

58. For a contemporary account of the pressure on Delambre to complete his book manuscript, and the fact that although he had received the first batch of Méchain's papers he had yet to go through them, see UBL MS074, Delambre to Van Swinden, 10 ventôse XIII [1 March 1805]. Delambre himself says he did not have Méchain's papers in time for Volume 1, in Delambre, *Base*, 2, pp. v-x. For a retrospective account, see Delambre, *Grandeur*, p. 224. On the meaning of the metre, see Ludwig Wittgenstein, *Philosophical Investigations*, trans. G. E. M. Anscombe, 2nd edn (Oxford: Blackwell, 1963), section 50. Also Saul Kripke, *Naming and Necessity* (Cambridge: Harvard University Press, 1972).

Chapter 11 Méchain's Mistake, Delambre's Peace

1. William Shakespeare, *Julius Caesar*, Act I, scene ii, in *The Riverside Shakespeare* (Boston: Houghton Mifflin [1699], 1974), p. 1108.
2. Jean-Baptiste-Joseph Delambre, *Histoire de l'astronomie moderne* (Paris: Courcier, 1821), 1, p. xli. He is speaking of his treatment of Descartes; see below.
3. Delambre, *Rapport historique*, p. 68.
4. KM, Delambre, *Base*, 1, title page. As it is not clear when Delambre presented the *Base* to Napoleon, it may well have been when all three volumes were published in 1810; see BA MS2038, Delambre to Baudouin, 21 January 1806. Delambre deliberately refrained from dedicating the *Base* to the Emperor to avoid the impression of kowtowing; see Delambre, 'Lui-même'.
5. AOP E2-9, Delambre's comments at end of Méchain's notebook.
6. For Méchain's alterations, see AOP E2-9, 23 January 1793. In one instance, Delambre could tell that the data had been recopied because of the way they were laid out on the page; yet Méchain had appended the times of the observations to the top and bottom of the page, something that served no purpose except to make the page appear to be original.
7. Delambre, in KM, Delambre, *Base*, 1, p. 510. For Delambre's notes on Méchain's sections, see KM, Delambre, *Base*, 1, pp. 289-510. For Méchain's 'falsifications' at Saint-Pons, see p. 345. The many alterations at Carcassonne (sixteen series suppressed) shifted the final outcome by 1.91 seconds; see p. 374. Delambre notes a case in which Méchain presented data to the International Commission that had been altered by two full seconds without any plausible explanation; see p. 386. Delambre also made corrections for typographical errors and occasionally tweaked his own equations.
8. For the latitude of Paris, then and now, see Delambre, *Grandeur*, p. 222; Bigourdan, *Système métrique*, p. 154.
9. Delambre's comments in AOP E2-9. See also KM, Delambre, *Base*, 1, p. 484; AOP MS1033b, Anon. [Tranchot?], 'Pour Delambre seul' [c. 1807-9]. Méchain published an abbreviated version of his results for Barcelona; see *CT pour l'an XII* (Paris, X [1801-2]), pp. 242-5.
10. Delambre, *Base*, 2, p. 619; Delambre, 'Auszug aus einem Briefe', 1 February 1808, *MC* 18 (May 1806), pp. 45-9. For his promise to publish all the data, see Delambre, 'Base du système métrique', *CT pour l'an 1808* (1807), pp. 463-6.
11. For the deposit of the papers, see Burckhardt, Biot and Bouvard, 'Dépôt des manuscrits à l'Observatoire impérial', 12 August 1807; and Bouvard, Burckhardt and Arago, 'Dépôt', 19 September 1810, in *Base*, 3, pp. 698-704. Delambre made the deposit in two lots because he wanted to hold on to some of the material while writing Volume 3 of the *Base*. However, unlike the published accounts of the second deposit in 1810, the manuscript version notes that Méchain's letters had been placed under seal. See the original at AOP D5-58, 'Dépôt', 26 September 1810.
