

Leonardo Maugeri

# the age of

What  
They  
Don't Want  
You to Know  
About  
the World's  
Most  
Controversial  
Resource

"Always interesting  
and insightful...  
this book is essential  
reading."

—Fareed Zakaria

---

# THE AGE OF OIL

---

*The Mythology, History,  
and Future of the World's Most  
Controversial Resource*

LEONARDO MAUGERI



THE LYONS PRESS  
Guilford, Connecticut

To buy books in quantity for corporate use  
or incentives, call (800) 962-0973  
or e-mail [premiums@GlobePequot.com](mailto:premiums@GlobePequot.com).

Copyright © 2006 by Leonardo Maugeri

ALL RIGHTS RESERVED. No part of this book may be reproduced or transmitted in any form by any means, electronic or mechanical, including photocopying and recording, or by any information storage and retrieval system, except as may be expressly permitted in writing from the publisher. Requests for permission should be addressed to The Globe Pequot Press, Attn: Rights and Permissions Department, P.O. Box 480, Guilford CT 06437.

The Lyons Press is an imprint of The Globe Pequot Press.

10 9 8 7 6 5 4 3 2

Printed in the United States of America

ISBN 978-1-59921-118-3

First published in 2006 by Praeger Publishers

First Lyons Press edition, 2008



The Library of Congress has previously cataloged an earlier hardcover edition as follows:

Maugeri, Leonardo, 1964-

The age of oil : the mythology, history, and future of the world's most controversial resource / Leonardo Maugeri.

p. cm.

Includes bibliographical references and index.

ISBN 0-275-99008-7 (alk. paper)

1. Petroleum—History—19th century. 2. Petroleum—History—20th century.

3. Petroleum—History—21st century. 4. Petroleum industry and trade—History—19th century. 5. Petroleum industry and trade—History—20th century. 6. Petroleum industry

and trade—History—21st century. 7. Petroleum reserves. I. Title.

TN870.M339 2006

553.2'82—dc22

2006006632

To Enzo Viscusi,  
who more than anyone else accompanied me on my journey through  
the oil industry and the complexities of international affairs.  
His unstinting generosity and wholehearted friendship  
have made this book possible.

---

## Contents

---

Note by the Author	ix
Preface	xi
List of Abbreviations	xix

### PART ONE

#### **A History of an Unreliable Market (and the Bad Policies It Prompted)**

1 John D. Rockefeller's Cursed Legacy	3
2 The Age of Gasoline and Oil Imperialism	19
3 The Carve-up of Arabia's Oil	33
4 The Oil Glut of the 1930s	41
5 Cold War Fears and the U.S.-Arabian Link	51
6 The Iran Tragedy and the "Seven Sisters" Cartel	63
7 The Golden Age of Oil and Its Limits	77
8 Oil and the Explosion of Arab Nationalism	93
9 The First Oil Shock	103
10 The Second Oil Shock	121
11 The Countershock	133
12 A Storm in the Desert: The First Gulf Crisis	145

viii Contents

13	The Soviet Implosion and the Troubled Caspian El Dorado	155
14	The Collapse of Oil Prices and Industry Megamergers	169
15	The First Oil Crisis of the Twenty-first Century	183

PART TWO

Misperceptions and Problems Ahead

16	Are We Running Out of Oil?	201
17	The Inner Secrets of Oil	207
18	The Puzzle of Oil Reserves and Production, and the Quest for Their Control	219
19	The Problems with Oil Quality, Price, and Consumption Trends	233
20	Flawed Forecasts, Foggy Alternatives to Oil	247
21	Arabs, Islam, and the Myth of Oil Security	259
22	The Long Wave of Resource Nationalism	271

Appendixes

1	Proven Reserves, Production, and Reserves Life Index of the First Twenty Oil Countries in the World and World Totals (2004)	285
2	Consumption Trends of the First Twenty Countries in the World (1980–2004)	286
3	Main Features of Some Qualities of Crude Oil	287
4	The Largest National Oil Companies	289
5	The Largest International Oil Companies	290

Notes	291
Bibliography	325
Index	337

---

**Note by the Author**

---

In order to help the reader, I resorted to some simplifications. In dealing with the history of oil companies, I used their current names instead of the original ones they held for part of their existence. So, for instance, the reader will find BP instead of Anglo-Persian Oil Company and—later—Anglo-Iranian Oil Company; Chevron instead of Standard Oil Company of California; Exxon instead of Standard Oil of New Jersey; Mobil instead of Standard Oil New York-Vacuum Oil; Total rather than Compagnie Française du Pétrole. Although some may argue against this choice, I think it will allow the reader to avoid being confused by too many names and too many confusing changes that add no value to the tale.

As to the transliteration of foreign names and words (Arabic, Iranian, Russian, etc.) I simply made the choice to use the forms prevailing in current American usage, avoiding those phonetic symbols that—in my opinion—have no sense in the American language.

Personally, I dislike abbreviations. However, I must admit that it is quite boring to constantly repeat “million barrels per day” instead of a simple “mbd,” or “Organization of Petroleum Exporting Countries” in place of its OPEC acronym. So I abdicated to some essential abbreviations.

---

## Preface

Oil has played a unique role in the economy and history of modern times. No other raw material has been so critical in shaping the destiny of nations, the development of military and global trade strategies, and relationships between countries. No other raw material has offered such great promises for improving the well-being of entire nations, promises which sadly remained unrealized, and which often turned into curses looming over their future. No other resource has had such a huge impact on the geography of our world, and the way our societies interact and are organized. More than any other raw material, then, petroleum has shaped our lives, and inevitably such a prominent role has made it the world's most controversial resource.

Throughout its history, "black gold" has given rise to myths and obsessions, fears and misperceptions of reality, and ill-advised policies that have weighed heavily on the world's collective psyche. Even today the vast majority of public opinion tends to think of oil as a kind of "witch's brew" identified with wars, greed, and unspeakable power plays orchestrated by transnational elites engaged in schemes worthy of spy novels. At the same time, ever since it burst into human life during the second half of the nineteenth century, oil has always been subject to unpredictable changes that have caught to world by surprise. Those who thought they could control it for their own benefit have been thwarted time and again by oil's boom and bust production cycles, its frequent market crises and often uncontrollable price fluctuations, as well as the political explosions in which it has played such a crucial role.

It should therefore surprise no one that most attempts at predicting the future behavior of oil have yielded such grossly inaccurate results.

As we look at the oil industry today, we find that these soothsaying efforts have not died. Once again, pseudoscience is used to spread fear through doom-and-gloom scenarios predicting catastrophic shortages, while ignoring the lessons of history and rejecting the cold logic of reality. Once again, the comforting slogan of "independence from oil" resounds in the world arena, proclaimed by most Western governments and even by the U.S. President George Bush, whose administration yet continues to favor the more irresponsible habits of oil consumption that has fed America's addiction with "black gold."

This overdramatization and sterile overreaction to oil's cyclical behavior draws its strength from the gap between the realities of the oil market and the perceptions of the casual observer.

Unfortunately, a true understanding of oil can be reached only by penetrating complex technical elements, the abstruse prose of experts, and esoteric indicators, coupled with a deep knowledge of past events, economics, and geopolitics. Public perception, on the other hand, is shaped mainly by the more simplistic language of the media, which is more at ease with extremes.

The lack of clear information is chronic and generalized, compounded by a decline in public interest since the 1990s, in sharp contrast with the obsessive concern of the previous two decades. Underlining the public's declining interest was the belief that oil had become "just another commodity," a resource facing an irreversible decline in its importance. This attitude took root after the petroleum "countershock" of 1986, and became more deeply ingrained in the last decade of the century as the world floated atop a sea of crude while demand grew only fitfully. At the same time, the more developed economies were reducing their dependence on raw materials and heavy industry, building their wealth on intelligence and inventiveness, on microchips and services. For the first time in modern history, their dependence on oil was no longer the subject of strategic concern or a matter of existential struggles for access to energy sources, as had been predicted during the 1970s and the early 1980s. In this context, the history of oil seemed to become a tale of past struggles with seemingly no future.

But by the start of the new millennium, black gold aggressively reclaimed center stage, surprising all pundits, and once again became the object of old-fashioned fears and obsessions, sometimes in new disguise. The fear of an inevitable exhaustion of reserves came back, along with the fear of an apocalyptic clash of civilizations, pitting Islam against the rest of the world and threatening access to the largest global oil deposits.

It is not easy to escape the trap of catastrophism, particularly when so many elements seem to justify a grim picture of the future. Yet we are not on the verge of any catastrophe. What is needed to fully grasp the issue is a sober and deeper approach, free of sensationalism. This approach must examine the history of the industry and the ways in which it has endowed its participants with a unique DNA that has led to extraordinarily similar reactions, behavior, and thought patterns over many decades. Such an approach is needed to sweep away the myths and distortions that underpin so many current assessments of the industry, lingering like evil spirits impervious to every kind of exorcism. They appear at the first sign of crisis and conspire to exacerbate it.

Only by retracing the history of the industry can we grasp its current reality and come to understand the economic, technical, social, and geopolitical variables that make it at once more complex and less dramatic than it is generally portrayed.

At the end of 2002, as I was beginning to draft a pair of articles that were ultimately published in *Foreign Affairs*<sup>1</sup> and *Science*,<sup>2</sup> I came to realize that only a book-length analysis could do justice to the depth and complexity of the oil business. And I decided to undertake the challenge even though my day-to-day responsibilities as an oil industry executive seemed to present a nearly insurmountable obstacle to such a project.

The more I went into it, the more I became convinced that a comprehensive book was needed, one that could take into account the entire history of oil and not just current problems. The last great work on the subject, Daniel Yergin's masterpiece *The Prize*, had been published in 1991.<sup>3</sup> Since then a few good books had appeared, but all of them addressed a specialized audience. Making matters worse, starting in 2000, a flurry of "eat-and-run" books began to hit the market, all exploiting a growing hysteria about oil by pointing to a dire as well as superficial forecast of the energy future.

As I stole time from holidays, weekends, and vacations and cut back on sleep, I was able to draw on a great deal of material I had been archiving in electronic form since my days as a graduate student preparing for my doctorate. Without this extensive documentation, supported by the lessons learned in my professional life, I would never have been able to put this book together in a little more than two years.

As you surely will have understood by now, this book is devoted to the history, economics, and geopolitics of oil.

The history of oil is covered in Part One, which is the book's longest. It begins at the very dawn of the industry, with the unexpected consequences of "Colonel" Drake's first modern oil well in 1859. It ends with the dramatic situation of post-Saddam Iraq, the public fear of a world seemingly running out of oil, the breathtaking growth of Chinese energy consumption, and the threat of radical Islam to the largest global oil producers.

The reader will find tales of peculiar characters and extravagant missions, the designs of great powers and the aspirations of emerging countries, together with the events that marked the rise of oil as a vital factor in modern society and its influence on shaping of the world we live in. The thread that runs throughout this history is the unpredictable succession of booms and busts that made it unique, often leading to the failure of ill-conceived policies and the destruction of entrepreneurial undertakings.

In reconstructing this tale, I also attempt to debunk most of the myths and obsessions generated by each cycle, and which to this day remain a part of the collective perception about oil. Probably the most enduring among them is the link between the fear of oil shortages and the global quest for control of reserves and the security of supplies.

