UKMA news

The newsletter of the UK Metric Association

Campaigning for a single rational system of measurement

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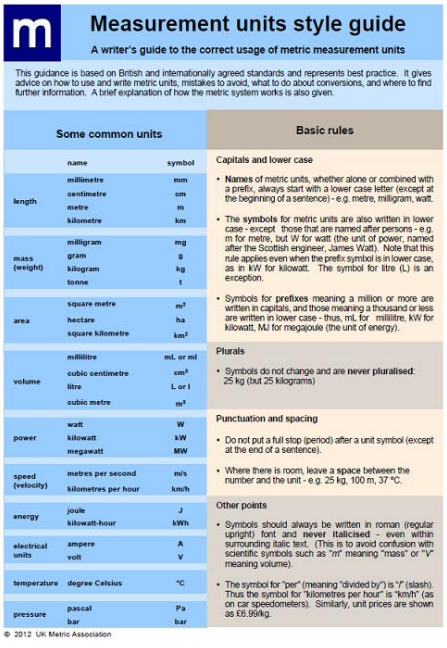
In this issue:

Style guide

The UK Metric Association published on 5 July a "Measurement Units Style Guide". Aimed at anybody who uses metric units in their writing, the Guide is available in both hard copy and as a free download from the UKMA website.

It is also attached in full at the end of this newsletter



Measurement units style guide

A writer's guide to the correct usage of metric measurement units

This guidance is based on British and internationally agreed standards and represents best practice. It gives advice on how to use and write metric units, mistakes to avoid, what to do about conversions, and where to find further information. A brief explanation of how the metric system works is also given.

Some common units

	name	symbol
length	millimetre	mm
	centimetre	cm
	metre	m
	kilometre	km
mass (weight)	milligram	mg
	gram	g
	kilogram	kg
	tonne	t
area	square metre	m^2
	hectare	ha
	square kilometre	km^2
volume	millilitre	mL or ml
	cubic centimetre	cm^3
	litre	L or l
	cubic metre	m^3
power	watt	W
	kilowatt	kW
	megawatt	MW
speed (velocity)	metres per second	m/s
	kilometres per hour	km/h
energy	joule	J
	kilowatt-hour	kWh
electrical units	ampere	A
	volt	V
temperature	degree Celsius	°C
pressure	pascal	Pa
	bar	bar

Basic rules

Capitals and lower case

- **Names** of metric units, whether alone or combined with a prefix, always start with a lower case letter (except at the beginning of a sentence) - e.g. metre, milligram, watt.
- The **symbols** for metric units are also written in lower case - except those that are named after persons - e.g. m for metre, but W for watt (the unit of power, named after the Scottish engineer, James Watt). Note that this rule applies even when the prefix symbol is in lower case, as in kW for kilowatt. The symbol for litre (L) is an exception.
- Symbols for **prefixes** meaning a million or more are written in capitals, and those meaning a thousand or less are written in lower case - thus, mL for millilitre, kW for kilowatt, MJ for megajoule (the unit of energy).

Plurals

- Symbols do not change and are **never pluralised**: 25 kg (but 25 kilograms)

Punctuation and spacing

- Do not put a full stop (period) after a unit symbol (except at the end of a sentence).
- Where there is room, leave a **space** between the number and the unit - e.g. 25 kg, 100 m, 37 °C.

Other points

- Symbols should always be written in roman (regular upright) font and never **italicised** - even within surrounding italic text. (This is to avoid confusion with scientific symbols such as "m" meaning "mass" or "V" meaning volume).
- The symbol for "per" (meaning "divided by") is "/" (slash). Thus the symbol for "kilometres per hour" is "km/h" (as on car speedometers). Similarly, unit prices are shown as £6.99/kg.

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UKMA conference report

From the UKMA Chairman, Robin Paice

Why aren't we getting our message across?

The theme of this year's Annual Conference, held on 7 July in central London, was "What are our messages – and how can we get them across?" Implicit in these questions was the fact that, despite >10 years of campaigning, and despite the overwhelming logic of our case, we are little nearer our objective of making metric units the default system of measurement for all purposes in the UK. Why are we failing to get our message across – and what can we do about it?

