

SIR HENRY DUNCAN LITTLEJOHN - A DYNAMIC FIGURE IN FORENSIC MEDICINE AND PUBLIC HEALTH IN THE NINETEENTH CENTURY

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There can be little doubt that our Scottish system of medico-legal procedure, just like our national game of Golf, will ultimately be adopted south of the Tweed.¹

EARLY LIFE AND TRAINING

Henry Duncan Littlejohn was born in Leith Street in Edinburgh in 1828, the son of a wealthy merchant. He was educated at Perth Academy and the Royal High School of Edinburgh, received his medical training at Edinburgh University and the Royal College of Surgeons of Edinburgh and graduated MD in 1847. His early experience was obtained at the Royal Infirmary of Edinburgh. Here he worked as house surgeon and clinical clerk, and also gained experience in the investigation of causes of death as the assistant pathologist. In writing a testimonial, James Andrew, Physician to the Royal Infirmary, stated that Littlejohn 'took every opportunity of assisting the pathologist in conducting the post-mortem examinations which occurred in the hospital.' This was followed by a period of private practice in the city of Edinburgh, and later studying operative surgery under Professor A. Guérin at Sorbonne in Paris, and at the Universities of Vienna and Berlin. In 1854 he became a Fellow of the Royal College of Surgeons of Edinburgh.

PUBLIC HEALTH IN THE NINETEENTH CENTURY

From 1800 onwards there had been a growth in Europe of ideas about public health, allied to an increasing sense of responsibility among the people; public health was entering its 'golden age'. Many different approaches to safeguarding public health were evident across Europe, reflecting the diversity of social and economic circumstances and governments. In Britain, Edwin Chadwick viewed sanitation and other local authority community-directed measures as public health's main focus, whereas in parts of continental Europe this was seen more as the application of social medicine with police enforcement - indeed the term 'medical police' was used for these activities.

The spread westwards of cholera from India focused the need for adequate sanitation and proved to be the catalyst for public health action. The 1831-2 cholera epidemic led to Chadwick's investigation and subsequent *Report on the Sanitary Conditions of the Labouring Population of Great Britain* published in 1842. Hence public health practice as understood nowadays, began on a slender scientific base as diseases were largely unclassified and undifferentiated and bacterial origins not yet recognised, much less proven. However the broad scope of public health and the

willingness at the time of the state to tackle problems led to a climate within which significant advances were achieved.

Within Edinburgh also there was a growing awareness of the relationship between public health and environmental conditions and, from around 1820, a sense of social responsibility was becoming increasingly evident. Public meetings discussed subjects such as the social conditions of the poor and sanitary improvements. The local press reported these debates, stimulating further popular interest. The cholera outbreak and Chadwick's report led in Edinburgh to increasing demand by the public for the appointment of an 'officer of health', although the duties of such an official were not clearly defined. A pamphlet published in 1839² asked the question 'Are fetid irrigations injurious to health?'² and uses the elementary principles of epidemiology to establish a concept of risk related to what would now be known as the 'postcode' of residence and associated deprivation category:

...not a single case of Cholera occurred in Restalrig on the very banks of the 'fool burn'. One case was reported to have occurred there; but as the history of the case is well known to us, we are warranted in saying that it had none of the symptoms of that alarming disease. The Cholera was also exceedingly mild in the South Back of Canongate; and comparatively so in Jock's Lodge and Comely Green, all in the immediate neighbourhood of the Irrigated Meadows. In reply to the remarks of Mr Rankin, who 'bears unequivocal testimony to the insalubrity of that pestilential neighbourhood' in regard to the case of the Station Keeper and family, who were reported to be so unhealthy, it may be observed, that he was in the same unhealthy state *previous to his living* at Seafield Toll-bar. While he was engaged in a different employment he enjoyed excellent health; but so soon as he became a toll-keeper, which he did first near Dalkeith, he became a martyr to a stomach complaint, which he attributed to his rising during the night; for since he has been placed in a situation where he has got his regular rest, his stomach complaint has left him. His children, he says, enjoyed excellent health when at Seafield Toll-bar.

It is evident from such published documents that the fundamental questions of public health were being discussed in Edinburgh in a scientific manner at this time. Littlejohn's interest in public health therefore did not develop within a vacuum: on the contrary, he joined what was already a lively debate.