It was the fear of oil shortages that moved the great powers to develop their first oil-driven foreign policies at the dawn of the twentieth century, leading to British control of what was then Persia (today's Iran) and to the establishment of today's Iraq (then Mesopotamia) in the 1920s. Later on, it was the perception of dwindling oil resources in the United States that inspired the close links between the American government and Saudi Arabia's. And it was the fear that Arab oil would fall under the influence of the Soviet Union that largely shaped American foreign policy in the Middle East after World War II.

Yet, the obsessive fear of a world short of oil and the political analyses and responses it produced always proved to be inconsistent with reality. Over almost 150 years, the dominant characteristics of the oil market have been oversupply and low prices, sometimes temporarily interrupted by shocking reversals. Each period of dramatic expectation that the end of oil was near concluded with a major oil glut. A prominent oilman saw this trend as early as 1925, at the peak of a groundless wave of fear about the future of oil, when he remarked:

My father was one of the pioneers in the oil industry. Periodically ever since I was a small boy, there has been an agitation predicting

an oil shortage, and always in the succeeding years production has been greater than ever before.<sup>4</sup>

Five years later, the world was plunged into one of the worst overproduction crises ever, leading to a major and prolonged collapse in prices. Similarly, in the 1970s an outpouring of gloomy forecasts predicted a day of doom that never materialized. The Central Intelligence Agency (CIA) was among the most persistently negative analysts, producing forecasts like this:

We believe that world oil production is probably at or near its peak. Simply put, the expected decline in oil production is the result of a rapid exhaustion of accessible deposits of conventional crude oil. Politically, the cardinal issue is how vicious the struggle for energy supply will become.<sup>5</sup>

In 1986, another huge wave of overproduction led to a new oil price collapse. Understanding the origin and cultural consequences of most oil myths and obsessions is essential to penetrate the issues facing the world of oil today. This is addressed in Part Two, which is much shorter than Part One. Here we explore questions such as *Are we running out of oil? Will China upset the world's oil consumption trends? Are there real alternatives to oil? What is the real impact of Islamic radicalism on oil-rich areas?*—and many others—in an attempt to give the reader a comprehensive insight into the complexities of the industry, and the wrongheaded interpretations to which they are usually subjected.

Naturally, understanding some of the most debated issues of our times requires some technical background, which I have tried to make as simple as possible for the casual reader. Particularly, the familiar ghost of a world short of oil—that has once again reappeared on the global stage—requires the reader to know the basic rules governing the discovery, extraction, production, and consumption of hydrocarbons. In spite of all doomsayers, those rules make it possible to understand some basic elements. First, we are very far from having an acceptable knowledge of subsurface oil resources, and there is plenty of evidence that a huge potential for future oil production still exists. Catastrophists of all kinds usually tend to underestimate the latter by cranking into their pseudo-scientific models data which assume a quasi-perfect knowledge of the ultimate level of existing resources—and this is the first major flaw in their predictions. Second, those same advocates of doom always tend to



overestimate consumption, making it a price-indifferent function—while in the long term demand always responds to prices. The problem is that in a prolonged high-price scenario, as in a low-price scenario, all actors involved—including oil companies—tend to see the future as the result of “adaptive expectations about current conditions,”<sup>6</sup> and in so doing they indefinitely prolong the situation in which they find themselves. So it is no surprise that in times like ours, a pessimistic view about the future of oil overwhelms the debate. Yet the final message of this book—if I may anticipate it—is that nothing we are experiencing today is a major departure from the historical cycles of the oil market.

This does not mean we can expect stability or avoid prolonged periods of tension in the future. Uncertainty and volatility are characteristics of all human activity, and they have been a constant throughout the history of the oil industry. But focusing only on negative concerns, using them as a platform to build visions of a dark future is like looking at a single tree, and missing the forest. Thus, for example, even as China’s oil consumption is growing exponentially, consumption is dropping in other areas and new technology is providing less energy-demanding solutions to support our lifestyle. At the same time oil production and reserves worldwide are silently growing, irrespective of any catastrophic assumptions to the contrary.

Oil supplies will not be exhausted when the Oil Age ends, because it is overabundant and because more intelligent and ethical ways to use it are emerging. By the same token, even if Islamic terrorists were to gain control over an oil-rich country, they would still have to cope with the elusive laws governing oil.

The conclusion line is that the wolf is not at the door. And even though dramatization is an unavoidable by-product of everything that concerns oil, there is nothing that dooms us to a vicious struggle for securing our future oil needs in the face of strangling shortages and geopolitical turmoil. Only the inability of decision makers to grasp this reality and to act accordingly may push us to that brink.

Everyone pursues the hobby that gives him or her the most pleasure. In my case I was fortunate in choosing one that largely coincided with my professional work. Nonetheless, writing a book is always a difficult experience. Trying to write a serious book, double or triple checking all sources, is even more difficult. Doing this in another language, and while engaged in a job which potentially consumes all of one’s available

time, is something that can stretch intellectual and physical strengths to their limits.

Beyond my personal fascination and daily engagement with the issues of this book, what helped me in overcoming many obstacles of this undertaking was the support of several people.

To start with, I have had the enormous good fortune to be blessed with the most lovable and understanding wife, Carmen, who has patiently supported and encouraged me in this project. Without her at my side, most things I managed to accomplish in my life would have never materialized.

I have an enduring obligation to my dear friends Claude Erbsen and Teddy Jefferson, the first priceless editors of the manuscript, who carefully read it while it was coming out of my pen (or rather, my personal computer) and made important textual suggestions and corrections. Naturally, I am wholeheartedly grateful to Hilary Claggett, Senior Editor for politics and current events at Praeger, who first—and without the help of a literary agent—demonstrated strong enthusiasm for my manuscript and supported its publication through a process involving three levels of approval by three different boards. Her personal dedication and support were something writers pray for when dealing with a publisher. I would also like to thank Carla Talmadge, project manager of my book, for her excellent and careful supervision of the editing process.

Many other persons helped me by double checking figures and statistics, or in discussing some of the issues I was dealing with. Most of them work with me at the department of strategy at Eni: I hope I remember them all, and I apologize if I omit someone. In rigid alphabetic order, they are: Marco Aversa, Paola Dagnino, Simonetta De Bartolo, Alvaro Donadelli, Fabio Ercoli, Alessandro Lanza, Sabina Manca, Giampiero Marcello, Maurizio Mangeri, Alberto Navarretta, Sandro Osvaldella, Cristiano Pattumelli, Salvatore Pino, Andrea Quarta, Manuela Rondoni, Mario Salustri, Giuseppe Sammarco, Lorenzo Siciliano, Maria Antonietta Solinas, Claudia Squeglia, Claudia Tenaglia, Antonella Tolentino, and Anna Maria Tibuzzi.

The enchanting hospitality of Ginesta and Alessandro Guerrera at their beautiful vacation home in the Turkish sea village of Kas over several summer holidays has been another important element in allowing me to write and correct parts of the book. The breathtaking and inspiring beauty of the place, along with the warmth of their friendship, has been a catalyst for ideas and the determination to work.

My brother Alessandro also helped me through long discussions about economics, finance, and history. His brilliant insights and appropriate advice have been decisive at critical points of this book. I also owe grateful appreciation and enduring affection to my two secretaries, Anna Laura De Francisci and Nadia Sturmman, who did not hesitate to devote part of their free time (and even Saturdays) organizing all the documents and even the electronic version of the manuscript.

Other friends, scholars, analysts, and several personalities of the oil world has helped me to carry out my project, through their advices, but also with their critics. In this case, however, I would risk losing some good friend by omitting his name in a long but incomplete list. And because I made the mistake not to take an orderly file of all the persons who somehow contributed to my work, I prefer to omit that list at all.

Finally, I have endless gratitude for Enzo Viscusi, to whom this book is dedicated. As always in his life, and as always when devoting himself to a cause or to a friend, he spared no effort in convincing me to go through with this project, acting as the real coordinator behind the different stages that brought it into being. Not surprising for a man of his talents, he served as literary agent, promoter, taskmaster, and adviser, depending on the circumstances. More than anything else, however, he helped me with the support of his friendship.

I still cannot decide if the final result has been worth the effort, and I leave that to the judgment of the readers, while inviting them to put the blame uniquely on me for any errors or deficiencies encountered.

---

## List of Abbreviations

---

AGIP	Azienda Generale Italiana Petroli
API	American Petroleum Institute
Aramco	Arabian American Oil Company
bcm	billion cubic meters
bpd	barrels per day
BNOC	British National Oil Company
BP	British Petroleum
Caltex	California Texas Oil Company
CERA	Cambridge Energy Research Associates
CFP	Compagnie Française de Pétroles
CNOCs	Consumers' National Oil Companies
EIA	Energy Information Administration
ENI	Ente Nazionale Idrocarburi (until 1992)
GDP	Gross Domestic Product
GTL	Gas-To-Liquids
IEA	International Energy Agency
IOCs	International Oil Companies
IPC	Iraq Petroleum Company
IPE	International Petroleum Exchange
mbd	million barrels per day
MEES	Middle East Economic Survey
NIOC	National Iranian Oil Company
Nymex	New York Mercantile Exchange
OAPEC	Organization of Arab Petroleum Exporting Countries
OGJ	<i>Oil &amp; Gas Journal</i>

xx List of Abbreviations

OOP	Original Oil in Place
OPEC	Organization of Petroleum Exporting Countries
PDVSA	Petroleos de Venezuela
PEMEX	Petróleos Mexicanos
PIW	Petroleum Intelligence Weekly
PNOCs	Producers' National Oil Companies
PSA	Production Sharing Agreement
ROCE	Return on Capital Employed
SUVs	Sport-Utility Vehicles
TPC	Turkish Petroleum Company
TRC	Texas Railroad Commission
UAE	United Arab Emirates
UAR	United Arab Republic
URR	Ultimate Recoverable Resources
U.S.	United States
WACC	Weighted Average Cost of Capital
WTI	Western Texas Intermediate
3-D	Three-dimensional (seismic)

---

PART ONE

---

## A History of an Unreliable Market (and the Bad Policies It Prompted)

---

## CHAPTER 1

---

# John D. Rockefeller's Cursed Legacy

Oil slipped abruptly into modern life by a back door. Long before its rise to prominence in energy production, its entry into daily use was brought about by people's need for a cheaper and more flexible source of illumination.

Indeed, petroleum derivatives have been exploited since the emergence of human civilization, particularly in ancient Mesopotamia and elsewhere in the Middle East, where a primitive but significant oil industry supplied asphalt for building roads, mastic for waterproofing ships, architecture, and hydraulics, as well as essential components for many medicines and treatments. Bitumen was used in warfare and many other fields. However, paradoxically, after having been widely used in ancient times, its eventual applications throughout the centuries were marginal and mainly confined to those places where oil was easily available through surface seepage.

