



Did the 1970s Crisis Lead to Convergence or Divergence? Usinor vs. Pechiney: An Examination of Renewal in the Steel and Aluminum Industries

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Usinor, since 2001 a major part of Arcelor, leads the world steel market, whereas in aluminum, Pechiney was swallowed up in a 2003 merger with the giant Canadian firm, Alcan. The two French companies faced similar problems during the 1970s: a sharp decrease in demand, the need to renew production capacities and to shift to more innovative processes, and the end of paternalistic labor management regimes. Although the market rules and structures of the two industries differ, as do their economic and social importance in France, there is a resemblance between steel and aluminum industrial and management models. Is this evidence of evolution toward total industrial similarity? In fact, the situation is complex. What explains Usinor's success as a major force in Arcelor, while Pechiney was relegated to a small role in Alcan? In the late 1960s, while Usinor engaged in a large mass-consumption market with products of low or average quality, Pechiney produced high-quality goods for a small number of aluminum users. Aluminum appeared to be "the" modern material, with steel viewed as a more common product. But Pechiney abandoned its focus on aluminum, while Usinor remained focused on its historic strengths—continuous mill technology and flat steel products.

Whereas in 2001 Usinor (Union sidérurgique du Nord de la France) became a major part of Arcelor, which leads the world steel market, Pechiney followed a more difficult path, culminating in its takeover by the giant Canadian aluminum company Alcan in 2003. The two French firms seemed to face similar problems during the 1970s: a sharp decrease in demand for their products, the need to renew production capacities, and the end of paternalistic labor policies. Just as Usinor needed to shift to more innovative production processes, Pechiney had to accept the end of

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an aluminum product growth of 10 percent per year, to procure electric power and bauxite at low cost, and to renew the chemical sector for its new existence as Pechiney-Ugine-Kuhlmann (PUK). Despite the differences between market rules and structures and the respective economic and social importance of the steel and aluminum industries in France, a quick look reveals the proximity of industrial and management models for the two industries. Are we witnessing an evolution toward total industrial similarity? The reality is more complex, and a careful analysis shows some important distinctive features. What were the main reasons for company decisions? Did the 1980s nationalizations play a role? Was the U.S. model of management implemented easily and fully within Usinor, while Pechiney chose a more subtle way?¹ Why did Usinor succeed and become a major force in Arcelor, whereas Pechiney became a small part of the giant Alcan?

At the end of the 1960s, Usinor was engaged in a large mass-consumption market, producing mainly low- or average-quality products; Pechiney produced high-quality aluminum for a relatively small number of users, while coping with very poor conditions in the chemistry sector. The financial policies of the two companies were quite different. Usinor relied on self-financing, capital increase, and bond debt, supported by the Groupement des Industries Sidérurgiques (GIS), an industry financial organization recognized by the French state. Reacting against a series of plant closures, workers launched several strikes and riots, which led to an intervention by public authorities through a quasi-nationalization organized by the right-wing government of prime minister Raymond Barre. With the appointment of a new chief executive officer and senior managers, the lenders' power in setting Usinor's strategy increased. In order to placate the workers, an early retirement scheme was launched, financed by the government and the steel companies. These actions formed the basis for Usinor's successful renewal. In the early 1980s, Usinor was officially nationalized. A new strategy was adopted, more concentrated on high value-added flat steel products and organizational capabilities aimed at making Usinor a leading multinational company. In 1995, after restructuring its organization and benefits, the company was

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¹ Pechiney was "Compagnie Pechiney" until the merger in 1971. It became Pechiney-Ugine-Kuhlmann after the merger between Pechiney, top French primary aluminum producer (founded in 1854) and Ugine-Kuhlmann (U-K), second French aluminum producer; U-K also produced chemical goods and steel. After the nationalization in 1982, and the end of the alliance with the chemical producer, the name again became Pechiney.

privatized. In 2001, a huge merger with Luxembourg's ARBED (Aciéries Réunies de Burbach-Eich-Dudelange) and Spain's Aceralia Corporacion Siderurgica S.A. created the world's largest steel company, Arcelor. Confirming the 1948 choice of Usinor's founders, continuous mill technology and flat steel production remain the core competencies of the new corporation's business strategy.

In the 1960s, Pechiney was a successful company, with high-quality products, a paternalistic labor model, a sound financial position, and favorable commercial and technical prospects. Pechiney was primarily a smelter and, during the 1960s, it became one of the technological leaders in producing primary aluminum in competition with Alcoa. Aluminum was gaining new customers and appeared to be "the" modern material, whereas steel was seen as a common product. In 1969 aluminum consumption in the West increased by over 13 percent. Paradoxically, French public authorities were unsupportive, so the French aluminum companies organized themselves to control the industry. From the very beginning, French companies focused their activities on producing primary metal for sale to a large number of independent firms and other end users. Pechiney converted only a small part of their primary aluminum in their own plants. After World War II, however, Pechiney shifted its strategy and invested in downstream operations by acquiring independent companies and by developing its own downstream production. After the Rome Treaty of 1957 established the European Economic Community (EEC), the fear that American aluminum companies would try to buy French downstream firms materialized. Pechiney achieved its down-stream integration, despite the reluctance of the French government, because the American aluminum company Kaiser tried to buy French semi-finished products firms.² Vertical integration was implemented by the late 1960s, after which the firm readjusted its strategy. New CEO Pierre Jouven had a huge job in trying to shape the organizational structure of the firm. By 1970, the company (since 1967, the "Groupe Pechiney") had succeeded in its transformation and had developed its activities, focusing on two fields: smelting and converting aluminum into alloys and semi-finished products; it also reinforced its positions in certain sectors of finished goods such as packaging. Because of good results, the Pechiney Group invested strongly in research to produce aluminum efficiently, and it became the leader in the technology of primary aluminum production.³ It was the beginning of an international expansion for the Group.

At that time, the chemical and steel company Ugine-Kuhlmann (U-K) was having great financial and technological problems. It was in roughly

² While the American aluminum company Reynolds bought British Aluminium in 1958.

³ For more details, see Muriel Le Roux, *L'entreprise et la recherche, un siècle de recherche industrielle à Pechiney, 1808-1996* (Paris, 1998).

the same situation as Usinor. The French government wanted a merger to save U-K and, since a merger with Usinor was not possible because of the steel industry crisis, they chose Pechiney. It was not an industrial choice, but a political one, but it came at the wrong time. Growth in the aluminum industry had slowed in 1970 and had ground to a halt in 1971, the year of the merger creating PUK. This was also the period of the oil crises. The 1970s crises were difficult for Pechiney, obliging managers to revise their strategies. In addition to the cost explosion because of the oil shocks, the aluminum industry also faced rising costs for labor and for raw materials. The bauxite-producing countries created a cartel, sharply increasing the cost of that vital input.

PUK was an international holding company with no real coherence except perhaps in the aluminum sector; it was the top producer of primary aluminum in Europe and fourth in the world. U-K brought businesses related to the nuclear sector, but even without the merger that direction would have been a sensible course for the aluminum companies because of the close technological links. The chemical division immediately became a dead weight, with the aluminum division having to bail out the chemical one. Even though PUK entered into some huge new markets (beverage cans, airplanes, and car bodies), the company failed to modernize its chemical plants, lost tremendous amounts of money, and was nationalized in 1982. The new CEO, Georges Besse, sold the steel division to Usinor in 1982 and the chemical firms to Rhône-Poulenc and Elf-Aquitaine in 1983. Then Pechiney, back to its original name, concentrated its strategy around aluminum, which provided 60 percent of the company's income. Nevertheless, the days of stable and competitive prices had definitely ended; in 1979 the price of aluminum began to be quoted on the London Metal Exchange, and the "Big Six" lost control over primary aluminum prices.⁴ As a result of the price increases, aluminum lost its pre-eminence. The development of new materials such as ceramics and composites also cut into the traditional aluminum market. With slackening demand and increasing costs, the aluminum industry found it difficult to earn a return on its investment, and some of the Big Six diversified into other businesses to try to escape the ups and downs of aluminum cycles. A new CEO, Jean Gandois, organized this diversification strategy for Pechiney, buying the U.S. packaging company American National Can. This strategy was not a complete success for Pechiney during the 1990s. In contrast, Usinor was able to regain several markets (cans, car bodies) as a result of innovation in strategies. Pechiney managers moved back to a more focused strategy in preparation for the globalization. For awhile, the economic results were quite good and, in accordance with French government policy, Pechiney was privatized in 1995. Although financial performance was good, aluminum, which was the company's core competence, was set aside on

⁴ The six biggest companies were: Alcoa, Alcan, Reynolds, and Kaiser in the United States, and Pechiney and Alusuisse in Europe.

the advice of shareholders against putting money into research and development (R&D) and innovation. Moreover, European policy issues became powerful influences on the choices the firm made. Pechiney's traditional industrial and economic advantages slowly began to decline, leading to the takeover by Alcan.

These parallel stories reveal the important role of the French state, not only in conducting industry reorganization, but also in promoting new business strategies and innovation through nationalization and privatization. Even after the Leftist parties won in 1981, however, the ownership change did not lead to a radical shift. Plant or workshop closures and staff reductions continued, and early retirement schemes were extended. Within this common framework, however, the new business leaders of Usinor and Pechiney chose different strategies. In 1986, internationalization, concentration on a single core competency, and financial equilibrium were the main goals of Usinor's new CEO, Francis Mer. In contrast, Pechiney's CEO, Jean Gandois, decided on a more diversified strategy. Twenty years later, the French steel industry still exists as an important part of a large international company, Arcelor, while Pechiney has been submerged within Alcan. From a prestigious position, Pechiney and the French aluminum industry became more pedestrian, while the steel industry appeared more dynamic and innovative.

To understand this evolution, it is necessary to examine the situation of the two corporations in the late 1960s and early 1970s. The 1974-1976 crisis disrupted traditional business models and market structures. Bankruptcy was not far away. Urgent and drastic decisions were needed; the French state intervened. During the 1980s and 1990s, with the help of public funding Usinor and Pechiney undertook complete reorganizations, but with different results. This period shows that public intervention imposed by economic constraints frequently was based on decisions similar to those proposed by the companies' top managers.

