no more concern over the financial drain they caused their home governments than they did for the Soviet Union. For those who believe that the strong French state "defended the national interest" in joining the international oil cartel, it is interesting that before World War II this "strong" government paid for its Mesopotamian oil as if it had been pumped and shipped from Texas, a costly fantasy to which all the great powers of the era, capitalist and noncapitalist alike, duly adhered.

The process of transnational structuring did not create a gigantic regulatory juggernaut that permanently held sway over the globe. It affected the distribution of revenues, of capabilities; it created institutions and practices around the world that proved remarkably durable even though price competition sometimes occurred. To judge the world oil cartel as a mere price-regulating device is beside the point; it was much bigger, much broader, a major international political economic event of the century, on a scale comparable to the monetary agreements among nations. Unlike "politics among nations," as Morgenthau would describe international politics,[175] this was politics *through* nations. State regulatory powers were drawn upon by international actors for market-related purposes that were orthogonal to the power-maximizing drives posited by realism-mercantilism. Transnational structuring in the oil industry consolidated even as other facets of international cooperation, such as the League of Nations or the gold standard, were losing their grip. Transnational structuring is a thing apart from these better-known kinds of international cooperation and agreement; to "see" it at all, one must concentrate on business interests on a world scale.

Even so, this chapter's description of the world oil cartel remains parochial, describing only the trifling collision of international firms with each other and their local adversaries, who all played with national power, national institutions, and regulatory structures the way children play with blocks. The truly cosmopolitan view can be had only by looking at the world *hydrocarbon* cartel, which was an expression not of oil's struggle with oil, but of all oil with coal.

[175] Morgenthau 1973.

Chapter Five

The World Hydrocarbon Cartel, 1922–1939

The agreements of 1928 did not just cover oil extracted from the ground; they durably affected the chemical and coal industries that had a serious potential for producing in the developing fuel market. Though seemingly arcane today, liquid fuels derived from coal had the potential to enhance, at a cost, national independence and self-sufficiency. The world *hydrocarbon* cartel extended the limited market-sharing objectives of the "as is" agreements to the evolution and control of technology. This chapter examines the world hydrocarbon cartel and its implications for the worldwide transition from coal to oil, concluding with an assessment of the principal achievements of French oil and hydrocarbon policy in the decade before World War II.

It is easy to believe, wrongly, that synthetic oil from coal never took off because of its expense relative to gasoline. That is not so. All the major European countries were willing to pay a price, a price higher than oil, to protect their coal economies. Coal was simply too politically and economically significant to do otherwise. The question was, How high a price? Oil from coal could have competed against oil at a higher price with the necessary protection, but not at an impossibly higher price. The efforts of the world hydrocarbon cartel were directed at making coal's difficult situation impossible. This could be done only by keeping chemical firms from using new hydrogenation technologies to make chemicals, synthetic rubbers, and fuels.

The point can be reduced to two equations:

1. Possible synthetic fuel program = [(sales of gasoline made from oil from coal) + (sales of all chemical by-products from the manufacturing process) + (sales from products made from related applications, especially synthetic rubber) + (sales of gasoline made from oil at same facility)] − (cost of coal feedstock over equivalent oil feedstock).

2. Impossible synthetic fuel program = (sales of gasoline made from oil from coal) − (cost of coal feedstock over equivalent oil feedstock).

Equation (1) was the strategy of any company or state authority eager, for whatever reason, to move the coal industry toward the production of synthetic oil and hence the new transportation era. This strategy would not have produced synthetic oil at a price equivalent to that of oil imports; but it would have been close enough for states to adopt the strategy on a wider basis than in fact happened. Equation (2) was the strategy of the world hydrocarbon cartel, and it was the one that won: outside Germany, those who made synthetic oil did not market the by-products, made no synthetic rubber, and did not blend conventional oil with oil from coal.

Energy autarchy offered to insulate national economies from such massive disruptions as the blockades of World War I (e.g., of the Dardanelles and of Germany); from the heavy-handed politics of the international companies; and from the social dislocations that would follow from a massive conversion from coal to oil. But the road to autarky was not taken. The worldwide failure to develop the alternative fuels offered by coal reflects the effects of the world hydrocarbon cartel. The world oil cartel of the previous chapter was but one component of the greater whole.

France's diminutive synthetic oil program was again typical of the broader world pattern. The outcome reflected the preeminence of the oil companies and banks that backed the world hydrocarbon cartel; an aggressive, mercantilist etatism disguised an insipid reality. An ancillary pattern of neglect took root across a broad range of energy policies in France, where the government might have improved the French strategic posture even if we set aside the question of synthetic oil from coal. I could describe this as typical of the Third Republic's many failures; but many countries of quite different character did the same, and the reasons are not to be found in particular qualities of individual states. The principal force at work was transnational structuring.

Historical Reasons for the Decline of Coal

There are two reasons why the coal industry failed to adapt to the evolution of the petroleum era. The first is historical and market based: in the nineteenth century, the oil industry developed in markets that were marginal to coal, and this explains why, when coal first confronted petroleum as an adversary in the fuel market, it faced large, fully developed corporations rather than weak new entrants.

The second reason is political: in spite of the failure to jump into

the oil market in the nineteenth century, the coal industry had another opportunity in the 1920s and 1930s. The attempt was made, but it failed because of the 1928 patent accords. In fact, the "as is" agreements were but a part of the more significant patent accords, which is why I distinguish here between the world petroleum cartel and the world hydrocarbon cartel, which included oil, but went beyond it. In this second argument I explain why the strategy summarized in equation (1) failed to materialize.

The term "coal complex" used in this chapter means the mines, the chemical companies, the coal gasification companies, and the steel companies that consumed large quantities of coal and produced from it a host of salable products. This coal complex ought to have resisted the development of the oil market, but surprisingly many histories of international oil companies and international oil politics are mute on this subject.[1]

Retrospectively, the decline of coal seems "easy to explain." Oil is intrinsically a better fuel than coal for most purposes: it is cheaper (oil extraction uses less labor than coal mining), is easier to handle, packs more caloric potential per unit of volume, and burns more cleanly. Had free markets operated, European coal use would have declined much earlier than the 1950s and 1960s. Large industries, however, do not operate in free markets because they have the political power to change those markets. The long decline of coal indicates in fact that there was a long political struggle. Nowadays we usually think of coal's decline as a matter of labor unions and government subsidies. A major question has been left unasked, however: Given the coal complex's massive presence in nineteenth-century industrial economies, why did it fail to buy its way into the oil business, capturing the infinitely smaller oil industry before it had time to overwhelm coal?

The historical, market-based answer. In the 1860s and 1870s the oil industry catered to the illumination market. The coal complex's illumination product, coal gas, was used in large cities where the high-density market justified the expensive infrastructure needed for manufacture and distribution. Worldwide, hundreds of millions of people did not live in urban zones. Oil was the premier illumination fuel, distributed cheaply in individual containers far beyond the limits of coal gas systems. Oil lamps were superior to candles in illumination power, reliability, and price. Even in cities with coal gas, lamp oil was the poor man's illumination fuel. High installation costs for coal gas kept it at the upper end of the market.

Until the 1880s and 1890s coal was the unchallenged fuel of choice

[1] Gordon 1970 does not discuss synthetic oil from coal programs.

for the world's railroads and ships. The large market of coal-consuming ships and railroads would have guaranteed a lengthy decline for the nineteenth century's premier fuel in any circumstances. Coal people should have seen themselves as transportation fuel producers, and some at least should have sought entry into oil production as an adaptive strategy. Oil's potential as a shipping fuel became evident toward the end of the nineteenth century.

During oil and coal's "age of illumination" the two fuels not only did not compete, they were complementary, one lighting the cities, the other the countryside. The oil multinationals, servicing the worldwide rural illumination market, grew to unprecedented size compared with the nationally fragmented coal industries.

When at last oil challenged coal in the transportation market, it did not do so as a weak new entrant with a novel product. Sometime between 1878, when the first oil tankers were launched by the Nobels, and 1911, when the British Admiralty adopted fuel oil and anyone could see this was the wave of the future, coal company executives would have had to "wake up" to the competitive challenge of oil.[2] But their oil competitors were by then already powerful, worldwide corporations, with two or three decades' advantage in finding, developing, and exploiting oil resources. The established oil industry was tough to take on, and this is one reason we do not find coal companies that entered the oil business. In a later era a maker of mechanical cash registers, the National Cash Register Corporation, changed itself into a major computer producer to keep up with the new generation of technology; but none of the coal complex industries made the analogous transition to oil.

There were other elements to the seemingly insurmountable fait accompli that the coal complex faced. The automobile and truck industries are now "obvious" competitors to coal-fired trains. But they did not begin that way. The automobile started as a "luxury item" for Sunday driving; trucks began as distributors from train stations. When at last internal combustion vehicles threatened rail transportation, the Sunday drivers and local delivery trucks had built up a distribution network that was already a sizable entry barrier. And yet the advantage of this built-up distribution network was acquired over several decades in market niches that did not at first threaten coal.

Additionally, electrification would eradicate both industries from the lighting market. Oil executives saw one stark imperative in electrification: concentrate on the development of transportation fuel or face shrinking markets. The coal complex responded differently: electrification worried mostly the coal gas companies. The other members of the coal complex (the mines, the chemical companies, the steel companies) saw lighting as only part of their market; politically, the "front line of defense" was left to the coal gas makers. Such markets as transportation, home heating, and supplying the raw feedstock of coal tar to the chemical industry seemed "more secure." Electrification helped the oil industry to focus its objectives; the more dispersed members of the coal complex reacted in a desultory manner to a more amorphous threat.

[2] Henriques 1960, p. 271.

Consequently, as a matter of timing, it makes sense that the members of the coal complex would not challenge oil until about the 1920s. But many new oil companies were founded in the decades after the 1920s, when oil made great and irreversible strides in coal's traditional transportation markets. Banks started oil companies: Why did coal concerns not do the same? The 1920s and 1930s were the last years when the major world coal industries were robust enough to challenge the rise of the oil market. The reason for their failure in this period was political.

The World Hydrocarbon Cartel, Synthetic Fuels, and the Political Reasons for the Decline of Coal

In the 1920s and 1930s there were two strategies that permitted members of the coal complex to eye with interest the development of a liquid fuel market. The benzol market offered limited opportunities to enhance the profitability of traditional coal-processing technologies. By contrast, the new technologies of the synthetic fuels market could have revolutionized the entire coal complex, gearing it up for massive liquid fuel production and oil refining, and raising possibilities for the production of other materials such as synthetic rubber and other synthetics.

Benzol was condensed from the gases released by burning large quantities of coal, especially by steel and coal gas companies. The rich, high-octane benzol fuel was suitable for airplane engines and often was mixed with either gasoline or alcohol to lessen its volatility and make it more suitable for automobiles. In France a benzol-alcohol or benzol-gasoline mix was known as a binary *(binaire)* fuel. Sometimes all three liquid fuels were mixed in a trinary *(ternaire)* fuel that had a higher octane rating than pure gasoline.

Benzol production techniques developed during the late nineteenth and early twentieth centuries. The extraction of by-products from coal burning was the heart of the nineteenth- and early twentieth-century chemical industry. Benzol production was routine for French firms that

burned large quantities of coal, chiefly the steel industry and the gaslight industry.[3] Coal burning also produced coal tar, a residue that large industrial firms either processed themselves or resold to the chemical industry as a feedstock. The historical association of steel and chemicals is explained by the large quantity of coal tar produced by blast furnaces.

When the gasoline market developed for automobiles, coal-burning firms commonly either distributed benzol directly to customers, as retailers, or made wholesale deliveries of the product to other distributors, who made binary or trinary fuels. Benzol was a true synthetic fuel, though not what we usually understand today by the term "synfuel."

Synfuel dates from the early twentieth century, when industry's ability to manipulate hydrocarbons improved dramatically. These technological advances developed in part because of the oil industry's need to produce the maximum of marketable products from crude petroleum. Increasing the gasoline yield relative to the "residual" fuel oil was a high priority as automobile engines became the dominant consumers of oil.[4]

The chemical industry, which made all manner of synthetic materials—chemicals, explosives, dyes, and fertilizers—also wanted to get the most from its coal tar feedstock. As a result, hydrocarbon processing technology advanced similarly in the oil-refining and chemical industries. The German chemist Friedrich Bergius took out the first path-breaking patents for the liquefaction of coal—that is, turning coal into a usable petroleum product—in 1913.[5] He took out patents in a number of countries and established the International Bergin Company in Holland to handle licensing. To simplify, Bergius' high-pressure "hydrogenation" was designed to "refine" coal, as if coal were an extremely thick crude oil. The oil produced could then be refined in a manner similar to refining ordinary petroleum. Hydrogenation was so named because high pressure forced hydrogen to mix with coal derivatives without the need for expensive, slow-acting catalysts.[6] Bergius' technique, unlike benzol recovery, was a twentieth-century synthetic fuel process, and it offered many more industrial possibilities than benzol.

[3] Synthetic gas, or "town gas," dates back to the early nineteenth century, when it replaced candles for lighting textile mills with round-the-clock production schedules. By the middle of the nineteenth century most major European and American towns had coal gasworks. The phrase "natural gas" originated to distinguish it from the more widespread man-made product. Coal gasworks were in use until the 1950s. Seattle's "gas park" features brightly painted old coal gas fixtures on which children clamber about.

[4] See Enos 1962 for a history of refining.

[5] Hexner 1946, p. 315; Probstein and Hicks 1982, p. 8. Bergius received the Nobel Prize for his work in 1931.

[6] Pat.Hearings, p. 3704, "Possible Scope of Testimony."

The chemical industry feedstock was coal tar; the refining industry used crude oil. The great chemical similarity between coal and oil meant that developments in oil refining had direct applications in the chemical industry and vice versa. The chemical industry, however, was an integral part of the nineteenth-century industrial base: it bought coal tars from coal gas and steel companies or else burned coal to get the feedstock. The whole industrial complex had a high degree of cross-ownership and cross-investment that had evolved when coal cartels forced steel producers to unite in monopsonies to negotiate better prices.[7] A steel firm bought shares in a coal company to get low coal prices; a chemical firm bought shares in a steel company to get good coal tar prices; the coal company bought shares in the steel company to make sure it would have a loyal large customer; and so on. In the early twentieth century, a European chemical company could not unilaterally replace coal tar feedstocks with oil without affecting the whole network of industries of which it was a part. Since the company directorates were tightly interlocked, such a move would have thrown into disarray the economic structure of the entire coal complex, the social structure of its boards of directors, and the profitability of all the members.

Using a coal-derived feedstock, the 1920s chemical industry made products that today come from oil-derived feedstocks. Figure 7 illustrates this coal-derived family of products, which were and are crucial to industrial activity. Given its capital- and science-intensive nature, the failure of the chemical industry and its industrial allies to become deeply involved in oil refining, and the oil industry, is even more puzzling than the failure of other members of the coal complex to do so. Adapting their technology for refining, the chemical companies might have spearheaded an industrial coalition to sell oil.[8]

Some heavy coal users did try to become involved in the oil industry. Royal Dutch–Shell included the Schneider industrial group and the Peyerhimoff coal syndicate in its ill-fated attempt to monopolize the French oil market. The Schneider steel operation at Creusot was

[7] Newman 1964 describes Germany; ownership patterns in France were much the same.

[8] Some major members of the chemical industry did buy oil companies in the 1980s, when U.S. Steel and DuPont bought Marathon Oil and Conoco, both small oil companies. The two parent firms vertically integrated in a way that had been common in the chemical industry of the coal era. U.S. Steel's (now USX) chemical industry ultimately became more profitable than steel; its heavy coal consumption for blast furnaces produced the by-products that were the basis for chemical manufacture.

