

MR. FOWLER'S REPORT ON THE CONDITION OF THE CALDER.

Part 2. Wakefield, 10th October, 1866.

Given in evidence before the Royal Commissioners at Wakefield, and published in their Report.

It would be difficult to find a more striking instance than that afforded by the Calder, of the extent to which our rivers have been defiled by sewage and refuse from manufactories. Since the springing up of many factories in the Vale of the Calder. Soon after the Thornes Soap Works were begun near Wakefield, many stones of fish, which had come up the river to spawn, were to be seen floating dead upon the surface. During that year all fish forsook this part of the stream as regular inhabitants. For some time after, however, during freshes, a fish was occasionally to be seen as a curiosity; and so lately as 1858, an experienced fisherman succeeded, on one of several persevering trials, in capturing two small chub.

At present, the condition of the river is most disgusting. Defiled almost from its source, it reaches us with the accumulated refuse of Todmorden, Hebden Bridge, Sowerby Bridge, Halifax, Brighouse, Cooper Bridge, Holmfirth, Huddersfield, Mirfield, Dewsbury, Earlsheaton, Thornhill, and Horbury. At the suspension bridge, about a mile and a half above Wakefield, it runs slowly, and in many places is almost stagnant. It has a bluish-black, dirty-slate colour; and a faint, nauseous smell, which leaves an extremely unpleasant impression for long after it has been once thoroughly perceived—considerably worse than that made by the Thames after a stage on a penny boat. The banks and every twig and weed in reach are coated with soft, black slime or mud, which is studded on the edges of the stream with vivid patches of annelides. Above are overhanging willows; and where the branches of these touch the water, especially in any quiet pool, large sheets of thin bluish or yellowish green scum collects, undisturbed save by the rising to the surface of bubbles of foetid gas.

Between this point and Wakefield, the refuse of extensive soap-works and worsted-mills enters, causing discolouration for several hundred yards. I have, in fact, traced large quantities of soap scum beyond Portobello, a distance of about half a mile. Nearer the town, quantities of refuse from large dye-works are continually being discharged, to say nothing of the periodical emptying of spent liquor and vat sediments. It is noteworthy that whereas formerly goods were brought to Wakefield to be dyed on account of the superiority of the water for the purpose, the trade has now left Wakefield to a considerable extent, and the Wakefield manufacturers have themselves to send away their finer goods from home to be dyed.

On the opposite side are two full streams, one of sewage, the other apparently from some cotton-mills; and here it may be stated that the exact degree to which influxes of this kind injure in different cases is extremely difficult to estimate; some manufacturers using ammonia, while others adhere to the old-fashioned pigs' dung and putrid urine. The banks on each side are here studded with granaries and malting houses, from the latter of which is received that most pernicious contamination, the steep-liquor of malt.

There is also the refuse of at least one brew-house and piggery, and of a second soap manufactory drained into the river before it reaches the outlet of Ings Beck, at the drain immediately above Wakefield Bridge. In this situation, on any warm day in summer, torrents of gas may be seen rising to the surface, and every now and then large masses of mud, which

float for awhile and then, after the gas they contain has escaped and polluted the atmosphere, break up and are re-deposited, or are at once carried down the river, stinking and putrefying in their course.

The Calder and Hebble Navigation Company are periodically put to great inconvenience and expense in removing collections of this kind, the smell of which is often most offensive, and has more than once caused serious illness to the workmen employed. About two years ago the mud had accumulated to a depth of five feet, and, the water having been drained off, at least two thousand tons were removed, thousand tons were removed, but no fish or living being of any kind was discovered. At the bridge there has been a water-mill for at least seven hundred years, and anyone interested in the smell of partially oxidized sewage should not omit to stand over the spray which ascends from the wheel. Masses of solid faeces may be seen at the grating through which the water is strained.