Sunshine before Dusk: The “Americanization” of France, Innovation, and Mass Consumption, 1945-1974

Usinor, a Champion with Potential Weaknesses. In July 1948, Usinor was founded in northern France by the merger of two major steel companies.⁵ The aim was to develop continuous rolling mill technology in France and to increase the production of flat steel products for the automobile and domestic goods industries. At that time, Usinor had eight plants. Only two were substantially rebuilt, but they represented the first move toward the specialization of Usinor's factories. The others, mostly making long

⁵ Les Forges et Aciéries de Denain-Anzin (DA), founded in 1834, and Les Forges et Aciéries du Nord et de l'Est de la France (NE), founded in 1881. For more details, see Éric Godelier, *Du local au global: Usinor, 1948-1986* (Paris, forthcoming).

steel products, remained organized on a nineteenth-century multiple product/multiple-technology basis.⁶

From its beginning, Usinor had a complex relationship with the French state and its industrial and financial policies. Since 1944, several projects to nationalize the French coal and steel industries had been debated. Although coal mines were indeed nationalized, things evolved differently for the steel companies. On the one hand, public authorities defended nationalization, arguing that it would permit the concentration and rationalization of the steel industry. On the other hand, the manufacturers' federation, the CSSF (Chambre syndicale de la sidérurgie française), argued that the companies themselves should first concentrate and rationalize as a pre-condition of nationalization. Over time, CSSF developed a trade-off strategy: they would rationalize in return for no nationalization. To prevent nationalization, the CSSF emphasized the steel industry's uniqueness, arguing that it was vital for the country and should be regarded as a kind of public service rather than as a purely competitive or capitalistic sector. The industry's leaders proposed to use distinctive criteria for assessing companies' performances and production processes. At the same time, the profession paradoxically applied the threat of nationalization to put pressure on public authorities in order to obtain financial subsidies for rationalizing the steel factories.⁷

Among steel industry leaders, Usinor's top managers adopted a cautious but modern business model. Rejecting the fear of overcapacity in steel and iron production, they anticipated market development based on huge productivity increases and cost reductions that would push prices down and gain new market share. In this view, Usinor's managers broke with the cartelistic view widespread in the other major steel companies, especially those in the eastern part of France such as de Wendel. Nevertheless, instead of the most modern rolling mill, they chose medium-range capacity (0.7 million tons/year), far below the best U.S. rolling mill working at that time (1.4 million tons/year). The construction of two new rolling mills was begun: a hot rolling mill in Denain (150 kilometers north of Paris), and a cold rolling mill in Montataire (60 kilometers north of Paris), using equipment from United Engineering and Westinghouse imported from the United States. Usinor's workers then numbered 15,000. The old paternalistic methods of worker management remained prevalent, mandating policies for housing and property loans, local recruitment of workers, high wages, and promotion based on seniority and length of service.

From the beginning, Usinor was one of the most competitive French steel companies. Its clear success resulted from the explosion of mass

⁶ Flat steel refers to sheets, used in the manufacture of items like cars; long steel refers to rods, beams, and the like, used primarily in construction.

⁷ Philippe Mioche, "La sidérurgie et l'État des années quarante aux années soixante" (Ph.D. diss., Paris IV-Sorbonne University, 1992), 569.

consumption, low financial rates, and a mix of public and private control of French steel markets. Usinor never faced a deficit from its first years until 1976. For almost thirty years, Usinor was constantly obliged to enlarge its production capacity to follow the tremendous growth in the demand for steel. The company had to invest heavily in plants and workshops specializing in flat products. Anticipating the creation of a bottleneck in Denain in the mid-1960s, Usinor was the first in France, after 1956, to build a coastal plant in Dunkirk. This marked a turning point in the history of the French steel industry. First, technologically, the plant used imported hematite iron ore instead of phosphorous ore from Lorraine. This imposed a completely new production process, leading Usinor had to develop a research department. Second, commercially, while Usinor's old plants were very close to local raw material suppliers and customers, from its beginning Dunkirk principally imported raw material from Africa and exported a large share of its output. Third, from a social point of view, apart from a few transferred workers moving from other factories, the large majority of the work force recruited came from the Dunkirk area and were former fishers or new industrial workers. They did not follow the traditional paths of recruitment and promotion. New industrial relations and a new trade union culture appeared, more radical and less respectful of tradition. In Usinor's other factories, especially those involved in long steel products, modernization was less rapid. Valenciennes and Haumont, for instance, received a smaller share of the total investment.

This evolution increased Usinor's capital requirements. Since 1948, the company had used three forms of financing: self-financing, increased capitalization, and bonds. From 1948 to 1970, the corporation's capital was increased on eleven occasions.⁸ Usinor was also one of the largest borrowers in the bond market through the GIS.⁹ Through that association, Usinor obtained lower financial rates than were available on the open market. In the late 1960s, the corporation continued its frequent reliance on the GIS.

These excellent economic results attracted a new competitor. Just before the 1973 oil crisis, Sollac (Société Lorraine de Laminage Continu S.A.), Usinor's competitor in eastern France, launched the construction of a second continuous rolling mill plant in Fos-sur-Mer, near Marseille. Solmer (Lorraine et Méridionale de Laminage Continu S.A.) was a 4 million tons-per-year unit. At this time, Usinor was pushing Dunkirk's capacities to 8 million tons per year in the Dunkirk III project. During the early 1970s, these investments represented a 40 percent increase in the French steel market. Soon, oil prices exploded.

⁸ From 120 million to 1,143 billion FRF.

⁹ The CSSF controlled the GIS and used it to address the long-term financial needs of several steel companies. It offered its bonds to the market through commercial bank facilities.

Pechiney: A Great Corporation in a Growing High-End Market. The roots of Pechiney go back to the middle of the nineteenth century, when it was a chemical company, producing aluminum under the Saint-Claire Deville patent. In 1886, Paul-Louis Héroult patented the current process of producing aluminum with power: the Hall-Héroult electrolytic process.¹⁰ After a short time in Switzerland, working with the incorporators of Alusuisse (taken over by Alcan in 2001), Héroult went back to France and created his own company. In 1921, these two French aluminum companies merged, creating Pechiney.

Until 1971, there were two aluminum firms in France: Pechiney and Ugine. Pechiney produced 80 percent of the aluminum, Ugine, 20 percent. They were the only producers of primary aluminum, which was sold through a cartel, l'Aluminium Français. They were not actually involved in the downstream sector, which was composed of many small enterprises, but were shareholders in many downstream sector firms. Pechiney still had a small chemical operation, which it used to transform aluminum by-products. During World War II, R&D activities continued to improve smelting capacity, and Pechiney had the most modern electrolysis technology in Europe. Still, senior managers knew that the company had weaknesses. They made no investments in their aluminum production units, and the situation was even worse in the downstream sector, where little research occurred because there was no major company involved in that segment of the enterprise. Although Pechiney had very good technology for primary aluminum, its plants were old. It owned some small downstream plants, but the French firm's position was far behind those of Great Britain and North America. Also of concern was that the bauxite mines in southeastern France were becoming much less productive.

As a producer of primary metal during the interwar period, Pechiney built many hydroelectric power stations, but those were nationalized in 1946 when the French government created a national, public electrical power company, Electricité de France (EDF). Pechiney's top managers considered it spoilation: the firm lost control of the price of electrical power in a situation where, as a Canadian proverb put it, "aluminum is nothing but ingot electricity." From then on, controlling the price of power became the life struggle for Pechiney until the Alcan takeover.

The nationalization of power stations caused suspicion concerning state economic policy, and negotiations for better power prices with the French government were always difficult until the 1990s. Moreover, after World War II, Pechiney and primary aluminum were not a priority of France's rebuilding program. Many plants had been partly destroyed or

¹⁰ Martin Hall was the American inventor; see Muriel Le Roux, "Innovation Relationships between Pechiney and Alcoa, a Complex Competition for a Technological Monopoly from the 1890s to the late 1930s", in *Transnational Companies, 19th-20th Centuries*, ed. Hubert Bonin, et al. (Paris, 2002), 727-35.

had obsolete equipment, so the managers decided to accompany reconstruction with a complete reorganization to modernize the company to face international competition.¹¹ In 1938, North American firms produced 4.5 times more aluminum than France did; after the war, the factor rose to 14.7. The aluminum industry is very capital-intensive: the primary issue for management is, in fact, making decisions between investment and clearing debt.¹² Modernization was the main target, and in 1948, they adopted a new organization based on the American model. They hired an American consultant with experience in France, K. B. White, to reorganize the company's structure. As adapted by Pechiney's senior managers, the report led to a decentralized multidivisional organization.¹³ However, it was impossible for the firm to finance its modernization and rebuilding alone; they used external financing from increases in capital and guaranteed state loans. Obtaining finance became easier after the reorganization because the decentralization clarified sectoral analysis for the banks. Pechiney also set up an investment company named Seichime.¹⁴

Thereafter, Pechiney continued to develop its strategy. The firm had found the way to renew itself: a modern organization, capital, and a highly efficient technology for primary aluminum. The drawbacks were the heavy concentration on one part of the aluminum industry and the high cost of power, which became the impetus for R&D to directed toward new processes using less and less energy.

Once it had overcome the economic stagnation of the immediate post-World War II era, the worldwide aluminum market grew stronger. Between 1951 and 1969, aluminum consumption increased in Western Europe by an average of 8 to 10 percent a year.¹⁵ The Korean War, in addition to the general economic and political conditions of the period, stimulated primary aluminum demand. Aluminum became the second most important metal, after steel.

During the 1950s and even more during the 1960s, Pechiney was in a very good position in the primary aluminum market. Because of the higher cost of energy in France compared with prices in the United States

¹¹ See Ludovic Cailluet, "Stratégies, structures d'organisation et pratiques de gestion de Pechiney, 1880-1971" (Ph.D. diss., Lyon-II University, 1995).

¹² Jean Gandois's definition; see Daniel Karlin and Rémi Lainé, *La multinationale, voyage au cœur du groupe Pechiney* (Paris, 1994), 21.

