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Industrial Consumers Versus Cartelized Producers: The French Carmaker Louis Renault and the Aluminium Cartel, 1911–1944

The repeated proliferation of restraints to competition should not overshadow the agency of downstream firms when confronted with the ability of cartels to challenge the established innovation strategies of their consumers. This article explores the relations between Renault and the aluminium cartels during the first half of the twentieth century, in peace and war. Strategies were similar on both sides: the creation and maintenance of a balance of power, compromise, and the reopening of competition. Yet, when the cartel set up an automotive department and then rallied to the idea of a people's car, it attracted the interest of broader stakeholders—engineers, other suppliers, the government, and even trade unions—but failed to persuade carmakers. Large industrial consumers can limit the impact of cartels, and destabilize them, by resorting to vertical integration. However, their underlying aim is not necessarily to destroy the cartel but rather to obtain better terms for their own business. Ultimately, their market power enables them to achieve relative stability. Who derives the main benefits from these compromises, both vertically and horizontally, as they sometimes limit or extend the scope of action of both parties?

Keywords: cartels, downstream firms, aluminium industry, auto industry, people's car

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On the one hand, what is the agency of consumer companies when faced with a cartel on which they depend for the price, quantity, quality, delivery times, and transaction costs of a strategic supply (i.e., are confronted by restraints of trade)? On the other hand, what are the prospects of a cartel that, over time, comes to believe that a consumer branch of industry is not sufficiently developing the use of its product? These are the two questions at the heart of this study of the evolving relationship between a leading French carmaker and the international and French aluminium cartels during most the first half of the twentieth century—in short, the two sides of a medal called market power.¹

Dealing with the agency of consumer companies to confront cartels is a topic already familiar to business historians of America. A major case of such a capacity has been in the chemicals initiatives engineered by Herbert H. Dow, the pioneering entrepreneur of inorganics in Midland, Michigan. He successively took on the distributors' cartel of bromine reigning in the US and the German producers' cartel dominating Europe and Japan at the end of the nineteenth century. His weapons were scientific innovation and an ability to turndown restrictions by challenging regional monopolies and prices and even by becoming a producer in their reserved domain. Business historian Margaret Levenstein has reinterpreted the Dow story to show that such outsiders sometimes succeed “to force renegotiation to a new collusive equilibrium with a different distribution of rents.”²

To be sure, there is a growing body of research on cartels, all the more as scholars continue to discover cartels in much more numerous fields as previously analyzed, and recognize that they “sometimes were born and functioning well after World War II and that perceived march onward toward free trade and the strict rule of competition.”³ Combining more and more the approaches of business history and economics, the literature now also takes into account the inputs of law, political science, sociology, and management.⁴ Yet, the above questions,

¹This article will retain the UK-English spelling for aluminum—aluminium—for consistency, except for in direct quotes.

²Margaret C. Levenstein, “Price Wars and the Stability of Collusion: A Study of the Pre-World War I Bromine Industry,” *Journal of Industrial Economics* 45, no. 2 (June 1997): 117–137.

³Margaret Levenstein and Stephen W. Salant, eds., *Cartels* (Cheltenham, 2007); Martin Shanahan and Susanna Fellman, eds., *A History of Business Cartels: International Politics, National Policies and Anti-competitive Behaviour* (New York, 2022). Also see Knut Sogner's review of Shanahan and Fellman's edited book in *Business History Review* 97, no. 3 (Autumn 2023): 691–693. For a partly different perspective, see Liane Hewitt, “Monopoly Menace: The Rise and Fall of Cartel Capitalism in Western Europe, 1918–1957” (Ph.D. diss., Princeton University, 2023).

⁴Espen Storli, “Cartel Theory and Cartel Practice: The Case of the International Aluminum Cartels, 1901–1940,” *Business History Review* 88, no. 3 (Autumn 2014): 445–467.

although essential to determine appropriate behaviors and practices of many relevant businesses, and to see whether governments themselves may be constructors or users of cartels, are not often at the heart of most cartel studies, even for Europe. These usually—and usefully—focus on relations between similar firms within cartels; on the influence of cartels on corporate strategy; on their impact on innovation, international investment, and world trade; on the backing of cartels by banks; and more recently on the military or strategic reserves of their products and on the environment, as well as, of course, on the policies of governments and international organizations.

Aluminium cartels are important in at least two respects. “Aluminum was one of the most cartelized industries in the international economy of the 20th century” until 1980. The second respect is that:

[T]he leaders of aluminum companies at different times and in different countries shared a common vision of the development of their industry, which was to maintain price stability as far as possible in order to encourage the expansion of uses and ensure returns on investment. Price instability, which characterized trade in other commodities, was unknown in the aluminum industry.⁵

Therefore, until recently, business history in this area has focused on the dynamics created by national and international aluminium cartels, emphasizing their relentless efforts to find new markets for this young metal, and consequently their (unusual) support for product and marketing innovations.

The present article, conversely, is part of a revised perspective that also considers the interests of consumer companies. It focuses on France and one of its leading carmakers, Renault, from the dawn of the First World War to the end of the Second World War. Renault became much more diversified and integrated than the other main French auto firms. The founder, Louis Renault (1877–1944), was well known for his public stance against cartels in the steel industry; thus, privileging this firm seemed logical. However, the company’s archives, which I consulted in my early work on the history of the firm and which are now located in Le Plessis-Robinson, have preserved very few documents dealing with the aluminium cartel. The collection of private papers of the Louis Renault family, kept by the Renault Histoire Association in

⁵Marco Bertilorenzi, *The International Aluminium Cartel: The Business and Politics of a Cooperative Industrial Institution (1886–1978)* (New York, 2016), ii.

Boulogne-Billancourt, has become accessible, but it sheds light only on one wartime initiative in bauxite mining. It is therefore thanks to the reclassification of the cartel's archives by the French Institute for the History of Aluminium (IHA) that I was able to retrace the main relationships studied here. A business historian of the French aluminium industry, Florence Hachez-Leroy, has published a brief outline of their beginnings from the opposite side.⁶ It showed me the way to follow for this article: to delineate the range of relations possible between a single industrial consumer that was a producer of final products and a champion of industrial competition, and a collective organization that acted as a supplier not only of a commodity but also of semi-products, of devices, and of innovations and was a champion of cartelization.

