Book Reviews

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The Prize: The Epic Quest for Oil, Money, and Power

DANIEL YERGIN
New York: Simon and Schuster, 1991
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Yergin's book is an engrossing narrative history, what the publisher's advertising could justifiably call "a terrific read." This review focuses on a few of its major themes.

1. Beginnings

In the beginning there was kerosene. Not quite in the beginning, for the most popular illuminant in the nineteenth century, for those who could afford it, was whale oil. But precisely because it was so expensive, and bound to become even more so, a vast market awaited the right product. It turned out to be kerosene, which could be manufactured from coal. In turn, there was a need for a cheap source of kerosene, and it turned out to be petroleum. Yergin's first tale of exploration and discovery is set in the late 1850s in Western Pennsylvania, the scene of the first of America's many oil bonanzas.

By the beginning of the American Civil War the Oil Regions of Pennsylvania were booming and another field was soon discovered in Ohio on the Indiana border. Very soon after the development of the petroleum industry the first of the great oil tycoons stepped on to the stage, in the person of John D. Rockefeller. Yergin summarizes the complex story of Rockefeller's Standard Oil, the world's first vertically integrated company, not neglecting its role as the company Americans most loved to hate. Its business practices eventually caught up with it in a celebrated "trust busting" case launched by Theodore Roosevelt, which eventually culminated in a landmark Supreme Court decision that brought about the dismantling of the Standard Oil empire. That empire's constituent parts would gradually become important entities on their own: Standard of California (Socal), Standard of Indiana, Standard of Ohio (Sohio), Standard of New York (Socony), and the largest of the successors, Standard of New Jersey.

Action in the oil industry was not confined to America. By the early 1880s trans-Caucasian Russia had become a producer second only to the United States. Although it was the Nobels and the French Rothschilds who provided the initial entrepreneurial impetus in Russia, they were soon joined by a former sea-shell merchant from London, Marcus Samuel. His close links to the

great British trading houses of the Far East were to play a crucial role in 1892, when he staged one of the great commercial coups of all time by shipping kerosene from the Rothschilds' Russian refineries through the Black Sea and Suez Canal, east to Bangkok and Singapore, there to be distributed by those trading houses in competition with Standard Oil. The details make a marvellous story. As Yergin explains, getting passage for such cargoes through the Suez Canal was no easy matter, particularly in the face of heavy lobbying by Standard Oil.

By now the oil business had become international, the Nobels, Rothschilds, and Standard having established branches in Britain. Adding to the international dimension of the industry, oil was discovered early in the 1880s in the Dutch East Indies, providing the basis for one of the world's major companies, Royal Dutch, (founded in 1890). Its march to commercial greatness was led by Henri Deterding, a tycoon to rival Rockefeller. After many years of living among the landed aristocracy in England, he died in Germany early in 1939, an admirer of the Nazis.

The twin spectres of scarcity and glut recur throughout the book. For instance, early in the new century America was awash in oil following a huge discovery in Texas: oil was selling for pennies. The glut was caused not only by new supplies, but also by the declining market for kerosene. Electric lighting had spread throughout urban America, and the kerosene market was increasingly confined to rural areas. The automobile age was the salvation of the oil industry, once the necessary refining breakthrough had been made (by Standard of Indiana). By the end of the 1920s the oil companies had established extensive marketing systems, and the ubiquitous service station industry was in place. The corporate structure of the American petroleum industry had become unrecognizable. Standard and its successor companies were no longer overwhelmingly dominant. Such companies as Gulf Oil, the Texas Company (Texaco), and Union Oil, were founded following major discoveries in Texas, Oklahoma, California, and Louisiana.

