

## *Bureaucracy and Early French Railroads: the Myth and the Reality\**

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The purpose of this paper is to test the validity of a powerful myth that has long held an important place in writings on the economic history of the July Monarchy. According to this myth, government engineers were partly, though not of course wholly, responsible for holding back the development of the new steam railroad in the period down to the passing of the June 1842 Law.<sup>1</sup> The myth was a contemporary one: politicians, publicists, and entrepreneurs early and repeatedly blamed the *Ponts et Chaussées*, and its Director General and General Council in particular, for delaying railway construction. However, historians have subsequently taken up the accusation and made it more rigorous.<sup>2</sup> That they should have done so is not surpris-

\* The author is happy to acknowledge his debt to the Social Sciences and Humanities Research Council of Canada which provided funding for this research.

<sup>1</sup> The 1830-42 period covered in this study can be justified on political and economic grounds. 1830 marked not only the change of regime in France but the opening of the Liverpool-Manchester railroad in Britain that was to demonstrate conclusively the viability of the steam locomotive. 1842 saw the passing of the Railway Law that effected an uneasy compromise between State and private construction and one effect of which was to make some reduction in the powers enjoyed by the *Ponts et Chaussées*. This is not to say, though, that the new legislation was the take-off point for railroads that it is reputed to have been. See YVES LECLERCQ, *Le réseau impossible. La résistance au système des grandes compagnies ferroviaires et la politique économique en France 1820-1852* (Geneva: Droz, 1987), pp. 185-193.

<sup>2</sup> Georges Lefranc is just one of a long line of historians to have been strongly critical of the role played by the *Ponts et Chaussées*: "Les chemins de fer devant le parlement français (1835-42)", *Revue d'histoire moderne*, 5 (1930), 337-64. The most distinguished of recent advocates of the thesis is Maurice Lévy-Leboyer, whose *Les banques européennes et l'industrialisation internationale dans la première moitié du XIXe siècle* (Paris: Presses universitaires de France, 1964) exonerates France's financial elite

ing. There has long existed a critical literature on elite-forming mechanisms, on the powers reputedly enjoyed by civil servants and by government engineers in particular. Besides, the rhetoric of government engineer-private sector relations has been constant ever since Perronet's rivalry with the Cassinis in the mid-eighteenth century: engineers accuse private enterprise of obeying selfish pecuniary motives, while the business community accuses the administration of hampering enterprise by imposing complex procedures and regulations. Historians have also been influenced by the kind of sources most readily available to them: the transcripts of parliamentary debates and the printed brochures and press articles published when the July Monarchy elites were grappling with the problem of finding some compromise railroad policy that would find general acceptance.<sup>3</sup> The great majority of these reveal that vocal contemporaries were usually highly critical of the part that the *Ponts et Chaussées* was playing and might be called to play in authorizing, planning and building the new means of communication.

The arguments that historians have been able to marshal are certainly powerful ones. In the first half of the nineteenth century, as later, government engineers enjoyed not only prestige but more importantly a degree of autonomy and power. They were already the products of a training characterized by restrictive entry, promotion and merit, and an unrivalled scientific and

from blame but decries the role of government engineers. YVES LECLERCQ, *Le réseau impossible...*, especially pp. 63-66, has recently repeated the argument.

<sup>3</sup> Much of the brochure and monographic literature on the railroad question in the 1830s and 1840s is conveniently collected together in the archives of the Commission des chemins de fer (fonds Valentin Smith), 12 AQ and the fonds Daru, 138 AP especially 342-349. Similarly rich is the C series at the Archives Nationales, both in its petitions series and in the *cartons* organised thematically for each parliamentary session. Because he enumerates the points in the case against the *Ponts et Chaussées*, the letter written by the long-standing critic and well-known railway engineer, Auguste Perdonnet, *Journal des chemins de fer*, 4 and 11 February 1843, offers a convenient summary.

engineering education geared to government service.<sup>4</sup> They entered the *Ponts et Chaussées* possessing a common background,<sup>5</sup> a powerful self-image and an ethos of service,<sup>6</sup> and they came to a Corps that already had a long tradition of planning, building and maintaining the nation's public works.<sup>7</sup> Thus when, from the 1820s onwards and especially in the following decade, the railroad became a feasible means of transport, the administration of the *Ponts et Chaussées* appeared to exercise considerable power. It did so because projects were always submitted for consideration to the General Council, because from 1832 the Corps was given the task of planning the routes for a national network, and because the advice of its Director General carried weight as a result not only of the technical expertise he represented but also of the chronic ministerial instability of the period. Moreover, the power and prestige enjoyed by the *Ponts et Chaussées* in France stood in marked contrast to the situation elsewhere. In Britain, the most advanced economy at the time, no body of government engineers existed and railroads were entirely planned and built by private enterprise.<sup>8</sup> The results

<sup>4</sup> ANNE QUERRIEN, "Ecoles et corps: le cas des Ponts et Chaussées, 1747-1848", *Annales de la Recherche urbaine*, 5 (1979), 81-114, insists that the hallmark of this system was that engineers were trained to lead and direct. In this period only 15 per cent of Ecole Polytechnique graduates resigned their commission on graduation. TERRY SHINN, "Des Corps de l'État au secteur industriel: genèse de la profession d'ingénieur", *Revue française de sociologie*, 19 (1978), 39-71 and the same author's *L'Ecole Polytechnique 1794-1914* (Paris: Fondation Nationale des Sciences politiques, 1979), pp. 80-99.

<sup>5</sup> As shown by ADELIN DAUMARD, "Les élèves de l'Ecole Polytechnique de 1815 à 1848" *Revue d'histoire moderne et contemporaine*, 5 (1958), 226-241.

<sup>6</sup> The ethos was certainly more important than the common background as Ezra N. Suleiman has shown. *Politics, Power and Bureaucracy in France* (Princeton: Princeton University Press, 1974). "There is no other country where the term 'esprit de corps' has such a literal meaning". EZRA N. SULEIMAN, *Elites in French Society. The Politics of Survival* (Princeton: Princeton University Press, 1978), p. 97.

<sup>7</sup> For superficial analyses, see JEAN PETOT, *Histoire de l'administration des Ponts et Chaussées, 1599-1815* (Paris: Marcel Rivière, 1958), and A. BRUNOT and R. COQUAND, *Le Corps des Ponts et Chaussées* (Paris: Editions du C.N.R.S., 1982).

<sup>8</sup> The idea was mooted in Britain that the Royal Corps of Military Engineers plan major railway routes. Parliament rejected the proposal in August 1836.

obtained in the two countries also seem eloquent: despite its smaller size, Britain had four times the length of track in operation that France had in January 1842 and, what was even more revelatory, had 800 kilometres more line under construction.<sup>9</sup> At the same time these extremely modest French achievements in railroad construction stood in stark contrast with the unprecedented programme of waterway- and road-building that the *Ponts et Chaussées* planned and executed from 1821 onwards. The July Monarchy continued the massive canal programme that Becquey had introduced and which was completed only in 1854, undertook major improvements in river navigation, especially from the mid-1830s,<sup>10</sup> and carried out an important building and maintenance plan that transformed the major and secondary road network. The conclusion to be drawn seems unavoidable. To integrate isolated regions, to create a more unified national market and to make France a centre for the transit trade — long a preoccupation in government circles — government engineers preferred waterways and roads over the railroad. Worse, it also appears that the *Ponts et Chaussées* hindered and even blocked the granting of railway concessions to individual promoters.

Testing the validity of this myth means more than questioning well-entrenched orthodoxy: it also means having to confront methodological and source problems. It has to be admitted at the outset, indeed, these difficulties are too important for them all to be entirely surmounted. A second proviso has also to be entered. While historical understanding advances through the

<sup>9</sup> Britain had 2,521 kms. of line in operation and 3,617 under construction, as against 627 and 2811 kms. in Germany and 569 and 885 kms. in France.

<sup>10</sup> By 1842 the July Monarchy alone had voted 81 million francs for river improvement and 162 millions for canal-building. MICHEL CHEVALIER, "Statistiques des travaux publics sous la Monarchie de Juillet", *Journal des Economistes*, October 1848, 112-113. Between 1820 and 1840 an annual average of 130.5 kms of canals had been built as opposed to 11.7 kms in the 1800-1820 period and 36.1 kms between 1840 and 1870. Ministère des travaux publics, *Statistique de la navigation intérieure* (Paris: Imprimerie Nationale, 1888) pp. 85-97.

dialectics of controversy, the clash of thesis and antithesis invariably leads not to a new synthesis but to a heightened awareness of complexity. Questioning the truth of accusations against the *Ponts et Chaussées* may be no exception to this rule.

The difficulties raised are of two orders: the one concerns the study of the State in capitalist society, the other the specific problem of analyzing the role played by government engineers in railroad creation during the July Monarchy. Understanding the role of the State in the French economy is bedevilled by the complexity of the phenomenon of the State and by the clumsiness of the tools of analysis the historian has at his disposal. Thus we know that the State should not be treated as autonomous, that it should be seen as a dependent variable, but we also realize that it is not without some autonomy. We know, too, that government policies are the result of a complex balance of forces and that, though they reflect contemporary attitudes, they are not their mirror-image. Approaches to State intervention and to the role of its servants have been hindered because too often they have not been free of bias — witness the use of normative terms like “bureaucracy”<sup>11</sup> and “technocracy” — because the debate on the nature of the State in capitalist society is on-going, and because, as in the first half of the nineteenth century, no economic theory provides our post-Keynesian world with the keys to determining the proper regulatory and promotional role government should play in the economy or to evaluating the consequences of the policies adopted. Historians, indeed, have adopted two different, though not necessarily mutually exclusive, approaches to examine the growth of government intervention and the concomitant expansion of the

<sup>11</sup> CLIVE H. CHURCH is surely right to complain that the assertion that in the past two centuries the French civil service has been the *mal français*, a parasite feeding on the commonweal, has never been properly tested. *Revolution and Red Tape. The French Bureaucracy 1770-1850* (Oxford: Clarendon Press, 1981), pp. 2-4. Despite the use of pejorative terms in the title of his study, the author does not set out to criticize the role of civil servants.

State budget in nineteenth- and twentieth-century France. These approaches have been termed the "hot" and the "cold",<sup>12</sup> but they might more accurately be termed the voluntarist and the structuralist. The one concentrates on the short-term, on politics, personalities, policies. Such, for example, was the method used by Marcel Marion in his multi-volume analysis of French state finances.<sup>13</sup> The other concentrates, instead, on long-term trends, on analysing the evolution of government revenue and expenditures against the growth and changing components of national income. This "cold" approach has been adopted only very recently but already its results have allowed us to see how, despite the dominant ideology that in the nineteenth century sought to limit spending and taxation, the government apparatus continued to grow. Already, too, we have a clearer idea of the critical role that war and economic crisis play in fostering the expansion of government spending.<sup>14</sup> The danger of the "hot" approach is to assume policies are only the outcome of individual decisions, the problem with the "cold" approach is that of giving no margin of manoeuvre to policy-makers. All the difficulty, of course, lies in trying to combine these two approaches, a difficulty illustrated by the debate among scholars on the early history of government intervention in nineteenth-century Britain as to whether increased intervention was the result of the pressure of reformers or just a necessary self-stabilising adjustment to the strains that resulted from unprecedented demographic and socio-economic change, a similar adjustment to those that occurred elsewhere.