¹³ K. B. White, who had worked with Wallace Clark's consulting team in France, had a degree from the Massachusetts Institute of Technology (MIT); Pechiney Archives. Pechiney's archives, which are now part of Alcan's archives, can be accessed with the help of the Institut pour l'histoire de l'aluminium, Immeuble le Signac, ZAC des Barbanniers, 1 avenue du Général de Gaulle, 92 230 Gennevilliers, France, <http://www.histalu.org/>.

¹⁴ Cailluet, "Stratégies," 399, 473.

¹⁵ Manfred Knauer, "The Golden Year: The European Aluminum Industry during the Post-War Economic Boom," *The European Aluminum Industry (1945-1975), Cahiers d'histoire de l'aluminium* (special issue 1, 2003): 11-18.

or Canada, Pechiney undertook research that provided it with the best electrolysis cells and the best technology to smelt aluminum with excellent gains in productivity. To compete with Alcoa, researchers also explored new ways to produce primary metal. Therefore, Pechiney's prices were always quite competitive, and its managers were very responsive to every opportunity for joint ventures with partner-states or firms.

At the same time, with the exception of Norway and France, the other European countries imported primary aluminum; prices were quite stable compared with the prices of other metals like copper. Throughout the period from 1945 to 1975, we should view the primary aluminum deficit in Europe as structural. After rebuilding and reorganization, Pechiney's managerial strategy abroad evolved, first, to address the firm's desire to remain the European leader for primary metal, and, second, to deal with the diminishing bauxite resources in France.¹⁶

The firm set up businesses in the French colonies in Western Africa. In 1954, the Alucam Company plant in Édéa (Cameroon) began to produce primary aluminum; in 1960, a new plant began to produce alumina in Fria (Guinée). In 1962, Pechiney bought How Sound in the United States to develop its position overseas. In 1965, after Pechiney had sold all of that company's business except the aluminum and turbine engine departments, it became Howmet. After opening Édéa, Pechiney built many plants and became a shareholder with Queensland Alumina, Ltd., in Australia and with Aluminio de Galicia in Spain. After lengthy negotiations with the Greek government to have direct access to bauxite mines there, in 1966 Pechiney completed a joint venture to build Aluminium de Grèce, a venture to produce aluminum semi-finished materials using the country's bauxite mines with, of course, smelting plants. The same year Pechiney opened Intalco in the state of Washington, and, in 1970, two other smelting plants at Eastalco in Frederick, Maryland. Pechiney Aluminium Presswerk (PAP) was created in Germany in 1968, and in 1971, Pechiney Nederland got underway. This establishment was very important because the plant was located in the middle of tulip plantations. Primary aluminum is a highly polluting industry, so the Dutch would agree to this development only if Pechiney was willing to improve its technology to protect the flower operations. The aluminum company answered the challenge: researchers developed less-polluting smelting units. This international expansion marked the beginning of Pechiney's specialization: selling turnkey factory smelting and providing engineering and environmental study services.

This expansion gave Pechiney better control of its inputs for upstream sectors (energy, bauxite, and alumina) and an active position on the international market for producing metal and selling technology. In France, at the same time, Pechiney rationalized its production. Between

¹⁶ To produce one ton of aluminum, one needs two tons of alumina, extracted from four tons of bauxite ore.

1959 and 1969, the managers reorganized the chemical sector, divesting it to Rhône-Poulenc in 1969. For two years, it was primarily an electro-metallurgical firm. The company reinforced the primary aluminum units by opening a new plant in Noguères in southwestern France, near the new natural gas field in Lacq, and decided to develop its downstream integration strategy.

Since 1921, Pechiney and Ugine had been the two primary aluminum producers in France, allied by necessity for foreign negotiations. From the foreign point of view, there was only one French smelting firm: the “Aluminium Français” cartel. In this system, Pechiney and Ugine did not work cooperatively. Pechiney neutralized the influence of Ugine and negotiated the position for French aluminum production and market control. In the late 1950s and early 1960s, however, the European trade situation began to change with the creation of the ECC. The 1957 Rome Treaty established a customs union and common economic policies. Moreover, in the early 1960s, the American insistence on organizing global trade under the Kennedy round of GATT talks particularly concerned Pechiney. The Americans wanted to eliminate customs protections and diminish the impact of the European industrial “ententes”; in 1962, customs taxes on aluminum dropped by more than 50 percent.¹⁷

Consequently, Pechiney for the first time saw its domestic market becoming freely accessible to European metal, jeopardizing its monopoly. It was the end of the old Pechiney-Ugine association through downstream R&D and their joint ventures and subsidiaries. Pechiney and Ugine were suspected of giving their subsidiaries better prices for primary aluminum. Pechiney CEO Raoul de Vitry considered merging with Ugine, but their strategies were too different. The Pechiney supremacy in industrial, trading, research, and technological activities was too great for Ugine. In addition, the new economic order introduced a subtle threat. One of the “majors” could introduce itself into the primary aluminum sector in France through a European subsidiary. Therefore, de Vitry and general manager Pierre Jouven determined to control their subsidiaries instead of remaining simple shareholders. They saw this as a question of survival.¹⁸

In 1964, Pechiney took control of Cégédur (Compagnie générale du Duralumin, founded in 1912 by Pechiney ancestors) and Ugine through the seller cartel Aluminium Français, which bought the patent from a British firm.¹⁹ In 1965, Pechiney created two companies, Cebal and Scal, to become a real competitor in the rapidly developing packaging sector.

¹⁷ Florence Hachez-Leroy, “The Construction of Europe and its Consequences on the French Aluminum Industry,” *Cahiers d'histoire de l'aluminium* (special issue 1, 2003), 19-28.

¹⁸ Interview of Pierre Jouven, by Muriel Le Roux (MLR), Oct. 1991; see Le Roux, *L'entreprise et la recherche*, 326-30.

¹⁹ Le Roux, *L'entreprise et la recherche*, 115-30. This was the beginning of Great Britain's specialization in the aluminum downstream sector.

Around 1960 the managers negotiated a partnership with the Germans to develop rolling mill capacity in Europe. However, probably due to the location of the future plant and American influence on the German economy, the Germans instead chose to form an association with the Canadian company Alcan. The French continued alone, creating the Rhenalu S. A. with a big plant in Neuf-Brisach, near the Rhine River and the German border. The plant produced thin sheets, between 0.5 and 1.5 millimeters, for car bodies and plane wings. To sustain this downstream sector the manager created an important research center exclusively devoted to the invention of new alloys and research designed to anticipate customers' needs, questions, and demands. Pechiney became a shareholder in many French and foreign companies.

At the same time, Tréfinmétaux, a firm specializing in copper and the only other important metallurgical firm in the downstream sector, sought better integration, and became very interested in a merger proposition from the American aluminum company Kaiser. However, Pechiney's managers referred the matter to the French government and obtained its support.²⁰ Kaiser then changed its mind, probably because it was still difficult to set up in France during the 1960s. In 1967, Pechiney merged with Tréfinmétaux, and the Pechiney Group was established. After fighting to control the downstream sector, however, the Group was in disarray. To conclude this integration work properly, in 1967 Pierre Jouven asked the American consulting firm McKinsey to audit the new arrangements. Jouven explained that he knew what he had to do; however, he thought that working with McKinsey was the better way to get so many different general managers to hear and follow him as president in so huge a "bazaar."²¹ Those fighting for market share had to work together, and, more important, for the first time in Pechiney's history, there was an obligation to think out trading and marketing strategies to anticipate and answer customers' needs. It was the end of Pechiney's reliance on the supremacy of its electrolysis technology. For the first time marketing became a priority for managers. In this way, R&D and marketing were associated.

Simultaneously, Pechiney took advantage of its knowledge of mineral exploitation and its chemical and metallurgical expertise to work with the Commissariat à l'énergie atomique (CEA, France's atomic energy commission). During the 1960s, Pechiney increased its interest in that sector, too, to round out its main activities. By the end of 1967, even if some parts of the Pechiney Group were still reluctant, it could be said that the merger had succeeded from top to bottom. It was the second time that an American model of management had inspired a manager—not so

²⁰ Ibid., 302-18.

²¹ Interview of Pierre Jouven, by MLR, Oct. 1991, see Le Roux, *L'entreprise et la recherche*, 326-30.

amazing, given that the Group's main competitors were North American enterprises.

Before the merger with Ugine-Kuhlmann, Pechiney—thanks to de Vitry and Jouven's integration and international strategy—had become the European aluminum leader, and the firm really belonged to the “Big Six” group. Pechiney's success was possible because until the beginning of the 1950s there was a huge primary aluminum deficit. Therefore, Pechiney quickly returned to a good position, giving up some liquidity to allow its expansion in France, in Europe, and all over the world. Despite the nationalization of its hydroelectric stations, Pechiney's leaders knew how to manage that crisis and how to turn the situation to their advantage, soliciting the French government as soon as needed. Even so, Jouven thought that the government's economic policy was often too timorous, especially for entrepreneurs. So, the managers were used to setting up their strategy alone, trying to limit the influence of national and general economic policy. They had integrated immediately after World War II, knowing that competition in the aluminum industry would be worldwide—thus their deep engagement in international negotiations. That was the golden age for Pechiney: management had adapted to the international competition, and things seemed to be going well. The Big Six controlled the market and the prices.

Nationalization or Death: When the French State Became a Business Leader, 1975-1995

Usinor and Pechiney both faced a huge crisis with their industrial customers. It was two years before they decided to reduce their own production and several months more before they closed and restructured the companies. Meanwhile, the state had nationalized the firms and replaced the senior management.

Usinor: debts, cyclic business model, and a new value-added strategy. In the early 1970s, Usinor's results and prospects were very good. In 1973, there was a worldwide shortage of steel products, which led to significant price increases. Logically, top managers decided to maintain or to accelerate the investment rhythm. Nevertheless, new difficulties appeared during these five years.

