

# Weights & Measures

David P. Currie

LONG BEFORE 1816, Congress had exercised most of the powers entrusted to it by the Constitution. It had imposed taxes and duties, regulated commerce, raised armies and navies, and authorized the issuance of letters of marque and reprisal. It had borrowed and coined money, protected the rights of authors and inventors, punished offenses against the law of nations, and established the seat of government. It had even enacted a bankruptcy law, though it had repealed it soon afterward. What Congress had never done, however, was to exercise its authority “to fix the standard of weights and measures.”<sup>1</sup> What is perhaps most surprising is that, even today, Congress has only indirectly defined for us such familiar measures as the yard, the gallon,

the bushel, and the pound.

## I. THE ADAMS REPORT

When he was Secretary of State, Thomas Jefferson had sent Congress an impressive report recommending the establishment of uniform weights and measures; it languished unheeded in congressional files.<sup>2</sup> President Madison called Congress’s attention to the problem in his last Annual Message in 1816, noting in particular “[t]he great utility of a standard ... founded on the easy rule of decimal proportions.”<sup>3</sup> The Senate obligingly requested the Secretary of State to prepare another report on the subject and adjourned.<sup>4</sup>

Unwilling to wait for the new report, a

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1 US Const, Art I, § 8, cl 5. Article IX, § 4 of the Articles of Confederation contained a similar provision. See 1 Stat 4, 7 (1778).

2 See David P. Currie, THE CONSTITUTION IN CONGRESS: THE FEDERALIST PERIOD 1789-1800 4 n.9 (Chicago, 1997) (hereafter cited as THE FEDERALIST PERIOD).

3 1 James D. Richardson, A COMPILATION OF THE MESSAGES AND PAPERS OF THE PRESIDENTS 573, 576 (U.S. Congress, 1900) (hereafter cited as Richardson) (Dec 3, 1816).

4 30 ANNALS OF CONGRESS 197, 202 (hereafter cited as ANNALS) (Mar 1 & 3, 1817).

House committee chaired by South Carolina's respected William Lowndes agreed that "this subject ought not to be left to uncertain usages, or to the various laws of particular States."<sup>5</sup> Rejecting the metric system recently adopted in France on grounds of scientific uncertainty and "the inconveniences of change," the committee urged codification of the standards "which are in most general use among us," namely the yard, the bushel, the gallon, and the pound.<sup>6</sup> The committee did not recommend provisions to punish departure from the standards to be established. While Congress might have power to enact them, "such provisions ... would ill comport with the general spirit and character of the Constitution." Enforcement of the standards should be left to the states.<sup>7</sup>

John Quincy Adams, who became Secretary of State in 1817, took nearly four years to complete his report. As always, he took his task seriously.<sup>8</sup> His report was every bit as impressive as Jefferson's, and he was rightly proud of it.<sup>9</sup> It confirmed Lowndes's conclusions in almost every detail.<sup>10</sup>

Not only did Adams share Lowndes's reservations about the desirability of introducing the metric system in the United States;<sup>11</sup> he even suggested doubts as to Congress's power

to introduce it. Congress was authorized only to "fix the standard" of weights and measures.

It may admit of a doubt whether, under this grant of power, is included an authority so totally to subvert the whole system of weights and measures as it existed at the time of the adoption of the constitution as would be necessary for the introduction of a system similar to that of the French nation. To *fix* the standard appears to be an operation entirely distinct from changing the denominations and proportions already existing, and established by the laws or immemorial usage.<sup>12</sup>

That was not all:

The doubts entertained whether an authority so extensive as this operation would require has been delegated to Congress are strengthened by the consideration of the character of the executive power, corresponding with the legislative authority. The means of execution for exacting and obtaining the conformity of individuals to the ordinances of the law in the case of weights and measures belong to that class of powers which, in our complicated political organization, are reserved to the separate States. The jurisdictions to which resort must be had for transgressions of this description of laws are those of municipal police. ... In *fixing the standard*, it is believed that Congress must rely almost entirely, if not altogether, upon State executive authorities for carrying their law into execution. And,

5 33 ANNALS at 755, 756 (Jan 25, 1819); 2 AMERICAN STATE PAPERS (Misc) 538 (Gales and Seaton, 1832) (hereafter cited as AM ST PAPERS). One of the War Hawks who first joined the House in 1811, Lowndes served until shortly before his premature death in 1822. See generally Harriott Ravenel, LIFE AND TIMES OF WILLIAM LOWNDES (Houghton, Mifflin, 1901).

6 33 ANNALS at 757-58, 763-64.