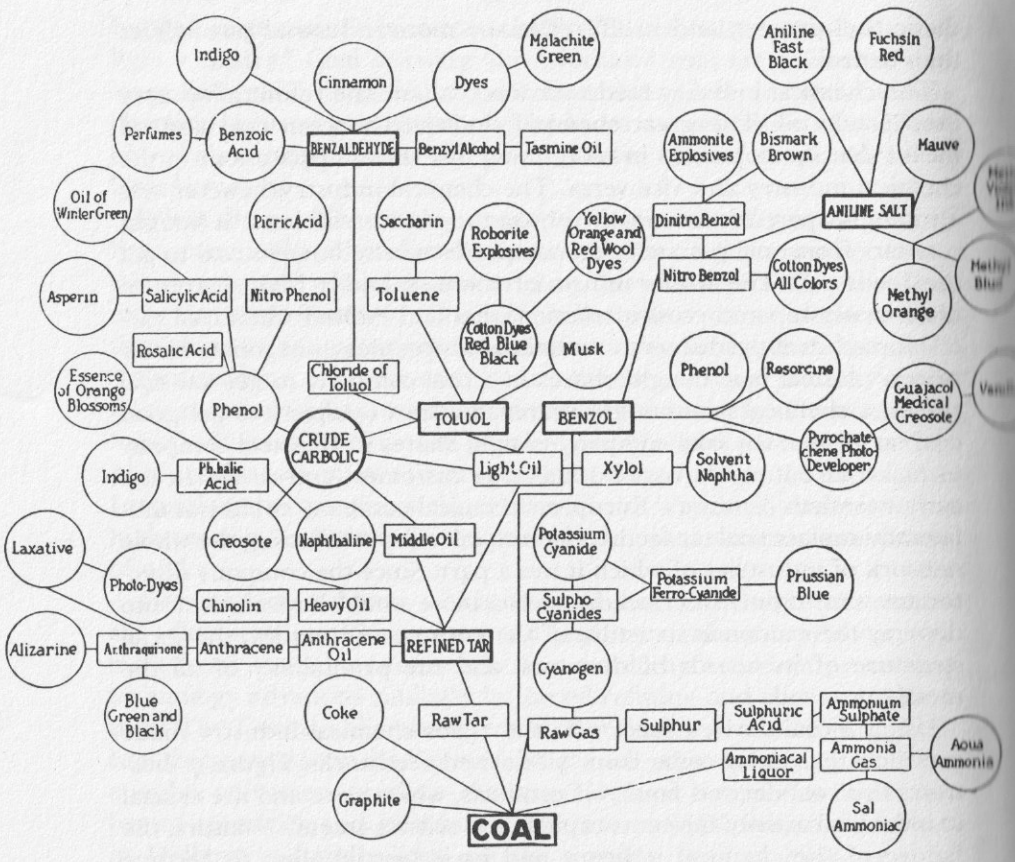

Figure 7. Coal-based chemical industry products, about 1920. *Source:* Oaks 1917.

shared with the de Wendel family; in the late 1920s members of both families sat on the board of directors of the Banque de l'Union Parisienne, which supported the Shell combine's 1919–1920 monopoly attempt but later diverted its oil efforts to become a major stockholder in Pétrofina. The head of the French branch of this company shared a director's seat with the coal syndicate's Henri de Peyerhimoff on the board of Pechelbronn. The Schneider industrial group also manufactured equipment for the chemical industry and, later, oil industry refining: under the right conditions, it could have entered the oil market.[9]

Pechelbronn was an Alsatian oil company that had exploited heavy oil deposits in the east of France for over one hundred years; during

[9] See, for example, the advertisement for refining equipment in the *Revue pétrolifère*, no. 829 (17 May 1939), facing p. 365.

the Prussian occupation of Alsace-Lorraine, German industrial interests worked the deposits. After the First World War the French government handed the oil-bearing area back to the private sector. The area provided only 0.7 percent of sales in the automobile market, but it dominated lubricating oils, where it held between 15 and 18 percent of French sales; its total contribution to France's total oil needs was about 8 to 9 percent.[10] This high-cost oil producer shared the coal industry's worries about large-scale oil imports into France, concerns that dovetailed with the Pétrofina allies' accurate fears that Russian oil imports would be the chief victim of the 1928 import quota.[11]

Pétrofina, oriented toward Russian and Romanian oil, shared Pechelbronn's protectionist objections to low-cost Mesopotamian imports. The coal industry as a group backed the high-cost oil importers and producers, for high-cost oil provided less incentive to convert from coal to oil-burning equipment. The Banque de l'Union Parisienne, as a major stockholder in Pétrofina and a participant in the Schneider group's industrial activities, favored an accommodation between the old coal-based technology and the new oil technology.

The alliance of high-cost oil and coal led to the particular tactics of the French coal complex vis-à-vis the growth of the oil market. The industrial interests with heavy coal investments wanted to adapt their outmoded production to the new era. This meant much more than simple protectionism against all oil imports. It really amounted to a whole program with which to challenge the oil industry; it was envisioned as part of an alliance with the high-cost oil importers. We can outline its phases as follows:

1. Adopt hydrogenation technology to produce chemicals.
2. Once the hydrogenation technology is in place, use it to produce some oil from coal.
3. Refine the oil into gasoline and sell it to independent French distributors.
4. Use the by-products from the previous two steps to make salable chemicals.
5. Branch into related uses of the technology; e.g., synthetic rubber.
6. Enhance refining capacity to use oil imports as well as oil from coal.
7. Produce gasoline from oil or coal depending on market conditions, level of protection, etc. Use oil as well as coal as a feedstock to make chemicals. Over the long term, phase out reliance on coal and

[10] Uhry 1927, p. 312.

[11] Pechelbronn did send survey teams to Mosul, Madagascar, Romania, Argentina, and Morocco. It never became a significant oil discoverer or producer, but through its loose association with Pétrofina and its stockholding in the Compagnie Française des Pétroles, it was affiliated with larger undertakings (Uhry 1927, p. 313).

increase reliance on oil, thus making the transition from the obsolete to the new technology.

8. Purchase own sources of oil supply; establish distribution network (or purchase a retail oil firm).

The idea, in short, was to use the chemical market and other product markets to finance expansion into the transportation market, thus solving the problem of how to manage a late entry into the oil business and also providing a transitional strategy from the coal age to the oil age. In the first, crucial period the chemical firms would not have to worry about the oil industry's monopolistic control over the world's major oil fields: their feedstock would be coal, in which a century of cross-investment had given them substantial protective strength. They could either look for new oil sources or buy from independents, some of whom were invited to testify during the 1928 oil law hearings.

The adaptive strategy hinged on the fact that chemical companies could not only market synthetic oil from coal, but also refine crude petroleum: the economics would thus not hinge on a straight barrel of crude versus equivalent barrel from coal calculation but would average the cost of the oil from coal and the crude oil, and further reduce costs on the whole through the cross-generation of profits from the sale of by-products in the chemical market. In addition, the same technology promised revolutionary possibilities in still unexplored markets, such as synthetic rubber.

The contrast of this ambition with a "pure" oil company is striking: a company like Standard Oil had no concern whatever with slowly phasing out investments in the coal industry, for it had none. Perpetuating the coal anachronisms in the burgeoning oil market could only slow the growth of outlets for its oil. And though the chemical market was "interesting," it was not "essential," as it was to the members of the coal complex. Standard Oil could and did sacrifice entry into chemical production in order to stave off the entry of the world chemical industry into oil refining and gasoline production, whether from oil, coal, or both.

This was the shared nightmare of the world oil companies: that the chemical industry would, through synthetic oil and refining, metamorphose into the oil business. The partners of the chemical companies would be the traditional members of the coal complex. Steel and coal mine owners, and their banks, would form a well-capitalized and politically almost invincible coalition that could easily manipulate market agreements such as the law of 1928 to favor themselves rather than the members of the "as is" agreements. The bitter struggle over hydrogenation patents was the last battle, largely unchronicled, of the whole

nineteenth-century industrial complex against that of the twentieth century.

The political language of the struggle was an autarchic fuel program, a recurring feature of French energy debates in the 1920s. Henri de Peyerhimoff, president of the Comité des Houillères, was a major expert witness at the oil hearings led by Charles Baron in 1927 and 1928. Peyerhimoff testified that the coal industry already made a number of chemical and energy products and that it would be "normal" to go on to make petroleum and gasoline. He wanted oil from coal to command 50 percent of the French gasoline market. Liquid fuel sales would insulate the coal industry from the business cycles associated with supplying heavy industry. He foresaw employing 70,000 French workers in the treatment of "by-products," meaning chemicals. For the vast capital outlays required, Peyerhimoff explained that he had already entered into preliminary negotiations with chemical companies, oil importers, and distributors. He claimed to have reached an "agreement in principle" with the "chemical industry." Although he did not name the firms, he did speak of specific negotiations over patent rights for synthetic oil processes with Germany's I. G. Farben.[12] Competition with Mesopotamian production was a clear threat to Peyerhimoff's plans, for the domestic synfuel production he envisioned would need protection and state backing to compete against the international oil majors. In his words,

> We need to talk about centrally rationalized production. We must all recognize right away that an enterprise of this kind cannot be envisioned without the support, and to some extent the control, of the state. You can easily imagine the conversations that will have to take place, when the time comes, with the great trusts of natural oil production as well as a certain neighbor, a powerful producer of synthetic oil.[13] . . . When the day comes for this synthetic oil to play a major role in the national economy, there is no doubt that, regarding prices, there will have to be between this industry and the government either de jure or de facto contacts, which in any event are a habitual practice among our large industries. De facto contacts are, in any event, every bit as useful as de jure relationships.[14]

The coal industry became a major player backing the oil import quota of 1928, seeing a regulated market as essential for its plans. It

[12] Testimony of Peyerhimoff, "L'Enquête parlementaire," *Revue pétrolifère,* no. 259 (3 March 1928): 283, 285.

[13] An allusion to I. G. Farben.

[14] Testimony of Peyerhimoff, "L'Enquête parlementaire," *Revue pétrolifère,* no. 259 (3 March 1928): 285.

was a delicate time for the "as is" companies. They had to use regulation to cartelize the market, *and* they had to keep this regulation from being wrested from their hands by the Soviet oil faction and the coal complex. Louis Loucheur, who played an oversight role in the Office National des Combustibles Liquides, noted in his personal documents that oil market regulation was necessary so that the oil majors "would not be able to lower prices temporarily so as to kill the synthetic oil industry at its first appearance."[15]

Even if only a portion of Peyerhimoff's ambitious 50 percent goal were realized, its impact would have been significant for a whole generation of French technology. The required industry-government cooperation was envisaged relatively early: the French state signed over Bergius patent rights to the Etablissements Schneider in 1924: the plan was to construct hydrogenation plants for synthetic oil.[16] The project stalled, however. Germany's I. G. Farben enjoyed a considerable lead in the development of Bergius-based processes. The free attribution of the 1914 and 1921 Bergius patents, won as war booty from the Versailles peace treaty, was not enough for French firms to compete with the German combine.

In response to the German lead, the French firms had successfully experimented with a process for manufacturing ammonia that had applications for nonoil synthetic fuels, especially methyl alcohol (methanol). Methyl alcohol as a fuel promised to extricate the French chemical industry from competing in the synthetic oil areas where I. G. Farben dominated; but the hydrogenation advances of I. G. Farben gave the firm the crucial patents even in methanol manufacturing. Although the technical feasibility of large-scale methanol production was never in doubt, the French government never backed this alternative.[17] Loucheur testified in 1927 that methyl alcohol had "been in practical use in automobiles, and that a mixture of methyl alcohol, benzol, and ethyl alcohol had been very satisfactory without requiring any modification of carburetors or causing any harm to the engines."[18] In 1927 Loucheur even entered into discussions with both I. G. Farben and Bergius, who held the methanol patents. But the Office National des Combustibles Liquides, which Loucheur tried to push in this direction, had a board of directors so topheavy with major oil interests that even some independent oil companies were suspicious of its composi-

[15] Hoover Inst. Loucheur, box 3A, folder 13, "Monopole des Pétroles," 1926, prob. December. Also cited in Nowell 1983, p. 262.
[16] Hoover Inst. Loucheur, box 3A, folder 13, contract dated 18 March 1924.
[17] Hoover Inst. Loucheur, box 3A, folder 13, letter dated 4 January 1927, signed Daniel Berthélot.
[18] Ass.Nat. Procès Verbaux de la Commission des Pétroles, 22 June 1927.

tion. For the members of the coal and chemical industries, the Office National could serve as an arena to discuss dividing up the energy market under the quota law as passed in 1928, but it was not a place to share sensitive information about synthetic oil or alcohol technologies under development.[19] The methanol alternative ultimately became moot because after 1928 I. G. Farben cartelized this technology in cooperation with Standard Oil, along with synthetic oil, rubber, and other applications.[20]

There was also a domestic economic disadvantage: German applications of the Bergius process went untaxed, whereas the French firms were taxed; the French firms saw themselves seriously disadvantaged vis-à-vis their German rivals, quite apart from technology and patents.[21]

Loucheur's papers do not say why, but he clearly did not get along well with the coal interests represented by Schneider and Peyerhimoff. The coal group did not oppose state equity in a synthetic fuels program, but it opposed Loucheur's conditions on profits and control over patents.[22] The Compagnie Française des Pétroles could get the tax break it wanted, and it had to "endure" state participation only when its major shareholders wanted the help; the coal industry got no such favors. The government that was putting great energy into acquiring a share of Mesopotamia lacked equivalent interest in a strong synthetic fuels program; in any case, the coal complex would have seen no possibility for seriously marketing synthetic fuel products without the protection of the 1928 import quotas, which in fact galvanized its interest.

But as always, the coal complex missed a beat. The same process of world cartelization that caused the law of 1928 also meant that the synthetic fuels program, after 1928, would be under the auspices of the oil companies, which intended to prove the program unworkable. The oil companies "read the play" of the coal complex correctly and mapped out their counterstrategy at the same time that they divided up world oil markets. As a result, synthetic oil programs all over the world, except in Germany, were only technological curiosities. The derailing of coal's pursuit of synthetic oil kept the chemical companies in the chemical industry, redefining their road to modernization. The

[19] Hoover Inst., Loucheur box 3A, folder 13, "Note," n.d., prob. 1927; same file, "Liste des Membres du Conseil d'Administration de l'Office National des Combustibles Liquides."
[20] Pat.Hearings, part 8, pp. 4610–4659.
[21] Hoover Inst. Loucheur, box 3A, folder 13, ". . . visite de M. Aubrun," 2 February 1927.
[22] Hoover Inst. Loucheur, box 3A, folder 13, ". . . visite de M. Aubrun," 2 February 1927; same file, Loucheur to Bokanowski, 6 January 1927; same file, Peyerhimoff to Loucheur, 10 January 1927.

only synthetic fuel that would be produced in any quantity was benzol, which was linked not to the new technology of the twentieth century, but to the dying technology of the nineteenth.

"As Is" and the World Patent Pool

The historiography of the "as is" agreements of 1928 has been dominated by the 1952 Federal Trade Commission Report, widely considered the single most celebrated and authoritative oil source document in the twentieth century. But the report, for reasons that can be known only to its authors, left completely untouched the earlier Senate Patent Hearings that detail the elaborate precautions taken by the same "as is" interests to create an oligopolistic lock on crucial hydrocarbon technologies in world markets.[23] In addition, the Federal Trade Commission report was censored; and even when it was ostensibly declassified and printed in 1975 by the Church committee, dozens of pages remained unprinted.[24] The many analyses of the 1928 agreements that make no reference to the patent hearings are limited to only half of the operations of the world oil cartel, perhaps not even the more important half.[25]

By 1924 the convergence of the oil and chemical industries was clear to the technological leaders in each. I. G. Farben officials visited Standard Oil's refineries, and in 1925 they invited a Standard Oil representative to visit their plants in Germany. They had discovered catalysts that would bring down the hitherto prohibitive costs of the Bergius process

[23] *Hearings before the Committee on Patents*, 77th Cong., 2d sess., part 7, 31 July–4 August 1942, on S. 2303 and S. 2491. Documents subpoenaed by the committee are reproduced in the report, making it a rich and easily consulted archival source. Senator Bone explained that "historically this should be interesting to students who may seek to discover the extent of our 'invisible government' of big business" (p. 3365). Cf. Schattschneider 1935, p. 287: "Influence is the possession of those who have established their supremacy in invisible empires outside of what is ordinarily known as government."

