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# Costing the State Pint (1916-1974)

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## Abstract

*The astounding thing is that nobody seems to be able to tell us what things cost to make.*  
Undersecretary of Munitions 1915. (Addison 1934:116)

Normative accounting history has identified modern British cost accounting as having its origins in the munitions industry during the Great War, 1914-1918. The waging of the first global industrial war necessitated the State efficiently harnessing all the nation's economic resources and directing these towards ultimate victory. The work of Loft (1986, 1990, 1994.) focused on State intervention within the munitions industry, which resulted in the introduction of recognisably modern cost accounting techniques as a management decision-making tool where arguably none had previously existed. The post war legacy of these techniques allegedly elevated 'scientific costing'<sup>1</sup> to prominence as an important component of 'scientific management'. The State intervention in the beer industry and particularly the State ownership of the Carlisle and District brewery witnessed similar developments, which have so far remained, unrecognised.

The objective of this paper therefore aims to redress the failure to acknowledge the significant contribution that the State brewery made to the agenda of cost accounting in the brewing industry and the wider business environment. At the same time it seeks to add to the existing discourses on public sector accounting and management history and as such it follows on from a previous paper devoted to the brewery's financial reporting framework presented at the 2004 JFMPS Conference.

## Introduction: Nationalising the Brewing Industry and Disinterested Management

The objective of the partial nationalisation of the British brewery has been explained in detail in the previous conference paper and its subsequent publication in the *Journal of Finance and Management in the Public Services* (Talbot: 2005a). However to briefly recapitulate the nationalisation was invoked in 1916 to curtail insobriety amongst munitions workers at Gretna and Annan and at the Cromarty Firth naval base. This involved the nationalisation and rationalisation of brewing in Carlisle, where the munitions workers spent their leisure time. The nationalisation at Carlisle endured until 1974 and this was popularly known as the 'Carlisle Experiment' or the 'The Scheme'. Nationalisation also occurred at Enfield Lock in London but these minor business operations were returned to the private sector in 1923. The Liquor Central Control Board (LCCB) managed the Carlisle Experiment between 1916 and 1921, which was later taken over by the State Management Scheme (SMS) from 1921 to 1974. The SMS was part of the Home Office who operated it on the basis of 'Disinterested Management', which was comprised of two elements defined by the Southborough Report published in 1932 as management and ownership. In the case of management it was,

*The conduct of a public house by a manager with a fixed salary and having no commission on the sale of liquor, but sometimes taking commission on the sale of food and non-intoxicants. They (the Committee) took as types of disinterested management, Public House Trusts and Associations, and State Management.*

Report of the Royal Commission on Licensing, (England and Wales) 1929- 1931, Cmnd 3988, S63 (a). (HO 48/12630)

<sup>1</sup> There is no precise definition of what constituted 'scientific costing' but it is invariably linked as constituting an important part of the more familiar 'scientific management' of FW Taylor (Solomons: 1952, Epstein 1978). The attachment of a qualifying scientific description was commonplace in the immediate post Great War period whereby British management claimed to be moving towards a wholesale application of scientific methods marshalling, comparing and weighing its facts before formulating and applying its principles. This consisted of 'an engineering science', 'a theological science', 'a domestic science' and a 'social science' for the age but once more the precise meaning was never explicit (Sheldon 1923: 14-15). However its pseudo-suggestion of the scientific was claimed to have hypnotized a number of important people (Hannah 1976:44).

A 'Scientific Costing Conference' was held in 1922 under the auspices of the Institute of Cost and Works Accountants (ICWA) now CIMA. J. C. Todman's paper 'The Necessity for Scientific Costing' was published in *The Cost Accountant* journal of the ICWA the forerunner of CIMA. It identified five main aims of a 'Scientific Costing' system, determining true cost, provision of a reliable basis for estimates, controls of stock and work in progress, valuation of work in progress and semi-finished products and the provision of statistical information for the guidance of management (Todman 1922:179)

In the case of ownership it was taken to be,

*The interest of the owner in the profits on the sale of intoxicants is, in theory or practice or in both, limited. This is popularly known as 'disinterested management'.*

Report of the Royal Commission on Licensing, (England and Wales) 1929-1931, Cmnd. 3988, S63 (b).

This agenda extended to a State sponsored social engineering project that attempted to develop and reform the public house and also restructure the drinking and leisure activities of the working classes in Carlisle and District. The State's attempts at modifying social behaviour also demanded a financial success to legitimize its continuance. Thus the economic activities of the brewery operations, which supplied beer to all the state controlled areas, required efficient production and distribution methods plus accurate financial information for management decision-making. This in turn led to the development of an advanced and accurate costing system, which it will be demonstrated, was in advance of long-standing commercial practice and as such represented a significant discontinuity with prior brewery accounting calculative technology.

### **The Brewing Process**

Before a detailed exploration of brewery cost accounting is undertaken it will be necessary to briefly outline the beer production process which accounting has attempted to record and control via a numerical format because,

*Although those who concern themselves with details are regarded as folk of limited intelligence, it seems to me that this part is essential, because it is the foundation, and it is impossible to erect any building or establish any method without understanding its principles. It is not enough to like architecture. One must know stone cutting.*

Marshall de Saxe (Foucault 1991:139)

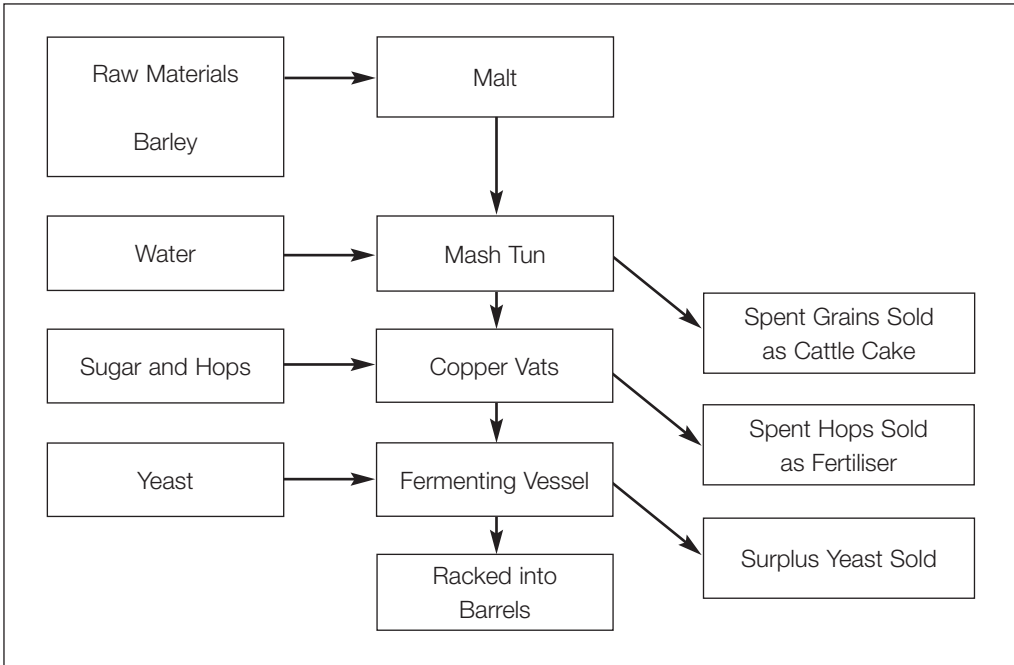
The brewing of ale is a long-standing and simple chemical process dating back to ancient Egypt from at least 1000 BC and it was commonly drunk amongst the Northern European races, particularly the British by the time of the Roman invasion (Haydon: 2001). The production of ale (essentially a beer produced without hops) was widely practiced both domestically and on a larger scale in the feudal manors, the monasteries and the universities<sup>2</sup>. It was during the fifteenth century that hops were introduced into English brewing by immigrant Flemish brewers and also because hopped ale or beer had become popular with English soldiers serving on the Continent during the Hundred Years War. The introduction of hops into the production process resulted in a bitter beer being produced, which was a more robust beverage than ale and benefited from having a greater longevity.