Since 1970, Solmer had faced financial problems in the construction of the Fos-sur-Mer rolling mill. Sollac's top managers proposed a capital share in Solmer to Usinor, which at first refused. After negotiations and an intervention by the Minister of Finance, Valéry Giscard d'Estaing, Sollac and Usinor signed a contract in 1972 under which Usinor received almost 50 percent of Solmer's capital. The state financially supported the operation, but provided less than promised. Meanwhile, the Dunkirk III project slowed down because of technical difficulties with the giant blast furnace. In addition, Usinor had to borrow once more to prevent Solmer's bankruptcy. By the end of 1970, debts reached 44 percent of income, and

climbed to 75 percent by the end of 1972. This did not alarm senior management, who had predicted a rate of 76 percent for 1973, 70 percent in 1974, and 60 percent in 1975. But in fact the rate had already reached 86 percent by the end of 1974.

In October 1973, oil prices rose by 70 percent. In 1974, French industrial production dropped by 15 percent, and interest rates climbed from an average 4 percent (during the 1960-1968 period) to 13.4 percent in 1975. In the early days of 1975, steel demand fell by 40 to 50 percent, prices by 25 percent.

Usinor's managers initially analyzed this economic turn as a normal inversion in the business cycle. They decided to implement a lay-off period, a reduction of daily and weekly work time. In February 1975, the CEO, Jean Hüe de la Colombe, stated that "in order to fight the present difficulties, the company must borrow again." During 1975, they increased investments. Like almost all its competitors, Usinor also tried to benefit from the world markets' higher prices. In order to increase its income, the company increased exports. It was a turning point, because the company traditionally had never exported much, unlike its competitor de Wendel, for example.²² This attempt rapidly failed, partly because of the pressure of Japan, Spain, and some Eastern European countries, which began to take market share from the French steel industry.²³

Things became very difficult around November 1976. Usinor's inventory reached 2 million tons, which deepened its financial difficulties. The company was not able to meet its monthly financial payments, although the recovery plan had already forecast a reduction of 50 percent. In December 1976, managers had to recognize that they were facing a real crisis. In the early days of 1977, Usinor had no cash left and was virtually bankrupt. For the first time in its history, the company suffered heavy losses.

At that moment, the French state and the right-wing government of Raymond Barre proposed a restructuring plan combining industrial and social elements. On April 1977, it imposed the closure of two plants, idling 3,700 workers. From then on, social reaction was strong, with demonstrations and even riots. For instance, on April 14, one-third of the town's population marched in Thionville and occupied the plant there. Facing growing social pressure and fearing the loss of the forthcoming 1978 general election, the government, with the employers' federation UIMM (L'Union des Industries et Métiers de la Métallurgie) and the trade unions, organized a general early retirement and transfer scheme, the Convention Générale de Protection de la Sidérurgie (CGPS). Workers aged at least 56 could retire with 95 or 100 percent of their wages and were

²² In the 1970s, Usinor exported an average of 22% of its outputs.

²³ Extraordinary General Meeting of 25 May 1976; Usinor Archives, L'Espace Archives, 172 rue du Général de Gaulle, 57290, Seremange, France.

replaced by workers moving from closed factories or workshops.²⁴ By the end of 1977, 4,500 workers had benefited from the CGPS.

In August 1977, facing Usinor's new financial needs and losses, the state brought together all the private and public creditors of the French steel companies for several meetings. The CEOs and top managers were deliberately left out. This led to the takeover of all steel companies by their creditors and the French state. The operation was seen as a financial moratorium. The second part of the plan organized the companies' recapitalization and the conversion of debt into funds comparable to stockholders' equity.

A holding company was created, the Société Financière Usinor-Châtillon (SFUC), which held a 67 percent share of the new Usinor. The former owners' share shrunk to 20 percent. The French state controlled SFUC's capital: the Caisse des Dépôts et Consignations²⁵ held 30 percent, and the Fonds de développement économique et social (FDES) held 15 percent.²⁶ The remaining shares were held by the banks (30 percent) and the GIS (15 percent). Next, the state took charge of the steel industry's debts, using a scheme called PACS (Prêts à caractéristiques spéciales). Usinor kept its name, but merged with Châtillon-Neuves-Maisons, an eastern steel company controlled by the bank Paribas. Actually, this operation could be considered a "shadow nationalization" by Prime Minister Barre. From then on, the state and the taxpayers paid most of the steel industry's losses. The new owners changed the management team.

On December 1, 1978 Usinor's new CEO was appointed. It was Paribas, former owner of Châtillon-Neuves-Maisons, that suggested the name of Claude Etchegaray. Like his predecessors, he had graduated from the École Polytechnique. However, for the first time, here was a leader who had not spent his career within the company, coming instead from ITT. He brought some U.S. models and organizational tools. The company soon adopted a four-divisional structure, each specializing in a single business activity: long steel products, flat steel products, specialty steels or ironworks, and preparations. Etchegaray also created a new formalized commercial forecast service closely linked with automobile and domestic appliance producers to facilitate anticipation of end-user demand. He introduced a cost and budget accounting system to monitor company and plant expenses more closely. Inspired by his previous experience in a U.S. company, he required each division president to report annual financial results to the strategic committee. Finally, he asked to recruit new types of

²⁴ In 1982, the official retirement age of 65 in France was reduced to 60 by the left-wing government. The criterion for the CGPS was returned to 50 years of age.

²⁵ This is a kind of public business bank collecting funds from Social Security, local governments, and so forth.

²⁶ This was a special account of the French public revenue department, which granted loans to public companies.

managers, trained in business administration and marketing rather than in engineering.

These actions were designed to implement a new corporate strategy: the company would produce mostly high value-added products, with excellent physical characteristics, fast delivery times, and a large profit margin. Breaking with the previous business model, Etchegaray promoted the hypothesis that Usinor was facing a serious structural crisis, with no hope of regaining its past level of production and sales. At the time, he was alone among French steel company senior managers, whose shared point of view was based on a different model: "The steel industry relies on a regular cycle of 2 or 3 years of financial difficulties between 2 single years of enormous benefits. The role of the top managers was then to continue, even with financial risks, to invest and enlarge production capacity in order to hit the jackpot when growth returned." In contrast, Etchegaray insisted that there was a need for decisive cuts in capacity. The experienced leaders of the steel industry accused him of destroying the company's potential for recovery.²⁷ To regain profitability, he concentrated production in the more modern plants. This allowed an increase in the running rate from 50 to 85 percent and facilitated breaking even. New closures were announced. Between April and December 1979, Usinor's work force dropped from 45,000 to 40,200. The social protests were violent, and (as a consequence) the CGPS was extended.

During this period, Usinor's human resource management also changed profoundly. For the first time in history, the workers of a single plant could come from other regions, factories, or workshops to replace those taking early retirement. This accelerated the speed of promotions for every staff member, because most of the early-retired workers were at the top of the hierarchy. However, at the same time, their departure created some problems in maintaining production. Lost with these experienced workers was a lot of memory and technical and manual skills, sometimes overnight. On several occasions, productivity declined rapidly during the weeks before the newly promoted people regained control of the equipment.²⁸ Nevertheless, in the end, this internal melting pot allowed the emergence of a common and more homogeneous culture.

Facing labor trouble and tensions, Usinor had to innovate in human resource management. A bigger and centralized Human Resources (HR) Department was created. The new HR senior executive, Jean-Marie Nathan-Hudson, was also in charge of public relations and internal communication. This was obviously a response to the company's lack of networking, lobbying, and communicating (among the state, members of

²⁷ Claude Etchegaray, former Usinor CEO (1978-1982), interview by Éric Godelier (EG), Nov. 1991.

²⁸ On some occasions, early-retired workers were asked to come back to help and to teach their secrets. They usually sent the plant messenger back with a resounding refusal.

Parliament, the press, the public) during the previous period. Until the early 1970s, senior management had supported a secretive mode of doing business.²⁹

In 1981 Socialist François Mitterrand won the presidential and general election. This created great hope among workers, as one of the major themes of the election was to break with the “capitalistic” way of dealing with industrial and social problems. The main political decision was to nationalize many industrial groups (for example, Rhône-Poulenc, Matra, Saint-Gobain, PUK, and thirty-six banks—almost all of the French credit system). Of course, Usinor and its last French competitor, Sacilor (Société des aciéries de Lorraine), were also nationalized. The law nationalizing the steel companies was issued in November 1981, and shortly afterward a new board of directors was appointed. The former shareholder representatives were dismissed and representatives of the French state and of employees, mostly trade unionists, replaced them. In February 1982, the Minister of Industry appointed Raymond Lévy as the new CEO. His objectives were to regain financial autonomy, stabilize employment, and improve the coordination between the two remaining steel companies, Usinor and Sacilor. For a short time, there was a debate about market perspectives. On the one hand, the trade unions and left-wing political parties supported the idea that there were unsatisfied steel consumption needs in France that would necessitate ending the plant closures and increasing the national production capacity. On the other hand, an official report written in March 1982 by Grenoble University professor Pierre Judet emphasized that national and international steel consumption was steadily declining for several reasons, including the development of plastics and aluminum as replacements for steel and international improvement in product quality and sophistication. Partly inspired by the organization of the German steel industry, Judet supported tightening the links between the steel companies and those making products from primary steel such as wireworks. The government shared this conclusion as a first step toward a new industrial policy based on creating industrial networks connecting all companies from raw material producers to final distributors.

The recovery plan designed by Raymond Lévy explicitly used the Judet production forecast of 24 million tons per year as a reference. First, Lévy immediately concentrated long steel product production at the Longwy plant. In 1981, although Usinor had only a 20 percent share in the production of long products, they were responsible for half of the company’s losses.³⁰ The second move was a commercial diversification toward high value-added products and growing markets. This strategy

²⁹ Jean-Marie Nathan-Hudson, former Usinor Human Relations and Public Relations manager, interview by EG, Jan. 1993.

³⁰ The flat products share was 71%, the special irons, 7.5%, and the smithy and casting 1.5%.

was a continuation of Claude Etchegaray's previous policy. After a short recovery, however, the market situation worsened again. In the 1980s, Usinor and Sacilor's financial results were still negative. Instead of pausing, the companies speeded up restructuring actions.