[24] See citations FTC1, FTC2, and Pat.Hearings in "published primary sources" in the bibliography.

[25] Borkin 1978 cites this source; as does Hexner's elegant *International Cartels* (1946). Engler 1976, pp. 96–115, is an important exception among the oil histories. Vietor 1984, p. 28, cites the international patent pool in the context of the "as is" and Red Line agreements; but his conclusion that "rapid technological developments by others either circumvented the pool or forced expansion of its membership to the point of meaninglessness" repeats a common error. The political muscle with which the oil companies discouraged new technologies significantly shaped the distribution of technological abilities at the outbreak of World War II. It was not a "meaningless" international hydrocarbon agreement that provoked the Senate Patent Committee hearings, that evicted coal interests from synthetic oil refining in France, or that formed the basis for business relations between Standard Oil, Royal Dutch–Shell, and I. G. Farben in Germany, to give but three examples.

but would have fundamental applications to oil refining as well. After these visits the companies remained in "continuous contact" and later agreed to collaborate: Standard Oil took the lead on applications of Bergius processes for refining, research for which was centered in the United States, while applications for the chemical industry were carried out by I. G. Farben in Germany.[26] By 1928 the companies knew that 90 percent of the hydrogenation process could be applied to coal and oil and that only minor adaptations were needed to specialize in one or the other, or both.[27]

In the 1920s the International Bergin Company ended up under the control of I. G. Farben, with Royal Dutch–Shell as one of the more important minority stockholders.[28] I. G. Farben's control of the company brought the Bergius patents into the orbit of the ongoing collaboration between I. G. Farben and Standard Oil. This had repercussions in France: the International Bergin Corporation had a contract with "a group of coal, steel, and chemical interests through an organization called Sicol," to which one finds few references in French documents, but which was undoubtedly the Peyerhimoff-Schneider group discussed above.[29] As I. G. Farben's plans to collaborate with Standard Oil and the world oil cartel neared completion in 1927, the German firm cut off agreements for patent sharing with the French group. I. G. Farben's president, Carl Bosch, told the French "of the proposed deal with Standard and that if it went through they would have to deal with the Standard in the future."[30]

I. G. Farben's and Standard Oil's negotiations proceeded concurrently with the "as is" oil negotiations. The two sets of negotiations were inseparable: the Germans could not pursue hydrogenation without guarantees against competition in their domestic market; the international majors could not cartelize world markets if oil companies and chemical companies were poised, with the new technology, to enter the business.[31] An agreement signed by Royal Dutch–Shell, Standard Oil, and I. G. Farben specifically refers to the "as is" agreements as a criterion for determining who would be eligible for licenses of the new

[26] Pat.Hearings, "Possible Scope of Testimony," p. 3704.

[27] Pat.Hearings, "Memorandum of Meeting–July 12th, 1928," p. 3437.

[28] Hexner 1946, p. 315; Pat.Hearings, "International Corporation," 11 August 1927, p. 3652. On p. 3653 is a diagram of company shareholdings, which were held "20% by Shell, 30% I.G., 50% Makot. Makot stock is held 40% I.G., 40% Bergius, 20% English group [Imperial Chemical Industries]."

[29] Pat.Hearings, "International Corporation," 11 August 1927, p. 3652.

[30] Pat.Hearings, "Memorandum of Meeting, March 21st, 1929," pp. 3442–3443.

[31] See letter on I. G. Farben issues from Henry Deterding to Walter Teagle (Pat.Hearings, Deterding to Teagle, 18 October 1929, pp. 3659–3660).

process.[32] The "as is" and hydrogenation agreements competed for time on the same agenda[33]; referring to cartelizing hydrogenation technology in September 1928, Jean Baptist August Kessler of Royal Dutch–Shell wrote: "I feel sure it is the only way to avoid nonoil interests to spoil all the good work that has been done lately."[34]

The Standard–I. G. Farben interests formed a joint holding company called SIG, after the initials of the two parent companies. SIG formed the Hydro Patents Corporation, which in the United States licensed all processes jointly held by the two parent companies. Standard Oil was responsible for licensing all American oil companies, which took shares in Hydro Patents in proportion to the size of their crude oil refining. Payments for stock and licenses were made to the holding company, SIG, and of these American payments Standard Oil pocketed 80 percent. If subscribing companies did not pay the fees to join Hydro Patents at the beginning, they ended up paying even more for patent royalties as nonmember licensees; hydrogenation was so crucial to the future of refining that eighteen major American oil companies succumbed to the industry shakedown.[35]

There were restrictions of great importance to members of the coal complex. The patent licenses applied to coal hydrogenation as well as to hydrogenation required for oil refining; yet no coal companies, steel companies, or chemical companies were invited into the Hydro Patents Corporation, which excluded them from the technology that would have helped them enter the oil business. Member oil companies could not apply their "refining" patents to production for the chemical industry: they too were channeled into the path desired by I. G. Farben and Standard Oil.

The Hydro Patents Corporation took even more unprecedented steps. Refineries erected by licensees were subject to complete review by a separate Standard Oil–I. G. Farben subsidiary, the Hydro Engineering and Chemical Company. For the privilege of this inspection, licensees paid 4 percent of the total capital cost of the plant under construction. Licensees were furthermore required to cross-register all their patents on their own refining discoveries with Hydro Engineering, giving Standard Oil and I. G. Farben a free ride on other

[32] Pat.Hearings, "Hydrogenation Agreement between International Company and Bataafsche Petroleum Maatschappij [Royal Dutch–Shell]," p. 3544.

[33] Cf. question in 1930 by a Standard Oil official "whether we should open the I.G. negotiations with the Shell before or after the discussion on the 'as is' agreement" (Pat. Hearings, Frank Howard to E. M. Clark, 19 March 1930, p. 3669).

[34] Pat.Hearings, Kessler to von Riedemann, 6 September 1928, p. 3662. This Kessler is not to be confused with his father, who ran Royal Dutch in the nineteenth century.

[35] Pat.Hearings, pp. 3341–3342.

companies' technological advances. If a licensee discovered its own catalytic process, it could not take out a patent, but had to turn it over to Hydro Engineering or else use the process without a patent.[36]

The American pattern was repeated worldwide in the International Hydro Patents Corporation, whose International Hydro Engineering subsidiary inspected refineries just as the American Hydro Engineering had done. Royal Dutch–Shell was excluded from exercising patent privileges in the American market, but it became a full partner with Standard Oil in international markets and exercised the licensing privileges enjoyed by Standard Oil for most non-American oil companies around the world. Standard Oil and I. G. Farben included Royal Dutch–Shell because of its great size and because it had independently done significant work in chemicals, leading one legal investigator to call it "an incident of cartelized commercial truce."[37]

The cartel dealt out special privileges to some members. Britain's Imperial Chemical Industries was permitted to make synthetic fuel, on condition that its oil be marketed by Standard Oil and Royal Dutch–Shell; Imperial Chemical Industries earned this privilege from its early foresight in buying a share of the International Bergin Corporation, whose functions were entirely absorbed by the International Hydro Patents Corporation.[38] Anglo-Persian (after 1932 Anglo-Iranian) got special treatment in the world patent pool because of its alliance with Royal Dutch–Shell after their 1927 joint oil marketing agreements. Wherever Anglo-Iranian had "as is" marketing agreements with Royal Dutch–Shell and Standard Oil, it could participate in the International Hydro Patents Corporation.[39] This agreement thwarted the coal industry's support for synthetic oil from coal.[40]

Standard Oil, Royal Dutch–Shell, and I. G. Farben agreed that only they would have the right to use hydrogenation on coal, unless a licensee agreed to market its products through them.[41] This proviso took the crucial technology out of the hands of the world's chemical companies. Though excluded oil and chemical companies tried to develop alternative technologies, the accords remained effective until unilaterally dissolved by United States consent decree in 1942. The excluded oil and chemical companies were naturally the primary constituents backing the patent hearings and the consent decree.

[36] Pat.Hearings, p. 3343.

[37] Pat.Hearings, testimony of Patrick Gibson, pp. 3347–3350.

[38] Pat.Hearings, testimony of Patrick Gibson, p. 3350.

[39] Pat.Hearings, "Outline of Proposal for Standard-Shell Agreement on Hydrogenation," 15 April 1930, p. 3666.

[40] See *Report of the Royal Commission on the Coal Industry*, 1926.

[41] Pat.Hearings, "Outline of Proposal for Standard-Shell Agreement on Hydrogenation," 15 April 1930, p. 3666.

The world's oil companies were kept out of the chemical industry in the same way. I. G. Farben licensed the chemical applications of the patents, whose conditions were as onerous as those imposed on the oil industry. The chemical industry could not use the patents to refine petroleum. Standard Oil agreed not to go into the chemical industry except as a partner of I. G. Farben, and I. G. Farben agreed not to go into the oil business except as a partner of Standard Oil. In Germany the synthetic fuel production of I. G. Farben was marketed through the normal retail outlets of Royal Dutch–Shell and Standard Oil.[42]

The "as is" agreements for oil and the world patent pool created an intimate basis for hydrocarbon control. Dr. Carl Bosch, president of I. G. Farben, observed that "the two companies were *married* for a long period and that each must respect the other's interest; that . . . the I. G. interest and the S.O. interest were the same, and that whatever Standard Oil did would react to the interest of the I.G. as well."[43]

The world hydrocarbon cartel members pledged themselves to be above ordinary national considerations in their work. As an American investigator summarized it: "In the language of high diplomacy and with the suggestion of a reliance upon a private law above the law, this agreement embodies mutual assurance by the parties to each other that they would voluntarily readjust their contracts to carry out their purposes in the event any obstacles were presented by existing or future law, act of governmental authority, or circumstance. This is only the barest effort to state the gist of the agreement, whose actual terms are next to impossible either to summarize or to characterize. That is best left to the text itself."[44]

If the world oil market division accords of 1928 achieve grandeur because of their scale and world vision, they nonetheless remain extensions of cartelistic business practices developed at the national level. The parallel world patent agreements go beyond mere business practicality; they reach for a transnational ideology of world business. Dr. Bosch's reference to the "marriage" of I. G. Farben and Standard Oil was but one example. The hydrocarbon cartel's royalty payments and enforcement provisions continued well after the outbreak of hostilities in World War II. Anglo-Iranian, as a participant in the world patent pool, protested the necessity of making royalty payments to Britain's Nazi enemy. An officer of Standard Oil dismissed the puny nationalist objections; he declared that "technology has to carry on—war or no

[42] Pat.Hearings, "Memorandum of Meeting, Friday Afternoon, 2 P.M., Aug. 31st, 1928," p. 3435; and testimony of Patrick Gibson, p. 3336.
[43] Pat.Hearings, testimony of Patrick Gibson, p. 3326. Italics added.
[44] Pat.Hearings, testimony of Patrick Gibson, p. 3336.

war—so we must find some solution to these last problems." The "problem" was that the "interested parties included Americans, British, Dutch, Germans, and war introduced quite a number of complications. How we are going to make these belligerent parties lie down in the same bed isn't quite clear as yet."[45] The reference to a "bed" is an interesting reification of Dr. Bosch's "marriage," but it shows how these partners envisioned a long-term relationship.

That these agreements could function two years after the outbreak of World War II astonished Senator Homer T. Bone of the investigating committee: "It presents an astounding picture." His witness replied, "I confess that I am at a loss to comment on the international implications of the arrangement."[46] Senator Bone colorfully derided the implicated companies as "cartel addicts."[47] His committee had investigated a case of transnational sovereignty, where power was measured not in military strength among states, but by the arcane criterion of who controlled the technology that the nations of the world and their armies would employ.

Some opined that the hydrocarbon cartel benefited the Nazi regime and even was controlled by it, because by the end of the 1930s patent accords in which German companies participated had to be approved by the Nazi government.[48] But in Germany the government's coordination and cooperation with the cartels predated Nazism and cannot be considered a unique feature of it.[49] By the late 1930s, I. G. Farben officials held posts in the Nazi government; distinguishing "corporate" from "national" purposes is difficult. This book cannot look in detail at the Nazi regime. The world hydrocarbon cartel originated well before the Nazis, however, at least as early as 1924; the collaboration of I. G. Farben and Standard Oil had solidified by 1928. The world patent pool was also part of cartel policies governing world oil markets, of which I. G. Farben was not a member. The ensemble cannot be explained as a function of Nazi strategic interests, which were but one part of an international system whose members, measured on a power-based state-competitive axis, were antagonistic but who were allied in international hydrocarbons. This is a feature of transnational structuring, in which states may "think" their interests are being served while business interests pursue orthogonal goals that may or may not "suit" the needs of states.

[45] Pat.Hearings, Patrick Gibson citing a memorandum dated 14 November 1939, p. 3410.
[46] Pat.Hearings, testimony of Patrick Gibson, p. 3414.
[47] Pat.Hearings, testimony of Patrick Gibson, p. 3411.
[48] Pat.Hearings, testimony of Patrick Gibson, pp. 3358, 3363.
[49] See Neumann 1963, p. 237.

Competition among the international corporations occurred in the recondite medium of patents, market shares, and distribution agreements. These agreements dealt out the technological cards with which nations played their particular power games and structured capabilities in the "politics among nations" that went unperceived until wartime crisis. By that time the assertion of state sovereignty over the world hydrocarbon cartel could alter the distribution of capabilities only with diffficulty, delays, and the commitment of extra resources. The only way to stop the German synthetic fuels program, which the agreements had fostered, was to bomb it. At war's outbreak American capabilities in some chemical manufacturing, such as synthetic rubber, were significantly retarded and had no installed industrial base—a result of the agreements. France and Japan were similarly left with purely symbolic synthetic fuel programs. Hydrogenation patents were used as bait to try to get the Japanese to change their "petroleum control law." Although some documents reveal I. G. Farben's velleity to help Japan get hydrogenation, a British survey after the war, based on interrogations of I. G. Farben officials who worked with the Japanese, indicates that the collaboration between the Japanese and Germans on hydrogenation was marked by interservice jurisdictional rivalry in Japan and by corporate rivalry in Germany.[50] I. G. Farben kept its information transfers to the Japanese to a bare minimum, exactly as it should have done under the terms of the world hydrocarbon cartel.[51]

The world hydrocarbon cartel impeded synthetic fuel development in France and elsewhere as part of its worldwide strategy. The strategy had two phases. In the first, which lasted until about 1936, the lock on technology was so tight that very little progress was made anywhere. In the second phase, the development of a rival technological process forced the world patent pool members into damage-control operations that led them to the business equivalents of "backfire" operations. In forest-fire control small, manageable fires are used to deplete available wood and prevent larger conflagrations; in the world patent pool, limited synthetic fuel programs were encouraged to tie up capital, encourage international respect of patent rights, and exert enough control over the synthetic fuel process to guarantee it would be an unprofitable alternative to oil.

A German steel firm with large coal consumption and commercial ties to Ruhrchemie developed the new synthetic fuel process that forced the transition to the second phase in 1936. The Fischer-Tropsch process was less efficient than the I. G. Farben–Bergius process, requiring seven tons of coal to produce one ton of oil as opposed to four to five tons of coal for the rival Bergius process. But Fischer-Tropsch was easily adaptable to coal gas production. Developed in 1934, by 1936 the process's advances led the controlling members of the International Hydro Patents group to conclude that they had lost their "complete control" over synthetic fuels.[52]

[50] On Japan, see Pat.Hearings, pp. 3349, 3354, 3680–3681, 3691, 3697, 3711–3715.
[51] Peck and Jones 1945.

Negotiations began almost immediately between the International Hydro Patents members and the Ruhrchemie group. By October 1938 I. G. Farben and Ruhrchemie had a new accord that subjected the Fischer-Tropsch process to the same rigid covenants that governed the Bergius patents.[53] The new principal members were Ruhrchemie, I. G. Farben, Standard Oil, Royal Dutch–Shell, and M. W. Kellogg, an American company.[54] A diagram of the international patent pool as it stood after the new agreements of 1938 is shown in figure 8.