Looking from the bridge westward, except in wet weather, is a large, open, shallow, almost stagnant pond of the most offensive character, with tracts of dark-coloured mud constantly exposed. The sewer of the town and the West Riding Asylum, with the refuse of the worsted, woollen, and cloth mills, malt-houses, breweries, brew-houses, slaughter-houses, dye-works, fibre-mills, soap mills, and grease-works enters by the drain just below; its surface covered with froth of every conceivable colour and degree of filthiness, overhung by willows, in whose branches are entangled and exposed to view the most disgusting objects. The scum may readily be traced down the river for a considerable distance. The last defilement of moment is that from some extensive grease-works, in which oil of vitriol is largely employed. The Ings Beck, to which I have already alluded, merits a few particular remarks, being the most important tributary the Calder receives in this district.

On the day I last examined its outlet, the smell arising- was most offensive. The general resemblance of the stream was rather to thick soup than water, and it had a dirty, greasy, yellowish, indigo-slate colour, where not coated by froth, scum, or floating filth. Its bed is silted to a considerable extent by black, foetid mud, and its outlet partially obstructed by two large ash heaps. It may be observed, however, that this is perhaps the only place in the neighbourhood at present where refuse ashes have been tilted, and that, though the height of the water in the river alters considerably according to the state of the weather, the raising of the bed is due for the most part to matters washed down from a higher source.

Such is the case with the miscellaneously constituted sediment dredged by the Calder and Hebble Navigation Company near the Wakefield dam, and with the shoal at Lupset pond above Wakefield; an accumulation of ashes and dye-woods having risen in the latter situation during the last five or six years. Walking up the bank of the beck, one may form a fair idea of the kind of contamination received. Besides dead dogs, tin kettles, broken pots, old pans, boots, hats, etc, we find house-sinks and surface drains, public-house refuse and factors' privies flowing in unscrupulously. Myriads of annelids in the mud upon the banks subsist on the impurities; that in the neighbourhood of a warm sewer being, in fact, for some distance entirely concealed by sheets of moving pink. A railway waggon-maker's establishment was a little while ago an artificial manure factory, and contributed greatly to the general pollution.

At the bottom of Thornhill Street are two strong foul streams, one of sewage, the other, on the day I visited it, **discharging deep indigo-coloured stuff**. Immediately above this the beck, though receiving muddy refuse from some cement-works, was **purple coloured**, and where the branches of overhanging shrubs dipped beneath its surface, a **polychrome froth and scum collected**. A few hundred yards higher, having passed the place of entrance of the purple dye, the stream regained nearly its original dirty indigo appearance.

Near the Low Hill bridge was a fall of **hot mauve refuse**, **with several yards of rainbow-coloured scum**. Where the water could be seen, in one light it would have a bluish tint, in another a dirty yellowish; and the mud was deep and flocculent. Nearer Chald Lane there was an extremely filthy ditch, covered with scum, and loaded with the privy and house refuse of a large number of cottages and low lodging-houses; and a little higher two large streams of thick purple dye refuse.

Above the dam in this situation enter the waste of a dye-works and shoddy-mill, with the filthy privy and surface drains of Salt Pie Alley. The water here is the colour of the contents of a slop-pail, is almost stagnant, coated in patches of several yards with scum, and is in other respects very offensive. At Brooks bank a kind of long oblong pond is formed, two sides of which are of thick mud, one exposing the privy refuse and excrements in three drains from the neighbouring cottages and lodging houses; and about here does or did recently enter the flushing's of the cesspools from the prison with its sixteen hundred inmates, and the refuse of the chemicals used in the annual manufacture, dyeing, and bleaching of about seven hundred and fifty tons of matting.

Balne Beck also enters at this point. Going upwards we find the Westgate Beck receiving the fouled water and other refuse of two large worsted-mills, of surface drains, of piggeries, and of privies; then muddy water, apparently from some brick-yards, and hot waste from a large woollen-mill. Immediately above healthy green conserves begin to show themselves; long grass floats on the surface; shrubs grow upon the banks; and if a brown scum collects where the branches touch the surface, it has altogether a less disgusting character. Fairly out in the country the water is bright and clear, and boys bathe in it in summer when deep enough. Balne Beck is on the whole as yet tolerably clean, the sides only being lined with mud patched with red, and the stones at the bottom coated with long trails of green confervae. The principal impurities are from a soap-works, a coal-mine, a skin-preparing shed, and a brick-field. The Yorkshire Fibre Company did a short time since drain a large quantity of poisonous matter into the beck, but is at present restrained by an injunction.