2. Oil, Imperialism, and Nationalism

The initial tremors of those forces which have shaken the world oil industry since the early 1970s were first felt in Mexico during its prolonged revolutionary period in the second decade of the century. The British were prominent in the Mexican industry, particularly in the person of the internationally famous engineer W. D. Pearson (later Lord Cowdray) during the long rule of the dictator Díaz. Mexico became a great oil producer by 1920, but its position had begun to slide during the revolution. The 1917 constitution contained a clause that would be a harbinger of things to come throughout the world petroleum industry: it stipulated that subsoil rights were owned by the Mexican government. For various reasons foreign firms found Mexico an unappealing investment prospect, and its petroleum industry went into a decline which was to last for several decades.

Despite those quiet intervening years, Mexico captured international attention in 1938 when the reformist president Cárdenas nationalized the industry. This caused consternation, to say the least, in Britain and the United States. Unfortunately for the American companies, the Roosevelt administration was occupied in mending fences with Latin America and was not available to champion their cause. As a result, those companies settled comparatively quickly and for comparatively little, while the British held out until after World War II and were well rewarded for their obstinacy.

Mexico was not the only new producer in the hemisphere. Venezuela, in the grip of a particularly avaricious dictator, provided good pickings for foreign companies during the 1920s. By the end of the decade Venezuela was the world's second producer. Nationalist-democratic forces gained ascendancy following the dictator's demise in 1935, and after World War II those forces were to alter profoundly the relationship between industry and government in Venezuela and, through its example, in many other oil-producing nations.

Those effects, however, were slow in coming. As we shall see, a more dramatic unravelling of the world petroleum order began after World

War II thousands of kilometres away in Iran. Those events had their beginning early in the century with the discovery of oil in a concession wrangled by a British group from an impecunious Shah. The firm, Anglo-Persian (eventually British Petroleum), became another of the world's giants. It is interesting to read Yergin's account of how the company which decades later would so adamantly resist interference by the Iranian government took a very different attitude towards the British government. Not only was the British government the majority shareholder, it also negotiated a secret deal to ensure a long-term supply of oil to the Royal Navy at discount prices. Establishment of that relationship ended chronic British worries that Anglo-Persian would be swallowed up by Royal Dutch/Shell (those two firms having merged), thus jeopardizing Britain's access to oil. A key part of the Anglo-Persian story involves the battle on the very eve of World War I to convert the Royal Navy to oil, a battle led by Admiral Fraser and the ever-combative Winston Churchill (in his persona as Liberal politician). Churchill, it is worth noting, appears at various points in the book, although not always as creditably as his admirers might wish.

Much of Yergin's story necessarily concerns the Middle East. In the years before World War I, the Turkish Petroleum Company — a joint interest of Royal Dutch/Shell, Anglo-Persian, and Deutsche Bank — mapped out an exclusive preserve encompassing what would become (after World War I) modern Turkey and Iraq, together with the Arabian peninsula (excluding Kuwait). There was another player in the game, and while his stake was small in comparison to the great companies, it was enormous in its potential to generate a private fortune. This was the fabulous Armenian billionaire-to-be, Calouste Gulbenkian, whose shadow would fall across the international oil business for decades. From one of Yergin's many vignettes we learn that Gulbenkian, at the age of nineteen, obtained a first-class degree in engineering from King's College, London, and seemed destined for graduate work in physics until the exigencies of family business interfered.

After World War I, the French having inherited (so to speak) the German share, and American firms having been dealt into the consortium, Turkish Petroleum was reborn as the Iraq Petroleum Company. The consortium looked forward with confidence to the discovery of massive amounts of oil in Iraq. That country, Mesopotamia when it was part of the Ottoman Empire, had acquired not only a new name but a new status as a quasi-colony of Britain (under a League of Nations mandate). The consortium's expectations were fully realized in the late 1920s; Iraq would eventually dominate even Venezuela as a producer.

