured out by house and factory chimneys.

A third pressure was from the very fact of the rapid growth and crowding as the population which built up in towns and industrial cities from the 1740s. A small country which had hitherto been relatively lightly populated, rapidly became one of the most crowded in Europe, where people lived in high houses on narrow streets. It was a situation which was very likely to lead to a rapidly deteriorating environment. The results were graphically described for the eighteenth century. Buchan wrote that 'In many great towns the streets are little better than dunghills, being frequently covered with ashes, dung and nastiness of every kind. Very slaughterhouses, or killing shambles are often to be seen in the very centre of great towns. The putrid blood, excrements, etc. with which these places are generally covered, cannot fail to taint the air, and render it unwholesome.'[58] Or again 'In Nottingham, a historian reported "the gathered filth within doors is scattered daily in the dirty passages without...and many of these streets and lanes, if so they may be so-called, are without any sort of pavement, consequently without regulated water courses.'[59]

---

[55]And other cases.

[56] Dubos, Adapting, p.201

[57] Dubos, Adapting, p.201

[58] Buchan, Domestic, p.101

[59] Chambers, Economy, p.104

The situation seems to have been hanging in the balance. This is well described by De Saussure. He noted that 'The streets of London are unpleasantly full either of dust or of mud. This arises from the quantity of houses that are continually being built, and also from the large number of coaches and chariots rolling in the streets day and night.'[60] Yet while 'A number of streets are dirty, narrow and badly built; others again are wide and straight, bordered with fine houses. Most of the streets are wonderfully well lighted, for in front of each house hangs a lantern or a large globe of glass, inside of which is placed a lamp which burns all night.'[61] Furthermore, he notes that 'Carts are used for removing mud, and in the summer time the streets are watered by carts carrying barrels, or casks, pierced with holes, through which the water flows.'[62] De Saussure was noting some of the effects of Wren's plans for the re-building of London. He also noted the effects of the new supplies of water, pumped by steam, which allowed the houses and streets to be washed. As Franklin was also to note 'The quantity of water brought into the city by the New River and other water-works, which runs daily to waste, helps to cleanse and keep the common sewers sweet, and thereby contributes much to the healthiness of the city.'[63]

William Heberden believed that the decline of the plague was largely the result of improvements in municipal sanitation after the Fire of London in 1666. He gives a graphic account of the widening of streets and various measures to keep them clear of all filth. As a result 'the new town rose up like a phoenix from the fire with increased vigour and beauty.' There was also a demonstratia effect, 'for it produced in the country a spirit of improvement which had till then been unknown, but which has never since ceased to exert itself.'[64] Blane likewise draws attention both to the actual rebuilding and to the new vigour of the officials which led to 'the removal of filth, the improvement of the common sewers, the widening and paving of streets.'[65] All judgments, of course, are largely a matter of what we are comparing the situation with, temporally and spatially. In comparison to the Japanese case, England was pretty filthy throughout the period under consideration. She paid in filth for the higher yields from the energy of animals and fossil fuels which helped to make her population several times richer in terms of available income or energy than the Japanese. In comparison to the Dutch the English environment was

[60] De Saussure, Foreign, p.67

[61] De Saussure, Foreign, p.67

[62] De Saussure, Foreign, p.68

[63] Franklin, Writings, 6, p.320

[64] Heberden, Observations, p.77.

[65] Blane, Dissertations, p.129.

not impressive. The Dutch cleanliness impressed English and other observers. 'The beauty and cleanliness of the streets are so extraordinary', ran an English account, 'that Persons of all ranks do not scruple, but even seem to take pleasure in walking them. 'Women could walk, if they wished, in mules without fear of besmirching them 'for the streets are paved with brick and are clean as any chamber floor.' [66] The amazing cleanliness is well described by Schama.[67] As he says 'No visitor to Holland, from Fynes Moryson to Henry James failed to notice the pains that the Dutch took to keep their streets, their houses and themselves (though there was less unanimity about this) brilliantly clean. The spick-and-span towns shone from hours of tireless sweeping, scrubbing, scraping, burnishing, mopping, rubbing and washing.'[68] But even this is relative. To the Japanese, the Dutch were dirty. (xxx)