LITTLEJOHN'S APPOINTMENT AS MEDICAL OFFICER OF HEALTH

In 1861 the sudden collapse of a tenement on the High Street in Edinburgh, killing 35 people, led to a public outcry and an overwhelming demand for the installment of a Medical Officer of Health. In 1862 a large public meeting elected a deputation to urge the City Council to appoint such an officer immediately. The General Police and Improvement (Scotland) Act (commonly called the Lindsay

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Act after its instigator, Provost Lindsay of Leith) provided the legal basis for such an appointment and, in September 1862, Henry Littlejohn was appointed the first (part-time) Medical Officer of Health for Edinburgh.

The Lindsay Act contained provisions for lighting, cleaning, paving, drainage and supplying water to towns, and the promoting generally of public health. Littlejohn's staff consisted of two policemen from the local force who acted as sanitary inspectors: one inspected lodging houses for overcrowding and infectious diseases, and the other visited the fever wards of the Royal Infirmary each day to keep note of new cases of infectious disease in the city.

REPORT ON THE SANITARY CONDITIONS OF THE CITY OF EDINBURGH

Following his appointment, Littlejohn investigated the living conditions and health of the people of Edinburgh and three years after his appointment he produced his Report.³ He divided the city into 19 districts and used census-derived data to determine the population within each. He made personal observations of the sanitary conditions in the different districts and related these to the mortality data for residents of the areas obtained from the Registrar General for Scotland. He supplemented this with a range of other sources of relevant data, which included the registers of paupers from the parishes, details of recent cholera epidemics in the city, and occupational data and comparative mortality data for other parts of Scotland. This research formed the basis of the wide-ranging report which described the overcrowding and the filthy conditions of the streets and houses in some areas, the state of the drainage and water supply, and the conditions in the byres and bakehouses. He noted that the death rate in the Old Town, in particular around the Grassmarket, Canongate and the Tron, were almost double those in the New Town. Infectious diseases were more common causes of death in these areas, and the cholera and fever epidemics of the 1840s were found to have affected people in these areas more than other parts of the city.

Littlejohn's observations demonstrated the association between poverty, overcrowding, poor sanitation and poor health. The report, now a classic, used for the first time in Scotland many epidemiological methods which are routinely employed in the practice of modern public health medicine. The overall conclusion, that poverty and ill-health are unequivocally linked, remains valid in today's society.

Littlejohn's report led to the passing of the Edinburgh City Improvement Act of 1867, by which authority many of the slums were demolished and replaced with new streets, including Market Street, Jeffrey Street and Chambers Street which still exist. Street-widening, better drainage systems and water supply also followed. Littlejohn's suggestions also led to powers of inspection for dairies, meat markets and bakehouses being granted to local authorities. The publication of the report was followed by local and national press coverage.

COMPULSORY NOTIFICATION OF INFECTIOUS DISEASES

Littlejohn's growing experience and knowledge of infectious diseases led him to propose compulsory notification of every case of infectious disease. He recognised the importance of knowing of the occurrence of cases early, but initially there was yet no mechanism in place to achieve this. When death returns suggested the

FIGURE 1

Clause 208 of the Edinburgh Municipal and Police Act, 1879.

In order to secure more prompt action in dealing with infectious diseases, every medical practitioner shall, within 24 hours of the same coming to his knowledge, report to the medical officer of health every case of cholera, typhus fever, typhoid fever, diphtheria, smallpox, scarlet fever, scarletina, and measles (in this Act characterised as infectious or contagious diseases) occurring in his practice, and stating the house or place where patient is being treated, under a penalty not exceeding 40 shillings; and if it be found by the medical officer of health that the diagnosis of such practitioner was correct, such practitioner shall be paid the sum of two shillings and six pence for each case reported and verified as aforesaid, and in order to facilitate the making of such report, every such practitioner shall from time to time be furnished, on application to the medical officer of health, with printed forms stamped for postal transmission.

possible occurrence of an outbreak of infectious disease, Littlejohn would issue circulars to the medical practitioners of Edinburgh, asking them to inform him of any cases which came to their attention. However, sadly there was little response to these appeals.

In 1876, at a meeting of the Edinburgh Medico-Chirurgical Society, Littlejohn made known his views on disease notification. There was little support, although the Poor Law medical officers did agree to notify cases. Littlejohn persevered and went on to prepare a report on compulsory notification. He proposed that this should be incorporated into a Police Act for the city which was due to be brought before Parliament. He sent copies of his proposals to all medical practitioners in the city. In addition the Town Council approached the two Royal Colleges for their views. The profession strongly opposed the proposals, claiming it would undermine confidence within the ambit of the doctor-patient relationship. The potential conflict between the interests of the individual patient and of the wider public health was, therefore, evident from the outset of modern public health medicine practice. However, Littlejohn was successful in persuading the Town Council of Edinburgh to include a clause in the Edinburgh Municipal and Police Act of 1879 (Figure 1). The Act was passed and notification was thus made compulsory.

