

In Defense of the Imperial System of Measurement in Law

by Steven Rinehart

In 1975, the United States enacted the Metric Conversion Act, amended by the Omnibus Trade Act of 1988, attempting to compel American citizenry to adopt the modern metric system as their official system of measurement (i.e., the International System of Units). The United States later directed all U.S. agencies to “take all appropriate measures within their authority” to convert to the metric system. Exec. Order No. 12770, 56 FR 35801, at 393 (July 29, 1991). Less than fifty years earlier, the consensus view of the U.S. Congress had been that “the metric system is inferior to the English.” *Congressional Hearing Relative to the Compulsory Introduction of the Metric System, on H.R. 10*, Cong. 237 (1926) (statement of Samuel S. Dale to the Committee on Coinage, Weights and Measures).

Questions about whether weights and measures should be expressed in the imperial system or the metric system in evidence, statutes, and case law have never been fully resolved. In many states, legislation arbitrarily reverts from the imperial system to metric system within subsections of the same statute. *See, e.g.*, Utah Code Ann. § 58-37c-19 (outlawing distribution and possession of methamphetamines in ounces); *id.* § 58-37c-20.5 (outlawing purchase of pseudoephedrine in grams); *see also, e.g.*, 18 V.S.A. § 4231(a)(3), (outlawing possession of cocaine measured in ounces); 18 V.S.A. § 4231(a)(2) (outlawing possession of cocaine measured in grams). The Supreme Court also appears to have vacillated about how best to express weights and measures. *See, e.g., Whole Woman’s Health v. Hellerstedt*, 579 U.S. 582 (2016) (expressing distance in miles using the imperial system); *Massachusetts v. EPA*, 549 U.S. 497 (2007) (converting evidence presented in the imperial system to metric system units). And although the U.S. Patent and Trademark Office (USPTO) technically requires applicants to use the metric system, it does not enforce this requirement.

Academics have long advocated for adoption of the metric system as a way of resolving this conflict, while blue-collar American works have resisted the same. Emerging evidence further discussed below appears supportive of the blue-collar workers’ reluctance.

Historical Controversy

Pressure from continental Europe to adopt the metric system began when the metric system was invented in 1791 during the French Revolution by Pierre-Simon Laplace. Thomas Jefferson rejected European pressure to convert, predicting the metric system would fail. U.S. DEP. OF COMM., *A History of the Metric System Controversy in the United States*, NAT’L BUR. STAND. SPEC. PUBL. 345–10. John Quincy Adams was forced to write a 117-page report in 1821 on weights and measures, concluding that the metric system was unnaturally contrived. He said, “[o]f all the nations of European origin, ours is that which least requires any change in the system of their weights and measures.” John Quincy Adams, *Report Upon Weights and Measures*, p. 93: U.S. Senate (1821). Even Napoleon himself ridiculed the metric system and prohibited its use in the First French Empire, which had created it. “Napoleon didn’t personally admire the metric system that Laplace invented, saying, ‘I can understand the twelfth part of an inch, but not the thousandth part of a metre.’” Andrew Roberts, *Napoleon: A Life* (Viking 2014).

Following enactment of the Metric Conversion Act in the United States in 1975, the USPTO issued a directive requiring that weights and measures submitted in U.S. Patent applications be presented in the metric system and codified this directive in the Manual of Patent Examining Procedure § 608.01. As a result of these laws and regulations intended to “metricate” the American people, nothing changed. Patent attorneys simply ignored § 608.01 and courts in our system of jurisprudence have largely done the same.

STEVEN RINEHART is a patent attorney employed by the firm Vested Law LLP. He regularly deals with questions of weights and measures in preparing patent applications.



Laymen across the country have resisted pressure to adopt the metric system whenever it is applied. The National Cowboy Hall of Fame director sued the National Bureau of Standards in 1981 for spending \$2.5 million per year to promote the metric system but had certiorari denied by the U.S. Supreme Court when he lost the case on standing. *The Supreme Court Today Rejected an Effort by Two Champions*, U. PRESS INT'L (Nov. 30, 1981), *available at* <https://www.upi.com/Archives/1981/11/30/The-Supreme-Court-today-rejected-an-effort-by-two/8345375944400/> (commenting on case No. 81-780). The Ford Motor Company refused to switch to the metric system and authorized articles critical of the metric system. Henry Ford, *Moving Forward* (1931). Francis Dugan, representing the U.S. construction industry on the U.S. Metric Board, promised that U.S. construction would “be the very last sector [in the U.S.] to implement conversion to metric measurement – if at all.” U.S. Metric Board, *Summary Report* (Jul. 1982).

