‘An adept in medicine’: the Reverend Dr William Laing, nervous complaints and the commodification of spa water

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Abstract

This essay addresses mineral water as a medical, experimental and economic material. It focuses on the career of the Reverend Dr William Laing (1742–1812), a physician and cleric who wrote two pamphlets about the water of provincial spa located in Peterhead, a town on the north-east coast of Scotland. I begin by outlining his education and I then reconstruct the medical theory that guided his efforts to identify tonics in the well’s water. Next, I explain why Laing and several other local inhabitants thought themselves to be authorities on the palliative power of the water and I close by showing how such effects were commodified by local entrepreneurs. Although I concentrate primarily upon Peterhead Spa, this study touches upon several issues relevant to the types of medical theory and chemical experimentation that were being used in provincial Scotland during the late eighteenth and early nineteenth centuries.

Keywords: Medical theory; Nervous disorders; Chemistry; Tonics; Testimony; Commodification

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‘Invitation to Peterhead’

Here Health her bath’s enlivening tide,
And fountain’s sparkling nectar pours;
Fields fluctuate in flower pride,
While cool gales fan the quiet shores.

James Hay Beattie (1793)

Her friendship warms, her smiles engage,
Her converse, quiet, learning, leisure,
Feed mirth, sooth care, afford the Sage
Instruction, and the Poet pleasure.

James Hay Beattie (1793)

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1 Excerpted from Laing (1793), pp. 78–79. An early copy of the poem was sent by Laing to James Beattie. William Laing to James Beattie, 19 December 1790, AUL MS 30/2/636 or Robinson (2004), no. 1680. Laing then requested permission to include it in his Peterhead pamphlet. James Beattie to Robert Arbuthnot, 9 July 1792, AUL MS 30/1/332. Robinson (2004), no. 1769; James Beattie to Robert Arbuthnot, [ca. 10 August 1792], AUL MS 30/1/330 or Robinson (2004), no. 1772. NB: throughout this essay I will make substantial use of the correspondence between William Laing and James Beattie. These letters are housed in several editions around Scotland and a large percentage of them have been summarised and placed in a numerated list in Robinson (2004). Whenever I cite a Laing or Beattie letter, I list its archival location and the number (if any) it has been assigned in Robinson. I will also use the following nomenclature to denote archival collections: AUL (Aberdeen University Library), NLS (National Library of Scotland) and EUL (Edinburgh University Library).
1. Introduction

In 1793 the Freemason’s Lodge of Peterhead, Scotland, celebrated the institution of a new pump room in which residents and visitors could enjoy a drink of the town’s wine-coloured spa water. After paying an admission fee, customers could sip at their leisure as they played card games and browsed the newspapers. Although the salubrious effects of the water had been known for centuries throughout the north of Scotland, Peterhead’s new trading links to the Baltic, Holland and England insured the arrival guests who knew nothing of the well’s virtues. For these potential customers, and for incredulous Lowlanders to boot, the Reverend Dr William Laing wrote a pamphlet that used chemical analysis, personal testimony and local case histories to substantiate the tonic power of the town’s mineral well. Entitled An account of Peterhead (1793), it was printed by T. Evans in Paternoster Row, London and was then sold in the capital, as well as Peterhead, Aberdeen and Edinburgh. Over a decade later, in light of the commercial success of the well, Laing wrote a follow-up ‘Appendix’. It was entitled Account of the cold and warm sea baths at Peterhead (1804) and was sold primarily in Aberdeen.

To bolster the Lodge’s attempt to make the water a therapeutic commodity, Laing strategically appropriated practices and theories that were the domain of medical chemistry. As the eighteenth century saw a proliferation of chemically orientated mineral well pamphlets, his work was part of a larger genre that sought to use chemistry to commodify the substances contained in local spa water. Even though comparative studies have sought to identify the chemical and commercial relevance of such pamphlets, monographs and books, little research has been done on the local contexts that engendered them. One of the main obstacles preventing studies on such publications has been the obscurity of the provincial authors who wrote them. For example, other than the brief biographical summaries devoted to Laing in Scottish episcopal clergy and the Fasti academicae mariscallanae Aberdonensis, the contours of his life remain murky. Indeed, he does not even have an entry in the Oxford dictionary of national biography. The lack of such studies makes it quite difficult to explore how local actors became scientific authorities and how they used their expertise to make mineral well water a medical commodity. In Laing’s case, the situation becomes even more intriguing when one considers that he was both an ordained priest and a practising physician. It is therefore the purpose of this essay to use Laing as case study to investigate both his expertise to make mineral well water into viable medical commodities.

Following in the footsteps of the insightful surveys of eighteenth-century mineral wells written by Noel Coley, Roy Porter and Alistair Durie, I will begin by briefly outlining Laing’s early education, his subsequent career as a priest and the events that led Aberdeen University to award him a medical degree. Turning to his chemical analysis of the well, I will then show that he was primarily interested in iron, fixed air and the temperature of the water—all three of which were tonics, that is, substances believed to have an ameliorative effect on the body. Although he held that these three substances could restore the imbalance that had been created by a wide number of diseases, I will only concentrate on how he believed that they could cure nervous disorders. Throughout my reconstruction of Laing’s familiarity with the literature and principles of contemporary medical theory, I will emphasise that he believed himself to be a local authority on the well’s contents and therapeutic value. As the essay draws to a close, I will address other local commentators on the well and how Laing reacted to their assessments. I will end by explaining how Laing’s research fit into the larger context of well’s commodification, especially in regard to its importance to the Freemason’s Lodge and the city in general.