The conference listened to recordings of a number of local radio broadcasts, featuring the Chairman and Secretary being interviewed in Birmingham, Leeds and Glasgow, and responding to phone-ins. These excerpts illustrated the ignorance, prejudice, myths and misinformation that surround the whole issue – both amongst the general public and amongst the radio presenters themselves.

Conference delegates identified good and bad practice in responding to interviews, and key points to get across (e.g. single system, easy to use, not an EU issue) and points to avoid (e.g. technical superiority). As a result of this session, a briefing note will be produced for anybody who speaks or writes on behalf of (or in support of) UKMA in radio or television interviews, phone-ins or newspapers.

A further idea advanced by the Chairman was that we need to have reliable data (rather than mere opinions and assertions by politicians and tabloid newspapers) about how the general public really feel about metric units. This could be useful for propaganda purposes, but, more importantly, it could help us to tailor and target our campaign to get our messages across more effectively. The Committee will consider whether this idea can be progressed – and whether funds can be raised to finance it.

Lord Howe calls for metrication progress

From MetricViews:

Lord Howe of Aberavon, the former Conservative Chancellor and Deputy Prime Minister, intervened in the Queen's Speech debate to reiterate his call for the Government to complete the conversion of the UK's weights and measures to metric units.

Speaking in the House of Lords, Lord Howe (who is patron of the UK Metric Association) described the present situation as "a uniquely confusing shambles ... that puts us all to shame." "Metrication has got stuck", he said. Stressing that the original decision to convert to the metric system "had nothing to do with our relationship with our European partners", he went on to "urge the Government as a whole and the country across the board to resume the long drawn-out process of conversion to the metric system, begun in 1965."

Lord Howe of Aberavon

From http://www.parliament.uk/biographies/lords/richard-howe/27069

Text of speech

The full text of Lord Howe's speech is here:

"My Lords, the topic which I propose to discuss certainly was not touched on in the gracious Speech, but it could and should have been raised at any time. It is a very simple proposition, which may surprise the House: British weights and measures are in a mess. We have litres for petrol and fizzy drinks but pints of beer and milk. We have metres and kilometres for athletics and the Ordnance Survey but miles per gallon for cars. We have the metric system for school but still have pounds and ounces in the market. Certainly, this muddle matters. It increases costs, confuses shoppers, leads to serious misunderstandings, causes accidents, confuses our children's education and, quite bluntly, puts us all to shame.

This is even a constitutional topic because about 800 years ago, Britain's first charter of human rights that dealt with constitutional matters—I refer, of course, to Magna Carta—proclaimed that there should be only, "one measure of wine throughout our whole realm ... and one measure of corn ... and one width of cloth" , and so on. Long before then and ever since, every civilised society has recognised the need for one set—and only one set—of standard measures. By contrast, we have managed to come near to recreating Disraeli's two nations—divided between, on the one hand, a metrically literate elite and, on the other, a rudderless and bewildered majority.

How did we get into this uniquely confusing shambles? It is because we have been dithering about it for some 150 years. As long ago as 1862, a Select Committee of the House of Commons unanimously recommended the adoption of the metric system which had swept across Europe and elsewhere. In 1904, the House of Lords voted in favour of a Bill to the same effect and, remarkably in a way, in 1965 the decision was finally taken—in response to requests from the CBI and others, and after long and widespread consultation—to go metric over the following 10 years. It is important to understand that that decision had nothing to do with our relationship with our European partners. It was our own decision on our own case, taken eight years before we joined the European Community.

How did we manage to end up in this very British mess? It is because successive British Governments have lacked consistency, candour and courage in implementing and presenting a policy which was, at the outset, rightly supported by a broad majority of all those who had given the topic serious consideration. It was the first Wilson Government who launched the process in 1965, and the Heath, Wilson and Callaghan Governments who carried it on. The whole operation was handled, without significant controversy, by a broadly representative commission: the Metrication Board, which, in its final report in 1979, was able to suggest that the change was by then almost complete. In the Heath Government I had been, as Britain's first Minister for Consumer Affairs, responsible for the metrication programme. By 1979, however, I had myself become a penny-saving Chancellor of the Exchequer, and as such I readily accepted the decision to abolish the Metrication Board, which claimed to have completed the process.

