# A Scottish Veterinary Remedy for an Irish Cattle Problem: The Rise and Fall of Davidson's Red Water Cure 1872 to 1938

### Abstract

The rapid transition from arable to dairy farming in Ireland following the Great Famine presented many challenges which included the spread of animal diseases. Providing solutions to these problems offered opportunities for entrepreneurs throughout Great Britain. This paper explores the origin and decline of a treatment for red water disease in cattle against the changing political and economic situation in Ireland. It draws heavily on correspondence between the Scottish proprietor of the remedy and a range of correspondents in Ireland. The product prospered with the expansion of Irish dairy farming from the 1860s, but came to an abrupt end largely as a result of the 'economic war' between Britain and Ireland in 1938. It also shows that some British entrepreneurs went to considerable lengths to defend their export trade to Ireland, not least the trade in veterinary medicines.

138 words

## Keywords

Irish; Scottish; entrepreneurs; animal disease; dairy cattle; red water; cure.

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## Introduction

In the mid-nineteenth century farming in Ireland was in a state of turmoil. Whilst larger farmers made a comfortable living producing cereals, small tenant farmers relied almost exclusively on the potato to sustain their families. When potato blight struck in 1845 the population quickly starved, leading to what became known as the Great Famine.<sup>1</sup> In 1846 there were still around 150,000 so-called 'well-off' farmers with an average holding of between fifty and eighty acres. But following the end of the Famine in 1852 Ireland reassessed its agricultural policy as part of its plan to rebuild its economy, with the aim of moving away from dependence on the potato.<sup>2</sup> The Corn Laws (trade barriers designed to protect cereal producers in the United Kingdom against competition from abroad) had been repealed shortly after the start of the Famine. Their repeal and the clearance of small tenants from estates facilitated a switch from crops to animals.

A rapid switch in Ireland's agriculture thus occurred, from crops to animals, from grain to pasture. The country moved increasingly from arable to dairy farming, leading to the increasing use of land for pasture.<sup>3</sup> Large grazing farms emerged, such that beef and butter production quickly became more important than corn.<sup>4</sup> Profits from pastures increased with rising prices after 1850, whilst the price of corn stayed more or less the same. By 1881 twice as much land was used for pasture as was used for growing crops. The number of cows in Ireland increased accordingly.

Farms with large numbers of cattle presented huge challenges, amongst which was dealing with the various diseases to which cattle were subject. One to which cattle in Ireland were particularly susceptible was red water disease. Red water and cattle tick disease were names given to the condition now known as babesiosis, a tick-borne disease caused by

parasites.<sup>5</sup> These organisms invade blood cells, and are transmitted from animal to animal by ticks. The ticks suck blood from an infected animal, later infecting other animals to which they become attached. The parasites perforate the red cells and release haemoglobin, which is removed from the blood stream by the kidneys. This colours the urine red, giving the disease its name. Clinical signs of infection usually appear between one and three weeks after infection.<sup>6</sup> Affected animals usually appear unwell, lose appetite, become jaundiced, and their eyes and gums appear pale from anaemia.<sup>7</sup> In severe cases, signs include lack of coordination, paralysis and coma; if left untreated, cattle suffered a slow and painful death.<sup>8</sup> The disease can occur almost anywhere, but it thrived particularly in the damp conditions found in Ireland and Scotland.<sup>9</sup>

Red water disease represented a considerable risk to Irish economic recovery when this relied so very heavily on dairy farming. The promise of an effective treatment for such a condition therefore presented a substantial opportunity for entrepreneurs both at home and abroad, given the scale of cattle farming in Ireland. Yet the devastating loss of population of previous decades through famine and emigration resulted in a great loss of relevant expertise, meaning that few Irish entrepreneurs had either the capital or the expertise to quickly take advantage of the opportunity. It was, however, not missed by entrepreneurs in Scotland.

In the nineteenth century chemists' shops were the usual source of animal remedies for farmers,<sup>10</sup> and whilst most Victorian pharmacists were content with selling a range of veterinary products to local farmers, others were more ambitious. Some developed their own products, promoted them heavily, and established large scale manufacture. One such product emerged from the pharmacy of Davidson and Kay in Aberdeen, which Charles Davidson had set up in 1834. The partnership was established in 1862, when Davidson took James Petrie Kay, who had just completed his apprenticeship with him, as his business partner.<sup>11</sup> Initially the firm ran a high class pharmacy in the centre of Aberdeen, and with the regular attendance of Queen Victoria at Balmoral and the need to supply her with medicines they soon acquired a

Royal Warrant of Appointment, in 1884.<sup>12</sup> In 1876 Davidson retired, and in 1889 Harvey George Kay, James' oldest son, was taken on as a partner. A second pharmacy was opened in a working class area of the city. The two Kays, father and son, were to be the key players in the Irish trade in Davidson's Red Water Cure (hereafter 'the cure').

Today Aberdeen Museum holds extensive correspondence relating to the product between the firm and farmers, wholesalers, newspapers and government officials in Ireland, which have recently become available. The life story of a cure for the treatment of red water in cattle developed by a small pharmaceutical chemists' business in Aberdeen illustrates not only the evolution of such products but also reflects the changing fortunes of Irish dairy farming in the late nineteenth and early twentieth centuries.<sup>13</sup> In fact, the lifecycle of the cure went through three main phases; an initial phase of promotion and recognition by both farmers and vets, closely associated with changes in Irish agricultural policy; a second phase of protection and growth, associated with the consolidation of dairy farming; and a final phase of decline, associated with developments in pharmacology, alongside De Valera's 'economic war' with Britain in 1938. This paper covers the life cycle of the product from 1872 to 1938.<sup>14</sup>

## **Red Water Cure and Irish cattle 1870-1877**

### **Contents and production**

The cure itself was a simple product, containing just five ingredients. It was made in batches of 33 gallons (about 150 litres) on the premises in Aberdeen. The cure was made by mixing together 10 gallons of linseed oil, 18 gallons of turpentine, 4½ gallons of spike lavender oil, 6¼ pounds of tar, and 6¼ pounds of red anchusa. Turpentine and linseed oil were both used as laxatives for horses and cattle. Tar was used as an antiseptic and antipruritic to prevent itching, and as an expectorant to treat coughs. Lavender oil, of which 'spike' was an inferior version, was used in the treatment of flatulence and colic, although it was also applied externally as an insect repellent. It was used in pharmaceutical preparations to cover disagreeable odours, and also had preservative properties.<sup>15</sup> Red anchusa, from dried roots, contains a red dye used for colouring oily preparations.