2. Becoming a medical authority

William Laing was born in Fraserburgh, Scotland on 29 March 1742. In 1762 he matriculated at Marischal College, Aberdeen. His studies were overseen by William Kennedy (Greek), Frances Skene (civil and natural history), George Skene (natural philosophy) and James Beattie (moral philosophy). In 1766 he was an awarded an MA. Whilst pursuing his studies, he developed a particularly close relationship with Beattie and they went on to become lifelong friends. Although the precise nature of Laing’s initial exposure to medicine is not known, it can be safely assumed that he learned a bit about the subject whilst in university. George Skene’s lectures, for instance, promoted chemistry, especially the works of Herman Boerhaave, and its usefulness for mineralogy and the related fields of medicine, agriculture and industry. Like several other inquisitive Scottish naturalists, Skene investigated the contents of Peterhead’s well during early 1770s. It is also quite likely that Laing studied medicine with John Gregory. In addition to being Beattie’s close friend and personal physician, Gregory was also the professor of medicine at King’s College, Aberdeen until 1764. Upon graduating, Laing was appointed preceptor to William Fraser of Kirktown in Philorth and, with the help of Beattie, he was made Under

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2 A basic outline of his vital dates and degrees appears in Bertie (2000) and Anderson (1889–1898).
3 Porter (1990), see Coley’s essay in this work. Durie (2003).
4 Wood (1993), pp. 91–94.
Master of Aberdeen Grammar School in 1770. He was ordained the next year, under the recommendation of Beattie, into the Episcopal Church of Scotland by the Bishop of Down and Connor. In the same year he was appointed as minister to the English Episcopal Chapel in Peterhead and he remained there for the rest of his career.

Over the next ten years, Laing continued to foster his interest in medicine by reading books and observing the ameliorative affects of Peterhead’s waters. In time he became proficient in medical theory and materia medica and he began to recommend remedies and cures to his parishioners and friends. As he did not hold an MD, he was not legally allowed to take payment for any of his medical advice. Beattie, however, often visited Peterhead and he was able to witness Laing’s abilities first hand. He was so impressed with Laing’s skills as an ‘adept in medicine’ that he approached Alexander Donaldson, Marischal’s professor of medicine, to see if his former student could be awarded an honorary Doctor’s degree in Physick’. Although such a recommendation from a professor of moral philosophy might sound a bit odd to modern ears, Beattie’s knowledge of medical theory was by no means slight and he was certainly qualified to assess Laing’s abilities (Beattie apparently did this as an act of benevolence and not on the direct request of Laing). Based on Beattie’s testimony, Donaldson agreed to support the measure and both professors presented Laing’s case to the university. As a result of this petition, Laing was awarded an MD in October 1782. The excited Beattie then wrote Laing of the good news: ‘I will Mr Laing you no more henceforth. You are now to all intents and purposes The Reverend Dr William Laing Doctor of Medicine—quod felix faustumque sit’. Laing took his MD seriously and henceforth. You are now to all intents and purposes The

Throughout the rest of his life, Beattie continued to hold Laing’s medical abilities in high esteem. They corresponded often about medical treatments and a variety of other topics (including politics, music and poetry). Soon Laing was acting as the Beattie family’s personal physician when they visited Peterhead. In 1790, Beattie expressed his approbation of Laing’s medical expertise in a letter to his friend Robert Arbuthnot:

Yet Dr Laing (of whose medical skill I have a very high opinion) is under no apprehensions, and assures me there is nothing the matter with him [Beattie’s son] but weakness, which, being the effect of relaxation merely, good weather, fresh air, strengthening medicines and moderate exercise, will in time remove.

Laing’s authority as a local physician soon led him to become interested in the therapeutic qualities of the town’s well and he began to conduct his own experiments on the water. As I will show below, his pamphlets on the well indicate that he was well versed in medical chemistry, especially as promoted in the works of William Cullen and Torbern Bergman, two of the most well known chemists in northern Europe. Near the end of the decade he expanded his interests in to the therapeutics of temperature and, even though he was in the province, he still followed the publications of leading medical authorities in Britain and abroad.

3. Tonics, spas and chemistry

The growth of the medical marketplace was on the rise in the eighteenth century. Although the sale of naturally occurring ‘cures’ was an ancient practice, the commodification of drugs in Enlightenment Scotland was tied to the nomenclature and classification practices of chemistry. Accordingly, when Laing published An account of Peterhead in 1793, he was keen to connect the chemical composition of Peterhead Well to contemporary therapeutics so that its contents could be commodified alongside the other tourist attractions of the town. He therefore devoted the first one third of the book to recounting the experiments that he had performed on the water. In this section and then throughout the rest of the book, he argued that the

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7 Anderson (1897), pp. 38–41.
8 Henderson (1907), pp. 375–376.
9 Beattie was also involved in the Peterhead appointment. James Beattie to William Laing, 25 June 1771, NLS Acc. 4796, Fettercairn Box 91 or Robinson (2004), no. 248.
10 Depending on a person’s state of mind, reading books could be beneficial or harmful (Johns, 2000).
11 Beattie’s medical knowledge was clearly evinced in his correspondence and his extensive reading on the nervous system undergirded much of his philosophy of mind—especially as expressed in his Elements of moral science (Beattie, 1790–1793).
12 For the context of such honorary, or irregular, degrees, see Johnston (1987).
13 James Beattie to William Laing, 28 October 1782, AUL MS 30/1/210 or Robinson (2004), no. 1081. The Latin phrase reads as follows in English: ‘May it bring you happiness and good fortune’. This letter contains other details concerning Beattie’s involvement in obtaining Laing’s MD.
14 James Beattie to James Hay Beattie, 3 August 1788, AUL MS 30/1/288 or Robinson (2004), no. 506.
15 Beattie encouraged Laing’s artistic interests in various ways like sending him a cello from Edinburgh or placing Laing in charge of two organs being constructed in Peterhead. James Beattie to William Laing, 13 October 1772, AUL MS 30/2/89 or Robinson (2004), no. 335; James Beattie to William Creech, 17 April 1773, AUL MS 30/1/40 or Robinson (2004), no. 372.
16 James Beattie to Robert Arbuthnot, 25 April 1790, NLS Acc. 4796, Fettercairn Box 92 or Robinson (2004), no. 1631.
well had a ‘tonic power’ that could be used to improve one’s health. In making this assertion, he was able to connect the substances in the water to chemical theories of illness and health that were being used by physicians in Scotland and elsewhere.21