After a long plunge into obscurity, oil partially reemerged in the mid-1850s, when parallel experiments by amateur and professional chemists were undertaken in Europe and the United States to refine oil to obtain an illuminating fuel. Among the many claiming to be the modern inventor of oil distillation, a Canadian scientist is due a special note of praise: Abraham Gesner, who first patented in the United States in 1854 a new oil product, Kerosene, to be used for "illuminating or other purposes."<sup>1</sup> Since it was cheaper, safer, and better than any existing illuminant, its use spread in Western Pennsylvania and New York City,<sup>2</sup> partly because of a favorable circumstance. Whale oil, until then the illuminating fuel preferred by the wealthy (the only ones who could afford artificial light), was running out as a result of intensive overfishing of whales in the Atlantic

Ocean. Procuring additional supplies involved traveling to faraway seas, like South Africa's, which brought an immediate jump in the product's price. Yet the most serious obstacle to petroleum's penetration of the market was producing it in sufficient volumes. All the extraction techniques applied since ancient times involved the collection of surface crude seepage with primitive instruments and amateurish devices; in most cases, oil was still picked up by hand. There were scattered examples of subsurface drilling in places like France, Japan, and some other Asian countries—particularly Azerbaijan—but this never was adopted as a common practice worldwide. The great revolution occurred in Pennsylvania in 1859, when Edwin Drake first succeeded in extracting oil from its rocky underground prison with a drilling machine.

A would-be "Colonel" with no skill at all in geology or engineering, Drake seemed doomed to a life of disappointments. He had undertaken many activities, dreaming of heroic achievement, only to fail at each, eventually resigning himself to much more modest jobs such as steam-boat night clerk, farm laborer, and many others.<sup>3</sup> While on leave in New Haven, Connecticut, for a painful form of arthritis, Drake became acquainted with George Bissell, a local banker who had established with a few partners a small company for extracting oil on a commercial scale on the muddy hills around the small village of Titusville, Pennsylvania. Drake's quixotic proclivity for hopeless missions, along with his forced condition as a convalescent, made him the right person to carry out the curious adventure Bissell had in mind, and he accepted operational leadership of the undertaking. To render it more appealing to new investors, Bissell and his partners dignified Drake with the title of Colonel although the only uniform he had ever worn was that of a railroad conductor.

Unexpectedly enough for a man with no record but failure, on August 28, 1859, Drake succeeded in striking oil with the new method he had devised at the suggestion of Bissell. Working with a small team of local workers, he had erected a wooden tower housing a large steam-driven wheel around which was coiled a cable with an iron bit attached at one end. The wheel rotated, raising the cable and its armament by pulley, and then letting it fall to the ground, thereby excavating a hole. Used for drilling salt domes, this technique had already been tried for oil exploration in Azerbaijan in 1847, but Drake added to it something of his own that proved decisive. He drove a pipe down the hole and ordered his men to drill inside it, so that water and loose material from the sides of the hole did not impede the iron bit from going farther.<sup>4</sup> Thus the

Colonel established the drilling prototype for the modern oil industry, which was eventually improved in Texas in 1901, thanks to the adoption of rotary drilling.<sup>5</sup>

He also introduced one of the most durable landmarks of the oil world, by casually resorting to Pennsylvania's forty-two-gallon (around 159 liters) wooden barrel to gather and transport crude: mainly used in the whiskey business, the barrel would become the fundamental measure of production and consumption still in use today in the oil market. The Drake venture's initial production was thirty-five barrels per day, sold at the staggering price of forty dollars each, the equivalent of around six to seven hundred dollars today.

Colonel Drake's epoch-making experiment is considered the birth date of the oil industry. Rumors and articles about its success aroused a dreamlike infatuation with this substitute for whale oil that promised to be an elixir of prosperity—"black gold," as it was dubbed by newspapers and popular songs. All of a sudden, the fields of Western Pennsylvania were invaded by thousands of amateur petroleum seekers—nicknamed *wildcaters*\*—along with transporters, refiners, traders, dealers, bankers, speculators, and the ever-present swindlers. In 1861, the first oil refinery came onstream, and the first cargo of oil exported from the United States sailed for London from Philadelphia, with the oil loaded in barrels. In 1865, the first successful pipeline was completed, with a capacity of 800 barrels per day and a length of five miles.<sup>6</sup> Thus began what could be called the "Black Gold Rush." Oil production soared, with kerosene making its way onto the American market and soon to Europe as well. But the dawning industry soon became a potential nightmare for many of its irrational pioneers.

Not only were discoveries of new sources of crude erratic and unpredictable, but once a discovery was made, the novice producers' ignorance of the elusive features of oil deposits, coupled with a legal framework that gave owners full rights to the minerals beneath the surface of their land encouraged a foolish overexploitation of the new fields. As a result, recurring gluts flooded the market and pushed oil prices down, bankrupting many operators who had spent all their savings, and borrowings, in their quest for fortune. Wild fluctuations in the price of oil became a

\*The expression "wildcaters" originated from the fact that the first oil wells were drilled in isolated and hostile places where the drillers could hear the cries of wildcats. Today the term "wildcat" is widely used to indicate an exploration well.

common feature of the business. In 1860, the oil price precipitated to ten cents, then in 1861 it rebounded to ten dollars; in 1862 the price fluctuated between 10 cents and \$2.25 per barrel, averaging \$1.5 per barrel. Eventually, the average price of an oil barrel at the wellhead was \$3.5 in 1863, \$8 in 1864, \$4 in 1866, \$2.8 in 1867, \$5.8 in 1869, \$4.2 in 1871, and less than \$2 in 1873.<sup>7</sup> The arithmetic average, however, hides dramatic ups and downs within each single year that gave the U.S. oil market a rollercoaster shape during its formative years. Paradoxically, for long periods of time the cost of the wooden barrel itself—which could fluctuate between \$2.50 and \$3.50—far exceeded the value of its contents.

As for Colonel Drake, he escaped neither the whiplash undulations of the inscrutable fledging industry nor the scornful destiny of repeated disappointment that had pursued him throughout his life. In 1861, a well he drilled burst into flames, destroying all the machinery and infrastructure of his company. With his savings, the Colonel threw himself into new businesses, such as oil and stock trading, only to meet with more failure. Drake ended his life poor, kept from falling into abject misery only by the help of pitying friends and, eventually, by a small pension from the State of Pennsylvania.

It was in this landscape that John D. Rockefeller (1839–1937) emerged as one of the most genial and merciless fathers not only of the oil industry but of modern industry as a whole.<sup>8</sup>

A bookkeeper by training and then a trader in various goods who entered the oil refining business by chance in Ohio in 1863, Rockefeller realized within a few years that the burgeoning oil market was doomed to permanent chaos if left to the blind appetites of hundreds of improvised fortune seekers. The calamitous results produced by foolish and chaotic competition reinforced Rockefeller's innate distrust of the supposed virtues of the free market, particularly its thaumaturgic capability for self-adjustment.

His world was not Adam Smith's. In Smith's world, each person contributed to the overall progress of society by embarking on and competing in economic activities, while the steady working of an invisible hand corrected all imbalances. But as soon as Rockefeller shifted his gaze from the theoretical framework of the British father of modern economics, he saw only the world as it was: a brutal blind struggle fueled by rapacity and greed. To his mind, there was no "invisible hand" at work behind this world, which—in the case of oil—was moved by irrational people, whose addiction to building castles in the air brought disaster on themselves and on the whole oil business. It was difficult not to agree with such a view. In

1869, for instance, refining capacity was three times higher than crude production, and 90 percent of refiners worked at a structural loss.<sup>9</sup> As Rockefeller himself once observed, "[O]ftentimes, the most difficult competition comes, not from the strong, the intelligent, the conservative competitor, but from the man who is holding on by the eyelids and is ignorant of his costs, and anyway he's got to keep running or bust."<sup>10</sup> According to his line of reasoning, open competition was by no means the best solution to the woes of the budding American industry; on the contrary, it was its main evil.

A look beyond the worrisome situation of the oil sector could not but confirm Rockefeller's pessimism. Indeed, the entire American economy seemed prey to a demon that blew upon the fire of irrational speculation, industrial chaos, and unethical behavior, leaving no safe haven for anyone. It was the "Gilded Age" described by Mark Twain, a frantic and highly risky laboratory where upcoming entrepreneurs, stubborn pioneers, charlatans, and "robber barons" mixed in a sea of sweeping corruption, spectacular swindles, and steady distortion of market rules. In 1869, for instance, an amazing wave of speculation on gold provoked a dramatic crash of the Stock Exchange—the second in six years—triggering a huge chain reaction of bankruptcies and opening to the path to a long depression. Watching this world with profound distaste, the devout Baptist Rockefeller poured real religious fervor into his dealings with what he considered the evil of his times.

Surprisingly gifted with figures and quick calculation and a master at penetrating the intricacies of business and rationalizing them in an orderly framework, Rockefeller began to conceive of a great rational architecture that could be superimposed on the oil industry to put an end to its boom-and-bust cycles and their deadly consequences. His final solution was at once simple, grandiose, and awful: to suppress competition altogether.

Rockefeller's design aimed at taking over all of the so-called downstream structures of the oil market, such as refineries, transportation routes, pipelines, ships, and so on, which he saw as the manageable bottlenecks between producers and consumers. Conversely, he always considered too erratic and thus unmanageable the control of oil production, which he left to adventurous wildcatters. Never keen on improvisation or gambling, he started by laying the foundations of his own war machine, establishing in 1870 a new corporation, Standard Oil. He then embarked on a comprehensive plan to cure the embolism that would have otherwise destroyed the vital circulation of the oil business. Accordingly he first

moved to consolidate the entire oil refining business in Standard's home town, Cleveland, Ohio, then one of the main producing centers of the United States. Between February and March 1872, he bought twenty-two out of twenty-six refining companies in what would come to be known as the "Cleveland Massacre." Eventually, in a Rossinian crescendo he launched an impressive nationwide acquisition campaign, bringing nearly all American oil refining and service companies under his control.

Most of those all he won over by persuasion, sparing no effort to appeal to his rivals' common interest in avoiding self-destructive competition. Those who accepted were well rewarded. Rockefeller offered them positions as shareholders and even top managers at Standard Oil, options that would have made them millionaires as well as optimal long-term allies of Rockefeller himself. In other cases, he concluded running arrangements with independent refiners, guaranteeing them a certain profit if they accepted a ceiling on their output, and acting as a "swing producer"—i.e., curtailing Standard Oil's own production to maintain an adequate level of prices—in periods of overproduction. However, those refiners and traders who stood against him were relentlessly squeezed out of the market and saw their hopes turn to ashes.

Never was such an ambitious design so perfectly and cynically realized. But Rockefeller did not make it all on his own. The key architect of the most audacious and controversial Standard Oil's moves was Henry Flagler, Rockefeller's most brilliant and unscrupulous partner.

The man who in his later years developed Florida and transformed it into the "American Riviera," founding Miami and Palm Beach, Flagler was as buoyant and aggressive as Rockefeller was tactful and patient. A risk taker by nature, he did not hesitate to display his life motto written on a small plaque on his desk—"Do unto others as they would to you—and do it first."<sup>11</sup> It was Flagler who probably suggested and eventually negotiated the decisive deals that permitted Standard Oil to destroy competition, notably secret agreements with the main American railroads to obtain large discounts ("rebates") on oil transport fees in return for guaranteeing railroads large volumes of business transporting petroleum.

