Commentary: Edmund Alexander Parkes, John Snow and the miasma controversy

Beverly P Bergman

Institute of Health and Wellbeing, University of Glasgow, 1 Lilybank Gardens, Glasgow G12 8RZ, UK.
E-mail: b.bergman.1@research.gla.ac.uk

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The advancement of scientific knowledge has often been characterized by controversy, but perhaps none has been more vehement than the conflict between supporters of the rival ‘miasma’ and ‘contagion’ theories of disease transmission. During the 19th century, a series of cholera pandemics originated in India and the second of these, which reached Britain in 1831, intensified the debate. At the time of the 1854 outbreak of cholera in London, which was part of the third pandemic, both theories still had their champions within the evolving specialty of public health. This carefully argued, highly critical but (with the benefit of hindsight) ultimately flawed commentary on John Snow’s seminal publication on the transmission of cholera by water provides an insight into the depths of that controversy in the years before the discovery of the role of microorganisms in communicable disease.
At the time of writing the commentary, its author, who styled himself simply E.A. Parkes, was Editor of the British and Foreign Medico-Chirurgical Review and Professor of Clinical Medicine at University College Hospital, London. A strong advocate of the miasma theory, Parkes would need much convincing to change his views. Far from being a crusty academic set in outmoded ways, he was still only 36 years of age and experienced beyond his years, his relative youth concealing a brilliant mind. Although a practising physician at the time of its publication, he was later to become one of the outstanding Victorian pioneers of public health.

Edmund Alexander Parkes (1819–76) was born on 29 March 1819, the son of a Warwick worsted manufacturer, William Parkes (1788–1840) and his wife Frances née Byerley (1785–1842). The family was well known in the English Midlands. They were related by marriage to several of the prominent families of the Enlightenment; William’s cousin had married the granddaughter of the theologian and chemist Joseph Priestley (1733–1804), whereas Edmund’s mother Frances was a great-niece of the potter Josiah Wedgwood (1730–95) and hence connected to the Darwins. They were Unitarians, as were many of the great intellectual families of the period. While Edmund was still a young boy, his father’s business failed and Edmund was sent to London to complete his education at Christ’s Hospital, a charitable school established in 1552 to provide a high quality education to children with academic potential whose parents could not otherwise afford it. Subsequently he worked as an assistant to his uncle Sir Anthony Todd Thomson (1778–1849), Professor of Materia Medica and Therapeutics and Joint Professor of Medical Jurisprudence at University College London, and it is likely that it was his uncle’s influence which secured Parkes’ admission as a medical student to University College London. He continued to work in his uncle’s laboratories during his student days, developing the research and experimental skills which would stand him in good stead throughout his career. He was academically gifted and won a number of prizes as a student.

Parkes graduated MB in 1841 at the age of 22 and chose to begin his medical career in the army; in 1842 he was gazetted Assistant Surgeon with the 84th (York & Lancaster) Regiment. His military duties took him to India and Burma and provided him with the material for his MD thesis ‘Remarks on the Dysentery and Hepatitis of India’ which was published in 1846, after he had left the army and returned to civilian practice. While in India he had witnessed two severe epidemics of cholera and in 1847 he published a work ‘On Asiatic and Algide Cholera’, followed by papers on ‘Intestinal Discharges in Cholera’ and ‘Early Cases of Cholera in London’. The physician Sir William Jenner (1815–98) was later to comment on these papers in an address to the Royal College of Physicians: ‘Having regard to the age of their author, the circumstances under which the materials for them were collected, and their intrinsic merits, these two works are among the most remarkable in medical literature’.

In 1855 Parkes was nominated by the British Government to establish a civilian hospital in Turkey for casualties evacuated from the war in the Crimea (1854–56). Together he and the engineer John Brunton selected and surveyed a suitable site at Renkioi on the Dardanelles where the world’s first prefabricated hospital, designed by Isambard Kingdom Brunel, was to be erected. Well appointed, well ventilated and staffed by nurses provided by Florence Nightingale, the hospital suffered none of the problems of many of the Crimean War hospitals and deaths were mercifully low.

Nonetheless, during his time caring for Crimean War casualties, Parkes became aware of the toll of preventable disease attributable to poor hygiene, including cholera, and he was to be a key witness at the subsequent commission of enquiry. One of the recommendations of the commission was that teaching in ‘military hygiene’ (public health) be provided to all newly appointed military doctors, and in 1860 Parkes relinquished his post in London on his appointment as the first Professor of Military Hygiene at the Army Medical School. His textbook A Manual of Practical Hygiene was the first formal textbook of public health and, although initially written as a text for his students, it quickly became internationally renowned in the wider community. Eight editions were published up to 1941, under a succession of editors, and it was translated into other languages including Japanese; a special edition was prepared in New York for the US market. As a textbook it was ahead of its time; many of the issues covered are familiar to a modern public health practitioner, including air and water quality, nutrition and exercise.

Parkes’ review of Snow’s work, published in April 1855, was almost certainly written shortly before his departure for Renkioi. Already it clearly shows the thought processes which were later to underpin his role in public health. Early in his review, Parkes stated that his object was ‘to see the strength of [Dr Snow’s] evidence’, a phrase which would come into common usage nearly one and a half centuries later in the era of evidence-based medicine. He then proceeded to a discussion of hypothesis testing, as befitted a scientist trained in research methodology under a professor of jurisprudence, and here he found Snow’s arguments wanting. In noting the different numbers of occupants of two properties affected by cholera (Case 1), he demonstrated an understanding of the importance of rates in epidemiology as well as the problem of confounders (here, differences in structure and ventilation between the two blocks of dwellings). In considering Parkes’ understanding of these issues, we must bear in mind that the science of what we now know as
epidemiology was only just coming into being at that
time, based on the work of William Farr (1807–83) and
others. Even the word ‘statistics’ was of relatively
recent origin, having been introduced into the English
language only 70 years earlier by Sir John Sinclair of
Ulbster (1754–1835), author of the Statistical Account of
Scotland, following a visit to the Continent where he
had seen the German practice of ‘statistik’. Early ex-
amples of ‘statistics’ were largely narrative in nature, the
mathematical and analytical approach only de-
veloping in the late 19th century; significance testing
would be a new concept in 1885, nearly 10 years after
Parkes’ death.13

In his discussion of Snow’s case reports, Parkes crit-
ically questioned Snow’s reasoning, assessing the
weight of evidence for water-borne vs airborne trans-
mition of cholera and generally finding Snow’s evi-
dence unconvincing. Case 10 is the well-known Broad
Street pump outbreak for which Snow is best remem-
bered. Snow’s own account showed that, in the ab-

The final two paragraphs of the review say much
about Parkes himself; as a scientist, as a physician,
as a political lobbyist but above all as a gentleman,
graciously acknowledging Snow’s diligence even while
disagreeing with his conclusions. Sadly his hope that
‘if [Snow’s] discovery should be established, the pre-
vention of cholera would be easy’ has yet to be rea-
lized, notwithstanding that our understanding of
the causative organism now even encompasses the
sequencing of its genome.16 If only public health
could be so simple.

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