In Chapter 2 of An account of Peterhead, Laing asserted that: ‘The medical effects of the Peterhead water, as of all other mineral waters, depend on a combination of various causes: but in so far as they depend purely on the water, they are founded chiefly on these three parts of it, the IRON, especially that part of it which is united to the muriatic acid, the COLD WATER, and the FIXED AIR’.20 In addition to these ‘causes’, he held that there were several other notable ingredients. Overall, after experimenting on twelve pounds avoidiupois of the well’s water, Laing concluded that it contained the following substances:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Grains</th>
<th>Cubic Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeriated Iron</td>
<td>3½</td>
<td>–</td>
</tr>
<tr>
<td>Muriated Iron</td>
<td>30/4</td>
<td>–</td>
</tr>
<tr>
<td>Muriated Lime</td>
<td>7</td>
<td>–</td>
</tr>
<tr>
<td>Siliceous Earth</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td>Gypsum</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td>Glauber’s Salt</td>
<td>13 1/4</td>
<td>–</td>
</tr>
<tr>
<td>Common Salt</td>
<td>7 1/2</td>
<td>–</td>
</tr>
<tr>
<td>Fixed Air</td>
<td>–</td>
<td>83 1/6</td>
</tr>
</tbody>
</table>

Although it may not seem readily apparent to the modern eye, all of these substances all had therapeutic value during the eighteenth century.21 In particular, iron, fixed air and coldness were all believed to ‘stimulate’ the tissue of the body. I will treat the medical rationale behind this notion in the next section, but here it will suffice to say that these three substances were all recognised to be a chemical remedy called a ‘tonic’. Laing even pointed this out to his readers by stating that a ‘tonic is used to express what gives strength and spring to the [body] parts’.22 Additionally, both chemistry and therapeutics were changing during the 1790s. In the years that followed the publication of Laing’s first pamphlet, Lavoisier’s nomenclature began to be accepted throughout Europe and medical theories based on body temperature gained increasing popularity. In the wake of such changes, Laing published An account of the warm sea baths at Peterhead in 1804 (the ‘Appendix’) in which he expanded his treatment of hot and cold tempera-ture to include a discussion of the tonic power of the town’s new hot and cold baths.

On the whole, Laing’s thoughts on the tonic power of spa water were common amongst literate Scots. In previous decades, articles or pamphlets had been published on Scottish mineral wells like St Bernard’s Well, Moffat Spa and Dunse-Spaw.23 There was also significant attention devoted to the chemistry of mineral wells in the Statistical account of Scotland (1791–1799). This interest conformed to a larger European phenomenon during the eighteenth century in which the therapeutic value of tonics became inextricably tied to the rise of spa towns.24 With the rise of medical ‘chymistry’ in the seventeenth century, it did not take long for physicians to combine experimentation with commodification. By the 1700s, the pages of Europe’s leading scientific journals all carried a wide array of articles that sought to connect mineral water with therapeutics. In mainland Europe, two wells that were examined frequently were Carlsbad in Bohemia (modern day Karlovy Vary) and Pyrmont in lower Saxony. As the century progressed, a plethora of books, monographs, articles and chorographies were published on the tonic power of the chemical substances contained in mineral wells.25 By the middle of the century, there were numerous local spa towns that espoused the therapeutic power of their water. In England, the most famous were Bath and Bristol, but there were many mineral wells that were frequented by regional, national and international tourists.26 Laing’s experiments on the tonic power of the Peterhead mineral well, therefore, were relevant both to health and the commodification of naturally occurring pharmaceuticals.

4. Tonics and medical theory

In order to understand why tonics were such a desirable commodity, a few words need to be said about the underlying medical theory that legitimatised their usage for Laing and other physicians in Scotland. Tonics were closely connected to cures that stimulated or invigorated the nervous system, which, at the time, not only included the brain, spinal column and nerves, but also muscles and tissues that are now considered to be part of circulatory and digestive systems. William Cullen, for instance, promoted what Bynum has called ‘a single and ultimately indivisible neuro-muscular system’.27 Laing’s publications indicate that he held a similar

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20 The upper case lettering in this quotation occurs in the original text written by Laing.
21 These substances appear in the pages of any early modern pharmacopoeia. A good reference work that lists the names, contents and therapeutic value of eighteenth-century drugs is Estes (1990).
22 Laing (1793), p. 22. A tonic was different from an ‘astringent’, the former was ‘only supposed to contract the [body] parts, as alum held in the mouth does its parts’.
23 For a sample of these publications, see Taylor (1790), Home (1751). For Moffat, see Eddy (2001).
27 The clearest explication of Cullen’s nervous theory that I have encountered occurs in Bynum (1993).
perception of the nervous system—a position that was no doubt influenced by reading Cullen’s works. In his first Peterhead pamphlet, Laing discussed nervous disorders that produced a ‘lamentable affecction both of body and mind, called hypochondriacal or hysterical disorders; which the last complaint is usually nothing else than a debilitated stomach, in an irritable condition, disordered accidentally by passion, or some excess or irregularity’. Based upon his knowledge of medicine and chemistry, he held that the spa’s waters could alleviate these nervous complaints.

Although mineral waters were historically held to have medicinal properties, pharmacology in Enlightenment Scotland used a chemical rationale to explain how the material composition of the water could be used therapeutically to restore health. This type of chemical pharmacology was in full swing by the 1750s when the pharmacopoeias of Edinburgh and London were translated from Latin into English. The causative agent in a drug that instigated material change in the body was often called the ‘active principle’. Physicians of Laing’s generation sometimes linked this active principle to the concept elective affinity, that is, the notion that chemical substances attract or repulse each other based upon a force (affinity) inherent in their material composition. For this reason the concept of affinity was often explained in pharmacopoeias. The causal powers of such principles were linked to a medical theory held that body tissue was made up of fibres that, depending on their composition, could be made to contract or relax. Contraction forced fluids out of the viscera and flesh, thereby making the body hard. Relaxation allowed fluids to seep in, thereby making it soft. If one wanted to maintain a healthy nervous system, one had to make sure that the tissues remained properly balanced between hardness and softness. When the body became imbalanced, drugs with specific types of active principles had to be used to restore the equilibrium. Laing was well acquainted with this medical theory and his comments on Peterhead’s tonic power over dropsy provide a particularly good example:

Drospy also is a disease of debility; wherein the vessels exhaling a fluid into the various cavities of the body for moistening them, from weakness, as is supposed, allow, too great a quantity of the fluid to escape through them; while the vessels take up that fluid, and convey it again into the mass of blood, fail to do their office from want of power. This points out the propriety of Peterhead water, as a tonic and stimulant. Laing’s first pamphlet focused primarily on the tonic substances found in the water. This was motivated by the central role given to tonics within Scottish neohumouralism (Cullen especially liked them) and was also linked to case histories of infirmary patients and the personal testimonies of both affluent and common spa denizens who held that the water had cured their nervous disorders. Based on experiments and patient histories, tonics were associated with specific material substances of chemistry, thereby making matter theory an issue of personal relevance to many people. Indeed, it was common in Lowland Scotland for students and members of the public to learn chemistry by attending medical school courses on materia medica, purchasing their own pharmacopoeias and reading articles in the periodic press. Indeed, even books for young children and adolescents contained apothecary weight tables and conversion charts.