First, this article analyzes the tensions between the growing needs of aluminium experienced by the Renault company in peace and war, from 1901 to 1918, and the growing control of these supplies by the cartels. Then, it deals with the industrial consumer's counter-offensive: an attempt at vertical integration challenging the monopoly of the cartel. Third, it evokes the result: the negotiation of a compromise between the consumer and the cartel. Fourth, it tracks the exploration of the limits of this compromise by initiatives taken on both sides in the 1930s. Finally, it surveys the wartime attempts to "push the walls" of the compromise.

The Legacy of Two Different Industrial Growth Paths, 1901–1918

Cartelization in the aluminium industry began internationally.⁷ After a bilateral agreement in 1896 between the American-based Pittsburgh Reduction Company (renamed Alcoa in 1907) and the Swiss and German Aluminium Industrie AG, the Aluminium Association was founded in 1901. This first international and intercontinental cartel brought together the two companies plus the British Aluminium Company and the two largest French firms, Produits Chimiques d'Alais et de la Camargue and Société Electro-Métallurgique de Froges.⁸ Following the world economic crisis of 1908, it experienced

⁶Archives of Rio Tinto France, Pechiney Historical Collection, Création et vie de L'Aluminium français, Box 500.1.17771. I would like to thank Ivan Grinberg, former general secretary of IHA. I published two of these documents in my short article, Patrick Fridenson "Aucune industrie ne peut être fermée," *Cahiers d'histoire de l'aluminium*, no. 56–57 (Dec. 2016): 79–83. Also see Florence Hachez-Leroy, *L'Aluminium français. L'invention d'un marché, 1911–1983* (Paris, 1999), 145 and 327 (using SEMF archives, now available at the Archives nationales du monde du travail, Roubaix).

⁷Bertilorenzi, *The International Aluminium Cartel*, 48–100.

⁸Karl Erich Born, *Internationale Kartellierung einer neuen Industrie: Die Aluminium-Association 1901–1915* (Stuttgart, 1994).

internal conflicts that led to its dissolution in October 1908. Producers had to find new solutions to manage sales and prices and to include outsiders. The international reorganization process included the opening of a national institution in France. In 1911, the five French aluminium producers decided to create a national cartel: l'Aluminium Français (hereafter, the cartel).⁹ It paved the way to the founding of a second international cartel in 1912, which was on a much larger scale than the first, but which kept the name of Aluminium Association. In the turmoil of the First World War, the international cartel disintegrated, but the national cartel grew stronger during the conflict.

The visions of the two industries—aluminium and automotive—were different. The young aluminium industry saw the even younger automotive industry as a highly potential market.¹⁰ The automotive industry (and soon the aerospace industry) saw aluminium above all as a means of lightening the weight of vehicles. However, the convergence of these two visions was not self-evident. The automotive industry was highly competitive on a horizontal level, and its main manufacturers had begun to diversify through vertical integration shortly before the war. In contrast, the aluminium industry encouraged cartelization for regulating competition to increase its influence.

The first application of aluminium in the French automotive industry was the lower crankcase of the first single-cylinder gasoline engine created by the manufacturer De Dion-Bouton in 1895. It was made of a cast aluminium alloy.¹¹ De Dion-Bouton sold part of its engine production to other car manufacturers. Louis Renault's first car, at the end of 1898, was fitted with a De Dion-Bouton engine as were some of his subsequent models.¹²

When his company became the largest French car producer, *ex aequo* with Peugeot, Louis Renault gradually increased his purchases of aluminium, and the inception of the French cartel led him from 1911 to feel the cartel to be a burden in terms of cost and quantity.

The outbreak of the First World War accentuated his impression. The Great War was a key period for the impact of aluminium on the

⁹Hachez-Leroy, *L'Aluminium français*.

¹⁰Also for North America, see George D. Smith, *From Monopoly to Competition: The Transformation of Alcoa, 1888–1986* (Cambridge, UK, 1988); Margaret B. W. Graham and Bettye H. Pruitt, *R&D for Industry: A Century of Technical Research at Alcoa* (Cambridge, UK, 1990).

¹¹Sylvain Jacob, "1895: première application de l'aluminium dans l'automobile: le carter inférieur du moteur de Dion-Bouton," *Cahiers d'histoire de l'aluminium*, nos. 56–57 (Dec. 2016): 94–95. For context, see James M. Laux, *In First Gear: The French Automobile Industry to 1914* (Liverpool, 1976).

¹²Jean Boulogne (pseudonym of Emmanuel Pouvreau), *La vie de Louis Renault* (Paris, 1931), 90.

automotive industry, which diversified in line with military orders. At the start of the war, Renault, one of the two leaders in this sector, set up an aluminium foundry in Billancourt, which had become necessary for the manufacture of crankcases for aircraft engines. The factories producing aluminium were in the army zones, and the models were in foundries located in the areas invaded by the Germans.¹³ The foundry went on to supply aluminium to two other car and truck manufacturers (Somua and Delaunay-Belleville), to a consortium of producers of aircraft engines, to the leading manufacturer of electrical parts for vehicles and aircraft (SEV, which Renault had helped to set up before the war), and to other firms.¹⁴ The use of aluminium (including imports) increased as the war intensified, and prices, harnessed by the cartel, jumped.¹⁵

After the war, Renault moved quickly against the cartel (as he had done immediately in steel). The industrial consumer's counter-offensive against the cartel took the shape of an attempt at vertical integration.

The Industrial Consumer's Counter-Offensive: An Attempt at Vertical Integration

With the return of peace, demand for aluminium increased considerably from 1919 onward, both in France and the rest of the world.

Louis Renault was already at the forefront of a battle against the hegemony of the steelmakers, seizing the opportunity created by the return of Alsace-Lorraine to France and gradually bringing together 400 consumer companies to buy back the large steel plant built in Lorraine by the German company Thyssen in 1912, which had been sequestered after Germany's defeat. Vertical integration was thus defined by Renault, an industrial consumer, as the optimal strategy.¹⁶

¹³ Ernest Fuchs, *Louis Renault*, booklet privately printed by the Renault Company, 1935, 18–19, Archives of Renault Histoire Association.

