Hereford and cholera — Why did we escape it?

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Make us duly sensible of thy goodness, in maintaining the domestic tranquillity of our land, in preserving us from intestine commotions, and in granting a plentiful return to the labours of our husbandmen.

From a prayer sheet, Hereford, 1848.

At a meeting in May 1852 of the Woolhope Naturalists’ Field Club (named after the dome of Silurian rocks rising through the old Red Sandstone east of the city) the members were congratulating themselves and the county on having escaped the cholera epidemics of 1832 and 1848 and were speculating as to why they had been so fortunate [1]. They were in fact remarkably lucky, and it is still interesting to wonder why we escaped so lightly from this disease. The discussion arose during papers by Dr Andrew Rowan on ‘The decomposition of sulphuretted hydrogen by Herefordshire marl’ and ‘The origin and use of peroxide in the old Red Sandstone’. He commented that ‘Herefordshire... has been proverbial for the salubrity of its atmosphere and the freedom of its inhabitants from those epidemic scourges which have so often depopulated districts resting upon other geological formations and it is a remarkable fact that, in the two visitations of cholera, not one case occurred in the county’. He believed that the iron in our soil protected us from sulphuretted hydrogen in sewage, a possible cause of cholera. Sir Roderick Murchison FRS, the president of the Geological Society and famous for his description of the Silurian rocks, was present at this meeting and commented that ‘all elevated places have escaped the cholera’, declaring that there had been no cases in Switzerland, the Highlands or Buxton, and that he ‘would feel quite safe from the disease if over six hundred feet’.

Did we escape it?

Cholera killed about 31,000 people in Great Britain in 1831 and 1832 and 61,000 in 1848 and 1849 [2]. ‘It is worthy of note that there is no record of any single case of Asiatic cholera ever having occurred in the county’ was written in Hereford in 1890 [3]. Were we really spared? The first of these epidemics was 6 years before the Registrar General started collecting figures, and the details submitted by the Boards of Health (formed from 1831 onwards) were not always reliable, but Durey, who studied the records carefully, stated that the ‘six counties unaffected in 1832 were all primarily agricultural, rural Surrey, Sussex, Hertfordshire, Northamptonshire, Herefordshire and Rutland’ [2].

The weekly Hereford Journal never mentioned any cases in the county whilst detailing the spread of the first epidemic throughout Great Britain. Week by week the paper noted the dissemination of the disease and the involvement, in the summer, of our neighbours in Worcestershire, Gloucestershire and Brecon but made no mention of infection within our boundaries. The first deaths in Worcester and Gloucester probably led to increased local action. The decision to form a Board of Health six months previously had not been implemented, and late in July the mayor arranged another meeting to form a Board of Health. He also issued a handbill urging cleanliness, removal of heaps of filth or decaying animal and vegetable matter from near residences, and penalties for keeping pigs.

August 1832 must have been a month of great anxiety as deaths all round Herefordshire continued to be reported. At last, in September the epidemic diminished, localities around us were declared free, and days of thanksgiving were declared. It would appear that Herefordshire did indeed escape cholera in 1831 and 1832.

We were nearly as fortunate in the next outbreak. Facts and figures concerning the more serious epidemic of 1848 and 1849 are readily available in the Registrar General’s report of 1852 [4] and the report of the General Board of Health of 1850 [5]. The six agricultural counties unaffected in 1832 were all involved, although Hertfordshire had only seven deaths and Rutland and Herefordshire one each. The Hereford Journal was proud of the county’s health: a leader on 2 February 1848 declared that ‘the County of Herefordshire is the healthiest district in all England, but want of proper drainage and other sanitary measures shortens life here’. On 26 September 1849, when England must have been mourning hundreds of deaths daily, the paper was able to say that the county was free from cholera. Hereford appears to have been as pleased with its morals as its health: a correspondent in the same edition asked readers to ‘avow our conviction that this extraordinary pestilence is a just

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retribution from the Most High for our national sins'. However, only 2 weeks later it announced that 'providentially protected as this county has been from this malignant disease, one case of Asiatic cholera has occurred...'. In Leominster a labourer's son aged 10 had diarrhoea and died 24 hours later. He had moved with his family from Wolverhampton only 4 days previously because of poverty and fear of the epidemic there. This was the one death in Herefordshire reported by the Registrar General [4].