What of government and other industry pressure to break up the pool? "Outsider" firms around the world pressured their governments to break the iron lock on the international patent pool. Patent pool members had foreseen this; as early as 1926 I. G. Farben's Carl Bosch observed, "The fact that patents can be expropriated for national defense must be kept in mind, and surely such action would be taken if nationals were ignored in the formation of companies."[55] Yet no government expropriated the patents until well after the outbreak of World War II. Dr. Bosch's strategy of recruiting "nationals" to form a local constituency to respect the patents worked throughout the 1930s.

France furnishes an example of Bosch's strategy in action. The Schneider steel and chemical group wanted a major French synthetic fuels program. Intimidated by the formidable array of Standard Oil, Royal Dutch–Shell, and I. G. Farben, it did not want to fund the project alone. This reluctance was logical in a national market where cheap oil was expected from Mesopotamia, and in an international environment where key patent processes were tied up beyond the reach of ordinary firms. The synthetic oil program needed firm government support for patents and for setting acceptable prices for eventual production. The Schneider group backed the government of Pierre-Etienne Flandin,

[52] Pat.Hearings, Teagle to Howard, 12 February 1936, with accompanying "Memorandum on New Synthetic Oil Processes," pp. 3698–3701.
[53] Pat.Hearings, "Hydrocarbon Synthesis Agreements," 7 October 1938, pp. 3739–3743.
[54] The Kellogg Company developed processes that could break the international patent pool and then sold them to the pool. It became the specialized research and development corporation for the patent pool companies, helping them maintain their technological lead in hydrocarbons.
[55] Pat.Hearings, "Memorandum of Discussion with I. G. at Plaza Hotel, November 6th, 1926," p. 3654.

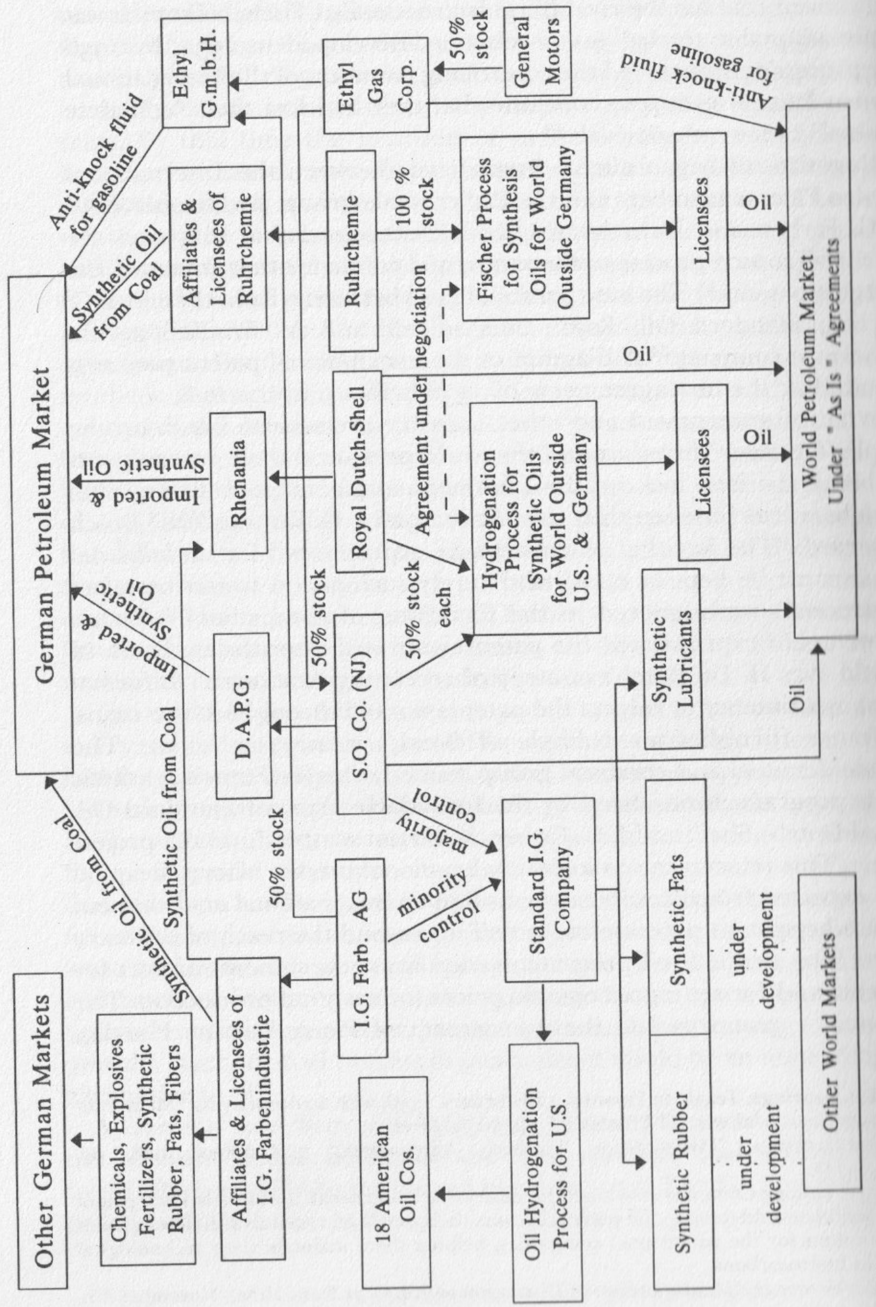

Figure 8. International patent pool, 1938. Source: U.S. Government Printing Office, *Investigations of the National Defense Program*, Senate, 77th Cong., 1st sess., March and April 1942, part 11, p. 4704.

and in Standard Oil's assessment it nearly succeeded in getting a synthetic fuel program adopted:

> The situation in France is quite serious. Prior to the fall of the Flandin Government, the prospects for the success of the Schneider project seemed bright. With the fall of that government, the uncertain political situation in France, *and the activities of Pineau*, there seems to be at present very little hope that Schneider will receive the financial support which they require in order to go ahead with this project. They have told us in no uncertain terms that they are not prepared to put up the money themselves. The project, if undertaken, must be subsidized in some way by the French Government. In this connection, I enclose copy of the Minutes of a meeting held on July 6th at the O.N.C.L, which Mr. Boris-Finaly sent me. . . . I would appreciate your impressing upon our people that these communications from him are highly confidential.[56]

This shows how significant an alliance with "nationals" was. Boris-Finaly was one of Standard Oil's connections with the Banque de Paris et des Pays Bas, and it provided the American company with confidential government papers on oil policy. The head of the agency ostensibly in charge of helping France to become energy independent, Louis Pineau of the Office National des Combustibles Liquides, was opposed to sponsoring a synthetic fuel program of significant scope. Pineau's motives are not revealed, but deliveries of Mesopotamian oil to France had begun in late 1934, and he had more than enough problems allocating the French market among existing concerns without having to factor in additional production from synthetic fuel sources. The Saint Gobain case, already discussed, was but one example of the tight competition for market share among existing and aspiring participants in the oil business. Pineau had an oil constituency to satisfy, and his interest coincided with the interest of the international oil companies. The International Hydro Patents group thus used Standard Oil's connections with the Banque de Paris et des Pays Bas and the Office National to keep France from developing the potent new technology for commercial purposes.

France's "etatist" energy czar is revealed by the document to be a conspicuous hypocrite. In 1934 Pineau had reviewed his country's—and his own—oil policy, citing the need for independent French policies, especially in synthetic oil. "During the course of some conflict, submarine warfare or a possible refusal of some countries to supply

[56] Pat.Hearings, letter from W. R. Carlisle to Frank Howard, dated 19 July 1935, pp. 3686–3687. The Flandin government fell in May 1935. ONCL is the acronym of the Office National des Combustibles Liquides. Italics added.

oil could dry up our imports, and the supply of the army would be compromised. *All efforts must therefore be made to bring about, in the best industrial and technical conditions, but in the briefest time,* the manufacture of quantities, which shall be determined, of fuel that will not depend for its raw material on foreign sources."[57] This came from the man who was credited by the Standard Oil Company with having helped kill an ambitious synthetic oil program sponsored by the coal complex in France.

Still, the impulse to break up the patent pool did not disappear. In France a cosmetic was needed to silence the opposition of powerful groups like the Schneider industries. Especially in the three years before the Fischer-Tropsch process came under the same controls that governed the Bergius process, opponents of the patent pool tried to open a wedge in the controls of the world hydrocarbon cartel. The Etablissements Schneider's efforts to launch an independent synthetic fuels program coincided with the moment of opportunity fleetingly presented by the Fischer-Tropsch process, before it was joined to the world hydrocarbon cartel. Efforts such as these, in France and around the world, led the International Hydro Patents group into its second phase. The strategy in the passage below, suggested by Standard Oil's chief officer in charge of hydrogenation, refers specifically to Japan and Italy but also applied to France:

> Although I did not express any conclusion to Mr. von Riedemann,[58] my own idea is that our interest would probably best be served by having the Italians use our hydrogenation process and thus become a minimum factor in the oil business; that is, their crude requirement would be least, their cost of gasoline highest and most artificial, and they would not be producers of any fuel oil. I have all along had the feeling, which I have expressed several times in connection with the Japanese situation, that in some respects it is highly desirable to have foreign governments interested in the oil business go the hydrogenation route. This ties up the most capital and tends to put them all together on a noncommercial plane in which their expansion is bound to be limited and in which they are not capable of becoming a disturbing factor outside of their own bailiwick, one of the most important factors always to be considered in connection with our policy toward governments that are anxious to stick a finger in the petroleum pie.[59]

The patent pool members licensed the hydrogenation process for

[57] Ass.Nat. Commission des Pétroles, *Rapport Général de M. Louis Pineau,* 2 July 1934, pp. 92–93. Italics underlined in original.

[58] Riedemann headed Standard Oil's operations in Germany.

[59] Pat.Hearings, Frank Howard to W. C. Teagle, 9 April 1936, p. 3698.

synthetic fuels to governments because they limited the license to permit only the manufacture of a few fuels. Without those conditions, an independent oil refinery or chemical company could use the hydrogenation technology for a much broader range of applications. Had the government made synthetic fuel and then sold the by-products of that fuel as commercial chemicals, the operation as an ensemble could have broken even or perhaps turned a profit. The sales from the chemical industry would have subsidized the fuel prices.

The world hydrocarbon cartel licensed patents to governments, but the licenses excluded the right to sell hydrogenation by-products along with the fuels. With access to the lucrative chemical end of the hydrogenation product spectrum denied, corporations and governments would deem hydrogenation unprofitable and would limit their production of synthetic fuel. Synthetic fuels under these constraints became by definition the "noncommercial plane," and state and private corporations found the process too expensive to expand production. In this manner the International Hydro Patents group limited governments' ambitions to "stick a finger in the petroleum pie."

These costly and ineffective development programs stifled outsiders' attempts to break up the patent pool. So long as the hydrogenation plants were owned by the patent pool members, whatever synthetic production did come on stream was sold to the advantage of the patent pool members rather than potential competitors. The objective of the second phase was thus to stifle, contain, and maintain control. In the words of one of Standard Oil's top European officers, Heinrich Riedemann:

> You realize the real position as being that if we should decline to make any further investment in France, which I think we all agreed is in itself the soundest thing to do, we run the risk that with the French Government having reached the decision of going ahead with the hydrogenation of the coal problem the coal people may succeed in persuading the government to build a really large plant, in which event our outlet to France would be cut down in proportion to the new indigenous production. In other words, if we can keep the necessary investment down to a comparatively small figure, we should have, on the one hand, the advantage of an increased outlet, while, on the other, if we should refuse to go ahead of these lines, we run the risk of a loss in outlet the amount of which cannot be foretold.[60]

A German industrialist working for an American company set the

[60] Pat.Hearings, Riedemann to Teagle, 18 March 1936, p. 3695. Riedemann was a native German speaker and his syntax in this passage is odd, but the meaning is clear.

boundary to French strategic capabilities in oil. France did establish two small pilot plants for the manufacture of synthetic fuels, but the corporate sponsorship of this effort was limited entirely to oil companies, and among these the leading members of the international patent pool, Standard Oil and Royal Dutch–Shell, were preeminent. The synthetic fuel company, called the Comptoir des Essences Synthétiques, was authorized by government decree on 10 July 1936.[61] Manufacturing only gasoline in accordance with the goals of the world patent pool members, the company built two factories, one in Béthune and the other at Liévin, and from 1937 to 1939 produced a combined output of about 25,000 tons a year, a miniscule fraction (below 1 percent) of total French needs.[62] The coal interests that would have pushed the French program to be as efficacious as its German counterpart (up to 28 percent of wartime oil consumption), such as the Schneider group and the coal companies under Peyerhimoff, were conspicuous by their absence.[63] The French synthetic fuel program that ought to have been but never was, like Sherlock Holmes' dog that failed to bark in the night, is thus of especial interest precisely because it was insignificant: the strategic advantages of autarchic production and the political backing of the large coal and steel lobby *ought* to have produced a program roughly comparable to Germany's; but instead the tightly coordinated action of the international oil companies choked off the endeavor.

The members of the diminutive French synthetic fuels program are listed in table 7. Effective control was exercised by companies directly or indirectly associated with the world patent pool. The second largest bloc of companies were significant shareholders in the Compagnie Française des Pétroles; their interest in coal hydrogenation was tempered by their access to Mesopotamian crude. The third largest block of stock, held by independent chemical and refining concerns, did not have control of the company; an additional 135 miscellaneous members had individual shareholdings too small to act as a unified voting bloc, if they voted at all.

The French synthetic fuel program demonstrated the political strat-

[61] Arch.Nat. Desmarais Frères 130AQ82, file 1, "Comptoir des Essences Synthétiques — Liste des actionnaires au 15 juin 1938."

[62] There were board-level discussions at the Compagnie Française des Pétroles about synthetic fuel production, but no significant program had been established by the time E. Zédet took over fuel policy after the collapse of the Third Republic. See CFP 1130A13, Comité de Direction, 1937–1941.

[63] There is a brief record of a "Comité Française des Essences Synthétiques" (Arch.Nat. 130AQ83, folder 2, n.d.), whose membership was all coal personalities, and some French national companies, such as Desmarais Frères. I found no records of development activity by this group; the absence of representation by the international majors doomed it to technological irrelevance.

Table 7. Stockholders of the Comptoir des Essences Synthétiques

Company	Number of shares	Percentage of stock
World patent pool members and allied companies		
Sté Générale des Huiles des Pétroles (Anglo-Iranian)	199	6.8
Sté des Pétroles Jupiter (R.D.S.)	304	10.3
Standard Française des Pétroles (S.O.)	434	14.7
Steaua Française	21	0.7
Sté Française des Carburants	43	1.5
TOTAL	1,001	34
French oil firms, members of Compagnie Française des Pétroles		
Desmarais Frères	280	9.5
Sté Fse des Pétroles, Essences, et Naphtes	82	2.8
Cie Industrielle des Pétroles	157	5.3
Lille Bonnière et Colombes	123	4.2
Raffinerie du Pétrole du Nord (Pétrofina)	81	2.7
TOTAL	723	24.5
"Independent" chemical/refining		
Raffineries de la Gironde	135	4.6
Cie des Produits Chimiques et Raff. de Berre (St. Gobain)	134	4.5
TOTAL	269	9.1
Passive shareholders		
135 other small retail and distribution companies averaging seven shares each	955	32.4

Source: Arch.Nat., Desmarais Frères, 130AQ82, folder 1, "Comptoir des Essences Synthétiques," 15 June 1938.

egy of the world patent pool: the French government had a symbolic right to use the patents, but in practice their use and functional installed capacity remained insignificant. The limited amounts of synthetic gasoline were marketed through the retail facilities of Standard Oil and Royal Dutch–Shell.[64]

The world patent pool and "as is" agreements for the control of world oil distribution were such an integral part of the world industry, during such a critical developmental period, that it is difficult to summarize what might have emerged in their absence. The agreements left their imprint on the world hydrocarbon industry long after the formal contracts and cartel accords had been dissolved or rendered irrelevant. In France coal was limited to competing in its traditional

[64] Pat.Hearings, Teagle to Howard, 26 February 1936, p. 3731.

markets. That is to say, coal producers had their traditional status as suppliers of a solid fuel for transportation, industry, and heating. They could not modernize, as Peyerhimoff wanted, through the development of synthetic fuels. As a result of the world hydrocarbon cartel, this avenue was closed off. The coal industry was left, for the liquid fuel market, with its traditional product, benzol.