Studying the role played by government engineers in deter-

<sup>12</sup> By JEAN BOUVIER, "L'Etat et les finances publiques", *Annales E.S.C.*, 33 (1978), pp. 207-15. See also MAURICE LÉVY-LEBOYER, "Histoire économique et histoire de l'administration", in *Histoire de l'administration française depuis 1800. Problèmes et méthodes* (Geneva: Droz, 1975), pp. 61-71.

<sup>13</sup> MARCEL MARION, *Histoire financière de la France depuis 1715* (Paris: A. Rousseau, 1928).

<sup>14</sup> LOUIS FONTVIEILLE, *Evolution et croissance de l'Etat français: 1815-1969* (Paris: Cahiers de l'I.S.M.E.A., 1976).

mining the nature and pace of early French railroad construction raises its own problems. These are not merely that in adopting a voluntarist approach we should not underestimate the force of wider structural factors, be they economic, ideological or political, but also because available sources are deficient. Statistical data on the economy and especially on the transport flows and transport costs that would enable us properly to determine demand for railways and the importance of the slow building of lines, are deficient, as both Toutain's and Lepetit's studies of transport show.<sup>15</sup> Sources on *Ponts et Chaussées* decisions, policy recommendations and relations with ministers, railway promoters and companies, are also scattered and incomplete. Thus in the administrative archives of the F14 series there is a luxuriance of dossiers on railway projects, and the minutes of General Council deliberations are frequently rich, but there is a dearth of information on attitudes and internal tensions<sup>16</sup> within the corps and, more importantly, on the advice that the Director-General gave to his minister.<sup>17</sup> The chiaroscuro nature of the administrative archives is the result, of course, of the practice of Directors-General taking away their personal dossiers when they left their posts but it is also a feature of all ministerial archives,<sup>18</sup> for, as V.G. Kiernan warned when he criti-

<sup>15</sup> J.C. TOUTAIN, *Les transports en France de 1830 à 1965* (Paris: Cahiers de l'I.S.E.A., série AF, 1967), pp. 10-19 and 83-93; BERNARD LEPETIT, *Chemins de terre et voies d'eau. Réseaux de transports et organisation de l'espace en France 1740-1840* (Paris: Editions de l'E.H.E.S.S., 1984).

<sup>16</sup> With some notable exceptions, the personnel and administrative files of the *Ponts et Chaussées* are disappointing. For discussions of just how difficult to write is a history of the civil service in the nineteenth century, see CLIVE H. CHURCH, *Revolution and Red Tape...* and GUY THUILLIER, *Bureaucratie et bureaucrates en France au XIXe siècle* (Geneva: Droz, 1980).

<sup>17</sup> This explains why the role and personality of the two most important Directors General — Becquey and Legrand — remain so difficult to determine. This is illustrated in the thin analysis of Becquey's role in planning the Restoration canal programme in REED GEIGER, 'Planning the French Canals: The 'Becquey Plan' of 1820-1822', *Journal of Economic History*, 44 (1984), 329-43.

<sup>18</sup> Ymbert, that incomparable satirist of early nineteenth-century civil service life, describes archives as the Père Lachaise of the ministries that contain only the

cised the famous Robinson and Gallagher thesis on British forward policy-making in late nineteenth-century Africa:

"It is... a delusion of archive searchers, who inhale a subtly intoxicating atmosphere and need its stimulus to keep them going, to suppose that ministers and under-secretaries are careful to leave behind them all the documents required for a verdict on their actions. They are at least as likely to be careful not to do so".<sup>19</sup>

The myth, then, is powerful, the difficulties that confront any attempt to evaluate it are important and cannot all be resolved. It will nevertheless be argued here that the myth is not an accurate representation of the role government engineers played in early railways.<sup>20</sup> The argument that will be developed is three-fold. It will seek to show, first, that the existence of the myth in the 1830s and 1840s can be explained in large part by factors other than by its validity. And since to explain the myth is not to explain it away, it will try, second, to show that the *Ponts et Chaussées* margin of manoeuvre was limited by a series of constraints, constraints which largely dictated outcomes. Finally, and most importantly, it will attempt to determine en-

skeletons of the past and adds: "Là, il est impossible de retrouver ce qu'on cherche: la circulaire ou le dossier que vous redemandez à ces funèbres archives, sont sourds [sic] à vos cris, comme le parent ou l'ami que vos regrets redemandent vainement au marbre funéraire". He adds, at least half seriously, that the scribblings on the *pancartes*, the large format sheets of rough paper that clerks put on desk-tops to protect their sleeves, would reveal more about administrative history than official memoranda. M. YMBERT, *Moeurs administratives* (Paris: Ladvocat, 1825, 2 vols.), I, pp. 37-38; II, pp. 58-60.

<sup>19</sup> V.G. KIERNAN, *Marxism and Imperialism* (London: Edward Arnold, 1974), p. 74.

<sup>20</sup> It might be noted that the validity of the myth has already been questioned, if not refuted, by Louis-Maurice Jouffroy, still the most able of French railroad historians. In his doctoral thesis Jouffroy had been critical of the *Ponts et Chaussées* (*Une étape de la construction des grandes lignes de chemin de fer en France. La ligne de Paris à la frontière allemande 1825-1852* (Paris: Derbon aîné, 1933). Twenty years later he was more appreciative of the corps as planners and of the difficulties they and others had to face. *L'Ere du rail* (Paris: Armand Colin, 1953), pp. 80-91. CHRISTOPHER H. JOHNSTON, "The Revolution of 1830 in French Economy History", in JOHN M. MERRIMAN, *1830 in France* (New York: New Viewpoints, 1975), pp. 139-180, is also sympathetic to the work of government engineers. Neither of these scholars, of course, addresses the myth in any sustained or detailed manner.

gineers' motives, policies and their consequences. This argument is based on a research strategy that consisted of using a combination of archives previously incompletely consulted. These are, on the one hand, the archives of the *Ponts et Chaussées*, and especially its administrative dossiers,<sup>21</sup> the bound volumes of the minutes of its General Council<sup>22</sup> and its dossiers on railway projects,<sup>23</sup> and, on the other, extant railway company records.<sup>24</sup> The purpose of this strategy, of course, was to attempt to penetrate behind public discourse in parliament, pamphlets and the press to discover actual relations between the Corps, ministers, railway promoters and companies.

## I

The myth to be explained has two facets. Firstly, contemporaries, and in their wake scholars, have claimed that the *Ponts et Chaussées* delayed railway concessions and construction by their cumbersome procedures and, more importantly, blocked concessions because it believed the State should plan and build the railroad network. Second, they have questioned the *Ponts et Chaussées*' technical competence by accusing it of seriously underestimating construction costs, imposing overly rigorous technical specifications, and of failing as a planner.

This contemporary myth stemmed, first of all, from the context of contemporary debates on economic growth and on the part that the State should play in the process, on centralization and government finance, and the mounting attacks on the Res-

<sup>21</sup> The dossiers concerning the organisation of the *Ponts et Chaussées* in this period: F14 9997-9999, 10014, 11052 and 11053.

<sup>22</sup> "Délibérations du Conseil général des Ponts et Chaussées", 1830-1848, F14\* 10912 (85-115). These minutes are particularly rich and instructive, especially when used in conjunction with the dossiers on the various railway proposals.

<sup>23</sup> "Chemins de fer: projets et avant-projets...", F14 8821-9188.

<sup>24</sup> If some of the railway company archives, like those of the lines that made up the Ouest Company in 1855, are thin, others, such as the Paris-Orléans archives, (60 AQ) are particularly rich.

toration launched by the liberal opposition in the last years of the regime. In these debates and these attacks the *Ponts et Chaussées* was a frequent and easy target. In 1828-1832, indeed, the Corps had to face what was arguably its most profound crisis in the nineteenth century, a crisis that was not related to railways but which had serious repercussions on subsequent debates on public works. This crisis had two aspects: the one was that outside criticism of the efficiency, the monopoly position, and thereby the very legitimacy of the Corps, intensified; the other was that the service was weakened by changes introduced by the new regime and by growing dissatisfaction and even overt dissent within its own ranks.

The single most important and obvious explanation for the increasing disrepute in which many held the *Ponts et Chaussées* was that the canal programme of 1821-1822, for which government engineers had responsibility, took longer and proved much more costly than expected.<sup>25</sup> Already in October 1828 Count Molé's report on the state of canal projects severely criticised the Corps for planning canals without proper consideration for their commercial potential and for failing to consult economic interests or properly cost construction. His report even suggested that completion of the network be taken out of the hands of government engineers altogether.<sup>26</sup> Construction costs, indeed, continued to rise in the following decade and by 1838 can-

<sup>25</sup> This is not to say, of course, that there were not doubts as to the results of having the *Ponts et Chaussées* build canals when the questions were discussed in the Chambers. As Héricart de Thury said, reporting on the 1821 bill: "il est reconnu que tout gouvernement qui fait exécuter à ses frais, dépense plus qu'une compagnie; qu'il n'achève que rarement ce qu'il entreprend; qu'il sacrifie bien souvent des sommes immenses sans utilité". *Archives parlementaires*, 11 juin 1821. Doubts were even expressed by some government engineers. G.J. BOUESSEL, "Observations sur le programme du gouvernement publié en 1820", 15 February 1821, F14 138592 (papiers de Becquey).

<sup>26</sup> He proposed the canal companies should complete the work under the supervision of army engineers. "Rapport lu par m le comte Molé, sur la position des questions relatives aux moyens d'achever les canaux entrepris en vertu des lois de 1821 et 1822", 6 October 1828. F14 9997.

als had already cost twice the original estimate. Equally important, rivers, which should have formed an integral part of the national waterway network, were only improved slowly. The unfortunate precedent of the canals, then, was used by opponents of the government and of government construction of public works, as a weapon to attack the *Ponts et Chaussées*' record on railway promotion and to denounce plans for their construction by the State. It was used by deputies in the Chambers<sup>27</sup> and it was used by railway interests.<sup>28</sup> This is not

<sup>27</sup> Already in 1831 the influential Charles Dupin, who was in favour of public works being carried out by private enterprise, had used the problems posed by the canal programme to suggest that France adopt the British select committee procedure. *Archives Parlementaires*, 67, session of 21 February 1831. In the following year Alexandre Laborde claimed that whatever the Minister of Commerce promoted was advantageous for France but that whatever he carried out himself was usually disastrous. *Ibid.*, 75, 22 February 1832. The engineers' record with canals was to continue to bedevil discussions as to who should build railways. Thus the committee set up by the Conseil général des manufactures in 1833 to discuss the role the government should play in railway construction, concluded that though it might be desirable that the *Ponts et Chaussées* build trunk lines, opinion inside and outside the Chambers was firmly against it for: «l'opinion publique est, à cet égard, fortement préoccupée de l'exemple des canaux, qui a été dans ce sens un précédent grave et fâcheux». Ministère du Commerce et des Travaux publics, "Rapport au Conseil général des manufactures sur l'intervention du gouvernement dans l'exécution des chemins de fer" (Paris: Imprimerie Royale, 15 janvier 1834), p. 16. F14 9999. In 1838 Milleret called the 1822 canal programme "la conception la moins raisonnable, la plus anti-économique, la moins morale dans quelques-uns de ses résultats, et la plus anti-financière que ait jamais été mise à l'exécution dans un pays civilisé". J. MILLERET, *Considérations sur l'établissement des chemins de fer en France* (Paris, 1838) pamphlet, p. 18, 138 AP 342.