Dr Rowan and his colleagues were not therefore strictly accurate in their remarks at the Woolhope Club in 1852. The one death was given little prominence in the Hereford Journal and the bishop may also have missed its announcement when, a week after the notification, he appointed a day of thanksgiving for 'the merciful exemption of our county and city from the visit of that fatal pestilence, the cholera'. Only one death in two epidemics was however remarkable and could be considered an escape. We were equally fortunate in later years with one death in the epidemic of 1854 and two in 1866.

Dr Andrew Rowan

Who was Andrew Rowan who thought that our soil might have protected us from a disease which killed so many thousands unfortunate enough to have other geological arrangements? The little information hints at a remarkable man. Although frequently referred to as a doctor, sometimes with an added MD, his name does not appear in lists of Herefordshire physicians and surgeons of the period. Anyway he would not have had much time for practising medicine since he was an analytical chemist and member of the Royal College of Chemistry, an agent for the Minerva life assurance company, compiler of meteorological tables for the weekly Hereford Times and a hat manufacturer. He must have been a very active entrepreneur for he had yet another business in Hereford — turning the contents of the city's cesspools into manure for agricultural use.

He was medically qualified; his medical school had been Hull and he was MD (Erlangen, 1846), LRCP (Edinburgh, 1864), LFPS (Glasgow, 1864) and LSA (1864). He had entered the Royal College of Chemistry in 1846 and registered for 2 days a week for 20 weeks [6].

He gave frequent lectures in Hereford until 1858, and then his name disappears from city records. He was in Scarborough in 1865, in Barnsley from 1866 to 1879, and then in Lewisham until he died in 1891 aged 82. One wonders why he moved so much and what interests he pursued after leaving Hereford.

Hereford's health

Whilst Dr Rowan was claiming, in 1852, that Herefordshire had been proverbial for the salubrity of its atmosphere, contrary and adverse opinions were being expressed in the city. The attention of the General Board of Health in London was being drawn by some residents to the 'poor condition of the sewerage, drainage, water supply and the sanitary condition of the inhabitants', and the high mortality rate was being noted [7]. As a result, Thomas W. Rammell, a superintending inspector from London, carried out an enquiry in Hereford in January 1853 [7].

Many unpleasant facts were revealed. Water from the river Wye was used for brewing but otherwise the whole city (population 11,000) was dependent on numerous wells, there being no public supply. Specimens from them had been recently examined by a government chemist and were most unsatisfactory; for example, the well water in High Town was 'vapid, saline and unpleasant, containing nitrates and very minute floating particles'. The irrepressible Andrew Rowan spoke to the enquiry at some length: he had examined several samples of well water and had found chlorine and carbonic acid which would act upon lead. Dr Henry Bull, possibly Hereford's most famous physician and an excellent naturalist, historian, archaeologist and author, said that he had never seen lead poisoning from such water but had frequently seen lead colic resulting from lead pipes carrying cider from cellars. Those who drank it from the tap early in the morning, he said, were often and severely affected, frequently with permanent paralysis.

Local officials reported on drainage and removal of refuse, revealing a disgusting state of affairs. The city surveyor said there was no map of the sewers available. They were only meant to take surface water and slops from houses; a local act prevented the passing of night-soil into them but this had not stopped many people from connecting their privies to the sewers. He denied any complete stoppages but a contractor said that they became 'quite inoperative in droughty weath-
er’, most of their liquid soaking through the brickwork into the gravel which ‘of course affects the wells more or less’.

The town clerk thought that the cesspools in Hereford were purposely constructed on a principle by which the accumulation of liquid refuse in them might be avoided, leading to the saturating of the soil in the ‘most offensive manner’. Cesspools were said to be the rule in the city; many were in cellars and back gardens. When full they were emptied; the ‘soil’ was carried into the streets and removed at night but sometimes it was just buried in another hole on the premises. The majority of the men emptying the cesspools were employees of Dr Rowan who therefore spoke to the inspector with authority on this matter, describing the activities in his city ’soilyard’. He had been engaged in manure manufacture for 4 years, emptying up to 50 pools a year at £1 each. Two-thirds of the houses had privies with cesspools which he said were called ‘bog-holes’; sometimes there were 20–30 houses to one privy. The soil was subjected, if necessary, to a process of decomposition in his factory and then mixed with dry ingredients to prepare it for sale at £6 a ton. He did admit that there had been five complaints to the authorities about the nuisance caused by his factory and that some dissatisfied complainants had managed to have a case against him heard at the assizes where he had been acquitted. Dr Rowan once again elaborated his theory about iron sulphuret which ‘disinfects water passing from the cesspools towards the wells’.

