

Getting the Measure of Things

One of the ongoing activities of organisations such as the National Physical Laboratory is the determination and maintenance of standards for measurement. The metric standard for length is the Metre. This was initially defined as the distance between a pair of pegs mounted on a solid base. Similarly the Kilogram was the weight of a specific piece of metal stored in a vault in France. Time was always a bit of a problem to standardise, because the second is not something tangible.

The Imperial system of units worked in much the same way as the Metric system and continues to serve admirably for hundreds of millions of people around the globe. Britain had the misfortune of being forced to change from Imperial units to Metric measure. It was a consequence of selfish political diktat. At the time of the change, one of the arguments advanced was that the UK would only be able to export into Europe if it adopted the European system of measure. In practice, the change undoubtedly limited the marketability of UK products in those countries which continued to employ Imperial units. Attempting to establish a foothold in the European market was fraught with difficulties, not least those of language and culture. Charles De Gaulle consistently opposed Britain's membership of the Common Market on the grounds that the British were not sufficiently European. President De Gaulle was forthright. British politicians should have paid close attention to the views of General De Gaulle. Metrication and trading with European countries ought to have remained a matter of choice for British Industry while companies continued to develop and serve their well established Imperial customers.

The conversion of machinery and products to metric standards combined with the retraining of staff hampered UK businesses, weakening them. That in turn undoubtedly made them much better value in the eyes of foreign speculators and asset strippers. Instead of exporting products, the UK made a once off export of its ability to produce products. Whether or not the policy of metrication should be regarded as shortsighted might depend on how successfully one exploited the decline of British Industry for one's own ends.

Of course, there was slightly more to it than that. The Common Market was a clique which had been established by 6 countries. The policy of keeping Britain out was intended to make British politicians more desperate to join the clique. The trick is so integral to human nature that schoolchildren use it. The Tory Party became so desperate to join the Common Market that they preferred to sell out their own electorate rather than ensure reasonable trading terms. The Irish government did exactly the same thing. These countries had no sooner joined the Common Market than their electorate realised the extent to which they had been betrayed. Ever since then they have been trying to negotiate better terms for themselves. Consider for example, the loss of the Irish fishing grounds to the EU. This single item has cost Ireland more than all the "Grants" and "Subsidies" the country has ever received from Brussels.

In reality the core of the EU clique is subsidised by countries the UK and Ireland, yet the European accountants and bankers have managed to invert the interpretation of reality. Many of the smaller countries have been saddled with debt which is entirely virtual, yet has been endowed with the reality of solid steel. It is not surprising that the EU Central Bankers have been able to pull off the scam. A law of diminishing returns applies to every field of human endeavour except finance. Exactly the same amount of effort is required to implement any given transaction in financial or commodities markets. Seldom does anything of a significant physical nature change hands, yet commissions increase with the total transaction value. In financial activities, the more money one possesses, the easier it is to make money.

The correct move would have been for countries like the UK and Ireland to establish their own little clique. By doing so they would have enhanced their dealing position. That is exactly what the former Soviet states ought to have done. A trading bloc formed of the countries from the Baltic to the Black Sea would have been a formidable economic power with the ability and culture to interface between Western Europe and the Russian Federation. They would also have retained their military integrity. For example, Poland would not have found itself being prepared as a battleground with the deployment of US missiles on its territory.

The essence of ensuring equitable trade between countries does not lie in unified legislation or a single currency. The important basis is to ensure equivalent "Value" of products and services as they are transferred between nations. A pair of shoes is a pair of shoes, a sack of potatoes is a sack of potatoes, and a day's work is a day's work. The trick is to reach international agreement on relative living standards and costs. Comparison between fundamental economic factors across borders changes slowly and progressively. It does not display the high frequency stochastic behaviour of Money and Commodity Markets.

These latter are entirely unsuited to International Trade Relations. They create tidal flows of migrant labour, eroding the structure of society, and undermining political stability. Financial markets ought to reflect economic activity. They should not be permitted to control it.