<sup>28</sup> Leading railway promoters and opponents of the *Ponts et Chaussées* used the canal programme to denounce government in public works: "Si jamais une opération a pu discréditer un gouvernement comme entrepreneur, c'est certainement celle faite en 1821 et 1822 par la restauration; car on y trouve tous les vices accumulés; mauvaise conception financière, engagements ruineux pour l'Etat, devis et évaluations erronés, inutilité de plusieurs lignes mal choisies, mode d'exécution lent et dispendieux, constructions colossales et de luxe. Enfin, la plupart de ces canaux n'ont pour débouchés que des rivières d'une navigation tellement imparfaite que, pendant longtemps, après l'ouverture des canaux, elles paralyseront les avantages qu'on devait attendre de si grands sacrifices". *D'une intervention utile du gouvernement dans les travaux publics* (Paris: Imprimerie Ducassois, s.d.), pp. 5-6. In 1841 J. Milleret, principal founder of the Saint-Etienne-Loire railroad, used the example of the canal programme as his chief weapon to combat State construction of railroads. "Des moyens d'établir dans l'espace de six à sept années, un réseau complet de railways en France" (Paris: Mathias, 1841), pp. 17-26. 138 AP 342.

the place, of course, to determine how justified these criticisms were but three points are pertinent for an analysis of railroad policies. The first is that other factors besides the competence of government engineers as planners and builders help explain delays and cost overruns.<sup>29</sup> The second is that what is perhaps most noteworthy about the waterway plan is that, without having detailed plans or cost estimates or even forecasts of traffic, the Chambers were willing in 1821-1822 to sanction not only an ambitious project but government agreements with *haute banque* consortia that were so generous to them.<sup>30</sup> The ease with which the canal bills were passed, indeed, is the antithesis of what was to happen with railways and there is certainly a dialectical relationship between deputies' earlier attitudes toward the canal question and their successors' reactions to railroads. The final point is that, whatever the validity of the case made against the *Ponts et Chaussées*, it is clear that the liberal opposition used

<sup>29</sup> Among the most important are that there is evidence to suggest that the true costs of the programme (the cost of building canals was known to be nearly twice as high as the *Ponts et Chaussées* claimed in defending the proposals) were deliberately underestimated to secure passage of the bills (this point was suggested to me by HENRI FOURNEL, *Examen de quelques questions de travaux publics* (Paris: Ladrangé, 1837), pp. 18-21. F14 11053), that cost overruns were a common feature of public works, that the *Ponts et Chaussées* had to work with the 1810 expropriation law that conferred great powers on property-owners to delay and to secure high compensation, and that many canals were eventually made wider than they had been in original plans. Government engineers explained the problems in "Discours prononcé par M. Becquey, séance du lundi 21 mai 1827"; "Discours de M. Becquey... à l'occasion du budget des Ponts et Chaussées, séance du 9 juillet 1828"; "Observations de M. Becquey... sur le rapport lu par M. le comte Molé dans la séance du 6 octobre 1828"; "Opinion de M. Lamandé... dans la discussion sur le budget des Ponts et Chaussées [juillet 1828]". All printed speeches in F14 9997 and 10014. There can be no doubt that the canal programme was drawn up without sufficient attention being paid either to the role canals would play or to the needs of the economy. However, the canal programme was more Becquey's and his close collaborators than it was the corps', since the Director-General made critical decisions on the network without apparently consulting the General Council. Minutes of the General Council, 1818-1822. F14<sup>+</sup> 10912 (31-51).

<sup>30</sup> These agreements were to appear more generous when the conditions for government borrowing improved after 1822. See HELMUT GROSSKRANTZ, *Privatkapital und Kanalbau in Frankreich, 1814-1848: Eine Fallstudie zur Rolle der Banken in der Französischen Industrialisierung* (Berlin: Dunker und Humboldt, 1977).

delays and cost overruns in the canal programme as a convenient weapon to attack the Restoration regime.<sup>31</sup>

The standing of the Corps and the morale of government engineers were further eroded in 1830-1832 by a series of government measures which attempted to introduce curbs on the powers and privileges of the *Ponts et Chaussées*. One explanation for these measures is that the administrative purges that followed the July Days were the most spectacular<sup>32</sup> and probably the most thoroughgoing of the century<sup>33</sup> and that for once the *Ponts et Chaussées* was affected.<sup>34</sup> Another is that criticism of over-centralization,<sup>35</sup> of the power, size and cost of the civil service had grown louder as the 1820s progressed. The liberal Left of the Restoration thus came to power in 1830 with a programme of curbing the power of public officials, slimming down what they regarded as an overweight bureaucracy and enhancing the powers of the Chambers. And the *Ponts et Chaussées* was an obvious target. Thus a royal decree of 10 October 1830 forcibly retired a number of senior engineers, reduced their administrative expenses and introduced changes in the General Council in an attempt to make it more efficient.<sup>36</sup> Early budgets made cuts in the Corps' operating budget and attempted to effect cuts in

<sup>31</sup> Henri Fournel rightly asked "peut-être raisonne-t-on trop aujourd'hui sous l'impression des boulets de ce siège dans lequel l'attaque des canaux était au moins secondaire". *Examen de quelques questions de travaux publics*, p. 23.

<sup>32</sup> Because of the trial of the ministers of CHARLES X. PAUL BASTID, *Les grands procès politiques de l'histoire* (Paris: Fayard, 1962), p. 262.

<sup>33</sup> As argued by JEAN TULARD, "Les épurations administratives en France de 1800 à 1830", in PAUL GERBOD et al., *Les épurations administratives. XIXe et XXe siècles* (Geneva: Droz, 1977), pp. 49-63 and as shown by DAVID H. PINKNEY, *The French Revolution of 1830* (Princeton: Princeton University Press, 1972).

<sup>34</sup> As it was to be again in 1848. However, the *Ponts et Chaussées* usually escaped because engineers were difficult to replace and not regarded as being politicized.

<sup>35</sup> When de Tocqueville argued that the French Revolution completed the Ancien Régime's efforts to centralize the State, he used the *Ponts et Chaussées* as his example. *The Old Regime and the French Revolution* (New York: Doubleday, 1955), pp. 38-39.

<sup>36</sup> Plus other less important changes. "Ordonnance du Roi et Rapport au Roi", signed Guizot. F14 9998.

office staff.<sup>37</sup> Finally, the decrees of 8 and 9 June 1832 sought to reduce the powers of the Director General by determining that all his decision involving promotions and the use of public funds had to have ministerial approval and that the minister himself would preside over General Council meetings.<sup>38</sup>

The *Ponts et Chaussées* was further weakened by dissent within its ranks. There is, first, some evidence that there was growing dissatisfaction at the way in which the Corps was being run — at the diminished power of the General Council under Becquey until his resignation in May 1830, at the political appointment of Bérard, his successor, at the high salary and power enjoyed by the principal civil servant in the Paris offices.<sup>39</sup> Unfortunately, it is impossible to determine the extent of this dissatisfaction since the administrative archives are silent on the question and the only source of information is the *Journal du génie civil*, founded in 1828, which published a series of articles critical of the running of the corps.<sup>40</sup> It is much easier to

<sup>37</sup> Here as elsewhere these attempts failed. There were 57 public servants at the *Ponts et Chaussées* in 1829; there were 60 in 1838 and 75 in 1845. The committee on the 1832 budget was even more outspoken in its criticism of government engineers and had even questioned whether the *Ponts et Chaussées* should not be abolished altogether. Thiers' Report *Archives Parlementaires*, 30 December 1830; *Observations présentées par M. Bérard... sur les rapports de la commission du budget de 1832* (Paris: Firmin Didot, 1832).

<sup>38</sup> "Ordonnances du Roi et Rapport au Roi", signed d'Argout, F14 9999. The number of divisional inspectors was also reduced from 16 to 12. The decree of 9 June placed Legrand at the head of the corps.

<sup>39</sup> It should be remembered that until 1804 the *Ponts et Chaussées* had been run by the General Council. The senior civil servant was de Cheppe, who had been Becquey's private secretary. He was to be moved to another department. Criticism by government engineers of the interference of civil servants and politicians is, of course, a recurring theme in the history of the *Ponts et Chaussées*. See, for example, HENRI CHARDON, *Les travaux publics. Essai sur le fonctionnement de nos administrations* (Paris: Perrin, 1904) *passim*.

<sup>40</sup> This journal also included leading government engineers among its collaborators. The most important of its articles criticising the state of affairs in the corps were republished as "Articles divers sur l'administration des Ponts et Chaussées et des Mines, par plusieurs ingénieurs" (Paris: Imprimerie Chassaignon, 1st November 1830), 32 p. C 2757. ALEXANDRE CORRÉARD, editor of the *Journal du Génie civil* and later a determined if unsuccessful railway promoter, also published critical pamphlets

judge the damage done by the vocal dissent expressed by two leading government engineers, both of whom were elected to the Chamber of Deputies while still on active service and both of whom in speeches and in publications criticized the *Ponts et Chaussées*. Indeed, it was for their repeated attacks that they were both forcibly retired in June 1832. The first of these was L.-D. Joussetin, whose forthright and pugnacious nature and imposing stature led fellow engineers to dub him "Joussetin l'Effrayant" to distinguish him from his shy and sickly brother whom they nicknamed "Joussetin l'Effrayé". It was for publishing a critique of the *Ponts et Chaussées* in 1829, for repeating his criticisms in the Chamber after his election in July 1832 and in articles in the *Moniteur* that he was dismissed along with a second engineer, Joseph Cordier.<sup>41</sup> The latter was a more brilliant engineer who as early as 1819 had proposed that public works be constructed by private enterprise,<sup>42</sup> but it was for his repeated criticism of centralization and what he termed the despotism of the *Ponts et Chaussées* that he, too, was released from duty.<sup>43</sup>

The crisis in 1832 had some positive effect for the *Ponts et*

and even sent d'Argout a reform proposal in 1831. "Observations sur les ordonnances et les divers actes, des 30 septembre et 19 octobre 1830, relatifs à l'administration des Ponts et Chaussées" (Paris, 1830); "Observations sur les actes relatifs à l'administration de M. Bérard" (Paris, n.d.) and "Note pour Monsieur le comte d'Argout, Ministre secrétaire d'Etat au département du Commerce et des Travaux publics", 21 March 1831. F14 11053.

<sup>41</sup> Joussetin's rich personnel dossier (F14 2249) reveals that Joussetin complained about his slow promotion in the 1820s and there is evidence that he clashed with other public servants and that there were complaints about the way in which he carried out his duties. His criticism of the public works programme of the *Ponts et Chaussées* is in his "Examen du budget des Ponts et Chaussées pour l'année 1830" (Paris: Carilian-Goeury, 1829), C 2756. See also *L'Ingénieur Joussetin. Souvenirs (1776-1858)* (Paris: Imprimerie A. Maulde, 1859).