Mr Rammell’s report ended with a summary of the inadequacies of the water supply and sewerage, and of the many nuisances in the city, and made recommendations for improvement to the General Board of Health. Little can have been done, for a year later a civil engineer Mr T. Curley, in an address to the mayor, could only add more dismal findings to a reiteration of Mr Rammell’s report [8]. He said ‘I witnessed such scenes of filth and uncleanliness in this city as I did not believe could exist in a civilized community’. He proposed many improvements and also suggested an increase in the manufacture of manure for the benefit of the city, quoting figures supplied by Dr Rowan ‘who has great advantages over other chemists from his practical experience in the manufacture of manure’. Apparently 7,000 inhabitants could produce 496 tons 17 cwt 2 qrs, which would realise £1,739-19s — another example of Andrew Rowan’s fertile mind. Further action was relatively quick and the Hereford Improvement Act 1854 soon followed. The city waterworks were opened in 1856 and sewers, opening into the Wye, were made but a sewage treatment works was not built until 1885 [9].

Hereford was not in any way exceptional in having such insanitary conditions. They were worse in many industrial and rural areas at the time of the epidemic of 1854, in spite of the publications of the great reformer Chadwick and in spite of the Royal Commission on the State of Large Towns and Populous Districts reporting in 1844 and 1845 and the Public Health Act of 1848. George Godwin, a reforming architect, wrote in 1859 about conditions in Canning Town which made Hereford seem a desirable locality, and he enumerated the foul features in a village on the Welsh borders in order to demonstrate the deceptiveness of attractive appearances and pleasant situations [10]. He quoted from a contemporary poem about King Cholera:

What is my court? These cellars piled
With filth of many a year;
These rooms with rotting damp defiled;
These alleys where the sun ne’er smiled,
Darkling and dreer!

What are my perfumes? Stink and stench
From slaughter-house and sewer;
The oozing gas from open’d trench,
The effluvia of the pools that drench
Courtyards impure!

An inspector who visited Leeds in 1865 stated: ‘Thousands of tons of midden filth filled the receptacles, scores of tons lay strewn about where the receptacles would receive no more. Hundreds of people, long unable to use the privy because of the rising heap, were depositing on the floors. . . . The pressure of these enormous weights was so great that liquid ordure had been seen, after penetrating the ground, to be forced up around the hearthstones of neighbouring cottages’ [11].

King Cholera was a great stimulus to remove such awful scenes, but not until the Public Health Act of 1875 and the last quarter of the nineteenth century was there any clear improvement in public health, and significant reductions in mortality from infectious diseases did not occur until the twentieth century [12]. In the epidemics between 1831 and 1866 there had been 135,000 deaths.

Why were we so fortunate?

Our good fortune was sufficiently unusual to occasion comment at the time. During the worst epidemic of 1848 and 1849 there were no deaths in 85 of 623 districts but ‘the only town of any magnitude in the 85 districts is Hereford. The other districts are made up of villages or small towns’ [4]. The Registrar General who wrote this did try to offer explanations for the relative exemption of some localities, but without firm conclusions. Much emphasis was laid on altitude, against which mortality was plotted to show a vague correlation, but Hereford is only 250 feet above sea level. It was suggested, also not very convincingly, that geology played a part. Another attractive theory was that ‘the exemption of Herefordshire from cholera is evidence that cider, notwithstanding the popular prejudice, is a much safer beverage in the time of an epidemic than spirits which were so largely consumed during the time of cholera in the places where it was most fatal’ [4]. Filth, poor water supplies and poor standards of living were recognised as contributing to the disease but its apparently unpredictable spread
awaited clarification by John Snow in 1857 and Robert Koch in 1883.