The new direction included a decision to close Denain, the historically oldest plant in the group and almost all the Longwy sites. This step represented a loss of 6,000 jobs in Denain and 5,500 in Longwy. The total work force was 45,422 at the end of April 1979 and 40,200 in December. It dropped to 34,238 at the end of 1980, to 29,302 in December 1983, and to 27,119 in 1984. Denain was closed and Longwy retained around 500 workers, whereas in the 1960s, 30,000 workers were employed there, and there were still 14,000 in 1978. These decisions led to violent riots, and the CGPS was extended several times with new and more generous criteria (departure at 50 years). Meanwhile, the European Community tried to improve the steel market situation. Nevertheless, it was not easy to resolve differences between national industries with a variety of specializations, and the temptation was for some to push problems abroad to other countries or competitors.

Apart from the losses in long steel products, Usinor's situation was attributable to its subsidiaries' restructuring program, for two reasons. Because of the M-style organization chosen by Claude Etchegaray, the difficulties of many new subsidiaries were integrated into the group. The mother company had to recapitalize them and sometimes help with financing their investments. Because of the government's industrial policy, this situation continued after 1981. Usinor was obliged to narrow the distance in its relationships with its primary industrial customers by helping them or sometimes by becoming a shareholder. For instance, in 1982 the company had to take a 15 percent share of a shipyard, the Société de participations et de Constructions navales, a step that worsened Usinor's cash flow problems. In June 1983, 20 percent of its losses were attributable to the subsidiaries. Lévy criticized this industrial strategy several times, highlighting the financial burden it created. He also argued for improving industrial and commercial coordination with Sacilor. In fact, Usinor and Sacilor were in competition in both long and flat product markets. This led to a rate of equipment utilization of only about 60 to 70 percent in long product plants, for example, and slowed down the recovery process. Lévy made public certain statements and some of the letters he sent to the Minister of Industry, Jean-Pierre Chevènement, which later led to his dismissal. Nevertheless, they established some cooperation in 1984, and two common subsidiaries were created: Unimetal for long products, and Ascometal for special flat products. This operation was a first step toward the 1986 formal merger and the creation of a holding company, Usinor-Sacilor.

Raymond Lévy was also innovative from a managerial point of view. He developed the multidivisional structure implemented by his predecessor. He also brought management models and tools from Elf-

Aquitaine, a big nationalized gas and petroleum firm, where he had spent almost twenty years. In 1981, an internal audit service was created. Linked to the Finance and Accounting Department, it was in charge of evaluating the operational aspects of accountancy and speeding up accounting normalization within the company. In 1983, a Communication Department, autonomous from the HR Department, was put in charge of internal and external communications. Merged with Sacilor, Usinor changed from an M organization to an H organization.

In September 1986, the right-wing Minister of Industry, Alain Madelin, chose Francis Mer as the new CEO of Usinor-Sacilor.³¹ His mission was to restore the company's competitiveness and profitability before the deadline imposed by the end of the protection created by article 58 of the European treaty. Things improved slightly and in 1988, for the first time since the oil crisis started, results were positive. The new company was then involved in four different businesses: flat steel products (42 percent of income), long steel products (19 percent), special irons (15 percent), and metallurgy and transformation (12 percent). Francis Mer also organized several distribution subsidiaries gathered in three types of businesses: production, transformation, and distribution. Despite the improvement in the economic situation, social restructuring programs continued. In 1989, 4,970 workers left Usinor-Sacilor, 90 percent using the CGPS. This early retirement scheme was once more extended until 1991, and 5,000 additional people benefited from it.

A big strategic change occurred during the late 1980s and early 1990s: the company undertook multinational industrial and commercial development to create a presence on five continents. Two main actions were launched: international takeovers and technical or commercial agreements with other companies. Under this plan, it was supposed that Usinor-Sacilor or its counterparts should have a plant specialized in one product category, avoiding competition with other plants and products in the same area. This was possible, thanks to benchmarking the strategies of automobile and domestic goods producers around the world, as in Detroit in the United States, or following Nissan around Europe. For instance, in 1989, the company took control of the German Saarlöhne, and, in 1990, of several U.S. corporations, including Techalloy and Jones and Laughlin, for a total amount of 7 billion FRF. Obviously, in the 1980s the state put on pressure for diversification, which had not been previously attempted on a large scale. Usinor-Sacilor concentrated its investments in steel or metallurgy branches. In contrast, companies like Nippon Steel were involved in chemistry or telecommunications.

Nevertheless, the corporate situation was fragile. From 1991 to 1994, the group faced heavy losses once again, and its debts were still very

³¹ Between Mer and Raymond Lévy, another CEO was appointed, but he essentially extended the work of his predecessor.

significant.³² The European Community rules did not allow the French state to intervene. In 1991, Crédit Lyonnais took a 20 percent share in the capital of Usinor-Sacilor. The company also started to sell businesses not directly engaged in high value-added and quality products or in making flat products. These steps brought some cash flow back. However, another change in the political majority led to a new series of privatizations.

PUK: When Nationalization Repaired Earlier State Action. At the end of the 1960s, the Pechiney Group was probably the most international of French firms. It was “the” firm where one could easily find English-speakers, with managers trained in American universities after finishing their studies in France, and engineers working in and with foreign joint ventures. The group had established itself on four continents. However, it was still a very French corporation with careful attention to the location of sensitive activities like research centers (all in France at that time), to its choice of partnerships, and to the writing of contracts. It was a French multinational firm whose major interest was aluminum, which was the heart of the group. The aluminum industry was already very highly capital-intensive, and all decisions had a long-term impact. Nevertheless, just before the merger with Ugine-Kuhlmann in 1971, the Pechiney Group had a very good position in the aluminum industry. Its international expansion compensated for the effects of decolonization and the increased difficulties with the newly independent states over negotiations for raw material prices.

Until the mid-1960s, Pechiney had very few interactions with the French state, but when the rules of the EEC began to have an impact on the firm, things changed. The managers asked for state support as often as necessary: to avoid the takeover of the French downstream firm Tréfilimétaux by Kaiser, or to finance R&D programs with public funds (which began in 1967), or to influence the former colonies’ activities through diplomatic action. Slowly but surely, state industrial policy began to permeate Pechiney’s strategy. It became more common for high-level managers to come from a ministry; it was the end of the “boss-owner” top manager era. With this evolution, a technocratic class mixing civil servants and business managers began to control the Group’s senior management.

Traditionally, since the beginning of the Fifth Republic in 1958, the president and the prime minister had determined significant economic and industrial developments. Even though policy became more liberal with Charles DeGaulle’s successors, Georges Pompidou and Valéry Giscard d’Estaing, state agencies continued to define the main policies. The intent

³² From 20.8 billion FRF in 1989, the debts climbed to 27.8 billion because of the new subsidiaries’ difficulties.

of the policy was to favor the setting up of large French companies able to compete on an international scale.

When Ugine merged with Kuhlmann in 1965, a high-level civil servant explained that it was the implementation of the French plan, the result of the Industrial Development Committee working group. In fact, it was an attempt to organize the chemical, oil, and steel industries. In the case of the Ugine-Kuhlmann merger, it was a severe setback, because there was no reorganization, no structural evolution, and no unity of action in the chemical and nonferrous metals sector. The managers of the new firm failed to act, and the banks reacted by searching for new partners. Between 1968 and 1971 the managers of U-K tried to merge with many chemical or steel companies, without success.

Naturally enough, following the state economic plan imposed by President Pompidou, the Pechiney Group was asked to help U-K, even more so because Pechiney had succeeded in its downstream integration and merger with Tréfinmétaux. At the time it was said that Raoul de Vitry symbolized a paternalistic model and Pierre Jouven a restructuring program and reorganization, and that Jouven was able “to make a selection from among the investments to improve as quickly as possible the return on investments and marketing efficiency.”³³ The Pechiney Group’s managers were more industrialists than bankers, and it was in that spirit that they approached the U-K merger. Pierre Jouven and his team thought that they could reinforce the aluminum sector, diversify production, and concentrate capital. Although all those arguments were correct, the Pechiney Group also had a very good public image and a strategic asset: its technology. This was not the case for U-K.

In the subtle relationships with high-level civil servants, bankers, and French economic planners, it was difficult for Jouven to refuse the merger with U-K, all the more so because PUK became the first private industrial group with more than 13 billion FRF of income. In 1971, the merger was complete and after a century of competition, this conglomerate, with much more diversified activities, remained the only primary aluminum producer in France. Pechiney-Ugine-Kuhlmann strengthened its position in nuclear fuel, heavy carbonaceous products, carbon and graphite components and systems, special steels, and turned to chemistry again.

Jouven thought that he could create a new strategy as he had done in 1967, but immediately after the first oil crisis, and even more after the second, he realized that the merger could not succeed without the support of banks and the state. The government had other priorities, however, especially with the steel industries. Until 1974, it was a slow but sure descent into hell. Jean Gandois, Pechiney’s CEO in the mid-1980s, said of this merger, “the French government wanted to unite the great sick firm

³³ PUK first Annual General Meeting 27 June 1972, Pechiney Archives. See also, Michel Beaud, Pierre Danjou, and Jean David, *Une multinationale à la française, PUK* (Paris, 1975).

U-K to Pechiney, the flagship of French industry.”³⁴ The two oil crises provoked heavy financial losses for PUK. Its main markets (cars, the building industry, and aeronautics) had seen considerable price increases, creating a decline in all PUK sectors. After Jouven retired in 1975, the new CEO, Philippe Thomas, had to reorganize the conglomerate. He confirmed that aluminum was still at PUK’s heart, developing the main electrolysis research center to preserve its high level of technology. He did the same with the Voreppe research center (near Grenoble), which became the central laboratory for general downstream research. He rationalized the company’s structure by merging Pechiney and U-K’s aluminum, nuclear, and steel sectors.

From a social perspective, there are many differences between the aluminum and steel industries. Because of the numerous mergers and the existence of very different industrial sectors with many different trade-union agreements, the social protests were not as violent as with Usinor. The “May 1968 syndrome” did not affect the firm. However, workers at the smelting unit of the Noguères aluminum plant (in southwestern France) did go on strike in 1973. It was not the first conflict in this old firm, but this strike had ominous overtones. During strikes, workers usually maintained production tools in good condition, because if they did not watch over an electrolysis pot, it would “die” (in the vocabulary shared by engineers and workers). For the first time in Pechiney’s history, the workers let the electrolysis smelting pots shut down. This was a serious conflict with determined workers, but it was a conflict from a time different than May 1968. The oil crisis had ended paternalistic organizations. Workers went back to work without gaining significant advances because the general manager did not have the money to negotiate. This conflict led to a loss of trust between managers and workers: the workers did not believe the senior manager when he explained that PUK was not in a good position; managers always suspected that the workers would intentionally let the smelting pots die again. The result was a very bad social climate. Labor costs regularly increased following inflation, leading management to think about having as few workers as possible in the plant. The new electrolysis plant opened in Dunkirk in 1991 embodied the results of the new research programs.

