REPORT

A Medical Sciences Historical Society meeting last autumn hosted the ninth Baron Von Liebig Memorial Lecture, given by medical historian Sue Weir. Howard Wingfield reports on Justus von Liebig's visits to Britain and their impact on society over a period of 19 years.

Liebig in London: the years 1837 to 1855

The Royal Society of Medicine, in Wimpole Street, London, was the venue for the ninth Liebig Memorial Lecture, which was given by medical historian Sue Weir in October last year. Mrs Weir took as her starting point the rise of chemistry as a separate discipline in Germany and in Britain and the teaching of medicine and its advances during the time that Liebig visited this country. She described how Justus von Liebig fitted in to the environment of a newly booming German industrial society.

Liebig was born in 1803 and, following study of chemistry at the Prussian University of Bonn and the University of Erlangen in Bavaria, went to the University of Giessen in May 1824. He remained there for 28 years and transformed it into an institution much sought after by aspiring chemists. Finally, he moved to the University of Munich in order to do less teaching and more research. He made many lasting friendships among his students, especially those from England who visited him. Liebig started something of enormous significance – a proper research laboratory – and thus chemistry was established as a true science in the German states.

In England, however, 19th-century scientists typically were divided into two groups: the natural philosophers, whose interests were either theoretical or laboratory-based; and the natural historians, who basically were concerned with observation. The teaching of medicine in early 19th-century England probably fared worse than the teaching of chemistry, as there were simply no facilities for the systematic teaching of medicine and surgery, and thus instruction was likely to be haphazard. There was no official syllabus or examinations and therefore medical education was sought either in Scottish or European universities.

It was not until the early part of the 19th century that interest shifted from a humoural theory to localised structural pathology and so began to focus on specific diseases. It was at this time that clinical medicine began to search for the cause and mechanisms of disease, and the three leading practitioners of this new method were Richard Bright (1789–1858), Thomas Addison (1793–1860) and Thomas Hodgkin (1798–1866). Unfortunately, there is no evidence to suggest that Liebig either met or corresponded with any of these pioneers.

> 'Thanks to Liebig, chemistry was established as a true science in the German states'

Visits to Britain

Liebig visited Britain on six occasions. The first, in 1837, was to speak at the British Association for the Advancement of Science at a meeting in Liverpool, where he met and befriended James Muspratt. James is widely acknowledged as the father of the heavy chemical industry, and his sons, Sheridan and Edmund, were sent to Giessen to learn chemistry from Liebig. The Muspratts of Liverpool changed the face of Merseyside by helping to make England a leading exporter of chemicals. Mulspratt's daughter, Emma, and husband, George Harley, a physician, chemist and Fellow of the Royal Society and Royal College of Physicians, became firm friends of Liebig.

Harley obtained his MD from Edinburgh University in 1850, aged 21, and then spent two years working in physiological and chemical laboratories in Paris. From there he went to Germany, where he spent two years at Giessen with Liebig. Harley's friendship with Liebig blossomed and his subsequent marriage into the Muspratt family sealed that friendship. In a letter to Emma, written on 22 January 1865, Liebig wrote "… I am also sending through Richard a sample of extract of meat for making the best broth", and, in a further letter on 28 October said: "You know I took much trouble over an extract of beef and hoped to bring it before the public as long ago as 18 years. The factory in Fray Bentos in South America is so small and output cannot keep up with demand, so I suggest that they enlarge their factory 10-fold, with me at the head so I can analyse the product to see if it is the proper strength." His final letter to Harley in 1871 claims that "the extract has

Medical historian Sue Weir receives a commemorative medal on behalf of the Medical Sciences Historical Society and the Liebig Society at Giessen from Professor Johannes Beuttner.

been shown to be of splendid use to the German Army and has been used in making strong soups in the hospitals."

On his second visit to Britain, in 1842, Liebig was introduced to leading agriculturalists and was made a Fellow of the Royal Agricultural Society, founded in 1838. Again, in 1844, he met the landowning farmers, attending the British Association for the Advancement of Science in York, and was the guest of honour at a lavish banquet in Glasgow. The following year he came on a purely commercial mission, to promote and negotiate the sales of his projected fertilisers and the disposal of quinidine wastes.

Teaching princes and public health

The Great Exhibition of 1851 coincided with Liebig's 25th wedding anniversary and he was persuaded to visit the Exhibition. He also visited Ireland and was appalled at the poverty he saw. While in Scotland he was a guest of Queen Victoria and Prince Albert at Balmoral, having struck up a deep friendship with the German Albert, and later gave chemistry lessons to the royal children.