Red Water Cure was one of several liquid products manufactured in bulk on the Aberdeen premises of Davidson and Kay. The manufacturing unit produced a wide range of products. With access to a limitless supply of cod brought in by the fishing fleet emulsion of cod liver oil was also made in large quantities. The bulk of the work was done by apprentices under the supervision of one of the pharmacists. Many thousands of pills (i.e. medicated spherical masses) were also made, with one apprentice making 57 dozen (nearly 700) pills in a single day.<sup>16</sup>

# Launch of cure

The cure made its first appearance around 1870. It seems to have been the brainchild of Davidson. The earliest reference to it appears in a testimonial included in an advertisement in 1872. The product was already in use in the Aberdeen area by that date. A George J. Walker, Esq., of Porthlethen, is quoted from a paper he read on 8 January 1872 at a meeting of the Kincardineshire Farmers' Club at Laurencekirk on the 'Breeding of Polled Cattle.' He described 'a wonderful cure for red water in cattle, which is prepared by Mr Charles Davidson, druggist in Aberdeen'. Walker claimed that it had been of great use in his district, never failing when properly applied. He thought that in districts where this disease was prevalent, no owner of stock should be without it (Figure 1).<sup>17</sup> Over the next year or so other testimonials followed. Davidson received a letter dated 25 March 1874 from a satisfied farmer in Aberdeenshire by the name of Hugh Burnett. 'I bought a bottle of your Red Water Cure from Mr Laurie, chemist, Banchory, which proved very effectual. It is a thing I can with confidence recommend to others.'<sup>18</sup>

Word spread rapidly, both to other parts of Scotland, and to Ireland. The trade was undoubtedly helped by the long-standing links between Ireland and Scotland; Belfast was only a four-hour steamship journey from Glasgow, and the Scottish population of Belfast

increased six-fold between 1851 and 1911.<sup>19</sup> The earliest mention of the Irish connection appears in a request dated 18 September 1873, from a veterinary surgeon in Limerick. He asked Davidson and Kay to send him by return of post a 6/6d bottle of their Red Water Cure. He was 'inclined to set a very high value on it for its powers of arresting the haemorrhage', although, he admitted, he sometimes had considerable difficulty afterwards in achieving the proper opening of the animal's bowels.<sup>20</sup> By 1876 orders were coming in from across Ireland. The firm received a letter from Castlebar in Co. Mayo, enclosing an order for £1 worth of the Red Water Cure, helpfully suggesting that it could be delivered to Balla railway station on the Midland Great Western Line (Ireland).<sup>21</sup>

With Davidson's retirement in the summer of 1876 his partner James Petrie Kay began to explore possible agency arrangements and newspaper advertising in Ireland. He received a letter dated 18 July 1876 asking if he would like to advertise the product in local papers in Co. Mayo. The letter also offered advice on setting up agencies in Ireland, and drew his attention to the advisability of his advertising his 'invaluable medicine for Red Water Cure' in their paper. The writer stated that he occupied the position of both grazier and newspaper proprietor, and from what he knew of the medicine he regretted that it was not more generally known in Ireland. His paper had an excellent provincial circulation, he claimed, and he thought Kay might know this from what he had heard from users of the product. Finally he advised Kay to appoint agents.<sup>22</sup>

A problem for all those ordering the cure was the high carriage costs. This lead to some farmers ordering very large quantities at a time. In a letter dated 8 November 1876 a customer asked Kay to send him six gross of the Red Water Cure by steamer to Westport. Furthermore, he should send it without delay, as the steamer sailed for Westport on the 14th. He enclosed a cheque for nine pounds. At the same time he expressed the wish that Kay might manage to pay the carriage to Westport, or if not that perhaps he could write to the agents of the boat to see if they might take it at a low rate, 'for they charge entirely too much carriage'<sup>23</sup>

Another order was for four dozen bottles. The customer explained that the reason for ordering so much at one time was because the carriage coming over to Ireland was so high, 'and I am told I will get four as cheap by mail as two dozen.'<sup>24</sup>

#### **Testimonials**

Kay embarked on an extensive advertising campaign in Ireland. As with the advertising of other products at the time it was supported by the liberal use of solicited testimonials. An advert for the cure around 1880 (Figure 1) was supported by extracts from a few of the numerous letters received from gentlemen in Ireland giving their experience of the medicine, and who had 'kindly allowed their names to be used as recommending it.' These included quotes from J. Studdert Mason of Belle-wood, Templemore, Co. Tipperary ('It is the best remedy I have ever used, and I can recommend it with confidence to graziers') and Thomas Gallagher of Moyode Castle, Athenry, Co.Galway ('I consider your medicine invaluable; every farmer and grazier should have a supply').

The cure was given internally, and full instructions were given on the bottle. It was diluted with water before use. Some farmers adapted the instructions on the strength of their own experience. One customer wrote: 'I had a very stubborn case last week, treated it for five days before a change was effected, persisted in your medicine, and now [it] is well and out again. [I use ten] drops in a pint of lukewarm water, given every eight hours until the disease is checked.'<sup>25</sup>

## **Promotion and Distribution**

Awareness of the product was initially spread by word of mouth. In a letter from South Park, Co. Galway, dated 12 November 1876 a customer stated that he had heard through his friend Mr Pollak who resided nearby that Davidson and Kay had 'a valuable remedy for bloody urine in cattle'. He had found the product invaluable for treating cattle suffering from this disease.<sup>26</sup>

At some point early on the decision was taken to distribute the product through a network of wholesalers rather than to undertake the onerous task of supplying direct to farmers, except to personal callers to the shops. Certainly by 1898, and probably much earlier, they were using a local Aberdeen wholesale agent, W. Paterson and Sons. An advertisement for Davidson's Red Water Cure appears in Paterson's wholesale catalogue of 1898.