12. AOP E2-9, Delambre's final comments in Méchain's notebook.
13. Delambre (c. 1810), marginal note to AOP E2-19, Méchain to Delambre, 7 brumaire VII [28 October 1798].
14. AOP E2-19, Méchain to Lalande, 11 ventôse IV [1 March 1796]. For the claim that the double star Mizar-Alcor may have ruined Méchain's data, see Jean-Nicolas Nicolle, *Mémoire sur un nouveau calcul des latitudes de Mont-Jouy... lu à l'Académie des sciences le 10 mars 1828* (Paris: Huzard-Courcier [1828]); also published in *CT pour 1831*, pp. 68-77. However, Méchain had publicly noted that Mizar was a double star; see Méchain, *MC* 8 (November 1803), p. 455. Moreover, the astronomer royal of England, George Airy, later examined Mizar-Alcor through the repeating circle which Méchain had sold to the Milanese, and found that he was able to resolve the double star. George Airy, 'The Figure of the Earth', *Encyclopaedia Metropolitana* (London: Fellows et al., 1845), 5, p. 250. On the issue of refraction, see Delambre, 'Auszug aus einem Briefe', 1 February 1808, *MC* 18 (1808), pp. 45-9. Delambre thought that Méchain's observations of Mizar proved that the Bradley tables were in error; see Delambre, *Base*, 2, p. 595.
15. For Delambre's speculations, see Delambre, *Base*, 2, pp. 618-19. Méchain himself worried that the Pyrénées would distort his readings; see AOP E2-19, Méchain to Lalande, 3 brumaire IV [25 October 1795]. Méchain's friend, the German astronomer Baron von Zach, cited Méchain's experience at Barcelona as evidence of the gravitational pull of mountains; see Franz-Xaver Zach, *L'attraction des montagnes et ses effets sur les fils à plomb* (Avignon: Seguin, 1814), p. 19. At the time, some geodesers noted that the tug of the local geography should have created a discrepancy in the opposite direction; see Joseph Rodriguez, 'Observations on the Measurement of Three Degrees of the Meridian', *Philosophical Transactions* 102 (1812), p. 344.
16. Some have suggested that Méchain sold his circle to the Milanese astronomers to get rid of the defective apparatus. This seems unlikely. Méchain gave the Milanese astronomers free choice between his two circles, and they chose the 360° old-fashioned circle rather than the 400° decimal circle, which is the one Méchain himself had used almost exclusively; see Delambre, *Base*, 3, pp. 503-4. For his sale to the

- Milanese, see AOAB Cart. 88, Méchain to Oriani, 12 February 1795. For the Catalan conspiracy theory, see Moreu-Rey, *Naïvement del metre*, pp. 91-2.
17. For Delambre's defence of the Fontana de Oro data, see Delambre, *Base*, 2, p. 620. Méchain's data for Mont-Jouy appear accurate by modern standards. In 1931, a Catalan astronomer measured the latitude of the exact same location on the Mont-Jouy tower, and using eighteenth-century methods of data reduction found the latitude to be $41^{\circ}21'44.62''$, which differs by only 0.44 seconds from the latitude found by Méchain. But without comparable measurements at the Fontana de Oro, which is no longer in business today, this information tells us little about the discrepancy between the two results. See Isidore Polit, cited in A. Ten, 'Les expéditions de Méchain et Biot-Arago, in *Figure de la terre du XVIII^e siècle à l'ère spatiale*, eds Henri Lacombe and Pierre Costabel (Paris: Gauthier-Villars, 1988), pp. 245-65, especially p. 263.
18. For Nicolle's critique, see Nicolle, *Mémoire*. See the appreciation of this work in Airy, 'Figure'. See the misguided critique of this work in Anon., 'Réflexions sur un Mémoire de M. T. [sic] N. Nicolle', *Philosophical Magazine*, new series, 5 (1829), pp. 180-8. For eighteenth-century methods of calculating latitude, see Charles Cotter, *A History of Nautical Astronomy* (New York: Elsevier, 1968), pp. 123-79; also F. Marguet, *Histoire générale de la navigation du XVI^e au XIX^e siècle* (Paris: Société d'Éditions Géographiques, Maritimes et Coloniales, 1931).
19. Arriving in the United States, Nicolle got in touch with Ferdinand Rudolph Hassler, described his geodetic instruments, books and skills to him, and asked to become part of the US geodetic survey; see NYPL Ford Collection, Nicolle to Hassler, 25 July 1832.
20. As Delambre did not measure any stars which passed south of the zenith, it is not possible to verify the accuracy of his results. Interestingly, Delambre was aware that one might balance 'north' and 'south' stars in this way, but he neither measured any southern stars, nor did he manipulate Méchain's data in this way, in part because he would have needed to know the declinations with much greater accuracy than was available in contemporary tables, and in part because the two stars he picked were much easier to locate than the stars Méchain selected; see Delambre, *Base*, 2, p. 186.