¹⁴ Patrick Fridenson, *Histoire des usines Renault*, vol. I: *Naissance de la grande entreprise 1898–1939*, rev. ed. (Paris, 1998), 93 and 102.

¹⁵ Philippe Mioche, "L'industrie de l'aluminium dans la Première Guerre," in *L'industrie dans la Grande Guerre*, eds. Patrick Fridenson and Pascal Griset (Paris, 2018), 357–379.

¹⁶ For Thyssen, see Jeffrey R. Fear, *Organizing Control: August Thyssen and the Construction of German Corporate Management* (Cambridge, MA, 2005), 290. Christian Marx, "Enteignung-Entschädigung-Expansion. Der Versailler Vertrag und die Gutehoffnungshütte (1918–1923)," in *1919—Der Versailler Vertrag und die deutschen Unternehmen*, eds. Dieter Ziegler and Jan-Ottmar Hesse (Berlin, 2022), 140. For a brief overview of Renault's strategy, see Patrick Fridenson, "Renault et la sidérurgie," in *Dictionnaire historique de la sidérurgie française*, eds. Philippe Mioche, Eric Godelier, Ivan Kharaba, and Pascal Raggi (Aix-en-Provence, 2022), 617–620.

For aluminium, he did the same. Faced with a full-fledged cartel, albeit a smaller industry than steel, he set about creating his own subsidiary for alumina and aluminium as a step in the conflict.

Because the supply of electricity was a key element in aluminium production, on August 11, 1919, Renault entered into talks to buy several waterfalls and even “two or three converter groups” in Saint-Michel de Maurienne (Savoie).¹⁷ He knew the town well because it was where the Société électrométallurgique française (SEMF) had been producing aluminium since 1905. At the end of 1916, he and two partners decided to have two waterfalls built there, and in 1917 they set up a plant specialized to manufacture special steels: the Société des aciéries du Temple. However, by the end of hostilities, the plant had not yet started up.¹⁸ Indeed, “during construction, the Ministry of Armament changed the use of the plant three and four times.”¹⁹ But challenging the grip of the cartel implied contacts between Renault—a self-taught industrialist—and his team of civil engineers and managers educated in law with another world occupied by the public engineers who staffed the cartel and enjoyed a long confidence in mastering high technology.²⁰ The difference of social status was wide.

On August 21, 1919, Jacques Level, a Polytechnique-Artillery public engineer with a strong reputation as an organizer and financier, who had been appointed general manager of the cartel in 1917 and also managing director of SEMF in 1918, met with one of Louis Renault’s right-hand men, a former notary clerk named Émile Duc (whom I was lucky enough to interview when he was 97 years old).²¹ Clearly, Level had gathered information on Renault’s intentions that are not recorded in the archives. He proposed “common ground.” On the one hand, the SEMF would provide “either all or part” of the force needed to increase the power of Renault’s Temple plant; on the other hand, if Renault “undertook not to make aluminium,” the SEMF and cartel would support the decision to “make him, for important markets, some

¹⁷Jacques Level, Note sur une entrevue de M. Level et de M. Duc, 21 Aug. 1919, Archives Rio Tinto France.

¹⁸Gilbert Hatry, *Louis Renault patron absolu* (Paris, 1982), 111.

¹⁹Jacques Level, Note sur une entrevue de M. Level et de M. Duc, 21 Aug. 1919, Archives Rio Tinto France.

²⁰Public engineers in France are always characterized by the name of the state schools where they were educated. Cecil O. Smith Jr., “The Longest Run: Public Engineers and Planning in France,” *American Historical Review*, 95, no. 3 (1990): 657–692.

²¹“Level (Jacques),” Patrons de France, 2009, accessed 13 Nov. 2024, <http://www.patronsdefrance.fr>, and Ludovic Caillaud, *Stratégies, structures d'organisation et pratiques de gestion de Pechiney des années 1880 à 1971* (Ph.D. thesis, Université Lyon II, 1995), 134–136. Also see “Duc (Émile),” in *Notices biographiques Renault*, ed. Gilbert Hatry, vol. I, Paris, Éditions JCM, 1990, 44.

concessions on prices.” Duc replied with circumstantial justification for his boss’s entry into the fray:

Mr. Renault has been looking for a use for this plant, which has cost him a lot of money; he has not found it [. . .] and it was only a few days ago that he has expressed his desire to manufacture aluminium, not so much to obtain a low cost price, since he knows that this is impossible with small quantities, but to have a basis for evaluating the price of this metal.²²

This statement could be interpreted as Renault’s reasoning based on the asymmetry of information to negotiate. However, the following day, August 22, Duc phoned Level. He now explained his boss’s position as fundamental: “Industry is still free, [. . .] no industry can be closed.” Duc announced that Renault was preparing to “make small quantities of aluminium which will be far from sufficient for the consumption” of his plants, and that he was ready for the rest of his needs to make all possible arrangements with the cartel.²³ Silence was the reply. After contacting him these two times, the cartel did not offer Renault further substantial concessions.

So, in October 1919, Renault took a first step to enter this new field. As is familiar to business historians, he recruited a specialist working at a cartel’s member, Jean Sejournet, who was a public engineer from the Paris Mining School, an engineer at SEMF, and a manager of its aluminium plant in Gardanne (Bouches du Rhône), near Marseille. He was no small fry: Jean Sejournet was the son of Paul Sejournet, also a public engineer (Polytechnique-Mining School), a former collaborator, and a friend of Paul Héroult (the founder of SEMF, deceased in 1914). Paul was the cartel’s vice president, but he decided to leave this position.²⁴ Jean was accompanied by several foremen. At the beginning of 1920, Louis Renault was still not satisfied with the cartel’s latest proposals. He took the initiative to “build an alumina plant in Alais,” a town in the Gard region that was one of the heartlands of the French aluminium industry. He bought the necessary land and bauxite deposits. He also planned to build an aluminium plant in the Alps at Saint-Michel

²² Jacques Level, Note sur une entrevue de M. Level et de M. Duc, 21 Aug. 1919, Rio Tinto France Archives.