While lagging behind Dutch and Japanese, what is impressive about England is that even with the increasing pressures it managed to provide an environment which seems to have kept mortality constant, or even falling. In comparison to other European cities, whether Paris, which Arthur Young described as dirtier than London, though a good deal smaller (ref.xxx)[69], or Portuguese or Spanish cities, London was relatively clean. Kames, for instance, described how 'Madrid, their capital, is nauseously nasty: heaps of unmolested dirt in every street, raise in that warm climate a pestiferous steam, which threatens to knock down every stranger. A purgation was lately set on foot by royal authority. But people habituated to dirt are not easily reclaimed: to promote industry is the only effectual remedy.'[70] Or again, 'The nastiness of the streets of Lisbon before the late earthquake, was intolerable; and so is at present the nastiness of the streets of Cadiz.'[71] The effects were noticed by eighteenth-century demographers, who claimed that London was surprisingly healthy. Short wrote in the mid-eighteenth century that 'It also appears from the Tables and Ages, that virtuous temperate People, of most Constitutions, begotten of the like Parents, often live as long in London as their Neighbours in their own native soil.'[72] He thought that this stemmed from its salubrious surroundings, 'For though London lies low, yet it stands and is

[66] Quoted in Schama, Embarrassment, p.375

[67] Shama, Embarrassment, p.3

[68] Schama, Embarrassment, p.375

[69] Goubert, Conquest, p.91

[70] Kames, Sketches, 1, p.248

[71] Kames, Sketches, 1, p.248

[72] Short, Increase, p.20

surrounded with fine dry, sandy, gravelly, pebbly Ground and small rising Hills, from which it is constantly fanned with fine fresh Breezes from the neighbourhood of the Thames; and is now supplied with good fresh Water, and has no large forests of Wood, nor putrid stagnant Waters, not extensive Fens; its Filth may be easily washed off twice a Day by the Tide. No canine Grotto's, nor Volcano's near it.'[73]

In the later eighteenth century, despite the growth of London, the city impressed foreign visitors by its cleanliness. Rochefoucauld in 1784 wrote that 'All the London streets are magnificently wide and accurately planned; all of them have paths on each side for the convenience of pedestrians. The streets are usually quite clean, as the flow of water is excellently managed.'[74] Six years later Karamzin echoed his remarks. He found that 'There is no city so pleasant for pedestrians as London: everywhere next to the houses wide pavements have been made for them; every morning the servants wash down the part in front of their house so that even when there is mud or dust your shoes are clean.'[75] It was not just the pavements which were clean, but 'the streets are wide and absolutely clean...'[76] Rochefoucauld even noted that the goods in shops were well protected 'Everything the merchant possesses is displayed behind windows which are always beautifully clean...'[77] Yet the surprising cleanliness seems likely that it was also due to a number of other factors.

One large area where there was an overlap between Japan and England was in detailed administrative regulation. Anyone who has studied the laws of England and their execution through the manorial and town courts will know that there was a complex and often very effective set of mechanisms in place throughout towns and villages to prevent dirt and refuse being dumped. When the old system tended to collapse in the massive cities of the mid-nineteenth century, it was recognized that public nuisances were checked earlier by the various equivalents to the Japanese street committees, namely the tithings, courts leet, quarter sessions and other institutions. For instance, Chadwick noted that 'The nuisances which favoured the introduction and spread of the cholera were for the most part evils within the cognizance of the leets, and could not have existed had their powers been properly exercised.'[78] He cites 'the statute

[73] Short, Increase, p.20

[74] Rochefoucauld, Frenchman, p.9.

[75] Wilson (ed.), Strange Island, p.130.

[76] In Wilson (ed.), Strange Island, p.129.

[77] Rochefoucauld, Frenchman, p.9.