21. Delambre, 'Lui-même'. Delambre, *Tables éliptiques des satellites de Jupiter* (Paris: Courcier, 1817). On the savant who discovered an error in those tables, see Anon., 'Nécrologie de M. le chevalier Delambre', *Nouvelles annales des voyages* 15 (1822), pp. 425-8.
22. For Delambre's attitude towards perfection in nature, see UBL MS1872, Delambre to Moll, 21 July 1820. An obituary in *Année de la religion* 33 (1822), pp. 111-12, called Delambre an atheist who respected faith, principally because he did not use geodesy or astronomy to challenge publicly the age of the earth as stated in the Bible.
23. Delambre, *Base*, 3, p. 103.
24. For Delambre's revised metre, see Delambre, *Base*, 3, p. 135.
25. For Delambre's mnemonics, see Delambre, *Base*, 3, p. 299.

26. WL 65667, Delambre to Lindeman, 1 May 1811.
27. For Legendre's discovery, see A.-M. Legendre, *Nouvelles méthodes pour la détermination des orbites des comètes avec un supplément*, 6 March 1805 (Paris: Courcier, 1806), especially pp. 72-80. Stephen M. Stigler calls the least-squares method the Ford Model-T of statistics; see 'Gauss and the Invention of Least Squares' [1981], in *Statistics on the Table: The History of Statistical Concepts and Methods* (Cambridge: Harvard University Press, 1999), p. 320. V. Parisot, 'Adrien-Marie Legendre', *Biographie universelle*, ed. Michaud, new edn (Paris: Desplaces, n.d.), 23, pp. 610-15; Elie de Beaumont, 'Eloge historique de Adrien-Marie Legendre', *MA* 32 (1864), pp. xxxvii-xciv.
28. For Laplace's *ancien régime* methods, see Laplace, 'Mémoire sur la figure de la terre' (1783, pub. 1786), in *Œuvres*, 11, pp. 5-9.
29. For Delambre's use of Legendre's analysis, see Delambre, *Base*, 3, p. 92.
30. For Gauss's interpretation of least squares, see Ch.-Fr. Gauss, *Méthodes des moindres carrés*, trans. J. Bertrand (Paris: Mallet-Bachelier, 1855). For evidence of his priority, Gauss claimed to have discussed it with several colleagues – although none of them seems to have understood him. Gauss clearly did have some kind of similar method at an early date because he was able to catch a typographical error in Delambre and Méchain's geodetic data, published in the *Allgemeine Geographische Ephemeriden* of 1799-1800. Delambre, in his role as Permanent Secretary of the Academy of Sciences, offered a fair-minded adjudication of this dispute, granting Legendre priority for the publication and the clarity of his presentation, while conceding Gauss's undeniable contributions; see Delambre, 'Analyse des travaux', *MA* (1811, pub. 1814), pp. iii-xiii. See also Churchill Eisenhart, 'The Meaning of Least Squares', *Journal of the Washington Academy of Sciences* 54 (1964), pp. 24-33; R. L. Plackett, 'The Discovery of the Method of Least Squares' [1972], in *Studies in the History of Statistics and Probability*, eds Maurice Kendall and R. L. Plackett (London: Griffin, 1977), 2, pp. 239-51; Stigler, 'Gauss and the Invention of Least Squares', pp. 320-31. For Gauss's work on least squares and geodesy, see O. B. Sheynin, 'C. F. Gauss and the Theory of Errors', and 'C. F. Gauss and Geodetic Observations', *Archive for History of the Exact Sciences* 20 (1979), pp. 21-72; 46 (1994), pp. 253-82. See also Laura Tilling, 'The Interpretation of Observational Errors in the Eighteenth and Early Nineteenth Centuries' (Ph.D. diss., Imperial College of Science and Technology, University of London, 1973). Bernard Bru, 'Laplace et la critique probabilistique des mesures géodésiques', in *Figure de la terre*, eds Lacombe and Costabel, pp. 223-44; M. Armatte, 'Théorie des erreurs, moyenne et loi normale', in *Moyenne, milieu, centre: Histoire et usages*, eds Jacqueline Feldman, Gérard Lagneau and Benjamin Matalon (Paris: Éditions de l'École des Hautes Études en Sciences Sociales, 1991), pp. 63-84; Eberhard Knobloch, 'Historical Aspects of the Foundations of Error Theory', in *The Space of Mathematics: Philosophical, Epistemological, and Historical Explorations*, eds Javier Echeverría, Andoni Ibarra and Thomas Mormann (Berlin: Gruyter, 1992), pp. 253-79.