With pipelines still in their infancy, railroads were critical to the transport of any product—oil included. Thus Standard's deals with them turned a major ingredient of the company's rapid success, as well as the ghost that later persecuted Rockefeller and finally led to the destruction of his empire. Thanks to those deals, on average Standard Oil was granted a 20–30 percent discount with respect to its competitors; adding insult to injury, Rockefeller and his partners even received a relevant

fee—about 25 cents for every dollar—for every barrel the railroad transported for shippers other than Standard Oil, thereby securing an astonishing advantage to the latter.<sup>12</sup>

To escape the mortal embrace of Rockefeller's monster-creation, its rivals had to embark on the daunting undertaking of building up the first long-distance pipeline ever. At that time, such a project was considered a foolish hazard because no technical guidance or feasibility study existed proving it was possible to transport oil on long distances. Yet Rockefeller's rival effectively succeeded in carrying out a 110-mile-long pipeline connecting Western Pennsylvania's oilfields with the Pennsylvania and Reading Railroad. Named Tidewater Pipeline, the project was completed in 1879, and in the same year oil began flowing through that major technological achievement, something "comparable to the Brooklyn Bridge four years later"—in the words of Daniel Yergin.<sup>13</sup> It took a few years, however, before Standard Oil jumped into the new technological frontier and assumed control of brand-new long-distance pipelines.

When in the early 1880s Rockefeller finally implemented his monopolistic plan, he controlled 90 percent of U.S. refineries and pipelines, owned the vast majority of tank cars used for both road and rail transport, and controlled the entire production of high-grade railroad lubricants, along with the largest tanker fleet for exporting oil worldwide; all this at a time when the United States accounted for 85 percent of world crude oil production and refining. Moreover, in an age before real-time information transmission, a vast network of Standard Oil agents monitored every corner of the country, carefully tracking all retail prices, all kerosene sales, and the behavior of all local competitors, as well as any hint of new oil discoveries that could affect the value of crude. This information soon reached Standard Oil headquarters in New York and the executive committee of the Group, which made all strategic decisions related to each specific issue. So, for instance, if some intrepid competitor tried to lower its kerosene price in one state, Rockefeller's men ordered its local company to go even lower, while at the same time ordering a price increase in another state to compensate for the loss. Of course, small independent rivals of Standard Oil survived, particularly if they presented no possible threat to the absolute predominance of the former. But on the whole, the multi-tentacled war machine created by Rockefeller could wipe anyone off the market, anytime, at his pleasure. It was the founder's dream come true, the perfect instrument for suppressing hated competition and regulating the steady growth of the oil market.

Rockefeller's talent in fulfilling this dream proved unique. He combined great vision and sophisticated thinking with an obsessive drive for mastering details—numbers—as well as controlling costs and efficiency. He was the first modern industrialist to apply central planning as an essential tool for putting a strategy into action and carefully controlling its implementation. The only problem with Rockefeller's huge empire was its fragmentation, which was not an easy problem to resolve.

In the late 1880s the United States still had no law allowing for federal incorporation, a situation that made “every corporation created by a state foreign to every other state,” in Rockefeller's judgment.<sup>14</sup> Simply put, a company could not hold stock in another state's company, which officially prevented the oil tycoon from gaining formal and centralized control of his vast holdings. But he was not a man to be stopped by laws he did not deem right. So he asked his chief legal adviser to find a solution to the problem which, without technically violating existing rules, simply circumvented them. The response came in the form of a device that would soon become a distinguishing feature of the late nineteenth century: the *Trust*.

To take advantage of this legal loophole, Rockefeller and his associates had to establish one or more companies in each state where Standard Oil had industrial activities. Eventually, the major shareholders of those companies had to transfer their shares to a Board of Trustees based in New York; the latter calculated the value of each individual share package against the overall value of the Group's companies' shares, and then assigned each shareholder a proportional quantity of trustee certificates. Through this intricate mechanism, Rockefeller ended up holding the controlling stake of Standard Trust, with a 27 percent quota of its certificates; with the shares held by his brother William and other members of his family, his control rose above 40 percent. An informal executive committee presided over by John D. Rockefeller himself ruled the whole system, a sort of shadow board whose legal and effective powers were not written down in any official document or bylaw. Nonetheless, it was the quasi-supernatural presence of Rockefeller that oversaw the silent management of all of the provinces of the empire, the coordination and integration of their activities, the strategic goals and step-by-step actions of the whole Group.

Established in 1882, the Standard Oil Trust remained top secret from the American public and legislators until 1889. By the end of the century, many more trusts had been established by other protagonists of

American industry in every sector of the economy, representing the most striking sign of the shift of the United States from an agrarian, small-business society to an industrial power. Meanwhile, the use of kerosene was spreading worldwide—probably the U.S.-associated product with the greatest influence on the daily living habits of a large part of the world's population; in the late 1870s and all through the 1880s, kerosene was “the fourth-largest U.S. export in value, and the first among manufactured goods.”<sup>15</sup> This triumph of the rising industrial strength of the United States bore the name John D. Rockefeller, who by then had already risen to the status of the richest man in the world.

But his giant creation, which was admired as well as feared and hated, would not remain unchallenged forever. Indeed, the attack on Rockefeller's dominance of the new oil business came from different fronts, and almost at the same time.

While the United States had been virtually the world's only source of crude and refined products for more than twenty years after Drake's lucky strike, competition emerged in Russia by the mid-1880s, posing a major challenge to Standard Trust's overwhelming grip over international markets.

Russian production was concentrated around Baku, in Azerbaijan, and spearheaded by Ludwig and Robert Nobel, brothers of Alfred Nobel, the inventor of dynamite. While Robert was the one who brought the family into the oil business in 1873, it was Ludwig who developed and built up the business, combining the talent of a creative genius and the obsessive attention to detail of a modern manager.<sup>16</sup> He was the first oilman to employ a professional geologist and to improve refining to produce cleaner kerosene. He also was the first to design and commission a tanker to ship oil through the Caspian Sea without the need to first store it in barrels. Under Nobel's leadership, tsarist Russia became the world's second oil producer, attracting new investors and operators in what became a Caucasus version of Western Pennsylvania.

The French branch of the Rothschild family was among the most prominent of the new investors. They entered the Russian oil business by financing the construction of a railroad to transport kerosene from Baku to the Black Sea port of Batum in Georgia, opening a route for Russian oil products to reach world markets. The railroad was completed in 1883. At the same time, the Rothschilds acquired production assets and refineries in Baku, and their company (Caspian and Black Sea Petroleum Company, or Bnito) rapidly moved into second place in the Russian oil market, behind the Nobel family operation.<sup>17</sup>



At the beginning of the 1880s, Russian exports of kerosene began to corrode Standard Oil's control of the European markets. Rockefeller's men reacted by launching an aggressive campaign of price reductions, similar to what Standard had done in the United States to force its competitors out of business.<sup>18</sup> But the Rothschilds did not surrender to the apparently unbearable might of the Rockefellers. On the contrary, they opted to mount their own offensive by extending their reach into Asia, where Standard's dominance was also overwhelming. The key player in this ambitious adventure was a man destined to enter the Pantheon of the oil industry's fathers: Marcus Samuel, an Englishman of Jewish extraction who later founded Shell.

The son of a merchant who had built a business selling shell boxes, which were very popular in Victorian Great Britain, Samuel expanded his father's operation into an export-import concern with a solid network of buyers and suppliers in the Far East.<sup>19</sup> Leveraging his commercial connections, Samuel took the Rothschilds' Asian ambitions to the extreme by conceiving a world-scale attack against Standard Oil. At the core of his strategic vision was the construction of a brand-new class of oil tanker ships with sophisticated engineering and safety equipment that enabled them to pass through the Suez Canal. This shortened transport routes and slashed costs relative to those of Standard, whose more traditional vessels had to sail around the Cape of Good Hope, at the southern tip of Africa, on their way to Asia.

Despite initial reservations by the Rothschilds and vicious attacks by Standard,<sup>20</sup> Samuel finally succeeded in fulfilling his vision: in 1892, the first oil tanker he had designed sailed from Batum, heading for the Far East via the Suez Canal. Eight more ships of the same type came along in the following two years. Concurrently, Marcus Samuel and his brother Samuel masterminded the construction of onshore terminals and storage tanks in key Asian ports, preparing their target markets to receive increasing quantities of kerosene.

It was an all-out war with Standard Oil, pitting the two companies in self-destructive commercial practices and prompting both to over-invest in infrastructure in an effort to secure a larger market share.

In the process, Samuel emerged as a giant of the industry, a status that was publicly recognized when King Edward made him a Lord. In 1897, at the apex of his success, he reorganized his oil business into a new joint stock company, which—in tribute to his father's original business—the named Shell Transport and Trading Company, or simply Shell.

The combined efforts of the Nobels, Rothschilds, and Samuels spurred Russian oil production and allowed it to briefly outpace that of the United States. In 1900, global oil production had reached nearly 430,000 barrels per day (bpd), with Russia providing around 200,000 bpd and the United States delivering around 165,000 bpd. Five years later, however, the United States had dramatically jumped ahead of Russia, reaching 370,000 bpd, more than twice Caucasian production.<sup>21</sup> (One century later—in 2000—those numbers would appear almost negligible in a world producing and consuming more than 75 million barrels per day!)

Before the nineteenth century expired, another intruder appeared on the once untouched Standard Oil's turf—the Royal Dutch Company. Incorporated in 1890, the company had discovered oil in East Sumatra (then part of the Dutch East Indies, and now part of Indonesia) which it put onstream in 1892. Its dramatic success made the area the third pole of world's oil production by the end of the century, although on a much smaller scale than that of America and Russia.<sup>22</sup> Eventually, Shell joined Royal Dutch in the region, having obtained a concession in Borneo, where it struck oil in 1897.

Now the Asian market was overcrowded. Proximity to consumers enabled local producers to challenge overseas exporters like Standard by offering lower prices, and failure marked repeated attempts at a truce among the participants in the international oil trade. Each sought to maintain its independence, while Rockefeller's men unsuccessfully urged the Rothschilds, the Nobels, the Samuels, and Royal Dutch to become part of Standard Oil, following the model they had developed in the United States face to their domestic competitors.

As this scenario played itself out, Samuel's Shell was the weakest player. It was short of oil of its own, and its deal with the Rothschilds for marketing their Russian petroleum expired in 1900. Shell had invested heavily in refining plants, oil-tanker ships, storage facilities, and pipelines, all of which were increasingly underutilized. The result was simple: Shell was running out of cash because it had little oil to market.

Having refused to negotiate a merger with Standard Oil, Samuel turned to the chief executive of Royal Dutch, Henri Deterding. He hoped to find a formula of association that would preserve some form of autonomy for Shell, and recognize his own role as the leader of the hypothetical combination, something that had proved to be impossible with Standard. But the still young Deterding revealed himself as a tough and

unbending leader, characteristics that would eventually make him a dark architect of the oil industry, and he never granted Samuel what he so desperately sought, notably equal treatment. Instead of a 50-50 share in the projected merger, the Dutchman insisted on a 60-40 formula in favor of his company, and told Samuel he could take it or leave it. His pride severely wounded, Samuel had no choice but to surrender.