So where should we go now? We simply cannot afford to go on crippling ourselves with acceptance of the present mess, and it certainly would be madness to go backwards. No one is now so foolish as to argue that we should actually move away from the rest of the world. The only solution is to complete the changeover to metric as swiftly and cleanly as possible. To sustain our present imbroglio would continue consumer confusion, perpetuate safety hazards and obstruct business efficiency.

I could have presented the case in this way: the most glaring omission from the gracious Speech is the lack of any reference to the need to complete the modernisation—and metrication, of course—of our system of measurement. Measurement is fundamental to industrial production, consumer protection, health and safety and science and education. The policy of all Governments since 1965 has formally been to change gradually from imperial to metric units, while continuing the option for consumers to continue using imperial measurements if they wish. However, there has been no further progress of any kind since the year 2000. Metrication has got stuck. As a result, we remain in a muddle of metric and imperial measurements, with some people using one system and others using the other, with all the resulting incomprehension, conversion errors and additional costs, giving the impression to visitors, especially in this Olympic year, that we are a nation living in the imperial past.

A particular recent concern, for example, was the failure of the Department for Transport to seize the opportunity to improve road safety by requiring all imperial-only height and width restriction signs on bridges over highways to be replaced by signs in dual metric and imperial units. That would be a simple thing to do and would cost about £500,000. If it were done, it would probably have huge financial benefits of over £2 million as a result of savings and reduced bridge strikes by metric drivers of foreign lorries on imperial roads with bewildering signs.

I urge the Government as a whole and the country across the board to resume the long drawn-out process of conversion to the metric system, begun in 1965. We should seize on opportunities for progress as they arise and make proper preparations for bringing us comprehensively up to modern international metric standards—a simple proposition that we have neglected for far too long but which we should courageously, carefully and swiftly undertake as soon as we can."

Correspondence with DfT - owned HS2 Ltd.

This correspondence resulted by your editors' interest in railways, particularly future plans for investment in the system.

To give some background, HS2 Ltd is a company wholly owned by the Department for Transport. HS2 will be a high capacity railway, designed to standard European high speed specifications, and making use of technology successfully developed in countries like France and Germany.

HS2's website includes pages on Increased Speed, Track Curvature and Vehicle Specifications that summarise some of the key statistics and characteristics of high speed rail, setting them alongside other comparable modes of transport.

It is these webpages that caught the attention of your editor and resulted in the following:

To authors of documentation and publications

I have been reading the excellent documentation on the HS2 project.

HS2 is a project that I whole-heartedly support.

It would be much better in my opinion, however, if the correct SI symbols were used in all documents and publications.

As an example of incorrect usage, the 'Technical Specification' located at http://www.hs2.org.uk/assets/x/77048 on page 17 contains speeds shown as 200 kph, 300 kph, etc.