²³ Jacques Level, second note on the Renault case, 22 Aug. 2019, Rio Tinto France Archives.

²⁴ On Jean Sejournet and his father, see Ludovic Cailluet, *Stratégies*, 81, 109, 128; Jacques Sejournet, “La gestion héroïque. Souvenirs du temps du père Renault,” *Gérer et Comprendre*, no. 7, June 1987, 47 and 49; Hachez-Leroy, *L’Aluminium Français*, 120 and 145. For the father, Paul, see “Jean Adolphe Paul Marie Sejournet (1855–1942),” *Annales des Mines*, accessed 13 Nov. 2024, <http://www.annales.org/archives/x/sejournet.html>.

de Maurienne. Accordingly, he “acquired various items of equipment intended for this purpose.”²⁵ To demonstrate his determination, Louis Renault set about recruiting staff from the SEMF plant in Gardanne. However, on March 26, 1920, first the SEMF and then the cartel rejected his proposals for his future plants to cohabit with the cartel.

Compromise between the Industrial Consumer and the Cartel

Nevertheless, the showdown resulted in a compromise. This is shown by a summary drawn up on June 21, 1932, by Jean Pertuisot, a civil engineer from the École Supérieure d'Électricité and head of the cartel's sales department since January 1919, and which henceforth is this article's main source.²⁶

In December 1920, the cartel opened talks with Louis Renault to persuade him to “abandon his plans.” On February 1, 1921, the board of directors of the cartel validated the results of the negotiation.²⁷ An agreement was drawn up and signed on March 3, 1921. The cartel bought back from Louis Renault the land at Alais as well as the bauxite deposits and the machinery in which he had invested the sum of 830,750 francs (US \$1,352,612 in 2024). Renault undertook to reserve all his primary aluminium orders for the cartel for a period of 20 years (in fact, it became renewable for 5 years). The cartel agreed to grant Renault the terms of most favored customer and set special prices for the metal that Renault would export in its model delivered abroad. The cartel told Louis Renault that the agreement met his objectives of supplying factories “at the lowest price and sheltered from fluctuations that might arise either from other operations” of the cartel “or from speculation, or from the state of the market.”²⁸

From Renault's point of view, the timing of the deal proved immediately fortunate. In March 1921, France's two leading aluminium producers, the Compagnie des produits chimiques d'Alais et de la Camargue (PCAC) and SEMF, merged to form the Compagnie des produits chimiques d'Alais, Froges et Camargue (AFC). The French cartel soon associated with only two companies: PCAC and Ugine (which was a merger of smaller companies).

²⁵ Draft letter from Louis Renault to Aluminium français, submitted by Aluminium français to the cartel on 17 Dec. 1925, Rio Tinto France Archives. See also Michel Roux, “L'usine du Temple: le plus ancien atelier décentralisé des usines Renault,” *De Renault Frères*, no. 30, June 1985, 211–212. Alais became Alès by decision of the municipal council in 1926.

²⁶ Text reproduced in extenso in Fridenson, “Aucune industrie ne peut être fermée,” 81–83.

²⁷ Minutes of the board of directors of L'Aluminium français, 1 Feb. 1921, 073.4.10030, Rio Tinto France Archives.

²⁸ Draft letter from Louis Renault to L'Aluminium français, submitted by L'Aluminium français to the cartel on 17 Dec. 1925, Rio Tinto France Archives.

It is worth stressing, though, that the cartel did not seem to have supported the Michelin Company's postwar new automotive policy.²⁹ In December 1922, "Michelin did an early market survey to gauge the potential market for automobiles in France." It mailed out some 4 million copies of the "enquête nationale de l'automobile Populaire," including some 220,000 to known automobile owners; 200,000 to peasants; 160,000 to hotel owners; 90,000 to *commerçants* (small business people); 80,000 to entrepreneurs; 75,000 to salesmen; 65,000 to teachers and clergy; 60,000 to professionals; and 40,000 to automobile and bicycle dealers. The company also sent out some 30,000 posters advertising the survey. Louis Baudry de Saunier summarized the results in the illustrated weekly *L'Illustration*. There was a sizable market for a car for four people and a price not exceeding 7,000 francs.

However, industrial consumers were not completely satisfied. In 1924, 1925, and 1926, the needs of French industrial consumers exceeded the cartel's production. The cartel was forced to import metal from foreign producers at high prices through the European Aluminium Association (EAA) and to cope with customs tariffs, with Renault's help. In a letter to Level dated December 19, 1925, Louis Renault blamed these problems on the cartel, which "had ingeniously developed consumption [...]. Thanks to new outlets, your production has become insufficient (we have suffered) and you have had to import. It's not your new customers, such as the Railways, who are exporting, but us." He demanded compensation and a revision of the agreement, insisting that the price should be equivalent to what Renault would have paid if it had gone into production itself, and if its own needs in terms of quantity had always been met.³⁰

The 1921 agreement was renewed in 1926. This was also the year when international cartelization was reconstituted, with the birth of the EAA.³¹ But Renault, whose annual order tonnage had tripled between 1922 and 1926 and who had become the cartel's biggest customer, asked for a revision. Negotiations lasted 9 months and resulted in improved terms, including lower prices and discounts on certain quantities. In

²⁹ Poster of the national survey of the popular car, reproduced online by the Conservatoire National des Arts et Métiers, Michelin Museum, accessed 30 March 2023, <https://atelierst.hypotheses.org/3624>; Louis Baudry de Saunier, "Causerie sur le Salon de 1923," *L'Illustration*, 81, 6 Oct. 1923, 306–308; from Michelin Museum, Clermont-Ferrand, Fernand Gillet, *Cent ans d'industrie: histoire anecdotique de la Maison Michelin, c. 1932*, vol. 2, 127; Stephen L. Harp, *Marketing Michelin. Advertising & Cultural Identity in Twentieth-Century France* (Baltimore, 2001), 217–218, 326.