One of the most widely read books on the chemistry of spa water in Enlightenment Scotland was William Buchan’s Domestic medicine. It was first published in 1769 and by 1802 it had gone through at least seventeen editions. As such a popular book, it had a considerable impact on the public’s understanding of the uses of chemistry as a therapeutic cure. The book classified the chemical content of spa water into four categories: ferruginous, gaseous, saline and sulphurous. These categories were directly linked to several irreducible chemical entities (most often called ‘principles’ in English) that guided experimentation during the 1760s: water, metals (ferruginous, that is, a substance containing iron), airs (gaseous), salts (sulphate) and inflammables (sulphur). The only remaining principle was earths, which some believed could not be dissolved fully in water. The process of dividing up the content of spa water into categories that corresponded with chemical principles mirrored practices used to classify minerals and drugs in the medical courses given at Scottish universities.

28 Laing (1793), p. 35.
29 For the history and publication rates of the Edinburgh and London pharmacopoeias, see Cowan (2001).
30 A good example appears in Lewis (1770), pp. 7–29.
31 This rationale of bodily liquidity, softness and hardness used by eighteenth-century doctors is often called ‘neohumouralism’ by historians and it is treated throughout Risse’s (2005) work on eighteenth-century Scottish medicine.
32 Laing (1793), pp. 37–38.
33 For instance, Laing cites both Beattie (a polite professional) and cases from the lower orders of Aberdeen Infirmary. For the latter see Laing (1804), p. 25.
34 The Scots Magazine published a number of chemically related articles every year. For example, the 1787 volume reprinted the Edinburgh Magazine’s summary of the positions the antiphlogistonists and phlogistonists. Obituaries of chemists were also related, including that of Lavosier. See Abridgment of M. Metherie’s retrospective view of the state of natural science for the year 1787 (1787), The life of Antoine Laurent Lavosier (1798) and Account of M. Lavosier (1798). The wider readership of chemistry is addressed in Golinski (1992).
36 Rosenberg (1983).
37 Holmes (1989).
Laing’s treatises argue that the strongest tonic substances in the well were iron, fixed air and cold water. These corresponded to three of Buchan’s categories, that is, categories that were broadly followed by both physicians and the reading public. I shall explore these three substances in detail in the next section.

5. Placing Peterhead’s three tonics

Ferruginous waters were wells that contained iron and they were sometimes called ‘chalybeat’ spas during the early modern period. Although the medical relevance of metals has been generally overlooked by historians, they played a very strong role in Enlightenment Scottish pharmacology. Iron in particular was thought to ‘constringe’ bodily fibres. For those whose nerves needed strong stimulation, pure iron filings were administered in the form of a pill. The easiest way to ingest iron, however, was via mineral water. Based on eighteenth-century chemistry, the only substances that could be fully dissolved in water were acidic or alkaline Salts. If an acid was poured over pure iron, it produced a salt known as ‘Vitriol of Iron’ (sometimes called ‘Salt of Iron’), that is, an acid that contained iron and which could be dissolved into water. Liquids that contained Vitriol of Iron could be made artificially or they could be obtained naturally via ‘chalybeate’ spas. In his first pamphlet on Peterhead Well, Laing stated that the spa’s water contained one whole grain of Salt of Iron to the pint. Such a dosage was considered to be just right for someone whose nerves had become a bit too tense and which needed to be loosened via a slight jolt of stimulation.

Gaseous water was an extremely popular experimental topic during the eighteenth century and it attracted the attention of leading chemists, especially since both air and water were held to be fluids. The tonic power of aerated waters was used for many diseases, two of the most common being a weakened nervous system (which caused sluggishness and inattention) and bladder stones. In Edinburgh, Francis Home and Robert Whytt were particularly interested in them. Their early studies, however, assumed that the gas impregnated in the water was ‘common air’. After Joseph Black (Cullen’s student) demonstrated the existence of ‘fixed air’ in the 1750s, Cullen suggested that this new gas had tonic powers. Over the next three decades, mineral wells that contained fixed air were prescribed based upon the chemical impact they were thought to have upon the body. If aerated water could not be obtained naturally from mineral wells, instruments and salts were also used to impregnate water with fixed air. Some of Cullen’s students even went as far as to suggest that the levels of fixed air in the body needed to be balanced like any other fluid if health was to be maintained.

Laing, on the other hand, was more conservative and stated that ‘I make no doubt that the tonic effect of fixed air lies much more in its rendering cold waters pleasant to taste, agreeable to the stomach, and easy to pass off, than in any strengthening power inherent in itself’. As implied in the quotation above, Laing held that the cold in the water was a tonic. As such, it is difficult to determine if he held ‘cold’ to be a property or a substance; a position that reflected the ambiguous nomenclatural status of ‘heat’ and ‘cold’ at the time. In Scotland, the therapeutic power of coldness had been investigated by Cullen during 1750s, especially in an essay that showed how evaporation facilitated a drop in temperature upon the surface of thermometer bulb. From this experiment, Cullen reasoned that ‘cold’ could possibly invigorate the body, which meant that it was a tonic. Drawing from this work, his pupils pursued further physiological experiments that convinced them that perspiration cooled the body—so sitting in a heated room or taking a walk in cool air, ironically, created a coldness that had a tonic power. Since tonic remedies had to be taken orally, temperature-based therapeutics were sometimes seen as being less invasive and their popularity increased in the 1780s and 1790s, thereby working in conversation with the development of portable, accurate and cheap thermometers. This therapeutic shift also engendered a change in the way that mineral water was administered and, consequently, commodified. Although people continued to drink it, hot houses and cold baths were built on spa sites so that visi-