The Water Company's works are situated about two and a half miles below Wakefield Bridge, and consequently receive the water in an extremely unfavourable condition. It has received the unchecked and accumulating filth and pollution of 400,000 inhabitants (number now much greater), and their manufactures, to which Wakefield itself, with its 20,000 inhabitants, has contributed. The large live-stock market also, with its average sale of 800 beasts and 6,000 sheep, has added a grave pollution. **As if to show how completely we acquiesce in the abandoned corruption of the stream, the putrefying carcasses of animals—not only of dogs and cats, but of pigs, sheep, and calves—are allowed to drift along with their surfeiting smell,** until stopped of themselves at Stanley Ferry.

On stirring up the mud from the bottom, a Winchester quart of gas was readily collected by means of an inverted funnel, and was found, on examination, to consist chiefly of carbonic acid, light carburetted hydrogen, sulphuretted hydrogen, and free nitrogen. It is not easy to estimate accurately the effect of nuisances of this kind on the public health. Two years and a half ago, whilst the waterworks were undergoing improvement, and for some months the supply to the town was merely pumped up from the river into the mains without filtration, the actual mortality did not appear directly to increase. This, however, may be explained by the fact that a peculiar atmospheric condition is necessary in order to develop fully the death-bearing properties of impure water; and it may be added that, as it was, and as I had occasion to represent to the Local Board at that time, there was a greater amount of diarrhoea, continued fever, erysipelas, diffuse abscess, and of cutaneous and subcutaneous cellular inflammation; while the inflammation generally was peculiarly liable to take on the erysipelatous form and become unmanageable, and the convalescence from various diseases to be unwontedly interrupted and prolonged.

Possibly this, and even an increased death-rate, had it occurred, might have been explained in part by other causes; but I cannot resist the conviction that bad water as a beverage, and the taint which it communicates to the atmosphere, bear a most important part both in causing actual disease and in weakening the power of the constitution to bear up against disease, and so shorten life in that way. Greatly improved houses have been built for the artisan class during the last few years; greater attention has been paid to the ventilation of mills and workshops; the agitation for a people's park, indicates how wide-awake the population is to the benefit of fresh air; wages have increased; the character of the food consumed is more closely inspected; the drainage is more efficient; many open sewers have been closed; bad wells have been stopped; but both the death-rate and the amount of disease have increased; the former reaching so high as 37.4 per thousand in the present year. The whole of the excess in this mortality is due to preventable disease, which includes diarrhoea, cholera, and typhoid, the poison of which may unquestionably and has frequently been known to be conveyed through water. An indication of the extent to which constitutional vigour has at the same time diminished, is found in the fact that less than twenty years ago to blister, bleed, and purge was the routine of the physicians' practice at the dispensary, while cod-liver oil and quinine were unknown.

This mode of treatment, if it did not cure, certainly did not kill; for the patients did well under it, having strength to bear up against and conquer both disease and treatment. Now, I will venture to say, that ninety-nine per cent, of our patients would sink under the depletory measures of bygone days; and during last year, in a practice of only 2,700 patients, it was found necessary to prescribe no less than twenty-three gallons of cod-liver oil, and sixty-four ounces of quinine, to say nothing of nourishment and stimulants. An atmosphere saturated with smoke, and shutting out instead of conveying the light of the sun, sedentary habits, dense population, and unhealthy pursuits, have doubtless shared in bringing about this general lowness of constitution; but the healthy textural drainage and repair of the body, and consequently the perfect activity of its functions, can scarcely take place if, instead of pure water, it be supplied with a compound with which it is not organised to operate.

I have nothing to add respecting the moral contamination of material filthiness, since that is out of my province. But surely drunkenness and vice, and other forms of intellectual insensibility, are fostered, if not originated, by mental despair and disappointment; the things which should, in the ordinary course of nature, be pleasing and refreshing to the mind, having ceased to be so. At least we are taught that in the heavenly Jerusalem the river which proceeds from the throne of God is clear as crystal, giving birth on either side to the tree of life for the healing of the nations; whereas "Upon the banks a scurf, from the foul stream condensed, encrusting hangs, that holds sharp combat with the sight and smell," freighted by devils, in the dingy regions of the damned.

(Signed) James Fowler.