<sup>42</sup> After a tour of British canals made at the behest of Becquey. *Histoire de la navigation intérieure, et particulièrement de celle de l'Angleterre et de la France* (Paris: Firmin Didot, 1819-20), 2 vols.

<sup>43</sup> Personnel file, F14 2188; Tarbé de Saint-Hardouin, *Notices biographiques sur les ingénieurs des Ponts et Chaussées, depuis la création du corps en 1716, jusqu'à nos jours* (Paris: Baudry, 1884), pp. 143-44.

*Chaussées*. It emerged from it more united than it had been before: open dissent in its ranks had been eliminated and in June Legrand, an able engineer rather than a political appointee, had been named Director General. During the July Monarchy, however, the Corps was to continue to be criticized. Many critics complained about the rigidities in its structures: training that was too theoretical,<sup>44</sup> the poor prospects and insufficiently challenging tasks of the ordinary engineer,<sup>45</sup> the failure to properly integrate its semi-skilled employees (*conducteurs*),<sup>46</sup> the absence of a mandatory retirement age for senior engineers.<sup>47</sup> Civil engineers, for their part, continued to resent its privileged position. More significantly, it emerged from the crisis with its standing diminished and with its critics armed with ammunition to attack any role it might play in the creation of railways.

Other reasons, too, help us understand why in the following decade the engineering corps was used as a principal scapegoat for delays in railway building. In the Chambers opposition deputies used the Corps as a way of attacking the government in

<sup>44</sup> The Ecole centrale des arts et manufactures, set up in 1829, deliberately sought to provide a less theoretical training.

<sup>45</sup> As engineers frequently complained. See J. LEBLANC, "Note sur quelques améliorations à apporter au système d'organisation du corps royal des Ponts et Chaussées", *Journal du génie civil*, 4 (1829), 157-66; "Considérations sur l'administration des travaux publics et sur les ingénieurs des Ponts et Chaussées", anonymous note, n.d. [1832], F14 11052. The complaints about slow advancement were partly the consequence of the absence of career opportunities for *Polytechniciens* outside government service. Maurice Lévy-Leboyer, "Innovation and Business Strategies in Nineteenth- and Twentieth-Century France", in EDWARD C. CARTER *et al.*, eds., *Enterprise and Entrepreneurs in Nineteenth- and Twentieth-Century France* (Baltimore: the Johns Hopkins University Press, 1976), p. 107.

<sup>46</sup> On the problem of access to the engineering profession see JOHN H. WEISS, "The Lost Baton: the Politics of Intraprofessional Conflict in Nineteenth-Century French Engineering", *Journal of Social History*, 16 (1982), 3-19 and "Bridges and Barriers: Narrowing Access and Changing Structure in the French Engineering Profession 1800-1850", in GERALD L. GERSON, ed., *Professions and the French State, 1700-1900* (Philadelphia: University of Pennsylvania Press, 1984).

<sup>47</sup> In 1831 the average age of the nine inspectors-general was 70. JAMES OLIVER MONTGOMERY II, *The Corps des Ponts et Chaussées, 1830-1848*, unpublished Ph. D. thesis, University of Missouri, 1967, p. 40. Only in 1848 was mandatory retirement introduced.

power, just, indeed, as ministries used public works programmes as election gambits. And in the major controversy as to how railways were to be built — by the State, by private enterprise or by some combination of both — opponents of State construction used the *Ponts et Chaussées*' record to denounce government as planner and builder.<sup>48</sup> Outside the Chambers railway entrepreneurs and would-be railway entrepreneurs similarly criticized the role played by the Corps, but again it was, in part at least, special pleading. In petitions and pamphlets many of those who had failed to gain approval for their projected lines blamed their frustration on government engineers. Those who had solutions to propose for the problem of how to promote railways like Bartholony, one of the most able and eloquent of railway entrepreneurs, who argued for a role reversal in public works construction where instead of companies providing the capital and the State planning and building, as had happened with canals, companies would take over and the State would offer only a guarantee of interest, liked to contrast the advantages of unfettered capitalism with the trammels imposed by government.<sup>49</sup> And there was special pleading, finally, in the protests of the two major railway companies formed in the 1830s, the Paris-Le Havre (plateau) and Paris-Orléans when, from late in 1838 onwards, they faced major financial problems and they campaigned for modifications in their contracts: they accused the *Ponts et Chaussées* for its failure to accurately cost their lines and for imposing draconian technical specifications.<sup>50</sup>

<sup>48</sup> Thus Arago used the argument that the *Ponts et Chaussées* had invariably underestimated the cost of public works to propose that the 1838 bill for State railway construction be rejected. A. PICARD, *Les chemins de fer français: étude historique* (Paris: Rothschild, 1844-45), I, pp. 113-123.

<sup>49</sup> FRANCOIS BARTHOLONY, *Quelques idées sur les encouragements à accorder aux compagnies concessionnaires des grandes lignes de chemins de fer* (Paris: Firmin Didot, 1836); *Du meilleur système à adopter pour l'exécution des travaux publics en France et notamment des grandes lignes de chemin de fer* (Paris: Belin, 1838); *Lettre à un député sur le nouveau système des travaux publics adopté pour la construction des lignes de chemins de fer* (Paris: Carilian-Goeury, 1842).

<sup>50</sup> In 1844 Bartholony was still blaming the 1838 fall in Orléans share values on

What makes all these oft-repeated criticisms seem all the more convincing is that the General Council of the Corps, which examined and made recommendations on railway projects, did not publish its deliberations.<sup>51</sup> Nor, apart from the interventions of Legrand in the Chambers, did the *Ponts et Chaussées* seek to defend itself in public, as some engineers lamented.<sup>52</sup> The story that most proposals were unfairly treated was thus all the more easy to spread.

## II

A *prima facie* case can be made, then, for claiming that the contemporary myth that government engineers held back railroad development was more the by-product of debates on other issues, of special pleading by railroad interests, than a faithful reflection of reality. The validity of the myth can also be questioned in other ways.

the *Ponts et Chaussées* which carried out inadequate studies and underestimated costs and, "pour se venger de l'échec qu'elle venait d'éprouver" with the rejection of the Legrand plan, imposed onerous technical specifications. "Résultats économiques des chemins de fer ou observations pratiques sur la distribution des richesses créées par ces nouvelles voies de communication..." (Paris: Librairie administrative de Paul Dupont, May 1844), pp. 9-10. 60 AQ 726.

<sup>51</sup> It also meant, of course, that the Chambers did not have available to them the kind of information that select committees on railway bills provided for the British Parliament, as Odilon Barrot rightly pointed out. *Archives Parlementaires*, 115, 15 February 1838. Since the *Pont et Chaussées* made its recommendations in closed session, it thus seemed to some observers that decisions were the result of behind-the-scenes manoeuvring.

<sup>52</sup> Some engineers recognized that the *Ponts et Chaussées's* failure to defend itself was a serious error. As H.C. EMMERY wrote: "Sous le régime de la presse, la vie sociale a ses exigences; ne pas y souscrire, c'est presque sembler mépriser l'approbation des hommes de bonne foi et abdiquer une des plus profondes satisfactions, nous avons presque dit une condition vitale, celle de se faire respecter". Entry "Ponts et Chaussées" in A Baudrimont et al. eds., *Dictionnaire de l'industrie manufacturière, commerciale et agricole* (Paris: Baillière, 1833-41). Emmery published this defence of the corps in a separate pamphlet: "Notice abrégée sur l'histoire, l'organisation et l'utilité sociale de l'institution des Ponts et Chaussées de France", 2 December 1829, 23 pp. Copy in F14 11052.

It can be questioned, most obviously, by showing that the margin of manoeuvre the *Ponts et Chaussées* had to impose its ideas was limited by economic and political structures. The existence of these constraints, in fact, goes a long way toward explaining why railroad construction was relatively slow under the July Monarchy. The constraints are too well known, of course, to need long rehearsal here. Suffice it to say that railroad construction in France was retarded by its geography, because longer distances were involved than in either Britain or Belgium, by economic factors, including higher costs of metallurgical products<sup>53</sup> and the relatively undeveloped state of the financial market, factors whose importance was accentuated first by the continuing depression in the early years of the new regime and, second and above all, by the crisis from the fall of 1838 onwards.<sup>54</sup>

It should be stressed, though, for it helps us better understand critiques made of the role played by the *Ponts et Chaussées*, that there were also major institutional and ideological barriers to a more rapid adoption of the railroad. The fact that government engineers were heavily involved in concession and planning procedures and that they were caught in the crossfire of acrimonious ideological debates served only to strengthen the myth of the nefarious role they were supposed to be playing. Political structures certainly militated against the rapid adoption

<sup>53</sup> Given the configuration of French economic space and doubts as to the ability of metallurgists and machine-builders to provide the capital equipment in the quantities and at the prices needed, the difficulties that evolving but still rudimentary railroad technology had to overcome seemed more important in France than they did elsewhere. The problem of tariffs on rails and locomotives also made discussion more arduous. See BARRIE M. RATCLIFFE, "The Tariff Reform Campaign in France, 1831-1836", *Journal of European Economic History*, 7 (1978), 61-138.

<sup>54</sup> Downswings, on the one hand, dampened the ardour of railroad promoters and led them to seek more generous conditions from the government, encouraged companies in the course of construction to blame government-imposed specifications for their difficulties and, on the other, led ministries and Chambers to be more generous. Upswings, especially in 1838, incited Chambers to impose more stringent conditions and emboldened private enterprise to accept them. The impact of fluctuations was thus made the greater by the behaviour of legislators, capitalists and investors.

of a clear railroad policy. The executive arm of government was weakened by the chronic instability of ministries, of which there were fifteen in the 1830s, and by an assertive Chamber<sup>55</sup> where defence of local interests dominated. But it was also weakened by the fact that political and economic elites were fissured rather than monolithic<sup>56</sup> and had conflicting visions of France's economy and its future. These doubts and uncertainties were a major cause of the apparent fickleness of the Chambers' attitudes towards railroads. Thus while the idea that improved communications were a *sine qua non* of economic growth found general agreement, and the belief that for railroad construction some form of collaboration between private enterprise and the State would be necessary also gained strength in the 1830s, no agreement could be reached as to how to bring it about or what form it should take.<sup>57</sup> On the one hand, defenders of the market economy distrusted the State and its corps of engineers,<sup>58</sup> defen-

<sup>55</sup> Thus in 1833 the Chambers succeeded in adding to their powers in the process of granting railroad concessions. Because alienation of public land was involved, the government submitted the proposed Montbrison-Montrond concession to the Chambers in January 1833. The Chambers determined that this exceptional procedure be adopted for all lines involving government funds or public land (law of 21 April) and by a new law of 7 July 1833 that any line over 20 kilometres long needed parliamentary sanction. The 1842 railroad law was only passed once a ministry with a stable majority had been installed.

<sup>56</sup> Interpretations of ruling elites at this time have moved away from Marx's view that the July monarchy was a joint-stock company run in the interests of a few bourgeois shareholders, through the more complex class version of Jean Lhomme, to the more convincing analysis of ANDRÉ-JEAN TUDESQ. *Les luttes de classes France* (Paris: Pauvert, 1964 edition); *La grande bourgeoisie au pouvoir 1830-1880* (Paris: Presses universitaires de France, 1960); *Les grands notables en France, 1840-1849: étude historique d'une psychologie sociale* (Paris: Presses universitaires de France, 1964), 2 vols.

