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MAIN ARTICLE

Vapours, gargles, darts and bougies: Victorian ENT treatments

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Abstract

Background: Sir Morell Mackenzie (1837–1892), the pre-eminent early laryngologist in the UK, is nowadays perhaps better remembered for his role in the management of the Crown Prince of Germany in 1887, than for his major contribution to the development of laryngology as a specialty. In this article we focus upon his text *The Pharmacopoeia of the Hospital for Diseases of the Throat* (fourth edition), and attempt a comparison of Victorian ENT treatments with today's management of ENT diseases.

Treatments: Some of these Victorian treatments bear a resemblance to modern day practices. Others have not withstood the test of time, in particular: silver nitrate sticks for syphilitic ulcers of the larynx (not epistaxis); nebulised sulphuric acid, which was used as a stimulant; nasal bougies, including scotch pine and lead acetate; chloroform vapour for the treatment of hay fever; 'London paste', a non-surgical treatment for the reduction of the tonsils, (which was perhaps the Victorian equivalent of coblation); and zinc chloride darts, which were plunged into intractable goitres.

Conclusion: Some of these remedies bear no resemblance to today's evidence-based practices, while other treatments (such as silver nitrate) are still in common use. In Victorian times, however, Mackenzie's books were widely read throughout Europe and were the standard references for a specialty in its infancy. The Pharmacopoeia was published in 1872, and major advances in medicine have been made since then. We have no way of knowing which treatments in today's *British National Formulary* will still be in use in 140 years.

Key words: History Of Medicine; Otolaryngology; History, 19th Century; Silver Nitrate; United Kingdom

Introduction

Sir Morell Mackenzie (1837–1892), was the pre-eminent laryngologist of his time. In 1863, he founded the Metropolitan Free Dispensary for Diseases of the Throat and Loss of Voice, which moved to 32 Golden Square, London, in 1865, and was renamed the Hospital for Diseases of the Throat.

In this article we discuss some of the content of Mackenzie's book *The Pharmacopoeia of the Hospital for Diseases of the Throat*, fourth edition.[1]

For this edition, Mackenzie augmented the previous pharmacopoeia, which had included substances from the Materia Medica. He made his own additions, chiefly, nasal bougies, pastils, insufflations, aural solutions and ear drops.

Before the preface, there is a quotation from Sir Jonathan Hutchison, the well-known surgeon, ophthalmologist, pathologist, dermatologist and venereal disease physician, in which he states '…it is the highest privilege of those who thus devote themselves to the reclaiming of new spots of territory, to be able after a while to hand them over to the commonwealth, to prove that they are now cultivated and well worthy of annexation'.

This quotation highlights the contribution made by Mackenzie to developing the specialty of laryngology. Mackenzie had travelled extensively and studied throughout Europe before being awarded the Jacksonian prize for his work on diseases of the larynx.[2] Laryngology hitherto had not been recognised as a specialty in its own right. Mackenzie popularised the use of the laryngoscope to visualise the larynx in the UK.[3]

In this article, we describe some of the treatments outlined in the Pharmacopoeia, how they were received contemporaneously and how they relate to modern management. An overview of Victorian ENT treatments can be seen in Table I. Although many of

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TABLE I
VICTORIAN ENT TREATMENTS

Treatment	Use
'London paste'	Non-surgical reduction of tonsils
Chloroform vapour	Relief of hay fever
Nasal bougies	Relief of nasal obstruction
Silver nitrate sticks	Syphilitic lesions of larynx
Zinc chloride darts	Intractable goitre

these substances are listed today with a corrosive warning, in the late 1800s they were used as sedatives and as treatments for syphilis and for laryngitis.

Treatments

Vapours

Vapours or inhalations constituted a large component of the Pharmacopoeia; these are listed in Table II. They were divided into five types: hot, cold, dry, spray or fuming. Mackenzie stated that the value of inhalations had long been recognised by the medical profession and the public.[4] The different types of inhaler are shown in Figure 1.

TABLE II
VAPOURS

Substance	Use
Acetic acid	Sedative, antiseptic
Benzoic acid	Affectations of air passages
Phenol	Syphilitic & carcinomatous ulcers
Prussic acid	Sedative, also useful in laryngeal tuberculosis
Sulphurous acid	Stimulant
Ammonia	Chronic laryngitis, functional aphonia & hay fever

'The eclectic inhaler' was designed by Mackenzie. Medicaments were placed in the large, vase-like container, which was filled with hot water to a specific line. There was an air space at the top and a lid with two layers. The lid layers were perforated so that hot air could rush between the apertures and up to the mouthpiece. There was also an opening in the lid for a thermometer. The specific instructions for use were: to use before meals, no more than six inhalations per 1 minute, and to avoid the cold for 30 minutes afterwards to prevent upper respiratory tract infection.