31. For the first French discussion of what later became known as the personal equation, see Delambre and Laplace, 'Rapport sur la théorie de Mars, par Lefrançois-Lalande', *ASPV* 2 (21 brumaire X [12 November 1801]), pp. 426-9. The first cited instance of the personal equation was the discrepancy between Maskelyne and his assistant in England in 1796, though this was not 'explained' for another twenty years. See Stephen M. Stigler, *History of Statistics: The Measurement of Uncertainty before 1900* (Cambridge: Harvard University Press, 1986), pp. 240-2. I am indebted for my analysis of the transformation of the astronomical discipline to Simon Schaffer, 'Astronomers Mark Time: Discipline and the Personal Equation', *Science in Context* 2 (1988), pp. 115-45. See also Lorraine Daston, 'Enlightenment Calculators', *Critical Inquiry* 21 (1994), pp. 182-202; Giora Hon, 'Towards a Typology of Experimental Errors: An Epistemological View', *Studies in the History and Philosophy of Science* 20 (1989), pp. 469-504.
32. For the role of nineteenth-century statistics in the various sciences, see Theodore M. Porter, *The Rise of Statistical Thinking, 1820-1900* (Princeton: Princeton University Press, 1986).
33. Jean-Paul Marat, *Les Pamphlets - 1792*, ed. C. Vellay (Paris: Fasquelle, 1911), p. 295. This is, however, a precocious use of the term. The term 'scientist' was introduced into English in the 1840s by William Whewell. The equivalent term in French, 'scientifique', used as a noun, did not come into general use in France until the early twentieth century, and the term 'savant' continued to be used there throughout the nineteenth century. Nevertheless, many of the elements of the new scientific 'professionalism' (and the new political world which sustained it) emerged in the early nineteenth century.
34. Napoleon to Lalande, 15 frimaire V [5 December 1796], in Napoleon, *Correspondance*, 2, pp. 175-6.
35. BVCS MS99, Lalande, 'Journal', 23 November 1805. Jérôme Lalande, *Histoire céleste française* (Paris: Imprimerie de la République, IX [1801]). A few years later, his grandson Isaac, named after Isaac Newton, was hard at work in the family astronomical workshop; see Lalande, 'History of Astronomy for the Year 1805', *Philosophical Magazine* 26 (1806-7), p. 362.
36. BNR MS Fr 12273 fol. 73, Anon., 'Air des fraises: Voyez du nain des savans / La fierté peu commune / Il voulait savoir des vents / Si l'on parle de lui dans / La lune, la lune, la lune.' On Mlle Henry, see Aulard, *Thermidorienne*, 4 (22 messidor VI [10 July 1798]), p. 533.
37. *Gazette de France*, 4 ventôse XIII [23 February 1805], cited in François-Alphonse Aulard, *Paris sous le premier Empire* (Paris, Cerf, 1912-23), 1, p. 620.
38. BN R43050, Lalande in Sylvain M[aréchal] [with Jérôme Lalande], *Dictionnaire des astres anciens et modernes* (Paris: Grabit, VIII [1799]), p. 57.
39. BN Ln27 11115, Anon., *Grand conseil tenu par les sylphes* (Paris: Souds-Muets, n.d.). For attacks on Lalande's atheism in the press, see Aulard, *Consulat*, 1 (12 December 1799, 18 March 1800), pp. 48, 221-2.

40. NL FRC18618, Lalande, *Notice sur Sylvain Maréchal* (n.p., n.d.), pp. 48-9. 'Les hommes fous, méchants ou bêtes / Prouvent que tout est mal dans cet indigne lieu. / Un scélérat suffit pour renverser les têtes; / L'homme ne serait plus s'il existait un Dieu.'