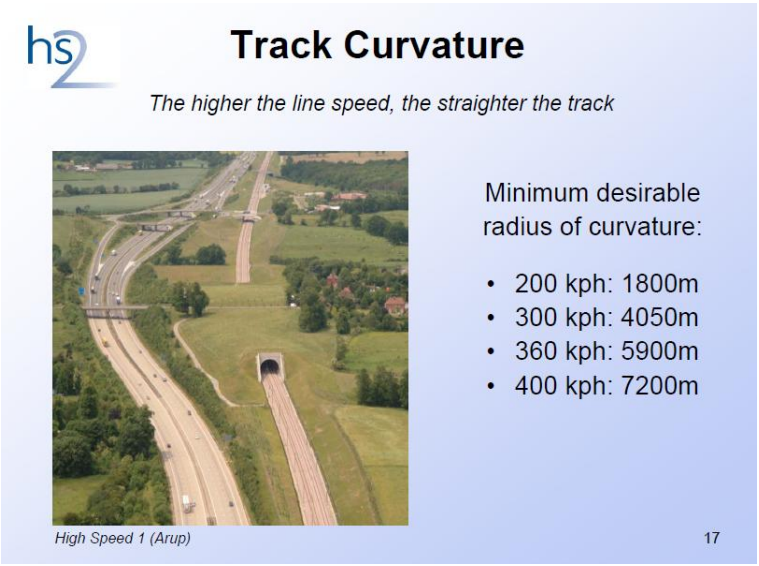
SI metric standards do not include abbreviations (suggested incorrectly by some dictionaries). The BIPM brochure page at http://www.bipm.org/en/si/si_brochure/chapter5/5-1.html refers to the form of unit symbols, specifically "Unit symbols are mathematical entities and not abbreviations" and "It is not permissible to use abbreviations for unit symbols or unit names, such as sec (for either s or second), sq. mm (for either mm2 or square millimetre), cc (for either cm3 or cubic centimetre), or mps (for either m/s or metre per second)."

Although the brochure refers to mps rather than kph, the principle is the same.

As a government body, I would have hoped that the highest level of professionalism would be applied in all matters and that standards that we as a country sign up to should be adhered to fully and correctly.

Regards

Martin B Clutterbuck, CEng, MIMechE



Page 17 of 'Technical Specification' located at http://www.hs2.org.uk/assets/x/77048

Reply from: HS2Enquiries HS2Enquiries@hs2.gsi.gov.uk

Dear Mr Clutterbuck.

Thank you for your email regarding the use of SI metric symbols in HS2 documents.

You are correct in stating that the BIPM recommendation is to use km/h as the written unit of speed. However it is the wish of HM Government that documents published by HS2 Ltd should denote speeds primarily in miles per hour (mph), with metric equivalents quoted where appropriate.

With that in mind we took the decision to use the colloquial term "kph" to describe "km/h" analogous with the use of "mph", as "kph" is in common use in the UK. Therefore speeds are quoted in mph and kph rather than mph and km/h.

Thank you for your interest in HS2 and for taking the time to contact us.

Please don't hesitate to write again if you require any further information.

Kindest regards,

Caitlyn McDonnell

HS2 Public Enquiries Team

T: 020 7944 4908

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Follow-up e-mail: to HS2Enquiries

Caitlyn

Thank you for your reply to my e-mail and your honest reasoning for the use of kph.

I do find this reason extrordinary however and it reinforces my belief that the government does not want to reduce the confusion that the public have to endure coping with two sets of measurement standards.

I also believe that the use of kph, in documents mixed with metric symbols correctly represented, sends out a signal that standards do not really matter and that they can be replaced at will.

kph is only a colloquial term because the correct symbol has not been sufficiently explained, promoted and used by the highest authorities in the land.

I do hope that HS2 Ltd will consider changing its policy on this matter.