The hospital inhaler was manufactured by Bullock and Company, a well-known pharmacy at Three Hanover Street, London. Essentially, it was a large, stoneware jug with openings for a mouthpiece and thermometer. A lighter and more affordable option was Martindale's Portable Inhaler. This was made from tin and needed to be placed within a woollen jacket to prevent patients from burning their fingers.

Cold inhalations were recommended to affect the mucous membranes of the entire throat. They were deemed to be particularly useful in hot climates. Many of them could be used as a hot inhalation if the strength of medication was slightly reduced.

Vapour or inhalation treatments included the following medications. (1) Acetic acid is the substance that gives vinegar its characteristic taste, and is also useful as a solvent. (2) Benzoic acid is a weak acid commonly used as a food preservative. (3) Carbolic acid, also known as phenol, has multiple uses. Historically, it has been used as an antiseptic and in conversion to plastics. Notoriously, it was used in Nazi Germany as a means of rapid execution by intravenous injection. More recently, carbolic acid has been used in chemical facial peels and for lumbar sympathectomy. (4) Hydrocyanic acid, also known as prussic acid, is

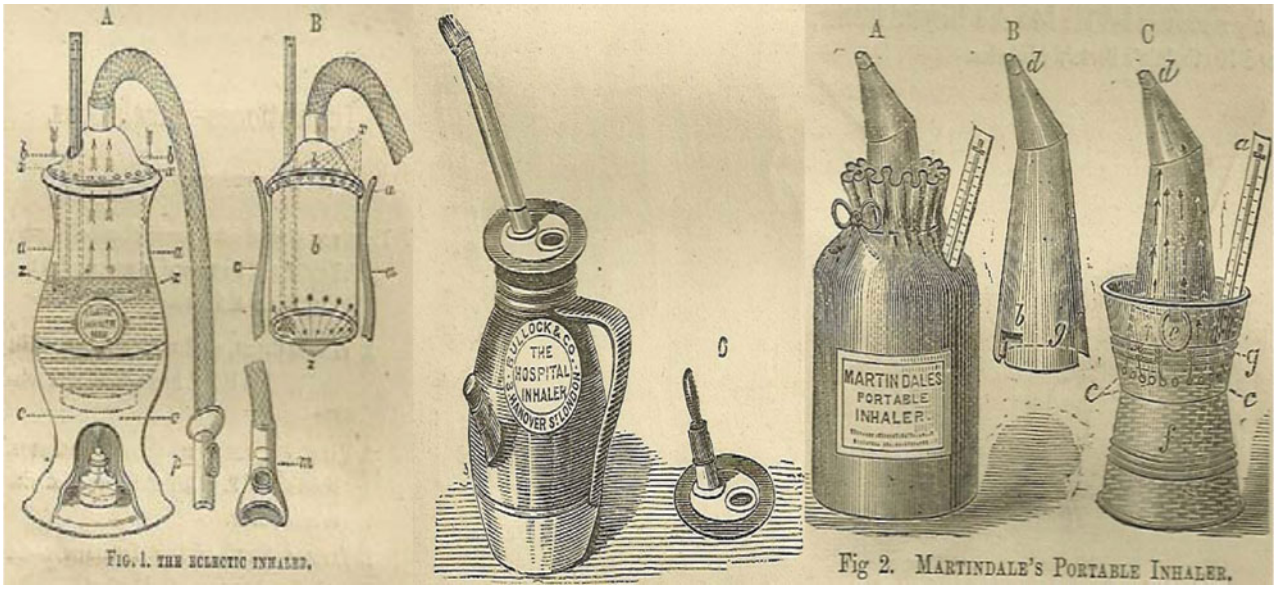

FIG. 1
Inhalers, as shown in the Pharmacopoeia.[4]

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another highly toxic substance. Today, it is still used in gas chambers in some US states that employ judicial execution. It was also used as a means of mass murder in Nazi Germany. (5) Sulphurous acid is used chemically as a mild bleach and disinfectant. (6) Ammonia has multiple uses, including household cleaner, fertiliser and in textiles. It is also the main component of 'smelling salts'.