The dissolution of the USSR presented an opportunity. However, many former Soviet States chose to join the EU and were given a worse deal than the UK and Ireland had obtained. First their currencies were traded down. Then the industrial assets of those nations were stripped and a “*Brain Drain*” to the West ensued. The same intellectual and physical asset stripping process will be applied to any country which now joins the EU. It is notable that the Russian Federation has recently embarked on a program, creating a new economic trading bloc. Perhaps they will show the West that they have learned from the mistakes of their erstwhile satellite states.

For many of us who grew up using Imperial units and subsequently adopted metrication, the use of mixed dimensions continues to this day. Some of us secretly exploit innocent Whitworth, BA, Metric, and UNC threads, all on the same component. We might even throw in the odd sample of British Standard Cycle or an entirely non standard thread for good measure. Breaking the rules so flagrantly gives us an adrenaline rush. However, we have to be very careful not to let the authorities find out. We must never forget the criminal prosecution of a certain butcher for being courteous towards his customers and persisting in the sale of sausages by the pound. In Britain, uniformity of inconvenience is enforced by the Iron Hand of the Law!

America had a narrow escape when it was deciding which system of units to adopt. The ship carrying the standard Metre and Kilogram from France sank en route. Some might declare the event to be evidence that God really exists. Here in Ireland, both systems of measurement have been embraced with the finest Irish humour. Perhaps the country’s strong ties with America have balanced its EU affiliations. Purchasing carpet by the square yard is quite normal. The carpet will arrive 13ft wide by the appropriate number of metres in length. It is a matter of routine for timber to be sold by Imperial cross section and Metric length. Now that’s detante! Nobody seems to mind as long as the goods do the job. For the normal human being, measuring tapes are marked in Metric and Imperial scales. Dimensions like “*Two foot and 76mm*” are easy enough to use once you get the hang of switching from one graduation to the other at the appropriate point. An engine which develops 100 horsepower is obviously more powerful than one which produces 80 Kilowatts. I’m sure any car salesman will “*Assure*” you of the accuracy of the above observation! Numbers sell things.

While on the subject of power, the correct term should perhaps be “*Horse*”. After all, nobody refers to “*Wattpower*”. The idea of naming units of power after an animal is natural. Horses are well known for their industrial utility. People can imagine a horse doing useful work. For all I know, James Watt was a couch potato. Using animals as the standard also accomodates larger units such as the “*Elephant*”, while smaller work outputs may be described in terms of “*Dog*” or “*Ant*”. It might be possible to discard banal prefixes like “*Kilo, Mega, Milli*” and so on.

As a calibration check on the current status of units, I will occasionally ask a teenager how tall they are. A typical answer might be “*5 foot 8 inches*”. In Ireland, height is seldom given in centimetres, much less in the “*Official*” millimetre equivalent. For confirmation, I then ask the teenager how much they weigh. The response is naturally given in Kilograms.

The difference between weight and mass really doesn’t matter one bit. Few people would know that any difference exists. Proponents of the SI system tried to hammer home the distinction between the Kilogram and Newton. For the most part, such enthusiastic pedantry probably served as an additional justification for students to choose careers in anything other than Physics or Engineering. To this day the distinction still doesn’t make a blind bit of difference to the life of the average person.

Nevertheless it must be remembered that there are several important purposes for standards. An obvious one is to keep those who define and enforce standards in highly paid jobs. The existence of different standards is important to me because it provides scope for variety and interest in my design and construction work. Another essential reason for the existence of standards is to make sure that there will always be something trivial for enthusiasts of different standards to argue over.

However, without doubt, the most important purpose which standards serve is the provision of obstacles to the creation of employment in areas such as manufacturing. This underlying purpose was exposed by the introduction of the CE mark, which, coupled with the insanity of producing instruction manuals in countless different languages, marked the onset of the final phase in the ascendancy of the parasite professions. Neither the CE mark, nor multilingual instruction manuals add anything to products. Importers should carry full responsibility for ensuring that products meet national standards.