Beer remained the staple drink of all classes and genders including children. The raw material ingredients were traditionally used for three brews of declining strength or gravities. The first brew or strong beer was for the consumption by men, the second brew or table beer was for female consumption and the third brew or small beer was for drinking by children. Prodigious levels of consumption were commonplace since sanitary water supplies were largely unknown until the early twentieth century. Industrialised beer production by the 'common brewers' supplying the entire market became apparent initially from the early eighteenth century in London driven by the needs of a large concentrated urbanised population which made the distribution of this bulky product less problematical. Beer consumption also received the explicit support of the government because beer drinking was promoted as a patriotic alternative to consuming wine, which was the product of Britain's European enemies. Drinking beer was also nutritious and less

<sup>2</sup> The world's longest serving brewery is to be discovered in academia. Brewing was carried out at Queen's College, Oxford from 1340 until 1939. (Lovett:1996:9-10)

iniquitous and socially disruptive than drinking gin (Dillon: 2002). Increasing beer consumption additionally provided the government with a lucrative source of tax revenues, which has been perpetuated to the present day.

The adoption of large scale industrialised brewing occurred in the provinces during the nineteenth century, which replicated the metropolitan model carried out in factory breweries reliant on increasing mechanization. By this date the former distribution problem had been overcome by the development of a cheap and efficient national railway infrastructure. Nonetheless the production process remained fundamentally unaltered (Figure1).



**Figure 1. The Brewing Process**

Consequently the industrialisation of manufacture allowed the velocity of beer production to be substantially increased which enabled the brewers to achieve substantial economies of scale so that,

*Although modern chemistry and technology have helped brewers to carry out their work more swiftly and accurately and greatly reduced the element of personal skill and experience required, the basic processes of manufacture have changed surprisingly little over a long period of time.*  
(Owen 1978: 28)

### Research Methodology

The objective of the research was focused on reviewing and critically assessing the development of costing in the brewery industry which in this instance was directed towards assessing the contribution of the public sector to that process through the accounting regime developed by the Nationalised Brewery at Carlisle. The rediscovery of this neglected area of accounting history consequently seeks to add to the existing discourses on public sector accounting and management.

The research was undertaken as part of a doctoral thesis at Warwick Business School on accounting history focused on the role of accounting in the management and organizational practices of the British brewing industry. The primary source materials of the LCCB and SMS are deposited in the Cumbria County Archives, Carlisle, which was examined by two separate visits that were funded by seed corn grants provided by the Institute of Chartered Accountants for Scotland (ICAS), which are gratefully acknowledged. A visit to the Public Records Office, London was also made to examine the army record of Joseph Henderson who became the assistant-accountant, subsequently chief accountant and ultimately the manager of the Carlisle brewery.

Other indirect primary commercial brewing archives were examined at the Coors Visitor Centre (formerly the Bass Museum), Burton upon Trent, Staffordshire, the Stafford Record Office, the Lichfield Record Office, the Whitbread Archive held at the London Metropolitan Archives and the archives of the Brewery History Society deposited in Birmingham Central Library in order to contextualize the cost accounting innovations of the LCCB and SMS within a Foucauldian methodology.

The approach to the research adopted in this paper is similar to that of Loft which *prima facie* offered parallels, which was conducted within a Foucauldian paradigm that forms part of the 'new accounting history' characterised by a 'heterogeneous range of methodologies' (Miller et al 1991:395) which extend beyond traditional history research parameters. In this schemata accounting is not held to be a neutral and evolving technology but one which has a social and institutional practice that is intrinsic to and constitutive of social relations rather than being derivative and secondary (Miller 1994:1). Contemporary accounting history research comprises three major competing paradigms offering alternative and plausible versions of the truth. Firstly there is the 'economic rationalist' approach that contextualises accounting as an evolving technology responsive to the economic environment and thus is confined to a technical calculative agenda. Alternatively the Marxist or 'labour process theory' approach extends the accounting agenda into a wider social context whereby accounting is distinguished as acting as instrument of power through which it controls production and exploits the labour process (Fleischman, Mills and Tyson 1996:67). In contrast the Foucauldian paradigm (named after the French philosopher and historian of thought Michel Foucault) interprets accounting techniques as a means of establishing a micro-level discipline within the workplace via a normalising or a Benthamite panoptic gaze<sup>3</sup>. The accounting numbers thus become a nexus of power/knowledge relationships that direct activities towards a common goal. In this sense accounting becomes supportive and consensual for all its users rather than being wielded as an instrument of power and coercion by capital as Marxist theorists advocate (Fleischmann et al 1996:66-67).

As such the Foucauldian approach is to discover how philosophy and all knowledge arrive at versions of the truth and how these are dependant upon assumptions or mind-set, or the age in which they were promulgated (Strathern 2002:1). This methodology involves two epistemological techniques, which Foucault termed as archaeology and genealogy. The archaeological analysis involves examining discourses in terms of systems of thought which existed at specific periods of time and genealogical in explaining how one system of discourse changed to another (Ryan, Scapens and Theobald 2002:88). Discourse is taken to comprise not only of linguistic systems or just texts (such as primary source documents) but also as practices (such as accounting and management) and it is through the analysis of statements, which form a discursive formation which in turn permits the constraints and the situation of the speaker to be located and identified

3 The Utilitarian philosopher Jeremy Bentham (1748-1832) designed a tower from which a prison warder, doctor, teacher or factory foreman could spy on and penetrate the behaviour of inmates, patients, students or workers. This would result in surveillance being omnipresent. Foucault noted that prisons resembled factories, schools, barracks and hospitals. In this schema the observation is carried out via accounting information that conditions and disciplines behaviour and punishes deviation.

(Horrocks and Jetvic 1997:84). In this instance this is realised by an archaeological approach by excavating commercial brewery management and accounting processes prior to the creation of the State brewery. In a genealogical context management and specifically brewery accounting practices can thus be identified and located in time as a discontinuity with prior discourse through the painstaking examination of primary historical sources.

### **Brewery Cost Accounting Pre LCCB/SMS**

In order to appreciate the substantive advance in brewery cost accounting achieved by the LCCB and SMS it is necessary to be cognisant of prior practice. This will be achieved through an archaeological examination of commercial discourses.