In France during the 1970s, public opinion turned against industry and business. It was a complete divorce. The managers were bitter and the public thought that giant capitalism was entirely responsible for the economic crisis. Pechiney’s management was perturbed, unable to communicate or to explain what was happening to the Group. Management with transparency also was totally unknown in this firm. A corporate culture built on innovation secrecy was part of its past success. The best example of this was a pollution crisis in the Maurienne Valley in the early

³⁴ Jean Gandois, quoted in Karlin and Lainé, *La multinationale, voyage au cœur du groupe Pechiney*, 17-18.

1970s. Management's instructions were to deny responsibility, and PUK became a media target. Belonging to management then was not easy.

Thus, Pierre Jouven's strategy failed because he did not prepare the firm for a more public view of its social, economic, and even ecological policies. He was the vertical integration and international strategy man, who worked as if the growth and supremacy of primary aluminum would go on forever. His strategy never included the idea that the general environment could change.

Throughout the same year, 1973, the prime minister of Guyana promoted the idea of an association of public and private bauxite producers to demand a greater return on bauxite. By the end of 1974, the majority of bauxite producers had joined the International Bauxite Association.³⁵ Even if each of the Big Six tried to negotiate, individually, with each national bauxite producer, the price increased. To end the disruption among the aluminum companies, in 1979 the London Metal Exchange began to quote primary aluminum. This futures market had been created at the end of the nineteenth century to cover the transport time of raw materials. It served as a regulating market to guarantee a correct price that included transport costs. Today, it is a speculative exchange; traders set a price and each day sell the equivalent of one month of aluminum production. Some aluminum traders negotiate aluminum as far as 27 months in advance. In the early 1980s, for the first time, fluctuating aluminum prices became a permanent feature. It was the breaking point for PUK's managers, who now had to manage the vicissitudes of price cycles. The Big Six lost the control of aluminum prices they had enjoyed for a century.

In 1979 CEO Philippe Thomas ceded non-aluminum wire cables to Pirelli and pursued international development, selling electrolysis technology, turnkey factories, and technical aid. This was not enough. His attempted reorganization failed because the merger was unexpected in the aluminum branch, where engineers who were not former competitors could easily cooperate. The rest of the firm supported the status quo. The Group was a feudal system under which the CEO had great difficulty imposing his strategy. In 1981, PUK dropped from first to eighth among French industries. The steel and chemistry sectors were jeopardizing the Group.

PUK was nationalized in 1982 by the new government under Mitterand not only to save it from bankruptcy. The Socialists' program for the presidential and general elections included nationalizations as a way for the state to own economic instruments in strategic sectors. The Socialists said that they could preserve employment, improve working conditions, and develop academic and industrial R&D. In this program, the

³⁵ Steven Kendall Holloway, *The Aluminum Multinationals and the Bauxite Cartel* (London, 1988).

aluminum industry, by tradition and because of its high-performance technology, was a symbol.

During the 1980s, there were three senior managers at Pechiney—Georges Besse (1982-1984), Bernard Pache (1984-1986), and Jean Gandois (1986-1994)—because of the changeovers between left- and right-wing parties. Only Besse and Gandois proposed and implemented a real strategy.

Georges Besse cut sharply into PUK's activities, using drastic remedies. In 1982, he ceded the steel firm Ugine-Acier to Sacilor and sold coloring activity to ICI. The following year he abandoned chemical activities to Rhône-Poulenc, Elf-Aquitaine, and CdF Chimie. In 1983, the group recovered the name "Pechiney." Besse closed many plants in historic sites in the Alps and the Pyrenees and sold Pechiney's shares in the non-affiliated subsidiaries, keeping only the metallurgic joint-venture shares. However, he supported continued aluminum development with Australian partners. They opened a complete new aluminum industry complex (bauxite, alumina, and aluminum) in Tomago, Australia, with less polluting French technology from the research undertaken to establish Pechiney Nederland many years before. Besse's program constituted an extreme action, but it was the price paid for the renewal of Pechiney. After this major restructuring program, he had further plans to reorganize Pechiney to enhance its competitiveness, but he was named CEO of the automobile firm Renault before those plans could be implemented.

In 1986, when Jean Gandois became CEO, his mission was the privatization of Pechiney. After balancing the accounts in 1987, he sold the copper sector to the Italian firm Metalli to complete Georges Besse's work. Between 1982 and 1986, Pechiney concentrated its forces on traditional trades, developing electrometallurgy and opening a new aluminum plant in Bécancour, Québec named ABI (Aluminerie de Bécancour) in 1985. In 1986, the rolling mill at Neuf-Brisach was enlarged to become one of the biggest, and the Saint-Jean-de-Maurienne plant was modernized with the introduction of the large-scale electrolysis cells invented by Pechiney's researchers.³⁶

Gandois was not a neutral choice for CEO. In 1971, he was the general director of the Lorraine steel industry, where his job was to implement an earlier restructuring plan and shed 12,000 jobs in a mono-industrial region. He then became Sollac's president and Rhône-Poulenc's CEO.

"Denationalizing" Pechiney was a possibility, and the media speculated whether Rhône-Poulenc or Pechiney would be first, but the stock market crashed, postponing privatization. Furthermore, Mitterrand won the presidential election again in 1988, and just before the election had said "Ni-Ni"—neither more nationalization nor more privatization of French corporations. Therefore, Gandois decided to work out a strategy for the future. He knew that aluminum had been Pechiney's soul for a

³⁶ Le Roux, *L'entreprise et la recherche*, 382.

long time. However, the firm had not had a strong project since the 1971 merger, and Pechiney's scale was underdeveloped for becoming a multinational company again.

It was impossible for the firm to escape the cycles in aluminum prices: in 1988 a ton of aluminum sold for more than \$3,000; in 1994 it cost \$1,100 (\$1,775 in May 2005). Because it was a nationalized firm, Pechiney's capacity to increase its capital was limited, but its capitalization was low. Gandois had only two choices for developing Pechiney: reduce the weight of the aluminum sector in the group or increase and develop around this sector, somewhere. The first solution was risky for Pechiney even if the firm would need to develop its traditional market, whose growth had been and continued to be slow. Therefore, he chose to diversify corporate activities. According to Pechiney's archives, it seems that he had no other choice.

Ironically, the Socialists made it a priority to reconcile the French to the importance of business. Henceforth, the public knew that healthy firms were essential for international competition. Thus, in November 1988 the left-wing prime minister Michel Rocard told the French in a television address: "great news for France: Pechiney bought American National Can to enlarge and develop the packaging sector in the group . . . and will build a new aluminum plant in France." At that time, politicians, French executives, and everyone thought that the common phrase, "In France aluminum is Pechiney, Pechiney is aluminum," was true. Therefore, people thought that fate was fair and that the company was obtaining its just reward. The French state, once again, had interfered in Pechiney's strategy, again with management's agreement.

In fact, the Aluminium Pechiney manager, Maurice Laparra, was convinced that Gandois decided to build a huge primary aluminum plant in the north of France at Dunkirk ("Aluminium Dunkerque") to balance the packaging investments made with the aluminum profits that had accrued when the cost per ton was \$3,000. Even if Laparra was partly right, there were many reasons to locate a large aluminum plant in France. First, Pechiney was definitely number one with its electrolytic process. So building a new unit integrating technological innovation was easy.

Second, after more than fifteen years of industrial crisis for both Pechiney and Jean Gandois (as steel industry manager), it was felt that Pechiney's social policies must become an example for other enterprises. With the help of Martine Aubry, Pechiney's general director (and member of the Socialist Party and close associate of Pierre Mauroy, Lille's mayor), they created a new labor hierarchy with only three levels and with priority given to the recruitment of unemployed workers native to Dunkirk and the surrounding area, whom Pechiney would train. There were three hundred external recruits. More than 1,200 people applied for jobs, including the majority of recruited workers. There was little appreciation of the new plant's management style when production began, but introducing the notion of responsibility at each level completely changed the work

atmosphere. If some people were doubtful, nevertheless everyone agreed that, in this new management concept, the human being was central. Today this view is widely shared, and it has become a major force in changing French business organizations.

Third, for the first time since the nationalization of the Pechiney hydroelectric power stations in 1946, the French state was associated with an industrial project. Electricité de France was a partner with Pechiney in Aluminium Dunkerque. The involvement of politicians, national policies on nuclear-powered electricity, local policies favoring a region with one of the highest levels of unemployment, and Gandois's desire to locate the flagship of the aluminum industry in France explain the building of Aluminium Dunkerque. In 1994, Gandois' last year as Pechiney's CEO, Aluminium Dunkerque produced 215,000 tons, compared with Aluminium Pechiney's one million tons per year. Each worker produced 400 tons a year, when the best American output per capita was around 350 tons. The price per ton cost was the cheapest in Europe, around \$1,000, so returns depended on the London Metal Exchange aluminum quotation. Even if Alcan had not bought Pechiney, the new location jeopardized the historic plant location in the French mountains, and, in consequence, the location of the most important primary aluminum research laboratory.

The renewal of Pechiney supposed a new location and aluminum complex in the United States, Canada, or Australia. Aluminium Dunkerque was the first step toward this European evolution.