³⁰ Letter from Louis Renault to Jacques Level, 19 Dec. 1925, Rio Tinto France Archives.

³¹ Bertilorenzi, *The International Aluminium Cartel*, 136–140.

addition, Renault was authorized to acquire 1.2 percent of AFC's capital, making it one of its main shareholders.³²

In this way, trust was gradually established between the cartel and the large industrial consumer Renault. The agreement was regularly renewed, despite the death of Jacques Level (who had become chairman) in a road accident in Morocco in 1939, until the end of the Second World War.³³

Exploring the Limits of Compromise

Initiatives on both sides verified Louis Renault's rejection of the principle of an "exclusive preserve," which he had spelled out on August 22, 1919. The stronger rejections came from the cartel, which was struggling with the French consequences of the world depression and now because of the (re)birth of an international cartel. It did not run a "price war," as horizontal cartels often did according to the literature, but it boldly challenged the product range of the main French car makers. Renault's initiatives were smaller.

The Renault company felt the need to obtain direct information about American prices and practices. It twice asked its usual contact in Detroit, French-born Émile Planche (who was a "consulting engineer, automotive designer and builder"), in spring 1935 and July 1937, about the prices at which American car makers bought their materials and accessories.³⁴ The list included aluminium and duralumin, among other metals. However, in October 1935, Renault sent two manufacturing engineers—René Roques, head of all its foundries, and Roger Pénard, soon-to-be the head of the foundry of non-ferrous metals—to visit American aluminium factories. They experienced "numerous difficulties" in getting clearance.³⁵ They called on Planche to visit the Alcoa plant in Cleveland, where Planche enjoyed a conversation with its famous chairman Arthur V. Davis. They were supported by J. P. Morgan Bank in New York in obtaining the War Department's permission to see "modern casting" of aluminium parts for aviation at the Wright Aeronautical Corporation, in Paterson, New Jersey.³⁶ The periodic negotiations for the renewal of the agreement, centered on prices and

³² Cailluet, *Stratégies*, 193.

³³ Jean Bally, "Une grande perte. La mort de M. Jacques Level," *Revue de l'aluminium et de ses applications*, no. 108 (Feb. 1939): 1544–1545.

³⁴ Letter from Emile Planche to Renault, 7 Oct. 1935, 91 AQ 24 (5), The Originals Renault, fonds historique, Archives of the Renault Company, Le Plessis-Robinson.

³⁵ See the memoirs of Fernand Picard, *L'épopée de Renault* (Paris, 1976), 271–272.

³⁶ Telegrams and letters by Emile Planche in Detroit, 7–29 Oct. 1935, and letter from François Lehideux in Billancourt, 9 July 1937, 91 AQ 24 (5), The Originals Renault, fonds historique, Archives of the Renault Company, Le Plessis-Robinson.

rebates, were tough, despite the “personal friendship” between Louis Renault and Jacques Level. Louis Renault, who had been eager since 1933 to use aluminium to cast more parts of engines and possibly gearboxes, quadrupled the purchases of this light metal, which led him to demand lower prices as a reward for his firm’s larger turnover with the cartel. One of his deputies obtained secret knowledge from the Peugeot company of the prices the cartel had agreed with them, and used this to bargain further with the cartel. Also, Renault negotiated specific prices for its subsidiary at Saint-Michel de Maurienne. On the other side, Renault, behaving as a dynamic customer, contracted in summer 1933 with Level’s son to share technology and product advice. These services soon were extended to the aviation industry, after the French government lured Renault into it. In exchange, Renault criticized the price conditions the cartel had granted to two of its smaller aviation competitors.³⁷

The cartel became more ambitious.

The international cartel was rebuilt in 1931.³⁸ Renamed Alliance Aluminium Company, it was no longer limited to Europe but rather extended to North America (via Canada), and its influence was global. The world economic crisis started in 1929 made the issue of prices central. The emergence of new producers and the development of national programs of rearmament changed the terms of the steering of the international cartel, now chaired by Frenchman Louis Marlio.

The French cartel, while taking its share of managing the worldwide depression, was always on the lookout for new markets for its product. Its leaders were unpleasantly impressed by the scale and duration of the fall in French car production, from 253,000 vehicles in 1929 to 168,000 in 1935.³⁹ The cartel’s vice president, Jean Dupin, a Polytechnique and Ponts et Chaussées engineer, set up an automotive department in 1933 and recruited Jean-Jacques Baron, a civil engineer from École Centrale, as its head.⁴⁰ In October 1934, when the French Société des Ingénieurs de l’Automobile, chaired by parts supplier Maurice Goudard, launched a national competition for popular car projects not exceeding 8,000 francs as a way out of the

³⁷ Letters between Louis Renault and Jacques Level, 1935, and between François Lehideux and Philippe Level, 1933–1936, 91 AQ 21 (2), The Originals Renault, fonds historique, Archives of the Renault Company, Le Plessis-Robinson.

³⁸ Hachez-Leroy, *L’Aluminium français*, 216–224; Storli, “Cartel Theory and Cartel Practice”; Bertilorenzi, *The International Aluminium Cartel*, 173–184.

³⁹ See Michel Freyssenet, statistical table published in 2012, accessed 13 Nov. 2024, <http://freyssenet.com/>.