Three years later, Littlejohn reported to the Board of Supervision in Scotland that notification was working very successfully, and that the medical practitioners in Edinburgh had now accepted and approved it. Edinburgh was the first city to obtain such an act. Littlejohn campaigned for an extension of notification to the whole of Scotland, and national compulsory notification was eventually achieved through the Public Health Act for Scotland in 1897.

FEVER HOSPITALS

Alongside an awareness of influences on health, Littlejohn did not neglect the need for planning and appropriate

provision of services for the people. In 1866, cholera threatened the city again. The Royal Infirmary made it known that they did not intend to admit any cases in the event of an epidemic. The Corporation therefore obtained temporary accommodation in the City Poorhouse Hospital and the cholera cases were treated there. Littlejohn strongly advised the Corporation to obtain permanent hospital accommodation for infectious diseases. They finally bought the Canongate poorhouse and converted it into the City Fever Hospital which opened in 1870. The inadequacy of this hospital quickly became evident and it was further reinforced with time. When the Royal Infirmary decided to build a new infirmary in Lauriston, the possibility was raised of buying the old infirmary building and converting it into a fever hospital. Again encouraged by Littlejohn, negotiations began, and in 1885 the second City Fever Hospital opened. However, even this new hospital proved insufficient with the concurrent epidemics of smallpox and scarlet fever in 1894. So, backed by the Royal Colleges and Littlejohn, the Corporation responded with the purchase of a large site at Colinton Mains and built a new hospital. The third City Hospital was opened in 1903 by King Edward VII. In 1948 this hospital passed into the control of the newly-formed National Health Service.

POLITICS AND PUBLIC HEALTH POLICY

Public health medicine today provides an important input to national policy and planning. Littlejohn likewise became involved in this area. From 1858 he investigated outbreaks of infectious diseases throughout the country (Scotland) and advised the Board of Supervision, at that time the central authority for the Poor Law in Scotland. In 1873 the Board became the central authority for public health and Littlejohn became their part-time medical officer. He was frequently called on as an expert in public health questions before committees of the House of Commons and House of Lords. Although he counselled against doctors becoming actively involved with 'party politics', he encouraged members of the medical profession to take an active part in local political matters. This, he considered, was essential in order that the medical expert had an input to decisions which affected health at a local level. He was, for example, rather critical about the willingness of some doctors to accept poor conditions of employment within local councils:

too often the representative of our profession in these bodies - the medical officer of health - very inadequately remunerated, is treated in a manner derogatory to the profession at large. Salaries of ten pounds and five pounds are freely offered, and, I regret to say, accepted. I have often remonstrated with my brethren for receiving such doles, reflecting, as they do, disgrace on our common profession.¹

The improvement of the health of residents of Edinburgh in the nineteenth century associated with Littlejohn's work was clearly demonstrated by the fall in mortality rates from around 34 per 1,000 in the 1860s to 14 per 1,000 in the early twentieth century. Smallpox and typhus disappeared from the city. The main causes of these improvements were the environmental changes and sanitary reforms, to which Littlejohn was the major contributor. The current climate of the NHS increasingly requires evidence of effectiveness in order to justify interventions: few these day will yield such spectacular results.

APPOINTMENTS AS LECTURER IN MEDICAL JURISPRUDENCE AND POLICE SURGEON FOR EDINBURGH
Littlejohn's attention to pathological investigation, toxicology and medico-legal subjects provided the basis for his appointment to the posts of Lecturer in Medical Jurisprudence at the Royal College of Surgeons of Edinburgh and Police Surgeon for the city of Edinburgh in 1855 at the age of 27. His lecture notes indicate that he was a lively and entertaining teacher, apparently drawing from his wide experience to complement the didactic elements of each lecture. He used humour, numerous gestures and frequent interesting anecdotes to illustrate his points. His teaching was well received; in a letter to the professor, a student wrote 'it was a privilege listening to your lecture'. His teaching included weekend excursions to places such as the courts, the sewage works and the sites of notable crimes. He brought to life for his students these embodiments of law, public health and forensic medicine with tales of events that had occurred there.