41. Delambre, 'Lui-même'.
42. Jérôme Lalande, *Seconde supplément au Dictionnaire des Astres* (n.p., 1805), p. 76. The publisher only printed the dictionary after being told by the Ministry of Police that he might do so for Lalande's private use. Lalande then 'accidentally' left some copies in the antechamber of the French Senate, where they were discovered. For a full discussion of this episode, see Aulard, 'Napoleon et l'athée Lalande', *Révolution française*, 4th series, 9 (1904), pp. 303-16. For Lalande's views on the function of religion, see NL FRC18618, Lalande, *Notice sur Sylvain Maréchal* (n.p., n.d.), pp. 36-7, and his conversation with the Pope, p. 88. See also his cheeky attack on Napoleon as a warmonger in *Journal de l'Empire*, 13 fructidor XIII [31 August 1805], in Aulard, *Empire*, 2, p. 147.
43. For Napoleon's accusation against Lalande, see Napoleon (at Schönbrunn) to Min. Int. Champagny, 23 frimaire XIV [13 December 1805], in Napoleon, *Correspondance*, 11, pp. 574-6. For Lalande's acceptance of the conditions, see AN AF IV 1050, Delambre to Min. Int., 5 nivôse XIV [26 December 1805]; and CUS, Président de l'Institut, 'Certifie que ce qui suit ...', 5 nivôse XIV [26 December 1805]. Delambre gave a detailed account of this episode and his attempt to make Lalande conform, while preserving academic freedom; see BI MS2041 v. 2, fol. 610, Delambre, 'Lalande' [1805]. For the re-edition of the *Dictionary*, see BN 8°R13719, Jérôme Lalande, *Seconde supplément au Dictionnaire des Astres* (n.p., 1806).
44. Lalande, 'Testament moral' [21 October 1804], in Amiable, *Lalande*, p. 53, emphasis added.
45. Delambre, 'Lalande', *Biographie universelle*, p. 613; Salm-Reifferscheid-Dyck, *La Lande*, p. 34. For rumours about Lalande's will, see *Gazette de France*, 8 April 1807, and *Journal de Paris*, 11 April 1807, in Aulard, *Empire*, 3, pp. 115, 117. For Delambre's increasingly harsh assessment of Lalande after his death, see Delambre, 'Eloge historique de M. de Lalande', 4 January 1808, *MA* (1807), pp. 30-57; Delambre, 'Lalande', *Biographie universelle*, pp. 603-13; Delambre, 'Lalande', *Astronomie au dix-huitième*, pp. 547-621.
46. BMA Arch. Rev. 2K10, Delambre to [Louis-François] Janvier, 12 August 1806.
47. On Delambre's debilitating illness of 1803, see CUS, Delambre to Cagnoli, 6 August 1810.
48. For Delambre's loans to Mme de Pompadour at favourable interest in 1800-1, see BI MS1041 fol. 29. Her property was located in Courcelles-sur-Viosne; see AN M.C. Etude II 797, 'Donation entrevu par Madame Delambre', 5 vendémiaire XIII [27 September 1804]. For his housing, see CUS, Delambre to Delambre (his cousin, a notary), 7 floréal [c. 1800]. For a description of Mme Delambre, see Charles Dupin, 'Notice nécrologique sur M. Delambre', *Revue encyclopédique* 48 (December

- 1822), pp. 22-3. For their mutual friendship with Humboldt, who may have introduced them, see Delambre to Humboldt, 22 January 1801, in Alexander von Humboldt, *Briefe aus Amerika*, 1799-1804 (Berlin: Akademie, 1993), p. 121.
49. BI MS2041, in Delambre's hand: 'An Athenian Air, Translation from the Roman.' Charles de Pomard's examiner for the Ecole Polytechnique was Biot, one of Delambre's scientific protégés, who ranked him near the middle of the incoming class; see BEP II/1, Ecole Impériale Polytechnique, 'Liste des élèves admis à l'Ecole Polytechnique en l'an 9' [1801]. Delambre to Humboldt, 22 January 1801, in Humboldt, *Briefe aus Amerika*, p. 120. WL 70807, Humboldt to Delambre, 27 August 1807.
50. BMA Arch. Rev. 2K10, Delambre to [Louis-François] Janvier, 12 August 1806. On Delambre's change of residence, see Delambre, *Grandeur*, p. 192. See his addresses in *Almanach national*.