To counter the popular resistance to the metrification of the United States, the National Institute for Standards and Technology established the U.S. Metric Program and the U.S. Metric Board

for metricating America in the 1970s. The U.S. Metric Board was disbanded by Ronald Reagan in 1982 while the U.S. Metric Program employed one person from 1982 until 2013. In 2013, when the sole employee of the U.S. Metric Program retired and was asked why nothing had been accomplished in thirty years, he blamed the failure of the U.S. to convert to the metric system on incorrigible semi-truck drivers whom he alleged were incapable of understanding overpass heights and prone to ramming their trailers into overpasses across the country. Carrie Swiggum, *Meet the Sole Employee of the U.S. Metric Program*, MENTAL FLOSS (Mar. 20, 2013), <https://www.mentalfloss.com/article/50160/years-ken-butcher-was-sole-employee-us-metric-program>.

While singling out truck drivers for ridicule, actual confusion was taking its toll among America’s more educated demographics. NASA’s Mars Climate Orbiter was lost in 1999 because NASA scientists misconverted feet to meters. An Air Canada plane crashed in 1983 after its pilots misconverted pounds to kilograms, and a patient died in 1999 when given 0.5 grams of Phenobarbital instead of 0.5 grains.

Helping attorneys and their clients...for almost four decades.

- A real estate broker who understands all the aspects of an estate sale, from working with court appointed representatives to the myriad of heirs of the deceased. One third of my business is estate sales. Divorce cases don't scare me and I'm able to get the property sold following court orders and if necessary, testifying before the judge.
- I have the complete team of estate liquidators, from appraisers, cleaners, contractors, and movers for the smallest to the largest homes or condominiums.
- Referrals available of other attorneys that I have worked with in Utah. I own my own firm and am reasonably priced with no hidden transaction fees to your clients. 38 years full time experience and in the top 5% of sales agents in the Salt Lake Board of REALTORS. Also member of the Washington County and Park City Boards of REALTORS.



Babs De Lay, Principal Broker
Urban Utah Homes & Estates

babs@urbanutah.com | 801.201.8824



Modern Chaos

Progressive thinkers continue to demand that the U.S. convert. Hollywood's Cate Blanchet asked on Jimmy Kimmel live in 2018, "Explain to me how the country that can send a man to the moon is still in gallons and inches?" Jimmy Kimmel Live, *Cate Blanchett Thinks Americans Should Use the Metric System*, YouTube (Sept. 14, 2018), <https://www.youtube.com/watch?v=f1FBYgk3svU>.

In spite of the Metric Conversion Act and a directive in 1984 from the Department of Transportation that the Federal Aviation Administration (FAA) switch to the metric system, the FAA largely failed to transition, insisting pilots could estimate runway lengths and approach speeds better in customary imperial units. The National Transportation Safety Board switched to the metric system in the 1980s, then abruptly switched back – actually printing interstate speed limit signs in the metric system for several months. The FAA's refusal to switch Federal Aviation Regulations, airworthiness directives, and traffic control practices to the metric system forced the rest of the world to switch their avionics and traffic control systems back to the imperial system and continue calculating altitude in feet, speed

in knots, and distance in miles and knots, rather than in kilometers. To the chagrin of its detractors, the imperial system is adopted by every country in the world for aviation-related functions as a result of U.S. dominance. Additionally, U.S. dominance in aviation resulted in the worldwide adaptation of English as the exclusive language of communication between pilots and air traffic control towers.

Is the Imperial System Illogical?

What are we to make of this chaos? Is the United States acting illogically in resisting metrification that reformists insist is inevitable? The imperial system bases its units of measurement on organically evolved common artefacts thought to be common to human observation and intuitively understood, whereas the derived units of metric system are defined as arbitrary fractions of scientific constants. For instance, a foot in the imperial system is about the length of a human foot. The meter, on the other hand, is defined as being 1/299,792,458 of the distance light travels in a second. In the imperial system, a cup is about a cup. The volume of a barrel of oil is, it turns out, about a barrel. An acre is about the amount of land a farmer can till in a day

After 30 years of representing health care providers, Terry Rooney of Gross & Rooney is now accepting the representation of Plaintiffs in medical malpractice claims. Referrals and consultations are welcome.



**GROSS &
ROONEY**

www.grossrooney.com
136 E. South Temple, 1500
801-935-4611



using an ox. A mile is 2,000 paces (i.e., 1,000 left and right steps). An inch is the width of a human thumb. The same intuitive observations underlie the units of teaspoons, tablespoons, bushels, grains, lightyears, and candlepower. Even the Fahrenheit temperature scale of the imperial system was created roughly to define zero degrees as the freezing point of seawater and 100 degrees as body temperature (while Kelvin defines zero as the temperature at which molecular motion ceases for any adiabatic process). We must ask ourselves whether it is easier to understand the power of your car in horsepower or in kilogram force in meters per second.