Some comments at the Woolhope Club in 1852 suggest that it was appreciated that two factors were needed to establish cholera in a locality: a means of arrival and means for the perpetuation of infection once it had arrived. During the first two epidemics, was Herefordshire sufficiently isolated from the rest of the country to protect it? Certainly there were fewer regular and busy lines of communication than in industrial areas. Our main communication with a port, by barges coming up the Wye from Bristol, can hardly have been very active (it took 20 men to haul a heavy coal barge upstream [13]). A canal connecting Hereford to the Severn was opened in 1844 and was busier. There were few railways in Great Britain in 1832; our first connection, with Shrewsbury, was only opened in December 1853. At the height of the 1832 epidemic the disease spread slowly, 'almost at walking pace', and followed main highways [14]; it must have been carried along these by manual labourers seeking seasonal employment, itinerant tradesmen, entertainers and migrants such as the Wolverhampton family who brought cholera to Leominster in 1849. Possibly there was not enough traffic with the neighbouring affected towns such as Shrewsbury, Worcester, Gloucester and Brecon to ensure the establishment of infection.

More important than the introduction of infection was its establishment and local propagation, partially dependent on the characteristics of the cholera vibrio. This, surprisingly, is a fragile organism and water requires repeated contamination to be a potent source of infection [15]. The vibrio can survive for several days in untreated night-soil and for up to 20 days in river water [16]. It survives in beer for 3 hours and in wine for only 15 minutes; spirits can possibly kill it in the intestine [2].

Fifth and poor living conditions are relevant to the perpetuation of infection, but water supply is the vital factor. Hereford’s water supplies were disgracefully inadequate in 1832 and 1848, but the multiplicity of wells may have been a saving grace. Streams, much used public wells or a large common source of water were much greater dangers, and still are in some countries. Maybe Dr Rowan’s theory did have some relevance to our escape, for the pH of the foul earth between privies and wells may have been low enough to discourage survival of the vibrio. Did Herefordian cider consumption offer some protection? Perhaps it did, but only in a very limited fashion in the same way that brewers’ men often escaped cholera in badly affected areas since they drank beer rather than water [14].

It is likely that Hereford’s escape was related to the absence of much traffic with other parts of the country, and to the lack of a large source of water susceptible to repeated contamination. Good surveillance by our Board of Health may also have contributed.

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References

1. Transactions of the Woolhope Naturalists’ Field Club Herefordshire 1852–1865: 20–4.
2. Durey, M. (1979) The return of the plague: British society and the cholera 1831–2. Ireland: Gill and Macmillan.
3. Directory and gazetteer of Herefordshire 1890. Hereford: Jakeman and Carver.
4. Registrar General (George Graham) (1852) Report on the mortality of cholera in England 1848–49. London: W. Clowes and Sons.
5. General Board of Health (1850) Report on the epidemic of cholera of 1848 and 1849. London: HMSO.
6. Royal College of Chemistry Register (1846) (communication from the college archivist, Imperial College of Science and Technology, London).
7. Rammell, T. W. (1853) Report to the General Board of Health on a preliminary enquiry into the sewerage, drainage and supply of water and the sanitary condition of the inhabitants of the City of Hereford in the County of Hereford. London: HMSO.
8. Curley, T. (1854) Hereford sanitary improvements (report to the mayor, aldermen and town council of the city of Hereford). Hereford: Hereford Times Office.
9. Atfield, C. E. (1986) Hereford in the 1850s. Transactions of the Woolhope Naturalists’ Field Club Herefordshire, XLV, 347–70.
10. Godwin, G. (1972) Town swamps and social bridges, 1859. The Victoria Library Edition, Leicester University Press.
11. Stewart, A. P. and Jenkins, E. (1869) The medical and legal aspects of sanitary reform, 1866. The Victoria Library Edition. Leicester University Press.
12. Flinn, M. W. (1969) Introduction to Stewart, A. P. and Jenkins, E. The medical and legal aspects of sanitary reform, 1866. The Victoria Library Edition. Leicester University Press.
13. Kissack, K. (1978) The River Wye. Lavenham: T. Dalton Ltd.
14. Morris, R. J. (1976) Cholera, 1832: the social response to an epidemic. London: Croom Helm.
15. Gangarosa, E. J. and Mosley, W. H. (1974) Pattern of spread. In Cholera (ed. D. Barua and W. Burrows) p 393. London: Saunders.
16. Felsenfeld, O. (1974) The survival of cholera vibrios. In Cholera (see Ref. 15) p 539.