Benzol marketing developed rapidly in the 1930s. Some coal gas companies found benzol essential to maintaining profits during the Great Depression. Benzol also gave them a new product to market in the face of rising competition from electrification. The very name of the Société d'Eclairage, de Chauffage, et de la Force Motrice,[65] shows the only viable commercial strategy left for coal, once oil from coal had been eliminated. Company records state: "Our equipment for refining coal tars and removing benzol from gas continues to function well. Thanks to it we have made important profits . . . the balance 1932 shows a profit equivalent to the previous fiscal year." In the following year, "refining of coal tars and benzol recovery have maintained our company in a healthy position from an accounting point of view."[66]

Since benzol was often mixed both with alcohol and with gasoline, benzol producers became active importers of gasoline. With synthetic fuels tied up by the world hydrocarbon cartel, this became the avenue for the coal gas industry to increase its position in the liquid fuel market, but it tied the companies to a recovery technology that would disappear once electrification swept away the principal market for coal gas. Still, coal gas companies' requests for licenses to import gasoline to mix with benzol became a durable feature of oil import policies in the 1930s. The proliferation of benzol-related gasoline imports for a time caused the "as is" companies' French market share to decline in the middle 1930s, although their sales in absolute terms increased.[67] The coal gas industry also allied itself with the agricultural lobby, which in 1923, in a display of powerful lobbying influence, had passed a requirement that all companies importing oil in France buy a percentage of alcohol to mix with their fuel. The coal-agriculture lobby's power renamed the Office National des Combustibles Liquides (National Bureau of Combustible Liquids), from the proposed Direction des Essences et Pétroles (Directorate of Gasolines and Oils).[68] The alcohol legislation was a pure income transfer to the agricultural sector, though it was touted as a strategic policy.[69]

[65] Company for Lighting, Heating, and Motor Fuel.
[66] Arch.Nat. 136AQ40, entries for 30 May 1933 and 28 June 1934.
[67] FTC1, p. 324.
[68] Thomas 1934, p. 68.
[69] See Rooy 1925.

The gasohol law remained in effect until 1957. There were also, as mentioned above, some efforts to join agricultural ethanol production to the production of methyl alcohol (methanol).[70] The world hydrocarbon cartel began to develop technical controls over the dispersion of methyl alcohol production patents, however, subsuming this product into its practices on synthetic oil from coal.[71]

When the French coal industry was nationalized after World War II, the high degree of cross-ownership among coal mines and other industrial sectors presented the legal problem of cross-nationalization. When it took over various mines, the government also nationalized by extension the stocks those mines owned in other enterprises. The government thus gained indirect participation in companies that had not been the object of the original nationalization. A special commission determined which cross-nationalized holdings would remain under government control and which would be returned to the private sector.[72]

The commission's work documented an aspect of the coal companies' activities that might otherwise have passed into oblivion: there were coal-owned companies for research on synthetic fuels, which had not had government support. Coal interests had also tried to develop their own conventional oil production in sites in Syria. The fundamental obstacle to these efforts was the monopolization of world oil resources by the members of the "as is" agreement, conjugated with the international patent pool. With hydrogenation and significant oil exploration efforts kept out of reach, the coal industry had only pathetic alternatives: marginal production areas in Syria, benzol marketing, and a failed alliance with the agricultural producers of distilled alcohol fuel. France had the industrial impetus and know-how to enter the modern age of hydrocarbons without the international oil majors; but through patent controls these companies forced French hydrocarbon development down the road they offered, and no other.

The Marginally Independent National Strategy

The independence of France and other countries in the interwar period was compromised by the tight control of world hydrocarbon resources. Still, France marginally *did* enhance its strategic posture.

[70] See Nowell 1985, pp. 110–131.
[71] Pat.Hearings, part 8, 24 May 1932, pp. 4622–4623.
[72] Fin. B9808, "Procès verbaux et comptes rendus de la commission interministérielle de l'article 17 de la loi du 17 mai 1946."

Because transnational structuring works orthogonally and not in opposition to state goals, not all of France's policies responded *solely* to the needs and compromises of the principal contending business groups.

Let us assume that France could not reasonably have resisted the oligopolization of world hydrocarbon resources by companies belonging to other countries. What might have improved the country's strategic posture? Realist theory cannot explain the specifics and timing of French hydrocarbon regulation, but the French state's actions may have had some overall benefit from a realist-mercantilist point of view. There were four arenas of oil policy in which the French might have enhanced their strategic posture without intruding, at least in the near term, upon the overarching objectives of the world hydrocarbon cartel. These were the national reserve requirement; oil exploration independent of the international majors; the development of refining; and transportation.

The National Reserve Requirement

The failure to develop a commercial synthetic fuels program meant reliance on overseas fuel supplies. Mesopotamia was one such source, but French control was sharply limited. France had only one vote out of four in the Iraq Petroleum Company; in wartime the sphere of influence was British. France remained as dependent on overseas supplies as it had been before and during World War I. The notion that the Compagnie Française des Pétroles had a particular *strategic* significance is exaggerated. The company had access only to whatever the British permitted it. The political elites who shaped France's energy policy knew this all too well. It may have been in France's national interest, as a matter of revenue, to have a French company earning money in foreign oil, but the debates over the Compagnie Française des Pétroles' equity structure and oil import quotas had little to do with the national defense. During the ratification debate in 1931 Léon Blum, the socialist leader who led the opposition to the government's proposal for the Compagnie Française des Pétroles, attacked the argument directly: "Let me address the argument . . . about the national defense. It is not a nice subject to have to think about, but let me tell you that any speculation on this subject is just nonsense that is bound to confuse. For if you are ever in a war situation, from the point of view of your petroleum supplies, there is only one question to ask and none other: that is the question of knowing if you will have on your

side or not the alliance and the active sympathy of England and America. That is the only question there is."[73]

Louis Loucheur, who had helped in the negotiations of the original bylaws for the Compagnie Française des Pétroles in 1924, who was one of the 1928 oil import law's principal authors, and who was for a time board chairman of the Office National des Combustibles Liquides (and the nominal boss of its director, Louis Pineau), answered Blum's criticism the next day: "In 1924 . . . having discussed the question with M. Poincaré, I was preoccupied, like him, not with wartime supplies—because, on this point, I am as skeptical as you, M. Blum—but in normal times, in time of peace, to reestablish the balance between offers from the Soviets and from the trusts, and it was thus that I thought the Compagnie Française des Pétroles should have as a goal the procurement of crude oil."[74] Loucheur's response confirms the readings of archival sources in this chapter and the previous ones. He has never been quoted in any of the previous English or French monographs on French oil, even though on the whole these have tended to portray French oil legislation as oriented toward furthering the "national defense" and the "national interest." Commercial pressures and competition meant more than any supposed strategic crises or other considerations. His explanation deserves a closer look.

Loucheur's reference to Soviet oil is an opaque allusion to the complex issues regarding Soviet oil. It is not clear what he means by reestablishing a "balance" of Soviet oil in 1924; he probably meant restoring the levels reached before World War I. Loucheur is referring to Mercier's failed efforts to get the Compagnie Française des Pétroles to import Soviet oil, efforts that were bypassed by the Office National des Combustibles Liquides' and Pétrofina's separate arrangements. In other words, Loucheur hoped the Compagnie Française would unite the Soviet and Mesopotamian oil factions; in spite of his best efforts the two split, the Soviet faction pursuing its goals through the Office National, the Mesopotamian faction dominating the Compagnie Française. The second part of Loucheur's statement is precisely the point of this book. Poincaré and he were worried about "normal arrangements," not wartime supplies. The major oil "crisis" France faced was not the ephemeral wartime crisis of the last two weeks of 1917, which indeed, had it been serious, would have cast the issue of oil regulation in a strategic light, but rather the protracted battle for control of the French market that caused Standard Oil to embargo deliveries from November 1919 to April 1920.

[73] Déb.Ch., 20 March 1931, p. 2107.
[74] Déb.Ch., 21 March 1931, p. 2155.

Political elites concluded that reconciling powerful conflicting commercial interests in peacetime was a higher priority than doing so in wartime. As Blum suggested and as Loucheur agreed (claiming Poincaré's concurrence), the wartime oil import game was lost without the help of the world's two major maritime, oil-producing powers. Peacetime relations among companies, on the other hand, were complex. The size and diversity of the industrial and financial groups interested in state policy put the state under extreme pressure to find a modus vivendi among groups whose antagonisms were fundamental. The Compagnie Française des Pétroles, far from being a national champion, was stripped down to the bare function of procuring crude oil, which it did only after the major trusts had taken large shareholdings, and then primarily from a source whose output was controlled by those trusts—the Iraq Petroleum Company.

Loucheur's remarks are a confession of state weakness from a realist-mercantilist point of view. The French state had no articulated oil policy during World War I, and in 1931 one of the leading participants in postwar oil policy averred that he sought to ensure oil procurement in peace only. There was no strategic oil policy during the war and no strategic oil policy afterwards, period. There were various "national goods" that may have been pursued, but once the dominant rhetorical element of national defense policy is removed, as by Loucheur in the passage above, the interpretation of French oil policy from a statist point of view becomes decidedly nonsensical.

Without the "self-help" concept of the national defense dictating appropriate economic policy, realism-mercantilism offers little to determine what goal should be pursued. The regulatory toilings of the French state were designed—for what? To favor the commercial interests that profited from them? To reduce the oil deficit? To freeze market shares of the national companies or their international rivals? To cartelize the market and raise prices? To give major financial institutions a chance to buy into an oil company with state guarantees? To deny synthetic fuel programs to the French coal industry? But if policymakers had concluded that they were helpless to enact any strategically meaningful oil policy, they were free to optimize the rent-seeking activities of groups that were willing to support them: the Banque de Paris et des Pays Bas and its allies in Poincaré's case; Saint Gobain and groups favorable to Russian oil in the case of the Left. Window dressing about the national interest was exactly that.

This brings us to the national reserve oil stocks. The 1928 oil law required all companies importing into France to maintain a three-month supply of oil, using their annual sales from the previous year as the base period. Since investment in Mesopotamian oil was primarily

a strategy for commercial compromise in peace, this was one of the few truly strategic elements left in French policy: how much oil would physically be in France in the event of a crisis. The three-month reserve requirement can be analyzed as it evolved and as it worked, as shown by documents from immediately before and after the outbreak of World War II.

Strategic considerations played a minor role in the reserve requirement's adoption. As we saw in chapter 2, a three-month naval reserve was funded by the French parliament before World War I, even though the navy had requested a nine-month reserve; the latter was deemed too expensive. During World War I, as covered in chapter 4, reserve requirements for the industry were put at 22,000 tons and raised to about 100,000 tons towards 1918. In 1921, when the wartime state monopoly was officially dismantled as a result of pressures from Standard Oil, the three-month requirement surfaced again. This time the reserve was not for naval requirements, but for three months' *civilian* consumption. This considerably lowered the quantities needed; it is unclear whether the stocks were rebuilt after the 1919–1920 embargo, but the switch to a "civilian" criterion released sizable stocks, purchased at high prices, that were sold off at a loss to the private sector when the monopoly was ended. The three-month "requirement" for the private sector really served as an excuse for a sell-off of reserves that had grown closer to the nine-month ideal of the navy; after the sell-off, the oil held in strategic reserve declined.[75]

Some kind of speculative maneuver occurred here. Because of Bérenger's 1918 "monopoly" policies, the government "owned" reserves but stored them in the facilities of the private sector; reducing the government reserves opened up additional commercial capacity for the importing companies without forcing them to build more storage. Even though the country had passed through a seven-month oil embargo a year earlier, the 1921 law diminished the size of strategic stocks and turned the responsibility for maintaining them over to the private sector. The "good sense" of the 1921 three-month requirement masks the reality of reducing real reserves only one year after a crisis.

In 1925 the three-month reserve, still in effect, was rewritten into law with the authorization of the Office National des Combustibles Liquides. The same clause was rewritten into the 1928 oil import law, but under radically different commercial conditions. The reserve was a light burden to major companies that were building refineries, but

[75] Doc.Ch., annexe 1782, 9 December 1922; Déb.Sén., 30 June 1921, p. 1471; Fin. B32314, "Le Monopole d'importation en France pendant la guerre et sa liquidation en 1921," n.d., prob. 1931.

when applied to the small importers of refined products it became an instrument of market discrimination. The import licenses were negotiable and had a value independent of the company that held them. They became a means to promote market concentration. In one case a company sold out to another: only one-third of the price was for the capital equipment; two-thirds was for the 38,700 ton import license.[76] The reserve requirement helped companies with storage facilities pry loose import licenses from those that could not afford to build storage.

France's military desired a much larger reserve than the required three months. A report prepared and circulated in 1922–1923 for the prime minister by the Conseil Supérieur de la Défense National, a French body roughly equivalent to the Joint Chiefs of Staff, is interesting to examine in light of what French policy eventually became.[77] The report likened oil's strategic importance to that of coal, iron, cotton, wool, and wheat.[78] The report forecast military needs for a reserve of 1,600,000 tons of various oil products, plus an additional 750,000 for civilian uses: this wartime "minimum" exceeded one year's commercial consumption for the entire country, yet the reserve requirement that prevailed, and that has continued in force until the present, was for only three months. In contrast to the French situation, the report evaluated British reserves at nearly a year's supply of commercial consumption and projected them to increase to well over that.

The report favored the construction of a refining industry in France, but with a six-month, not a three-month, reserve requirement. Japan and Italy were each reported as seeking total reserves of over one million tons—all of which underscores the inadequacy, as measured by the policies of "world peers," of the three-month requirement. The report observed: "The general policy of nations must tend, to the greatest extent possible, to liberate them from foreign supplies of the products necessary to their economic existence in wartime; in spite of this there will unfortunately be some products for which this will prove impossible."[79] The report outlined a series of measures concerning synthetic and substitute fuel production, including shale oil, as well as stockpiling and conservation, none of which alone could create independence for the country, but that together would have done much

[76] Déb.Ch., 25 March 1931, p. 2183.

[77] Fin. B32313, "Rapport au sujet de la politique du pétrole en France," 24 May 1923. All material cited as "the report" comes from this source unless otherwise indicated.

[78] This is an additional argument against the notion that strategic considerations guided state policy in the formation of Compagnie Française des Pétroles. One would expect equivalent "Compagnies Françaises" in cotton, iron, wool, etc. The constellation of private interests in the oil market thrust state policy in the direction of a state company, but there was no equivalent pressure for the other strategic commodities.

[79] Fin. B32313, "Rapport au sujet de la politique du pétrole en France," 24 May 1923.

more than the country actually achieved. The French market was large enough to interest all major oil suppliers, and Poincaré and the government used this interest to incite cooperation for the peacetime regulation schemes.

The report warned, in true realist fashion, that today's friends could become tomorrow's enemies. A policy of total reliance on the international companies was inadvisable. "Everyone remembers," the report said, "how in 1920 Standard Oil refused to contract with the French state under the oil import monopoly regime."[80] The British cutoff of supplies from the Caucasus in 1919, when France was scrambling to make do without Standard Oil deliveries, was also fresh in Louis Pineau's mind in 1928 shortly after the oil import quota law had been enacted.[81] In the face of this perfect bureaucratic memory of earlier supply failures, it is difficult to justify not having more significant oil reserves than the three-month supply required in the 1928 law.