Back to American National Can. When Jean Gandois announced that Pechiney had taken over the world's number one packaging company, American National Can, the employees, from the general manager to the workers, were stunned. It had been hard for them to accept that the stable price period was really over and that poor years would be more frequent. So buying an American company seemed incredible, even if it was one involved in aluminum packaging. It was a turning point in Pechiney's history. There were two objective consequences, and one subjective one. First, Pechiney's scale changed: its earnings grew from 40 to 80 billion FRF, and the number of employees doubled. Second, for the first time primary aluminum did not provide the main part of the corporation's annual earnings: packaging accounted for 46 percent; aluminum, 26 percent; international trade, 11 percent; turbine engine components (Howmet), 8 percent; and miscellaneous industrial activities, 9 percent. Gandois hoped that this takeover could establish the corporation's position in a non-cyclic and heavy growth sector: drinking cans. Moreover, workers and the public were proud of the "conquest." The media trumpeted on the front page Pechiney's role as a new industrial leader in the American market; with more than 20,000 American employees, it was the leading French company in the United States. With the acquisition, Pechiney was set up in seventy nations on five continents as the leading packaging producer, before the Japanese firm Tokyo Sekan.

The packaging activities included not only aluminum drinking cans, but also steel cans, glass and plastic bottles, food packaging, and beauty care and medicine packaging. Pechiney had twenty-six research centers, twenty in France and six in the United States. It was a great business decision.

Unfortunately for Pechiney, in November 1989 the Berlin wall fell, heralding the end of the Cold War and the collapse of the Union of Soviet Socialist Republics. Gandois, like many others, did not anticipate this historic event in his strategy. The disorganization of the Soviet Union's economy allowed both legal and illegal trade to flourish. In a few months, the Russians began to sell raw materials in huge quantities at a very low price, including primary aluminum at prices lower than had ever been available. Russian aluminum's low cost jeopardized Pechiney's efforts to renew its international competitiveness. All activities without direct links to primary aluminum and packaging were sold between 1991 and 1993 to support Gandois's American strategy.

No one knows what Pechiney's history might have been without the merger with U-K. The managers' archives show that the balance sheet remained fragile, and that the firm was never able to recover the international position it had held before the merger. Nationalization gave Pechiney time to build up a strategy focused once again on the aluminum industry.

Back to Capitalism? The Future and Privatization, 1995-2005

In 1993, the Socialist Party lost the general elections. As promised, the new right-wing government decided to privatize Usinor-Sacilor and Pechiney. In this way, from a symbolic and prestigious national position, the steel industry became a more common capitalist industry.

Continuity and Changes: From Public Oligopoly to Private Regulation. In May 1995, the estimated value of Usinor-Sacilor was 15.7 billion FRF with a share price around 90 FRF. Privatization was a success, but only 77 percent of the company's capital was sold, 55 percent of which was reserved for institutional investors, mainly those with public status. Usinor-Sacilor changed its name to Usinor. At that time, the company employed 46,300 people in France—compared with 1974, when the total number of steel workers had been 164,000. This privatization created very few social or trade union reactions. Obviously, by this time the steel industry had already lost most of its symbolic and economic importance and become a “common” industry and Usinor, a common company. The change in the mode of governance had an influence on strategy: from then on, the results of Usinor's activities would be carefully monitored by the stock market. This led senior management to adopt new plans and to reorganize the company's structure.

They installed a profit center, mainly the various Usinor plants, but the result was not satisfactory, because profit center logic supposed relatively

autonomous plants, whereas Usinor's were closely linked to product flows and therefore interdependent. The stock market also reacted negatively to the strategy, which seemed far too specialized in flat steel products. For instance, in 2001, when the flat product markets were in bad shape, the share price fell immediately. Usinor was trying to maintain its concentration strategy and to reach the break-even point with a huge sales volume, but such a strategy did not allow the company to benefit from the differences between business economic cycles in the flat product and long product markets. This realization encouraged a strategy change based on a new division of the European steel markets and new international technological and commercial agreements. A period of new concentration began, partly accelerated by the 1993 European unified market and the worldwide removal of commercial barriers. In fact, the steel industry was less concentrated than some others were. For instance, at that time, only two companies, Posco (South Korean) and Nippon Steel (Japanese), exceeded 3 percent of the world's production. In 1998, the two German companies, Thyssen and Krupp, merged; British Steel and the Dutch Hoogovens created the Corus group, and Usinor bought a large capital share of the Belgian Cockerill-Sambre. With Arcelor's creation in 2001, bringing Luxembourg's ARBED and the Spanish Aceralia with Usinor, it was the logical continuation of recent history of restructuring.

Usinor controlled the majority capital share with around 52 percent, with a 48 percent share for ARBED and Aceralia. The head office was located in Luxembourg, and Francis Mer, former CEO of Usinor, was appointed president of the board.³⁷ Arcelor kept the four-business structure largely inherited from Usinor: carbon flat steel, carbon long steel, stainless steels, and distribution. With 110,000 employees, a 30 billion Euro income, and 5 percent of the world market, it is the leading steel company.³⁸

Does this mean that early in the twenty-first century restructuring is now over? The answer is probably "no" because of the dominant position of the new company, which has been criticized by the European Commission. There have been repercussions in European markets, and in 2001 Arcelor sold several plants and companies to satisfy European economic regulations. Furthermore, there might be some European closures and rationalizations to simplify the corporate structure and production system. But, apart from its international aspects, Usinor's strategy has not changed since the early 1980s: it is to increase the production program of a few plants specialized in a particular product in a

³⁷ Francis Mer was appointed Minister of Economy, Finances, and Industry in the new government of Jean-Pierre Raffarin in 2002. He left office in 2004.

³⁸ With 45 million tons of iron a year, compared with Nippon steel at 28 million tons a year; Posco, 27; LNM Ipsat (India), 22; Corus (United Kingdom) and NKK (Japan), 20; Thyssen Krupp (Germany) and Baoshan (China), 17; Riva (Italy), 15; and Kawasaki (Japan), 13.

specific geographic area. This policy has led to staff reductions.³⁹ The strategy increasingly relies on international agreements.

There have been several negotiations and agreements launched since the late 1990s. For example, in 2001, Usinor and Nippon Steel expanded their carbon flat steel agreement to include technology transfers, research capabilities, and results or patent exchanges, with no capital cross-participation.⁴⁰ Using such agreements, steel companies can follow their domestic customers around the world through subsidiaries or local partners without investing heavily. This is helpful given the companies' weak financial resources and their low stock market capitalization.⁴¹ Each steel company belonging to the network can offer a large range of products with the same technical specifications. The members can therefore simultaneously increase equipment profitability, reactivity, and flexibility in regional and domestic markets.

The creation of Arcelor is probably the first event pointing to a new era of large mergers and restructuring programs around the world. The recent threat of a commercial war between Europe and the United States shows that world overcapacity in steel is still an issue.⁴² One must emphasize, however, that only a very limited number of firms would be for sale. In Europe, privatization could occur at a few steel corporations from the former Communist zone; the others, in Western countries, are often in a difficult position and would require heavy financial investment for restructuring. Thus, the financial fragility of steel companies can temporarily hold off new takeovers. However, at the same time, China's economic growth dramatically increases that country's demand for steel. Arcelor could be considered a world champion.

Although the 1980s and 1990s industrial and social restructuring program was successful, the social and political costs were enormous, estimated to be 100 billion FRF for the period. In a way, this underlines the symbolic weight of the French steel industry. These choices were also the result of social struggles. Traditionally, steel had the greatest number of militant unionists, especially from the Confédération Générale du Travail. From a social perspective, the north and east of France were devastated. Denain, for instance, had the biggest factory in Europe in the 1960s with 12,000 people; fewer than 500 were employed there by the

³⁹ Probably more than 3,000 people.

⁴⁰ Other agreements were signed around the world at the same period—for instance, Nippon Steel with Posco, China Steel (Taiwan) with Thailander Siam United Steel.

⁴¹ Usinor's market capitalization, for example, represented only 50% of its net assets, which is the European average. The European steel companies' total market capitalization represented only 1% of the total stock market capitalization.

⁴² In Dec. 2001, seventy U.S. steel producers urged president George W. Bush to introduce high tariffs on steel imports to prevent further U.S. bankruptcies (twenty-seven companies had already declared bankruptcy).

early 2000s. In a nearby town, one-third of the houses are for sale; the unemployment rate is one of the highest in France. It is possible to conclude that the labor model inherited from the nineteenth century, based on qualified unionized steel workers, died with the closures. In the French presidential and general elections in 2002 the far right party of Jean-Marie Le Pen reached some of its highest vote totals in these parts of the country, where in the past the Communist and Socialist parties were usually far ahead.

“In France Aluminum Is Pechiney and Pechiney Is Aluminum”: Was It True? The main goal for a firm is to produce. An entity with a multinational status must compete by international economic rules. That was Jean Gandois’s plan, but he could not anticipate that a major historic change, the collapse of the Soviet Union, could interfere with his strategy.

Gandois failed in integrating American National Can with Pechiney because of the aluminum cycle. Less than three years after the takeover, the price of aluminum per ton dropped to \$1,100; the future looked dark because the cost per ton was around \$1,000. Gandois’s plan was a strategy devised for a more stable day, trying to pursue profits and resist decline in a known environment.

Russian plants were highly polluting. Pechiney tried to negotiate an exchange of its less polluting electrolysis technology with Russian producers for limited export of Russian aluminum. The European Union did not strongly support this initiative, which would have required international negotiations. Pechiney also tried vainly to convince Alcoa and Alcan to bring about an agreement with the Russians to respect a real cost price. Meanwhile, all aluminum producers lost a lot of money, and the smaller were not able to compete. The Spanish and Dutch were in danger, as were the members of the Big Six. Alcan bought Algroup (Alusuisse Lonza Group) in 2001.

What could Gandois have done? In the early 1980s, the firm was in poor condition. Georges Besse and Jean Gandois revived Pechiney, and to survive the company needed to develop its activities. As historians, we place our analysis in a general context. In 1988, to prepare for privatization, the takeover of American National Can was not a bad idea. In any case, Gandois did not have many business options.