In 1907 the two companies merged, giving birth to the Royal Dutch Shell Group. In fact, no legal entity bearing that name ever existed, because the merger was somewhat unusual. Royal Dutch and Shell both maintained their formal, independent status and separate listings, while their overall assets were allocated to two sub-holdings. One embraced all production and refining assets and was based in The Hague, while the other was responsible for transport and storage facilities, and had its headquarters in London. Each holding company owned a participation in both sub-holdings, following the 60-40 formula that Deterding had imposed to insure Dutch predominance. Two boards continued to exist, with senior managers sitting on both. The overall activities of this strange construction<sup>23</sup> were coordinated by a "Committee of Managing Directors" that had no legal standing, but enjoyed the support of both boards. Deterding's autocratic leadership over more than three decades made it possible for the new group to thrive and become one of the biggest oil companies of the twentieth century. Despite the Group's organizational cacophony, determined by the survival of two parallel structures with no real central corporate power, Deterding acted as a one-man band, imposing his overwhelming influence as Rockefeller had done through Standard Trust's informal "executive committee." Remarkably, the weird organization he created survived until 2005, when Royal Dutch-Shell finally decided to evolve into a single company.

Thus, at the turn of the century, Standard Oil was no longer alone in the international arena, where its position weakened day after day. Yet the most damaging attacks on its empire came from within the United States itself.

First, the grip of Rockefeller's creation on the American market relaxed because of the relentless appearance of local competitors, bred by a flurry of new oil discoveries in other parts of the country. If the Standard monopoly had been favored by the concentration of production in Western Pennsylvania, by the 1890s the center of gravity for oil production began to move southwest, prompting a new boom in exploration and production. California led the way in this redeployment of forces when vast amounts of oil were discovered on its territory. To

a lesser extent, oil also began to flow from Kansas, Colorado, and other states, but it was particularly in Texas and Oklahoma that a new era of American petroleum began. In 1901, oil was struck in Spindletop, a little hill near the small city of Beaumont, Texas. It happened to be the largest discovery ever in the United States. Oil erupted with such a violence that it formed a huge overflowing fountain, capable of delivering 75,000 barrels per day—a bewildering phenomenon that introduced a new word into oil jargon, *gusher*. Unfortunately, wildcaters assaulted the new El Dorado, torturing it by drilling too many holes too fast, such that the oilfield's internal pressure was quickly exhausted. By the end of 1902, Spindletop was incapable of producing oil.

Nonetheless, this extraordinary Texas find excited the imagination of armies of oil-seekers, who made the American Southwest the new frontier of exploration campaigns and new discoveries. Even more amazing than Spindletop was the discovery of the huge Gleen Pole (1905) field near Tulsa, Oklahoma, which made the state the leader in American oil production up to 1930. Thanks to this and other successes, the United States soon reclaimed the crown of top world crude producer. At the same time, the new boom was accompanied by the establishment of new oil companies that would erode the overwhelmingly dominant position of Standard Oil: noteworthy were the cases of the Texas Oil Company, or Texaco, incorporated in 1902; Gulf Oil Company, which was officially incorporated in 1907 in Texas, under the patronage and ownership of the Mellon family; and California's Union Oil (1893), later Unocal.

More than international and domestic market erosion, however, it was the local and federal governments of the United States that hit a fatal blow to Standard Oil's once absolute power, for reasons that went back to the very roots of Rockefeller's career.

The father of the oil industry was the single most important character of an age that witnessed one of the major social and economic transformations of the United States. In a way, it was Rockefeller who was responsible for the tectonic shift that transformed Jefferson's America—based on the equation between freedom and direct ownership of the means of production and land by every single man—into a global economic power dominated by industrial concentration through the "trust" formula. Rockefeller later proudly described that shift and his own role in it:

This movement [concentration] was the origin of the whole system of economic administration. It has revolutionized the way of doing

business all over the world. The time was ripe for it. It had to come, though all we saw at the moment there was the need to save ourselves from wasteful conditions. The day of combination is here to stay. Individualism has gone, never to return.<sup>24</sup>

It was thus inevitable that Rockefeller would become one of the favorite targets of the “trustbusters” once the counteroffensive against monopolies reached critical mass. And indeed, harsh critics did their best to make oil and monopoly synonymous in the mind of American and world public opinion. When Theodore Roosevelt became president of the United States in 1902, the antitrust movement gained its most effective and toughest representative, and John D. Rockefeller his most lethal enemy. By then, the founder of Standard had left the operating leadership of the company (in 1895), retaining only a formal position as its chairman. But Rockefeller had committed a grave mistake in never making his retirement public, partly at the request of his partners.

That secret move—which let him remain the visible symbol of Standard Oil—allowed his opponents to make him the number-one target of a harsh campaign of growing attacks. That campaign reached its climax in 1904, when a destructive portrait of Rockefeller’s career was presented to the American public by journalist Ida Tarbell, the daughter of one of the many Pennsylvania oil pioneers whom Rockefeller had driven out of business. Her two-volume *History of Standard Oil*<sup>25</sup> turned “America’s most private man into its most public and hated figure,” as historian Ron Chernow later wrote.<sup>26</sup> Yet the public perception of his character and personal history did not reflect either the complexity of Rockefeller’s personality or the importance of many of his achievements.

Though sometimes confused with his lavish and greed-driven contemporary “robber-barons,” Rockefeller was wholly unlike the majority of them. As one of his biographers recalled, he had been “the best employer of his time, instituting hospitalization and retirement pensions,”<sup>27</sup> and was highly regarded by his own employees for his benevolence, kindness, and complete lack of arrogance. At the same time, although he achieved the status of the richest man in the world (with a personal wealth still unchallenged today, unless by Microsoft founder Bill Gates) he was disgusted by the unethical habits and obsession with luxury that characterized the new tycoons of the industrial age. He always lived modestly and far from the limelight.

To his credit, Rockefeller could also claim responsibility for the consumer benefits brought by Standard Oil, which had transferred to its

clients at least part of the gains the greater efficiency of its organization had allowed: the price of kerosene in the United States (without taxes), declined from approximately forty-five cents per gallon in 1863 to about six cents by the mid-1890s.<sup>28</sup> Moreover, Rockefeller never speculated on the stock exchange as many of his contemporaries did—particularly, and with great frequency, the robber-barons—and he never made swindling into a business practice. Rather, his overall achievements were mostly based on elusion and encirclement of poor laws.

On the other hand, Rockefeller’s role in suppressing competition and winning privileges even by resorting to illegal means, such as bribery, was beyond question.<sup>29</sup> So was his relentlessly imposed policy of “begging-my-neighbor,” manipulating prices in different regions in order to break his competitors by underselling them. However, what pursued him like an implacable ghost was his original sin: the secret agreements with the railroads. Rockefeller always defended the rationale behind preferential rebates and the discounts he had got from them:

Who can buy beef the cheapest—the housewife for her family, the steward for a club or hotel, or the commissary for the army? Who is entitled to better rebates from a railroad, those who give it 5,000 barrels a day, or those who give 500 barrels—or 50?<sup>30</sup>

Whatever the logical force of this reasoning, Rockefeller’s critics rebuffed it with an argument that would become the key premise behind the modern regulation of utilities, notably the public service nature of railroads, which operated under state charters. This status endowed them with the right of “eminent domain,” which entitled railroad owners to expropriate private property to build their routes. In return for this right, railroads had to behave as “common carriers” and provide all clients with uniform conditions to access their services. Consequently, fee discrimination was unacceptable, no matter how great the volume of business that Standard Oil could guarantee to the railroads.<sup>31</sup>

In any case, one of Rockefeller’s most serious mistakes was to underestimate the increasing role of the press in the evolving American society, and his failure to understand its crucial importance in shaping the public’s perception of reality. For years, secrecy ruled his life, and he viewed press criticism as a temporary phenomenon without lasting significance. As a result, he failed to take any steps to counter the daily attacks on his image, allowing the negatives to stand unchallenged. By the time Rockefeller understood the problem and changed his approach,

it was too late, and the harsh portrait of his life and career was engraved in the public mind and that of the oil industry, surviving him by many decades.

After years of attacks, investigations, and trials, in 1911 the U.S. Supreme Court finally ruled for the dismantling of Standard Oil, calling for it to be broken up into more than thirty independent companies.

This decision was a milestone in the history of the antitrust movement and cemented the association in the mind of the global public between the oil industry and everything that was sinister and secretive in modern industrial society. As with the mythical Phoenix, from the ashes of Standard Oil would emerge a host of the eventual protagonists of the oil era—among them Exxon (Standard Oil of New Jersey), Mobil (Standard Oil of New York), Chevron (Standard Oil of California), and Amoco (Standard Oil of Indiana). At the same time, the antitrust ruling did not prevent major oil protagonists from resorting to Rockefeller's anti-competitive practices.

For many decades to follow, monopoly and oligopoly remained the sacred texts by which the oil industry guided its behavior, especially during recurring phases of overproduction—or when seeking to avoid it. Indeed, Rockefeller's curse on free competition in the oil business is active right through our day, its shadow stretching over the latest interpreter of his doctrine—OPEC.

---

## CHAPTER 2

---

# The Age of Gasoline and Oil Imperialism

Just as Standard Oil was facing its day of reckoning, a profound shift was occurring in the significance of oil in modern life.

By 1900, oil was not just the main source for illumination anymore; at least 200 crude by-products had entered daily use, ranging from lubricants for industrial machinery and petroleum wax for pharmaceuticals and candles, to medicines, solvents, and fuel for stoves and internal combustion engines.

Meanwhile, artificial light had found another powerful source, which was to change the history of the twentieth century. In New York in 1882, Thomas Alva Edison made his first public presentation of his latest invention, a light bulb powered by electricity. The new device soon captured the collective global imagination, even though the need to create a large infrastructure to provide the new tool with power—from the generator to the home—initially limited its diffusion to public lighting or large industrial complexes, without endangering the role of kerosene. (In 1900, only eight million light bulbs lit the United States; in the rest of the world, the total figure was far more negligible.)<sup>1</sup>

While Edison's achievement set the stage for one of the most important revolutions of our time, a flurry of amateur inventors was experimenting with and perfecting the first prototypes of internal combustion engine vehicles, fuelled by diesel or gasoline. In their small assembly shops and garages, those men were paving the way for as revolutionary an invention as Edison's, and one that would dramatically upset the concept of physical distance and change oil's role in contemporary history.

Neither the internal combustion engine nor the automobile had a single inventor. Different models of motors and cars popped up

contemporaneously, each somehow taking advantage of improvements and advancements introduced by others.<sup>2</sup> Europe was initially far ahead of the United States in nourishing the new business. It was the birthplace for what is generally credited to be the first commercial version of an internal combustion engine, patented in France in 1860 by Belgian mechanic Etienne Lenoir. Eventually, sweeping innovations were brought about by German manufacturers, starting with Nicolaus Otto's milestone four-cycle engine introduced in 1876 (which first compressed the fuel-air mixture into the working cylinder), and followed by models patented by Karl Benz, Gottlieb Daimler, and Rudolf Diesel.<sup>3</sup> At the same time, the 1901 Mercedes designed by Wilhelm Maybach, inventor of the carburetor and a long-time assistant to Gottlieb Daimler, for the German *Daimler Motoren Gesellschaft*, deserves credit for being the first modern motorcar in all essentials.<sup>4</sup> By the end of the century, dozens of prolific pioneers had delivered original prototypes of four-wheeled vehicles in the industrial countries, proving that the new transportation tool was reliable and sufficiently safe. Nonetheless, it still represented an extravagance limited to a restricted club of very wealthy people.