Chloroform for hay fever

Hay fever in Victorian times caused particular problems. An article entitled 'The treatment of hay fever',[5] published in the *British Medical Journal* in 1903, stated that:

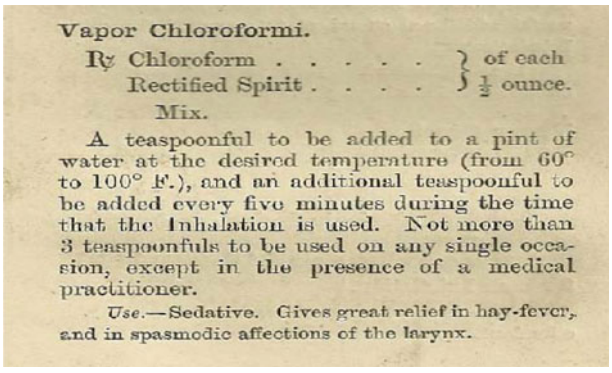
> … sufferers have therefore had to bear their trial with such fortitude as they could command, perhaps in the thought that their complaint is, like early baldness according to the Prince Consort, a mark of breeding. … More distinctly than gout, it is an ailment of the well to do, for there is no poor man's hay fever.

In the Pharmacopoeia, it is stated that great relief from hay fever could be gained by regular inhalations of chloroform, the anaesthetic agent.[6] As Figure 2 shows, Mackenzie exercised moderation with the chloroform inhaler, limiting the quantity of chloroform to no more than three teaspoonfuls.

This sentiment of moderation was not echoed by Lockard,[7] who, in a 1903 edition of the *Boston Medical and Surgical Journal*, (which became the *New England Journal of Medicine*), recommended large doses of chloroform in combination with draconti (an emetic root) and belladonna (deadly nightshade). The same article recommended lemonade as a useful temporising measure for attacks of hay fever.

Zinc chloride darts

Zinc chloride darts were recommended by Mackenzie for fibrous goitres of the intractable type. They were to be plunged into the goitre via a cannula and left in place. No descriptive guidance was issued in the Pharmacopoeia as to how long they should be left in situ.



Vapor Chloroformi.

℞ Chloroform . . . . . } of each
Rectified Spirit . . . . } ½ ounce.
Mix.

A teaspoonful to be added to a pint of water at the desired temperature (from 60° to 100° F.), and an additional teaspoonful to be added every five minutes during the time that the Inhalation is used. Not more than 3 teaspoonfuls to be used on any single occasion, except in the presence of a medical practitioner.

Use.—Sedative. Gives great relief in hay-fever, and in spasmodic affections of the larynx.

FIG. 2
Instructions on the preparation and use of chloroform inhalation as a treatment, as shown in the Pharmacopoeia.[6]

FIG. 3
Photograph of one of Mackenzie's former patients, a 38-year-old woman with a goitre which had developed over 34 years. Reproduced with permission from the BMJ Publishing Group Ltd.[9]

A 1874 case report by McNaughton[8] described the case of a young machine worker who was successfully treated with such darts for 17 months. Another case report,[9] published in the *British Medical Journal* in 1903, described one of Mackenzie's former patients in whom zinc darts had been used for 14 months to no avail. This patient is shown in Figure 3. It is difficult to judge how successful these treatments were when there are only a handful of cases in the literature.

Today, the use of darts in medicine appears to be limited to the dart guns used by veterinarians to fire sedatives. However, the concept of zinc dart usage is somewhat similar to brachytherapy, whereby active treatment is brought closer to diseased tissues, or embedded within them, in order to affect them locally and limit damage to nearby healthy structures. This is not always possible with external radiation therapy.

Interestingly, three years after the publication of the Pharmacopoeia, at the 41st annual meeting of the British Medical Association, Mackenzie himself stated (in the Surgery Section) that injections of iodide into a goitre were preferable to setons and darts, to prevent suppuration.[10] This was based on the work of the German professor, Lucke.