Regards

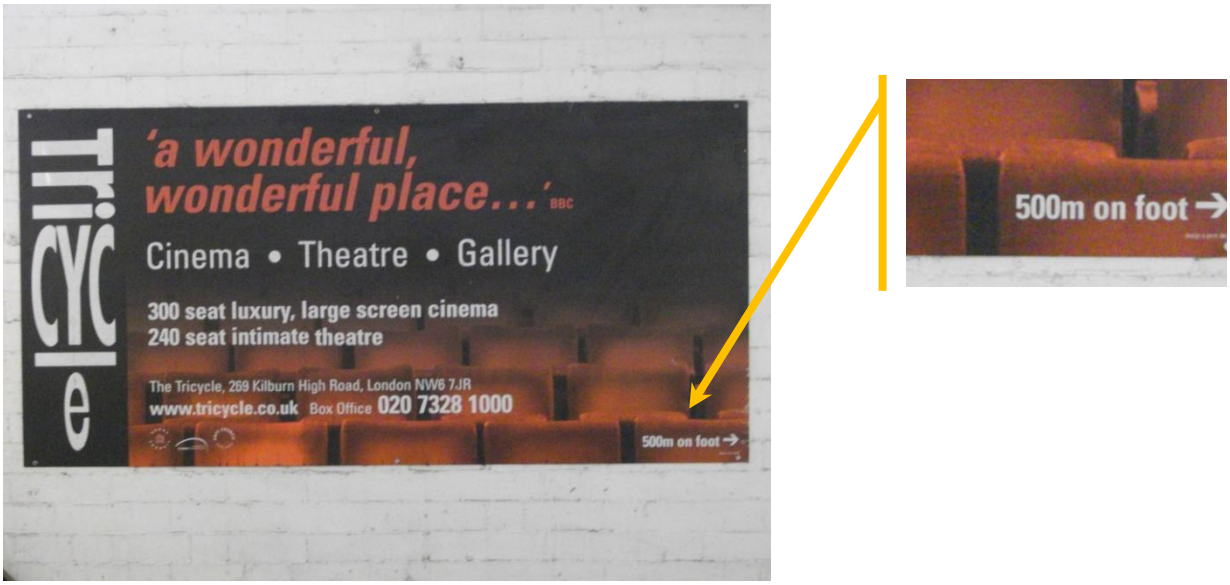
How can UKMA members respond to this kind of Government's influence?

Do members agree with my argument on this issue?

Whatever your views, please let me know.

Metres on advert at exit to Kilburn tube station and m on private sign, yds on LU sign.

From Ronnie Cohen:



When you walk towards the exit of underground, overground and rail stations, public sgns that show distances to nearby places must show yards, a legal requirement by the DfT. However, the advert for the Tricycle cinema is placed on the way to the exit of Kilburn underground station. When you exit the station, you cannot miss it.

On the corner of the advert, it says that the cinema is 500 metres away (one image shows the whole advert and the other shows just the corner of the advert that shows the distance to the cinema in metres).

Isn't it absurd that an advert shows the distance in metres but the public bodies and private train companies are not permitted to put up public signs that show distances in metres?

m on private sign, yds on LU sign

These two signs next to each other by Baker Street underground station show the distance to the Madame Tussauds attraction. One shows a distance of 100 metres and the other shows 370 yards. One of them must be wrong. Not only do we have yards and metres being used on different signs, we also have big differences in the distances shown.

In October 2011, I was told by London Underground that the use of yards on public transport signs was a legal requirement as the DfT uses yards for distances. This was an email in response to my request that LU changes signs from yards to metres. The absurdity of this is exposed when you see that a private sector sign uses metres exclusively and is next to the LU sign.

This is more evidence that the DfT is out of step with the modern world.

ERTMS – a metric rail control system

The European Railway Traffic Management System (ERTMS) is a major industrial project developed by eight rail industry companies - Alstom Transport, Ansaldo STS, AZD Praha, Bombardier Transportation, Invensys Rail, Mermec, Siemens Mobility and Thales - in close cooperation with the European Union, railway stakeholders and the GSM-R industry.

ERTMS has two basic components:

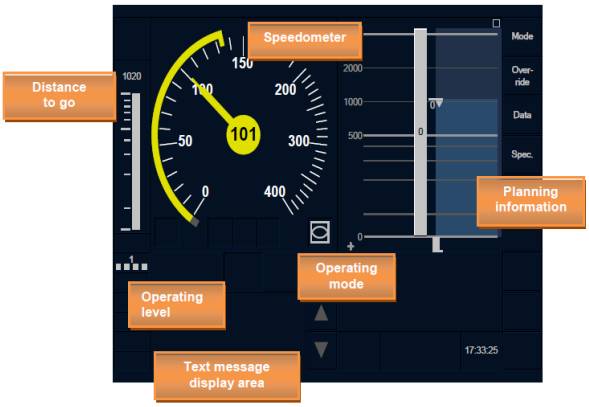
- ETCS, the European Train Control System, is an automatic train protection system (ATP) to replace the existing national ATP-systems;
- GSM-R, a radio system for providing voice and data communication between the track and the train, based on standard GSM using frequencies specifically reserved for rail application with certain specific and advanced functions.