The creation of the great Metropolitan breweries of the eighteenth century established wealthy and enduring brewery family dynasties such as Watney-Coombe, Barclay-Perkins, Truman and most prominently Whitbread. If an economic rationalist paradigm is accepted for accounting development then these advanced manufacturing beer factories could have potentially created a putative cost accounting framework. However the evidence indicates the contrary. The often-detailed financial accounts provided data for ad-hoc and irregular postproduction computations on barrelage cost. Sir Benjamin Truman attempted such an exercise from these sources and the gyle (production) books in 1770, 1760 and 1775. These crude cost calculations allowed him to appreciate albeit imprecisely the benefits of economies of scale and the impacts of volatile raw material price fluctuations despite increased efficiency and outputs (Mathias 1959:472), which allowed him to project gross profits (Mathias 1959:39). Whitbread's archive, which was examined in September 2005, contains no surviving examples of even these crude ad-hoc attempts at product costing. The early Whitbread production books survive, i.e. the Porter Brewing Book No1-22, July to August 1804 (LMA 4453/10/09), the Ale Brewing Book 1834 to 1837 (LMA453/10/001) and 1837 to 1838 (LMA453/10/002) and the Fermentation Book 1834 to 1837 (LMA453/10/008) but these are technical narratives without any attempts at financial or non-financial cost calculation.

The latter part of the nineteenth century has been labelled as the 'Costing Renaissance' based largely on the publication of seminal texts on the subject whereby accounting data was systematically internalised by manufacturers for management decision-making (Solomons: 1952, Chatfield: 1997). This period witnessed a growth in the publication technical literature devoted to cost accounting and arguably the most prominent British text of this period was Emile Garcke's and John Manger Fell's (1887), *Factory Accounts: A Handbook for Accountants and Manufacturers*. It is normally cited as the most influential of the early costing literature that ran to seven editions until 1922. Another influential text of this period was G. P. Norton's, (1889), *Manufacturers Bookkeeping* that enunciated a systematic bookkeeping framework, which was widely adopted in UK and US woollen mills that used inputted costs similar to a standard costing concept. The remaining notable text of the period was J. S. Slater-Lewis's (1896) *Commercial Organisation of Factories*, which considered the use of integrated accounts, which dealt with the allocation, and apportionment of overheads on modern lines (Hannah: 1976). On the eve of the Great War Elbourne's (1914) *Factory Administration and Accounts* completed this typology which synthesised administrative methods, including cost accounting, within a framework of production planning and stock control. Elbourne's text emphasised the work of the cost accountant and the text was reissued in 1918 with a strong endorsement from the *Ministry of Munitions Journal* (Loft 1990:15). None of these seminal texts included any mention of breweries or brewery cost accounting.

A literature search of brewery accounting texts has revealed not only a paucity of financial accounting but also a total absence of cost accounting material during the 'costing renaissance' era. Solomon's (1968) cites *Amsdon's Guide to Brewery Bookkeeping* (1881) that has thus far

proved untraceable, as indeed is Hoskins' *Improved System of Bookkeeping for Brewers* that was advertised in the contemporary brewery press (Diary for the Brewing Room: 1898). Similarly Tripp's<sup>4</sup> (1892) *Brewery Management* and De Peyer's<sup>5</sup> (1915) paper *Brewery Accounting* failed to include any mention of cost accounting techniques or applications. Certainly brewery records were being prepared that would have allowed cost accounting to be carried out,

*...an illustration of (a) Brewing Book, showing quantity of materials used for each gyle (beer production) and the barrels produced from them, but without any hint that it might be useful to the brewer to know the cost of each gyle, much less any directions.*  
(Solomons 1968:16)

The gyle book or beer production book had a long ancestry that recorded raw materials quantities and comments by the brewer concerning times, weather conditions and quality observations. The commercially produced gyle books of the Lichfield Brewery Company are typical of their type in having twenty-two separate columns detailing raw material inputs, times, temperatures, gravity measurements, racking etc...along with the occasional additional comments but exclude any monetary calculations (Lichfield Brewery Company: D13/5). John Joules brewery at Stone in Staffordshire from 1885 onwards employed a commercially produced 'Brewing Register' published by H. Smart, Printer and Stationer and Account Book Manufacturer of Gloucester which provided for the recording of date, raw materials, length of boiling, gravities, racking with provision for general comments on the racked beer, i.e. dull, fair bright or even brilliant (John Joule and Sons (Stone) Ltd, D1502/11/1). Nonetheless the brewers were capable of costing, albeit without a financial metric to calculate production mixes to maximise production yields as this entry from 1905 explains,

*Thus, the excess weight, say 385lbs, of a standard barrel (36 gallons) of wort (pre fermented beer) above that of 360 lbs of water at 60F with a specific gravity of 1000° was termed a 25lb wort that produced a 25lb beer. Therefore, the brewer recognised that a 1000° specific gravity equated to 360 lbs calculated production levels of specific gravity with precision that had been hitherto absent. Consequently a production batch of 100 barrels with a specific gravity of 55° equated to 19.8 brewers pounds. (i.e.  $55 \times 0.36 = 19.8$ ) The production level then multiplied by the poundage figures i.e. 100 barrels  $\times$  19.8, demonstrated that 1,980 lbs was required for that production batch or brew. The previous recording and knowledge of malt yield extracts per quarter was then applied to determine the raw material input of production. An average yield of 86lbs per quarter of malt in this instance would have required 23 quarters of 336 lbs each, i.e. 1980 lbs divided by 86 lbs.*  
(Baker 1905: 130-33)

Such figures could be subject to manipulation by the introduction of malt substitutes and different sugar types as well as accommodating the normal levels of loss sustained during production, thus potentially permitting a rudimentary form of standard production costing to be exercised albeit without the application of monetary values. The application of this calculative process necessitated the use of reliable and accurate scientific instruments, the sacchrometer and hydrometer that had

4 Charles Howard Tripp was a professional and experienced brewery manager whose reputation and credibility suffered when under his management the Ind Coope brewery in London was reduced to bankruptcy in 1909. His text's sub-title 'How to Run a Brewery' was widely lampooned in the brewing trade for allegedly omitting the qualification 'not' after the word how!

5 Edward Charles De Peyer or Peyer, FCA, was admitted to the Chartered Institute of Chartered Accountants, England and Wales on 1st February 1888. He was thus amongst the original cohort of founding members. He worked for the firm of Alfred, Thomas, Peyer and Miles in London. He appears to have worked extensively in brewery accounting from 1865 onwards from the information disclosed in his paper. By 1915 at the date of the paper he was working at Thomas, Peyer and Miles of 5, South Street, Finsbury Park, London. He claims to have been considering producing a text on brewery accounting at this date but this was never realised. He was also the honorary auditor of the Institute of Brewing at the time of his paper. (ICAEW Archives).

been available since the mid eighteenth century onwards. The failure by the brewers to apply a financial measurement to these raw material mixes must remain problematical but evidently they perceived no pressing need for this type of accounting innovation.

Nonetheless it would be incorrect to dismiss the brewers of not being aware of their product cost structures albeit viewed as imperfect by modern standards. The most prominent brewery of the period, Bass, Ratcliffe and Gretton located at Burton upon Trent, Staffordshire produced from 1879 until 1949 a series of annual 'Accounting Statistics' and re-classified these from 1894 without explanation into controllable and predominantly uncontrollable costs. A summarised example of this technique (Figure 2) is provided below.