Littlejohn's duties as police surgeon included the examination and medical care of ill members of the police and of prisoners. He also took part in the investigation of cases of sudden death, accidents and of homicides. As surgeon to the Edinburgh police and with his additional experience in forensic medicine, Littlejohn was called as an expert witness in all the major criminal trials of the period - including the controversial case of Walter Ronaldson who was acquitted of the murder of his wife. Ronaldson was found guilty of the lesser charge of assault despite the fact that, according to a newspaper report of the time, 'in Dr Littlejohn's opinion, the examination of the body *failed to reveal any other cause than external violence to which he could attribute death.*' Then, as now, the evidence of the forensic doctor is only one element in the Crown's case and the jury is cast in the role of deciding what weight to give it in the midst of all the evidence put before them. The case retains a contemporary interest because the author of the newspaper report concluded '(p)erhaps the humane...may think that to beat a wife to death is not the less murder because the beating extends over three entire days.'

One area of forensic investigation which has undergone radical change since the mid-nineteenth century is the scientific analysis of ante- and post-mortem samples. We learn, from a testimonial written by Professor J.H. Bennett of the Institutes of Medicine and of Clinical Medicine at Edinburgh, that Littlejohn 'had paid considerable attention to Toxicology' prior to his appointment as Police Surgeon. Littlejohn's case notes show that he was often called upon to personally analyse such samples in a variety of poisoning cases; in modern forensic practice this task is no longer performed by the medical expert but by specialised toxicology laboratories.

APPOINTMENT TO THE CHAIR OF FORENSIC MEDICINE IN EDINBURGH

In Scotland, medical jurisprudence was closely linked to the area of 'medical police' or public health medicine until the end of the nineteenth century. This fact had actually previously led to a delay in the formation of a Chair in Medical Jurisprudence at Edinburgh University in the eighteenth century, as public health medicine was associated with radical political thinking.⁴ The chair was eventually founded in 1807 under a more radical Whig government

and was subsequently split in 1897 by the foundation of the Bruce and John Usher Chair of Public Health Medicine, when Littlejohn, by then a well-known figure in forensic medicine circles, took the Chair of Forensic Medicine at the age of 78 years.

The core elements of Forensic Medicine as understood by Littlejohn are illustrated by the four questions in the Forensic Medicine Final Professional Examination of 1904 (Figure 2). These would have tested the examinees' knowledge of the principal areas of the subject, namely pathology, toxicology, law and clinical medicine. Currently the subject of Forensic Medicine has been all but eliminated from the curriculum of most medical schools in the UK with, at most, an abbreviated course of lectures being offered and examination of the subject being the exception. Somewhat ironically perhaps, Littlejohn himself referred to forensic medicine as 'this generally neglected branch of medical study'.¹ If examination was still required, then the paper set by Littlejohn and M'Vail would provide a more than adequate nucleus for questions relevant to the subject today.

The first question, on post-mortem findings in cases of death due to hypothermia and the role of alcohol in such deaths, could still be set as it stands, as these are still common causes of morbidity and mortality. Question two is less

relevant for today's medical students as cyanide ingestion is rarely encountered nowadays; however a similar question could be posed for a drug or poison which is currently a more common intoxicant, for example paracetamol or methadone. The third question concerns itself with the medical and legal aspects of abortion, a subject that would still be relevant for a modern Forensic Medicine examination, however the answer expected would have altered considerably with changes in the legislation since 1904, principally the passing of the Abortion Act 1967. Similarly, the question regarding the medico-legal aspects of mental health would be just as relevant to today's medical students. A modern examiner would undoubtedly dispense with the archaic language of question four; and Mental Health legislation would have a central role in today's question and, hopefully, the candidate's answer.

Littlejohn was aware of the unique importance of the practice of forensic medicine:

(i)ndeed, we must confess, that in ordinary practice, too often our mistakes are buried with our patients, and that undetected disease escapes public observation. It is the reverse in medico-legal practice; any mistakes we make in a defective post-mortem examination, or too hasty examination of an injured party - such faults committed, so to speak, in secret, come to be proclaimed on the house-top, and we are brought to face them in a court of justice.¹

Although a forensic practitioner might be only too aware of the innate truth of that observation, the modern reader might not agree with all his assessments of the achievements of medicine: 'the risks of warfare have been wonderfully lessened by the discoveries of our profession.'¹

An indication of Littlejohn's meticulous approach to his work can be seen by perusing the detailed handwritten notes of his lectures and other materials. Whilst he held the Chair of Forensic Medicine, he collated an extensive range of newspaper cuttings, and copies of pamphlets and other published works covering a wide spectrum of medical and scientific topics. These materials are currently held by the Special Collections department at the University of Edinburgh Library. Included in the collection are various humorous letters on medical matters written to *The Times*. It is interesting, given the current concern over the accuracy of the 'International Classification of Disease Coding' of suicide, accidental and undetermined deaths, to note a fascinating debate in these letters concerning whether the death of a man who, whilst looking down the barrel of a gun, was killed when it misfired could be attributed to an 'accident' (12/3/1891).