By 1939 the situation had not changed. The 1928 oil legislation was eleven years old, the Compagnie Française des Pétroles was producing oil and making profits, but the government had yet to make the oil industry hold significant oil reserves. The situation looked deplorable even to an industry representative, Léon Wenger of Pétrofina, who in May 1939 completed a survey for the French government of available oil sources and observed that "the question of war stocks . . . is still not resolved, in spite of all the efforts in that direction." What these efforts might have been, Wenger does not say; but they could not have included large oil purchases, for he was still talking about war stocks in the conditional mood: "I have always said that the creation of war stocks would permit the reabsorption, for example, of the 150 million francs in commercial back payments and 300 million francs in longer-term debt that Romania owes France. In addition, these stocks should be protected, in underground storage."[82]

Even France's adversaries could not believe the pitiful state of its oil stocks. After France's capitulation in June 1940 the Italian admiralty sought, during armistice negotiations, to lay its hands on the vaunted French stocks:

> Admiral Raineri Biscia took the floor and pushed hard concerning the interest the Italian navy had in getting a favorable response to its requests

[80] Fin. B32313, "Rapport au sujet de la politique du pétrole en France," 24 May 1923.

[81] Pineau refers to the British control of the pipeline from the Caucasus in Fin. B32310, folder 4, "Reunion chez M. de Saint Quentin," 16 April 1928.

[82] Fin. B32313, Wenger to Coulondre, 15 May 1939. The linkage of oil imports to debt, now focused on Romanian payments, remained even in 1939 characteristic of Pétrofina's concerns as a "bankers' oil company."

for fuel oil. He was astonished at the refusal of the French minister of the navy. He said that he knew about the fine organization of this navy and the high quality of its officers, especially Admiral Darlan, whom he saw once at a conference in London; and he thinks he can infer that the French naval reserves must have been quite large. He made an especial mention of Bizerte [in Tunisia], where there ought to be, he said, veritable "underground lakes" of oil. He added that warships near Toulon must have, in their holds, at least 300,000 tons of fuel oil.

Our representatives answered that, as the Italian delegation knew, French naval needs remained important; *that the guarantee of the freedom of the seas had allowed us not to accumulate stocks as large as Admiral Biscia claimed to know about;* and that a large part of the stocks had been destroyed during the German advance.[83]

French representatives had every reason not to tell the truth to their Italian counterparts in 1940, and it would have been to their credit if, in this situation, they had been deceiving the Italians. One indication that they were is the navy's claim that "naval needs remained important," surely an exaggeration after the British sank the bulk of its fleet off the coast of Africa, at Mers El-Kebir, in July. Still, in the main they were truthful. Their statements are remarkably similar to a much earlier report made to the government in 1939:

It is said that the Anglo-French accords will permit, in wartime, sufficient supplies in gasoline and fuel oil and that the real thing to worry about is the impossibility of finding anywhere sufficient quantities of aviation fuel. *Yet the Germans have synthetic gasolines made in Germany that have the necessary quality (octane rating) to be used for aviation.*

It may be that [current policy] is enough, from the military viewpoint, but I have to say that I can only with difficulty admit that the Anglo-French accords can replace a stock, which would be immediately available on French soil from the moment hostilities began, a stock that could be used for aviation, in case of an unexpected intensification of aerial or submarine warfare.

I have equal difficulty admitting that we could be permanently subordinated in our political and diplomatic activity to the desires of England alone, which could, simply by refusing us fuel, forbid us any freedom in our own European interventions.[84]

Wenger underscores that the French three-month reserve requirement, as of mid-1939, offered no margin of additional security. France's

[83] Arch.Nat. Desmarais Frères 130AQ16, folder 3, "Note," n.d., but cites text as referring to a meeting between French and Italian delegations in Rome, 6 August 1940. Italics added.

[84] Fin. B32313, Wenger to Coulondre, 15 May 1939. Italics are underscored typewriting in original.

oil policy was really reliance on British formal assurances, country to country, and American informal assurances, which were more of the nature of company to country.[85] France's oil policy had not gotten it much independence, nor, it appears, much security either: after two decades of the government's supposedly "strategic" intervention in the oil market, by mid-1939 there was not enough aviation fuel on hand to meet battle conditions.

Why then did the 1928 legislation stipulate a three-month reserve requirement? What was the purpose of such legislation, given its utter inadequacy? We have seen that most aspects of French oil policy during this period, from oil import quotas to the fight over state equity participation in the Compagnie Française des Pétroles, trace their origins to specific interest group conflicts. The three-month reserve requirement was no exception.

Any enterprise maintains stock for commercial purposes. Raw materials wait to be processed into finished products; some materials are in transition from the raw to the finished state; the finished products await shipment. The state required an oil company to keep on hand three months' oil sales as determined by total sales the year before. How much was this, measured against the quantity of oil that the company would keep on hand anyway? Ernest Mercier testified in 1929 that oil refineries normally needed a forty-five-day supply of crude, a quantity of "intermediate products" waiting for further processing equal to about fifteen days of sales, and an additional thirty days' worth of finished products waiting to move to market.[86] That totals ninety days, or three months. The ninety-day "reserve requirement" was no requirement at all, at least not for the large companies that planned to go into the refining business.

If the reserve requirement was not in fact a requirement, what function did it serve? France continued to have, as before World War I, many small importers who typically imported a petroleum wagon, or shipload, of refined products from Romania or elsewhere. This oil petty bourgeoisie competed against the larger firms, whose state-cartel prices made outsiders' attempts to enter the market a certainty. The three-month reserve requirement was particularly onerous for these small firms, for whom it represented not only excessive capital to be invested in maintaining an unnecessary level of stock, but the additional costs of proper storage. Conflicts over enforcement of this requirement, an integral part of the oil-import quota system, were a recurrent element

[85] The French had repeatedly agreed in the naval conferences of the 1920s and 1930s to a smaller navy than other major powers, relying on British and possibly American naval support in the event of hostilities.

[86] Arch.Nat. Desmarais Frères 130AQ1, "Notes pour les experts—Déposition de M. Mercier devant la commission des experts," 6 June 1929.

of the oil market in the mid-1930s.[87] A common quota evasion tactic was for a small importer to rent sufficient oil storage space to qualify for assignment of an import license, and then import without using the tanks. In short, the cost of the three-month stock was onerous. The small importers would have been brushed aside by the oil majors had not many of them sold their refined products to benzol producers: the true conflict over refined imports was between oil and the coal sector.

The scheming of one oil importer illustrates the reserve requirements' effects. To eliminate the "independents" of "lesser importance" than himself, he proposed, "The most effective means would be to buy their products using third parties as buyers . . . to the degree that their reserve requirement will increase [in proportion to their sales], so will they have financial problems; for it is not always easy for these groups to buy fractions of one- or two-thousand-ton cargoes. Their progressive weakening can be hastened if we buy their products. . . . After letting a certain amount of time go by, and letting their required reserve stock go up, it will be easy to eliminate them from the market altogether by offering to buy their entire reserve stock, and thus their right to import."[88]

The elaborate scheme of front men buying on behalf of the larger oil companies never took place, but the passage's anecdotal value lies in the author's perception that the reserve requirement was going to be a significant burden on small companies. Along these lines, another French company, which imported refined products from Romania, testified that the three-month reserve requirement "constitutes an incredible cost for us."[89]

Reliance on the "freedom of the seas" as guaranteed by Britain was repeatedly used as an excuse not to build up large oil supplies. If the First World War had brought about a major supply crisis in 1917, as standard histories say, one cannot explain how French elites could have come around to this position. The interpretation offered here is more consistent: Standard Oil had pulled France through the previous war, and Standard Oil could pull them through the next one. Therefore the best thing to do was to make Standard Oil feel at home. Give Standard Oil a share in the French "national" company; give Standard Oil a generous quota under the 1928 legislation; adhere to the worldwide hydrocarbon patent agreements of Standard Oil and its friends: these things would make the company feel welcome.

[87] Arch.Nat. DF130AQ1, letter from Détinguy to Cayrol, 27 June 1935; "Unification du régime des autorisations," 4 June 1935; "Fédération Française des Carburants," 26 June 1935.

[88] Arch.Nat. Desmarais Frères 130AQ6, "Les Indépendants," 12 August 1928. The mastermind was A. Kahan of the Union Général des Naphtes.

[89] Testimony of Marcel Champin, "L'Enquête parlementaire," *Revue pétrolifère*, no. 261 (17 March 1928):364.

France succeeded in making Standard Oil feel at home: hydrogenation as the backbone of synthetic rubber and fuels progressed no more in France than in the United States. One-hundred-octane aviation gasoline, as Wenger notes above, was not to be had in France; but Standard Oil also refused the United States Army's request to make the fuel available. The fuel might have given the United States "the lead over the military aviation of the rest of the world," but "Standard Oil . . . to comply with the wishes of the United States Army and to so serve the country's defense . . . would have to violate its contracts with I. G.," which the company would not do.[90] France's policy was not "national independence." Nor was it particularly shrewd, since the single major oil crisis the country had faced had come from a dispute with Standard Oil. And when the favors were handed out to Standard Oil every other member of the oil industry also held its hand out, and in the mad rush for market shares strategic considerations disappeared altogether.

A white knight would supply oil to France in a crisis. Strong state intervention had engendered a weak state's policy. Did it have to be *so* weak? Even the Italians, who have not been noted for military prowess in this century, had difficulty believing France's lack of preparation. Perhaps French oil regulation has passed as a "strong state's" market intervention because the truth is, in mercantilist terms, unbelievable.

The strategy of neglecting domestic oil stocks while relying on allies to guarantee freedom of the seas did not win the approval of military strategists; it was the product of civilian control, especially Poincaré's governments. The 1923 military report on oil policy was willing to ask the difficult and pertinent questions: "Can we imagine the possibility of a great struggle without also having, thanks to our alliances, the freedom of the seas? Must we take into consideration the possibility of a more limited struggle where our own fleet would have to guarantee a certain relative freedom of the seas?"[91] For the military, the problem was how to achieve independence from the trusts. "Above all," the 1923 report continued, "France must establish direct relations with other productive countries, such as Mexico, Central America, Venezuela, Colombia and others of the South American states, as well as Romania, Poland, and Russia, which would undoubtedly favor such a policy, which our country could pursue through an accord with the Belgians and the Italians."

These are the realist-mercantilist goals of supply diversification. They assume that the international oil majors were the powers from which France ought to be independent. The military wanted to unite

[90] Pat.Hearings, testimony of Patrick Gibson p. 3353; memorandum, 29 March 1935, pp. 3708–3710.

[91] Fin. B32313, "Rapport au sujet de la politique du pétrole en France," 24 May 1923.

the underdogs against the dominant world oil interests, the opposite of the collaboration with them followed under Poincaré. The recommendations followed naturally from the assumption that the "oil problem" was how to achieve independence from the trusts. Independence connoted autarky, indigenous production, stockpiling procedures, and finding ways to bypass the trusts in world oil markets to make direct ties with the "underdog" undeveloped nations who also, so the report's authors presumed, had a strong desire to bypass the oil internationals. France had "realists," but they were not relevant.

The navy wrote: "Concerning acquiring oil-producing terrain, the minister of the navy points out that it will be necessary to avoid operations in countries too far from France or in countries in which our land and sea links might be cut in time of war. Such would be the case, for example, of the Caucasus and Georgia, if the straits of the Dardanelles could not be neutralized or were under the domination of the Turks, who might again be allied with our adversaries. On the contrary, except for the risks of naval warfare, it will always be possible to bring into France oil from Mexico or South America; thus the purchase of oil-bearing terrain in these countries seems particularly interesting."[92]

Two years later this same French navy, in order to help Pétrofina's oil purchases, began to supply itself almost exclusively from Soviet sources, even though the Dardanelles and the Caucasus had been singled out as unreliable regions. The procurement continued through 1939.[93] Although Mesopotamian oil was more secure than Soviet oil, it too depended on a control of the Mediterranean that the French armed forces considered questionable. Yet French oil policy focused exclusively on this oil source, and one finds few efforts directed at commercial relations with the oil-supplying countries whose Atlantic supply route would have posed fewer strategic problems.[94]

Independent Exploration

The 1923 report of the Conseil Supérieur de la Défense Nationale strongly supported oil prospecting in French territories and colonies. The French mandate of Syria was part of the Red Line agreement; oil

[92] Fin. B32313, "Rapport au sujet de la politique du pétrole en France," 24 May 1923.

[93] Fin. B32313, Wenger to Coulondre, 15 May 1939. Léon Wenger's survey of Eastern European sources of oil commented that "the [Soviet] Pétronaphte still enjoys a kind of monopoly on fuel oil supplies for the navy."

[94] CFP 11SGA15, Comité de Direction, 1937–1941, has some records of board-level discussions by the Compagnie Française des Pétroles to establish a commercial presence in Venezuela and Paraguay. Nothing came of these pre–World War II efforts.

exploration was deliberately crippled by the Iraq Petroleum Company, which included the French "national champion." The procedure was to drill shallow holes in order to avoid finding oil. As the Iraq Petroleum Company's director said, "the Company should drill shallow holes which would constitute technical compliance with the Company's obligations." The idea was to dupe the Syrians into thinking that real efforts were being made. Fake oil exploration, tolerated by the French government, extended into other areas of the world as well. Restraints of trade were encouraged by Ernest Mercier, who himself in September 1930 had negotiated the "pro-ration," or inclusion in the "as is" agreements, of the French national market so long as oil imports from Mesopotamia were allowed.[95]

Not all of Mercier's colleagues viewed these collusive practices with equanimity. Louis Tronchère, for example, was a top lieutenant of Ernest Mercier and a director of the Compagnie Française des Pétroles and the Compagnie Française de Raffinage. In 1930 Tronchère complained about his own company's treatment by the French colonial government in Gabon and Cameroon: "It is too much to ask for the help of the CFP for three colonies when *it is believed* that the chances [of finding oil] are weak and that we get eliminated when *it is believed* that the chances [of finding oil] are strong. [The colonial governor] answered that for this year it was too late, but that next year we would be allowed in. By that time *our participation will come too late for us to have given our own opinion.* We want to be *consulted now* . . . because we are convinced that someone is going to *do something stupid.*"[96] How the exploratory mission described above turned out is not on record, but the end result is known: Gabon did not become an oil producer until much later. Tronchère's letter shows how the Compagnie Française des Pétroles was the last to be called in, even in French territory, when the prospects for oil appeared promising. This is consistent with the pattern of suppressed production in Syria. It is inconsistent with the idea of a "national champion" charged with finding independent sources of French oil, as the French admiralty desired. It fits the expected behavior of a firm that collaborated in the 1930s with world oil interests who wanted to hold back global overproduction.

Significantly, Tronchère lodged his complaint about exploration in Gabon not with his superior, Ernest Mercier, but with Robert Cayrol, head of the French independent Desmarais Frères. The most faithful repository of the "public interest" was the single largest French *private*

[95] FTC2, pp. 149, 168.

[96] Arch.Nat. Desmarais Frères 130AQ32, folder 3, Tronchère to Cayrol, 15 April 1932. Italics are underlined handwriting in original.

interest, which wanted to increase the amount of oil available to the Compagnie Française des Pétroles rather than hold back that production in line with the desires of the international majors. The Compagnie Française des Pétroles' oil exploration record in the pre–World War II oil market remained unimpressive.[97]

Perhaps capitulation to the world hydrocarbon cartel brought France "security through interdependence." The country's collapse in World War II was so rapid that no long-term strategic procurement policy could have been tested. The alliance with Britain and the United States could hardly perform when the national government had been replaced with the Vichy regime. Still, sudden turnabouts of allies and enemies are the very stuff of realist thinking about the international arena. In the eyes of the French military, whose tradition of continental power balancing included centuries of opposition to the English, reliance on the British "guarantees" of "freedom of the seas" must have seemed the height of naïveté. The Conseil Supérieur de la Défense Nationale voiced a pure realist skepticism about the value of France's oil policies: "What does it matter if we have all these accords, all these contracts, if we are not masters of a productive territory? Someone can deny us oil, when the time comes, in spite of all the written promises."[98]

Refining

The 1928 import quotas fostered peace between the international majors and domestic French oil companies, resulting in the growth of a genuine refining industry on French soil. The refining industry had two important effects. Refining investments increased the stake of the oil multinationals in France and gave an incentive to keep them working and profitable. Standard Oil would think twice about suspending oil deliveries, as it had in 1919–1920, if that meant idling its own refinery. The presence of the refineries on French soil also gave the government something to seize if a national emergency required it. Though the quotas that made the refining industry possible were the artifact of private capital, France's strategic position objectively improved.