ERTMS aims at replacing the different national train control and command systems in Europe. The deployment of ERTMS will enable the creation of a seamless European railway system and increase European railway's competitiveness.

Currently there are more than 20 train control systems across the European Union. Each train used by a national rail company has to be equipped with at least one system but sometimes more, just to be able to run safely within that one country.

Each system is stand-alone and non-interoperable, and therefore requires extensive integration, engineering effort, raising total delivery costs for cross-border traffic. This restricts competition and hampers the competitiveness of the European rail sector vis-à-vis road transport by creating technical barriers to international journeys. For instance, the Thalys train sets running between Paris-Brussels-Cologne and Amsterdam have to be equipped with 7 different types of train control systems, which add considerable costs.

Driver Machine Interface – equivalent to car dashboard



Typical Driver Machine Interface Display

The DMI must only display information that is necessary to support the driving task and to maximise situational awareness.

Depending on the operational mode, the information presented to the driver can include the following:

a) The speed limit that ETCS is currently supervising to in km/h

b) Actual speed in km/h

c) Distance to go to, for example non-zero speed target or other defined location

Notice that speed is shown correctly as km/h. As this control system expands throughout the UK, metric measures will eventually take over from the existing use of miles and chains. Progress is not rapid though, as these plans show:

- Great West Main Line (177 km route) from Paddington to Reading, Newbury, Oxford, Swindon and Bristol. This route will be signalled Level 2 ERTMS with light signals in the first instance and with new electrification traction, resignalling and recontrolling work undertaken in parallel. The target date for ERTMS operational service commencement is 2017 with completion in 2018.
- East Coast Main Line (251 km route) from London Kings Cross station to the approaches of Doncaster station will be signalled Level 2 ERTMS without signals. This line is already electrified. The target date of readiness for operational ERTMS services is December 2018 with completion in 2020.
- Midland Main Line (158 km route) from London St Pancras to Leicester will be signalled Level 2 without lineside signals. The target date of readiness for operational ERTMS services is December 2021 with completion in 2022.

Metric muddle report - 1862

15th July 2012 is the 150th anniversary of a report from the Select Committee on Weights and Measures.

It recommended the adoption of the metric system to resolve the measurement muddle and recognised the need for a single, uniform and rational system of measurement. It was acknowledged that no nation that adopted the metric system has failed to gain great benefits from it (DfT: please take note).

The report opens with the following passage:

"On a subject of such general importance to nations as well as individuals, your Committee have taken advantage of the opportunity afforded by the International Exhibition, to obtain the opinions, and profit by the experience of enlightened foreigners, who have studied the question of Weights and Measures, and assisted in reforming them in their several countries."

The International Exhibition of 1862, (presumably) referred to by the Select Committee, was a world's fair. It was held from 1st May to 1st November 1862, beside the gardens of the Royal Horticultural Society, South Kensington, on a site that now houses museums including the Natural History Museum and the Science Museum.

The exposition was sponsored by the Royal Society of Arts, Manufactures and Trade, and featured over 28,000 exhibitors from 36 countries, representing a wide range of industry, technology, and the arts.

Exhibitions included such large pieces of machinery as parts of Charles Babbage's analytical engine, cotton mills, and maritime engines by the firm of Henry Maudslay, as well as a range of smaller goods including fabrics, rugs, sculptures, furniture, plates, silver and glass wares, and wallpaper. The exposition also introduced the Bessemer process for steel manufacture.