<sup>57</sup> Already in 1834 a committee of the Conseil Général des Manufactures, set up at the behest of the Minister (the first of the consultations that governments were to make down to the 1842 bill), concluded that railways should be built and that the State should not and private enterprise could not build them alone. It could not agree, though, on an acceptable form of collaboration between the two. "Rapport au Conseil Général des Manufactures sur l'intervention du gouvernement dans l'exécution des chemins de fer" (Paris: Imprimerie Royale, 15 January 1834), F14 9999.

<sup>58</sup> Defence of individualism against government intervention was a common argu-

ders of the tax system<sup>59</sup> did not believe that the government could find the funds that State construction would require. On the other, suspicions and even fears of the financial elite, joint-stock enterprise and the potential monopolies that railroad companies might become were already widespread and were to prove long-lived.<sup>60</sup>

These conflicting interests and ideologies surfaced at critical junctures. In 1837 the government's bills for the first four major lines failed because the Chambers could not agree on concession conditions.<sup>61</sup> In 1838 not only did supporters of private enterprise, opponents of the Molé administration and those who feared the national budget would be strained if the bill was adopted, combine to defeat the government railroad plan but the same year the Chamber imposed stiffer contracts for the trunk lines to Le Havre and Orléans that were conceded because it

ment. The engineer Jules Seguin wrote in 1838: "Les corps, les collections, les associations n'inventent jamais rien: ils maintiennent, ils conservent. C'est l'individu qui invente et qui perfectionne. Or, le mobile de l'individu, c'est l'intérêt personnel. Ce qui rend le corps des Ponts-et-Chaussées inapte à l'exécution des travaux publics, c'est donc d'abord le défaut d'intérêt personnel. C'est, secondement, l'incapacité, l'inexpérience, si l'on veut, d'une partie importante de l'exécution, celle des transactions commerciales. C'est enfin le défaut de liberté individuelle dans l'action". *Chemins de fer. De leur exécution par l'industrie particulière* (Paris: Heideroff, 1838, second edition), pp. 15-16. Similar arguments were advanced by ADRIEN FELINE, "Mémoire sur les encouragements à accorder aux entreprises de chemin de fer" (Paris: Levrant, 1837), pp. 20-23, 138 AP 342.

<sup>59</sup> On the importance of this defence of the *status quo*, see JEAN BOUVIER, "Le système fiscal français au XIXe siècle. Etude critique d'un immobilisme", in JEAN BOUVIER and PHILIPPE WOLFF (eds.), *Deux siècles de fiscalité française, XIXe-XXe siècle. Histoire, économie, politiques* (Paris: Mouton, 1973), pp. 226-62.

<sup>60</sup> These suspicions were a commonplace in discourse on railroads down to 1838. For a discussion of the reasons behind suspicions of joint-stock enterprise, see Anne Lefebvre-Teillard's analysis of the *Conseil d'Etat's* application of article 37 of the commercial code. *Les sociétés anonymes* (Paris: Presses universitaires de France, 1985). While capitalists seeking authorization were suspicious of shareholders and anxious to retain effective control of the company, the *conseillers* tried to defend the interests of both the general public and shareholders. Similar fears about the monopoly power of railroad companies were expressed in Britain at this time. HENRY PARRIS, *Government and the Railway in Nineteenth-Century Britain* (London: Routledge and Kegan Paul, 1965), especially pp. 1-27.

was anxious to limit the companies' prerogatives and was encouraged to do so by a rising market.<sup>62</sup>

### III

There is a second way in which the myth of the nefarious influence of the *Ponts et Chaussées* can be questioned: to examine each element in the myth. The first element is the frequently repeated accusation that their bureaucratic procedures slowed down the granting of concessions. So widespread was this claim, indeed, that to assuage criticisms the government in December 1838 established a separate section of the General Council whose sole task was to examine railway questions.<sup>63</sup> So little founded were these criticisms, however, that the section did not actually function until 1843.<sup>64</sup> And while it is true that during this period the central offices of the *Ponts et Chaussées* had to deal with a rapidly increasing volume of work,<sup>65</sup> an analysis made in 1838 showed that in that year the General Council dealt with 57 railway dossiers and that the average delay between the receipt of a dossier and its discussion in the General Council was only nine days.<sup>66</sup> More importantly, it becomes clear when

<sup>61</sup> The difficulty was not just subsidies and routes, but tariffs. Cockerill, for example, wanted to be allowed to import rails duty-free for his Nord line. Other projectors, too, requested similar rights: the Pereires for their Paris-Saint-Germain line and Laffitte and Riant for their Paris-Rouen project in 1835-36. F14 8863.

<sup>62</sup> YVES LECLERCQ, *Le réseau impossible...*, p. 178. The companies were to roundly condemn the fickleness of the Chambers by showing how conditions were progressively more onerous when the share market was unprecedentedly buoyant in mid-1838. See "Mémoire présenté au gouvernement par la Compagnie d'Orléans...", written December 1838).

<sup>63</sup> "Attributions et organisations successives du Conseil Général des Ponts et Chaussées", note drawn up by Avril, March 1840. F14 10003.

<sup>64</sup> "Conseil Général des Ponts et Chaussées, section des chemins de fer, ler registre, 28 décembre 1843-29 décembre 1845". F14 11041.

<sup>65</sup> In the quinquennium 1825-1829, the central offices dealt with an annual average of 1,501 affairs; in 1830-34 the annual average had risen by 25 per cent to 1,881 and in 1835-39 by a further 69 per cent to 3,185. Computed from "Tableau récapitulatif du nombre d'affaires enregistrées au secrétariat du Conseil...", March 1840. F14 10003.

<sup>66</sup> E. AVRIL, "Note relative à l'examen des affaires par le Conseil Général des

the procedures are examined that the *Ponts et Chaussées* bore the opprobrium for delays whose principal cause lay elsewhere. The truth was that the process of approving railroad concessions before the 1842 Railway Act had three major disadvantages. First, the procedures to determine public utility, then to establish routes and finally to fix properties to be expropriated were deliberately elaborate, for their aim was to protect local interests and the rights of private property but their result was to delay not just the granting of concessions<sup>67</sup> but also the building of lines. Nicolas Koechlin's Mulhouse-Thann line, for instance, was only twenty kilometres long but it took two years to expropriate the 700 properties needed.<sup>68</sup> A report to the 1839 Commission on Railroads calculated that the process of expropriation took an average of no less than nine months.<sup>69</sup> Legislation on expropriation had a second drawback: by giving too much power to property-owners it raised land costs.<sup>70</sup> Their in-

*Ponts et Chaussées*", 21 March 1840. F14 10003. Avril was secretary of the General Council.

<sup>67</sup> Just as procedures for approving joint-stock companies were lengthy and just as there were long delays in Britain between the submission of plans and the Act conferring the concession on a company. It took the Pereires three years (1832-35) to secure the Paris-Saint-Germain concession; it took the London and Birmingham almost three (1830-33). M.C. REED, *Investment in Railways in Britain, 1820-1844. A Study in the Development of the Capital Market* (Oxford: Oxford University Press, 1975), pp. 79-80.

<sup>68</sup> NICOLAS KOECHLIN et frères, "Lettre à M. Dufaure, Ministre des Travaux publics, sur l'urgence de quelques modifications à apporter à la loi du 7 juillet 1833, sur l'expropriation pour cause d'utilité publique", 1 June 1839, C 2768. Other railroad promoters also pressed for changes in the law. See, *inter alia*, LÉBOBE, "Exposé soumis à M. le Ministre du Commerce et des Travaux publics, par la Compagnie de Paris à la mer", 3 April 1839, C 798; FRANÇOIS BARTHOLONY, *Quelques idées sur les encouragements à accorder aux compagnies concessionnaires des grandes lignes de chemins de fer et autres travaux d'utilité publique* (Paris, pamphlet, n.d. [1836]).

<sup>69</sup> VIVIEN, "Rapport sur la loi du 7 juillet 1833 sur l'expropriation pour cause d'utilité publique", 12 AQ 11.

<sup>70</sup> The 7 June 1833 legislation was replaced by a new law in May 1841. It was no accident that in the compromise June 1842 Railway Act the State was to have the responsibility for paying the land costs that had proved so high. The idea behind having local authorities contribute to infrastructure costs was to put pressure on local expropriation juries to moderate the settlements they imposed. This clause remained a dead letter and was abandoned in 1845.

ability to forecast land costs accurately proved a major deterrent to prospective entrepreneurs and a serious handicap to companies building lines.<sup>71</sup> Procedures had a final drawback: despite the elaborate protection of different interests built into the system, there were still variations in the modes of concession<sup>72</sup> and the levels of security deposit<sup>73</sup> that government and parliament adopted. Government engineers clearly cannot be blamed for these procedures.

Those who have accused that the *Ponts et Chaussées* delayed concessions to railway promoters do not just claim, though, that this was because of its inefficiency; they argue that it deliberately blocked private enterprise projects. Different explanations have been put forward to justify this accusation. The first is that government engineers failed to realize the potential of the steam railway because they were too committed to the waterway network. The second is that since from 1832 the *Ponts et Chaussées* was already planning railroad routes and since it was suspicious of civil engineers, the Corps preferred its own plans and found fault in those of others.<sup>74</sup> The third, and most damning, is that

<sup>71</sup> There is an instructive analysis of the expropriation question by a railway entrepreneur Seguin aîné, *De l'influence des chemins de fer et de l'art de les tracer* (Paris: Carilian-Goeury, 1839), pp. 59-65 and 72 and there is an illuminating dossier on attitudes towards expropriation and protection of property interests in the Daru papers. 138 AP 219. Daru was on the Peers' committee for the 1840-1 bill to amend expropriation legislation.

<sup>72</sup> "Rapport de M. Baude sur la formation, les statuts et les conditions à imposer aux compagnies de chemins de fer", 1839, 12 AQ 7.

<sup>73</sup> This problem was discussed by the 1837 railway commission which voted in favour of standardizing amounts to be required (10 per cent of capital for companies up to 20 million francs and thereafter a declining proportion up to a maximum of 3 millions. "Procès-verbaux de la Commission supérieure des chemins de fer", November-December 1837, C 789.

<sup>74</sup> Thus in the first issue of the *Journal de l'Industriel et du Capitaliste*, 1 (1836), 1-11, it was claimed that the slow spread of capitalist enterprise was to be attributed to investors' lack of knowledge of industry and public works, and to speculation. The journal added: "Enfin, les vices de la législation qui confie le sort des grandes entreprises à l'administration des ponts et chaussées, en sorte qu'elle est en même temps juge des entreprises des capitalistes et entrepreneur de travaux en concurrence avec les capitalistes". Other railway promoters similarly claimed that government engineers dis-

the Corps really wanted the State to plan and build railroads. Indeed, one of the conclusions of Maurice Lévy-Leboyer's justly influential study of economic development in Western Europe in the first half of the nineteenth century is that the delay in railroad construction in France was the consequence of seven years of struggle by the *Ponts et Chaussées* to have major lines built by the State.<sup>75</sup>

The accusation is serious and not easy to assess because we have only a few fragmentary traces of what went on in those face-to-face meetings between Legrand and successive ministers. It can be argued, though, that the case against the Corps is not proven and that the failure of the bulk of the many projects that were put forward in the 1830s can be explained on other grounds. Thus, though it is hardly conclusive evidence, an examination of the dossiers on railroad projects and the minutes of the General Council reveals that government engineers always followed procedures in submitting feasible proposals to public inquiries and in making its final recommendations. It also shows that if the Corps reached negative decisions on most projects this was because they were summarily presented or contained major technical errors. It further indicates that down to 1836 railroad promoters, and especially those who wanted to build lines that began at Paris, adopted the tactic of only requesting short but strategically-placed lines which they intended to make the railheads for trunk routes.<sup>76</sup> There were two explanations for this strategy. One was that it was being adopted elsewhere.<sup>77</sup>

liked private enterprise. See, for example, JULES SEGUIN, *De l'influence des chemins de fer et de l'art de les tracer*, pp. 4-6.