[78] Chadwick, Report, p.360

of the view of Frankpledge, 13 Edw.II where "direct enquiry to be made of waters turned, or stopped, or brought from their right course, and obstructions in ditches were presented at the Leet".'[79] Very early on, statutes had been passed to encourage public health. For instance 'The Venetian ambassador to England in 1497 noted with surprise that "there is even a penalty attached to destroying them (i.e. scavenger birds) as they say that they keep the streets of the towns free from all filths"...'[80] The same point is noted for the sixteenth century, and for the same reason.[81] Or again, to prevent over-crowding in the cities and consequent pollution and dirt, an Act of 1598 enacted that four acres of land were to be annexed to the cottages of labourers in husbandry, and over-crowding was prohibited under severe penalties.'[82] Incineration of rubbish was undertaken by municipal authorities in the sixteenth century[83] and strong powers were given by a law of Henry VIII's time to Commissioners to improve sewers and drains. Rosen notes that 'At Coventry and Ipswich in the sixteenth century and at Gloucester in the seventeenth century, each householder had to clean and sweep the streets in front of his door every Saturday. At Cambridge, all paved streets had to be swept on Wednesday and Saturday. At Gloucester, four inspectors made rounds on Monday to make sure the job had been done the previous Saturday, and at Coventry the inspection was carried out on a Sunday.'[84] As Chadwick noted 'The ancillary arrangements such as road cleansing as well as road structure, were provided for by the highway laws, including the provisions of the 5th Eliz.c.13.s.7/4 for the cleansing of ditches etc.'(REF) The turnpike trusts of the eighteenth century were only a late expression of endless efforts to improve roads, while the paving act of 1766 helped, Creighton believed, to reduce disease in London.[85].

In general, the situation seems to be one where it was widely recognized that the environment should be kept clean and people were prosecuted for polluting it. The bad reputation the system has earned is partly a result of our tendency to work back through the reports on nineteenth-century conditions when the unprecedented growth of urban population had led to its near collapse. Chadwick found that 'The

[79] Report, 354

[80] Italian Relation, p.11

[81] Wilson, Plague, p.30

[82] Rogers, Industrial, 1, p.41

[83] Wilson, Plague, p.31

[84] Rosen, Public Health (xerox), p.98.

[85] Creighton, Epidemics, ii, p.133.

local arrangements for the cleansing and drainage of towns etc. generally present only instances of varieties of grievous defects from incompleteness and from the want of science or combination of means for the attainment of the requisite ends.'[86] New methods were needed for a new age: the answer was mechanization. 'The exclusive use of hand-labour in street-sweeping is pronounced by competent judges to be a mere barbarism, and several machines have been invented which demonstrate that by mechanical power, moved by horses, the cleansing may be effected in a far shorter time.'[87] Already London was leading the way. The general use of dustcarts could lead 'to a practice similar to that of London, where the dustcarts take the refuse direct from the house without any deposit in the streets.'[88] The new world of modern refuse collection was about to emerge, alongside modern sewers.

It would be a mistake to believe that the urge to keep public space clear was a new one in the nineteenth or even eighteenth century. A reading of medieval guild or borough regulations would quickly dispel this illusion. The problem, as Chadwick was aware, was that 'With all this legal strength, however, there is scarcely one town in England which we have found in a low sanitary condition, nor scarcely one village marked as the abode of fever, that does not present an example of standing violations of the law...'[89] The laws needed enforcing. This was an expensive matter, but it was becoming affordable as Britain forged ahead with its industry and Empire. The returns in health improvement would be great. After the great reforms, Lane-Claypon could look back and note that 'The proper disposal of refuse is an expensive matter, but the cost is abundantly repaid in the improved conditions of life and in the general health of the inhabitants.'[90] The methods which were developed would, like the sewage system, be extended all over the world, including Japan, and make it possible for people to live relatively healthily in vast cities and crowded towns. In the earlier centuries, the English, despite the pressures we have noted, seem to have aimed, and to a certain extent succeeded, in keeping their public environment of streets, parks and countryside reasonably clean.

Flies.

One specific illustration can be given to show the way in which the cumulative effects of all the social

[86] Chadwick, Report, p.109

[87] Chadwick, Report, p.126

[88] Chadwick, Report, p.163

[89] Chadwick, Report, p.354

[90] Lane-Claypon, Hygiene, p.77

conditions I have outlined acted on one of the most lethal of insect vectors, the housefly.