51. For the view of Gauss, see Gauss to Bessel, 13 November 1814, in *Briefwechsel C. F. Gauss-F. W. Bessel* (Hildesheim: Olms, 1975), 1, p. 202. For a more generous view, see Wilson, 'Perturbations', pp. 283-96. Delambre's tables were plagiarized while still in manuscript form by the German astronomer Baron von Zach, who took advantage of Lalande's generosity in conveying scientific results. This infuriated Delambre, though he restrained himself publicly; see Delambre, 'Lui-même'.
52. For Delambre's military research, see AN AF IV 1205, Delambre to Gen. Duroc, 23 vendémiaire XII [16 October 1803]; see also Fernand Beaucour, 'Un problème d'optique posé par Napoléon à l'Institut, en 1803, résolu par Delambre', *Bulletin historique de la Société de Sauvegarde du Château Impérial de Pont-de-Briques* (1972), p. 196-206. For the background of the threatened invasion, see Edouard Desbrière, *Projets et tentatives de débarquement aux îles Britanniques* (Paris: Chapelot, 1902), vol. 3.
53. For Delambre's key role in saving the life of James Smithson, who later endowed the Smithsonian Institution, see CUS, Delambre to Clarke (Min. Guerre), 16 April 1809. Delambre also convinced the Emperor to release the English astronomer Edmond Pigot; see APS MS 76-932, 'Letter book, 1802-6'. See also Banks to Delambre, 30 January 1804; Delambre to Banks, 11 October 1806, in Gavin de Beer, *The Sciences Were Never at War* (London: Nelson, 1960), pp. 138, 177, also pp. 154-5. Delambre sent eight copies of his *Bases* to England; see Delambre to Banks, 27 April 1807, 2 March 1808, 8 March 1812, in de Beer, *Sciences*, pp. 179, 181, 192. For his general wishes for peace, see Delambre to Banks, 18 [March 1815], in de Beer, *Sciences*, pp. 193-5.
54. ASPV 4 (27 August 1810), p. 375.
55. For the complaint filed by Méchain's 'children', see ASPV 4 (24 June 1811), p. 490. As Jérôme-Isaac was then in the Dardanelles, this presumably means Augustin (and perhaps his sister). There is no mention of Mme Méchain's role. For the committee's response, see Arago et al., 'Rapport sur la réclamation de la famille Méchain', ASPV 4 (8 July 1811), pp. 496-7. The committee was not stacked too heavily in Delambre's

- favour. Although Arago, one of Delambre's protégés, was the author of the committee's report, the committee also included Guyton-Morveau, one of the two savants who had voted against Delambre's admission to the Academy in the first place; see Delambre, 'Lui-même'. The other members were Charles and Vauquelin. The final report asserted that Delambre had a conflict of interest because he was on the jury; but he was not on the jury, he was the Permanent Secretary. Institut de France, *Rapports et discussions de toutes les classes de l'Institut de France sur les ouvrages admis au concours pour les prix décennaux* (Paris: Baudouin, 1810), 1, pp. 130-7.
56. For Lalande's repudiation of the calendar he had once taken credit for, see Aulard, *Consulat*, 1 (21 November 1801), p. 618; 4 (27 September 1803), pp. 400-1; also 6 brumaire XIII [28 October 1804], and 18 messidor XIII [7 July 1805], in Aulard, *Empire*, 1, p. 349; 2, p. 43. Also see his 'I told you so', in Jean-Etienne Montucla, *Histoire des mathématiques*, ed. Lalande (Paris: Agasse, X [1802]), 4, pp. 329-33. Delambre also reminded his colleagues of the calendar's flaws; see ASPV 1 (26 pluviôse V [14 February 1797]), p. 172; 2 (6 vendémiaire IX [28 September 1800]), p. 233. For a general discussion of the repudiation of the calendar, see *PVICP*, 6, pp. 207-13; Léon de Lanzac de Laborie, *Paris sous Napoléon* (Paris: Plon-Nourrit, 1905-), 3, pp. 202-6; [Blagdon], *Paris as It Was*, 2, pp. 79-80.