7 Id at 762.

8 He had read Jefferson's report, he wrote in his diary, and the subject "weighs much upon my mind." 4 MEMOIRS OF JOHN QUINCY ADAMS 13 (Charles Francis Adams ed, J.B. Lippincott, 1875) (Oct 7, 1817).

9 5 id at 290-91 (Feb 22, 1821). See also George Dangerfield, THE ERA OF GOOD FEELINGS 160-61 (Harcourt, Brace and World 1952); Samuel Flagg Bemis, JOHN QUINCY ADAMS AND THE FOUNDATIONS OF AMERICAN FOREIGN POLICY 258-59 (Knopf, 1949).

10 The report is printed, with appendices, in 2 AM ST PAPERS (Misc) at 656-750 (Feb 22, 1821).

11 "[W]ere the authority of Congress unquestionable to set aside the whole existing system of metrology, and introduce a new one, it is believed that the French system has not yet attained that perfection which would justify so extraordinary an effort of legislative power at the time." Id at 699.

12 Id at 698.

although this reliance may be safely indulged in relation to a law which should merely fix the uniformity of existing standards, its efficacy would be very questionable in the case of a law of great and universal innovation upon the habits and usages of the people.<sup>13</sup>

It was not like Mr. Adams to be so chary in his interpretation of federal powers. Madison, congenitally niggardly in this bailiwick, had expressed no such qualms in endorsing the decimal system for legislative consideration. One might have thought authority to fix the standard of weights and measures was authority to determine what that standard should be.

Another committee chaired by Lowndes recommended that Congress follow the Secretary's advice and copy British standards for the yard, bushel, gallon, and pound,<sup>14</sup> but that was the end of it; another superlative study was left to gather dust on congressional shelves.

## II. LONGITUDE

Something did come, however, of a more specific proposal first recommended by a House committee in 1810, namely that the President be authorized to determine the longitude of the Capitol.<sup>15</sup>

The reason for this determination was to lay a foundation for establishing "a first merid-

ian for the United States of America." The necessity of such a point of reference, "from which geographers and navigators could compute or reckon longitude," was "too obvious to need elucidation [sic]." Because of our location "more than three thousand miles from any fixed or known meridian," it would be desirable, "in a national point of view, to establish a first meridian for ourselves."<sup>16</sup>

Solicited by the House for his advice, Secretary of State James Monroe concurred in the committee's recommendation, observing that all "the great maritime and commercial nations of Europe" had prescribed meridians of their own; "the establishment of a first meridian for themselves has become by the usage of nations an appendage, if not an attribute, of sovereignty."<sup>17</sup> But Monroe did not stop at that. If the job was to be done at all, it should be done right.

It is known, that the best mode yet discovered for establishing the meridian of a place, is by observations made on the heavenly bodies;<sup>18</sup> and that, to produce the greatest accuracy in the result as a result, such observations should be often repeated, at suitable opportunities, through a series of years, by means of the best instruments. For this purpose, an Observatory would be of essential utility.<sup>19</sup>

The clear implication was that Congress

<sup>13</sup> Id at 699.

<sup>14</sup> 39 ANNALS at 1251-53 (Mar 11, 1822); 2 AM ST PAPERS (Misc) at 927-28. Adams had recommended that Congress require federal officers to employ the new standards and punish the use of other standards by anyone "with intent to defraud." Id at 701. Lowndes demurred: A sense of duty would suffice to bring federal officers into line, and enforcement against others should be left to the states. Id at 927, 39 ANNALS at 1252.

<sup>15</sup> 21 ANNALS at 1660-62, 2 AM ST PAPERS (Misc) at 53 (Mar 28, 1810). The report was made in response to a petition by one William Lambert, who ended up making the requested determination. Id at 53-71.

<sup>16</sup> 21 ANNALS at 1660-61.

<sup>17</sup> 24 ANNALS at 1577, 1578, 2 AM ST PAPERS (Misc) at 194-95 (Jul 3, 1812). Lambert had gone so far as to suggest in his petition that the establishment of a meridian was crucial to our independence from Great Britain, which at the moment was somewhat in question. See id at 53 (Dec 15, 1809).

<sup>18</sup> But see Dava Sobel, LONGITUDE: THE TRUE STORY OF A LONE GENIUS WHO SOLVED THE GREATEST SCIENTIFIC PROBLEM OF HIS TIME passim (Penguin, 1995).

<sup>19</sup> 24 ANNALS at 1578, 2 AM ST PAPERS (Misc) at 195.

ought to establish not only a meridian but an observatory as well.