Silver nitrate

Silver nitrate is a substance widely used in ENT departments today in the management of epistaxis and for cautery of granulation tissue. In the Pharmacopoeia, Mackenzie highlighted its use in treating syphilitic lesions of the larynx (Figure 4).[11]

Historically, silver nitrate was popularised by the surgeon John Higginbottom,[12,13] for wound care. He found multiple uses for silver nitrate and highlighted its importance in shortening in-patient care, for out-patients and in ambulatory care. The use of silver

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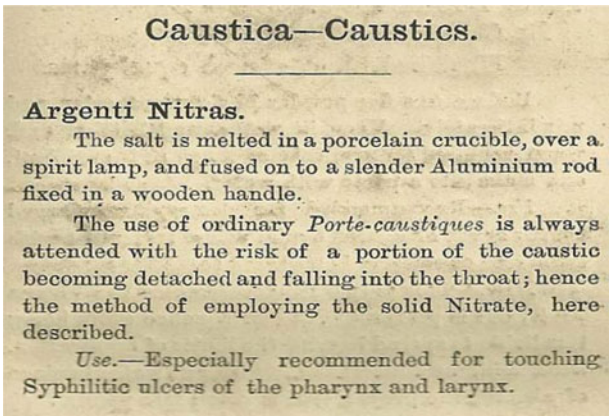

Caustica—Caustics.

Argenti Nitras.

The salt is melted in a porcelain crucible, over a spirit lamp, and fused on to a slender Aluminium rod fixed in a wooden handle.

The use of ordinary *Porte-caustiques* is always attended with the risk of a portion of the caustic becoming detached and falling into the throat; hence the method of employing the solid Nitrate, here described.

Use.—Especially recommended for touching Syphilitic ulcers of the pharynx and larynx.

FIG. 4

The preparation and use of silver nitrate as a treatment, as shown in the Pharmacopoeia.[11]

nitrate, however, extends as far back as medieval times. Its use was documented in 1635 by Alexander Read of London, who advocated silver nitrate for dealing with wound cavities.[14]

'London paste'

'London paste' was formulated by Morell Mackenzie. The principle constituents were caustic soda and unslaked lime, to which water was added. The paste, which was used to obliterate large tonsils or an elongated uvula, was considered by Mackenzie to be less painful and safer to use than 'Vienna paste', which contained potassium carbonate. Mackenzie recommended the use of London paste where the use of the guillotine, or removal of the tonsils with scissors, was contraindicated.

Many years after its invention, there was still concern about the safety and efficacy of London paste. Doctors were uncertain how long it should be used for and how many times it could be applied.[15] Some surgeons felt that it was an ineffective form of treatment and should not be used when surgical treatment with the guillotine was already well established.[13]

Another concern regarding London paste was that it caused considerable pain, despite the preliminary use of cocaine paste. Others felt that it was unsafe for use because it could spread to the faucial pillars, ulcerating them. Further condemnation came from colleagues of Mackenzie who stated that he [Mackenzie] himself rarely used the paste.[16]

Nowadays, the destruction of tonsil tissue can be carried out by radiofrequency ablation (coblation), rather than by the application of caustic substances. In an echo of the debates 130 years ago, today's established methods of tonsil surgery are deemed safer than the newer ablative method of coblation.[17]

Nasal bougies

Bougies containing medicament are solid preparations that can be inserted into an orifice to create a local or systemic effect, in a similar manner to a suppository. The nasal bougies used in the Victorian era were made with a glycol-gelatine base, into which other medicaments were incorporated.[18] They measured approximately 8 cm in length. Mackenzie had learned from Dr Catti about nasal bougies during his studies in Vienna.[1] The bougies dissolved slowly with time, gradually exposing the nasal mucosa to their contents.

The contents of the bougies listed in the Pharmacopoeia were obvious from their names. They included: carbolic acid, used as an antiseptic and anaesthetic; bismuth, for nasal syphilis; copper sulphate, used as an antifungal agent; iodine, used as an antiseptic; morphine, used as an analgesic; scotch pine leaf oil, used as a disinfectant; lead acetate, a soothing ointment; thymol, used as an anti-fungal agent; and zinc sulphate, used as an astringent.

Today, the treatment of nasal disease is evidence-based.[19] Mackenzie too tried to establish a scientific basis for his treatments. For this reason, he employed the pharmacists at Bullock and Company to conduct a series of experiments to ascertain the best formulae for his nasal bougies, as Catti's work had not included such details.

Discussion and conclusions

It is unlikely that many readers would volunteer for any of the above-mentioned treatments. Mackenzie, however, firmly believed in his treatments, although many of them are unrecognisable in the present day. At the time, the Pharmacopoeia was well received, being quoted by Haweis[20] as a 'medical classic'. Furthermore, seven editions of the Pharmacopoeia were printed, which indicates its popularity. Many of our treatments today are not based on the most robust levels of evidence; one only has to look at the controversy surrounding the management of conditions such as Ménière's disease and laryngopharyngeal reflux to appreciate this.