Scientists say that the metric system has more “coherence” than the imperial system because the derived units of the metric system are directly related to the base units without the need for intermediate conversion factors. In layman’s terms, scientists say the metric units makes more sense because you simply multiply everything by ten. They do not think anyone can remember there are sixteen ounces in a pound or twelve inches in a foot. But if you times nonsense by ten, don’t you simply end up with ten times as much nonsense? Do we not use the imperial system of weights and measures for the same reason we speak an organically derived language? Despite its irregular verb conjugations

and spelling, most of the world would consider English to be preferable to contrived languages such as Esperanto. Why are some units of measurement, common to both the imperial system and the metric system, indivisibly correlated to human observation – for instance measuring time using twelve months to a year and thirty days to a month, corresponding to the phases of the moon and seasons?

Evidence Supportive of American Claims

Preliminary results of studies being done for the first time only in 2022 seem to confirm that because the base units in the imperial system are intuitively derived, those who use the imperial system are better able to estimate distance, temperature, speed, volume, and weight than those who use the metric system. This finding holds true for layman and scientists alike. According to one study, even among those with degrees in hard sciences, baccalaurei educated using the imperial system were better able to estimate distance in feet than their counterparts educated using the metric system could in meters – by nearly an entire standard deviation. *See* Steven Rinehart, *Cross-Sectional Study on the Ability of Those Educated Using the Imperial System of Measurement to Estimate Weights and Measures Relative to those Educations Using the Metric System*, AUCTORES (Aug. 10, 2022), <https://www.auctoresonline.org/article/cross-sectional-study-of-the-ability-of-those-educated-using-the-imperial-system-of-measurement-to-estimate-weights-and-measures-relative-to-those-educated-using-the-metric-system>. Study participants were also better able to estimate temperature and speed in the imperial system. With the exception of physicians’ ability to estimate small units of volume, every demographic estimated weights and measures more accurately in the imperial system than the metric system. *See id.* This is of consequence in the law where juries are tasked with interpreting and understanding evidentiary data presented to them. It is also important where witnesses, such as law enforcement officers, are regularly tasked with estimating distance, speed, and other measurements in the courts of the land.

Metrification Justification

The two justifications perpetually advanced for 250 years for converting to the metric system have always been: (1) that because Europe, as the center of scientific and economic power in the Western world, uses it, the U.S. must also use it or fall behind economically and scientifically; and, (2) that the metric system is easier to understand for the unlearned masses because it defines every unit as consisting of exactly ten of the units smaller than it.

Auctioneers & Appraisers

Erkelens & Olson Auctioneers has been the standing court appointed auction company for over 35 years. Our attention to detail and quality is unparalleled. We respond to all situations in a timely and efficient manner, preserving assets for creditors and trustees.

Utah’s Leading Auction & Appraisal Service



3 Generations Strong!

Rob, Robert & David Olson
Auctioneers, CAGA Appraisers

Call us for a free Consultation

801-355-6655
www.salesandauction.com

New Location: 954 S 4400 W, Suite 390 in SLC!

A review of editorial opinions published by major news outlets and scientific journals from 1996 to 2015 shows that of 1,110 cited publications during this period about metrification of the United States, essentially all advocated American transition to the metric system by relying on these two arguments. *Published Articles about the Metric System, Metrication, and Related Standards*, U.S. METRIC ASSOC. (Aug. 10, 2022), <https://usma.org/published-articles-about-the-metric-system-metrication-and-related-standards>.

Since the arguments upon which proponents of the metric system rely were originally formulated, however, America has grown to overshadow Europe in economic and scientific power; and emerging studies seem to support the claim that the imperial system may be the more intuitive and readily understood of the two systems. Consequently, rather than being moot, both arguments exclusively advanced over two centuries for converting to the metric system would appear now to prescribe the opposite course of action than that for which they were proposed (and Cate Blanchett has her answer).

Is it possible that Jefferson, Adams, Reagan, and Napoleon were right all along? Do the proponents of the metric system bely ulterior motives in their insistence the U.S. convert? Is there an element of academic snobbery in the hype about the metric system? Is it even possible that the metric system itself comes to us as some kind of political artifice born in protest of British imperialism? Has the time come to repeal the Metric Conversion Act?

Conclusions

There may be reason for judges and attorneys crafting local rules – or even the rules of civil procedure – to require that weights and measures in evidence be converted into customary units when supplied to juries. Could verdicts rendered by juries presented evidence in the metric system be collaterally attacked on the basis the metrics were not converted? In fact, it appears they have been. *See Commonwealth v. Rivera*, 918 N.E.2d 871, 874 (Mass. App. Ct. 2009) (finding non-harmless error where jury required to apply metric system without testimony about metric unit conversions).

Despite all the advocacy over the years in favor of the metric system and denouncement of the imperial system as anachronistic, the belief in the superiority of the metric system might still be argued to be a large-scale example of groupthink. Perhaps there is still wisdom in the old Latin maxim, *via antiqua via est tuta* (the old way is the safe way).

W P O I



Providing hope where it's hard to find.

For attorney Beau Burbidge, hope is pushing against seemingly insurmountable odds to bring a case to court. It's providing fairness for all, helping the underdog, and giving clients a powerful voice for justice.

BurbidgeMitchell.com | 801-355-6677

BURBIDGE | MITCHELL