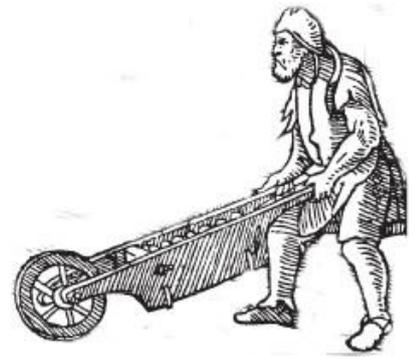




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FULCRUM is a newsletter for collectors of antique weighing and measuring equipment and enthusiasts of historic metrology. It is published in February, May, August and November. Contributions should be sent to the Editor, John Knights.

Fifty Fifty



In the last edition I mentioned the somewhat ill fated attempt to introduce a decimalised version of the imperial system into the UK. The cental was introduced in 1879, described somewhat optimistically as ‘the new hundredweight’. This suggests that there was a more ambitious scheme afoot to actually replace the existing system with the decimal version. For some reason it took a few years before the actual weights in the series were introduced. The 50lb appeared in 1903 and the 20lb, 10lb and 5lb three years later. Shortly afterwards, in 1897 however, the optional use of the metric system was introduced into UK law and perhaps it was then decided to pursue that as the go-to

option rather than mere decimalisation. This of course proved to be the case and the legislation requiring the (almost) exclusive use of metric weights and measures in the UK was rushed through in a mere 100 years.

One of the main concerns relating to weights and measures in public use was the avoidance of confusion and thereby, opportunities for fraud. Thus having a set of weights, in circulation, that was somewhat similar in size and appearance to a slightly larger set of weights could be seen as asking for trouble. This problem was addressed by having the decimal weights made in an irregular octagonal form and it was hoped the chopped off corners would readily distinguish the weights from their septimal cousins if the emblazoned value proved insufficient. As previously mentioned it was only the 5lb weight that routinely found its way into the wild and then normally in industrial

situations. The retail world remained pretty much untroubled by this attempt at decimal infiltration. Other nations of course embraced decimal weights, in particular the USA, where it appears to be the norm. A comparison between the UK and weights is shown above.



Through a Glass Darkley

One of the more optimistically listed items on EBay recently was an Avery headwork clearly wrenched from a defunct dormant platform scale and offered for sale at £50 or Best Offer.

Whilst it offered little as an item of either practical use or aesthetic form it was of of some interest to those interested in historic metrology (or me anyway). It illustrates yet another one of those transitional designs that bridged the gap between traditional mechanical machines and the pure electronic instruments of today.

The design, from the late 1960s makes use of new, for those days, technology, in the form of a light projection system showing the weight value on a ground glass screen.

Similar systems had already been used on precision balances but this adaption for use on heavy duty machines was a later idea.

As can be seen from the pictures this system greatly simplifies the design of a large capacity headwork. Gone are the cams, ribands, racks, pinions, drop weights etc and the whole cabinet looks ridiculously empty by comparison to the clattering miscellanea of yore. In this machine the whole weight range, by the wonder of microphotography and light projection can be encompassed in one swing of the pendulum. The 'chart' is a transparent photographic strip enclosed in a glass graticule that moves through a light projection system as the resistant displaces. Gone however is also any recognition of the forces at

work! There is no oscillating beam, no sweeping pointer, no strain, no heft, no intrigue. The weighing operation is reduced to numbers on a rather miserable little frosty screen. We also see, of course, a machine entirely dependant upon an external power source. Even though



