

USA metric system history

Pat Naughtin 2009

Without the influence of great leaders from the USA there would be no metric system.

Since many in the USA do not believe this statement, let me repeat it in a different way.

It is my belief that without the influence of Benjamin Franklin, Thomas Jefferson, and George Washington, the metric system would not have developed in France in the 1780s and 1790s.

The contribution made by these three great world leaders arose firstly from their cooperation in developing and implementing the idea of a decimal currency for the USA. The idea was that all money could be subdivided by decimal fractions so that money calculations would then be little more difficult than any normal whole number calculation.

In 1782, Thomas Jefferson argued for a decimal currency system with 100 cents in a dollar. Less well known, he also argued for 1000 mills in a dollar. Jefferson reasoned that dividing America's First Silver Dollar decimally was the simplest way of doing this, and that a decimal system based on America's First Silver Dollar should be adopted as standard for the USA.

The idea of using decimal fractions with decimal numbers was not new – even in the 1780s. Thomas Jefferson had studied '*Disme: the art of tenths*' by Simon Stevin in which the use of decimals for all activities was actively promoted. Stevin proposed decimal fractions and their decimal arithmetic for:

... stargazers, surveyors, carpet-makers, wine-gaugers, mint-masters and all kind of merchants.

Clearly Simon Stevin had in mind the use of decimal methods for all human activities and it is likely that this thought inspired Thomas Jefferson to propose not only a decimal currency for the USA but also a whole decimal method for weights and measures. It's interesting that a tenth of a dollar in the USA is still called a dime and it seems likely that this coin was named after the title of Simon Stevin's book '*Disme: the art of tenths*'. Jefferson and Washington were also influenced by their own experiences using Edmund Gunter's chain for surveying as each chain length was divided into 100 links making surveying calculations much easier, see <http://www.metricationmatters.com/docs/MetricationTimeline.pdf>

Thomas Jefferson was also interested in the decimalisation of all measurements. Jefferson seems also to have been conversant with the thoughts of the English writer, Bishop John Wilkins, who wrote down his plan for a system based on a '*universal measure*' in 1668. You can find details of John Wilkins idea for a *universal measure* at <http://metricationmatters.com/docs/CommentaryOnWilkinsOfMeasure.pdf>

Thomas Jefferson used thoughts from both of these sources, Stevin and Wilkins, when he wrote about the use of a decimal system as a basis for dividing and multiplying money, weights, and measures. Thomas Jefferson wrote that this would reduce:

... every branch to the same decimal ratio, thus bringing the calculations of the principal affairs of life within the arithmetic of every man who can multiply and divide plain numbers.

Thomas Jefferson suggested the use of a decimal currency for the USA as early as 1782 and achieved agreement among the states on this, in principle, by 1785. Jefferson's promotion of decimal ideas was also beginning to spread among the leaders of the USA. It would appear that James Madison (who would be the 4th President of the USA) was influenced by the decimal ideas of Thomas Jefferson (who would be the 3rd President of the USA) and was passing on these ideas to James Monroe (who would be the 5th President of the USA). As part of this process, on 1785 April 28, James Madison (1751-1836) wrote to James Monroe (1758-1831) to express his concerns about currency, weights, and measures.

I hear frequent complaints of the disorders of our coin, and the want of uniformity in the denominations of the States. Do not Congress think of a remedy for these evils? The regulation of weights and measure seem also to call for their attention. Every day will add to the difficulty of executing these works. If a mint be not established and a recoinage effected while the federal debts carry the money through the hands of Congress, I question much whether their limited powers will ever be able to render this branch of their prerogative effectual. With regard to the regulation of

weights and measures, would it not be highly expedient, as well as honorable to the federal administration, to pursue the hint which has been suggested by ingenious and philosophical men, to wit: that the standard of measure should be first fixed by the length of a pendulum vibrating seconds at the Equator or any given latitude; and that the standard of weights should be a cubical piece of gold, or other homogeneous body, of dimensions fixed by the standard of measure? Such a scheme appears to be easily reducible to practice; and as it is founded on the division of time, which is the same at all times and in all places, and proceeds on other data which are equally so, it would not only secure a perpetual uniformity throughout the United States, but might lead to universal standards in these matters among nations. Next to the inconvenience of speaking different languages, is that of using different and arbitrary weights and measures.

Jefferson's decimal currency idea was acted on when there was a shortage of small coins in 1787. Congress then asked Benjamin Franklin to design a one-cent coin to be 1/100th of a dollar. Franklin designed a coin containing the words, '*Tempus Fugio*' (*Time Flies*). Franklin's '*Fugio*' cents were soon in wide circulation throughout the USA.

Jefferson's idea for a decimal currency was well established by the time George Washington was inaugurated as the first president of the USA in 1789. The decimal currency was also well established in the USA before the French revolution made it possible to consider the legalisation of money and measurement changes in France.

During this time, both Benjamin Franklin and Thomas Jefferson served as ambassadors to France. They were also both active in the scientific community of France during their ambassadorial service: Franklin served from 1776 to 1784 and Jefferson from 1784 to 1789. Both men were active in promoting the ideas of decimal currency and decimal measurements to the French Royal court and to the scientific '*philosophes*', who would later develop the *decimal metric system*.

Also in 1789, the First Congress of the USA took up the question of weights and measures and, in 1790, George Washington (1732/1799), in his first message to Congress, reminded the legislators of their responsibility on weights and measures when he said:

A uniformity of weights and measures is among the important objects submitted to you by the Constitution, and, if it can be derived from a standard at once invariable and universal, it must be no less honorable to the public council than conducive to the public convenience. ... Uniformity in the currency, weights, and measures of the United States is an object of great importance, and will, I am persuaded, be duly attended to.