Debit	£ Proceeds	£ Average Per Barrel	£ Uncontrollable	£ Controllable
<b>Total proceeds (7 line items)</b>	£3,308,432.9s.3d	£2.18s.5d		
<b>Credit total</b>	£ Cost			
<b>Malt</b>	£588,363.12s.0d		£0.10s.5d	
<b>Hops</b>	£182,115.11s.10d		£0.3s.2d	
<b>Excise Duty</b>	£482,026.11s.5d		£0.8s.5d	
<b>Discounts Allowed</b>	£614,067.11s.3d		£0.10s.10d	
<b>Carriage Out</b>	£191,544.16s.5d		£0.3s.5d	
<b>Wages</b>	£77,777.12s.0d			£0.1s.5d
<b>Agency Expenses</b>	£182,542.14s.5d			£0.3s.2d
<b>Salaries</b>	£51,667.8s.0d			£0.0s.10d
<b>Others (authors summary)</b>	£643,280.15s.10d			£0.11s.10d
<b>TOTAL</b>	£3,013,386.13s.2d	£2.13s.6d	£1.16s.3d	£0.17s.3d
<b>Profit per barrel</b>		£0.4s.9d		

**Figure 2. Bass Ratcliff and Gretton Ltd Stationery Department - year ended 30th June 1908**

(Output 1,132,075.75 barrels<sup>6</sup>)

(Bass Ratcliff and Gretton Ltd, Statistics Book, A139, Coors Visitor Centre).

It is not apparent from surviving records as to why and how this detailed information was used by the Bass management (Talbot 1999). These are simple postproduction unit cost calculations simply taking all line income and expenditure levels and dividing these by output. The technique applied is similar to those evident in the work of the early Victorian statistical movement and particularly that of Colonel W H Sykes (Talbot 2005b) a President of the Statistical Society and his 1864 paper, *Comparison of the Organisation and Cost in detail of the English and French Armies* (Sykes 1864) where each army's line budget was divided by their respective headcounts to derive a cost per man. This military application is noteworthy because the same techniques were uniquely implemented from 1879 until 1907 in the successful financial administration of the Bass Rifle

<sup>6</sup> A standard barrel contained 36 gallons or 288 pints.

Volunteer's of the North Staffordshire Regiment, a precursor of the Territorial Army which was used for the comparison and benchmarking performance (Talbot 2002) and it is plausible that this was how the statistical costs were applied in Bass's commercial practice.

Another seductive example of batch cost accounting practice appears to have been carried out by John Joule and Sons (Stone) Ltd (Talbot 1999) that employed commercially produced 'Cost Price Books'<sup>7</sup> from 1903. In the Cost Price Book the input of raw materials by quantity and value and the excise duty was entered and then totalled allowing the cost, gross profit and percentage loss per barrel to be calculated (Figure 3).

INPUT	QUANTITY	£	£
<b>Malt</b>	29 qtrs	62.7s.0d	
<b>Sugar</b>	12 cwt	8s.8s.0d	
<b>Hops</b>	S11	29.4s.5d	
<b>Duty</b>		50.12s.7d	
		150.12s.0d	
<b>Spent Grains</b>		(4.5s.0d)	
<b>Total Cost</b>			146.7s.0d
<b>Barrels Brewed</b>	90		
<b>Barrels Racked</b>	84		
<b>Loss</b>		6.7%	
<b>Cost Per Barrel</b>		£1.14s.10d	
<b>Selling Price Per Barrel</b>		£3.6s.0d	
<b>Gross Profit</b>		47.3%	

**Figure 3. John Joule and Sons (Stone) Ltd Cost Price Book. Batch 43, 16th November 1903 Export Ale**

(John Joule and Sons (Stone) Ltd, D1502/11/21, Stafford Record Office).

This system was retained until 1921 by Joule's and then in a monthly-summarised format until at least 1946 though not recorded in a commercially produced format, (John Joules and Son (Stone) Ltd D1502/11/19). It is not apparent how this costing information was used since there was no integrated financial and cost accounting system present. However, it may be conjectured that it could have been used to monitor the gross profit levels since this was being calculated. Tripp had stated that a gross margin of 50% and preferably a borderline gross margin of 60% were necessary to absorb all costs to offer a reasonable return (Tripp 1892:18) whereas De Peyer had stated that an adequate level was 40% (De Peyer 1915:22). However it is more likely that this system was employed to meet the requirements of the amended and simplified tax regime and if this is the case it can be accurately dated to 1880 when the liquor tax base was changed from raw material input, the 'mash tun' to a barrelage and gravity basis (Figure 4). Thus such records are likely to have had no costing significance at all but were utilised only to meet the strictures of the tax regime.

<sup>7</sup> The Review Press of London, printers, stationers and account book manufacturers produced the Cost Price Book. This type of commercial stationery indicates that it was produced for widespread dissemination and use within the overall brewing industry. As such it would provide a ready audit trail for Customs and Excise inspections that were frequently and unexpectedly carried out.

Date	Details
1660	Rate of 4s 9d per barrel of strong beer and 1s 3d for each barrel of small, intermediate and table beer.
1697	A malt tax at the rate of 6 d per bushel was levied in addition. This rate stood at 9½d in 1760, 1s 4½d in 1780, 1s 7½d in 1791, 4s 5¾d in 1803, 2s 5d in 1816, 4s in 1854, 3s 8½d in 1856 at which figure it remained until its abolition in 1880.
1711	A hop duty of 1d per lb was imposed. In 1801 it stood at 2½d, was reduced in 1860 to 1½d and in 1862 the duty was abolished.
1784	A licence duty was imposed on brewers, with a minimum of 20s for table beer, and for strong beer it ranged from 30s up to £50. From 1875 until its repeal in 1880 a uniform rate of 12s 6d per 50 barrels was imposed, yielding about £400,000 a year.
1800	The beer duty after some minor changes was raised to 10s for strong beer and 3s for small beer.
1830	On its abolition in 1830 the rates were 9s to 10s for strong beer and 1s 9½d for small beer. Including the malt tax, beer at the end of the reign of King George IV was approximately 4½d per gallon.
1850	A sugar duty of 1s 4d per cwt was imposed. In 1854 it was increased to 6s 6d, in 1874 11s 6d and in 1880 it became merged in the beer duty. In 1901 when a general tax on sugar, molasses &c, was imposed, distillers were given exemption from the duty, but brewers had to pay it.
1880	Gladstone's budget repealed malt and sugar duties and brewers' and matters' licence duties. In their stead a licence duty of £1 was imposed on all brewers for sale and a duty of 6s 3d for every barrel of beer of a specific gravity of 1057° with an allowance of 6% for waste. The change was mainly the result of long years of agitation by the agricultural interest, which disliked the malt tax. The Brewing Trade opposed the change.
1885	Childer's budget proposed increasing duty on beer by 1s and on spirits by 1s generated so much opposition that the Government was turned out.
1889	In Goschen's budget the standard gravity was changed from 1057° to 1055°, equal to an increased duty of 2½d.
1890	Goschen reduced the duty to 3d per barrel so far as Imperial Revenue was concerned, but immediately re-imposed it for local taxation purposes.
1894	Harcourt's budget increased the duty from 6s 3d to 6s 9d
1900	Hicks Beach the duty was increased by a 'temporary' (2nd Boer) war tax of 1s, which remained permanent.
1910	The brewers' licence duty was altered from a flat rate of £1 and based on a sliding scale, the effect of which was to increase the duty by about 3d per barrel.
1914	Output 36,165,000 as the standard pre war annual barrelage, duty raised from 7s 9d to 23s per standard barrel.
1916	Duty rose to 24s, and various War restrictions on output, gravities, prices, &c, imposed until 1921.
1917	Duty rose to 25s per barrel.
1918	Duty rose to 50s per barrel.
1919	Duty rose to 70s per barrel.
1920	Duty rose to 100s per barrel - an increase of 1,190% from pre war levels.
1921	Restriction as to Average Permitted Gravities ended, control of wholesale prices abolished.
1923	Rebate of 20s per bulk barrel made from a duty of 35 per standard barrel with arrangement that the Trade should bear the balance of 4s by reducing the price of beer by 1d per pint, equal to 24s per bulk barrel and maintain gravities.
1930	Duty rose from 103s to 134s per standard barrel subject to rebate above.
1933	Standard barrelage basis for calculating Duty abolished and Duty charged at rate of 24s per barrel up to and including 1027 ° and 2s per additional degree. The Duty was 10.32 times the pre-war rate.