In his monumental work on **The Housefly, Its Natural History, Medical Importance and Control**, Luther West quoted an educational pamphlet of 1912 which referred to the housefly as 'the most dangerous insect known.' West commented that 'sanitarians today are still unable to dispute the general truth of this assertion.'[91] Why is it so dangerous? Firstly it is ubiquitous and lives close to humans. 'The housefly is world-wide in its distribution and in close association with human dwellings.'[92] Secondly, it breeds very fast. A figure is quoted that 'A pair of flies beginning operations in April may be progenitive of 191,010,000,000,000,000,000 flies by August. Allowing one-eighth of a cubic inch to a fly, this number would cover the earth 47 feet deep.'[93] We are told that 'From egg to adult fly occupies about three weeks in English summer weather; in the tropics the period may be as short as a week.'[94] It will 'breed in many different substances, (ranging from snuff to spent hops!), of which the only common factor seems to be a moist, fermenting or putrefying condition. Typical examples are (a) the excrement of various animals (pig, horse, calf, man), (b) rotting vegetable matter, especially with a high protein content (seeds, grain), and (c) the heterogeneous mixture which constitutes garbage.'[95] For instance, flies were found to be breeding in about sixty per cent of refuse bins in London and a city in Georgia, U.S.A.[96]

All of this would not be of importance if it were not for the fact that flies carry so many and varied bacteria. Roberts describes how flies may spread 'typhoid and paratyphoid fevers, epidemic diarrhoea, the dysenteries and possibly cholera, anthrax, tuberculosis and other infective disorders.'[97] Riley concludes that 'Flies carry more than a hundred species of pathogenic organisms and are believed to transmit more than sixty-five human and animal diseases.'[98] Their danger to humans is increased by the

[91]West, **Housefly**, New York 1951, 265

[92]Busvine, Insects (xerox), 191

[93]quoted in May, Ecology, 166

[94]Roberts, Hygiene, 239

[95]Busvine, Insects (xerox), 192

[96]Busvine, Insects (xerox), 379

[97]Roberts, Hygiene, 240

[98]Riley, Insects (xerox), 850

number, as well as the range, of bacteria they carry. Thus we are told, for instance, that 'In a study involving 384,193 flies taken in Beijing, China, researchers estimated that, on average, each fly from a slum area carried 3,683,000 bacteria and each fly from the cleanest district carried 1,941,000.'[99] They carry such large numbers that the critical mass to infect foodstuffs is always available.[100] The flies' feeding habits and the way in which it transfers bacteria also contribute to its lethal power. 'The fly is especially well suited to provide a means of transportation of shigellae and other agents living in excreta. Its proboscis is covered with an abundance of fine hair that collects germs as it picks up food from the surrounding filth. The feet are also covered with hair secreting a glue, which adds to their ability to collect microscopic organisms. Because the fly commonly feeds on excreta, its vomit and droppings contain an abundance of shigellae if any were present in its meal.' It thus carries bacteria on its body, vomits frequently, and excretes probably every five minutes or so.[101] Since it is particularly attracted to 'all sorts of foods used by man, especially milk, butter and cheese...meat and fish...as well as human perspiration'[102], its negative health effects can be enormous.

When we turn to the incidence of flies in England, we need to remember that the nineteenth century equivalent to the problem of car pollution through traffic congestion was the surfeit of horse manure. We are told that 'Thompson estimates that there were almost half a million (487,000) horses in use outside agriculture in 1811...'[103] The number grew rapidly so that 'It has been estimated that there were 1.5 million town horses in the late nineteenth century, each producing 22lbs of manure a day.'[104] If we add to this the English love of other animals, particularly dogs, we can see that towns must have had very large amount of human and animal excreta in which flies could breed.

I do not know how all this manure was dealt with, for animal dung could not be flushed down a water closet, and as Kames pointed out of horse manure, 'in an extensive city, the bulk of it at least, is so

---

[99]Riley, Insects (xerox), 851

[100]ibid, 851

[101]Busvine, Insects (xerox), 197

[102]idem

[103] Wrigley, Urban Growth, p.721,n.28

[104] Wrigley, Urban Growth, p.656, n.27

remote from the fields to which it must be carried, that the expense of carriage swallows up the profit.'[105] What seems certain is that both in the city streets and even when deposited on the dung heaps, paths and fields the immense number of animals must have created a considerable health hazard through faecal and fly-born contamination. This was one of the few respects in which the English were potentially worse placed than almost all other nations. The improvement of power available per person through unusually high levels of animal muscle and animal protein was balanced by an increased risk of disease.