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39 The therapeutic use of metallic simples dates back to ancient times. For Scotland, see Maehle (1999) and McCallum (1999). See also Lewis (1770), pp. 489–546.
40 Ibid., pp. 492.
41 The English Imperial troy grain at this time was 64.8 mg. Connor and Simpson (2004), p. 758.
42 Including Joseph Priestley (1772).
44 Black (1756).
45 The most well known instrument used to impregnate water with fixed air was Nooth’s apparatus. They were made of glass and were fragile. The first one was designed in the mid 1770s and it soon went on to become popular throughout Britain. Coley (1982) also addresses instruments used to extract gases from mineral water. See also Brownrigg (1765).
46 For the therapeutic relevance of fixed air, Macbride (1764). This book was widely published in multiple editions.
47 Laing (1793), pp. 22–23.
48 Chang (2002). See also the various sections on ‘cold’ and ‘heat’ in Chang (2004).
49 Cullen (1756).
50 The experimental evidence for the tonic power of cold water, as investigated by Cullen’s students during the 1780s, is addressed briefly in Risse (2005), p. 84.
51 Theories of heat and health are addressed in Forrester (2000).
52 For the development of medical thermometers, see Estes (1991).
tors could soak themselves in vaporous heat or cold baths. As ‘coldness’ was a tonic, the most readily available medium for the substance was sea’s water and air—not the water of the mineral well. Laing’s first pamphlet on Peterhead Spa noted this trend and his discussion of coldness focused more upon the town’s sea baths—the extreme cold of which (48° Fahrenheit) contributed to health by ‘gently irritating its [the body’s] nerves and blood vessels, and thereby producing that glow and sensible perspiration on the skin, which are so agreeable after cold bathing’. For those unable or disinclined to bathe in seawater, Laing recommended the benefits of the cold sea air.54

6. Laing as a provincial authority

Up to this point I have focused primarily upon how Laing’s views of the well conformed to therapeutic theories espoused by contemporary medical professionals and professors—none of whom was as familiar with the spa as Laing or even the patients who visited it on a regular basis. I would, therefore, like to turn my attention to the evidence that Laing cited to support the therapeutic claims that he made for the chemical content of the well’s water. First and foremost, he cited the publications of a handful of medical authorities, namely, Torbern Bergman, William Cullen, Carl Linnaeus, James Currie, Count Rumford, William Wright and Thomas Beddoes. Although this may seem like a small number of sources, it should be noted that Laing seems to assume that his readers were vaguely familiar with the basics of chemical therapeutics and that they would accept his medical evidence. This was a common approach in late eighteenth-century Scotland and the pages of local newspapers and the gentlemanly Scots Magazine were filled with chemically based suggestions about health and agriculture.55 Overall, health-related periodicals and books were increasing in number and readership in Britain, thereby creating a more medically literate reading public.56

Aside from summarising several patient histories, the bulk of the empirical evidence in the pamphlets originated from Laing’s own observations; a situation that suggests that he held himself to be an authoritative local expert. Yet, as Laing indicates, obtaining chemical data from the well did have its difficulties. Since he did not have easy access to the metrologically uniform instruments being produced in metropolitan settings, he performed experiments using whatever his locality could provide. In his case, he employed wine glasses, china cups, tin plates ‘tubulated’ into retorts, glass retorts, Florence flasks, glass bottles, siphons, a tin kettle, stoneware cups and tobacco pipes for stirring. Laing also states that he tried to use Nooth’s apparatus in his experiments—but it broke and he could find no one to fix it.57 As most of these items were used regularly by apothecaries, it points to the key role that they played in nurturing chemistry outside large cities.58 Using the above instruments, heat and acids, he was able to perform a variety of chemical processes, including, distillation, filtration, crystallization, evaporation, deliquescence, calcination and phlogistication. With the help of gravimetric tabulation, he determined the number of grains of each substance contained in a twelve pound sample.

Despite the ingenuity of his experiments, Laing disavowed the exactitude of his results. More specifically, he believed that time constraints and the ‘imperfection’ of his apparatus had created some quantities that could not be replicated in future experiments on the water.59 Indeed, on the front page of his first Peterhead pamphlet, Laing honestly stated that ‘the analysis of mineral water is a matter of no little difficulty’. He even felt that some of his results could have been ‘more accurately performed by another’.60 This situation, however, was not unique to Laing or to other rural-based physicians per se. The student-led Royal Society of Medicine in Edinburgh, for example, often made the same complaints concerning the lack of proper facilities and equipment.61 Notwithstanding Laing’s humble protestations, he was able to do a great deal with the tools and materials that he had in his possession and his inability to achieve the exactitude that he desired was less a matter of his skill and more of an issue of limited free time and the financial resources required to acquire or repair equipment.62 In the end, the major difference between the pharmacological legitimisation engendered by Laing’s analysis and that of Scotland’s medical schools was one of scale and the fact that he did not pursue in vitro experimentation. In addition to the above named instruments, Laing also employed several qualitative practices that not only used sight, but also smell and taste to