#### Figure 4. British Beer Tax Regimes 1660-1933

(The Manual of British and Foreign Brewery Companies for 1938-1939: A Compendium of Joint-Stock Brewery Enterprise: 26-27).

Thus the brewers were not totally ignorant of the cost structures of their product albeit this knowledge was derived through the application of pre-modern costing techniques. This was apparent during the February 1922 'Boycott Beer' campaign arising from a widespread public perception of profiteering by the brewers. This provoked a defensive response from the Cheltenham Brewing Company Ltd to deny the profiteering allegations by producing a chart illustrating the cost structure of the typical pint of beer of the day, which was widely disseminated amongst public houses (Illustration 1).

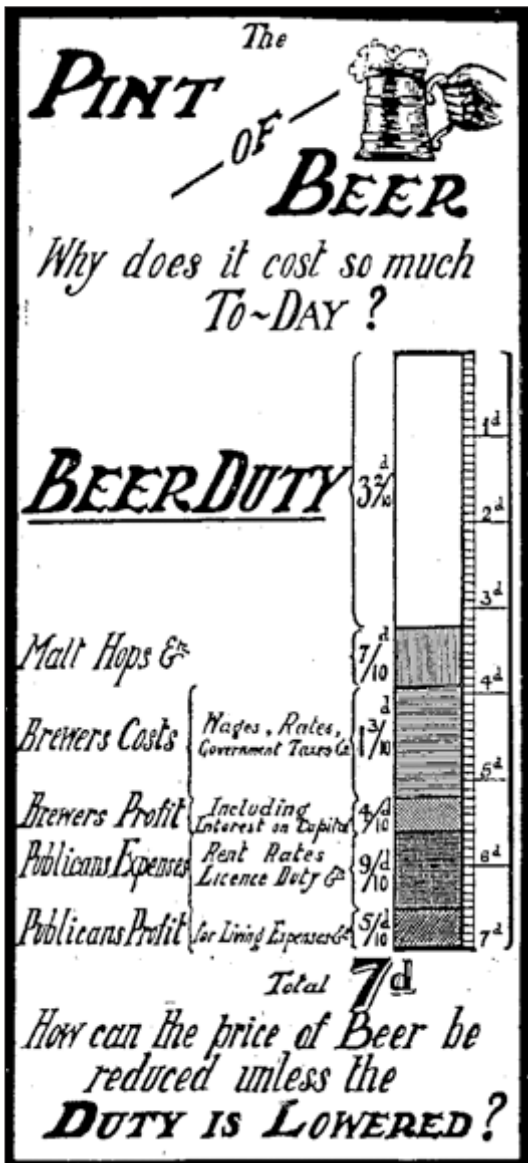


Illustration 1. The Cost of a Pint of Beer 1922 (Authors Collection)

Such a chart could have been easily constructed in much the same manner as Bass's statistical accounting methodology. Commercial brewery cost accounting therefore before 1914 appears not to have developed a recognisable form of modern cost accounting and this view is confirmed by a knowledgeable contemporary source drawn from within the brewing sector,

*In those days few breweries had any real system of costing and by the end of our investigation I had learnt much about the expenses of running a brewery...*  
(Neville<sup>8</sup> 1958: 47)

8 Sir Sydney Nevile (1873-1969) trained and worked as a brewer from the 1888, rising to become a director of one of the leading Brewery Company's, Whitbread's after the Great War. He became an important and influential figure within the trade being at one time president of the Institute of Brewing, 1919-1921, chairman of the Council of the Brewers Society 1938-1940, master of the Court of the Brewers' Company 1929-1930 and vice president of the Council of the Federation of British Industries, 1958. He also served on the on the State Management Scheme from 1916 until the mid 1950's. (The Journal of the Brewery History Society 2002: 29-30)

It appears from the available textual evidence that brewery accounting did not explicitly contribute or form any significant part of the 'costing renaissance' and that by implication 'scientific costing' was absent in the brewing industry which accords more significance to the discontinuity of accounting developments initiated by the nationalised brewery.

### Cost Accounting at the LCCB and SMS (1916-1974)

The major advances or discontinuity in brewery costing practices can be genealogically identified, as being instigated during the Great War and that it was the direct involvement of the State that was instrumental in this accounting development. The State purchase of six breweries had initially presented management with accounting problems that were dealt with through the rationalisation of the separate businesses and the implementation of effective financial systems. Surviving records have preserved in a comprehensive archive. Included amongst these is a formalised set of accounting regulations that was detailed in Appendix C of the General Managers annual report of 1916. The General Manager was Edgar (later Sir Edgar) Sanders who had been Clerk to the Justices of Liverpool described as an expert in licensing matters, the chairman of the Magistrates' Clerks Association, later to become the chairman of the Brewers' Society and a managing director of Lever brothers (Nevile 1959: 102, 222). The scheme's accounting regulations consist of twenty separate items of which items fourteen to fifteen specifically concern cost accounting, Figure 5.

Item 14	Brewing Cost Sheets	A cost account is prepared for each brew, showing the quantities and values of materials used, the wages and other charges, and the loss in the various processes, and in racking, and the cost per barrel racked. It also contains the technical information relating to extracts and gravities, &etc, necessary to enable judgement to be passed on the efficiency of the Brewery Staffs, and the outcome of the materials used. The results arrived at are carried to a Brewing Cost Summary in which the cost of delivery and Management charges are added, and the total cost per Barrel delivered to the Branch or customer is shown. These Cost Sheets and Summaries have already proved very useful in enabling wastage of materials, and losses of the finished product through carelessness to be traced and investigated.
Item 15	Malting Cost Sheets and Summaries	These are similar to the above, and show the cost per quarter of malt produced

**Figure 5. LCCB General Managers Report - December 1916 (Carlisle TMS 2)  
Appendix C Accounting System - Cost Accounting Regulations**

These textual entries are noteworthy because for the first time cost accounting is acknowledged within a technical brewery accounting framework both for beer and malt manufacturing which emanated from the unlikely source of a nationalised business rather than from a private sector entity driven by commercial imperatives.