On the other hand, it may be that what was by the eighteenth century the most organized and well-run mixed agricultural system the world had known helped prevent some of the worst effects of all this dung. The efficient storage and use of animal manure may help to explain the fact that flies do not seem to have been as prevalent in England as in many other countries. Walter and Schofield speculated that the improvements of sewers and drains in the eighteenth century 'Though not intended...had the consequence of reducing the density of insects, notably flies, thereby diminishing the probability that the latter would spread disease by contaminating food.'[106] Certainly one perceptive Swiss visitor noticed the absence. Commenting on the practice of cutting off horse's tails, he noted 'Luckily for them, they live in this country and not in ours where flies abound.'(REF XXX) A similar observation was made by the French visitor La Rochefoucauld a few decades later. Speaking of English horses he wrote 'their manes are cropped quite short and their tails to the first joint. It is contended that otherwise the horses would be overladen and that, as there are few flies in summer, they have no need for their tails.'[107] If it were indeed the case that England was relatively free of flies not only in comparison to Switzerland, France and perhaps other Continental countries, but also to America, this would help to explain something we will note below, namely that the relative absence of flies in Japan was noted as odd by a number of American visitors to Japan, but not by British writers like Alcock, Willis, or Bird.

Further research is clearly needed. For instance, we need to know how animal manure was stored. If it is kept in certain ways, for instance surrounded by a cement or water barrier, flies cannot breed in it. Roberts points out the need to 'Remove all refuse, etc. from the neighbourhood of dwellings. What cannot be removed at once should be covered. This will abolish breeding-places and is the most important measure.'[108] We need further information in housing patterns. For instance it has been suggested that in relation to servants, 'Kussmaul has described the shared sleeping and eating

[105] Kames, Sketches, 3, p.94

[106] Watter; Schofield, p.65-6 ref. to Riley, Eighteenth Century

[107] Rochefoucauld, Frenchman, 208

[108] Roberts, Hygiene, 240

arrangements of servants and masters and cites seventeenth-century references to chambers over oxhouses and servants' beds in stables'[109] and we came across references to this in relation to Scotland in Chadwick's work. Yet in general, in most of England, the relatively high quality of housing and the fact that from at least the fourteenth century it seems to have been normal to house animals and humans in separate buildings may have been very important. Again we need to test the theory of Brownlee that the late nineteenth and early twentieth-century decline of summer diarrhoea was due to 'the introduction of the automobile and reduction of the horse population and thus of favored breeding and feeding sites for the fly.'[110] We also need to know more about the screening of humans and their food.

Turning to the Japanese case, the virtual absence of animal manure in Japan, and the fact that when it did fall it was eagerly scraped up minimized the threat of disease.

The effects were particularly important in the huge cities. We can see this best if we compare the situation in Japan with that in England. Japanese cities were not knee deep in horse manure, unlike western cities. The Japanese kept fewer dogs and, more importantly, hardly used horses. This has the advantage of avoiding millions of pounds of manure a day being left on the streets of the cities. As Lock points out, 'Since horse-drawn carriages were not used, one common source of infection in Europe, that of animal manure, was avoided in Japan.'[111]

The absence of animal and human excreta left lying about in the streets and gardens must be connected to a most significant background feature in Japanese health, namely the curious facts concerning flies. Every large agrarian civilization is filled with flies - except one, namely Japan. Somehow the Japanese had almost managed to eliminate the common house fly. It was American visitors who noted the contrast. Griffis observed that 'There are very few flies to trouble them. Japan seems to be singularly free from these pests.'[112] Geoffrey found that 'Common houseflies, strangely enough, were rare...'[113] King noted that 'One fact which we do not fully understand is that, wherever we went, house flies were very few. We never spent a summer with so little annoyance from them as this one in China, Korea and

[109]Dobson, Hiccup (xerox), 420

[110]Riley, Insects (xerox), 855; cf Busvine, Insects (xerox), 192, who makes the same point

[111] Lock, Review of Jannetta, p.525

[112] Griffis, Mikado, p.528

[113] Geoffrey, Immigrant, p.64

Japan.'[114] He wondered at first whether it was the time of year. 'It may be that our experience was exceptional but, if so, it could not be ascribed to the season of our visit for we have found flies so numerous in southern Florida early in April as to make the use of the fly brush at the table very necessary.'[115] The absence was confirmed as soon as he got on the boat to return to America. 'Indeed, for some reason, flies were more in evidence during the first two days on the steamship, out from Yokohama on our return trip to America, than at any time before on our journey.'[116]