57. For exhortations to continue to use the metric measures, see Chaptal (Min. Int.) to Préfets, 2 frimaire XI [23 November 1802], in *Moniteur* 111, 112, 113 (21, 23, 24 nivôse XI [11, 13, 14 January 1803]), pp. 446, 454-5, 459-60. See 'Préfecture de Police', *Moniteur* 17 (17 vendémiaire XI [9 October 1802]), p. 63. For the ongoing use of old measures, see AN F21/106/31, Duplantier (Préfet de Landes) to Conseiller d'Etat, 26 thermidor XIII [14 August 1805]. For a denial of the rumours of the metric system's demise, see ADSe VD* 430, Bureau Central de Paris, *Avis: poids et mesures*, 26 brumaire VIII [17 November 1799] (Paris: Lottin, VIII [1799]).
58. BLUC Laplace Box 10, Laplace to Napoleon, 7 May 1811. For the lobbying of Laplace and Delambre, see BLUC Laplace Box 10, Laplace to [Min. Int. Chaptal], 13 pluviôse XII [3 February 1804]; also printed in [Arthur-Jules] Morin, 'Notice historique sur le système métrique', *Annales du Conservatoire des Arts et Métiers* 9 (1871), p. 607. For the attempt to connect the metre to Napoleon's conquests, see AN F12 1289, Anon., unaddressed letter, 2 March 1811.
59. On the 'ordinary measures', see Napoleon, 'Décret concernant l'universalité des poids et mesures', 12 February 1812, in *Moniteur* 50 (19 February 1812), p. 199; Monalviel (Min. Int.) aux Préfets, 28 March 1812, in *Moniteur* 116 (25 April 1812), p. 454-5.
60. Benjamin Constant, *De l'esprit de conquête* (Paris: Librairie de Médecis, 1813), pp. 53-4. See also Benjamin Constant, *Cours de politique constitutionnelle* (Paris: Guallemin, 1872), 2, pp. 170-5.
61. AN F12 1290, Préfet (Bouches du Rhin) to Min. Int., 6 July 1813; see also, Min. Int. to Préfet, 20 July 1813; Préfet to local mayors and

- administrators, June 1813; Préfecture du Dépt. des Bouches du Rhin, broadsheets in French and Dutch, 12 February 1813 (Bois-le-Duc: Lion [1813]).
62. Napoleon, *Mémoires*, 4, pp. 211-15. By 'forty million people' Napoleon was referring to the population of imperial France. See also his bitter views on the savants and the metric system in Napoleon, *Sainte-Hélène, Journal inédit de 1815 à 1818*, ed. Gaspard Gourgaud (Paris: Flammarion, 1899), 1, p. 95; 2, p. 28.
63. UBL MS1872, Delambre to Moll, 7 May 1814.
64. On Delambre's second change of residence, see CUS, Delambre to Mlle Delambre (his sister), 18 November 1815; Delambre, 'Lui-même'. As Permanent Secretary, Delambre had a salary of 6000 francs, but he lost his salary as Treasurer of the University, which was much larger - 12,000 francs; see *ASPV* 6 (27 March 1816), p. 43. On Delambre's defence of the savants' political neutrality, see Delambre to Min. Int., 18 April 1816, in Bigourdan, 'Bureau des Longitudes' (1928), p. A49.
65. For the Report to the Emperor, see Jean Dhombres, 'Introduction' to *Rapports à l'Empereur sur le progrès des sciences, des lettres et des arts depuis 1789*, vol. 1, *Sciences mathématiques*, ed. Jean Dhombres (Paris: Belin, 1989), pp. 13-37.
66. CUS, Delambre to Cagnoli, 6 August 1810.
67. For the only comparable history of science prior to Delambre's work, see the history of (applied) mathematics begun by Montucla, with volumes 3 and 4 completed by Lalande in 1802; see Montucla, *Histoire des mathématiques*. For the relationship of Delambre's *Histoire* to his *Traité*, see Delambre, *Astronomie moderne*, 1, p. lii. For an appreciation of Delambre as a historian, see I. Bernard Cohen, 'Introduction', in Delambre, *Histoire de l'astronomie moderne* (New York: Johnson Reprint, 1969), pp. ix-xx.