A detailed examination of these Cost Sheets reveal that they are similar to those of Joules and Sons (Stone) Ltd but significantly it accounts for other direct and indirect costs by adding wages

and 'other' charges to the cost of production. It is not immediately apparent what is included or meant by 'other' charges but a detailed examination of the records indicates that this refers to production overheads. The accounting permitted the calculation and application of overhead absorption rates, which were regularly recalculated. For example in 1933 from September until the end of the year a monthly overhead absorption rate was recalculated and applied which was taken to two decimal places<sup>9</sup>. This enabled an accurate total cost of production to be made available for management control. Thus a leap in calculative discourse is identifiable and the precise location of its discontinuity from prior practice becomes evident because overhead costs are now explicitly recognised as being an identifiable part of the cost of production. Moreover it represented a technical accounting advancement since overhead absorption rates were now capable of accurate calculation whereas previously they had been held to be unobtainable because they were considered too difficult to calculate accurately. Both Tripp and De Peyer had written within a financial accounting context concerning the construction of a 'Beer Manufacturing Account' where both authors had debated the lack of consensus concerning what constituted legitimate expenditure items to be included in the production account, and Tripp in particular saw no value in this type of financial calculation,

*Some there are who hold that in addition to materials and duty, here should be included wages, finings,, coals etc... I dissent from this entirely, for if we include wages, why not salaries? and if finings why not preservatives ? and so on. No: let all such charges be kept distinct and out of the produce book for they are the most difficult of apportionment, varying in amount and are apt to be very misleading.*

(Tripp 1892:17).

Significantly the LCCB/SMS management perceived no inherent technical accounting difficulty and explicitly recognised that these detailed and accurate cost accounts were an effective means of management control over production, and wastage etc.

The earliest surviving Brewing Cost Summary referred to in the general manager's report is Volume 3 dating from September 1933 - September 1942. The last summary, Volume 6 is dated October 1959 - March 1973 demonstrating a continuity of cost accounting practice, which lasted until the end of the 'Carlisle Experiment'. The early missing volumes have not been located despite further extensive searches at the Cumbria County Records Office and at the Public Record Office at Kew in London and may have been lost to posterity. It may be reasonably conjectured that this cost system was implemented from the inception of State involvement given the reference to it in the general manager's report of 1916 and its subsequent success and usefulness to management ensured its perpetuation. The Brewing Cost Summary ledgers like Joules Cost Books were commercially produced volumes<sup>10</sup> that recorded each production batch. The earliest known surviving example from 6th September 1933 demonstrates the construction of such an entry (Figure 6).

<sup>9</sup> The 1933 overhead absorption rates applied were as follows, September 12s.4.76d, October 9s.8.98d, November 11s.026d and December 11s.0.5sd per barrel. Overhead absorption rates at this period were volatile but from 1936 onwards overhead costs became more settled and henceforth rates were revised every quarter. The final overhead absorption rate utilised ran from December 1971 until May 1973 at £2.75p per barrel, an increase of 443½% over 40 years.

<sup>10</sup> The Cost Summary Ledgers are substantial records. Charles Thurnam and Sons, Manufacturing Stationers and Account Book Makers at the County Printing Works, Carlisle, printed all the known surviving SMS cost ledgers.

<b>Number 151, quality X</b>	£. s d.
<b>Malt 16.5 quarters</b>	40.15.11
<b>Maize</b>	-
<b>Sugar 4cwts 50lbs</b>	5-0-8
<b>Hops 121lbs</b>	10.13.9
<b>Salts</b>	1-10-10
<b>Preservatives</b>	0.8.9
<b>Yeast</b>	-
<b>Priming</b>	5.10.8
<b>Duty</b>	233.19.1
<b>Oncost (12s/4.67d)</b>	94.10.10
<b>Total</b>	392.10.6
<b>Credit Grains 16.5 quarters</b>	(0.13.4)
<b>Net total</b>	391.17.2
<b>Gravity</b>	1031°
<b>Excise Qty</b>	146 brls 20 gals
<b>Brewed</b>	155 brls 20 gals
<b>Blended</b>	
<b>Racked</b>	152 brls 22 gals
<b>Loss</b>	2 brls 34 gals
<b>Cost per barrel racked</b>	51s .4d

**Figure 6. Brewing Cost Summary 6th September 1933.** (Carlisle TSMS 2)

The wider dissemination of this costing knowledge within the industry was readily available for those who chose to adopt it; there was no deliberate secrecy as preferred by the private sector. The Scheme's General Manager referred to the continual visits by various representatives of the Trade, the Temperance movement, Trade Unions and local and national government officials as did the Labour Party MP Arthur Greenwood (1920) a major supporter of the 'Experiment' and any visitors were informed of all aspects of the operations of the Scheme. Moreover, the body appointed by the Home Secretary to oversee the operations of the nationalised brewery always included from its inception representatives from the commercial brewing trade such as Sir Sidney Nevile from Whitbread's and Sir William Waters-Butler from Mitchell and Butlers the Birmingham based brewing company. Subsequently the Scheme's General Manager was able to report that,

*An accounting system of the most modern principles has been devised and it is doubtful whether there are any many brewing firms in the kingdom, which can show a more concise and useful analysis of trading results.*

(TSMS 6/1: SMS General Managers Report 1919).

In the following year the quality of the financial information being regularly produced by the Scheme led the General Manager to state,

*Representatives of brewing firms who have visited Carlisle have not hesitated to ask for particulars with a view to incorporating something of our system in their own business and it certainly cannot be contended that the work at Carlisle is not conducted upon business lines!*

(TSMS 6/1: SMS General Managers Report 1920).

The SMS thus appears to have been in advance of commercial accounting practice. It will be recalled that the minimal brewery accounting literature circulating prior to the Great War did not mention any aspects of costing. The initiators of this costing system were J Baird, FCA the first chief-accountant of the LCCB/SMS and Joseph Henderson as stated earlier the assistant accountant and later the chief accountant and general manager. Little is currently known of Baird and a search of Kelly's Directory of Cumberland and Westmorland of 1921 has failed to locate the elusive Baird. However more is known about the assistant accountant Joseph Henderson. Henderson had been the accountant of the Maryport Brewery Ltd, Cumbria that had been one of the breweries taken over by the State. A copy of the medal index record held at the Public Record Office in respect of private Joseph Henderson, 11581, 6th Battalion, the Border Regiment reveals that he had served in the Balkans from 1915 and was also seconded to the South Wales Borderers Regiment before being recalled to work in the LCCB accounts department in Carlisle from September 1916. The link with the Welsh regiment may be significant because also serving in their ranks was Arthur Grimwood later a Colonel in the short-lived army Corps of Military Accountants who masterminded the equally ephemeral Army's 'Cost Accounting Experiment' between 1917-1925 which fell victim to the post-war retrenchment of public finances (Black 2001). The details of this link and its potential influences can, however, only remain conjectural.

The longevity of the cost accounting system attests to its usefulness which was developed further as it was harnessed for regular management decision making and pricing decisions. Thus by July 1943 surviving evidences indicates that management were being regularly supplied by cost reports identifying production in barrels and line costs divided into direct prime costs comprising raw materials, labour and analysed by product lines and gravities, i.e. XX ale 1030°, Pale Ale 1034° and Bitter Beer 1038°, by overall total and this cost accounting framework endured until the demise of the SMS (TSMS 2). This permitted the SMS management to undertake regular rational financial decisions as in the case of its own in house malting production facility in 1965-1966 with a classic example of a make or buy decision (Figure 7).