A House committee headed by the renowned Samuel Mitchill of New York, himself a scientist, duly recommended erection of an observatory in the District of Columbia:

By such an institution, means may be adopted not only to fix the first meridian, but to ascertain a great number of other astronomical facts and occurrences through the vigilance of a complete astronomer.<sup>20</sup>

The United States, if the committee had its way, was going into the business of astronomy.<sup>21</sup>

On the strength of yet another committee report invoking “the promotion of science and national credit,”<sup>22</sup> Congress by joint resolution in 1819 finally authorized the President to determine the longitude of the Capitol.<sup>23</sup> Monroe, now President, commissioned William Lambert, original author of the proposal, to carry it out and submitted his report to Congress January 8, 1822.<sup>24</sup> Replete with eye-glazing observations and computations, this

report concluded that the Capitol stood 76 degrees, 55 minutes, 30.54 seconds west of the meridian previously established at Greenwich, in England.<sup>25</sup>

As the initial resolution had said nothing of compensation for Mr. Lambert and his henchmen, the President asked that Congress make the necessary provision, and it did.<sup>26</sup>

Was this, like the creation of a federal Vaccine Agent in 1813,<sup>27</sup> a well-meaning intrusion into matters that were none of Congress’s concern?

James Monroe, who supported Lambert’s project back in 1812 and lived to submit his report to Congress ten years later, was just months away from an interpretation of the spending power that, while controversial, would have justified the outlay that Congress eventually made.<sup>28</sup> When it authorized the study, however, Congress said nothing about money; it is not obvious that later appropriations can justify actions taken without envisioning the expenditure of federal funds.

The promotion of science, leaned on by

20 25 ANNALS at 855, 856, 2 AM ST PAPERS (Misc) at 197 (Jan 20, 1813).

21 See also the similar report of a second committee filed by Representative Nelson in 1815, 28 ANNALS at 1170, 2 AM ST PAPERS (Misc) at 273-74.

22 34 ANNALS at 1403, 1404, 2 AM ST PAPERS (Misc) at 546 (Feb 24, 1819). This committee, though Nelson was again its spokesman, prudently decided “not [to] take upon themselves to recommend that an observatory be erected” as well. Lambert, the moving force behind this entire campaign, had suspended that request for the nonce. Id; see 2 AM ST PAPERS (Misc) at 759.

23 3 Stat 648 (Mar 3, 1821).

24 See 2 Richardson at III, 2 AM ST PAPERS (Misc) at 753.

25 Id at 793. One recent atlas places Washington, D.C. at 77° 1’ west of Greenwich. RAND McNALLY’S NEW INTERNATIONAL ATLAS 221 (1980).

Having borrowed the instruments necessary for his investigations “from one of the Departments of Government,” 2 AM ST PAPERS (Misc) at 769, Lambert took the occasion to renew his plea for a national observatory:

Until an observatory be erected and furnished, we shall be compelled to rely on the labors of scientific men in Europe for the elements necessary to be used in our astronomical calculations; and it never can be in the power of a few individuals in this country, however laudable and persevering their exertions may be, to remove or lessen that dependence on foreign nations, if they do not meet with adequate encouragement and support.

Id at 794.

26 2 Richardson at III, 2 AM ST PAPERS (Misc) at 753; 3 Stat 668, 673, § 1 (Apr 30, 1822).

27 See David P. Currie, *The Vaccine Agent*, 1 GREEN BAG 2D 245 (1998).

28 See the essay accompanying his veto of the bill to collect tolls on the Cumberland Road, 2 Richardson at 142, 171-73 (May 4, 1822).

one congressional committee, could no more sustain determination of the meridian than it could the appointment of a vaccine agent. As Representative Thomas Tucker had pointed out during the First Congress, Congress was authorized to promote science only by granting patents;<sup>29</sup> President Jefferson had rationalized Lewis and Clark's expedition as an exercise of the commerce power.<sup>30</sup> The utility of a meridian to navigators, harped upon in the 1810 report, suggests that its ascertainment, like the erection of lighthouses, might have been necessary and proper to the conduct of foreign commerce – although a similar connection had failed to persuade an earlier Congress to support an expedition to determine the equally critical location of the magnetic pole.<sup>31</sup> Monroe's effusive description of a national meridian as an "appendage" or "attribute of sovereignty" could be understood as a not very convincing effort to assimilate it to such patriotic symbols as the National Anthem and the flag, whose adoption had apparently been considered inherent in the creation of the government.<sup>32</sup>

Or was the establishment of the meridian a modest exercise at long last of the neglected

power to fix standards of weights and measures? Longitude was an indubitable "measure," and Lambert's report certainly fixed it. Was it a "standard"? It did not, like the pound or the yard, define a general quantitative criterion for determining the size of objects in general; it specified the location of a single point on the globe. To define a degree of longitude would have been to set a standard; what Lambert did was to apply a presupposed standard to a particular case. He did not define a measure; he *measured* the Capitol, as one would determine the distance between home plate and first base. Indeed it can be said that all he did was to determine the distance from Washington to London.