52 Laing (1793), p. 45.
53 Chapter 5 of Rusnock (2002) gives a helpful overview of the therapeutic aspects of airs (meteorology) promoted during the eighteenth century.
54 The chemico-mineralogical content of the Scots Magazine is addressed briefly in Eddy (2007).
55 Porter (1985). A basic knowledge of medical theory was often encouraged among polite members of British society (see Golinski, 1992, pp. 11–49). For continental Europe, see Chapter 6 in Steinke (2005).
56 This list of Laing’s instruments is a bit more basic than types of apparatus that Peter Shaw (1734) believed was needed for mineral water analysis. Shaw’s list is reprinted in Coley (1982, p.128). For chemical experiments occurring outside university laboratory settings in Scotland, the Duke of Argyll’s instruments have received the most detailed attention. Many of them are catalogued in Emerson (2002).
57 Laing most probably obtained his instruments from James Arbuthnot, the local apothecary.
58 At the start of his experiments, he had hoped to track the water’s quantity of fixed air by using a Nooth’s Apparatus; however, to his consternation, it broke and he could not get it repaired.
59 Laing (1793), p. 18.
61 Laing’s time was monopolised by house repairs and other political and ecclesiastical responsibilities. This explains why it took him at least a year to write the first pamphlet. James Beattie to Robert Arbuthnot, 9 July 1792, AUL MS 30/1/332 or Robinson (2004), no. 1769.
determine the water’s contents. In one instance he even postulated the presence of iron by noting its metallic smell. Although his measurements may not have been as exact as he wanted them to be, he trusted his own analyses enough to propose cures that were based on the substances that he thought the water contained. From the start he recognised that the positive nervous effects of the water, in most instances, could be known only by analogy. As he had been drinking the water for over twenty years, he considered himself an expert authority and he states how the water invigorated him on numerous occasions. He also cites instances where he had personally witnessed the ameliorative effects of the water. For instance, in his section ‘Of disorders that required strengthening’, he states that the water had cured a woman who suffered from the ‘sinking of the spirits’ and convulsions (that is, two nervous disorders). He also considered himself to be authoritative enough to recount case histories that had been witnessed by others. Even so, for the most part, Laing concentrates on the palliative effects of the tonic substances isolated in his experiments. There are only a few references to any type of systematic therapeutic observation on the scale that was occurring in infirmaries that were used as teaching hospitals by medical professors (especially the Royal Infirmary in Edinburgh). Thus, determining the tonic substances in the water alone seems to have been good enough for the type of audience the he knew would be reading his pamphlets; and this shows that both chemical analysis and medical theory were used in provincial settings to make mineral waters into a medical commodity.

7. Other local authorities

Laing’s treatment of the tonic abilities of cold water was limited in the first pamphlet and this point was soon noted by the Reverend Dr George Moir when he wrote Peterhead’s entry in the *Statistical account of Scotland* during the mid 1790s. Moir was the Presbyterian minister of the town and his interest in the chemistry of the well stretched back at least to 1773 when he had corresponded with Joseph Black about the water’s contents. Moir’s article accepted Laing’s chemical analysis of the well’s composition, but differed on the therapeutic effect that Laing had assigned to it:

This water has long been deservedly in repute, for general debility, disorders of the stomach and bowels, flatulences and indigestion, nervous complaints which flow from these causes, and diseases peculiar to the fair sex; and in all these disorders, I can from 30 years of observation and experience affirm, I know of no remedy no more efficacious.

Having establishing himself as a local authority, he then unabashedly criticised the therapeutic value that Laing had attributed to the metallic and gaseous tonics in the water. Moir opposed the stimulatory power of tonics as being too harsh and he favoured the relaxatory effect of diuretics, diluents, fomentations and opiates. To challenge Laing, Moir used evidence gathered from patient histories (especially on dropsy) and from Francis Home’s *Clinical experiments*, which ‘strongly recommended’ laxatives, diuretics and deostruents. In expressing this view, Moir was voicing a turn against stimulants that was moving through the Scottish medical community during the 1780s and 1790s (especially after the death of Cullen in 1790). In addition to these relaxatory alternatives, Moir also asserted that the therapeutic value of bathing was inhibited in Peterhead due to lack of a ‘warm bath, and a bathing machine on the sea-beach’. Although his criticism of tonics was well grounded in medical theory, he gave little attention to Laing’s comments on cold water sea bathing and this oversight might possibly be linked to differing political opinions and not medical theory.

In addition to Moir’s authoritative comments, James Beattie also considered himself knowledgeable of medicinal qualities of the well’s water. Although he was familiar with the authors and principles of medical chemistry, his main interest in the water was the tonic power that it had over his many maladies. Over the course of his adult life, he was plagued by a weak and over-worked nervous system that engendered headaches, a ‘windy’ stomach, weak bowels, ‘depression of spirits’ and vertigo. During the Enlightenment such disorders were often associated with intellectuals, as the process of intense thinking was thought to weaken the nerves. Additionally, his son Montagu was sickly as a child.

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63 Laing (1793), p. 4.
64 Ibid., p. 35.
65 The nature and efficacy of the therapeutic treatments in Edinburgh’s Royal Infirmary are addressed in Risse (1986) and Tröhler (2000).
66 Moir (1795).
68 Moir (1795).
69 Home (1780).
70 Cullen’s therapeutics were particularly under attack by the followers of John Brown (‘Burnonians’) at this time. They challenged the analogical and inductive links that had been made between chemical substances (including heat and cold) and the cures engendered by drugs. See Bynum & Porter (1988).
71 Moir engaged in a heated war of words with Laing and Beattie during the 1780s in a disagreement over non-jurors. William Laing to James Beattie, 13 December 1788, AUL MS 30/2/579 or Robinson (2004), no. 1540.
72 Beattie was especially fond of Priestley’s work in chemistry. James Beattie to Elizabeth Montagu, 27 May 1774, AUL MS 30/1/78 or Robinson (2004), no. 556. Additionally he believed in its tonic power all the way up to the end of his life. William Laing to Sir William Forbes, 1 November 1803, NLS Acc. 4796, Fettercairn Box 95 or Robinson (2004), no. 2031.
and his wife, Mary, suffered from a nervous disorder that eventually led her to be committed to an asylum.74 Thus, James, Mary and Montagu all frequented the well for their nervous illnesses. The Beattie physicians were John Gregory, George Skene, Thomas Livingston (physician to the Aberdeen Infirmary) and Laing. As was common, they all prescribed spa water for nervous conditions. Laing even used James Beattie (who he named the ‘benevolent Dr B****’) as one of his case histories in the first Peterhead pamphlet.75 Although he was familiar with the waters of Tunbridge, Pitcaithly and Pannoninich, Beattie’s letters repeatedly emphasised that he preferred the active principles of Peterhead’s water and the air of its surrounding environment. Indeed, Beattie both drank and bathed in the well’s water.76 From the early 1760s until his death in 1803, he spent much of his free time residing in Peterhead and, as a result, much of his summer correspondence was written from the town. A close look at these letters reveals that Beattie rarely verbalised a link between the water’s individual chemical substances and the active principles that it had upon his nervous system. Since he was suffering, he was mainly concerned about its effects. The same can be said for other chemical remedies that he took (Peruvian bark for example). Since Laing served as his personal physician in Peterhead, it was he, not Beattie, who seems to have made the links between the chemical content of the water and its various therapeutic powers. So once again, though Laing denigrated the imprecision of his chemical prowess, it did not make him reticent to employ medical theory based upon chemical assumptions. Like Moir, Beattie’s belief in the internal tonic power of the water’s substances had started to wane and by the late 1780s and, as a result, he drank less of it. Having imbibed the water so many times, however, he had come to a point where he thought he could prescribe it to himself. As he stated in a letter to Sir William Forbes in 1788:

I was in very low spirits:—and, in a sort of despair, as a last resource, I thought of drinking the mineral water (which for some years I had not tasted, as it generally did me more harm than good) and of drinking it upon a new plan of my own contrivance. Instead of taking it with an empty stomach and exercise after it, which is the established method, I drink it at six in the evening, at going to bed, and between three and four in the morning, sleeping after it. It has produced one symptom, which every body tells me is a favourable one [flatulence] . . . and I am upon the whole much better.77

The key point here, however, is that his self-prescription does not seem to have featured any sort of chemical calculations; rather, it was based principally on past experience of the water’s palliative effect. Whereas he valued the water’s gaseous and metallic substances in his youth, his latter years saw him turn to tonics that were based upon the ‘substances’ of hot and cold, the medium of which could be either the fluids of the well or the local air. So, though he trusted Laing’s medical expertise, he felt that he understood the effects of the water well enough to medicate himself—the basis being his own testimony of the water’s ameliorative powers.

8. A context of commodification

Although Laing, Moir and Beattie had minor disagreements about the uses of Peterhead’s water, they all agreed that it improved one’s health. Such a quality did not go unnoticed by local entrepreneurs. As Laing relates in his pamphlets, the town of Peterhead had rapidly expanded in recent years. From the 1770s to the 1790s it had doubled its size from a few hundred residents to a population of well over five hundred. Its economic success was largely dependant on its role as a base for fishing vessels and as a port for cargo ships arriving from Europe (Norway, Sweden and Holland), England (Newcastle, Sunderland and London) and Scotland (Leith and Inverness). With the rise in trade also came increased accessibility for tourists and one of the leading local groups that sought to exploit this potential market was the town’s Freemasons.78 In 1793 the society bought a plot of land adjacent to the well. Under the leadership of James Arbuthnot (junior), the town’s apothecary, the society improved the facilities available to visitors. Such an investment was predicated upon the expectation of financial success. It should come as no surprise, therefore, to see that Laing’s first pamphlet appeared during the very same year that the Freemasons began to invest seriously in the well. Indeed, since the initial order of one hundred copies sent to Peterhead sold rapidly, they were no doubt bought by those who frequented the site.79 Since most of

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74 Robinson (1996).
75 Laing (1793), p. 72.
76 References to his drinking and bathing in the water are made throughout his correspondence from the 1760s up until his death. An outline of his health (and that of Mary Beattie) is given in the introduction of Robinson (2004).
77 James Beattie to Sir William Forbes, 10 July 1788, NLS Acc. 4796, Fettercairn Box 92 or Robinson (2004), no. 1499.
78 I have not been able to ascertain if the Freemason’s Lodge employed any other local physician to test the well’s waters, nor if they stocked the pump room’s reading other types of medically relevant reading material. For the interaction between Freemasonry and natural philosophy, see Elliot & Daniels (2006). The reading rooms of spas and the presence of spa pamphlets in reading libraries is briefly addressed in Grenby (2002, see especially pp. 24, 31).
79 Despite the Aberdeen printer (Chalmers) of the pamphlet being crippled by gout, it still proved to be popular. James Beattie to Robert Arbuthnot, AUL MS 30/1/33 or Robinson (2004), no. 1804; James Beattie to William Laing, 10 October 1793, NLS MS 3648 f. 169 or Robinson (2004), no. 1820b. Once Chalmers recovered later in the year, he was keen to get Laing to write a supplement. Laing, however, complained of slow sales, but it was probably his busy schedule that postponed the publication of the ‘Appendix’ to 1804. William Laing to James Beattie, 6 November 1793, AUL MS 30/2/696 or Robinson (2004), no. 1834.
the paying visitors would have come from the upper ranks of society, Laing was quick to mention that the well’s clientele included ‘ladies and gentlemen’ and ‘senators, judges, philosophers, military officers, clergy, [and] merchants’.

As implied throughout both pamphlets, Laing was extremely keen to commodify the water so that both he and the town could reap the financial rewards. Beattie summarised this plan in a letter that he sent to Sir William Forbes in 1793:

Our friend Laing at Peterhead has, at Mr Arbuthnot’s desire and mind, written an Account of Peterhead, its mineral water, air, and neighbourhood: it is a pamphlet of 80 pages closely printed; and I think will do honour to him and good to the public; I hope too he shall get a little money by it. It is dedicated to the Merchant main Hospital, who certainly ought to make him a handsome present, as his work can hardly fail to draw strangers to Peterhead, and so raise the value of their property.

Laing’s recommended dosage for the water was one gill per day for six weeks and he also recommended regular bathing. Since summer admission to the Society’s pump room cost one guinea and each bath cost a shilling, it is clear that the Lodge benefited from the medical legitimacy that Laing’s case studies and chemical analyses gave to the well. So in this sense, Laing’s comments on its ferruginousness, gaseousness and coldness worked hand in glove with the well’s commodification. In addition to entrance fees, visitors also had to pay for accommodation, meals and entertainment—all of which benefited the local economy. By the mid 1790s, the summer spa business was booming in Peterhead and in 1795 the Lodge added cold and warm baths, contiguous with the well, that used sea water on account of the ‘the gentle stimulus of the saline particles applied to the nerves and vessels of the skin’. The cold bath ranged between 46° and 48° Fahrenheit (the normal temperature of the sea) and the warm bath was heated to 96°. This use of hot and cold baths followed similar additions to other European spa towns (Bath and Carlsbad for instance) and by 1799 James Arbuthnot had installed a 40 by 20 foot gentleman’s bath and turned the Mason’s Lodge into a pump room where nerves of visitors could be stimulated by drinking coffee or relaxed by listening to organ music. As Laing kept pace with the broad contours of the medical literature on the subject, his 1804 ‘Appendix’ included a thorough examination of the temperature of the town’s well, seawater and air. It is unclear as to whether his interest in this topic engendered the addition of the baths, or if the lucrative prospect of the baths motivated him to investigate the therapeutics of temperature-based cures. In any case, both prospects worked in conversation with each other.