Kay soon took up the suggestion of appointing local wholesalers, approaching two of them independently. Both were keen to have the business. However, he received a letter dated 18 July 1877 from McMaster, Hodgson & Co, Wholesale Druggists and Oil Crushers, of Capel Street, Dublin, warning him that he had a competitor. They feared that unless Kay reduced his prices for the Red Water Cure there would be no market for it. The trade would not take it up on these terms. They claimed that 'another party' was now sending out the same preparation at a price 25% lower than his. They indicated that once this product was widely advertised in Ireland Kay's would be pushed out of the market.<sup>27</sup>

Kay immediately sought advice from the other wholesaler about both competitor products and advertising. He received a letter five days later from Mssrs Boileau & Boyd, Wholesale Druggists and Manufacturing Chemists of Bride Street, Dublin. It advised him which newspapers to advertise in: 'Our leading daily papers are *Irish Times, Daily Express, Freemans Journal, Saunders Newsletter*, and weekly *General Advertiser*. All good papers. If [you] write to any of the offices and, say Dublin, you will get a paper and their list of charges.'<sup>28</sup>

A few days later he received a second letter from Boileau and Boyd concerning the competitive product. They had obtained a sample bottle from the party concerned, and found it to be 'put up exactly like yours'. They suggested that if Davidson and Kay advertised their cure and gave Boileau and Boyd sole agency, 'with adequate terms for our trouble', they could build up the trade in the heart of Ireland where the greatest demand was. The *Irish Times* was the best medium for advertising.<sup>29</sup>

Kay wrote back suggesting that Boileau and Boyd be one of two agents for the product in Ireland (having already appointed McMaster, Hodgson & Co. as the other). The suggestion was not well received. They replied on 8 September 1877: 'When we heard from you about your [other] agency we did not anticipate it, not to be divided, and we refused an agency for a similar article. The fact is the country is not large enough for two agencies, and previous to taking up the offer we should like to hear from you.'<sup>30</sup>

Boileau and Boyd seem to have quickly re-assessed the potential size of the business, since they subsequently agreed to be one of several agents after all. Indeed, such was the success of the product that by 1880 the firm had appointed no fewer than seven wholesale agents in Dublin alone (see Figure 1), with three additional agents located in Belfast, and one each in Cork, Limerick and Londonderry.

## Sales

Figures for volume of sales of the Red Water Cure have not survived, although some indication of it can be gleaned from both the number of wholesale agents appointed and the size of some of the orders despatched, which frequently extended to several dozen bottles. A conservative estimate is that on average one batch of thirty-three gallons (150 litres) was produced each week, or around 1,650 gallons (7,500 litres) per year. However, detailed costings for the cure have survived<sup>31</sup> (Table 1). The total cost of producing a thirty-three gallon batch of Red Water Cure, using spike lavender oil, was £11 12s 9d.

Ingredient	Quantity	Cost per unit	Cost per batch
Spike Lavender oil	40 lb	@ 3s 2d per lb	£6 6s 8d
Linseed oil	10 gallons	@ 2s 4d per gallon	£1 3s 4d
Turpentine	18 gallons	@ 3s 9d per gallon	£3 7s 6d
Red anchusa	6¼ lb	@ 1s 4d per lb	7s 8d
Tar	6¼ lb	@ 1s 4d per lb	7s 7d

 Table 1: Cost of ingredients for batch of Red Water Cure

An alternative costing was calculated if the cure was made with the more expensive BDH oil of lavender (supplied by British Drug Houses Limited). The cost of this was 4s per lb, which gave the cost of the whole product as £13 6s 1d. These two costings were then averaged to give a final cost of £12 9s 5d. The extent to which the BDH oil of lavender was actually used is not known. It would appear that it was used when the cheaper spike lavender oil was not available.

The product was packed into bottles containing 2oz, 4oz or 9oz of the cure respectively. These were very small volumes for a large animal, but the dose given was measured in drops. It was then sold in bottles originally selling for 1/6d, 2/6d and 5/-, although later the price went up to 2/-, 3/6d and 6/6d respectively. Directions for use appeared on each bottle. The costings to the wholesaler survive, with everything costed to the nearest fifth or third of a penny.<sup>32</sup> Since thirty-three gallons cost an average of £12 9s 5d to make, one gallon (or 160oz) cost 7s 6 2/3d to make. So, in the making of one gross of 2oz bottles of Red Water Cure the costs were 144 x 2oz of Red Water Cure = 13s 7 1/5d plus the cost of the bottles. Since 144 x 2oz empty bottles cost £1 1s 0d, the total ingredient plus container cost of the cure was 13s 7 1/5d plus £1 1s 0d or £1 14s 7 1/5d.

The empty bottles cost more than their contents. A gross of empty 4oz bottles cost £1 4s 0d, and a gross of 9oz bottles £1 15s 0d, making the cost of a gross of 4oz bottles of Red Water Cure £2 11s 2 2/5d, and a gross of 9oz bottles £4 16s 2 1/3d. The cost to the wholesaler of one gross of the 2oz size was 2/-x 144 = 288/-, less a third (96/-) = 192/-, less a further 5% for cash; this equated to 9s 7d, which meant that the price actually paid was 182s 5d, or £9 2s 5d. Since the ingredient and container cost was just £1 14s 7 1/5d, the selling price was about 530% of the ingredient cost. This of course takes no account of the production costs or wholesale and retail margins. Nevertheless, the product was clearly very profitable. The margin was even greater for the larger sizes; the cost to the wholesaler of a gross of the 4oz bottles was £15 19s 3d, and the cost of a gross of 9oz bottles was £29 12s 9d.

# Trade mark registration, advertising and promotion 1877 to 1930

The threat of serious competition to the Irish trade in the summer of 1877 galvanised Kay into action. Fortuitously the Trade Mark Protection Act had just been passed, in 1875. Kay promptly set about seeking advice about registering the words 'Red Water Cure' as a trade mark, but on behalf of 'a friend'. He received a detailed reply, telling him that his 'friend' could register the words 'Red Water Cure' as a Trade Mark provided that he could sign the declaration that he was entitled to the exclusive use of such words as a Trade Mark, and also that he had used the same before the 13th August 1875, the date of the passing of the Act. If he has not used such words before that date they could only be registered in conjunction with a distinctive device. He was advised that it might be advisable to register both the words and the label 'if such is distinctive'.<sup>33</sup>

Kay wasted no time in following this up. He received another letter from the Trade Mark Protection Society, telling him that they did not see any reason why the words Red Water Cure could not be registered, as registration had been given in similar cases. Likewise they did not know of any person having registered words similar to these in the class appropriate to medicine and pharmacy. They could, they said, 'only speak of the marks which have been advertised in the official journal, not of those which may be in the Trade Mark Registration Office but have not yet appeared in print'.<sup>34</sup>

Kay continued with the registration process, but not without further query. He clearly wanted to register the whole label, including the name and address. He received another letter from the Society dated 2 November 1877. They understood from Kay's letter that he was claiming the exclusive use of the words 'Red Water Cure'. They thought that the registration of those words under the Trade Marks Registration Act 1875 would be sufficient. Indeed, there would be little point in registering the other parts of the label, as Kay could not claim the exclusive use of printed matter other than the words 'Red Water Cure'.<sup>35</sup>