⁴⁰ *Annuaire de l’aluminium et de ses industries* (Paris, 1950), i–vi; Hervé Joly, *Diriger une grande entreprise au XX^e siècle. L’élite industrielle française* (Tours, 2013), 297–298; Jean-Jacques Baron, “L’Aluminium Français et la promotion de l’aluminium dans l’industrie de l’automobile en France entre 1933 et 1958,” *Cahiers d’histoire de l’aluminium*, no. 16 (1995): 60–84.

slump, the cartel, at Baron's suggestion, offered an additional prize for the best use of aluminium in a project.⁴¹ The head of an independent design office, Jean-Albert Grégoire, an engineer from Polytechnique, approached the cartel during the competition because developing a chassis independent of the bodywork and consisting of a cast light-alloy carcass "was more expensive than conventional industrial techniques." On behalf of the cartel, Baron agreed to help, in the hope that the project would be "a perfect flagship for his material." To "test the very first alloy chassis," they replaced the original chassis of a front-wheel-drive German car: an Adler Trumpf. The Grégoire model did not win the competition, and neither did the 101 other entries, none of which met the conditions set.⁴² It did, however, attract the interest of a small manufacturer, Hotchkiss, which decided to produce a car based on this principle, with an Alpac (light aluminium alloy) chassis: the Amilcar Compound. The model was developed in 1938, but series production, launched in 1939, was interrupted by the outbreak of World War II.⁴³

In 1938, the cartel proposed a second national contest for a popular car, this time to be organized by the French Automobile Manufacturers Association. It was a subtle maneuver. Jean Dupin's arguments were the "bad" level of production of the French car industry, the "possibility to reach new layers of buyers with a car outside the usual framework," the "material encouragement to idea seekers," and the development of "automobile suppliers." The Société des Ingénieurs de l'Automobile supported the proposal because it would show government and Parliament that "the entire motor industry was doing everything it could to get out of its slump by itself" and thus "meet the increasingly harsh criticism of public authorities."⁴⁴ During the same meeting, Dupin added that "from year one" the cartel had taken interest in the building of light cars in aluminium, they had subsidized the development of the

⁴¹ A total of 2,000 copies of this catalog with the 102 projects were printed: *Album de la voiture SIA 2 places*, Boulogne-Billancourt, Société des Ingénieurs de l'Automobile, 1936. See also Frederick A. Usher, "The SIA Contest of 1935," *Automobile Quarterly* 16, no. 2 (1978): 212–218; Patrick Fridenson, "Opinion publique et nouveaux produits industriels: les pressions en faveur des voitures populaires dans les années 1930," in *La politique et la guerre. Pour comprendre le XX^e siècle européen. Hommage à Jean-Jacques Becker*, eds. Stéphane Audoin-Rouzeau, Annette Becker, Sophie Coeuré, Vincent Duclert, and Frédéric Monier (Paris, 2002), 342–353.

⁴² *The Motor Trader*, 6 Nov. 1935, 209.

⁴³ Sophie Pehlivanian, "The Grégoire—Institute for the History of Aluminium Collection: An Original Look at the History of the Automobile," *Cahiers d'histoire de l'aluminium*, no. 42–43 (2009): 6–55.

⁴⁴ Jean Hubert, note de service, no. 2152, "Concours aluminium. Réunion le 7 juillet rue de Presbourg," 8 July 1938, 91 AQ 21 (2), The Originals Renault, fonds historique, Archives of the Renault Company, Le Plessis-Robinson.

Amilcar model with a chassis in Alpac by independent designer Grégoire, and the model was being tested by one of the French Big Three, Peugeot. Peugeot was worried about the cost of the tools for its current main model. The Renault company was not surprised, as a chief engineer of the cartel had shown it Grégoire's model in Renault's headquarters "more than one year ago."⁴⁵ The project was, however, rejected by the association at the suggestion of the three main car makers (Citroën, Peugeot, and Renault) and after Louis Renault had written to Level on June 14, 1938, to express his opposition.⁴⁶ Never mentioning final consumers, Peugeot's deputy COO Maurice Jordan declared that the suggested sum of "a million francs was, by far, insufficient to cover the start-up costs of a vehicle," and during a meeting with the various stakeholders on July 7, he argued that, rather than a "revolutionary car" (i.e., disruptive innovation), "continuously reducing the production costs of each part and each device" (i.e., incremental innovation) would be "more fruitful."⁴⁷ Meanwhile, Citroën, now controlled by Michelin, the tire company, had secretly designed a people's car, the 2 HP, whose body was entirely built of aluminium. The first 200 cars were ready in September 1939, but World War II prevented their appearance.

Would the war change this pattern of coexistence, or stop the challenges to the compromise?

The Second World War as an Opportunity to Force Compromise

On a global scale, the Second World War put an end to the international cartel, but the French cartel continued its activity. Furthermore, in September 1939, the French government granted it the responsibility of importing (from Canada, Norway, and Switzerland) and allocating the raw metal under the guidance of the new Ministry of Armament. Acknowledging "insufficient forecasts" before the war, Jean Dupin lectured the main processors of aluminium about the growth of production that was necessary, the insufficient capacity of special ovens to supply alloys and its development, and the setting of prices (the same as in January 1939, with an extra cost for metal coming from America).⁴⁸

⁴⁵Jean Hubert, note de service, no. 2152, 8 July 1938.

⁴⁶Fridenson, *Histoire des usines Renault*, 284; Loubet, "L'automobile des années vingt à cinquante: modèle, crise et remise en cause," in *L'économie française dans la compétition internationale au XX^e siècle*, ed. Maurice Lévy-Leboyer (Paris, 2006), 205–206.

⁴⁷Quotation from Maurice Jordan, Peugeot's deputy COO, July 7, 1938, in Fridenson, *Histoire des usines Renault*, 284–285.

⁴⁸Jean Gremeaux, note, "Compte-rendu de la réunion du 14 décembre de la section Aluminium," 91 AQ 21 (2), The Originals Renault, fonds historique, Archives of the Renault Company, Le Plessis-Robinson.

At the first meeting of this group on December 14, 1939, Renault's engineer in charge of purchasing metals noted: "We are the only representative of consumers."⁴⁹ During the German occupation of France, the supply of bauxite and aluminium was a major concern for the Nazis, as for the rest of Europe, and they twisted the arm of French producers and their seller, the cartel, to overcome its reluctance.⁵⁰ The war also provided both partners an opportunity to extend the compromise as far as possible.