We are splitting hairs, are we not? Lambert was setting a standard by reference to which navigators everywhere could measure their position. To do that was surely within the spirit of the constitutional provision. And thus Congress may finally have exercised its power to fix weights and measures, if only in part.

President Adams's First Annual Message renewed Lambert's additional request for an observatory.<sup>33</sup> Congress ignored him.

29 See *THE FEDERALIST PERIOD* at 71, 93.

30 See 1 Richardson at 352, 353-54 (Jan 18, 1803).

31 See *THE FEDERALIST PERIOD* at 71, 93. An argument as to the utility of the meridian for *naval* navigation would have been, if anything, marginally stronger before the lighthouse precedent was set; for while Congress has power only to "regulate" commerce, it has power to "provide and maintain" a navy. US Const, Art I, § 8, cl 3, 13.

32 See *THE FEDERALIST PERIOD* at 204-05. Congress in 1818 had confirmed this authority by revising the formula for designing the flag. 3 Stat 415 (Apr 4, 1818).

33 2 Richardson at 299, 313 (Dec 6, 1825). This suggestion provoked an extended exchange between Secretary of State Henry Clay and former Treasury Secretary William H. Crawford, unsuccessful rivals of Adams in the 1824 election. Crawford began by dismissing Adams's proposal for "light houses to the skies" as "[a] recommendation entirely inconsistent with the idea of the government's being limited by the enumeration of powers." Crawford to Clay, Feb 4, 1828, 7 *THE PAPERS OF HENRY CLAY* 76 (Robert Seager II ed, Kentucky, 1984). Clay replied that most previous Presidents had made similar suggestions; surely there could be no objection to establishing an observatory in the District of Columbia. Clay to Crawford, id at 99, 101. Crawford retorted that he had no recollection of comparable proposals, id at 268, 269. Clay had the last word: He was alluding to earlier requests to establish a university, "of which it is not unusual for an observatory to be an appendage." In any event, Clay continued, the case for an observatory was the stronger "because of its direct relation to the commerce and navigation of the United States, to say nothing of the public domain." Id at 353.

### III. SEQUEL

When he became President, John Quincy Adams plaintively urged Congress once more to adopt a comprehensive system of weights and measures.<sup>34</sup> Congress ignored him again. Three years later, Albert Gallatin having brought from London a replica of the standard British troy pound, Congress prescribed it as “the standard troy pound of the mint of the United States, conformably to which the coinage thereof shall be regulated.”<sup>35</sup> Prompted by a Senate resolution, the Treasury then adopted standards for the yard, pound, gallon, and bushel for the use of the Customs Service, on the theory that “divergences among the weights and measures in use” for this purpose “were directly opposed to the spirit of the Constitution, which requires that all duties, imposts, and excises shall be uniform throughout the United States.”<sup>36</sup> In 1836 Congress ordered that copies of these standards be sent

to each of the states for their own use, “to the end that an uniform standard of weights and measures may be established throughout the United States.”<sup>37</sup> The states soon adopted these standards, and thus uniform standards were initially achieved not by federal legislation but by leaving the matter to the states.<sup>38</sup>

In 1866 Congress authorized use of the metric system, defining metric units in terms of “the weights and measures now in use in the United States.”<sup>39</sup> Pursuant to 15 USC § 272(a), which entrusted the Secretary of Commerce with “[t]he custody, maintenance, and development of the national standards of measurement,” the National Bureau of Standards published a list of “customary” measuring units in 1968,<sup>40</sup> but Congress has still not prescribed their general use.

If Congress is looking for something to do, it might consider at last giving us an honest-to-goodness uniform system of weights and measures. *♣*

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34 First Annual Message, 2 Richardson at 299, 313 (Dec 6, 1825).

35 4 Stat 277, 278, § 2 (May 19, 1828).

36 Lewis V. Judson, *WEIGHTS AND MEASURES STANDARDS OF THE UNITED STATES* 6 (National Bureau of Standards, 1976).

37 5 Stat 133 (Jun 14, 1836).

38 L. Judson, *WEIGHTS AND MEASURES STANDARDS* at 8 (cited in note 36).

39 14 Stat 339, §§ 1, 2 (Jul 28, 1866), now 15 USC §§ 204, 205.

40 33 Fed Reg 10755-56 (Jul 27, 1968).