68. On his historical method, see Delambre, *Histoire de l'astronomie ancienne* (Paris: Courcier, 1817), 1, pp. xviii-xx, xxxvi. He especially attacked the speculative *ancien régime* histories of Bailly; see Delambre, *Histoire de l'astronomie du moyen-âge* (Paris: Courcier, 1819), pp. xxxiv-xxxvii. For Delambre's interest in the Egyptian expedition, see BI MS1041, Nouet to Delambre, 21 fructidor IX [8 September 1801]; 8 floréal X [28 April 1802]. Delambre and Méchain were the Académie's examiners for the results brought back from Egypt by Nouet and Jérôme-Isaac Méchain; see *ASPV* 2 (1 floréal X [21 April 1802]), p. 495. For his doubts about the pyramid claims, see BI MS 1042 fol. 388, Delambre, *Recherches sur les sciences de l'Égypte* par M. Fourier, n.d. Delambre, *Astronomie ancienne*, 1, pp. 89-90. Delambre, *Astronomie du moyen-âge*, pp. vi, lcv.
69. Delambre, *Astronomie moderne*, 1, p. xli; 2, p. 235, emphasis in original.
70. Delambre, *Astronomie moderne*, 2, pp. 199-200.
71. On Descartes' skull, see Delambre, 'Crâne venu de Suède et que l'on dit être celui de Descartes', *ASPV* 7 (14 May, 8 October 1821), pp. 193-7, 232-3.
72. On Delambre's destruction of private letters and papers, see Charles Dupin, 'Notice nécrologique sur M. Delambre', *Revue encyclopédique* 48

- (December 1822), pp. 12-13. For his autobiography and biography, see Delambre, 'Lui-même'; Mathieu, 'Delambre', *Biographie universelle*, pp. 304-8.
73. For Delambre's death certificate, see AN Etude CVIII 987, Jean-Eustache Montand, 'Actes de décès: Delambre', 26 August 1822. For the sale of Delambre's large collection of fifteen hundred books, see AOP 22569, *Catalogue des livres composant la bibliothèque de feu M. le Chevalier Delambre*, 10-20 May 1824 (Paris: Gaudfroy et Bachelier, 1824). For his eulogy, see Joseph Fourier, 'Eloge de M. Delambre', 2 July 1823, *MA* 4 (1824), pp. cciv-ccxxviii. For Fourier's appointment, see *ASPV* 7 (26 August 1822), p. 362.
74. UBL MS1872, Delambre to Moll, 21 July 1820.
75. For Delambre's last biography of Méchain, see Delambre, 'Méchain', *Histoire de l'astronomie au dix-huitième siècle*, ed. Claude-Louis Mathieu (Paris: Bachelier, 1827), pp. 755-67. Lalande himself said in his eulogy for Méchain that he had met the young man through a correspondence; see Lalande, 'Nécrologie', *Monteur* 22 (7 nivôse XIII [28 December 1804]). Delambre wrestled several times in his manuscripts with the phrase: *funeste résolution d'en faire mystère*; see BYU folder 32, Delambre, 'Méchain'; also BI MS2041 fol. 10, Delambre, 'Méchain'. Delambre also wrote a mini-biography of Méchain, published in 1821, which takes much the same tone; see Delambre, 'Méchain', *Biographie universelle*, ed. Michaud (Paris, 1821), 28, pp. 464-8.
76. Delambre, 'Méchain', *Astronomie au dix-huitième siècle*, pp. 766-7.
77. Delambre, *Grandeur*, pp. 231, 234.
78. The sealed manuscripts were presumably opened by Guillaume Bigourdan at the very end of the nineteenth century, although he made no use of them in his *Système métrique* of 1901.

Chapter 12 The Metred Globe

1. G. K. Chesterton, 'The Rolling English Road', *The Flying Inn* (London: Methuen, 1914).
2. Josephus, *Jewish Antiquities* (1, p. 61), in *Works*, trans. H. St. J. Thackeray (London: Heinemann, 1930), 4, p. 29. Cain was the first to lay out territorial boundaries and to build a city.
3. John Quincy Adams (Secretary of State), 'Weights and Measures', US Senate, 22 February 1821; 16th Congress, 2nd Session, no. 503, Class 10, vol. 2, pp. 656-750; see p. 672. The report was written in response to a request made by the Senate on 3 March 1817 and echoed by President James Madison. See US House of Representatives, 15th Congress, 2nd Session, no. 463, pp. 538-42.
4. Armand Machabey, 'Aspects de la métrologie au XVII^e siècle', *Les Conférences du Palais de la Découverte*, Series D, 14 (1955), p. 5.
5. J. Q. Adams, 'Weights and Measures', p. 699.
6. Jefferson to J. Q. Adams, 1 November 1817, in Jefferson, *Writings*, 7, p. 87.