George Washington was clearly referring to an idea similar to Bishop John Wilkins' '*universal measure*' when he said, '*derived from a standard at once invariable and universal*'.

Thomas Jefferson, who was serving as the first Secretary of State to President Washington, was asked to investigate this idea and he submitted a report to Congress proposing a decimal-based system with a mixture of old and new names for measuring units but the Congress chose not to act on Jefferson's recommendations.

George Washington repeated his call for uniformity in the currency, weights, and measures of the United States of America with similar calls for action in his second and third annual presidential messages to congress (later these annual reports became known as the '*State of the Union Address*').

We now know that the decimal idea has proved to be fundamentally simple and applicable to all measurements – anytime and anywhere in the Universe. The French people were able to use the success of decimal currency in the USA, and Jefferson's plan for decimal measurement from the USA as a model to argue for decimal changes to their own money and measurement methods. It also helped that the French leadership knew Benjamin Franklin and Thomas Jefferson personally from the time they had lived in France and they were able to correspond with these two after they returned to the USA.

Thomas Jefferson was in regular contact with English and French intellectual leaders of the Enlightenment as they formed their ideas about universal measurement. It is highly likely that he passed copies of his report to Congress to his friends in Paris, Talleyrand and Condorcet, who he knew were also working on reform of weights and measures for France. It seems likely that they were impressed by his report as they were with his success at promoting decimal currency for the USA.

(For the full text of Jefferson's proposal see: http://ourworld.compuserve.com/homepages/Gene_Nygaard/t_jeff.htm and see http://en.wikipedia.org/wiki/Plan_for_Establishing_Uniformity_in_the_Coinage,_Weights,_and_Measures_of_the_United_States for the Wikipedia discussion of Jefferson's plan for weights and measures in the USA).

It also seems likely to me that Thomas Jefferson's choice of the word cent to divide dollars into hundreds led to the idea of the metric prefixes that we now use. For example, the transition of cent into centi is obvious, but what is less well known is that Jefferson had also considered the word mil for a thousandth of a dollar; again the transition from mil to milli is obvious.

In 1790, the Prieur du Vernois (1763/1832), later known as the Prieur de la Cote-d'Or, presented a suggestion to the National Academy of France for a single uniform set of weights and measures. His suggestion had a remarkable similarity to that made by Thomas Jefferson to the Congress of the USA with the French '*pied*' divided: *into 10 inches, each of 10 lines; and 10 feet would be equal to 1 rod*. Prieur's proposal also included the use of centi and milli as prefixes for the *decimal metric system*.

In 1790, George Washington and Thomas Jefferson combined political forces, to formally legalise the decimal currency for the USA. Decimal currency became a legal reality with the establishment of the Federal Mint in 1792.

As Ambassadors to France, Benjamin Franklin and Thomas Jefferson, were able to influence the French '*philosophes*' of the benefits of using decimal fractions with decimal numbers as the '*philosophes*' developed the idea of a '*universal measure*' into a legal '*decimal metric system*'. Thomas Jefferson was to continue this influence by correspondence after he returned to the USA in 1789.

The decimal nature of the metric system means that when measuring and recording larger or smaller amounts, suitable units can be devised for any purpose – large or small – by placing a suitable prefix in front of any metric unit. For example if you put kilo in front of metre, you now refer to 1000 metres or 1 kilometre; if you put kilo in front of gram, you are referring to 1000 grams or 1 kilogram; and if you put kilo in front of joules, you are referring to 1000 joules or 1 kilojoule of energy. This mostly removes the need for writing large numbers and using decimal fractions. It also removes the necessity for using common or vulgar fractions at all.

The decimal nature of the metric system is one of its great benefits. Decimal currency and decimal measurements have proved to be one of the greatest legacies of Benjamin Franklin, Thomas Jefferson, and George Washington. However, the source of this gift from the past is rarely recognised and attributed to these three leaders.

Everyone in the world now owes a debt to the USA as they enjoy the benefits, such as simplicity, honesty, openness, and worldwide standards, when we all use the metric system for all of our daily measuring. We would not have these benefits without the driving forces that came from the USA in the 1780s to develop the metric system as the legal '*decimal metric system*' of France in the 1790s.

So let me repeat:

Without the influence of great leaders from the USA there would be no metric system.

Please note that I have used the spelling, metre, in this article rather than the spelling, meter, currently common in the USA. My choice of metre is in keeping with the spelling used by Benjamin Franklin, Thomas Jefferson, and George Washington. For a full discussion of this issue, see http://www.metricationmatters.com/docs/Spelling_metre_or_meter.pdf

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Metric system consultant, writer, and speaker, Pat Naughtin, has helped thousands of people and hundreds of businesses upgrade to the modern metric system smoothly, quickly, and so economically that they now save thousands each year when buying, processing, or selling for their businesses.

Pat Naughtin is the author of '*The Metrication Leaders Guide*' that you can obtain from <http://metricationmatters.com/MetricationLeadersGuideInfo.html>

Pat provides services and resources for many different trades, crafts, and professions for commercial, industrial and government metrication leaders in Asia, Europe, and in the USA. Pat's clients include the Australian Government, Google, NASA, NIST, and the metric associations of Canada, the UK, and the USA.

Pat specialises in the modern metric system based on the International System of Units (SI), but he is mostly concerned with the processes that people use for themselves, their groups, their businesses, their industries, and their nations as they go about their inevitable metrication process. See <http://www.metricationmatters.com> for more metrication information, contact Pat at pat.naughtin@metricationmatters.com or subscribe to the free 'Metrication matters' newsletter at <http://www.metricationmatters.com/newsletter>