<sup>75</sup> *Les banques européennes...*, p. 702. GEORGES LEFRANC ("The French Railroads, 1823-1842", *Journal of Economic and Business History*, 2 (1930) 299-331), makes the same claim.

<sup>76</sup> The strategy was adopted for every one of the major routes out of the capital. For one instance, see BARRIE M. RATCLIFFE, "Railway Imperialism: the Example of the Pereires' Paris-Saint-Germain Company, 1835-1846", *Business History*, 18 (1976), 66-85.

<sup>77</sup> Thus the founders of the London-Greenwich never intended their line to be complete in itself: their aim was to extend eastwards to Dover. The Brussels-Malines,

The other, more important, was that the difficult economic and financial conditions prevented the launching of more ambitious enterprises. The General Council repeatedly refused to countenance such tactics.<sup>78</sup> It did so because existing legislation would not allow concession of longer lines if detailed plans had not already been submitted to the consultation process. It was also reluctant to grant away lucrative railheads, and in the light of later experience of shared stations in Paris (at Saint-Lazare) and in London (at London Road), it is by no means evident that its refusal was an error.

An examination of the fate of projected lines for the Paris-Rouen-Le Havre route serves as an excellent illustration of the argument that delays in conceding the line were not the result of a refusal of the *Ponts et Chaussées* to grant concessions to private enterprise. It is an excellent illustration because, at first glance at least, the case of those who decry the role of government engineers appears irrefutable. Both entrepreneurs and government early recognized that, whatever precise functions railroads would eventually fulfil, this line was likely to be a profitable one. Engineers with railroad experience and who claimed to have secured financial backing and land in the capital for access and their terminus, soon put forward projects that were to use either the river or the plateau route. And yet none of these proposals was successful. When the railroad was finally conceded to a company in 1838, it was for the plateau route that the

opened in May 1835, was to be the first twenty kilometres of the trunk line to Antwerp.

<sup>78</sup> In 1833 Legrand argued that such railheads would be an obstacle to the building of major lines and were a tactic aimed at gaining control over them. He added: "l'Administration qui voit, qui comprend de pareilles intentions, ne devrait-elle pas en empêcher l'effet et égarer à l'avance de toute entrave une entreprise importante qui aura bien assez de difficultés qui lui sont propres". "Rapport à M. le Ministre du Commerce et des Travaux publics", 24 October 1833. F14 8862. The *Ponts et Chaussées* repeatedly refused to accept the tactic. It did so for plans for lines from Paris to Pontoise, to Poissy, to St.-Denis, to Meaux. *Délibérations du Conseil Général des Ponts et Chaussées*, 18 April 1835 and 24 March 1840. F14\* 10912 (92 and 99). For the Paris-Meaux projects (1838-42), see F14 9100 and 9101.

*Ponts et Chaussées* preferred and, in any case, the company failed. Not until 1840 was the line, this time along the Seine, finally conceded to a company that successfully completed and operated the railroad. Two disgruntled projectors of the 1830s, F.N. Mellet and C.J. Henry, published bitter attacks on the role played by government engineers. They blamed the *Ponts et Chaussées* for delays in consultation procedures and compared Bérard, who favoured private enterprise and with whom they had worked well, with Legrand, his successor as Director-General, who, they claimed, believed the State should build railroads.<sup>79</sup> Their loud denunciations appeared all the more credible given that they had already been granted the Andrézieux-Roanne railroad and were to gain the Montpellier-Cette concession in 1836.

An examination of the complex history of the various proposals for lines to Rouen and Le Havre certainly reveals that government engineers cannot be entirely exonerated from all blame since the *Ponts et Chaussées* preferred the plateau route and as early as March 1835 its own plan for the line was ready.<sup>80</sup> However, it also shows that the proposals of both of the major projectors, Riant and Laffitte and Mellet and Henry, contained weaknesses that were serious enough to have led to their rejection. Riant first proposed a railhead plan for a line to Saint-Denis in September 1833. By the end of the following year he had joined with Laffitte and others in a plan to build a line to Rouen but in sections, the strategy being to only build a line from Paris to Poissy in the first instance. The *Ponts et Chaussées*

<sup>79</sup> Mellet attacked government engineers in his entry "Ingénieur" in A. BAUDRIMONT *et al.*, *Dictionnaire...* but he and Henry developed their critique, above all, in *L'arbitraire administratif des Ponts et Chaussées dévoilé aux Chambres, par MM. Mellet et Henry, adjudicataires du chemin de fer de Paris à Rouen et à la mer* (Paris: Giraudet et Jaoust, April 1835). This critique was published when the Chambers were discussing the government's bill for the Paris-Rouen line. As late as 1850 a report to the General Council of the *Ponts et Chaussées* concerned a request for compensation for the funds spent by Mellet and Henry in preparing their plans. F14 8862.

<sup>80</sup> LEGRAND "Rapport à M. le Ministre de l'Intérieur", 9 March 1835. F14 8862.

rejected this as unacceptable.<sup>81</sup> The Mellet and Henry plan, which adopted the similar tactic of first requesting the concession of a line only as far as Pontoise, where the Oise joins the Seine, was first put forward in March 1831.<sup>82</sup> This time the tactic nearly worked because the government, anxious in the continuing depression to secure employment for the 2,000 workers the Company promised to hire, granted them the concession the following November. The *Conseil d'Etat*, however, quashed the concession on the grounds that the government's specifications had included a clause that allowed the Company to extend the line from Pontoise to the sea providing it did so within three years, and yet no inquiries had been held and official notices had only invited tenders for a railway as far as Pontoise.<sup>83</sup> Over the next two years Mellet and Henry continued to seek a concession to Rouen. They even secured the backing of four major Paris banking houses, claimed to have acquired land in Paris, and to have signed agreements with ironmasters for the supply of rails in exchange for shares.<sup>84</sup> Not until November 1833, though, were their plans for the Pontoise-Rouen section submitted to the *Ponts et Chaussées*. These plans were unquestionably deficient and the technical errors they contained led the General Council to reject them in 1834.<sup>85</sup> Had the plans been acceptable,

<sup>81</sup> The Riant project was first submitted 5 September 1833; revised plans were ready 31 January 1833; a new company was formed with Laffitte, Jourdan and others, 23 November 1834; a new plan for a line to Rouen by the Seine route and in sections, was sent 5 January 1835. In March the same year the *Ponts et Chaussées* General Council unanimously rejected the idea of first only approving the Paris-Poissy segment as the first part of an eventual line to Rouen. Only when Laffitte and Riant agreed that their Paris-Poissy would be complete in itself was the project submitted, with others, to public inquiries. Thiers to Laffitte and Riant, 11 April 1835; response of Laffitte, Riant and Jourdan 15 April 1835. F14 8862 and F14\* 10912 (93).

<sup>82</sup> As a plan for a line that would eventually have gone to Dieppe proposed by Henry de Ruolz (1 March 1831). "Projet de chemin de fer de Paris à Pontoise avec embranchement sur la Seine au port d'Herblay", F14 8862.

<sup>83</sup> By a narrow majority of 13 votes to 11. Deliberation of 28 December 1831 in F14 8862. The *Ponts et Chaussées* was represented on this body but the arguments invoked were legal rather than technical.

<sup>84</sup> Alphonse Cerfberr and Mellet to Thiers, 29 September 1833. F14 8862.

<sup>85</sup> They only began surveying the line in May 1833 and it is clear they had prob-

Legrand would certainly have been willing to recommend they be given the concession. In a note to his minister he recommended the cession of the line to Pontoise, because the route posed no technical difficulties, began in an undeveloped part of the capital and could compete with river transport, and because its success would serve as an inducement to private enterprise.<sup>86</sup>

Over the following three years, indeed, the government was to persevere in its efforts to grant the concession to a private company and eventually succeeded in doing so. The proposed route, however, was the one preferred by the *Ponts et Chaussées*. This preference for the plateau can be criticized but it can be understood if it is seen in the context of current uncertainties about transport technology and the role railroads were destined to play. Government engineers regarded the Seine route as more sinuous and as raising more technical problems, above all between Rouen and Le Havre. They also believed that the navigability of the Seine, on which goods traffic was already rapidly increasing, would be further improved by the spread of steamboats and the success of the new movable dam techniques being experimented from 1833 onwards. Their choice of the more direct plateau route was also the logical consequence of the political and transit functions they expected the railroad would fulfill.<sup>87</sup>

lems funding their study. Their plans were submitted six months later. Meller and Henry to Legrand, 10 May and Mellet and Henry to Thiers, 26 November 1833, F14 8862. *Délibérations du Conseil Général des Ponts et Chaussées*, 26 March and 28 May 1833 and 12 April 1834. F14<sup>s</sup> 10912 (88 and 89). In February 1833 Mellet and Henry had another of their projects — for a line from Paris to Roanne — rejected in part because the plan was too sketchy.

<sup>86</sup> Unsigned note in Legrand's hand and drawn up in May 1834. F14 8862. Legrand wrote that the line from Paris to Pontoise was "sous tous les rapports, le chemin modèle".

<sup>87</sup> They also claimed that the plateaux route, which followed the Route royale 14, would also serve Dieppe while the line along the Seine would not. For the *Ponts et Chaussées*' defense of its choice, see DEFONTAINE, "Mémoire sur le projet d'un chemin de fer de Paris à Rouen, au Havre et à Dieppe" (Paris: Imprimerie Royale, 1837), 12 AQ 22 and Legrand's explanations in "Procès-verbaux de la Commission supérieure des chemins de fer, novembre-décembre 1837", C 789.