The story of Saudi Arabia is particularly interesting, in large part because of the personality of its king, Ibn Saud. His clan had ousted the Hashemites after World War I, the latter destined for thrones created for them in Trans-Jordan and Iraq by the British. Central to the Saudi Arabian sub-plot is the king's close confidant, the eccentric English Arabist H. St. John Philby, father of an even more famous son. Philby realized that oil could be the solution to the king's chronic money problems and, acting as intermediary, helped secure a large concession for American companies in 1933. Towards the end of the 1930s virtually limitless oil was discovered on it. With oil in quantity being discovered at about the same time in Kuwait, and a bit earlier in Bahrain, the contemporary Middle Eastern scene had begun to emerge. World War II intervened before development in either Saudi Arabia or Kuwait could take off (the wells in Kuwait were cemented to prevent their falling into Axis hands).

In 1951 a political earthquake, overshadowing the Mexican tremor of 1938, struck when the government of Iran nationalized the oil industry. And what was the Shah doing? He was a young man very much not in control of his country, where continually shifting alliances of Islamic fundamentalists (as they would later be called in the West), nationalists, and "leftists", dominated politics. These were the early years of the Cold War. Stalin's designs on Iran seemed clear enough, and there was little reason to view the Communist party as other than the local agent for the Soviet government. The extraordinary concern shown by the United States and Great Britain over events in Iran therefore reflected not only their usual concern over oil supplies, but

also their Cold War concerns about Soviet expansion. For a couple of years Iran was in constant turmoil, various Western leaders periodically paying court to Mossadegh, the aged and theatrical Prime Minister, until events came to a head in 1953. The Shah and his family were forced to flee into exile. Then, virtually overnight, the tide turned. The Shah had become popular in Teheran. His restoration is widely ascribed to plotting by the CIA and the British, although Yergin notes the possibility that Western intervention might have had a merely secondary effect (serving as a lubricant, so to speak). Two decades later, Western governments would wonder about the Shah's sense of gratitude.

3. The Beginnings of OPEC

Yergin sees an ironic foreshadowing of an international cartel of oil exporting nations in the successful American experiment with pro-rationing during the Great Depression. Following huge discoveries early in the 1930s, prices in Texas were driven virtually to zero. Gradually, thanks to the efforts of an unlikely sounding regulatory agency,the Texas Railroad Commission, and the efforts of the interventionist Roosevelt administration in Washington, "voluntary" allocation of production among the states (helped by tariffs) propped up prices for the remainder of the decade at a level satisfactory to the American industry.

Yergin's account gives a major role in the formation of OPEC to the Venezuelan, Pérez Alfonzo, a veteran of the democratic resistance movement in his country. The oil companies are also given credit. By the end of the 1950s there was a large surplus in international markets, and in attempting to deal with it the companies made a big mistake. In 1960 they cut the posted prices upon which royalties were based, infuriating the exporting countries. Although the companies tried to make amends, it was too late, and in 1960 the Arab oil exporting nations, together with Iran and Venezuela, formed OPEC. It was a bad time to try to form a cartel. Large amounts of Soviet oil were entering world markets, large quantities had been discovered in Algeria in the late 1950s, Nigeria was becoming a major producer, and towards the end of the 1960s Libya was on its way to becoming a major producer. There was a surplus of oil, and the companies could afford to ignore OPEC.

4. The Take-off of Oil Prices

The spiral in oil prices began at the end of the 1960s after Colonel Qaddafi and associates wrested power from the aged king of Libya. Soon after, pace-setting terms were negotiated by the new government. Then Iran, Saudi Arabia (the latter represented by Ahmed Yamani), and other Gulf states began agitating for more than just a better split. They wanted participation, and the firms had little choice, nationalization being the alternative. While nationalization had formally taken place in Iran in the early 1930s during the reign of the first Pahlavi Shah, it had little effect on Anglo-Persian (Anglo-Iranian by now). The current Shah, however, was determined that the national oil company would be the operator, foreign firms being relegated to mere selling agents. He got his way. Overall, the exporting nations had achieved their goals by 1973. Their success was due to the deteriorating bargaining position of the oil companies in the face of growth in international demand: the glut had vanished. As a result there was a "leapfrogging" of prices under the auspices of OPEC.