Unfortunately Kay failed to provide everything that was required in making his submission. He received yet another letter from the Trade Mark Protection Society, dated 30 November 1877. They had received the notice paper signed by Kay, but he had not sent the Block or Electrotype for the words Red Water Cure which was required for insertion in the *Trade Marks Journal*. They asked Kay to send them the same as soon as possible, adding that the Government had instructed the *Journal* not set up the type themselves when the trade mark consisted only of words.<sup>36</sup> Eventually, Kay managed to complete all the formalities correctly. Some months later he received a letter dated 16 April 1877 from the registrar of the Trade Marks Registry Office, informing him that 'the Trade Mark applied for by you in Application No. 13673, and duly advertised in No. 124 of the Trade Marks Journal, has been registered in your name in Class 2.<sup>37</sup>

The trade mark protection was valid for fourteen years, and the next referenc to it is in 1905. Kay received a letter from George Patterson at the Patents, Designs and Trade Marks Office, telling him that the registration of the Trade Mark would shortly fall due to be renewed. Patterson indicated that he would be very pleased to renew the Mark for a further period of 14 years, and his charge for doing so, including all Government fees, would be £1-10s-6d.<sup>38</sup> Kay duly renewed the mark.

# Advertising

Kay's distribution network of wholesalers in Aberdeen and agents in Ireland were supported by extensive advertising, not only in the Irish papers but also in wholesaler's catalogues. An advertisement published in Peterson's wholesale catalogue included a letter which had first been published in the *Mark Lane Express* on 16<sup>th</sup> August 1880. A correspondent reported that, in a recent conversation with one of the largest graziers in Ireland, he was informed that 'this remedy was there found most reliable, and looked upon as a great boon in those parts of the country where this troublesome disease is of frequent occurrence.'<sup>39</sup>

The Irish side of the business flourished well into the twentieth century, largely reflecting the rising prosperity of Irish dairy farming. There were however occasional hints that it was not as effective as was claimed. The writer of a letter to Kay dated 14 September 1880 described himself as a life customer of his Red Water Cure, but he regretted to say that he had a great many cases of Red Water Disease in his cattle; in fact he had over 100 cases every year. But latterly he was finding it not as effective a cure as he did at first.<sup>40</sup>

However, such comments were rare. Most of the correspondence received continued to heap praise on the product. A letter from a farmer in Kilkenny dated 19 September 1889 read: 'I am after using a Bottle of Red Water Cure, with a cow, and have found it good at effecting a cure.'<sup>41</sup> Many of the letters included requests for information. Michael Keane from Calla Louiseburgh, Co. Mayo, had used a great deal of Red Water Cure over the last two or three years, and he believed it to be very valuable. He wanted to know if it was fit to act for dry udders, and if not what should be done.

George Cliffe in a letter dated 19 November 1881 reported that he had lost a great deal of cattle with the disease and requested a copy of Kay's Remarks on the product and any other information he could let him have on the disease. He had been using the medicine for the last twelve months. It was, he claimed, 'certainly the best I ever got.'<sup>42</sup>

The firm advertised extensively in the farming press, in both the *Farmers Weekly* and the *Farmer's Gazette*. On 25 May 1889 Kay wrote to the *Farmers Weekly*, enquiring about advertising space. He received the following reply: 'I beg to say I shall be happy to accept your offer of £5.0s.0d. per year prepaid for No 1 Advertisement to appear on the front page, and £7.0s.0d. per year for No 2 Advertisement prepaid to appear in best position possible...I now enclose your proofs of the two Advts you sent me'.<sup>43</sup>

The arrangement was indeed acceptable to Kay, for he received another letter dated 5 June 1889. The advertisements which appeared on the front page of the *Farmer's Gazette* were all set in small type, and were of a uniform nature, with no capital letters or displayed

lines. This was a rule set by the *Gazette*'s directors and was strictly enforced. If Kay agreed to the terms offered, the *Gazette* could give him a position at the top of a column on the front page. The terms agreed were the payment of  $\pounds7$  per year in advance.<sup>44</sup>

Not surprisingly other publishers were keen for Kay to buy advertising space. The publishers of the *Weekly Freeman* wrote to him in 1890. They noted that Kay had several agents in Ireland for the sale of his Red Water Cure, and hoped to draw his attention to their *Weekly Freeman* as a valuable medium in which to advertise it. The weekly circulation of the *Weekly Freeman* was, they assured him, over 100,000, and it went mostly to agricultural and stock raisers. It was, they concluded, most suitable as an advertising vehicle for this product. Prices were 5/- per inch for 1 insertion, 4/- per inch for 12 insertions, and 3/- per inch per insertion for 52 insertions.<sup>45</sup>

A few months later Kay received a letter from the *Farmers' Gazette* enclosing a copy of the advertisement that had appeared in its columns a year earlier. They asked if they could continue it for a further series on the same terms as before.<sup>46</sup> His advertisements in the Irish farmers' press supplemented those in the wholesalers' catalogues, such as the full page advertisement which appeared in the 1898 catalogue of William Patersons of Aberdeen, and was widely distributed throughout Ireland by its wholesalers.<sup>47</sup>

#### Decline of the product 1930 to 1938

James Petrie Kay continued to champion the cure until his own death on 6 April 1922, after which his son Harvey George Kay took charge. The Irish trade in the product continued to be healthy. During the early decades of the twentieth century trade between Britain and Ireland flourished. In 1926, 65% of all imports into the Irish Free State were from Britain; 83% of all exports were to Britain.<sup>48</sup> The total number of cattle in Ireland in 1920 was 1,685,523, and some 101 vessels were engaged in the trade between Britain and Ireland.<sup>49</sup> Indeed, Nicholas Fitzgerald, giving evidence to the Commission on Agriculture in 1921,

noted that 'the whole system of agriculture in this country rests on dairying; in fact dairying might safely be called the key industry of agriculture.'<sup>50</sup> But economic activity peaked in 1929, and the last years of the Cumann na nGaedheal government (which had been in power since the establishment of the Irish Free State in 1922), saw substantial drops in output, trade and employment. Sales of the cure started to decline.