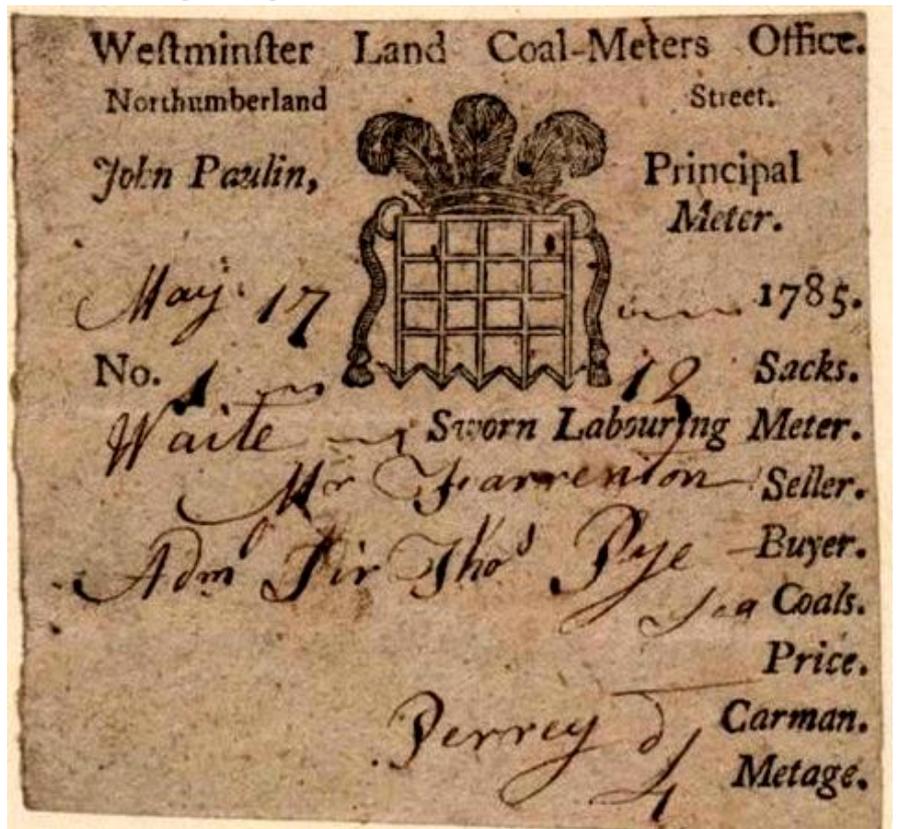
the scale is still a mechanical device that can achieve its equilibrium, no one can know the result if it's not plugged in. It was the beginning of the end for the aesthetics of weighing and the beginning of its reduction to a sterile technology.

Meters and Metage

Our good friend Mike Sharpe recently sent me a picture (right) of a little slip of paper issued in the 18th century as part of the Byzantine system that surrounded the trading of coal in London. Those who have followed my meanderings in Fulcrum over the years may recall I did a piece on this subject back in Edition 7. Coal was delivered to the capital by sea from the North East of England and was unloaded by 'whippers' who hauled it from the holds of the ships.

The quantity in the hold was ascertained by the use of a nine bushel vat on the deck, which was filled to a standard heaped condition and then decanted into barges or 'lighters' which took the fuel to the wharf. From there it was bagged up and put into carts for delivery to the customer. The sacks were required to hold 3 bushels. This was

measured out using a bushel measure which under the system of the day was also a heaped measure. Heaped measure is, superficially, a strange concept as it immediately introduces a degree of estimation into what was supposed to be an exact process. The size of the heap was prescribed ie. a 6 inch cone on top of a filled Winchester Bushel. This resulted, apparently, in an actual measure of one bushel plus a quart of the black stuff. It must be noted that constructing a precise cone, 6 inches high out of lumps of coal is not a task best suited for a gent with a big shovel who is required to perform his



task really quickly. The whole process was overseen by the coal meters of various stripe who were tasked with ensuring that the vats on the ships and bushels on the lighters were properly filled. The document found by Mike appears to relate to a load of coal consigned to a carman on behalf of a merchant for delivery to a buyer. The load consisted of 12 sacks which would or should have contained 3 heaped bushels each. The loading was overseen by the Westminster Land Coal-Meters' Office who were responsible for the assessment at the wharf and the well being of the ultimate consumer. The meters were, however, also remunerated on the basis of the amount of coal ultimately or apparently yielded from each shipload. This payment is represented by the Metage entry on the ticket. Thus the system was really a cosy conspiracy between official and consignor with the customer being the only one destined to lose out. The whole cumbersome and corrupt system was ultimately done away with but because of the importance of coal as a ubiquitous necessity it long continued to be subject to great official concern and control.

It occurs to me that it is a little odd that the survival of humanity has always relied of artificial sources of warmth. Whereas polar bears and penguins are quite happy to mooch around in sub-zero temperatures as they have the necessary thermal layers we were denied this protection. Instead, we had to don furs, stripped from other properly equipped creatures and seek out stuff to set fire to in order to avoid hypothermia. This of course led to our thirst for technological advancement in other areas of life. Thus, ironically, it was our intrinsic frailty that resulted in our ultimate pre-eminence and mastery of the world. Whilst other creatures are content to merely repeat the same life cycle each year we acquired the improvement habit in a big way and can never stop developing. Regrettably we have now, somewhat belatedly, realised that we are actually in danger of improving ourselves out of existence. Perhaps when we've finally finished frying the planet some less busy species will take over.

The Coalman Cometh

Throughout the 20th century the coal trade was considered to be a bit dodgy by all engaged in weights and measures administration. The supposedly ingenious methods of customer defrauding were an important part of the inspector's mythology and a good amount of official time and effort was committed to the pursuit of these transgressions. Fuel of all sorts was a comparatively expensive commodity so consumers were somewhat concerned that the correct amount was received and some sellers saw it worthwhile to cheat as significant illicit gains could be made.