- **Morell Mackenzie's contribution to laryngology is often overshadowed by his care for the Crown Prince of Germany in 1887**
- **The several editions of his Pharmacopoeia are comparable to today's drug formularies**
- **He recorded the use of inhalers, vapours, darts, bougies and topical pastes**
- **His Pharmacopoeia provided a basis for ENT practice for almost a century, and a platform for advancement of the specialty**

Despite this, Mackenzie's remedies had a relatively long life span. The recommendation of inhalations was still common in 1949, (see *Diseases of the Nose and Throat* by Thomson and Negus),[21] some 79 years after the publication of the Pharmacopoeia. On the other hand, with the exception of epistaxis, the application of caustic substances is no longer used for

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treatment of nose and throat pathology. It is interesting to see that London paste was still recommended in 1949 by Thomson and Negus for cases where tonsillectomy was not advised, or where the patient refused a surgical procedure. However, Thomson and Negus acknowledged that it was difficult to remove the whole tonsil solely using London paste, and that further bouts of tonsillitis may occur following use.

It is interesting to look back at these treatments and consider how many of today's treatment options will still be widely used in 140 years' time.

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References

1 Mackenzie M. *The Pharmacopoeia of the Hospital for Diseases of the Throat*, 4th edn. London: J Bale and Sons, 1870
2 Weir N. Sir Morell Mackenzie (1837–1892). In: Mathew HCG, Harrison B, eds. *Oxford Dictionary of National Biography*. Oxford: Oxford University Press, 2004;**35**:612–13
3 Wolfenden RN. Sir Morell Mackenzie MD. *J Laryngol Rhinol Otol* 1892;**6**:95–108
4 Mackenzie M. *The Pharmacopoeia of the Hospital for Diseases of the Throat*, 4th edn. London: J Bale and Sons, 1870;67–74
5 The treatment of hay fever. *BMJ* 1903;**1**:743
6 Mackenzie M. *The Pharmacopoeia of the Hospital for Diseases of the Throat*, 4th edn. London: J Bale and Sons, 1870;82
7 Lockard L. The treatment of hay fever. *Boston Medical and Surgical Journal* 1903;**148**:59–62
8 MacNaughton-Jones H. Well marked case of an anaemic exophthalmic goiter treated by seton through the goiter and digitalis. *BMJ* 1874;**2**:775
9 Payne EM. Six cases of goitre. *BMJ* 1903;**1**:660–2
10 Mackenzie M. Section B surgery: the treatment of certain forms of bronchocele by injections of iodide. *BMJ* 1873;**1**:255
11 Mackenzie M. *The Pharmacopoeia of the Hospital for Diseases of the Throat*, 4th edn. London: J Bale and Sons, 1870;30
12 Obituary: John Higginbottom (FRS FRCS Eng). *BMJ* 1876;**1**:553
13 Higginbottom J. *An Essay on the Use of Silver Nitrate in the Cure of Inflammation, Wounds and Ulcers*. London: Seeley and Burnside, 1829
14 Block SS. Historical review. In: Block SS, ed. *Disinfection, Sterilization and Preservation*, 5th edn. London: Lippincott, Williams and Wilkins, 2001;3–18
15 Moore I. Enlarged and diseased tonsils of cryptic type destroyed by applications of escharotic paste. *J Laryngol Rhinol Otol* 1919;**34**:20–2
16 Moore I. The treatment of enlarged or diseased tonsils where surgical treatments are contraindicated. *Proc R Soc Med* 1919;**12**:243–8
17 Brown P, Ryan R, Yung M, Browne J, Copley L, Cromwell D *et al*. *The National Prospective Tonsillectomy Audit: Final Report of an Audit Carried out in England and Northern Ireland Between 2003 and 2004*. London: Royal College of Surgeons of England, 2005
18 Marriot J. *Pharmaceutical Compounding and Dispensing*. London: Pharmaceutical Press, 2006;18
19 Fokkens W, Lund V, Mullol J. European position paper on rhinosinusitis and nasal polyps. *Rhinol Suppl* 2007;**20**:1–136
20 Haweis HR. *Sir Morell Mackenzie; Physician and Operator: a Memoir Compiled and Edited from Private Papers and Personal Reminisces*. London: WH Allen, 1893;250
21 Thomson St C, Negus VE. *Diseases of the Nose and Throat*, 5th edn. London: Cassell, 1949;33–5, 448

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