Merit for removing the automobile from the empyreal grasp of the elite and turning it into a product for mass consumption goes to Henry Ford and his landmark industrial achievement, the Model T (1908).

A farm boy born in a small town near Detroit in 1863, Ford took his first steps in the automotive industry as a machinist, rapidly becoming a self-taught engineer. In 1896, while working for an electric utility company, he built his first quadricycle fed by an internal combustion engine. Eventually, after several ups and downs he established the Ford Motor Company in Detroit in 1903. In the same year, at the age of forty, he set down his basic theory, envisaging his future revolution that would mark forever modern industrial organization and production methods: "The way to make automobiles is to make one automobile like another automobile, to make them all alike, to make them come from the factory just alike—just like one pin is like another pin when it comes from a pin factory."<sup>5</sup> In simpler words, he wanted the standardized production of a single model with the same austere equipment and just one color: black.

Launched in 1908, the four-cylinder Model T was one of the greatest industrial successes ever: between 1908 and 1914, the Ford Motor Company sold 1 million units. Riding the wave of this staggering achievement, Ford introduced the first assembly line in history, in 1914, to speed up vehicle construction. It was the ultimate step toward the age of the automobile, allowing sales to skyrocket to 2 million in 1916 and 10 million

in 1924. When the final curtain fell on the Model T in 1927, Ford had sold 15,458,781 of them.<sup>6</sup>

These industrial achievements were underpinned by another key intuition that Ford translated into a consistent strategy: the price of a new car had to be low enough for his workers to afford to buy one. Accordingly, Ford transferred to his consumers the steady cost reductions he obtained through the evolution of his producing processes,<sup>7</sup> incessantly slashing Model T prices from the original \$890 in 1908 (when the average American worker's pay ranged between \$500–\$570 per year) to \$550 in 1914 and \$290 in 1924—then equivalent to about one quarter of the yearly wage of a worker.<sup>8</sup> At the same time, by 1914 he upset most of his narrow-minded industrialist colleagues by increasing his workers' daily salary to five dollars, almost doubling what they had been earning, and reduced the working day to eight hours; in 1921 he cut the work week once again, from six to five days. All of these reforms made him one of the most admired men of his time, such that even Lenin held him in high regard.<sup>9</sup>

At the beginning of the 1920s, Ford accounted for 50 percent of world automobile production and 60 percent of that of the United States. However, in the following years Ford was to be outstripped by another creative genius and revolutionary of modern industry, Alfred Sloan, the head of General Motors Corporation (GM).

Sloan realized that the increasingly wealthy consumers of the "Roaring Twenties" were searching for diversified products, notably different car models made in different colors and with a wide range of accessories and options. It was Sloan who established modern industry's habit of launching new car models each year, mainly through a constant restyling of existing models. And it was Sloan who in 1925 conceived of a new system of industrial organization, based on a multidivisional structure in which each division was an independent business unit, responsible for its own profits and losses, while the corporate headquarters retained responsibility for strategy, central planning, and control. This restructuring turned out to be particularly well suited to Detroit-based GM, which was born in 1910 of a consolidation of several brands, including Pontiac, Buick, Oldsmobile, and Cadillac. Empowered by direct responsibility for their business results, GM's division chiefs supplied the market with the variety of models it hungered for. It was the triumph of Sloan's vision and the demise of Ford, whose inflexible production concept did not fare well in the changing times.

In any case, Ford-GM competition was a blessing both for Detroit, which rose to its long-lasting predominance in world car production

and for the American market. On the wave of both companies' amazing successes, four out of five cars produced in the world in 1927 were made in the United States. In the same year, the country crossed the threshold of mass motorization, with one motor vehicle for every 5.3 people, or nearly 200 cars for every 1,000 people—even today a figure unmatched by most countries in the world. (At that time, in the most mechanized countries in Europe—Great Britain, France, and Germany—there was only one car for every forty-four people.)<sup>10</sup>

Boosted by the rapid spread of cars and other motor vehicles, in 1910 gasoline sales surpassed those of kerosene and other lighting oils in the United States. Symbolically, this development heralded the advent of oil's "age of energy."<sup>11</sup> However, one more transformation would change forever not only the pattern of oil consumption, but also oil's strategic role in power politics: a transformation in the *art of war*.

By the end of the nineteenth century, the new internal combustion engines had been installed on ships and large vessels as well, with consequences that awakened the interest of many military strategists. Oil offered several advantages over coal as naval fuel that could prove to be key in the case of war. First, it had a higher thermal efficiency, which enabled ships to travel faster and cover greater distances while enjoying greater self-sufficiency; for example, naphtha (an oil product) yielded for 50 percent greater mileage than an equivalent quantity of coal. Moreover, with oil a ship could be refueled while underway, whereas the loading of coal required a ship to stop in ports equipped with the necessary facilities. Finally, oil products were far simpler to store and move on board than coal, and required less space and fewer men, considering that on coal/stream ships, a full three-quarters of the crew was generally devoted to moving coal and controlling related machines.

The revolution caused by the introduction of the internal combustion engine dramatically changed the nature of oil for nations and for mankind, and it took only a few years for "black gold" to rise to its current status as a strategic commodity, vital to the national security of the Great Powers.

The country that best grasped this new reality was Great Britain, at the urging of a young Winston Churchill. As First Lord of the Admiralty, it was Churchill who lobbied for the Royal Navy's conversion from coal to oil in 1911, ultimately winning approval for it in 1913. With that choice, London could hope to preserve its predominance on the seas, particularly against the rise of the German naval force. Yet the shift entailed also a very big problem. While the United Kingdom supplied

about half of the coal traded worldwide, and held a virtual monopoly of the hard smokeless coal that had become the maritime fuel of choice,<sup>12</sup> it had neither domestic sources of oil, nor sources in its colonies. Once the country opted for an oil-propelled fleet, the UK's energy self-sufficiency was lost forever, and the search for stable and invulnerable oil sources became a vital necessity for the country. It fell to Churchill again to come up with the solution, notably government control of the Anglo-Persian Oil Company—the progenitor of today's BP—a private enterprise that held a very promising oil concession covering most of the territory of Persia, the future Iran.<sup>13</sup>

The first venture of its kind in a Middle Eastern country, the Persian oil saga had begun in 1901, when an Irish businessman, William Knox D'Arcy, was granted a sixty-year exclusive oil concession covering the whole extent of the Persian Empire except for five northern provinces.<sup>13</sup> In return for the concession, the Persian monarchy received an up-front payment of 40,000 pounds, the right to a yearly 16 percent cut of net profits, and a royalty of four gold shillings for every tonne of oil sold.<sup>14</sup> D'Arcy's venture was also absolved from paying any kind of tax to the Persian authorities, including income tax. This milestone agreement would become the model for all subsequent oil concessions in the Middle East for five decades. But Persia was not a safe haven for a British company at that time.

Indeed, control of the whole of Central Asia had been the prize behind the almost century-long confrontation between Great Britain and Russia, both countries considering the region key to their security and power. For the UK, Central Asia was the shell around the pearl of its Empire, India; for Russia, it was the soft belly of its own domain, the place whose "open grasslands historically served as the highways of conquest for Mongol invaders,"<sup>15</sup> as well as the door through which Islam could penetrate the heart of the Tsarist Empire. Known to history as the "Great Game" after Rudyard Kipling popularized the expression in the novel *Kim* (1901), that struggle was still under way when D'Arcy's undertaking took shape, making the Russians the more dangerous candidates to replace the British grip on Persian oil.

Furthermore, by 1912 Anglo-Persian/BP found itself in deep financial trouble. Oil production continued at a modest rate, while large capital expenditures were committed to complete the construction of a pipeline

\* Persia changed its name into Iran in 1935.



network and a refinery in Abadan, on the Persian Gulf. This rapidly exhausted the company's working capital and by 1914 put it on the verge of bankruptcy.<sup>16</sup>

Part of the UK establishment then pushed Churchill to consider what came to seem like an inevitable resolution—the acquisition of a majority stake of the company. Already the chief advocate of a rising British oil lobby, Churchill carefully engineered the final move of a plan that would officially recognize the strategic linkage between oil, national security, and world power for the first time in history. To ease the way for his coup de théâtre, he began catechizing a still skeptical parliament in 1913, arguing:

If we cannot get oil, we cannot get corn, we cannot get cotton and we cannot get a thousand and one commodities necessary for the preservation of the economic energies of Great Britain.<sup>17</sup>

In that same speech, Churchill introduced the notion that oil sources and commerce had to be directly controlled by the Admiralty, with the target of ensuring Great Britain both an ample diversification of supply and independence from any foreign company. Then in 1914 Churchill launched his ultimate assault, proposing the acquisition of a 51 percent stake in BP for 2.2 million pounds. On June 17, 1914, the British parliament approved Churchill's proposal by 254 votes to 18.<sup>18</sup>

As BP's majority shareholder through the Admiralty, the United Kingdom's government now had the right both to appoint two out of seven board members (including the executive chairman), and to exercise a veto over the others' decisions, particularly in case of politically sensitive issues. Apart from these limits, the company had to run its business according to the financial and industrial strategies typical for any private company, and its bylaws would shelter it from any interference from political forces. This complex architecture rendered BP an oxymoron, notably a state-controlled enterprise with a private soul and mission. But above all, it made it the paradigm of the shift that occurred in the strategic perception of oil.

World War I reinforced that perception. Naphtha, gasoline, and diesel—all petroleum products—emerged as the leading fuels for moving people, armies, airplanes, and naval fleets throughout the world. It soon became clear that both the wealth of modern economies and mechanized war based on mass mobilization could be sustained only with access to ample sources of oil. Thus, after the war the quest for oil

became an international phenomenon, also spurred by another powerful factor: the deceptive specter of crude oil scarcity.

The alarm was sounded during World War I in the United States. At that time the country that had been the birthplace of the modern oil industry was still by far the world's largest oil producer, accounting for almost 70 percent of global output, or more than one million barrels in 1919.<sup>19</sup> Yet the findings of a Senate inquiry begun in 1916 suddenly shook its sense of certainty about the future of oil.

In its final report, the Senate stated that most of the American oilfields had already passed their peak production, were in a phase of rapid depletion and were likely to be exhausted within twenty-five years according to the most optimistic view.<sup>20</sup> It was not the first time such alarms had been sounded, but the authority of the institution making the charge gave it rock-solid credibility and assured its worldwide dissemination. A flurry of additional gloomy predictions followed, and in 1919 even the head of the prestigious U.S. Geological Survey delivered his no-exit verdict: American oil would run out in nine years!<sup>21</sup>

Everything conspired against optimism. Worldwide consumption of oil products had risen by 50 percent between 1914 and 1918, just when war damages and the Bolshevik Revolution were constraining oil supply from Russia, which was finally curtailed by the revolutionary government's 1919 decision to nationalize the whole industry. America's mounting hysteria about oil was further exacerbated by a remarkable price increase: between 1918 and 1920, it climbed on average from less than two dollars to three dollars per barrel, underscoring the notion that the country's productivity was under stress.