[97] Forbin, a "pro–oil company" author, reports (1940, p. 227) that after exploring in Algeria the companies "recognized the uselessness of their efforts and abandoned them *too* discreetly. Contrary to established custom they closed up the bore holes without giving to the Algerian authorities the logs (stratigraphic sequences, daily memoranda kept on the site of the exploration) which would have informed us about the composition of the underground strata. The explanation of abandoned effort because of failure to find oil is not considered true by the Algerian colonists; for them, the trusts indeed discovered oil, but for unknown reasons decided not to develop it."

[98] Fin. B32313, "Rapport au sujet de la politique du pétrole en France," 24 May 1923.

Opportunities to maximize the strategic value of the refining industry were passed up, however. Ordinary market forces would have brought some refining capacity into France even without the quota system. In the nineteenth century free traders had mocked the refining industry in France: "If you cannot refine oil in France, then don't do it. Would you take French wine abroad in order to distill it into cognac? No, you distill it in France, so do the same for oil . . . you don't have oil, too bad for you, your industry is impossible."[99] It was thought that without protection there could be no refining in France even much later. By the late 1920s, refining advances meant that higher proportions of crude oil could be distilled into a marketable product rather than discarded as waste. The old analogy with cognac no longer applied, largely because of the convergence of chemical synthetics and oil-refining technologies. Residues from oil refining could in theory have been processed directly by the refinery into chemical products, but the world patent pool preempted this "natural" development. The second alternative was for a refinery to sell its "residual waste" to a chemical company for processing into chemicals.

Refining near the country of consumption affected shipping costs. An oil company could ship crude from the point of production to the point of consumption, where it made its normal spread of gasoline, fuel oil, and residuals for sale to a chemical firm. All it needed was a tanker equipped for crude oil. Refining at the source required specialized tankers for each kind of product: at a minimum, different holds had to be outfitted to transport each finished product. Since crude oils varied in their product yields depending on their region of origin, a company would have to calculate the optimal proportions of product-carrying ability necessary to build into the holds of the various ships. Since market demands shift, how to constitute an ideal corporate fleet was a problem. There were also differential rates of wear on tankers designed for refined products as opposed to crude oil; refined products were more corrosive and shortened the useful life of tankers.[100]

Thus the advantage shifted, though not completely, in favor of locating refineries near the point of consumption. To this day the world oil market offers examples of refining both near the source of production and near the point of consumption, or at a convenient point of transshipment. Some factors argued in favor of putting a refinery near production, especially when the industrial profile of the market area did not permit the sale of a full range of products. The Abadan refin-

[99] *Annales du Sénat et de la Chambre des Députés*, vol. 5 (20 April–8 May 1880), p. 200.

[100] Testimony of Marcel Champin, "L'Enquête parlementaire," *Revue pétrolifère*, no. 261 (17 March 1928): 364.

ery in Iran could sell its fuel oil to the British navy and furnish kerosene to the Asian markets, which used lamp oil longer than the European market. Shipping Iranian crude to India made no sense, for part of the spectrum of products would have to be shipped back to industrial countries for consumption. On the other hand, Anglo-Iranian did locate a full refinery at Swansea in Britain. Britain could absorb a full product spectrum. As a "late developer," Anglo-Iranian was less committed to refining near oil sources than Royal Dutch–Shell and Standard Oil. It was one of the first companies to locate modern refining plants in France.

The French domestic companies used the national oil producing and refining companies to achieve complete vertical integration. They wanted to insulate themselves from depending on the refined products supplied by the world trusts. Other firms interested in refining included Pétrofina, which wanted to enlarge its presence in French markets, and the Saint Gobain group. For them the import quotas of 1928 meant that the expensive refineries would be protected from the risk of fluctuating market demand. Investment in the refining industry also became a means of promoting one's eligibility for a quota, so that the investment itself became part of the competitive process to obtain a legal claim on market share. Saint Gobain's frustration in this process was one of the underlying causes for the struggle over the size of state equity in the Compagnie Française des Pétroles, as discussed above. On the whole, however, the legislation was accurately summarized in a report to Louis Pineau as having "sheltered from the trusts" Desmarais Frères and other French national companies.[101]

Even within multinational firms, there was no consensus about where to put refineries. Standard Oil confessed before parliament to internal disagreement about the relative merits of refining in France in 1927. A. C. Bedford thought that "refining in a non-oil-producing country was not economically sound" but added, "in my company, not everyone is of the same opinion." He thought the oil import quota system would work if "it allows us to survive and develop our business affairs according to normal commercial practices"; he worried that if the regime was not maintained long enough, investments made on the basis of the law would not be adequately amortized.[102] Privately, Standard Oil wanted the French companies lumped into one group so as to control production in the market as a whole: in Teagle's words to I. G. Farben representatives, "We could let the Compagnie Nationale build a refinery in one place, we in another, Standard to give an outlet to Compagnie Nationale's product."[103]

[101] Arch.Nat. Desmarais Frères 130AQ1, letter to Pineau dated 24 June 1930.

[102] Testimony of Bedford, "L'Enquête parlementaire," *Revue pétrolifère*, no. 269 (12 May 1928): 665.

The syntax "we could let" is extraordinary: Americans negotiating with the Germans "could let" the French build a refinery. And in fact that is what happened: Standard Oil got one refinery; it "let" the French "Compagnie Nationale" have another, it did not become the distributor for the French national company's products, but that was a detail: as the I. G. Farben representative said, "What you want is the selling," to which Teagle replied, "Yes; same percentage as now. What we hope for in France is a unification of the various French interests behind a policy satisfactory to the majority."[104] And that is what Ernest Mercier and Standard Oil put together; or rather, what "they let" France do, with the knowledge, consent, and prior discussion of the matter with I. G. Farben, which sought to prevent the spread of hydrogenation technology.

The state's concern with refining reflected financial and strategic considerations. National refining would reduce foreign exchange losses by keeping the profit on refining within France. In 1927 Poincaré himself spoke of "the connection of oil affairs with general political considerations as well as with finance politics."[105] In 1923 a French admiral argued for bringing the refining industry into France because "any diminution of our financial power acts against our military power."[106]

In theory, refineries in France meant the government could tell them where they had to buy their oil and so could have diversified sources. In practice this option depended on political and technical factors. The political factor was the will to tell companies where they could buy their oil; there is not much evidence that such a will existed. The technical factor was outfitting the refineries with the equipment they needed to switch from one crude source to another. Refineries were designed to handle specific kinds of crude. Different crudes either did not produce optimal yields or actually damaged refineries not able to handle them, sulfur content being a key variable. The government could have forced a "flexibility requirement" on refining companies as a condition of the import quota, requiring them to accept crude from almost anywhere in the world. As with stocking requirements, however, the government

[103] Pat.Hearings, Memorandum of Meeting, 31 August 1928, p. 3430. "Compagnie Nationale" means the Compagnie Française des Pétroles.

[104] Pat.Hearings, Memorandum of Meeting, 31 August 1928, p. 3430.

[105] Fin. B32310, folder 1, Poincaré to Minister of Commerce, 8 November 1927.

[106] Fin. B32313, "Rapport au sujet de la politique du pétrole en France," 24 May 1923. Forbin 1940, p. 222, puts the increase in the number of refineries from two in 1930 to fifteen in 1936.

backed down, and refineries specialized in specific crudes.[107] The ostensible reason was the cost, which Pineau estimated for the entire country at FF200–300 million, or about one-twelfth of total investments in refining made in France during the 1930s.[108] The government made no effort to capture the strategic advantages of having a refining industry; the one advantage it did capture was that of having the industry on its soil, which many of the oil companies themselves either favored or did not strenuously oppose.

The world hydrocarbon cartel kept hydrogenation processes from being adopted in French refineries, which limited the gains in technical expertise and related industrial knowledge that a completely modernized refining industry could bring. In 1934 Standard Oil's brand new one-million-ton French refinery did not have the hydrogenation technology that would have greatly enhanced the plant's productive flexibility.[109] Pineau argued that hydrogenation could not be used in "small" refineries; but this is not backed up by the United States Senate Patent hearings of a decade later. If the process was not profitable in France, it was because the Standard Oil–I. G. Farben accords prevented marketing the full range of by-products that would have rendered it so.

The oil-refining industry's development in France resulted primarily, but not entirely, from the law of 1928. That legislation was strongly backed by French national firms; the international firms had independent reasons to support it. Changes in technology and demand allowed refining operations to move from sources of production to the more developed market areas. Where strategic objectives indicated specifying technologies, the state backed down. Refineries specialized in specific crudes, integrating France ever more with the overall logic of international production organized by the 1928 "as is" agreements. Though some strategic benefits were realized, the whole can scarcely be called the result of realist-mercantilist state policy.

Transportation

During the First World War, the availability of oil had been less of a problem than who would deliver it, with attendant effects on company

[107] Ass.Nat. Commission des Pétroles, *Rapport Général de M. Louis Pineau*, 8 July 1934, pp. 35, 40.

[108] Fin. B32314, "Monopole d'importation et monopole de raffinage: Aspects technique et économique du problème," n.d., prob. 1933.

[109] Ass.Nat. Commission des Pétroles, *Rapport Général de M. Louis Pineau*, 8 July 1934, p. 90.

market share. The small French tanker fleet, then under British registry, was only with difficulty made available to French firms.

In the 1920s French policy brought more tankers under the national registry. There was no great opposition from any party, French or otherwise, importing oil into France. Why bother? During the First World War Standard Oil had pulled most of its fleet under German registry out from German service with complete ease. The Germans might well have had other uses for those tankers, but Standard Oil reassigned them to Asian waters, and the Germans were powerless over any ship not directly in a German port.

At any given time the bulk of an international oil company's tankers are at sea, beyond the reach of any single sovereign power. A company fleet remains de facto independent even if it is not so de jure. Sometimes a nation can get the better of a company, as for example when Britain requisitioned Socony's Hong Kong fleet and assigned it to Royal Dutch–Shell. Such actions guarantee a wartime corporate struggle for political control of industry regulation. In the 1920s the major international companies registered some of their ships under the French flag with no objection; the tonnage of oil tankers under French registry increased throughout the 1920s. French tankers carried only a small fraction of the total deliveries to France in 1919 but delivered about 13 percent by 1928.[110]

Since companies could redirect ships at sea, this gave France a marginal increase in power over shipping compared with World War I. In World War II, after the capitulation, the tankers working for foreign firms under the French flag were pulled from French service, confirming the purely symbolic character of the "control."

Of greater consequence was the development of a purely French tanker fleet. Some of these ships were military: the practice, still used today, was for oil tankers to accompany fleet movements and refuel ships at sea. The tankers so employed were not strictly speaking commercial, and any naval power needed them whether or not it was in the oil business. In the French case, however, a commercial tanker fleet was developed to carry the Iraqi oil of the Compagnie Française des Pétroles. This part of the tanker trade serviced the 25 percent of the French market reserved for the French national firm. The tankers were operated by the Compagnie Française des Pétroles along with a private firm, the Compagnie Auxiliaire de Navigation.

By 1938, however, the Office National des Combustibles Liquides, in conjunction with top management of the Compagnie Française des

[110] Figures are in Doc.Sén., annexe 77, 18 February 1926, pp. 73–74; and in Doc.Ch., annexe 5449, 3 February 1928, p. 377. A table will be found in Nowell 1983, p. 247.

Pétroles, was still of the opinion that the "oil fleet under the French flag was insufficient" and proposed a new mixed company, the Société Française des Transports Pétroliers, to purchase and operate additional tankers.[111] The state was to take a 30 percent shareholding, the Bank of Worms 22 percent, the Louis Dreyfus Bank and the French domestic firm Desmarais Frères 12 percent each, Saint Gobain 7 percent, and a combined shareholding of the Compagnie Auxiliaire de Navigation and the Compagnie Navale des Pétroles 18 percent. This commercial fleet could in theory have meant an additional margin of maneuver for the state, or those interests it wished to favor, in the event of intense rivalry over tanker tonnage under conditions similar to those of World War I. French policy in shipping was neither controversial nor, it seems, exceptionally vigorous; but it was certainly better than nothing.

A greater clash developed over pipeline routes in the Middle East, to run from the Kirkuk fields in Iraq to the Mediterranean. The French favored a pipeline route through their mandate in Syria; the British favored a route through Palestine. The Solomonic compromise was a pipeline that bifurcated in western Iraq, one branch heading to the Mediterranean through Syria to Tripoli (Lebanon) and the other through Palestine to Haifa. The French were suspicious of allowing the British exclusive control over any oil pipeline facility; their experience with Britain's seizure of oil export facilities in the Caucasus in 1919–1921 left a bad taste. So said Pineau in 1928, but the crucial producing end of the pipeline remained under British control in Iraq. The British could easily cut off French oil from Iraqi territory, whether the final port was in Syria or Palestine. Since there would be a need for some storage space at the point of export, however, the facilities on French soil provided a small buffer against a short British cutoff.[112]

The French navy also wanted an oil fueling facility in a "French" port in the eastern Mediterranean; the bifurcated pipeline answered this need.[113] French banking interests favored the increase in economic activity that the pipeline would bring in areas of the Middle East where they had investments. The Banque de Paris et des Pays Bas favored a route through Alexandretta, where it had substantial investments, but agreed to the Tripoli route when it was brought into the financing.[114]

British desires for a pipeline route through the mandate in Palestine

[111] CFP 11SGA15, Comité de Direction, 1937–1941, 12 September 1938.

[112] Fin. B32310, folder 4, "Réunion chez M. de Saint Quentin," 16 April 1928; Fin. B32310, folder 4, "Note pour le président," 25 July 1928.

[113] MAE E-Levant, Mésopotamie-Irak, 1918–1929, vol. 35, "Ministre de la Marine à Monsieur le Ministre des Affaires Etrangères," 26 August 1928.

[114] Fin. B32310, folder 4, "Beyrouth, 5 June 1928."

were much the same. The Admiralty pushed for Haifa over Alexandretta, which was an early candidate over Tripoli, because it was farther from the Turkish frontier and more insulated from a potential foe whose prowess had been demonstrated under Mustafa Kemal.[115] Anglo-Iranian was no more eager to be dependent on French jurisdiction than the French were to trust the British. The French distrusted the British to care for their pipelines, yet relied on them to guarantee "freedom of the seas," an excuse not to build up large oil reserves. The strategic reasoning was inconsistent, but the commercial reasoning was not: everyone wanted control over distributing what would be the least expensive oil in the eastern Mediterranean.[116]

Royal Dutch–Shell collaborated in Asian markets with Anglo-Iranian and echoed its preferences on the pipeline. Some of the Shell combine's management and stockholders sympathized with Zionism and wanted the pipeline to contribute to the economy of the Palestine mandate.[117] Marcus Samuel was a Zionist, but how much his influence continued after his death is hard to tell. With the Rothschilds as major stockholders, it was easy to call the firm pro-Zionist, and an anti-Semitic appeal was addressed to the government of Iraq by an independent British firm that wanted concessions in 1924. Phoenix Oil and Transport combined naked opportunism with a vulgar appeal to the basest motives imputable to the Iraqi government. It vaunted its board of directors, who were "real British interests and also shows an entire absence of that Jewish and Dutch financial control so noticeable on the Directorates of those Companies who apparently had been selected to form the group of Turkish Petroleum Company combine. . . . the Anglo-Saxon Company [Royal Dutch–Shell] have a directorate composed of 50 to 60 percent Jews while [in] others including the Shell and Asiatic the same preponderance of Jewish Directors [is] also noticeable and therefore should the British Government eventually decide to sell the interests they now hold in the A.P.O.C. to the Shell group the whole financial position in Iraq would be absolutely dominated by Jewish Financiers, thus producing the same conditions with its attendant evils as now exist in Palestine."[118] Shell's Henry Deterding, swayed by anti-Sovietism, became increasingly pro-Nazi in the 1930s, a development hard to reconcile with his career, which included thirty years of close collaboration with prominent Jews. Replaced by August Kessler in the 1930s,

[115] Fin. B32310, folder 4, "M. de Fleuriau à . . . M. le Ministre des Affaires Etrangères," 1 December 1928; Fin. B32310, folder 4, "Rapport au président du Conseil," 27 September 1928.