Many a happy hour of inspector's time was passed cruising around looking for coal lorries, weighing the bags on the back of said lorries, reconciling the number of bags on the lorry with the accompanying documentation, surreptitiously observing deliveries and digging out the contents of peoples' coal bunkers.

A bit of a shock-horror moment occurred in the 1960s when technology loomed onto the hitherto unchanging coal delivery scene.

This was, in reality, a less than high-tec development but it did threaten to alter the ability for official scrutiny. The device popularly known as the autobagger allowed for solid fuel to be carried in bulk on a delivery vehicle and weighed out at the point of delivery (below left). The weighing device was laughably simple. A conventional coalman's deadweight was installed at the rear of the vehicle in conjunction with a cradle arrangement that could be raised and lowered by a motor. When lowered, the bar of the cradle sat on the goods plate of the scale and the hoist mechanism disengaged.



A detachable sack was hooked into the base of the cradle and sat below a chute with a conveyor belt that ran under the hopper holding the fuel. By operating the conveyor fuel was dropped into the sack until the scale tipped as the correct

weight was achieved. This tripped a switch which turned off the conveyor. The coal man would then remove the filled sack and in the conventional way carry it into the customer's coal shed. It was immediately apparent that this simple device lent itself to interference by an unscrupulous operator and that detection of any 'leaning on the scale' could be difficult to detect. There was the real prospect of delivery men being actively pursued up the garden path so the bag could be weighed before it was tipped. It is amazing just how much the sale of coal and other solid fuels was such a big part of life in the 20th century. The laden coal lorry was a common sight and the reputation of the coalman as being a bit of a rogue was part of popular culture. Comedians cracked jokes about coal in the bath, parrots counting in deliveries etc as before the widespread use of central heating, coal in the bunker was a matter of great importance to everybody in the UK with its somewhat mercurial climate.

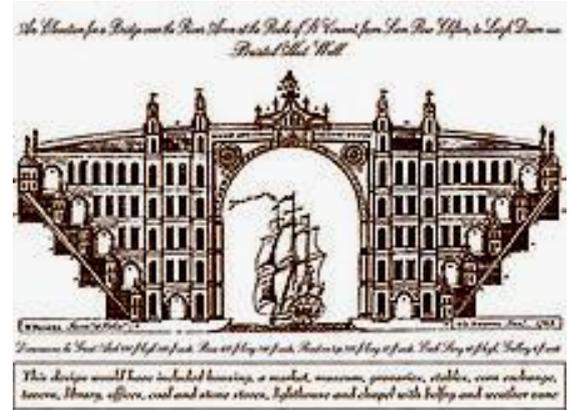
We now see the day coming when the use of all fossil fuels will become a thing of the past and the last few coal lorries, along with the oil tankers and petrol pumps will be consigned to the folk memories of the elderly. Whilst this is a laudable ambition given the state of the world it does represent yet another break with a more innocent past.

A Bridge too Far

I was recently in Bristol, one of my favourite English cities. On this occasion however the corona virus tragedy was looming and an air of gloom was increasingly descending on the town during our few days there. We did wander up onto Clifton Down to look, again at Brunel's wonderful suspension bridge. Dating from the 1860s it is of course ill equipped for modern traffic and has a 4 tonne weight limit imposed. Eight wheeled juggernauts are therefore required to find an alternative route. Payment of tolls is increasingly by contactless cards and lifting barriers control entry onto the bridge. Weigh pads are inserted into the road on each approach and any excessive weight detected causes the barriers to lock.



I would love to be able to say that the weighing system is a wonderful clanky piece of Victorian ingenuity like the bridge itself but regrettably the axle weighers are actually a pair of scarcely noticeable metal rectangles (right). Beneath of course is wonderful microelectronic technology that weighs and summates in an instant and protects the bridge from the Bulgarian eight wheeled lorry driver following his satnav on the shortest route to Weymouth. The construction of the bridge was famously dogged by misfortune. Construction began in 1831 but owing to civil unrest, financial crises etc it was not actually completed until 1864, unfortunately after the death of Brunel.



The scheme to bridge the Avon gorge dated back to the mid 18th century and Brunel's design was by no means the only one submitted for consideration. Among the others was a scheme by William Bridge (top right). Brunel won out of course because his design was technologically advanced and despite being a challenging build was probably cheaper to construct than the other contenders. Mr Bridge's design would certainly not have been cheap but with all respect to Isambard, I should imagine that had it come to be it would be an even greater draw to the West Country than the current edifice.

The sketch gives little indication of the scale and grandeur of Bridge's design but by the wonder of modern technology someone has constructed an image of how it would have looked had it been dropped into the gorge (bottom right).

Described as being a small town the bridge would have contained multiple rooms occupied by domestic and commercial premises. Now of course, they would have been elegant apartments with a spectacular view of the gorge and an eye watering price tag.