## IV

A second element of the myth casts doubts on the technical competence of the *Ponts et Chaussées*: by underestimating costs, by the technical specifications it imposed, by its failings in planning a network, it held back railway construction. The first of these claims is unquestionably accurate. Government engineers did underestimate the construction costs of the lines they studied. However, the failure to predict costs accurately was commonplace in the 1830s because cost studies were based on empiricism rather than on firm principles, and the *Ponts et Chaussées*' margin of error was no greater than that of others who were faced with the impossible task of costing projects and, happily, engineers and railroad promoters also underestimated revenues. In Britain high costs were popularly blamed on the expense of getting bills through Parliament or on the excessive powers given to engineers and contractors. The real causes, there as in France, were that rapidly evolving railroad technology led to the adoption of heavier and more expensive locomotives and rails and that land costs were invariably higher than expected. This explains why, when in 1842 French engineers set out to estimate average construction costs, they put them at two and a half times more than what had seemed reasonable only ten years earlier.<sup>88</sup>

A second criticism levelled against government engineers was that they adopted theoretical principles imbibed during their training — one critic talked of an “algébromanie”<sup>89</sup> — to impose unnecessarily strict curve and gradient limits on the railroads that were conceded.<sup>90</sup> It was further claimed that these specifica-

<sup>88</sup> YVES LECLERCQ, *Le réseau impossible...*, p. 72. Only in the 1840s were more rigorous — though still empirical — attempts made to estimate railway costs. For an example of this greater rigour, see ADOLPHE JULLIEN, “Du prix des transports sur les chemins de fer”, *Annales des Ponts et Chaussées*, (1844).

<sup>89</sup> “Les chemins de fer et les faiseurs de calculs”, *Journal du Commerce*, 21 November 1835. This article was a criticism of Navier's calculations recently published in the *Annales des Ponts et Chaussées* (1835, 130-171).

<sup>90</sup> Whereas in his 1933 thesis L.M. Jouffroy had talked of “un dogmatisme puisé

tions were still being imposed even when experience showed that higher gradients and tighter curves could be safely and economically negotiated by newer locomotives. As Michel Chevalier said, "l'expérience... vaut tous les A+B du monde".<sup>91</sup> This rigour, it is said, dampened the ardour of promoters and raised building costs for the companies who gained concessions.<sup>92</sup>

The accuracy of this claim can be questioned in three ways. First, in *Ponts et Chaussées'* deliberations on the viability of railroad projects, in the studies of routes government engineers undertook from 1832 and published from 1835, it is clear that specification were based not only on technical but on economic and even political considerations. Already early in 1832, when Odilon Barrot had claimed before the General Council that it should not pronounce on the economic feasibility of public works projects, government engineers had responded that, though technical questions were their primary responsibility, it

dans les assurances d'une culture exclusivement mathématique" (*Une étape de la construction des grandes lignes...*, I, p. 16), in his general study published twenty years later he praised the wide curves and low gradients for helping make French railroads the fastest and most efficient in Europe. *L'Ere du rail*, pp. 90-1.

<sup>91</sup> MICHEL CHEVALIER, *Des chemins de fer en France, extrait d'un mémoire lu à l'Académie des sciences morales et politiques et inséré dans la Revue des deux mondes des 15 mars et 15 avril 1838* (Paris: H. Fournier, 1838), p. 34.

<sup>92</sup> The argument that government engineers' insistence on low gradients and wide curves unnecessarily raised French railroads costs has long been repeated by scholars. Indeed, French government statistics for 1853 (Ministère de l'Agriculture, du Commerce et des Travaux publics, *Documents statistiques sur les chemins de fer*, Paris: Imprimerie Impériale, 1856, table XXIII), indicate that Belgian railroads cost 18 per cent less and German 36 per cent less to build than French lines. However, such arguments and figures have to be treated with circumspection. In early accounting procedures capital and current accounts were not as separate as they would be in later practice. Besides, early Belgian lines, built economically, had to be rebuilt to take heavier and speedier locomotives, while in 1853 many lines in Germany were still single track. And even if these available national statistics are judged roughly comparable, a close analysis reveals that the infrastructure (railbed, bridges and tunnels) was not, as the argument leads us to believe, the most important element in French construction costs: 60 per cent of the total was made up by infrastructure and land costs. A good proportion of greater French costs can be explained by higher land and, above all, labor costs. In any case, greater construction costs did not prevent — on the contrary — French railroad companies from being more profitable than those in Belgium and Germany, as the 1853 statistics also demonstrate.

was impossible for them not to take other considerations into account.<sup>93</sup> Besides, in 1836 Legrand declared that railroad routes were economic rather than technical questions and that he was in favour of treating the technical aspect as subordinate.<sup>94</sup> *Ponts et Chaussées'* specifications, then, also resulted from the role it believed that railroads would fulfill as carriers of passengers and transit goods. This led engineers to seek the most direct and level routes.

The validity of the claim can be questioned, secondly, by showing that the specifications they recommended were based on their reading of the state of railroad technology. Because of the low power and efficiency of early locomotives and the high price of mineral fuel, they sought to keep traction costs as low as possible. Such norms, in fact, were those that Stephenson and Brunel were applying on the trunk lines being built in Britain. It was only from 1838, when these lines began operating, that it became clear that traction was a less important part of operating costs than had previously been thought. And it was only in 1843-44 that it was conclusively demonstrated that newer locomotives could safely and cheaply negotiate steeper inclines and tighter curves than those imposed on early French lines,<sup>95</sup> that traffic between intermediate stations would provide an im-

<sup>93</sup> Exchange between Barrot and Engineer-in-chief Tarbé in "Délibérations du Conseil Général des Ponts et Chaussées", 2 April 1832. F14\* 10912 (87).

<sup>94</sup> Speech, 13 June 1836. *Archives parlementaires*, 105. In the 1840s, of course, Jules Dupuit, a government engineer, published remarkably prescient studies on determining the utility of public works schemes.

<sup>95</sup> By Edmond Teisserenc [de Bort], who had been sent to Britain to study changing railway technology, and who concluded that slopes of 10-12 mm. had no appreciable impact on operating costs. *Rapport adressé à M. Le Ministre des Travaux publics sur les chemins de fer* (Paris: Imprimerie Royale, 1843), pp. 11-48. CHARLES-JOSEPH MINARD, *Des pentes sur les chemins de fer* (Paris: Imprimerie de Fain et Thunot, 1844), concluded from an analysis of railway returns from Britain, Belgium and France that though steep gradients were to be avoided as far as possible, it was more important to limit construction costs than to seek to impose gentle slopes. The debate on gradients, however, was to continue through the 1840s. See "Introduction des fortes pentes dans le profil des chemins de fer", *Journal des Chemins de fer*, 27 June 1846.

portant part of railway revenues,<sup>96</sup> and that railways would be major freight carriers in France.<sup>97</sup> However, already in 1839 the General Council of the Corps had determined that its technical specifications had to be flexible enough to take account of the particular circumstances of different routes<sup>98</sup> and this flexibility is evidenced in the contracts drawn up in 1839-40.<sup>99</sup>

The companies that were granted the two most important railway concessions in the 1830s, the Paris-Orléans and the Paris-Le Havre (plateau), were to claim that the technical specifications imposed on them were a major cause of the discomfiture they experienced from the fall of 1838 onwards. The third way in which the accusation can be questioned, then, is to examine the truth of this assertion. Both companies, it should be said, were launched on an unprecedented wave of optimism. In May 1838 all the 90 million-franc shares of the Plateau Company were taken up on the first day of issue.<sup>100</sup> However, its engineers soon announced that the true costs of building had been underestimated by government engineers and that the gradients

<sup>96</sup> CHARLES-JOSEPH MINARD, "Importance du parcours partiel sur les chemins de fer", *Journal des Chemins de fer*, 10 June 1843. However, as early as 1837 P.-D. Bazaine, basing himself on the example of the Antwerp-Cologne line, deliberately chose a longer and more difficult route for the Strasbourg-Bale line he was planning, in order to serve more intermediate towns. PIERRE-DOMINIQUE BAZAINE, *Chemin de fer de Strasbourg à Bâle, notes et documents* (Paris: Imprimerie nouvelle, 1892) pp. 14-24.

<sup>97</sup> As shown by the operating results of the Paris-Rouen and Paris-Orléans, both of which opened in 1843.

<sup>98</sup> Délibérations du Conseil Général des Ponts et Chaussées, 3 March 1829. F14 10912 (92). This general discussion had been prompted by the Paris-Orléans Company's request to be permitted to build sharper inclines than those imposed in its charter. "Mémoire présenté au gouvernement par la Compagnie du chemin de fer de Paris à Orléans" (Paris, 1839), 12 AQ 25. Even earlier, though, the *Ponts et Chaussées* had permitted some exceptions to its general rules.

<sup>99</sup> The maximum for slopes was increased to 5 mm., while the minimum for curves was lowered to 800 m. The contracts also stipulated that the *Ponts et Chaussées* could approve derogation to these limits if circumstances justified doing so. "Des lois sur les chemins de fer votées pendant la dernière session", *Journal de l'industriel et du capitaliste*, 8 (1840), 329-66.

<sup>100</sup> MAURICE LÉVY-LEBOYER, *Les banques européennes...*, p. 623.

and slopes imposed would needlessly raise construction costs. By November the company suspended its activities and was wound up in August 1839.<sup>101</sup> The Paris-Orléans was also to argue that the conditions imposed were too stiff. It undertook a joint campaign with the Plateau Company to secure changes in specifications and financial help from the government and at the end of 1838 published a brochure that compared the specifications that had been proposed in May 1837 with the much less favourable terms imposed in the concession bills that were passed by the Chambers a year later.<sup>102</sup>

It becomes clear when the causes of the problems both enterprises faced are studied more closely that it was politicians who had made general and not just technical specifications more rigorous. It was the Chamber, for example, that considerably raised potential costs by insisting on two tracks into Paris and on raising the weight of rails to be used on the Paris- Le Havre line. More importantly, it becomes clear that the real causes of their difficulties were the massive fall in share prices soon after the concessions had been granted and the companies' inability to call in share payments.<sup>103</sup> This is what emerges from a reading of the minutes of the meetings of the Board of Directors of the

<sup>101</sup> Before accepting the concession, however, the Plateau Company had been aware that Defontaine's estimates were nearly three years old. During debates on the bill, the deputy Billault had even raised serious doubts about the usefulness of these estimates given the heavier rails and locomotives being adopted. *Moniteur Universel* 16 June 1838. The Company was only able to raise 14.7 millions before the market crashed. Note signed Leboe, 18 June 1839. F14 8863.

<sup>102</sup> "Mémoire présenté au gouvernement par la Compagnie du chemin de fer de Paris à Orléans", January 1839 (written December 1838). 12 AQ 25; "Compagnie du chemin de fer de Paris à la mer. A M.le Ministre du Commerce et des Travaux publics", 3 April 1839. C 798.

<sup>103</sup> One of the most important weaknesses of concession procedures was that, whereas in Britain a company's solvency was determined before Parliament granted a concession, in France companies were only formed after a concession was granted and shareholders only had to pay their holdings in instalments. Baude proposed to the 1839 Railroad Commission that companies be fully investigated and shares be entirely paid up *before* a concession was given, but the Commission rejected the idea for fear of alienating the *haute banque*. "Rapport de M. Baude sur la formation, les statuts et les conditions à imposer aux compagnies de chemins de fer", n.d. 12 AQ 7.

Paris-Orléans Company: what was being said behind closed doors: was not the same as what was being proclaimed in public.<sup>104</sup> These minutes reveal, indeed, that the Board was rent by a power struggle between Pillet-Will and Bartholony that was only resolved by the resignation of the former in late November 1839.<sup>105</sup> They also show that the problems the Company faced were not the result of poor costing by the *Ponts et Chaussées*<sup>106</sup> or even of the technical specifications the Company had accepted, although the proposed crossing of the Juine Valley after Corbeil posed serious difficulties, but of the general fall in share prices.<sup>107</sup> What made matters worse was that it was not clear to company directors whether this decline was a temporary setback or an indication that the share market, the "spirit of association", was not yet sufficiently mature to sustain large joint-stock enterprises.<sup>108</sup> The crucial problem, therefore, was to

<sup>104</sup> Procès-verbaux du Conseil d'administration June 1838-1848. 60 AQ 1\*-6\*. There is a gap in these minutes: at first the founders adopted the policy of settling contentious issues before they formally met as a Board. Not until November 1838 did this change.