	£. s. d	£ s. d
<b>Malt cost produced in house - 5,382 quarters</b>		£46,222.12s.2d
<b>Costs which would still have to be borne</b>		
<b>Proportion of wages, salaries etc..</b>	£592.2s.6d	
<b>Management expenses</b>	£121.15s.8d	
<b>Indirect Management</b>	£2,005.9s.1d	
		£2,723.7s.3d
		£48,945.19s.3d
<b>Average market price per quarter</b>	£9.1s.10d	
<b>Own malt production ( i.e. £48,945.19s.3d /5,382 qtrs)</b>	£8.7s.1d	
<b>Saving per quarter</b>	14s.9d	

**Figure 7. State Management Scheme 1966 - Malt Production; Make or Buy Decision Making** (Carlisle TSMS 2)

### The Foucauldian Paradigm Realised

The significance of the costing innovations in the State brewing operations as in its direct involvement in the munitions industry was an explicit recognition by management that the full and accurate cost of production had to be known in order to plan and control processes. This in turn now meant that all the

aspects of operations could be recorded and reported on paper by translating these into numbers after the physical completion of production (Braverman 1974: 125). The development of these modern cost and management practices for the first time created a specific knowledge regime about organisational activities that rendered such performance visible in monetary terms (Burchell et al 1970: 17). This paper has replicated the Foucauldian archaeological and genealogical approach to knowledge acquisition (Foucault: 1991) by adopting a detailed documentation of the development of brewery costing techniques through a Foucauldian classification that offers cost accounting as a disciplinary micro-technology presented within a broad historical and social framework. Foucault had identified the discontinuity of knowledge progression and this is readily apparent in both accounting generally and distinctly in the case of cost accounting practice. This is demonstrably the case in the brewing industry and the evidence suggests that a new disciplinary knowledge regime in brewery accounting was first established within the government owned LCCB and SMS. The cost accounting records thus became not only a financial means of identifying profitable and loss making activities but also acted as a mechanism representing diverse organisational activities, which could be disaggregated and attributed to individuals along with group responsibilities and at the same time promote accountability. In the Foucauldian schemata such,

*Methods of observation, techniques of registration, and procedures for investigation and research, apparatuses of control ... exercised through subtle mechanisms it cannot but evolve, organise and put into circulation knowledge, or rather an apparatus of knowledge.*  
(Foucault 1980: 102)

This knowledge in the form of the regular cost account calculations and reports flowing to the management centre enabled a continuous bureaucratic observation and control to be exercised from a distance, which could be monitored and benchmarked. In turn this knowledge permitted the discipline of individuals and also inculcated a system of self-discipline, in this case amongst the brewing and malting production staff to achieve expected norms but it also acted as a discipline over management to perform equally efficiently as the information flows fed ultimately to the Home Office. Thus in such a system of knowledge and power,

*...power is not exercised simply as an obligation or a prohibition on those who do not have it. It invests them, is transmitted by them and through them.*  
(Horrocks and Jevtic 1998:112)

## Conclusion

The creation of the cost and management accounting framework endured until 1973-1974 and the end of the 'Carlisle Experiment' without any major modifications. That the enterprise was profitable is undeniable given that it continually reported annual profits until the final year of operations when the Scheme was disposed of piecemeal to the private sector and when normal production activities were severely disrupted (Talbot 2005a). Although this was a State controlled business operated as a virtual monopoly on the ideology of disinterested management it was always administered on sound business principles a fact that had been long recognised,

*Throughout the management has pursued a business policy. It has arrived at making profits and it has succeeded in doing so yet at the same time it has persistently endeavoured to maintain standards, which irrespective of profit appear to be demanded by the public interest.*  
Report of the Royal Commission on Licensing (England and Wales) 1929-1931: Chpt. XII S410 (HO 48/12630)

The Scheme's accounting framework and its cost accounting techniques contributed towards these management objectives and these innovative methods offered the potential to be adopted across the industry as 'best practice' reflecting a public sector lead despite conventional wisdom.

Indeed the cost accounting template of the LCCB/SMS is apparent in Brewery Accounting (1939) the work of the chartered accountant G.S Hamilton. Hamilton's slim volume is mainly devoted to financial accounting but it also contains a separate and brief chapter on cost accounting that replicates many of the cost accounting practices developed at Carlisle.

The Scheme was undoubtedly an oddity and the rationale for operating a State brewery on a commercial basis was located in the specific problems of insobriety encountered during the Great War and the needs to boost munitions production. The nationalised brewery business was further legitimised by its operations being conducted within the auspices of disinterested management. The Scheme remained

CARLISLE & DISTRICT STATE MANAGEMENT SCHEME													
RETAIL PRICE LIST													
SPIRITS, WINES, CORDIALS AND LIQUEURS													
DESCRIPTION	"ON SALE"				"OFF" SALE			DESCRIPTION	"ON SALE"		SMOKING ROOMS		"OFF" SALE
	Public Bars Per Half-Glass	Public Bars Per Glass	Smoking Rooms Per Half-Glass	Smoking Rooms Per Glass	Per Bottle	Per Half-Bottle	Per Quarter Bottle		Public Bars Per Half-Glass	Public Bars Per Glass	Per Half-Glass	Per Glass	
<b>WHISKY.</b>							<b>WINES.</b>						
Border Blend and other Proprietary Brands	1/6½	3/1	1/7	3/2	35/-	18/3	9/6	Port (Ruby)	1/-	2/-	1/0½	2/1	18/-
Dimple Haig Black Label	1/7½	3/3	1/8	3/4	37/-	-	-	Sherry (Martial)	1/1½	2/3	1/2	2/4	19/6
<b>BRANDY.</b>							<b>CORDIALS, etc.</b>						
Finest Pale	2/2½	4/5	2/3	4/6	42/-	21/6	11/-	Vermouth (French)	-	2/1	-	2/1	-
Martells * * *	2/3½	4/7	2/4	4/8	44/-	22/9	11/9	" (Italian)	-	1/9	-	1/9	-
Hennessey * * *								Lime Juice	2d.	4d.	2d.	4d.	-
<b>RUM.</b>							<b>LIQUEURS.</b>						
Demerara	1/6	3/-	1/6½	3/1	35/4	18/5	9/6	Peppermint	6d.	1/-	6d.	1/-	-
Jamaica								Ginger Wine	6d.	1/-	6d.	1/-	-
<b>GIN.</b>							<b>DRAMBUIS.</b>						
London, etc.	1/6	3/-	1/6½	3/1	33/9	17/7	9/2	Advocaat					1/6
De Kuypers	1/8	3/4	1/8½	3/5	37/-	-	-	Cherry Brandy					2/3
								Benedictine					2/6
								Drambuie					2/6
<b>DRAUGHT BEERS</b>						<b>BOTTLED BEERS, STOUT, AND CYDER</b>							
DESCRIPTION	"ON SALE"			"OFF" SALE		DESCRIPTION	"ON SALE"		"OFF" SALE				
	Public Bars Per Half-Pint	Public Bars Per Pint	Smoking Rooms Per Pint	Per Half-Pint	Per Pint		Per Small Bottle	Per Small Bottle	Per Bottle	Small	Large	Small	Large
XX ALE	6½d.	1/1	7d.	1/2	6½d.	1/1	10½d.	11d.	10½d.	1/8	10/6	20/-	
BITTER BEER	8d.	1/4	8½d.	1/5	8d.	1/4	OFF SALE ONLY	1/2	1/2	-	14/-	16/-	
<b>MINERALS</b>													
DESCRIPTION	"ON" SALE		"OFF" SALE		A deposit at the rate of 2/- per dozen to be charged on all beer and mineral water bottles sold outdoor, and 2/- each on Syphons, to be allowed for on return.								
	Per Bottle	Per Bottle	Per Bottle	Per Bottle									
Large Size Soda Water	4½d.	4d.											
Split Size " "	4d.	3½d.											
Baby Size " "	3½d.	-											
Syphons " "	-	1/-											
Large Size Lemonade	4½d.	4d.											
" Ginger Ale													
" Ginger Beer													
Split Size Lemonade													
" Dry Ginger													
" Indian Tonic	4d.	3½d.											
" Grape Fruit													
" Orange Fruit													
" Sparkling Lime													
<b>CIGARETTES AND TOBACCO</b>													
Woodbines	...			1/4	for 10								
Gold Flake, Capstan, Navy Cut	1/9½			per 10									
Twist Tobacco	...			3/7	per oz.								