Still wishing to increase its outlets in the automobile industry, the cartel soon looked for new ways to put pressure on carmakers, including Renault. The independent designer Grégoire, eager to maintain a flow of orders in a time of deep crisis, resumed contact with the cartel. In January 1941, Dupin, who had become the cartel's COO after Level's death, asked Grégoire to study the prototype of a small, inexpensive vehicle adapted to wartime (if the German and French governments allowed it) and postwar shortages.⁵¹ Grégoire accepted the contract, and prototypes were designed in cooperation with the team of Jean-Jacques Baron, who became the cartel's technical director. As the archives of Renault's research and development (R&D) department have shown, a first prototype began to be tested on roads "at the end of December" 1941.⁵² In a move that was not unprecedented—it reminds us of the cartel's presentation of Grégoire's Amilcar model to Renault in 1937 and Peugeot in 1938—the cartel, with the support of the authoritarian Ministry of Industrial Production and its Directorate of Mechanical and Electrical Industries, wrote to each of the three major automakers on January 27, 1942. In this letter, Dupin told each of them that it would take one of its three Aluminium Français prototypes to their headquarters for testing and evaluation in April. The technical details of the prototype were appended to the letter. Nevertheless, 11 months passed. It was only on March 8, 1943, that a prototype was presented to the Renault plant. Clearly, numerous adjustments would be necessary.

⁴⁹Jean Gremeaux, note, "Compte-rendu de la réunion du 14 décembre de la section Aluminium," 91 AQ 21 (2), *The Originals Renault*, fonds historique, Archives of the Renault Company, Le Plessis-Robinson.

⁵⁰Alan S. Milward, *The New Order and the French Economy* (Oxford, 1970), 235–243; Michel Margairaz, *L'État, les finances et l'économie. Histoire d'une conversion 1932–1952* (Paris, 1991).

⁵¹At the same time, Grégoire also designed one of the first electric vehicle models of the German occupation period, this time under contract to Compagnie Générale d'Électricité, CGE-Tudor. Its body was made of sheet aluminium. See Sigfrido Ramirez Perez, "Jean-Albert Grégoire, la voiture tout aluminium et la voiture électrique: le destin commun de deux innovations technologiques entre guerre et Reconstruction," *Cahiers d'histoire de l'aluminium*, no. 49 (2012): 70–89.

⁵²I follow here the archival research by Claude Le Maître, "Les prototypes 4 CV et Aluminium Français Grégoire face à face," *Renault Histoire*, no. 10 (June 1998): 47–57.

However, the model was not left to be tested. Grégoire postponed it. It was only on May 5, after a second bombardment of the plant by Allied aircraft, that a car was lent for tests.

Renault's team who carried out special tests wrote an overall laudatory assessment on May 13, 1943. Its two criticisms focused on the engine start and the gas consumption. Despite connections with Dupin and the cartel, CEO Louis Renault concluded in the negative.⁵³ Renault's competitors Citroën, Peugeot, and Simca followed suit. The Big Four had their own projects, their own evolving technical worlds, and their own corporate cultures. What is more, Citroën had just abandoned the use of aluminium for the body of its 2 HP in 1941, following an internal study led by Pierre Bercot (the firm's future CEO), who estimated the cost to be 40 percent above specification. The new sheet-steel body was "three times less expensive" than the original aluminium, according to the memoirs of Lucien Robin, one of Citroën's main engineers.⁵⁴ At Simca, after liberation, the ministry forced top management, weakened by workers' demands, to remove the CEO and instead to appoint Grégoire as technical general manager. Grégoire, not content with the agreement reached in October 1943 with the medium-sized manufacturer Panhard for a small series production of what was to become the Dyna X in 1947, tried to impose on Simca the manufacture of the AFG car. Nevertheless, thanks to the recent publication of Émile Dumaine's memoirs, it is clear what the rest of top management concluded in February 1945: The AFG was "too delicate to manufacture and too expensive to cost."⁵⁵

The cartel did not want to risk success or failure on one car. It supported independent design engineer Jean Andreau's R&D for a three-wheeled car with a body and an engine block made of aluminium, which was tested on the roads in 1942, and was to be produced by the Mathis company in peace time.⁵⁶ Presented at the first postwar Paris motor show in October 1946, this model attracted the interest of engineers and journalists, but it did not pave the way to a mass

⁵³ See also the conflicting memoirs of Jean Albert Grégoire, *50 ans d'automobile: La traction avant* (Paris, 1974) and of Fernand Picard (Renault's R&D deputy director), *L'épopée de Renault*.

⁵⁴ Patrick Fridenson, "Genèse de l'innovation: la 2 CV Citroën," *Revue française de gestion*, no. 70 (Sept.–Oct. 1988): 40–41. See also Roger Brioult, *Citroën. L'histoire et les secrets de son bureau d'études depuis 1917*, vol. I, 2nd ed. (Avon, 2020 [1987]).

⁵⁵ Émile Dumaine, *Un pionnier sort de l'ombre*, ed. Jean-Claude Malsy (Compiègne, 2021), 240–242.

⁵⁶ Jean Andreau, "Le problème de la voiture économique légère," *Journal de la Société des ingénieurs de l'automobile* 19, no. 3 (May–June 1946): 61–68; Edmond Massip, "Et voici . . . la 4 chevaux Renault, qui concrétise 8 années de progrès," *L'Automobile* 1, no. 1 (Sept. 1946).

production of three-wheeled cars, as some manufacturers did in West Germany and Japan.

Also in 1942, the cartel, on Baron's initiative, set up the Société des Prototypes de Carrosseries Légères (SPCL), in conjunction with coachbuilders.⁵⁷ "Initially opting for a prefabrication system unsuited to the characteristics of the market, the SPCL developed a solution using Carindal processes" that considerably reduced "the extra cost of an aluminium body compared with steel or wood."⁵⁸

Conversely, Louis Renault also tried, during the German occupation of France, to go beyond the limits of the compromise with the cartel. In 1942, he personally acquired mining land in the main bauxite-rich area of Brignoles (Var) in France.⁵⁹ This investment was made via his own fortune, as a subsidiary of the Usine du Temple, created, as noted above, for aluminium and calcium alloys at Saint-Michel de Maurienne, in the Alps, in 1919–1920. It was simply called Société des Etablissements Louis Renault Exploitation de Bauxites, and had a "regional office" located in front of a train station.⁶⁰ To prove that he was a significant player, he hired Marcel Auvert, a civil engineer and the director of the second-largest bauxite company in the area, Mines de Bauxites de France. Auvert, in turn, recruited miners and foremen.⁶¹ On January 1, 1943, the company issued a "regulation for workers at the L. Renault bauxite mine," which was later preserved by a foreman.⁶² By September 1943, it was employing 18 workers, or about 10 percent of the larger mines' labor force. The company was immediately recognized by the section for bauxite of the Organization Committee for Aluminium and Magnesium, the official coordination of private enterprises created for each sector by the Vichy regime operating under German rule.⁶³ Since the section for bauxite was chaired by one of the main board members of the cartel, the cartel could assess Renault's intentions.⁶⁴ More than 20

⁵⁷Ludovic Cailluet, "L'aventure des prototypes de carrosseries légères, 1942–1968," *Cahiers d'histoire de l'aluminium*, no. 8 (Summer 1991): 24–44.