5. War and Oil

The twentieth century being what it is, wars and revolutions recur throughout the book. The First World War, with its enormous need for fuelling ships, trucks, cars, airplanes, and even tanks, depended absolutely on oil. Yergin even credits the British denial of trans-Caucasian oil to the Germans in August 1918 with sealing Ludendorff's fate.

Prior to World War II, both Germany and Japan were conscious of their total dependency on foreign oil. This led Germany to spend considerable resources during the 1930s on developing synthetic fuels and caused Japan to plan for the eventual seizure of the Netherlands East Indies. As part of his extensive discussion of the interrelation between the War and the petroleum

industry, Yergin describes Germany's futile attempt to capture the Russian oil fields and Japan's successful capture of the Dutch fields.

Later, we get brief histories of the Middle East wars, starting with a glance at the 1948 war between the newly independent Israel and several Arab states. The next war, involving the British-French-Israeli attack on Egypt following President Nasser's nationalization of the Suez Canal, had serious consequences for the West's oil supplies. On reading Yergin's account, one cannot help reflecting on the profound difference in relations among Britain, France, and the United States during the 1956 war as compared to the 1991 war. The Six-Days War in 1967, the closing of the Suez Canal, and the response of Western governments and international oil companies are given some attention. The Yom Kippur War of 1973 and the ensuing oil embargo which coincided with an end to the oil glut and exacerbated the supply situation are given more attention. Finally, Yergin considers the recent Iran-Iraq war, the full consequences of which cannot yet be assessed.

6. Economic Rents and Ubiquitous Politics

That national and international politics have always played a crucial role throughout the history of the petroleum industry is obvious even to such lay observers as the reviewer. Yergin's book provides countless interesting details about the interrelation between oil and politics. For instance, the American public demanded protection from the depredations of Standard Oil a century ago. The British Government was closely involved in the formation of Anglo-Persian and took out a majority ownership. American independent producers, once proponents of a wide open industry, found prorationing during the 1930s useful, and they were instrumental a couple of decades later in obtaining oil import quotas which virtually closed the American market to foreign oil for years.

The actions of the OPEC cartel struck many in the West as unfair. And, as Yergin points out, from the perspective of the international companies those actions were indeed unfair. In their view, the producing countries had oil revenues because of the companies' efforts. It was not only a matter of prospecting for oil, often a costly and futile task, it was pumping the oil, transporting it efficiently over huge distances, refining it, and putting into place a complex marketing system. Who can deny the stupendous organizational, scientific, engineering, financial, and marketing skills that have gone into the effort.

But, as Yergin also points out, the picture looks very different to the Third World oil-producing nations. At issue is the economist's concept of rent. In a nutshell, rent is surplus over the cost of production (allowing for a "normal" return to capital). Who is entitled to the rents? The industry position used to be that, without their expertise, there would be nothing to share. They were forced to abandon this position as the producing countries became able to enforce their interpretation, namely that they are entitled to the whole surplus because they own the scarce resource. As Yergin notes, one or the other interpretation prevails depending upon the balance between the supply of and the demand for oil.

The last great oil price "shock" came with the end of the Shah's rule, in late 1978. Virtually all sectors of the Iranian public had become disenchanted with him, and his Western backers, surprised by the rapidity of events, could do nothing for him. This time his exile was tragically permanent. Internal strife in Iran, together with world-wide panic buying, caused oil prices to skyrocket, with grave consequences for most Western economies.

What will be the effects of the 1991 war? Kuwait will be out of the picture as a major producer for some time given the extent of the destruction of its wells (its reservoirs might also be significantly damaged). Iraq will take a long time to reconstruct its production and transportation infrastructure, to say nothing of reconstructing itself politically. Its exports will not achieve prewar levels for years. Perhaps Saudi Arabia and the Gulf emirates will substantially increase their production under prodding from the West. Perhaps they will not.