Several factors contributed to its downfall. By the 1920s more effective remedies had been developed; there were difficulties in renewing the registration of the trade mark; but the critical factor was the deteriorating relationship between the Irish Free State and Britain. In 1929 Harvey Kay sought reassurance about the continuing effectiveness of the cure from an Inverurie vet. The latter gave a considered but rather disingenuous reply: '...the disease as seen in Ireland in clean cattle is an entirely different one from our [version], and is much more easily cured I should think than in the majority of cases in Scotland. Your mixture should cure 90 percent of the cases without further interference with any drug'.<sup>51</sup>

The 1930s were years of political turmoil, economic crisis, and change in Ireland.<sup>52</sup> In 1932 Fianna Fail became the majority party in the Irish Free State's parliament, with Eamon de Valera as its leader. Dramatic changes in economic policy followed his victory. Highly protectionist measures sought to create jobs and to built a large indigenous industrial sector producing mainly for the home market.<sup>53</sup> On coming to power de Valera set about dismantling not only the political but also the economic and cultural links with Britain. He discontinued the repayment of land annuities to the British treasury, the repayment of loans from the land acts at the turn of the century.

Britain retaliated by imposing high duties on a range of agricultural imports from Ireland, and introduced a system of quotas. De Valera responded by placing tariffs on British goods. This trade dispute, 'the Economic War,' lasted from 1932 to 1938; it stimulated some industries that had since become established in Ireland, although agriculture suffered.<sup>54</sup> With

fewer cattle, farmers needed less food and medicine. Davidson's Red Water Cure became caught up in the complex politics between Britain and Ireland in the 1930s.

The first indication of a problem for Kay came in a letter from Shirley, Spence Belford Ltd., wholesalers of Dublin dated 15th June 1933. 'We have this day been advised that the Customs authorities will not permit the entry of the goods into the Irish Free State as the importation of all veterinary medicines is now prohibited. In the circumstances we are reluctantly compelled to ask you to make arrangements with Messrs Burns & Laird Lines, Ltd. for the return of the consignment, and very much regret any trouble you have been caused in the matter.'<sup>55</sup> Four days later Shirley, Spence & Belford Ltd wrote again in response to a request from Kay. They had made a further application for a licence, but again stressed the necessity of Kay forwarding the cure's formula to the Department of Agriculture.<sup>56</sup>

Kay could be in no doubt that market conditions in Ireland had changed dramatically. A similar letter was received from one of the other wholesalers involved, May, Roberts & Co. Ltd. They very much regretted to learn that Kay was not agreeable to submitting his formula of Red Water Cure to the Department of Agriculture, as in those circumstances the Department would not give consideration to the granting of a licence. This meant that the goods recently despatched to them by Davidson and Kay would have to be returned to them, and that all trade in this line in the Irish Free State would be lost. May, Roberts & Co. asked Kay to consider manufacturing in Ireland. If he did May, Roberts & Co. had a large up-todate factory, and they could facilitate Kay in carrying out this work. They emphasised that they had no desire to lose the business in connection with Red Water Cure.<sup>57</sup>

#### Renewal of the trade mark

But Kay had other problems to contend with. The trade mark registration had been renewed again in 1909 for another fourteen years, until 1933. During this time the firm had converted to a limited company, in 1929. George Patterson was still in post, and Kay had written to him at his Edinburgh office. The letter was forwarded to Patterson on holiday.<sup>58</sup> His response on his return to Edinburgh was perhaps not what Kay was expecting. A letter dated 12 September 1933 noted that the mark was registered in the name of Davidson & Kay, and was renewed in the same name. When the renewal fee due was tendered the Registrar would want to know the date of registration of Davidson and Kay as a limited company. If this was more than six months previously (as it was) then a fine of £10 would have to be paid in addition to the renewal fee of £3; there would also be further expenses involved in altering the Register. This might bring the total expense up to £18 or £20. Patterson's advice was unequivocal: unless the Mark was being used extensively then he would not advise Kay to renew it. He added that there was only one way in which Kay could avoid having to pay the fine of £10, and that was for him to sign the necessary documents for renewal as 'Harvey G Kay – trading as Davidson & Kay.'<sup>59</sup>

There is no record of the documents being changed to read 'Harvey G Kay-trading as Davidson & Kay'. It seems that Kay allowed the registration of the trade mark to lapse. Other more effective products were entering the market, and in any case there was nothing to stop him continuing to use the trade mark: it simply would not be protected. During the summer of 1934 Kay considered his options regarding the Irish market. He decided to seek the advice of one of the other wholesalers, Boileau & Boyd of Dublin, but he received a similar response to the earlier one.<sup>60</sup>

Twelve months later the same position was described by yet another wholesaler, John Smith of Dublin, who had interviewed an official of the Department of Agriculture about the regulations governing the importation of Red Water Remedy into the Irish Free State. He explained to Kay that the formula must be disclosed to the Minister who would treat it as confidential, and that the retail price must also be stated. If approved, the importer, who must be resident in the Irish Free State, must obtain a licence to import. There was then no restriction on the distribution, except that each package had to bear a label with wording as

follows: 'The Compound feeding stuff contained in this package was manufactured by Davidson & Kay, Aberdeen, and was imported into Saorstat Eireann under a licence issued by the Minister of Agriculture.'<sup>61</sup>

Kay asked Smith to enquire about registering the trade mark in Ireland. Two months later Smith wrote again to Kay, telling him that he had been informed that the Trade Mark Red Water Cure could not be registered in the country, and the fact of its being registered in Great Britain would be no protection there. Holding it out as a cure would prevent its registration, whilst a coined word or device with or without the signature of the owners would be accepted. The fees were one guinea on application and two guineas on registration. There did not appear to be anything to prevent Kay importing the cure into the country in the English pack, but the trade mark would not be protected, and all the local veterinary medicine manufacturers would be able to market their own versions of the red water cure too and sell it at a lower price.<sup>62</sup>

<sup>\*\*\*\*</sup>Further correspondence with Smith followed, with Kay making a number of suggestions. In March 1936 Smith agreed to Kay's suggestion to send his representative, Mr. Ward, over to Ireland to explore the whole situation. Smith could explain to him exactly what the company could or could not do, but he saw no need for him to bring the company's legal adviser with him. The regulations were there for the guidance of all those with an interest in the matter. Indeed, the Revenue Commissioner's Office issued a very clear directive on Duty on Medical Preparations.<sup>63</sup> Smith offered to help Mr. Ward in any way he could, and was willing to go with him to the appropriate government departments. He had mentioned in a previous letter that there was one department dealing with veterinary medicines and another dealing with trademarks.<sup>64</sup>