OTHER ACTIVITIES AND INTERESTS

Littlejohn was elected President of the Royal College of Surgeons in 1875, founder and first president of the Society of Medical Officers of Health in Scotland (1891-93) and a member of many voluntary organisations, including chairman of the Society for the Prevention of Cruelty to Children. He was knighted in 1895. He retired in 1908 to enjoy his country home in Arrochar where he died in 1914 at the age of 86.

CONCLUSION

In recent times public health has been given the definition 'the science and art of preventing disease, prolonging life

Time-Tables of the Oral Examinations are posted at the Gate of
the New University Buildings.

UNIVERSITY OF EDINBURGH,
FINAL PROFESSIONAL EXAMINATION.

FORENSIC MEDICINE.

TUESDAY, 14th June 1904.

1 to 2.30 o'clock.

The Subject of Examination and also the Name and Edinburgh Address of
the Candidate to be written on the outside of each Paper.

Any Candidate who has in his possession a book, or printed papers, or notes
of any kind, or who communicates with another by word or sign, or who
permits his paper to be seen by another, will be required to leave the
room, and will be reported to the Senatus.

Examiners—Professor SIR HENRY D. LITTLEJOHN and
Dr. M'VAIL.

THREE Questions to be answered, of which No. 4 must be one.

1. Death from Cold.—Mention (a) the External, and (b) the
Internal appearances of this form of death. (c) What is the
effect of drunkenness as regards the fatality?

2. Hydrocyanic Acid and Cyanide of Potassium.—(a) What
is the fatal dose of each of these Poisons? and what is their
respective fatality? (b) What is their appropriate treatment, and
(c) their differential diagnosis? (d) What precautions have been
taken by the authorities to regulate their sale? (e) Why should
the chemical analysis be proceeded with as soon as possible?

3. When is a child *in utero* presumed to be viable? What
are the distinctive appearances in a five and in a seven months
child?

4. What circumstances would justify you in certifying a
person as a dangerous Lunatic? What is the official procedure,
and what is the form of the certificate required?

FIGURE 2
The Forensic Medicine Final Professional
Examination of 1904.

and promoting health through the organised efforts of society.⁵ Over 100 years ago, Sir Henry Duncan Littlejohn worked at the time when public health in Scotland was first being defined and its importance was first being recognised. The recent return, in the late 1980s, from the term 'community medicine specialist' to the original name of 'public health physician', signals an increasing awareness that the tasks of the modern public health physicians include the use of epidemiological methods to identify environmental and social risks to health, the description of health needs of populations and advice to those planning services. Littlejohn was involved in all these tasks within the beginnings of modern public health medicine practice in Scotland.

Although there is no evidence that Littlejohn actively campaigned with evangelical zeal for the 'conversion' of England and Wales to the Scottish medico-legal system, that he was aware of its inherent benefits is beyond doubt. He identified, for example, a crucial advantage of the Scottish death certification system: 'no body is interred without its having been examined and certified by a legally qualified medical man.'¹ This led to the abolition of the term 'uncertified death' in the Registrar General's reports in Scotland. This link between accurate death certification and comprehensive recording and compilation of statistical data remains a cornerstone of the relationship between forensic medicine and public health. One of the legacies of Littlejohn's work is, indeed, to remind practitioners in both fields of the profession that each can contribute to and learn from the other.

Sir Henry Littlejohn was an admirable Scottish pioneer, who used his great energy, intellect and experience to

protect the public and improve the health of the population which he served.

ACKNOWLEDGEMENT

We wish to acknowledge the generous assistance extended to us by Arnot Wilson of the University of Edinburgh Library.

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ADDITIONAL SOURCES OF INFORMATION

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The plaque outside Sir Henry Duncan Littlejohn's house in Edinburgh. (Photography by Mr A. Harrower.)