As concern with the supposed end of oil grew, President Calvin Coolidge established the Federal Oil Conservation Board in 1924, a decision he explicitly justified by linking future oil needs with national security, as Churchill had done ten years earlier:

Developing aircraft indicate that our national defense must be supplemented, if not dominated, by aviation. It is even probable that the supremacy of nations may be determined by the possession of available petroleum and its products.<sup>22</sup>

These concerns had already provoked an early diplomatic reaction by the United States. In 1920, Secretary of State Charles Evans Hughes and Secretary of Commerce (and future president) Herbert Hoover recommended helping American petroleum companies obtain oil concessions

abroad before Great Britain and other European powers took most of them.<sup>23</sup>

In effect, by then London was searching to grasp another important potential oil base in the Middle East, Mesopotamia—the future Iraq—as a part of its energy imperial strategy.

Already in 1918, British War Cabinet Secretary Sir Maurice Hankey had written Foreign Secretary Lord Balfour that

Oil in the next war will occupy the place of coal in the present war... The only big potential supply that we can get under British control is the Persian and Mesopotamian supply.... The control over these oil supplies becomes a first-class British war aim.<sup>24</sup>

Because the United States was Great Britain's main supplier of oil, fears of American subsoil insolvency reinforced this drive for resource imperialism and added a key ingredient to the British "Arab" policy devised during World War I.

In 1915–1916, London had stimulated the rise of nationalism among Arab populations and convinced them to revolt against the Ottoman Empire, then on the side of Great Britain's enemies in the war. The instrument of that policy was Hussein, the emir of Hejaz, a small kingdom in the Arabian Peninsula. The British felt that Hussein possessed strong personal leadership and sufficient forces to stir up and then direct the Arab upheaval; most importantly, he ruled the Muslim holy towns of Mecca and Medina, and his Hashemite dynasty claimed to be directly descended from the Prophet Mohammed. In return for Hussein's support, London promised him Great Britain's backing in the establishment of a great Arab nation under his own rule, within the boundaries of the Fertile Crescent (MacMahon-Hussein agreement, 1915–1916).

In 1916, Hussein and his sons Faisal and Abdullah launched the Great Arab Revolt, advised by the eventual apologist of their undertakings, the British agent Thomas Lawrence, who passed into history as Lawrence of Arabia. The Hashemites had considerable success and played a significant role in helping the British war effort on the Eastern front. However, at the end of the war Hussein's men abruptly found out that Great Britain's promise was nothing more than a cynical political *escamotage*. Already in 1916, Great Britain and France had secretly agreed (Sykes-Picot agreement) to a partitioning of the territories London had just granted to Hussein as a reward. According to the text of the entente,

Mesopotamia and Palestine would go to the British, while France would get Syria and Lebanon.

The consolidation of this scheme was carried out at the San Remo Conference (1920), where the partition plan was openly blessed also by the newly formed League of Nations. In San Remo, the British oil lobby carved an important clause into the agreement that stipulated that "any company developing oil in Mesopotamia should be under permanent British control."<sup>25</sup> In return for this generous grant, France was given a stake in the Turkish Petroleum Co. (TPC), a company established in 1912 with the mission to obtain an oil concession for Mesopotamia. Dominated by BP (50 percent) and Shell (22.5 percent), TPC was originally participated in by Deutsche Bank (22.5 percent), whose presence mirrored a more general German strategy toward the Ottoman Empire. After the war, German interests in the company were confiscated as a war reparation and given to the French. Five percent of the TPC's stock always remained in the hands of the man who had first outlined the oil potential of Mesopotamia at the end of nineteenth century, and eventually masterminded the compromise between British and German competitors that made possible the birth of TPC; his name was Calouste Gulbenkian, and he may be considered the founding father of the Iraqi oil industry, as well as a major figure in the shaping of the Middle East's petroleum policy.

Now the stage was set for Great Britain to secure its "first-class aim" through direct control of Mesopotamia, but unexpectedly things turned out to be much more difficult than envisaged.

As early as 1920, a revolt started in the southern Iraqi cities of Nasiriya and Falluja as a reaction to the San Remo Agreement. Rapidly and unexpectedly, the revolt spread throughout the whole of Mesopotamia, pushing British forces to launch a harsh and even inhuman repression involving the aerial bombing of cities and villages. The final cost was a staggering 10,000 Iraqi and 400 British casualties.<sup>27</sup> London realized that something more acceptable than overt Arab servitude had to be devised; what was needed was some ornamental façade to disguise its rule at the cheapest cost possible. In fact, the traditional colonial model was revealing its financial unsustainability, putting the British Treasury under considerable stress. In 1920 alone, expenditures on the administration of Mesopotamia reached 32 million pounds; the following year, even though slashed to 24 million pounds, they came to "more than the total of the UK health budget."<sup>28</sup>



At the urging of its newly-appointed Secretary of Colonies, Winston Churchill, the United Kingdom decided to resolve the dilemma of Mesopotamia through a strategy of indirect government. Key to this plan was the establishment of a state built upon the three loose provinces of Kirkuk, Baghdad, and Basra, ruled by a British-chosen Arab monarch and based on a fundamental law providing for an elective assembly. In order to cement that complex architecture, a British-Iraqi alliance treaty would guarantee London's supervision of any sensitive matter concerning the new state.<sup>29</sup>

Accordingly, in 1921 the British masterminded a referendum in Mesopotamia by resorting to bribe the local tribal chiefs in order to crown Hussein's son Faisal King of Iraq (even if the new name of the state was officially adopted only in 1929). By 1925, they carried out the other points of their agenda, establishing a general assembly resembling a parliament and signing the alliance treaty. To achieve its targets, London did not hesitate to make use of threats and emergency measures against the new hesitating king, who unexpectedly tried to withstand what he considered a complete surrender to the British will. Particularly, it was hard for him to accept a treaty that imposed upon Iraq both an ill-disguised British rule and even its costs. Indeed, while the alliance treaty provided for the King to be assisted and advised by British High Commissioner in Iraq "on all matters affecting the international and financial obligations and interests of His Britannic Majesty,"<sup>30</sup> it also required Iraq to pay half the costs of British engagement in the country. But Faisal could do nothing against the British menace to deprive him of his throne and Iraq of a part of its territory (the region of Kirkuk, claimed by the Turkish), and so Great Britain had its new state built and organized according to its original plan.

Even before the assembly was elected, the treaty ratified, and the constitution promulgated, Great Britain made sure to secure an oil concession in Iraq through the British-controlled TPC. Article five of the concession agreement marked the final accomplishment of such policy, stating that TPC had to remain a British company registered in Great Britain, and its chairman (as chief executive) had to be a British subject.<sup>31</sup>

Thus modern Iraq was born out of the dictates of a foreign government, with oil playing a central role. Yet the imperial drive that led the British oil lobby to shape the destiny of a nation was not unrivaled and actually provoked a major clash with the United States.

Prior to World War I, the American government had consistently refused to become involved in the overseas operations of American oil

companies, essentially Standard Oil.<sup>32</sup> This position was abandoned quickly in response to the grim prospect of domestic oil depletion that spread from 1916 on and prompted the country to search for alternative sources worldwide. But when the U.S. companies tried to bid for new concessions abroad, they came up against walls erected by the colonial powers. As a consequence, Hughes's and Hoover's warnings about the risk that American oil interests in the world would remain empty-handed developed into a proactive official U.S. oil diplomacy. Washington proclaimed the "Open Door" doctrine—i.e., free access to all countries of the world for every company, whatever its nationality—and quickly clashed with London over the destiny of Mesopotamia's still-to-be-discovered resources.

After several years of confrontation, in 1928 an agreement was finally reached. BP, Shell, Total, and the American predecessors of Exxon-Mobil combined, became equal partners of Turkish Petroleum Company (later renamed Iraq Petroleum Company), each one with a 23.75 percent stake in the company.<sup>33</sup> The father of the Iraqi oil saga, Calouste Gulbenkian, succeeded in retaining its 5 percent stake, and also convinced his partners to include in the venture's bylaw a clause committing each of them not to initiate without the others' consent any individual oil operation in countries of a large portion of the Middle East, spanning from current Turkey to Saudi Arabia and Bahrain (but excluding Kuwait, Iran, and Egypt). For making clear what the concerned area was, Gulbenkian himself took a map and delimited the area in red ink, thereby leaving to history his anticompetitive device as the "Red Line Agreement."<sup>34</sup>

The case of Iraq marked the beginning of a rush that would place seven major Western oil companies—later to be known as the "Seven Sisters"<sup>35</sup>—in control of all Middle Eastern petroleum by the early 1930s. By that time, however, some of those companies had already secured the bulk of oil concessions in Latin America, where an oil boom had taken place in the first three decades of the new century, centered in Mexico and Venezuela.

The Mexican oil history began as an appendix to the Texas one, thanks to a world-renowned British engineer and occasional oilman,

\*Using as a reference their modern name, they were (original name between parentheses): Exxon (Standard Oil of New Jersey), Royal Dutch Shell, BP (Anglo-Persian Oil Company), Mobil (Standard Oil New York), Chevron (Standard Oil Company of California), Texaco (Texas Oil Corporation), Gulf Corporation.

Weetman Pearson. Pearson had conceived and built up the Panama Canal and other engineering marvels of his age, so that Mexico's dictator Porfirio Diaz had asked for his services in order to study and eventually carry out some great undertaking in his own country. But as soon as he entered Mexico from Texas, Pearson was hit by the inhabitants' tales of local oil seepages, exploited since ancient times in plenty of applications. Influenced by the Texan oil euphoria, the British engineer then decided to establish an oil company in 1901, the Mexican Eagle, and plunged in his own quest for "black gold." The concession terms he was granted followed the scheme set up by D'Arcy in Persia and would set the model for all eventual contracts in Mexico: a modest royalty for every tonne of oil produced, a tax on surface occupation, no income tax, and the direct ownership of subsurface findings.

During the first years of his new venture, Pearson went through the same difficulties and financial distress that were quite forcing William Knox D'Arcy to abandon his Persian oil dream in the same period. However, the audacious Pearson was finally helped by the talent of a still young Everett DeGolyer, the later father of modern seismic prospecting. Hired by Pearson as a last chance bet, in 1910 DeGolyer struck the huge oilfield Potrero del Llano 4 in the Tampico area. It was probably one of the largest findings worldwide till then, which rapidly made Mexico the epicenter of a new and successful oil rush. On the eve of World War I, the country was the third largest oil producer in the world—after the United States and Russia—with production topping 100,000 barrels per day. In 1921, it even surpassed chaotic Russia, achieving a peak production of nearly 530,000 bpd. By that time Pearson—then known as Lord Cowdray, having been knighted in 1917—had already left the country and sold Mexican Oil to Shell,<sup>35</sup> fearing the consequences of the overthrow of his protector Porfirio Diaz in 1913 by a revolutionary government. Once again, his intuition would prove correct.