**HOURS OF SALE**—The only hours during which Ale, Beer, Stout, Wine, Spirits, or Cyder can be sold, supplied, or consumed are as follows :—  
 Week Days :—From 11-30 a.m. to 3 p.m., and from 5-30 to 10 p.m.  
 Sundays, Christmas Day, and Good Friday :—From 12-30 to 2-30 p.m., and from 7 to 10 p.m.  
 14th January, 1952. J. HENDERSON, General Manager,

Illustration 2 - SMS Product Charges 1952

(Reproduced by the kind permission of the Cumbria County Archives, Carlisle).

Note the lower prices of the state beer compared to the commercial equivalents.

unique as a government controlled body and its retention from the outset of a recognisably modern cost accounting regime distinguished it from other State controlled bodies: the Army for example abandoned its own cost accounting framework in 1925 after pressure from the Treasury. In some instances the Army was also like the SMS having its own sausage and boot manufactories factories (Black: 2001) but unlike the SMS it did not face the same commercial imperatives to retain any cost accounting technology.

The usefulness of the LCCB/SMS cost accounting regime is evidenced by its retention and its ability to assist in management decision-making. This was especially the case in product pricing where rival commercial products had to be undercut to ensure sales levels (Illustration 2). As part of the financial reporting framework product costs were regularly reported to the Home Office and any price increases had to be justified by accurate product costing that were examined in London before approval was granted.

The demise of the SMS was due to two main factors. Firstly the major change in political attitudes from the 1970's onwards witnessed the championing of market forces instead of State administered solutions in providing a broad range of public sector services and the SMS was an anachronism within this context. Yet the SMS had repeatedly demonstrated profitability but this profitability was confined to a restricted market sector within which it was allowed to operate. The recurring suggestion by various members of the SMS to extend sales outside the Carlisle area and thus increase profitability was always thwarted as the reply by the General Manager of the Scheme demonstrates,

*The SMS's operations are confined by the provisions of the Licensing Act 1959 Schedule 9. The Scheme has advantages over other brewers trading in the Carlisle district and the view was taken that it would not be right for it to go outside the area to compete for new business with commercial concerns.*

(SMS Minutes 19th December 1963 Carlisle TSMS 7 1/1/6)

The SMS was despite criticism a demonstrably efficient operation as sundry management consultants attested to,

*...there is little, if any, scope for reducing labour and an overall increase in production is probably ruled out because your sales would appear to be reasonably static. Your brewery, moreover is a small business and we doubt if the cost of a complete exercise in a time and motion study would be justified, particularly since the objective does not appear to be to increase output.*

BAPEC Ltd Bottling and Packaging, Engineering Consultants 4th March 1969 (Carlisle TSMS1/4/2)

By the standards of the day the Carlisle brewery had by then become a small operation with an average annual output of 250,000 barrels and the deliberately restricted market within which it operated precluded this output being exceeded. Nonetheless this production efficiency was made apparent in a cost accounting and benchmarking exercise conducted by the Technical Committee of the SMS in October 1970 whereby in co-operation with the management of Higson's Brewery of Liverpool<sup>11</sup> a series of joint inter-brewery comparisons were undertaken on production and efficiency levels. It is not apparent why Higson's was selected or agreed to take part in this exercise but it was of comparable size to the SMS operations. A representative sample of cost units both favourable and unfavourable is presented to reflect the SMS's performance levels (Figure 8).

<sup>11</sup> Originally founded in 1780 in Liverpool it was bequeathed in 1865 by the owner Thomas Howard to his chief cashier Daniel Higson. It was registered in 1888 as Daniel Higson Ltd and re-registered as Higson's Brewery Ltd in 1937. It was acquired by Boddingtons Breweries Ltd in 1985 and ceased brewing in 1990. (Barber 2005:101)

Cost Unit	Higson's Brewery Cost Unit Shillings	SMS Cost Unit Shillings
<b>Retail Profit per barrel (Bar Prices) - Mild Beer</b>	134s	137s
<b>- Bitter Beer</b>	170s	148s
<b>-Keg/Mild</b>	188s	210s
<b>-Keg/Bitter</b>	236s	182s
<b>Bottle Average</b>	5s 6d	7s
<b>Wages of bar staff expressed as percentage of takings</b>	13.1%	13.8%
<b>Brewery Wage per barrel</b>	18s	12s 3d
<b>Brewery Standing charge per barrel</b>	8s 4d	9s 1d
<b>Brewery Average Weekly wage - production workers</b>	396s	344s
<b>Brewery Average Weekly wage - shift workers</b>	477s	418s
<b>Bottling Stores - wages per barrel bottled</b>	19s	22s.2d
<b>Bottling Stores -hours worked per barrel bottled</b>	2.2 hours	2.4 hours
<b>Bottling Stores - average weekly wages male</b>	387s	382s
<b>Bottling Stores - average weekly wages female</b>	233s	257s
<b>Bottles and Cases - Cost per barrel (including bottles and depreciation of cases)</b>	10s	10s 11d
<b>Converted barrels sold per person (Whole Staff)</b>	1,732 barrels	1,360 barrels

**Figure 8. Comparison of Costs with Higson's Brewery- October1970**

(Carlisle TSM16/1/4/2)

The Technical Committee noted that the results of the comparison were by no means unfavourable to the Scheme.

The objectives of the SMS have a new resonance in contemporary British society with the liberalisation of the drinking laws in the government's belief that this will reduce overall levels of insobriety. This is a diametrically alternative solution to that invoked between 1914-1918, which witnessed the introduction of licensing hours and in Carlisle a local nationalisation programme to curb the worst excesses, which a free market commercial solution could not provide. The populist image of an inefficient state bureaucracy incapable of operating on commercially profitable business lines in the case of the LCCB/SMS was demonstrably inaccurate. Part of the reason why the LCCB/SMS was efficient and financially successful was because it developed and applied a modern cost accounting system to assist in its overall management procedures, which were directed to achieve socially acceptable profits.

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