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

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Here 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 M.D. 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 1839 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 installation 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
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. 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 mortality data for other parts of Scotland. This research formed the basis of the wide-ranging report which detailed the overcrowding and 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 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 Medical-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 Canongate 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.

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 of these will yield such spectacular results.
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'. 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)n deed, 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.

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...
and promoting health through the organised efforts of society. 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.' 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
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ADDITIONAL SOURCES OF INFORMATION
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Faculty of Public Health Medicine of the Royal College of Physicians of the United Kingdom. Personal communication.

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