# A final attempt 1938

Irish agriculture was badly hit by the Economic War; the prices of many commodities fell rapidly, with the prices of fat and store cattle dropping by almost a half between 1932 and

mid-1935.<sup>65</sup> Farmers obtained some relief through export bounties, and the coal-cattle pacts of 1935-37, which involved quota exchanges of Irish cattle for British coal, helped. Anglo-Irish relations were finally normalised once the Finance and Trade Agreements were reached in the spring of 1938. Kay clearly thought that it was worth one last try to get the product back onto the Irish market. He wrote again to various wholesalers in Ireland at the end of May 1938. His first reply came from Shirley, Spence and Belford Limited of Dublin. They doubted if the position had changed much since the preparation was discontinued there some years previously, as importation of veterinary medicines for oral administration were prohibited from import by the same legislation, and they had not been re-introduced in Ireland since. They reported however that in the meantime local manufacturers had issued various preparations for the treatment of red water in cattle. Consequently, they thought that there was no hope of Kay securing preferential treatment for his preparation.<sup>66</sup>

The following day, 2 June 1938, a letter along similar lines was received from May, Roberts and Co. Ltd. Kay had hoped to travel himself to Ireland to discuss the situation, but he was too unwell to travel. May, Roberts and Co. indicated however that it would in any case be a waste of his time, as the trade agreement between the British and Irish governments did not in any way affect the prohibition order relating to the importation of Kay's Red Water Cure. To put the preparation back on the Irish market it would be necessary for Kay to lodge the formula with the Irish Department of Agriculture, from whom it was necessary to obtain a licence to manufacture. The writer was clearly getting a little irritated with Kay's persistence. He reminded Kay that he had discussed the matter with one of his people some time previously; as he had heard nothing since he assumed that the question had been dropped.<sup>67</sup>

Shirley, Spence and Belford did however take up the matter up directly with the Office of the Revenue Commissioners. On 13th June 1938 they wrote again to Kay, enclosing a copy of the letter they had received from the Revenue Commissioners.<sup>68</sup> They were directed

to inform them that the prohibition of the import under the Agricultural Produce (Cereals) Act, 1933-1938, on 'Articles of the nature of a food or medicine for internal use for the use of horses, mules, jennets, asses, cattle, sheep, swine, goats or poultry, which pass in commerce under the designation of a proprietary or protected trade name, save under and in accordance with a licence in that behalf issued by the Minister for Agriculture', remained in force.<sup>69</sup>

Kay then decided to take further legal advice in Scotland. He forwarded the letters he had received to his solicitors, Clark and Wallace of Aberdeen. Their response was that greater clarity was required. They considered that there seemed to be a 'considerable amount of indefiniteness about the situations,' with one writer suggesting that the matter was in the hands of the Department of Agriculture, and another saying that it was a matter for the Department of Industry and Commerce. Clark and Wallace suggested that an approach be made to these two departments in turn 'in order to ascertain exactly the present legal position'. They helpfully drafted a short letter which Kay could revise and alter as he thought fit, and then send off in the hope that it might bring forward a reply which would clarify the situation.<sup>70</sup>

Kay took this advice and wrote to the Department of Agriculture in Dublin. 'Our Company many years ago manufactured a cure known as 'Red Water Cure' which was largely used among the agricultural population in Ireland for the treatment of their cattle' he wrote. He had reason to know that this Red Water Cure was highly acceptable to many of the farmers in their country, and even now he had enquiries from many of them on the subject. But owing to legislative action it had been impossible for him to import the cure to Ireland for a number of years. However, in view of the new Trade Agreement between the two countries it occurred to him that permission might now be given to resume the import of the remedy which had proved highly satisfactory. He wrote accordingly to ask if the Department would be prepared to grant a Licence for its importation. He was writing this in the belief that the matter fell within the activities of the Department of Agriculture. If this was not the case he

'would be obliged if you would let us know to whom we should address our correspondence.'<sup>71</sup>

The reply from the Department of Agriculture came in a letter dated 12 July 1938. It was short and to the point. 'With reference to your letter regarding the importation of Red Water Cure, I am directed by the Minister for Agriculture to state that the Trade Agreement between the Government of this country and the Government of Great Britain and Northern Ireland made no provision for animal medicines. Accordingly the importation of such preparations is still subject to the restrictions imposed of the Agricultural Produce (Cereals) Act, 1933, which have been re-enacted in the Agricultural Produce (Cereals) Act, 1938.'<sup>72</sup> Kay referred the letter to his solicitor. Clark and Wallace concluded that the response from the Secretary of the Department of Agriculture, which stated unequivocally that the Trade Agreement between the two Governments made no provision for animal medicines, ruled out altogether the question of the Red Water Cure, and that 'we are just exactly in the same position as we were.'<sup>73</sup>

Three months later Kay tried one last time by writing directly to the Department of Overseas Trade. Their reply was no more encouraging. They pointed out that medicinal preparations were also liable to package duty when imported in containers of any description not exceeding 7 lbs. gross weight. The rate was ld. per lb., or in the case of liquid products, ld. per pint, or fraction thereof. The importation of dutiable articles into Eire by letter post was prohibited. The minimum Customs charge on any parcel containing dutiable articles was 1/-, and a Customs entry fee of 6d was also payable. Certificate of Origin Form 120 A (Sale) had to be furnished with such consignments. These forms were obtainable from the firms indicated in an attached list.<sup>74</sup> On its receipt the letter was endorsed with a footnote written by Kay. 'I fear we shall have to decline orders in future. I think customs in the I.F.S. take advantage of [importers]'. It is the last mention of Red Water Cure in the archive.

## Conclusion

So ends the Red Water Cure story. In reality its day had long passed. By the 1930s other remedies were becoming available that were much more effective. One, a urea derivative, went under the trade names Pirevan, Acapron and Piromuth. The arrival of Prontosil in 1935 made them all obsolete. But Davidson's Red Water Cure deserves a place as a footnote in the history of Irish agriculture, in Anglo-Irish relations and in the history of Irish advertising. This paper has explored the life cycle of a product aimed at alleviating a serious disease of Irish cattle; in doing so it has cast light on some of the social, political and economic factors that helped shape the difficult relationship between Ireland and Great Britain during this period.