One of the most authoritative texts during the late 1790s that addressed the tonic and relaxatory powers of temperature was James Currie’s Medical reports on the effects of water, cold and warm (1797). Other notable works were published by Count Rumford, William Wright and Thomas Beddoes. Though the temperature of aerial and aqueous fluids had a long therapeutic history, these works were written during the change over from the older principle-based classification system of chemistry to that proposed by Antoine Lavoisier and his colleagues. Like cold, in the 1790s, heat (or caloric) was still treated as therapeutic substance. Laing competently discusses all of the above-mentioned sources in the ‘Appendix’ and relates their therapeutic conclusions to Peterhead’s waters and airs. In doing so, he introduced names taken from the French nomenclature and new therapeutic appellations, thereby popularising the chemical terms to locals and visitors who may not have previously encountered them. Laing also used the work of Currie to set the record straight with the Reverend Dr Moir’s accusation that he did not properly understand the therapeutic value of using heated or cooled water. Although he did not specifically state Moir’s name, he strongly criticised the ‘wrong direction’ given by other local ‘advisers’ who offered poor advice on account of their ill knowledge of the medical theory behind temperature based therapeutics. In doing this, Laing used his knowledge of contemporary chemistry and medical theory to establish himself as an authority over the therapeutic value of the water, thereby establishing his expertise over other potential competitors—a move that no doubt fattened his pocketbook and his pride.

9. Conclusion

In this essay I have used the Reverend Dr William Laing’s thoughts on mineral water to dig a bit deeper into provincial notions that shaped his understanding of a tonic in the Scottish province. One of the reasons that I chose him as a subject stemmed from my interest in how chemistry was used to make mineral water a medical commodity on a local level. In excavating his career, an interlocking

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80 Laing (1793), p. 75.
81 James Beattie to Sir William Forbes, 23 February 1793, NLS Acc. 4786, Fettercairn Box 94 or Robinson (2004), no. 1796.
82 Laing (1793), pp. 49–50. A gill was a ‘measure of liquid capacity, being 1/16 of a pint, ¼ of a mustchkin’ (Connor & Simpson, 2004, p. 758).
83 Laing (1804), p. 18.
84 Currie (1797). Currie’s work on the therapeutics of heat and cold are addressed in Forrester (2000).
85 Wright (1786), Thompson (1798) and Beddoes (1799). Notably, Currie, Beddoes and Wright studied medicine in Edinburgh under Cullen and Black. For the chemistry of temperature at this time, see Cullen (1756) and Black (1770)—although it must be kept in mind that that the latter source was a pirated edition.
86 Ibid., pp. 15–16.
87 Ibid., pp. 10–11.
world of cross-professional categories has emerged. Although he started out as a minister, Laing ended up becoming a provincial medical expert in Peterhead. As the careers of Moir and Beattie suggest, the movement from an ecclesiastical authority to that of medicine, natural history or even natural philosophy was not uncommon at this time. The intellectual context that sustained this type of transfer no doubt stemmed from the larger epistemological coherence generally shared by students educated in Scotland’s universities. Such a situation, however, complicates the idea of a ‘provincial’ physician. Even though Laing was a ‘local’ authority, his factual knowledge of non-local materials (solvents) and techniques was based on what he had learned (either orally or in print) from medical leaders based in universities. Thus, whilst the material under analysis (mineral water) was indigenous, Laing’s initial intellectual training was not. This point is further supported by the fact that his pamphlets gave no significant attention to other local medical or chemical authorities who lived in the town—especially that of James Arbuthnot, the local apothecary.

Drawing from the medical theories being taught in Scotland, especially in the work of William Cullen, Laing believed that his knowledge of chemistry strengthened his role as a medical authority. It was for this reason that he dedicated so much of his time to isolating the substances contained in the well. Furthermore, even though there were several different types of substances with ‘active principles’ contained in mineral water, Laing was particularly interested in iron, fixed air and coldness because their tonic powers were believed to ameliorate nervous disorders. This knowledge of chemistry affected Laing’s work on the well in two significant ways. First, in practice, he used gravimetric analysis and simple forms of instrumentation to determine composition. Second, the ameliorative effects of the tonic were implicitly linked to the neohumouralist theories concerning the hardness and softness of body tissue. Crucially, even though Laing’s views on chemistry were shaped by university-based medical professors, his Peterhead pamphlets show that he and his target audience were well attuned to the basic contours of chemical practice and theory.

Although Laing cites several prominent medical theory texts, he does not mention any of the chemical experiments on the well that had been conducted in recent decades by professors like George Skene or Joseph Black. The absence of such readily identifiable academic authorities suggests that he did not intend for his study to be comprehensive. Relatedly, the explicit absence of specific local authorities, does not mean that Laing’s knowledge of the well’s contents or therapeutic powers was not influenced by local knowledge. On the contrary, Laing’s instruments consisted of local objects commonly associated with the apothecary trade, as well as the laboratories of universities. In other words, the instruments that ‘made’ the water were by no means elaborate and this points to ordinary forms of analysis that played an important role in provincial settings where material substances were being medically commodified. Such a state of affairs links up with Peter Galison’s work which has suggested that instruments of experimenta-

tion are inherently tied to economic and technological endeavours not traditionally associated (in a historiographical sense) with the scientific enterprise. Additionally, even though Laing cites how the well benefited his own health, by in large, his knowledge of its ameliorative effects came from the testimony of patients. Thus, in order to verify the ‘power’ of the well’s tonics (which was implicitly undergirded by a chemically infused medical theory), Laing had to depend upon local actors.

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