> 'It was in the public health sector that Liebig had the most impact on the medical world'

It was in the public health sector that Liebig had the most impact on the medical world. The General Board of Health in 1849 appeared to adopt something of the actual mechanism defined by Liebig, not in relation to the body as much as to the environment. Liebig's concern with London's sewage problem was the result of a cry for help from the Lord Mayor of London, who wrote to Emma Harley in 1865. Liebig was appalled at what he saw as a complete waste of useful agricultural nutrient being washed into the Thames. His rather widely optimistic views on the agricultural value of London's sewage stimulated Joseph Bazalgette to set about building a network of interconnecting sewers that would convey the sewage, rain water and other effluent to the outskirts of London, where it could be treated, purified, pumped and the water re-used. Liebig's final visit to Britain was in September 1855, when he was invited to Osborne House on the Isle of Wight to meet the Queen and Prince Albert again.

Commemorating chemistry

Mrs Weir concluded a fascinating and beautifully illustrated talk by noting that Liebig was a friend of royalty, loved and respected by the newly emerging chemists of Britain. Although his views were looked on with some degree of scepticism by the medical profession, Justus von Liebig clearly was a giant among men.

At the conclusion of her presentation, Mrs Weir was presented with a commemorative medal on behalf of the Medical Sciences Historical Society and the Liebig Society at Giessen by Professor Johannes Beuttner. The lecture was sponsored by Oxoid, once a part of the Liebig Extract of Meat Company!

LETTER

Pathology wastes are unquestionably hazardous

SIR Recently, David Muskett presented a timely summary of the disposal of clinical and other wastes from pathology laboratories consequent upon the implementation of the Hazardous Waste Regulations (HWR).[1] This new legislation imposes substantial change in the management of wastes. Much of this is long overdue and, together with a current review of NHS guidelines for the management of clinical and other wastes, should drive improvement in waste management standards that are, in many hospitals, woefully inadequate.[2] The HWR are predictably complex and largely untested. Official guidance is welcome and the Environment Agency paper *Interpretation of the definition and classification of hazardous waste technical guidance* (WM2) seeks to provide simplified schemata for the management of clinical and other wastes. However, this guidance may be grossly, and dangerously, oversimplified.

As David indicates, Environment Agency guidance makes clear that wastes classification should be based upon clinical judgement and formal risk assessment. On this assessment, clinical wastes are categorised as hazardous or non-hazardous, and it is this classification that dictates the standards and techniques for, and cost of, onward disposal. So far, so good. But the Environment Agency goes further, proposing the classification of pathology wastes as non-hazardous in circumstances where clinical assessment indicates a low risk of infection. Such a proposal is surely without merit. It highlights a lack of understanding in the formulation of such guidance, and of the realities of work in clinical laboratories.

In the laboratory, should we review individually the many hundreds of specimens received each day? Are broad assumptions acceptable? Or do we act responsibly, adhere to CDC recommendations[3] and guidance provided by the Health and Safety Executive,[4] and manage all clinical wastes from pathology laboratories as hazardous? All unscreened blood and tissue specimens fall within Hazard Group 2 and must be handled with care. The risk does not change at the point of disposal. If safe laboratory practice mandates a robust and universal approach to the prevention of infection with bloodborne virus agents such as hepatitis B and HIV, then it is logical that all biological wastes from laboratories should be classified as hazardous and handled accordingly.

On that premise, it is clear that the advice from the Environment Agency presented in WM2 is misleading. Although the document has been improved and clarified in its most recent iteration, it falls far short of the standards set by successive codes for the prevention of infection in pathology laboratories, and should not be followed.[5]

The current Environment Agency guidance document (WM2) offers a potent cost-driver that permits down-regulation of waste classification. However, there should be no variation in our approach to safe working in the laboratory and logically this extends to the disposal of clinical wastes.[6] Those responsible for the management of wastes from pathology laboratories must be aware of the fate of all wastes that leave the laboratory, and ensure that standards of safety are maintained at all stages in the disposal chain. The only safe conclusion to risk assessment will be to classify all wastes as hazardous under HWR in order to comply with established safety codes, and with health and safety legislation, and to reject the inadequate guidance from the Environment Agency.

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REFERENCES

1 Muskett D. Hazardous waste. Its safe and legal disposal. *The Biomedical Scientist* 2005; **49:** 1252–3.
2 Blenkharn JI. Standards of clinical waste management in UK hospitals. *J Hosp Infect* 2006. In press.
3 Centers for Disease Control. Recommendations for prevention of HIV transmission in health-care settings. *Morbid Mortal Weekly Rep* 1987; **36** (Suppl 2S).
4 Health and Safety Executive. *Safe working and the prevention of infection in clinical laboratories.* London: HSE Books, 2003. ISBN 0 7176 2513 3.
5 Blenkharn JI. Lowering standards of clinical waste management – do the Hazardous Waste Regulations conflict with CDC universal/standard precautions? *J Hosp Infect* 2006. In press.
6 Blenkharn JI. Pathology waste – issues, implications and regulations. *The Biomedical Scientist* 2005; **49:** 678–82