This is a book about tycoons and wheeler-dealers and crooks, about high policy and great events. There is virtually no room for the countless workers who laboured, often at low wages

and in atrocious conditions, to construct those monuments to corporate capitalism. But one can hardly expect the book to cover everything, and indeed this review has touched on only a few of the topics covered by Yergin. It has said nothing about Yergin's discussion of periodic attempts by the great companies to form world-wide combinations, nor about the on-and-off use of such competitive tactics as price-cutting. Nor has it considered the story of the battle, led in the 1920s by an indefatigable oil man, to get American producers to understand the need for reservoir-saving extraction methods. These and many other issues are to be found in this engrossing book.

Finally, on matters of presentation, more charts and tables would have been helpful. In the realm of utter trivia: Baku is east of Tiblis (p. 160) and the Treaty of Portsmouth was signed in Portsmouth, New Hampshire (not Rhode Island) (p. 131). And what about Canada? It gets a few lines, nothing remotely near the attention given to Romania in the story of oil.

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L'échec des surgénérateurs - autopsie d'un grand programme

par DOMINIQUE FINON
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327 pp.

L'analyse comparative de Dominique Finon dans *L'échec des surgénérateurs* porte essentiellement sur le processus de prise de décision au sein de deux grandes agences technologiques: le Commissariat à l'Énergie Atomique (CEA) en France et l'Atomic Energy Commission (AEC) aux États-Unis. Cette approche, très réussie, nous pousse à nous interroger sur le rôle de l'intervention de l'État dans les industries de grands équipements de pointe.

Tout comme les grands programmes Appolo, SST et Concorde, le surgénérateur (ou "Fast Breeder Reactor") fait partie des mythes technologiques de l'Après-Guerre. L'attrait scientifique du surgénérateur repose sur sa capacité potentielle de produire plus de plutonium qu'il n'en consomme et de pouvoir réaliser d'énormes économies en uranium par rapport à la technologie nucléaire conventionnelle. Comme tout mythe, sa perception est fondée sur l'illusion: l'illusion des pénuries d'uranium et d'autres sources d'énergie, d'une demande d'énergie en croissance perpétuelle, de l'utilisation contrôlée du plutonium, de la sécurité environnementale et, enfin, de la rationalité économique de la filière. Finon procède à la démystification du surgénérateur en s'attaquant systématiquement à ces illusions dans la première partie du livre. Selon lui, "il n'est pas sûr que l'on trouverait, dans l'histoire des innovations lourdes, un projet technologique qui ait été autant porté par les convictions inébranlables des experts et des gouvernants et qui ait à la fois été soumis à autant d'incertitudes" (p. 45). L'auteur démontre, de façon particulièrement habile, les lacunes et parfois les manipulations des estimations de réserves et de coûts d'uranium sur le marché mondial (pp. 29-36).

Or, la véritable contribution de Finon est sa démystification de l'agence technologique en tant qu'instrument de promotion de grands équipements de pointe dans deux cadres institutionnels et idéologiques diamétralement opposés. L'AEC aux États-Unis, fondée sur le modèle libéral de l'action gouvernementale, se caractérise par une plus grande ouverture du processus décisionnel, une plus importante participation de l'industrie privée et, par conséquent, un champ d'action autonome plus réduit que celui de son homologue français. Par contre, le CEA, qui selon l'auteur, relève du "despotisme éclairé" de l'État technico-industriel se distingue par une forte centralisation du pouvoir décisionnel, un accès privilégié aux ressources politiques et financières de l'État, un comportement dirigiste envers l'industrie et une capacité de s'isoler des pressions économiques et socio-environnementales.