A company I worked for had three talented designers. Each had been responsible for one or more of the company’s flagship products. When I joined the firm, one of the three had his time fully committed to producing user manuals and obtaining CE approvals. One third of the corporate creative capability was wiped out to satisfy irrelevant regulations.

One very troublesome aspect of standards institutes is their propensity for naming units after individuals. Unlike reference to an animal, a person’s name has no physical significance.

Rather than think in Newtons, I tend to think in terms of KgMS^{-2} . In fact I generally regard problems as being in two parts which run in tandem. There are the numerical values on the one hand and the dimensions on the other. With numbers it is always possible to work out a result. However if the dimensions don't turn out to be meaningful, calculating the result is pointless.

Metrication was perhaps the largest single opportunity wasted by the scientific community in recent history. The whole metrication process seemed to have been dominated by an exercise in "*Who gets their name associated with which unit.*" Had meaningful names been introduced instead, Physics and Engineering might have flourished. However, assuming the destruction of British Industry was the objective all along, the purpose was well served.

I don't have any grouse against Isaac Newton. In fact he had rather a hard time of it from Hooke and the scientific community in general. Newton deserves recognition for having been one of the greatest scientists that Britain ever had. They just don't make Newton's any more. Equating the magnitude of Isaac Newton's impact on science to that of an apple is a bit small minded to say the least. Leaving aside his contributions to optics, Newton gave the world something far more important than a miserable little force.

Gravitation combines the unique combination of having infinite range, applying to every piece of matter, always being attractive, and incapable of being screened or attenuated. Newton's law of gravitational attraction quantified a characteristic which may be the most fundamental property possessed by matter. In my view, the Universal Gravitational Constant "*G*" is possibly the most important quantity known. The observed constancy of the speed of light in a vacuum "*c*" is its natural partner. The significance of the latter was brought to light by Albert Einstein. It was also Einstein's efforts which demonstrated the seniority of these two constants in the hierarchy of physical constants.

If standards institutes must insist on naming units after people, the principle really ought to be extended. For example, the basic quantity of political dogma required to wipe out a nation's manufacturing capability might be defined as the "*Thatcher*". The unit of measure for the extent to which parliament must be misled in order to start a war could become the "*Blair*". The quantity of rouge trading necessary to break a bank may be defined as the "*Leeson*".

Engineering is a goldmine of opportunities for the creation of irrelevant and confusing terminology. For example, one might choose a pitch of 12 threads to the inch and call it a "*Whitworth*". A three eighth Whit thread would then be 0.375" dia x 1.333 Whitworths. A 3/8" BSF can be expressed as 0.375" dia x 1.666 Whitworths. The adaptability of the approach is indisputable. Any thread might be expressed in its Whitworth equivalent. An 8.0mm Metric coarse machine screw can readily be replaced by one of 0.3149606" dia x 1.6933 Whitworths (Approximately). Provided thread forms are ignored and sufficient torque applied, - in Lb-Metres perhaps, - the approach ought to work exceedingly well. While on the subject, the unit of torque might be renamed after some all-in wrestler, preferably a woman. It is important to remain politically correct and maintain gender balance.

One may be certain that those who define standards will continue introducing new ones until the day they die. I heard the politician, Jack Straw, on the radio. He sanctimoniously extolled the role of the British Parliament. In his view, the purpose of the House of Commons was to "*Create legislation*". All those years, people had been casting their votes thinking their elected MP would represent their interests. In truth, the only role of an MP is to constrain and hamper the lives of the electorate. Perhaps the "*Straw*" might become the unit of voter gullibility. One characteristic the UK evidently shares with Ireland is that few politicians ever seem to have considered the possibility of using government for the purpose of serving the interests of the Nation!

Perhaps a Select Committee could be established to consider the potential merits of having a government which would act for the benefit of the electorate.

In the highly unlikely event that good government ever needed to be quantified, perhaps an appropriate unit could be the "*Beveridge*" after Lord Beveridge, whose books include "*Full Employment in a Free Society*".

Jim Cahill

© 20th July 2013 revised 26th July 2014 All rights reserved.

Copy freely with full acknowledgement.