⁵⁸Renamed Carindal in 1953, the company expanded its sales "without becoming a profit center," and became part of Cégédur in 1968.

⁵⁹Agenda of the steering committee of Société anonyme des usines Renault, July(?) 1942, Louis Renault Papers, Archives of the Association Renault Histoire.

⁶⁰Privately kept documents provided by Professor Jean-Marie Guillon, Archives of the Société des Bauxites du Midi.

⁶¹"Société Astronomique de France, Séance du mercredi 7 mars 1934," *L'Astronomie* 48 (1934): 168. Also see Jean-Marie Guillon, "Les Bauxiteurs 1936–1943. Enjeux et difficultés d'une organisation patronale marginale," *Rives méditerranéennes*, no. 45 (2013):73–84.

⁶²In 1973, a retired foreman, Mr. Chevalier, donated it to the archives of the Renault Histoire Association, Boulogne-Billancourt.

⁶³Adrian Jones, "Illusions of Sovereignty: Business and the Organization of Committees of Vichy France," *Social History* 11, no.1 (1986): 1–36.

⁶⁴Compte rendu de la réunion du Comité d'organisation de l'aluminium et du magnésium, Marseille, 25 June 1943, Louis Renault Papers, Archives of the Renault Histoire Association.

years after his first attempt, Louis Renault was still interested in producing alumina independently of the cartel's yoke. His commitment, made after the Germans had invaded the South of France, was moderate. He took only one share out of the 44 in the Auxiliary company of bauxite quarries, which the Organization Committee founded in 1943, to buy materials in common. However, after the liberation of France and his arrest on charges of industrial collaboration with Germany, Renault died in a clinic on October 24, 1944. His company was nationalized on January 16, 1945, but his initiative at Brignoles was not taken up by the new leadership of the nationalized company.

Yet, the story did not end there. Indeed the nationalization of Renault after liberation gave a new hope to the cartel's desire of larger orders from the company and of a closer relationship. During the German occupation, Jean Dupin had direct contacts with the Resistance, particularly with engineer Pierre Lefaucheu, who became a friend of his. When Lefaucheu was appointed CEO of the nationalized Renault, Dupin lobbied him to use aluminium on the postwar Renault models. In the early months of 1945, Dupin invited Lefaucheu and his deputy R&D director, Fernand Picard, to watch a demonstration of the AFG car staged by Baron and to drive the car. The verdict was as negative as at Simca: The use of aluminium for both the body and mechanical parts made the model costly to build and impossible to manufacture in large quantities in a timely way. As Citroën had during the German occupation, the nationalized Renault abandoned the aluminium used on its 4 CV prototype and replaced it with pig-iron.⁶⁵ The importance of the demographic renewal and the changes in the economic and political perspectives that Dupin stressed in his book 1 year later did not allow the cartel to extend the limits of the compromise.⁶⁶

Conclusion

This article confronted two visions of the competition by a cartel distributing new materials and one of its main industrial consumers.⁶⁷ It highlighted three different strategies: the creation or maintenance of a

⁶⁵ Picard, *L'épopée de Renault*, 281 and 286; Margairaz, *L'État, les finances et l'économie*, 653.

⁶⁶ Jean Dupin, *Problèmes actuels* (Monaco, 1946).

⁶⁷ Louis Renault was also a major player in the main French airline, Air Union (1923–1932). He attended 30 of its 100 board meetings, as evidenced by the board's records, sold in Paris at an auction of the Collection Jacques Miloux on April 22, 2017. It is not yet known whether he supported the use of aluminium on the company's engines or hulls, which occurred later. His two foundry engineers visited Wright Aeronautical in October 1935 (mention earlier in a different context) after the Renault company bought the Caudron Aircraft Company in 1933.

balance of power, compromise, and the reopening of competition in the other party's field. In the case of France and the aluminium industry, it shows that neither partner possessed sufficient resources to settle permanently in the other's area of activity and support the costs of full diversification. Consequently, the relationship that prevailed between the two parties was one of commercial trust based on a kind of armed peace, with the industrial consumer becoming and remaining a significant shareholder in the largest firm of the cartel, with which it periodically negotiated growing purchases. Nevertheless, the cartel challenged this armed peace by supporting disruptive innovation in an entirely national automotive industry.

On a more general level, the actions taken by Louis Renault and the successive results that his company achieved bring to mind the observations made by the American economist George J. Stigler in 1964.⁶⁸ Large industrial consumers can limit the impact of cartels and threaten to destabilize them by resorting to vertical integration. But their underlying aim is not necessarily to destroy the cartel but rather to obtain better terms for their own business, often at the expense of their competitors. Ultimately, their resources and market power enable them to achieve the (relative) stability they desire.⁶⁹ It remains to be seen who derives the main benefits from these compromises, both vertically and horizontally, as they sometimes limit and sometimes extend the scope of action of both parties.

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⁶⁸ George J. Stigler, "A Theory of Oligopoly," *Journal of Political Economy* 72, no. 1 (Feb. 1964): 46–54.

⁶⁹ Margaret C. Levenstein and Valerie Y. Suslow, "How Do Cartels Use Vertical Restraints? Horizontal and Vertical Working in Tandem," *Antitrust Law Journal* 83, no. 1 (2020): 15–39.