Davidson's Red Water Cure also illustrates several features of Victorian entrepreneurship. The veterinary chemist's business was vast,<sup>75</sup> and Davidson's initiative was by no means unique. In 1867 Stephen Willsher, who owned a pharmacy in Tenterden in Kent, greatly expanded the veterinary side of his business.<sup>76</sup> He introduced 'Willsher's Cattle Food', which he manufactured on a large scale in a neighbouring building and distributed throughout Kent and Sussex. Like Kay, he attached great importance to advertising, promotion and the use of trade mark protection. Like Kay, Willsher's advertising was highly targeted. Like the Red Water Cure the product was heavily promoted by means of testimonials. Unlike Kay, Willsher extended his manufacturing activities into other products, including 'horse food,' poultry food' and 'dog meal.'

Surprisingly the cure received no mention in the history of Davidson and Kay published in 1962.<sup>77</sup> But by the early 1930s the demise of the product had already been anticipated. An account of the company in 1932 notes that 'the business is purely dispensing and high-class retail, with a few veterinary and other specialties.'<sup>78</sup>

In Ireland chemists' veterinary businesses were often substantial, despite the fact that many vets made their own medicines. Veterinary practice developed slowly in the late

nineteenth century and included dispensing medicines. Vets rolled pills and folded powders from ingredients bought in bulk. But vets' bills were high, and farmers were all too familiar with diseases such as red water in cattle. They bought medicines in bulk direct from wholesalers where they could. Davidson's Red Water Cure could not have survived as long as it did without users believing in its merits, since they had to justify its cost in economic terms. The surprise is that it survived as long as it did.

The revival of agriculture and particularly the rise of dairy farming played an important part in raising Irish living standards over the period 1850 to 1921, with the gap in living standards between Ireland and Great Britain narrowing but never quite closing.<sup>79</sup> This paper has thus not only presented a case study on a Victorian veterinary medicine but has illustrated the rise and fall of commercial activity between Ireland and Scotland in this period.<sup>80</sup>

# Acknowledgement

The assistance of Jenny Brown, assistant keeper (industry) at Aberdeen Maritime Museum in facilitating access to the archives of the George Shepherd Pharmaceutical Collection is gratefully acknowledged.

<sup>2</sup> For authoritative accounts of the great famine see C. O'Grada, *The Great Irish Famine* (London, 1989). M. Daly, *The Famine in Ireland* (Dublin, 1986). H. Litton, *The Irish Famine: An Illustrated History* (Dublin, 1994). R.F. Foster, *Modern Ireland 1600-1972* (London, 1988).

<sup>&</sup>lt;sup>1</sup> C. O'Murchadha, *The Great Famine: Ireland's Agony 1845-1852* (London, 2011).

<sup>&</sup>lt;sup>3</sup> J. Bell and M. Watson, *A history of Irish farming, 1750-1950* (Dublin, 2009). J. Feehan, *Farming in Ireland: history, heritage and environment* (Dublin, 2003).

<sup>&</sup>lt;sup>4</sup> Kinealy, *Great Calamity*, p.175.

<sup>&</sup>lt;sup>5</sup> Veterinary Counter Practice, Tenth edition, (London, 1949).

<sup>6</sup> Babesiosis, http://vie.strath.ac.uk/vie/CaDDiS/docs/Babesiosis.html. Accessed 20.01.12.

<sup>7</sup> For a fuller description of red water fever see

http://www.thedairysite.com/diseaseinfo/196/Babesiosis-redwater-fever.

<sup>8</sup> Babesiosis, http://www.thedairysite.com/diseaseinfo/196/Babesiosis-redwater-fever.

Accessed 20.01.12.

<sup>9</sup> For recent information on red water disease in Ireland see

http://animalhealthireland.ie/ckfinder/userfiles/files/20130806%20PC%20Redwater.pdf.

<sup>10</sup> D.W.M. Davidson, 'Agricultural and Veterinary Records' in *Pharmaceutical Historian*,

15:2, (1985), p. 1.

<sup>11</sup> The chemists' business of Davidson and Kay ceased trading in the late 1970s. The contents of its two shops were donated to Aberdeen City Council by George Shepherd, the last chairman of the company.

<sup>12</sup> Anderson, S.C. (2012) 'A Remarkable Pharmacy for Aberdeen,' *The Pharmaceutical Journal*, 289, 7737/8, 727.

<sup>13</sup> For estimates of agricultural production during this period see M. Turner, *After the Famine: Irish Agriculture 1850-1914* (Cambridge, 1996), pp 106-20.

<sup>14</sup> Davidson & Kay ceased trading in the late 1970s. The contents of its two shops were

donated to Aberdeen City Council by George Shepherd, the last chairman of the company.

<sup>15</sup> R.G. Todd (ed.) Martindale Extra Pharmacopoeia (25th ed., London, 1967), p. 856.

<sup>16</sup> G. Shepherd, *The Gilded Phoenix: An Account of Davidson and Kay Ltd and the business from which it grew* (Aberdeen, 1962), p. 20.

<sup>17</sup> Advertisement, 1880 (Aberdeen, George Shepherd Collection, ABDMS081295).

<sup>18</sup> Letter, 25 March 1874 (Aberdeen, George Shepherd Collection, ABDMS081347).

<sup>19</sup> For an account of the Scottish community in Ireland see Kyle Hughes, 'We Scotsmen by the Banks o'the Lagan': The Belfast Benevolent Society of St Andrew 1867-1917' in *Irish Economic and Social History*, 37 (2010), pp 24-52.

<sup>20</sup> Letter, 18 September 1873 (Aberdeen, George Shepherd Collection, ABDMS081349).

<sup>21</sup> Letter, 3 June 1876 (Aberdeen, George Shepherd Collection, ABDMS081335).

<sup>22</sup> Letter, 18 July 1876 (Aberdeen (George Shepherd Collection, ABDMS081334).

<sup>23</sup> Letter, 8 November 1876 (Aberdeen, George Shepherd Collection, ABDMS081352).

<sup>24</sup> Undated letter, probably 1876 (Aberdeen, George Shepherd Collection, ABDMS081348).

<sup>25</sup> Letter, 16 June 1924 (Aberdeen, George Shepherd Collection, ABDMS081499).

<sup>26</sup> Letter, 12 November 1876 (Aberdeen, George Shepherd Collection, ABDMS081350).

<sup>27</sup> Letter, 18 July 1877 (Aberdeen, George Shepherd Collection, ABDMS081355).

<sup>28</sup> Letter, 23 July 1877 (Aberdeen, George Shepherd Collection, ABDMS081333).

<sup>29</sup> Letter, 27 July 1877 (Aberdeen, George Shepherd Collection, ABDMS081331).

<sup>30</sup> Letter, 8 September 1877 (Aberdeen, George Shepherd Collection, ABDMS081332).