Snippets from the report include:

- *"In this country a standard of uniformity existed before the conquest. It was enacted in the time of Richard I, and declared by Magna Carta, that there should be one weight and one measure throughout the realm. In more recent times, committees and commissions have been appointed to inquire into the practicability of introducing a more simple and uniform system of weights and measures, as well as a system of decimal coinage."*
- *"The silent influence of usage has baffled the decrees of legislation; and we are still far distant from the uniformity at which we have so often, yet so vainly, aimed."*
- *"Our system of Weights and Measures, being in this state of disorder and of darkness, a sudden light was thrown upon it, and the advantage of a common international system fully brought into view, by the Great Exhibition of 1851. The jurors of that Exhibition experienced the greatest embarrassment from the various, Weights and Measures used by the exhibitors of different countries. They could with difficulty arrive at any common standard."*

And so it goes on... We may have lost a great deal of the 1862 muddle, for example:

"For measures of length, we have the ordinary inch, foot and yard. We have in cloth measure, yards, nails and ells. There are four different sorts of ells. For nautical purposes, we have fathoms, knots, leagues and geographical miles differing from the common mile. The fathom of man-of-war is 6 feet; of a merchant vessel, 5 1/2 feet; of a fishing-smack, 5 feet. We have also the Scotch and Irish mile, and the Scotch and Irish acre. There are several sorts of acres in the United Kingdom, and there are a great variety of roods. We have, in almost every trade, measures of length especially used in those trades: for the measurement of horses, we have the hand; shoemakers use sizes; and we are compelled to adopt gauges where the French use the millimetre. These gauges are entirely arbitrary. The custom of the trade is the only thing which would decide

the question, in case of dispute. For measures of capacity, we have 20 different bushels: we can scarcely tell what the hogshead means. For ale it is 54 gallons, for wine 63. Pipes of wine vary in many ways; each sort of wine seems to claim the privilege of a different sort of pipe. For measures of weight, we have about 10 different stones; a stone of wool at Darlington is 18 lbs.; a stone of flax at Downpatrick is 24 lbs.; a stone of flax at Belfast is only 16 3/4 lbs.; but it is also at Belfast 24 1/2 lbs., having in one place two values. The hundredweight may mean 100 lbs., 112 lbs., or 120 lbs. If you buy an ounce or pound of anything, you must inquire if it belongs to Dutch, troy, or avoirdupois weight."

... but why has it taken 150 years so far and we are not yet finished? Will it take another 150?

Next Director of the BIPM is Dr Martin Milton

The BIPM announced on its website (http://www.bipm.org/) that Dr Martin Milton will join the BIPM on 1 October 2012 as Deputy Director/Director Designate to take over the directorship from the present Director, Dr Michael Kühne, on 1 January 2013.

Dr Milton received a BA in Physics from Oxford University in 1981 and a PhD in Physics from Southampton University in 1990 followed by a MBA from the London Business School in 1991. He joined the National Physical Laboratory of the UK in 1981 as a Scientific Officer, became Principal Research Scientist in 1994 and NPL Fellow in 1998. Since 2005 he is Lead Scientist for the Gas Metrology and Trace Analysis Group at the NPL.

Dr Milton is an active participant in the meetings of the Consultative Committee for Amount of Substance (CCQM) and the Consultative Committee for Units (CCU) of the CIPM. He is a Fellow of IUPAC and a Fellow of the Institute of Physics, UK.

Biography from the NPL website (http://www.npl.co.uk/people/martin-milton):

"Martin has provided scientific leadership for the Analytical Science Team since joining NPL from Oxford University in 1981. He has taken an internationally-leading role in the application of new physical principles to the measurement of gases in the atmosphere and establishing the comparability of gas measurements around the world. He is Chair of the Gas Analysis Working Group of the CCQM, and is active in the standardisation work of ISO."

Let us congratulate Dr Milton on his appointment and hope that he can help the UK to meet the aspirations of the UKMA and the 1862 Select Committee on Weights and Measures, before the next 150 years are up!

Just as a reminder:

The task of the International Bureau of Weights and Measures (BIPM) is to ensure world-wide uniformity of measurements and their traceability to the International System of Units (SI).

- It does this with the authority of the Convention of the Metre, a diplomatic treaty between fifty-six nations, and it operates through a series of Consultative Committees, whose members are the national metrology laboratories of the signatory States, and through its own laboratory work.
- The BIPM carries out measurement-related research. It takes part in, and organizes, international comparisons of national measurement standards, and it carries out calibrations for Member States.