From an internal point of view, Gandois probably did not explain and communicate his strategy well enough to the French aluminum workers, although he always told the truth and always worked with an open mind. Aluminium Pechiney’s engineers, managers, and workers felt guilty about the low profits, but in the 1990s, prices became even more unstable. After the takeover of American National Can, Aluminium Pechiney could have had its “own private customers” among its subsidiaries, and indeed Daniel Karlin and Rémi Lainé’s work showed that officially all the Pechiney firms bought 80 percent of their primary metal needs from Aluminium Pechiney, but also 20 percent from the Russians and from Alcoa and Alcan. For example, the main French subsidiaries Rhenalu and Cebal,

working for Coca Cola or L'Oréal and Colgate, did that. It seems that the reality was worse for Pechiney than the potential advantage. There was a contradiction in management between the logic of the corporation and immediate business needs, but everyone knew that. All the subsidiaries' managers were caught in this contradiction. Gandois knew that, too.

Perhaps we can explain the managers' malaise. Pechiney's management was very hierarchical; Georges Besse and Jean Gandois tried to break down strongholds, and they partly succeeded. But the internal rivalry between the "noble" primary aluminum sector and "the business downstream sector," which still existed before the takeover of American National Can became more intense afterward. Gandois probably underestimated the effects of cultural heritage. He failed to mix the teams, and corporate cross-department functions could create links only with subsidiaries working in the same sector. The R&D director should have required the research center managers to meet once a year to exchange knowledge. Furthermore, although the executive committee contained outstandingly intelligent people, Gandois could never manage to create a real collective team, and rivalries persisted. During the 1980s, managers and engineers had to integrate a managerial logic: stock reduction and competitiveness. There were two new imperatives: producing absolute and consistent quality, and listening to customers. They had done very well, but the new management added to the sophisticated technology, creating more rigidity within the firm.

Pechiney had never existed as an "Aluminum and Packaging group." American workers were quite indifferent because Pechiney was an industrial group, so nobody feared its takeover, and French workers were bitter because of the adverse situation. Investment was balanced between Europe and the United States, but old-plant closures were non-negotiable.

In July 1994, Gandois, before leaving Pechiney, said that it was impossible to privatize the firm, which was in poor condition once again because of the price per ton of aluminum. The group went into debt. Whatever one's opinion of Gandois's management, his vision was excellent, because Pechiney could not develop without a strong position in North America.

Jean-Pierre Rodier was named CEO in July 1994. The corporation had many debts stemming from the American National Can takeover, but it had been a long time (before 1971) since Pechiney had had strong capital. Rodier wanted to privatize Pechiney as quickly as possible. Once again, the French state's influence explained the strategy. The government changed its position: the influence of the theory that the "French state must have its national champion" in the industry was now remote. The economic crisis was serious in the mid-1990s, and the right-wing government wanted to reduce its activity as a business shareholder. In 1995, the new CEO proposed a "challenge plan," an important audit designed to change management methods and develop or improve efficiency.

To begin, Rodier decided to cut Pechiney's debt without having a real plan for the firm after privatization. Therefore, he ceded the best assets, which were more easily negotiable, such as the American turbo-engine firm Howmet (which had belonged to Pechiney since 1962) to Alcan. He did the same with other subsidiaries with good incomes. There remained "only" the aluminum industry and some joint ventures in the drinking-can sector, which was as cyclic as primary aluminum. After eighteen months, Pechiney was privatized. The firm appeared weak, without any plan or clear strategy, and worse, the majority of intermediate managers and some of the senior managers thought that the firm's organization had lost its efficiency.

Privatization was not well accepted, and the decision permanently influenced Pechiney's destiny. The firm went through many restructuring programs and cost-cutting measures, and many consulting groups wrote reports. Industrial disorganization was the consequence of an unclear vision for the future. According to an anonymous high-level manager quoted by *Le Monde*, Pechiney probably lost 15 percent of its earnings in 1999-2000, which were economic growth years.⁴³

Furthermore, this evolution transpired contrary to Pechiney's culture. Workers, managers, top managers—nobody understood Rodier's strategy or his "language." Even though Jean Gandois was an industrial manager, he had some difficulty explaining his decisions; Rodier appeared as a technocratic manager with no credibility at all with the workers and mid-level managers. As the social atmosphere worsened, most of the top managers left the firm. This important brain drain explains the confusion in which Pechiney found itself. The CEO led the firm as an executive to satisfy a new element among the shareholders, the American pension funds. In 2003, at the last annual meeting, the annual report said that international investors owned 55 percent (40 percent were American) of Pechiney's capital. To satisfy them, Rodier's investments included the aeronautic and plastics industries instead of Pechiney's heart, aluminum. For almost ten years, Rodier himself had not supported the aluminum industry. Even R&D, the way to survival, was not spared.

R&D was traditionally a major activity for Pechiney. From its origins, one and a half centuries earlier, the firm had conducted research, alone or with industrial and academic partners. The main goals were to improve its processes and its products in order to have lower prices and higher quality. In the aluminum industry, R&D required huge investments in equipment and research personnel and was as sophisticated as the pharmaceutical industry. Researchers needed almost ten years to invent a new generation of electrolysis cells, to create new packaging, to address environmental questions, or to produce new alloys for Ariane Espace or Airbus Industries. Management needed a similar amount of time to train high-level researchers. Effective R&D assumes an R&D manager who knows the

⁴³ *Le Monde*, 19 Dec. 2003.

scientific pool. No one was recruited after the R&D manager left in 1997. Research requires money and hope, but the CEO gave neither. Pechiney's excellent R&D was the crown jewel of the company, and Alcan knew that. We think that Pechiney's R&D was the main target of Alcan's takeover strategy.

A recurring question in the business historian's mind is: What was Pechiney's responsibility for its demise? In their book, Daniel Karlin and Rémi Lainé wrote that during the 1980s, one of Pechiney's managers said that selling its own technology would lead to the company's death.⁴⁴ Nobody wants to fight against superiority in science and technology research. The manager pointed out that in 1994, on the eve of its privatization, Pechiney produced the same quantity of aluminum with 2.5 times fewer workers than in 1970. Pechiney began to sell its technology during the 1930s and by the end of the 1990s more than 90 percent of electrolysis cells came from the Pechiney industrial research laboratory, Laboratoire de recherche de fabrication de Saint-Jean-de-Maurienne. For the new producers (very often located in countries where labor costs are much less expensive), it was possible to sell at a loss. Pechiney often sold its technology to countries with no potential market, transforming newcomers in the primary aluminum sector into exporters. The question for the downstream sector is complementary. R&D, in inventing new processes, suggested that very soon an entire aluminum industry could be located at one site from bauxite to semi-finished products (refining, smelting, foils, forgings, wire and electrical conductors, and so forth) for continuous industrial production to increase productivity. This evolution suggests that the aluminum industry became more and more capital-intensive, employing fewer and fewer people, thus creating contradictions for management, frustrations for the workers, and incomprehension for the citizens who had paid for the company's nationalization, when Pechiney disappeared in the takeover by Alcan.

Who was responsible for this takeover? In this type of industry, senior managers must always have a strategy. The aluminum industry, like the steel industry, is like an oil tanker in a storm: very difficult to maneuver. Decisions commit the firm for more than ten years. Until the beginning of the twenty-first century, multinational firms had a nationality; this was true for Pechiney, Algroup, and others. Today things are different. The collapse of the Soviet Union probably created a truly open world market where competition has become a struggle for life. It has become difficult to work in a world with no rules. It was probably this important rupture (not often cited by French business historians) that explains the history of French firms in the early years of the twenty-first century; some firms have adapted, while others are dead.

It was not easy for Jean-Pierre Rodier to choose between aluminum and speculation. Compared with Arcelor, Pechiney was privatized only a

⁴⁴ Karlin and Lainé, *La multinationale, voyage au cœur du groupe Pechiney*.

few months too late, during a difficult economic period, making it possible for a majority of foreign shareholders uninvolved in the aluminum industry to control its capital. In complete contrast to Arcelor, which developed its steel positions roughly at the same time, Pechiney's CEO abandoned aluminum investment, when the other medium-size primary aluminum producers were busy consolidating their positions or merging (Alumax, Reynolds, Vaw, Hoogovens, Algroup). Jean Gandois's predictions were exactly right; alliances were an obligation because Pechiney was not big enough.

It is also true that the French government did not have a clear position concerning Pechiney. Just before Gandois left Pechiney, the government refused a merger between Pechiney and Compagnie générale du Rhône. Rodier explained in *Le Nouvel Observateur* news magazine that the date and pace of privatization were the result of state policy, and the government did not want to wait to allow Pechiney to recover a better cash-flow.⁴⁵ More important, when the European Union (EU) commission members refused to allow the APA (Alcan, Pechiney, Algroup) merger, the French government did not support Rodier's 1999 action to intercede on behalf of the creation of APA.

After that, it seems that the CEO did not know how to react. Pechiney did not try to gain control of the German aluminum firm Vaw, thinking that Brussels would refuse once more. The Norwegian Norsk Hydro did try to become the first European aluminum firm, in itself a signal that Pechiney was weak.

During summer 2003, when Alcan made a hostile takeover bid, the Canadian firm said it would complete the takeover only if, unlike the case with APA, the EU did not make a detailed inquiry. The EU did not, and by December 2003 Pechiney was dead. Henceforth, Alcan owned Pechiney's technology. Alcan succeeded where Alcoa had failed a century earlier, when Alcoa wanted to buy the French inventor Paul Héroult's patent.⁴⁶ Alcan made some commitments to maintain Pechiney, but in 2005 those trying to visit Pechiney's website are forwarded to Alcan's site. When the French media regularly publish articles about Alcan's closures in France, the French state policy is coherent; because the French state wants to reduce its involvement in the industrial sector, no one has said anything about Pechiney since 1995. In contrast, there was much ado about Alstom's case (involving Compagnie Générale d'Electricité/Alcatel).

What is clear is that if French firms cannot survive it is not only an economic or a strategic question, but also a matter of culture. In the case of Pechiney, it is notable that few managers were able to analyze a setback as a setback. For them a mistake was not a mistake, but a sin. In contrast, in the case of Arcelor, we can assume that crises and the earlier international struggle educated the managers and probably prepared them

⁴⁵ *Le Nouvel Observateur*, week of 17 March 2005.

⁴⁶ Le Roux, *L'entreprise et la recherche*, 109.

for globalization. It was certainly the main regret of Jean Gandois that he did not succeed in transferring his steel firm experience to the aluminum industry; he said that Pechiney had always resisted him. Human experience, contrary to technology, is not easily transferable.