<sup>31</sup> Ingredient costs, 1880 (Aberdeen, George Shepherd Collection, ABDMS081340).

<sup>32</sup> Cost to wholesalers, 1880 (Aberdeen, George Shepherd Collection, ABDMS012525).

<sup>33</sup> Letter, 30 July 1877 (Aberdeen, George Shepherd Collection, ABDMS081413).

<sup>34</sup> Letter, 11 August 1877 (Aberdeen, George Shepherd Collection, ABDMS081414).

<sup>35</sup> Letter, 2 November 1877 (Aberdeen, George Shepherd Collection, ABDMS081415).

<sup>36</sup> Letter, 30 November 1877 (Aberdeen, George Shepherd Collection, ABDMS081416).

<sup>37</sup> Letter, 16 April 1878 (Aberdeen, George Shepherd Collection, ABDMS081340).

<sup>38</sup> Letter, 11 September 1905 (Aberdeen, George Shepherd Collection, ABDMS081493).

<sup>39</sup> Letter, *Mark Lane Express*, 16 August 1880.

<sup>40</sup> Letter, 14 September 1880 (Aberdeen, George Shepherd Collection, ABDMS081351).

<sup>41</sup> Letter, 19 September 1889 (Aberdeen, George Shepherd Collection, ABDMS081401).

<sup>42</sup> Letter, 19 November 1881 (Aberdeen, George Shepherd Collection, ABDMS081399).

<sup>43</sup> Letter, 27 May 1889 (Aberdeen, George Shepherd Collection, ABDMS081424).

<sup>44</sup> Letter, 5 June 1889 (Aberdeen, George Shepherd Collection, ABDMS081423).

<sup>45</sup> Undated letter, possibly 1890 (Aberdeen, George Shepherd Collection, ABDMS081402).

<sup>46</sup> Letter, 2 March 1891 (Aberdeen, George Shepherd Collection, ABDMS081400).

<sup>47</sup> Wm. Paterson and Sons, *Wholesale Catalogue* (Aberdeen, 1898).

<sup>48</sup> C. Kinealy, A New History of Ireland (Stroud, 2004), pp 232-3.

<sup>49</sup> Summary of Evidence of Dr D.S. Prentice, chief inspector, veterinary branch (The National Archives of Ireland, 2005/68/384).

<sup>50</sup> N. Fitzgerald, IFU Evidence, Commission on Agriculture (The National Archives of Ireland, 2005/68/62).

<sup>51</sup> Four letters all dated 8 June 1929 (Aberdeen, George Shepherd Collection,

ABDMS081363, ABDMS081404, ABDMS081405, ABDMS081406).

<sup>52</sup> J.P. Neary and C.O'Grada 'Protection, economic war and structural change: the 1930s in Ireland' in *Irish Historical Studies*, 27, (1991), pp 250-266.

<sup>53</sup> Neary and O'Grada (1991), *Ibid.* pp 250-266.

<sup>54</sup> Kinealy, New History of Ireland (Stroud, 2004) p. 233.

<sup>55</sup> Letter, 15 June 1933 (Aberdeen, George Shepherd Collection, ABDMS083146).

<sup>56</sup> Letter, 19 June 1933 (Aberdeen, George Shepherd Collection, ABDMS083147).

<sup>57</sup> Letter, 26 June 1933 (Aberdeen, George Shepherd Collection, ABDMS083149).

<sup>58</sup> Letter, 26 August 1933 (Aberdeen, George Shepherd Collection, ABDMS081497).

<sup>59</sup> Letter, 12 September 1933 (Aberdeen, George Shepherd Collection, ABDMS081498).

<sup>60</sup> Letter, 25 October 1934 (Aberdeen, George Shepherd Collection, ABDMS083142).

<sup>61</sup> Letter, 13 October 1935 (Aberdeen, George Shepherd Collection, ABDMS083143).

<sup>62</sup> Letter, 10 December 1935 (Aberdeen, George Shepherd Collection, ABDMS083144).

<sup>63</sup> Duty on Medical preparations. Revenue Commissioner's Office (The National Archives of Ireland, FIN/1/3242).

<sup>64</sup> Letter, 23 March 1936 (Aberdeen, George Shepherd Collection, ABDMS083145).

<sup>65</sup> Neary and O'Grada (1991), *Ibid.* pp 250-266.

<sup>66</sup> Letter, 1 June 1938 (Aberdeen, George Shepherd Collection, ABDMS083150).

<sup>67</sup> Letter, 2 June 1938 (Aberdeen, George Shepherd Collection, ABDMS083152).

<sup>68</sup> Letter, 13 June 1938 (Aberdeen, George Shepherd Collection, ABDMS083148).

<sup>69</sup> Letter, 11 June 1938 (Aberdeen, George Shepherd Collection, ABDMS083141).

<sup>70</sup> Letter, 17 June 1938 (Aberdeen, George Shepherd Collection, ABDMS083151).

<sup>71</sup> Letter, 18 June 1938 (Aberdeen, George Shepherd Collection, ABDMS083140).

<sup>72</sup> Letter, 12 July 1938 (Aberdeen, George Shepherd Collection, ABDMS083137).

<sup>73</sup> Letter, 19 July 1938 (Aberdeen, George Shepherd Collection, ABDMS083138).

<sup>74</sup> Letter, 12 October 1938 (Aberdeen, George Shepherd Collection, ABDMS083139).

<sup>75</sup> W. E. Court, 'The formulary of a West Yorkshire pharmacy 1885-1927' in *Pharmaceutical Historian*, 27, no. 1, (1997), pp 2-9.

<sup>76</sup> H. V. Roberts 'The eighteenth century pharmacy at 60, High Street, Tenterden, Kent' in *Pharmaceutical Historian*, 28, no. 3, (1998), pp 35-42.

<sup>77</sup> 'Aberdeen Pharmacies and Pharmacists' in *Chemist and Druggist*, 10 September 1932, p.293.

<sup>78</sup> S. Kayne, 'Veterinary Medicines', in S. Kayne and M. Jepson (eds.) *Veterinary Pharmacy*, (London, 2004), p. 67.

<sup>79</sup> A. Bielenberg, 'Estimating Irish GDP from the mid-nineteenth century to the First World War' in *Irish Economic and Social History*, 37 (2010), pp. 90-2.

<sup>80</sup> The principal source of material used in this paper is manuscripts held in the archive of the George Shepherd Pharmaceutical Collection at Aberdeen Art Gallery & Museums.