Finon trace l'évolution du "Fast Breeder Reactor Program" aux États-Unis à partir de ses débuts, en 1947, avec les premières études pour

le réacteur expérimental EBR 1, jusqu'à l'abandon du projet de Clinch River en 1986. La première étape de cette évolution est marquée par la prise en charge des intérêts privés du développement de la filière dans la réalisation du réacteur Enrico Fermi par la compagnie d'électricité Detroit Edison; tentative audacieuse certes, mais échec fracassant résultant en un des incidents potentiellement les plus sérieux de l'histoire nucléaire avec la fusion partielle du coeur du réacteur près du centre-ville de Détroit en 1966. Pour Finon, le projet Fermi est l'expression par excellence de la référence libérale: "[l]e projet résulte autant de la séduction exercée par le surgénérateur que d'une volonté idéologique de démontrer la supériorité de l'initiative privée pour promouvoir la technologie nucléaire civile" (p. 71).

L'AEC devient le joueur clé à partir des années 60, l'âge d'or des grands programmes technologiques américains comme l'Appolo et le SST. Sous la direction de Milton Shaw, la trajectoire du programme retourne sur ses bases technologiques. La R-D fondamentale absorbe désormais la plus grande part des énergies et des ressources budgétaires aux dépens du développement de la filière. Le résultat est que le programme américain s'embrouille dans des bifurcations scientifiques interminables et perd son avance de plus de dix ans sur ses compétiteurs français et allemands.

L'autonomie relative de l'agence nucléaire américaine se trouve graduellement réduite à partir de 1975. Le surgénérateur américain devient de plus en plus vulnérable aux critiques concernant la prolifération nucléaire et les justifications économiques du programme. L'arrivée au pouvoir du Président Carter en 1977 coïncide avec la disparition de l'un des plus importants promoteurs institutionnels du projet (le "Joint Committee on Atomic Energy") ainsi qu'avec l'arrêt du projet de Clinch River. Ce hiatus s'avère fatal pour le surgénérateur. Une tentative de redémarrage en 1982, dirigée par le chef de la majorité républicaine au Sénat, Howard Baker, avorte malgré l'intérêt moins prononcé porté aux questions environnementales par l'administration Reagan. Le projet est donc mis en veilleuse avec l'abandon de Clinch River en 1986, victime de la doctrine de désengagement de l'État et de la crise fiscale. L'État aura investi plus de 13 milliards de dollars sur quarante ans sans que le projet atteigne le stade de commercialisation du réacteur, soit presque deux fois le coût total du programme français.

Par contre, le programme du surgénérateur français, qui part avec dix ans de retard sur son rival outre-atlantique, dépasse la filière américaine avec la mise en service en 1973, dans les délais et aux coûts prévus, du prototype de démonstration Phénix (250 MW). Cette réussite technique, pour laquelle Finon ne cache pas une certaine fierté nationale, est toutefois gâchée par une commercialisation mal conçue dans le cadre du projet SuperPhénix (1200 MW) qui relève plus de l'imbrication des intérêts que d'une évaluation rigoureuse des réalités économiques du programme. "A aucun moment, et dans aucun lieu institutionnel, la critique scientifique et économique du programme n'est reconnue et confrontée à l'expertise officielle" (p. 201). Pour mieux illustrer sa condamnation de ce despotisme éclairé, l'auteur situe le surgénérateur dans son contexte de culture institutionnelle où le volontarisme étatique en matière de développement industriel et technologique est pratique courante.

Avec grande habileté, Finon pénètre l'univers hermétique de l'appareil technico-administratif français pour mettre en valeur les enjeux du programme: les relations entre Electricité de France (EDF) et le CEA concernant la filière graphite-gaz, les rivalités interdépartementales à l'intérieur du CEA et les canaux d'accès aux ressources de l'État. En effet, le jeu politique des choix stratégiques se déroule dans le monde clos de l'axe EDF-CEA en absence de toute médiation extérieure. Ceci permet aux promoteurs de la filière de garder le contrôle de la perception sociale et économique du risque nucléaire. Le programme est ainsi isolé de la crise des valeurs sociales des années 70 autour des enjeux de prolifération et de protection de l'environnement qui ailleurs, notamment aux États-Unis et en Allemagne, ont largement influencé l'évolution du programme.