King only gradually realized the significance of the absence. 'We have adverted to the very small number of flies observed anywhere in the course of our travel, but its significance we did not realize until near the end of our stay.'[117] He contrasted the situation in America and Asia. 'We breed flies in countless millions each year, until they become an intolerable nuisance, and then expend millions of dollars on screens and fly poison which only ineffectually lessen the intensity and danger of the evil.'[118] A lesson could be learned from this. 'If the scrupulous husbanding of waste refuse so universally practiced in these countries reduces the fly nuisance and this menace to health to the extent which our experience suggests here is one great gain.'[119] He believed that the careful elimination of rubbish was a conscious sanitary policy of the Chinese and Japanese. 'It is to be expected that the eternal vigilance which seizes every waste, once it has become such, putting it in places of usefulness, must contribute much toward the destruction of breeding places, and it may be these nations have been mindful of the wholesomeness of their practice and that many phases of the evolution of their waste disposal system have been dictated by and held fast to through a clear conception of sanitary needs.'[120]

As a zoologist on the look out for specimens, Edward Morse wrote that 'The absence of flies of the common kinds in the country is a noteworthy feature and to get one at any moment would be

---

[114] King, Farmers, p.78

[115] King, Farmers, p.78

[116] King, Farmers, p.202

[117] King, Farmers, p.202

[118] King, Farmers, p.78

[119] King, Farmers, p.78

[120] King, Farmers, p.202-3

difficult.'[121] This notable absence he puts down to two main factors. One is the general cleanliness of the Japanese - they do not leave refuse about, as Morse had described in detail. (see ch.XXX). Consequently there were no flies. Secondly, he explained it by the scarcity of horses. 'One sees but few flies about,and this is probably due to the scarcity of horses, in the manure of which the house-fly breeds.'[122] Elsewhere he widens the link. Having noted the absence of common flies as a 'noteworthy feature', he soon also notes 'furthermore there are no horses, cows, sheep, pigs, goats or any other animals except man and fowl. Very few hens are seen...'[123] Even where there are animals, their manure was very carefully scraped up and taken away to the fields. Likewise, human excrement was not left lying about. The general cleanliness of the streets, houses and all surfaces in Japan, which we have already examined and the absence of refuse and the manure and animals, led to a crowded population which lived without swarms of flies.

Conclusions.

In an important recent article, Riley has drawn our attention to the important consequences of insect control in England from the eighteenth century. He notes that 'Until the mid-eighteenth century, insect vectors, especially the fly and mosquito, had made an important contribution to infant and childhood mortality.'[124] He then detects a shift. This was 'not a systematic and persistent campaign resulting in complete insect control but instead a campaign consisting of uncounted local efforts waxing and waning in their effectiveness, which, in many individual places and periods, reduced numbers of arthropods and perhaps also rodents below the threshold necessary to cause epidemics.'[125] He believes that consequently 'a significant part of the first phase of the European mortality decline can be explained by insect control.'[126] He tends to place the emphasis on conscious effort; 'eighteenth-century physicians, public authorities, and others introduced and reintroduced measures likely to have reduced the number of places for insects to breed and feed.'[127]

---

[121] Morse, Day, i, p.206

[122] Morse, i, p.51

[123] Morse, i, p.206

[124]Riley, Insects (xerox), 858

[125]Riley, Insects (xerox), 841

[126]Riley, Insects (xerox), 854

[127]Riley, Insects (xerox), 853

No doubt conscious and directed effort by public authorities did play its part. But a comparison with Japan suggests that much of the increasing control of insects was an unintended consequence of other factors. In particular, as we have seen, the absence of animals in Japan, the separation of animals and humans in housing in England, the changes to cotton clothing, the development of mosquito netting to protect people against insect bites in Japan, the high level of agricultural technology and care over drainage and sewage. In all these ways Japan was outstanding from very early on, and England, despite its heavy load of domestic animals, increasingly developed, through its wealth and orderliness, a surprisingly insect-free environment.