<sup>105</sup> Meeting of 23 November 1839. 60 AQ 1\*. Odier and Mathieu resigned along with Pillet-Will.

<sup>106</sup> The Company capitalized at 40 millions, even though the government engineer's estimate put costs at 22.8 millions. Late in 1839, after specifications had been changed, the Company still believed it could complete with its original capital. Meeting of 29 November 1839. 60 AQ 1\*. If the major criticism leveled against Defontaine's technical specifications — the passage through the Juine valley between Etampes and the Beauce plateau — is examined it turns out that Company engineers were wrong. They adopted the drier valley of the Huméry and used 8-millimetre gradients. However, this was long to necessitate the use of a second locomotive that meant high operating costs and, in any case, it was later proved that fears of the peat moss of the Juine valley had been largely unfounded since the branch line from Etampes to Pithiviers was later to cross it. Procès-verbaux du Conseil d'administration, 12 October 1838 and 31 July 1840. 60 AQ 1\* and 3\*.

<sup>107</sup> Shares began to fall even before new studies of the line had been made and a minority on the Board already wanted to halt activity. See statement by de Waru, Procès-verbaux du Conseil d'administration, 19 February 1829. 60 AQ 1\*. What made matters worse for the eight founding houses — and their discussions the more acrimonious — was still that they were all heavily invested in the Company. Each still had 2,125,000 francs' worth of shares out of the 3,700,000 francs originally subscribed. Procès-verbaux du Conseil d'administration, 20 June 839. 60 AQ 1\*.

<sup>108</sup> As a pessimistic Bartholony told fellow Directors (26 November 1838): "l'expérience vient de prouver qu'on s'était trompé sur l'état réel de la France en matière

restore public confidence in Orléans shares. The dispute among Board members, made the more bitter because the eight founding firms were also affected by the crisis, revolved around the best policy to adopt: whether to build the line as far as Corbeil so as to bolster public confidence and begin earning a return; whether to call in the second share payment; whether to suspend all activity as had the Plateau Company. They were agreed, however, that to restore confidence in their shares they should also seek to secure a government guarantee of interest and to moderate the rigour of stipulations imposed in the concession law. When the Company representatives met Legrand in March 1839 they were surprised that he proved willing not only to recommend changes in technical specifications but to propose to his minister that the government purchase a bloc of Orléans shares.<sup>109</sup> In July 1839 the Chambers agreed to make important modifications to crucial clauses of the concession. However, share values continued to languish and the crisis in the Orléans Board went on. This explains why the Orléans Company continued to press for a guarantee of interest.<sup>110</sup> The technical specifications that government engineers recommended for the Orléans and Le Havre lines, then, were but one contributing factor to the difficulties the companies experienced from the fall of 1838 onwards.

The third and final component of the case of those who call into question the *Ponts et Chaussées*' technical competence is the criticism of the role it played in planning routes and networks from 1832 onwards. One of these reproaches — that its plans

d'industrie. Il n'y a pas encore chez nous un véritable esprit d'association, il n'y a guère que de l'esprit de spéculation".

<sup>109</sup> Board meeting, 8 March 1839. 60 AQ 1\*.

<sup>110</sup> When the list of changes requested by the Company is examined, it becomes clear that restoring confidence was the most important motive. This explains why the Company wanted to be allowed to pay 4 per cent to shareholders during construction and to have the 10 per cent ceiling on profits removed, at the same time that they asked for a guarantee of interest. Bartholony saw the guarantee as like a preference share: a means to attract small investors.

took too long to prepare — is not a serious one. Detailed studies of four major routes (Paris-Le Havre-Dieppe, Paris-Orléans, and the Nord and Lyon-Marseille) were ready as early as 1835. A second criticism is more substantial: these plans were faulty because they were based on a misreading of the role that railroads were destined to play as freight and passenger carriers and because they produced a network that converged on the capital. Government engineers' view of railroads and their insistence on the need for planning, however, have to be understood in their context. It is true that one reason why the Corps believed in planning is that it was suspicious of big business and the monopolies that large railroad companies might become.<sup>111</sup> However, as the debates and votes of the Chambers on railway bills show, these suspicions were widely shared at the time. Besides, the Corps also marshalled compelling arguments to justify some form of coordination. It claimed that, since France had already embarked on a public works programme, it should have a fully integrated transport system, that this was necessary because backward areas with low traffic densities would not be served by private enterprise, and because France was not wealthy enough to follow the British example, where lines were being built by private enterprise, for Britain had already conquered foreign markets while France still had to create her own domestic market.<sup>112</sup>

Only with the benefit of hindsight, is it possible to argue that the *Ponts et Chaussées* misunderstood and underestimated

<sup>111</sup> Franqueville, who greatly admired him, later claimed that Legrand's ideas could be summed up as "le respect de l'intérêt général et la lutte contre l'intérêt des spéculateurs et contre l'exploitation du public". In AMABLE CHARLES DE FRANQUEVILLE, *Souvenirs intimes de mon père* (Paris: privately printed, 1878), pp. 142-3. An instance of Legrand's continuing fear of conferring monopoly powers in transport is his opposition to the plan of a banking consortium to maintain canals in return for the right to levy tolls. In his 1847 report, he rhetorically asked: "Veut-on rétablir les anciennes Fermes générales que la Révolution française a si heureusement abolies?" and he went to to argue that in canals the government had a means of combatting railway monopolies. "Rapport au ministre", 27 April 1847. F14 7076.

<sup>112</sup> Navier eloquently presented the case in his "De l'exécution des travaux publics et particulièrement des concessions" (Paris: Carilian-Goeury, 1832). C 2759. This was first published in the *Annales des Ponts et Chaussées*, 2 (1832), 1-31.

the role of railroads. In the light of what was then known about them and of contemporary expectations as to the cost-cutting potential of waterways, their views become understandable. Government engineers certainly underestimated the railroad's potential as a freight carrier but so did the most successful of the major railroad companies: the Paris-Orleans did not believe it would carry goods and did not even include any wagons in its original estimates; even the Paris-Rouen did not begin its goods service until mid-January 1844.<sup>113</sup> Similarly, the notion cherished by Legrand that France could wrest the transit trade from Belgium, Holland and the Rhine route, or even from Trieste, turned out to be a chimera, yet it was a belief shared by others and always figured prominently in debates on trade and transport policy and was a major reason, for example, why the Marne-Rhine canal project was approved in 1838.<sup>114</sup> As for the "star" network, centred on Paris, it replicated the road network (and to some extent the waterway network still under construction) rather than imposing new patterns of traffic flows. In any case, access to the capital was sought after by the major towns and was the objective of the most important private enterprise railway projects. If there were interests and individuals who claimed that regional economies would not be well served, objections were less about Paris and centralization than the danger of not being served by lines and being excluded from access

<sup>113</sup> Procès-verbaux du Conseil d'administration of the Orléans Company, 13 March 1840 (60 AQ 3\*); Report of the Board of Directors of the Rouen Company to the Annual General Meeting 22 January 1844 (76 AQ 4).

<sup>114</sup> Securing the transit trade, joining the Atlantic and the Mediterranean, had been key ideas behind Becquey's canal plan of 1820. For the continuing belief in the possibility of making France a redistribution centre, see debates in the Chambers on the Marne-Rhine canal bill, and especially Legrand's speech of 1 June 1838. *Archives parlementaires*, 120. By the 1840s doubts as to France's and railways' capacity to secure an important share of the transit trade had grown stronger. See the critical analysis in the Daru Committee's report on branches for the Nord line. Ministère des Travaux publics, "Rapport fait à la Commission sur le tracé des embranchements dirigés du chemin de fer de Paris à Lille sur le littoral de la Manche" (Paris: Imprimerie Royale, 1844), pp. 13-16. 138 AP 235.

to the capital. It should be added that, unlike many in the Chambers, Legrand early believed railroads had a vital role to play politically and strategically<sup>115</sup> as well as economically<sup>116</sup> and that for ten years after 1832 in the face of unstable ministries and divided Chambers, the *Ponts et Chaussées* maintained a steadfast faith in the necessity of a railroad network.<sup>117</sup> Its insistence was one reason why in 1842 Parliament accepted the compromise solution of a joint State and private-enterprise effort to build trunk lines.

## V

The purpose of this paper has been to evaluate the myth that government engineers played a major role in delaying railroad development in the period preceding the 1842 Charter. It has not been to exonerate the *Ponts et Chaussées* from all the charges that have been levelled against it. It can still be claimed, indeed, that errors were made: though its mistrust was widely shared, the Corps was suspicious of financial consortia and afraid of granting away monopoly powers to railway companies; and, if its views on railroads were shared by many other experts, it did underestimate the potential of the new technology. Even a full evaluation of the myth itself proves elusive because surviving sources, though more instructive than previously thought, are still mute on important aspects of government

<sup>115</sup> Witness Legrand's speeches in the Chamber of Deputies, 19 June 1837 and 15 February 1838. *Archives parlementaires*, 113 and 115.

<sup>116</sup> *Ponts et Chaussées* views on the economic function of railroads were based on two principles: that they would chiefly carry passengers and therefore should link the capital with major towns; that France was destined to become a centre for the transit trade and thus east-west and north-south links were essential. See Legrand's analysis at the second meeting of the 1837 Railway Commission. "Commission supérieure des chemins de fer. Procès-verbaux des neuf séances du 19 novembre au 1er décembre 1837". C 789.

<sup>117</sup> Richard Kauffmann was right, then, to claim there was a continuous policy in Paris at this time. *La politique française en matière de chemins de fer* (Paris: Librairie Polytechnique, 1900), pp. 3-24.

policy-making. Three principal conclusions, however, can be drawn. First, the very existence of the contemporary myth is indicative not so much of the accuracy of the accusations against the *Ponts et Chaussées* as of the tenor of contemporary debates of France's path to balanced economic growth and on the economic policies to be adopted.<sup>118</sup> Second, the analysis of each of the criticisms formulated by contemporaries and by historians shows that the *Ponts et Chaussées* played a more positive role than it is reputed to have done. Thirdly and finally, the myth errs in its voluntarist approach in ascribing too great a margin of manoeuvre to individual actors for there were severe limits to the power government engineers had to hasten or delay railroads. This was not just because there is no evidence that they did not follow procedures but also, and above all, because their margin of manoeuvre was limited by real factors — geographic, technological, economic — as well as by institutional and ideological constraints.

<sup>118</sup> It might be argued that a sense of relative backwardness was not enough and that what was missing was the kind of shock to rally elites that occurred in Prussia after the defeat of 1806, in Belgium after independence and which led to the government railroad programme, in Russia after the Crimean War, or even in France itself after 1945. For the French case, see RICHARD KUISEL, *Capitalism and the State in Modern France* (Cambridge: Cambridge University Press, 1981), pp. 275-79.