En France, le dirigisme étatique vis-à-vis de l'industrie contraste avec le libéralisme du programme américain. Finon décrit le rôle de l'EDF dans le cadre de tout projet nucléaire en terme

"d'architecte industriel" (p. 152). Le secteur manufacturier national, fragmenté au début du programme, est consolidé à partir de 1969 par la participation directe d'EDF dans Framatome, le constructeur français de centrales nucléaires conventionnelles. Toutefois, malgré le désir d'EDF de promouvoir la concurrence dans son réseau de fournisseurs, les firmes Babcock (1972) et CGE-Alsthome (1975) sont évincées du marché des réacteurs à eau légère par décision ministérielle, une action gouvernementale qui peut paraître tout-à-fait impensable à un lecteur nord-américain. Babcock se trouvait ainsi reléguée à la filière du surgénérateur. Contrairement aux firmes américaines, l'autonomie de l'industrie semble ainsi assujettie aux intérêts des acteurs publics.

Avec le démarrage du prototype SuperPhénix en 1985, la France est le seul pays à avoir atteint le stade de commercialisation du surgénérateur. "Mais, cruelle ironie de l'histoire, le complexe nucléo-industriel français s'est retrouvé seul en tête avec, sur le bras, une technique vraisemblablement inutile pour longtemps parce qu'il est le seul qui ait pu ignorer les objections et les demandes de débat et préserver sa légitimité en évitant tout aménagement institutionnel" (p. 250). En effet, ce n'est qu'avec les études sur SuperPhénix II (1800 MW selon les souhaits d'EDF) et sur RAP1500 que les promoteurs doivent faire face aux réalités économiques. Avec le retrait des intérêts allemands et italiens du consortium après 1986 et un appui de moins en moins enthousiaste de la part d'EDF, lourdement endettée, le programme semble au moins temporairement freiné.

A la lumière de ces deux études de cas Finon démontre que la logique institutionnelle des agences technologiques est fondée en priorité sur la recherche de la virtuosité technologique et la consolidation institutionnelle beaucoup plus que sur la pertinence industrielle ou commerciale des grands programmes. En termes de réalisation d'objectifs techniques clairement définis, "le modèle français s'avère indéniablement supérieur aux autres modèles pour le développement des grands équipments lourds de pointe que les exigences mettent hors de portée de la grande entreprise" (p. 255). Or, le mode de fonctionnement de toute agence technologique est mal adapté aux réalités du marché. A ce titre, l'auteur partage l'avis de Eads et Nelson selon lequel le rôle de l'État doit se limiter aux premières étapes de développement des grandes technologies mais que la commercialisation doit relever de l'initiative des grandes entreprises privées (p. 260).

En somme, Dominique Finon raconte de façon intéressante et accessible l'histoire d'un grand programme technologique encore mal documenté en Amérique. Sa maîtrise des enjeux institutionnels du programme et sa réflection sur le rôle des agences technologiques est une importante contribution à la littérature sur l'action gouvernementale dans les économies modernes. Il est toutefois regrettable qu'un travail si riche en information soit dépourvu d'index.

Enfin, outre deux références (aux pp. 25-6) à la province de la Saskatchewan, ce livre aura quand même un intérêt particulier pour le lecteur familier avec le programme nucléaire canadien et le développement du CANDU. La dynamique entre CEA et EDF ainsi que la subordination de l'industrie manufacturière aux intérêts des deux acteurs publics évoquent des similitudes frappantes avec le cas canadien et l'axe EACL-Ontario Hydro (surtout aux pp. 150-4). En effet, la réussite technique et la commercialisation tronquée du CANDU relèvent de ce même modèle d'intervention gouvernementale. Les conclusions de Dominique Finon sur le surgénérateur français sont d'une pertinence magistrale pour l'industrie nucléaire canadienne.

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