[116] Fin. B32310, folder 4, "Note pour le président," 25 July 1928.

[117] Fin. B32310, folder 4, "Note pour le président," 25 July 1928.

[118] MAE, 1930–1940, Iraq, vol. 67, Cheney to H. E. Jafar Pasha, 21 January 1924.

he died honored by the Nazis and shunned by the company he had made one of the twentieth century's foremost firms. Given the impassioned context of Zionism in the 1930s, the allegation that pro-Zionist considerations dictated pipeline policy must be considered skeptically. The combine would have had to depart from the single-minded devotion to oil profits that had motivated it over several decades. A sudden interest in routing its pipeline out of eleemosynary concerns for Zionism is implausible, unless those concerns matched commercial goals.

These commercial goals were not lacking, and they suffice to explain the company's position. Royal Dutch–Shell and Anglo-Iranian keenly desired to control Iraqi oil in the Mediterranean, allowing Royal Dutch–Shell to recoup the dominance it had enjoyed twenty years earlier as the second largest producer in the Caucasus. For precisely the same reason, Standard Oil opposed the British attempt to control oil exports in the Mediterranean, and the American company weighed in on the side of the Compagnie Française des Pétroles, supporting a bifurcated route instead of the Haifa-only route. "Standard Oil," read one report, "would be happy to align itself with a solution that would avoid the total control of the English authorities and would have an international character."[119]

Decisions of the Iraq Petroleum Company required a majority of the board of directors, which was divided equally between Royal Dutch–Shell, Anglo-Iranian, the Standard Oil companies, and the Compagnie Française des Pétroles. A major policy dispute in which the parties divided evenly was a recipe for trouble.[120] The pipeline debate was not just over routes, but over whether the oil should be developed at all. Given the intense thirty-year struggle for control of the Mesopotamian oil fields, this was ironic. But the world oil market was tending towards overproduction, and to maintain prices Royal Dutch–Shell and Anglo-Iranian slowed down the development of the area to keep its oil from reaching the market. In the words of the Federal Trade Commission: "The Anglo-Persian group was a large producer of oil in Persia (Iran), and if Iraq oil were brought to full development, it would compete with Iranian oil. Consequently, it was to the interest of Anglo-Persian to retard the arrival of Iraq oil on world markets. This interest was shared by the Royal Dutch–Shell and American groups. Royal Dutch wanted to protect its holdings in the Dutch East Indies, and the American group wanted to prevent the competition of Iraq oil with oil supplied by Venezuela and the United

[119] Fin. B32310, folder 4, "Rapport au président du Conseil," 27 September 1928.
[120] The majors had made Gulbenkian a nonvoting member of the company board to prevent his vote from becoming the controlling tiebreaker.

States. Thus three of the major group . . . had a general interest in 'curtailing world oil production.'"[121]

The three of the four major parties that had an interest in curtailing Iraqi production did not seek to suppress it totally. Commercial strategy dictated caution in bringing such a large source of oil into world markets; the conflict was over the timetable. According to a Standard Oil memorandum, Sir John Cadman of Anglo-Persian at first pushed for an early settlement of the pipeline route question but gave in later to dilatory pressure from Royal Dutch–Shell:

> Sir John Cadman seemed very much impressed with his visit to Iraq and the prospects the TPC[122] had before them. He also stated that although there was apparently an overproduction of oil in the world today, yet in a few years' time the companies might be in a position of wanting to draw on the Iraq fields, and he was advocating quite strongly the necessity of pushing on the development as quickly as possible, and was anxious to get this question of the route of the pipe line settled, and thereafter, the construction of the line put in hand.
>
> Sir Henry Deterding, who as you know has just returned from New York after attending conferences in connection with the limitation of production, said nothing on this subject, but looked, according to my observation, as if he were not entirely agreeing with Sir John Cadman's enthusiasm for pushing matters on.[123]

Calouste Gulbenkian favored rapid production. In September 1930 he opined that the prolonged dispute over the pipeline route was attributable to "the three oil groups [desire] to prevent any pipeline being built at all." He exaggerated, however, to put pressure on the recalcitrant parties. Standard Oil was willing to go along with the French, but only if the French were willing to adhere to the general principles of the "as is" agreements. The pipeline route dispute led Ernest Mercier to agree to pro-rationing of Iraqi oil in the French market in September 1930, on the condition that such "pro-rationing" not reach 100 percent, a total shutdown of Iraq.[124]

Construction finally started in 1932 and was completed in 1934. The two-year project had been dragged out for five unnecessary years. The first tanker was loaded on 2 August 1934 at Tripoli and on 26 October 1934 at Haifa.[125] The British manager of the Iraq Petroleum Company, John Skliros, used the extra five years to reduce the oil found, restrict

[121] FTC2, p. 145.
[122] The Turkish Petroleum Company, renamed the Iraq Petroleum Company.
[123] FTC2, p. 145, reproducing Standard Oil memorandum dated 26 March 1929.
[124] FTC2, pp. 148–149.
[125] FTC2, p. 157.

the number of wells drilled in Iraq, and cut back the depth of those that were drilled. He tried to push the completion of the pipeline project back to 1938. While he delayed, negotiations continued on how to integrate Iraqi oil into a world market that had been hit hard by the Depression. The Royal Dutch–Shell directors of the Iraq Petroleum Company "considered that an essential preliminary to any decision on the finance of pipeline construction was a full and open discussion between the Major Groups of the whole world oil with a view to the building up of their Iraq business on secure foundations and not on sifting [*sic*] sands."[126]

By November 1934, however, the groups could agree "to make every effort to take their full share of oil, but it was agreed that if the sales coordination committee could not suggest an outlet the quantity not accepted would not be produced." Iraqi production, and with it the fraction of French production, was securely anchored in the overall objectives of the management of the world oil cartel. This led to a continual tug-of-war between the "as is" principal companies and the French company, whose interest in increasing production stemmed from its role as supplier of domestic companies that, unlike the oil majors, had few alternative sources on world markets. The French government and the national companies (especially Robert Cayrol of Desmarais Frères) had similar desires to bring in more "French" oil from Iraq. The conflict between the desire to hold back Iraqi production and the desire to increase it had no clear winners. Iraqi production was shut back by 400,000 tons because of cartel agreements in 1935 but increased to full pipeline capacity from 1936 to 1938. When the French group proposed increasing pipeline capacity in 1939, the three major oil groups were opposed.[127]

As a result of the world cartel, Iraq became a swing producer. The "as is" companies kept Iraqi production down in order to favor production in other areas where the French did not have a stake. The effects of efforts to hold back Iraqi production are perhaps best seen by comparison. In 1936 Iranian production, under the exclusive control of Anglo-Iranian, was double Iraq's, and by 1948 it would be seven times Iraq's, even though the size of Iraqi reserves would have merited, under other conditions, more rapid development. From 1934, the year Iraqi production began, to 1939, Venezuelan production increased 50 percent; during the whole interwar period when the role of Iraqi production in world markets was debated, from 1928 to 1939, Venezuelan

[126] FTC2, p. 150.
[127] FTC2, pp. 159–160, 163–164.

production nearly doubled.[128] Fighting with the French over the route delayed production and was in itself a victory for the oil majors, for whom each year of delay meant additional productive capacity developed elsewhere. This was true regardless of whether the French ultimately "won" by getting their pipeline branch where they wanted it. As the Federal Trade Commission summarized, "Delaying tactics and restrictive policies of IPC have contributed substantially to the lagging position of Iraq relative to other Middle East oil developments."[129]

The refining industry that grew up in the 1930s and the pipeline from Iraq gave significant benefits to the French state and economy, but these benefits do not explain the evolution of regulatory policy. Multinational companies got extra profits from the quota and used it to contain Soviet oil production. The bias of the world oil industry moreover, was, shifting toward refining in the country of consumption rather than in the country of production. The oil import quota allowed the international firms to replicate the "as is" agreements in French domestic policy, solving the problem of cartel enforcement.

Strategic opportunities were missed. The government failed to impose a flexibility requirement on refineries; the refineries that were built did not employ the hydrogenation technology controlled by the world hydrocarbon cartel. France's share of Iraqi oil, which would reach 25 percent of the domestic market, benefited the balance of payments. Without dogged French persistence, the Iraq pipeline would not have been routed through the French mandate, thus forfeiting the advantage of French-controlled refueling facilities in the eastern Mediterranean.

The military disliked depending on Mediterranean oil delivery routes. Control of the seas was not a French prerogative, and so France relied on allies, particularly Britain, who had been unreliable in the past. Léon Blum and Louis Loucheur admitted in public debate that oil deliveries could be ensured only through the proper alliances. Others, especially Louis Pineau at the Office National des Combustibles Liquides, hypocritically spoke for independence while acting to the contrary. His office caved in to the world hydrocarbon cartel on hydrogenation and synthetic fuels and rubber; his inattention to large reserves for military needs was systematic and prolonged.

The military never had control over, nor even great influence on, energy policy. By the late 1920s the army had lost its fight for significant reserve stocks in France. The navy fared better, but only marginally; the three-month reserve requirement was used to stop all discussion about enlarging reserve stocks. Civilian policy and the pow-

[128] Figures in Tugwell 1975, p. 183.
[129] FTC2, p. 171.

erful companies that drove it overwhelmed purely "etatist" strategic considerations, as defined by the people in charge of fighting.[130] There were desultory efforts to increase the reserves, but the private sector's unwillingness to finance these proposals, and the state's unwillingness to make the private sector finance them, kept a serious reserve policy from developing in the 1930s. This was ironic because internal memorandums show that Standard Oil was willing to go much further than the French government ever required. The American oil giant would have accepted a storage consortium in which the state and private interests participated.[131]

The tremendous interest group conflicts of the 1920s shunted aside strategic goals, which were always secondary. This was underscored in 1932. As a result of parliamentary pressures to purchase a refinery for military use, Premier André Tardieu put the Office National des Combustibles Liquides in total control of French oil policy, in both war and peace.[132] Pineau consulted the military from time to time, but primarily he cartelized the French market in oils and hydrocarbons.

Marginalized in national policy, the army pursued quixotic alternatives that now appear quaint. Convinced that autarky was the only reliable answer to oil dependency, the army explored an alternative technology based on the gasification of wood. Burning wood gives off gases that can be collected and run through a carburetor to provide locomotive power. The large, awkward collection devices were fitted onto tanks and automobiles; in spite of Pineau's opposition, army experimentation on these devices continued through the 1930s. Trucks fueled by wood gas supplied the Maginot Line in 1936.[133] This seemingly ludicrous alternative became a primary means of automotive locomotion in France during the Second World War. The army's worst-case scenario about oil supplies had proved too true. It is no tribute to Pineau's foresight or pro-cartel bias that his Vichy successor, Emile Zédet, could write that by 1938 alternative fuels, such as coal synthetics and wood-burning vehicles, "did not correspond to any systematic plan of production."[134]

Conclusion

What were the transnational structuring effects of the world hydrocarbon cartel? Government policies worldwide were designed not to

[130] Nayberg 1983, pp. 519–521.
[131] Pat.Hearings, p. 3693, document dated March 1936.
[132] Fin. B32313, "Instruction sur la production, l'importation, et la repartition des combustibles liquides, carburants et lubrifiants en temps de guerre," signed Tardieu, 14 May 1932.
[133] Nayberg 1983, p. 564.
[134] Hoover Institution, René de Chambrun Collection, Emile Zédet deposition, n.d.

favor independence, but to favor the needs of the world hydrocarbon cartel members, whose "cooperation is emphatically illustrated in their unanimity of policy in the face of political demands of such foreign governments as France, Germany, Italy, Spain, Hungary, and Japan."[135] Other countries such as the United States and Great Britain were no exception.[136] The improved refining, synthetic rubber, and synthetic oil that would have gone with this technology, as well as a closer relationship between the chemical industry and the oil market, were delayed, by international corporate agreement, in every country except Germany.[137] Worldwide the coal industry, trying desperately to adapt to the evolution of the new liquid fuel market, for want of better technology and government help was forced to rely on benzol. After major efforts to get hydrogenation in France were defeated, the principal coal lobbying went into seeking import permits to mix gasoline with benzol.

The coal industry backed the creation of the Office National des Combustibles Liquides, backed quotas, and pushed both in the early 1920s and in the 1930s for a synthetic fuels program. In spite of their commercial importance, the French coal interests failed to get the kind of state cooperation for their synfuel program that oil had gotten for its projects in domestic refining and Mesopotamia. The international oil companies and the financial houses pushed their oil agenda, which included the supposed tools of "French independence," the oil import quota and the Compagnie Française des Pétroles. These same interests opposed the coal agenda for synthetic fuels. They won in French oil policy, and they won in controlling independent technical progress towards autonomy from the world oil market. Their success in France was only one of many victories, for they were successful elsewhere as well.

A market structuring effect was that chemical companies were given a strong bias not to move into refining; there were attempts at this, but the operations of the world hydrocarbon cartel, both in the United States and in France, prevented serious movement. The Saint Gobain failure shows what happened when a major chemical firm tried to buck the tide and expand its operations to include the oil market.

These things occurred in spite of a strong autarchic bias (predicted by realism-mercantilism) in the nation's military. Its bias against imports from the eastern Mediterranean were swept aside, as was its desire for national reserve stocks. Premier Tardieu consolidated power in the hands of Louis Pineau, whom Standard Oil counted as its own,

[135] Pat.Hearings, p. 3349.
[136] Pat.Hearings, testimony of Patrick Gibson, pp. 3350–3351.
[137] Pat.Hearings, "Outline of Proposal for Standard-Shell Agreement on Hydrogenation," 15 April 1930, p. 3666.

and who opposed a major synthetic fuels program. Can anyone doubt that the armed services would have preferred oil from coal? Napoleon had answered the continental blockade with widespread substitution policies: beets replaced sugarcane, chicory replaced coffee. His bold substitutions show the pathos of his Third Republic descendants, whose only effective answer to the world hydrocarbon cartel, once it had got its hands around Pineau and the Office National des Combustibles Liquides, was to bolt wood-burning gasification units onto their tanks and trucks. The irony of history is that even though some preached the necessity of "freedom of the seas" guaranteed by Britain, the armed services and Pineau himself knew full well that Britain had once proved unreliable and might again prove so. That France had vehicles that could move at all during World War II was due to the armed services' wise distrust of their nation's "mercantilist" oil policy.

But the mercantilist view is an illusion created by distorted histories of the oil market and idealized, erroneous conceptions of the state. Ernest Mercier was explicit about the need for French domestic policy to match the goals of the international oil cartel. Louis Loucheur was equally candid: France did not try to satisfy the needs of national defense in war, but attempted to appease the intense commercial conflicts that had erupted in time of peace. The founders of French oil policy themselves said and wrote these things. Negligent historiography and the dominance of realist-mercantilist, state-centric ideology have allowed them to go unremarked.

Transnational structuring is seen even in state victories. The French victory over Anglo-Persian and Royal Dutch–Shell in getting a pipeline route through Syria to the Mediterranean was possible only because of an accommodation with Standard Oil; while this fight dragged on, the world hydrocarbon cartel successfully brought on stream millions of tons of annual production and stalled development in Iraq. This had a durable effect on Iraqi national development and left France further at the mercy of the international market, while the cartel's ally in the Office National staved off the development of synthetic fuels.

The achievements of France came to this: a pipeline through Syria whose source point was controlled by the British; a small increase in tanker capacity that was virtually unopposed by the oil majors; and refining, some of which would have come to the country anyhow, and which the government failed to require to have flexible technology to handle crudes from more than one area. That there were some gains for France, particularly in the movement of the profit margin on refining to the national territory, is not to be disputed; but this was more the by-product of intense commercial competition between domestic

and international interests than it was the triumph of a realist-mercantilist policy.

As for describing not what France did from a realist-mercantilist viewpoint but rather *what was in fact done in the world political economy,* the state-centric international relations vocabulary of realism-mercantilism has no terminology, no conception, and therefore no history of these events.