In 1917, a new parliament amended Mexico's constitution to extend government control over oil resources. Afterward, a heated clash over ownership rights of underground mineral resources and taxes to be paid to the central government erupted between the new Mexican leaders and foreign oil companies.<sup>36</sup> With both parties unwilling to accept any compromise, the standoff grew in harsh acrimony and led international companies to shift their sights to another appealing Latin American country, Venezuela, which had the "political advantage" of being ruled by a cruel and corrupt dictator, Juan Vicente Gomez.

Actually, the entire American subcontinent was rife with widespread corruption and satraps, and as one of the Pearson's agents had pointed out clearly in a letter to his chief:

I have no doubt that you realise that the sort of concession that we are trying to get does not appeal to any government and that it is very difficult to obtain it in a country enjoying a real parliamentary system; it is to my mind only easy in countries of a one man government like Mexico under President Diaz, Venezuela under Gomez or Colombia under Reyes.<sup>37</sup>

Given this context, it was not by chance that oil nationalism first ignited in Latin America, leading to the nationalization of oil resources first in Argentina (1922) and eventually in other countries. Yet in spite of its similarities to other Latin American countries, Venezuela was unique.

As Daniel Yergin wrote, Gomez governed Venezuela as "his own private hacienda," repressing all dissent with terror and brutality and enriching his cronies. His family members sat in key governmental positions, while his brother was his own deputy.<sup>38</sup> Ruling over a barely formed state with no well-established institutions, Gomez could shape as he wished the life of his country and the nascent oil business. In 1912, he forced the country's supreme court to revoke landowners' rights to their subsoil resources, which were redefined as the property of the government—i.e., of Gomez himself. Then he started a dance of oil concessions by selling subsoil resources rights to foreign companies as well as to his cronies and relatives, so that the latter could resell them at a profit. Royal Dutch-Shell won the lion's share of Venezuelan oil and also discovered the first commercial oilfield ever in the country (1914); on the contrary, American companies temporarily backed away from their original interest in the region, and in many cases sold their concessions to Shell itself.

Throughout this first phase of oil development, Venezuela had no oil legislation, and concessions were granted through private negotiations between companies and Gomez's men. The first oil law was introduced in 1920, and was soon rescinded because it did not meet companies' expectations. Finally, in 1922 Gomez gave the green light to another law that had been written by foreign companies' lawyers.<sup>39</sup> The new rules were inspired by the Persian D'Arcy model, but they dramatically improved economic conditions (in terms of royalties and taxes) for

private bidders, such that in 1930 they were defined as the “best in the world for companies” in a confidential memo to these companies written by one of Gomez’s ministers.<sup>40</sup>

The new legislation lured a second wave of prospectors, bringing the total number of companies involved in Venezuelan oil production to more than thirty by the end of the 1920s, now including Exxon, Gulf, Mobil, Texaco, and Amoco (Standard of Indiana), in addition to other American firms. The effect was dramatic. Venezuela’s oil production rose from a modest 19,000 barrels per day in 1919, to 523,000 bpd in 1929 and 779,000 in 1939, making the country the third largest producer in the world after the United States and the Soviet Union, as well as the main oil exporter worldwide.<sup>41</sup> Production growth coincided with its rapid concentration in the hands of just three companies: Exxon, Shell, and Gulf, holding respectively 52, 40, and 8 percent of Venezuelan oil production on the eve of World War II.<sup>42</sup>

This bonanza had its dark side as well. The rapid development of the Venezuelan oil sector discouraged participation in traditional activities such as agriculture and small businesses, and provoked an inflationary spiral that impoverished all who were not benefiting from the oil boom. In the late 1960s, this phenomenon would be given its very own name—*Dutch Disease*—after the discovery of natural gas in the Netherlands brought a sudden infusion of wealth that was concentrated in relatively few hands, driving up all domestic prices and eroding the purchasing power of all those outside the natural gas-based economy. Well before it entered the lexicon, *Dutch Disease* became the common destiny not only of Venezuela and most of the Middle Eastern countries blessed with oil, but also of the majority of countries that polarized their economies by depending on revenue derived from a single resource.<sup>43</sup>

With Persia, Mesopotamia, Mexico, Venezuela, and the East Indies under tight control, all the world’s main oil-producing areas outside the United States and Soviet Union were now in the hands of a restricted club of Western companies. There was only one major protagonist of the twentieth-century oil drama that was still missing, the Arabian Peninsula. But it too was about to come onstage.

## CHAPTER 3

### The Carve-up of Arabia’s Oil

At the dawn of the first global struggles for oil, the Arabian Peninsula did not attract much interest and did not trigger any acts of resource imperialism. Odd as it may seem today, there was a simple reason for the lack of interest in the area: no serious person at that time believed the region contained a single drop of petroleum.

It was BP’s men who most influenced this conventional wisdom. In 1923, for instance, the General Manager of BP, Sir Arnold Wilson, expressed his judgment about Saudi Arabia in these terms:

I personally cannot believe that oil will be found in his reign [that of King ibn-Saud, then coinciding with the most oil-rich region in Saudi Arabia]. As far as I know, there are no superficial oil-shows, and the geological formation does not appear to be particularly favourable from what little we know of it; but in any case no company can afford to put down wells into a formation in these parts (however favourable) unless there is some superficial indication of oil.<sup>1</sup>

Given the company’s experience in the Persian Gulf area its negative verdict served as a last word on the subject and admitted no reply, the more so since Great Britain had the final word on everything that could take place there.

Starting with Bahrain in 1880 and Kuwait in 1899, the majority of the Arabian Gulf’s small sheikdoms had relinquished part of their sovereignty to Great Britain, agreeing, among other things, not to grant foreigners any concession on their soil without British consent. In return,

they obtained British military protection and financial support, which were to last until the beginnings of the 1970s.<sup>2</sup> That almost voluntary abdication of power had its own peculiar justification.

Most of the Arabian Peninsula at that time had no fixed boundaries separating its sheikhdoms and tribes. To make matters worse, its deserts were largely inhabited by nomadic peoples unfamiliar with any form of loyalty beyond their own ethnic group or family. For them, moving from one place to another was a rule of life, dictated by millenary habits and daily hardships. No sheikdom could adequately protect its borders from these migratory flows or from the emergence of strong tribal chiefs intent on expanding their power and territory. With the decline of the Ottoman Empire that had ruled over them, the monarchs of these vast regions thus chose Great Britain as an alternative shelter to the vanishing central power of Constantinople in the second half of the nineteenth century.

Having acquired this semi-colonial power, London extended to its Arab protectorates the so-called British Nationality Clause, that required any company operating in any British colony to be registered in Great Britain and managed by British subjects. Moreover, while engaged in its nation-building effort in Iraq, London also drew the lines that mark the current frontiers of the whole region. The man who took on responsibility for that task was Percy Cox, an official who played a special role in shaping today's Middle Eastern boundaries.

After having been the British High Commissioner in Muscat and in Persia, Cox was appointed as Great Britain's top official in Mesopotamia, where he put in place the foundations of the new Iraqi state while masterminding the political architecture of the whole region. In 1922 it fell to him to trace the lasting borders of the Arab states in the Persian Gulf during a meeting of local dignitaries called to discuss the subject. Frustrated and bothered by their failure to reach agreement, Cox picked up a red pencil and drew some lines on a map, which was eventually shown to, and approved by, those in attendance.<sup>3</sup>

Under the forceful guidance of Percy Cox, the entire region remained virtually a private business preserve of Great Britain, despite the clash with the United States on the future of Mesopotamia. Its resolution did not weaken the British grip on the area, thanks to the special role given BP in running the new Iraq Petroleum Company, and the clauses of the "Red Line Agreement" prohibiting companies engaged in Iraq from developing independent initiatives almost anywhere else in the Middle East.

With Great Britain looming large over any significant event in the region, BP dismissing its potential, and a hostile environment making access prohibitive to most Westerners, the Arabian Peninsula seemed doomed to remain on the sidelines of the global quest for oil. But change came in the form of an eccentric possessed by the demon of seemingly foolish undertakings, Frank Holmes, who opened the door to its oil development. A mature mining engineer from New Zealand, Holmes had bought\* some oil concessions in Bahrain and Kuwait and in what was to become Saudi Arabia. He had to exercise those rights within a few years, or they would expire. In 1926, strained by financial problems, he sought to sell his rights to Iraq Petroleum Co. through BP, but they rebuffed his offer, reiterating their belief that the Arabian Peninsula did not hold any valuable oil prospects, once again repeating the worst assessment in the history of oil.<sup>4</sup> Having failed to perform any drilling, Holmes lost his rights in Arabia, but succeeded in selling his Bahrain and Kuwait concessions to Gulf, which later resold the Bahraini concession to Chevron. Holmes's Arabian adventure had ended, but the chain reaction he had set off would not be stopped.

Holmes's sales soon provoked another clash between the United States and Great Britain. London invoked the "British Nationality Clause" to deny Gulf and Chevron entry in Kuwait and Bahrain, triggering a strong American diplomatic reaction. Things were less difficult for Chevron, although by no means smooth. The California company found a way around the problem by transferring the Bahrain concession to its own Canadian subsidiary—which was not a British registered company but at least belonged to one of the countries formally ruled by the British monarchy. Bahrain and Chevron signed a formal contract in 1931, and a year later Holmes's intuitions proved farsighted. The Americans found oil in commercial quantities in the small sheikhdom, an unexpected result that put the whole Arabian Peninsula into a new perspective.

Taken by surprise, Great Britain reacted by preventing Gulf from entering Kuwait on its own, and forced it into a joint venture with BP. Established in 1933 as the Kuwait Petroleum Company, the joint venture signed a formal oil concession agreement with the Kuwaiti authorities a year later. In the same period, BP also obtained oil concessions in Qatar and Oman, on behalf of the Iraq Petroleum Company.

\* Holmes operated as a shareholder and representative of the Eastern and General Syndicate, a British company of which he had contributed to the establishment.

The only area escaping diplomatic quarrels over oil rights was today's Saudi Arabia. Credit for attracting foreign companies to the Kingdom goes to a former British official, who had left his service and his country, converted to Islam, and become a loyal adviser to the Saudi king. His name was John Philby, and beyond his role in Saudi Arabia's oil development, he later gained notoriety as the father of Kim Philby, the senior British Intelligence agent who, in the late 1950s, was unmasked as one of the most important Soviet spies in Great Britain—the same one who inspired John Le Carré's novel *Tinker Tailor Soldier Spy*.

John Philby had long been critical of Colonel Lawrence's passionate support for the Hashemite's dynasty of Hussein and Faisal, and repeatedly tried to convince the top brass in the Foreign Office that Great Britain had to bet on the house of Saud as ruler of the Arabian peninsula. Having lost his battle against Lawrence of Arabia, he had devoted the rest of his life to serve King Abdul Aziz ibn-Saud—the head of the Saud family—which by then ruled over a part of the Arabian Peninsula. Trying to somehow make money from the radical turn he had taken in his life, Philby soon discovered that all the early business ventures he had plunged into were frustrated, bringing him to quite a difficult financial situation. In his own memoirs, he recalled that he desperately needed money even to sustain his family and pay Cambridge University's fees for his son Kim and tuition for his three daughters' first-class schools.<sup>5</sup> These kinds of worldly worries played a key role in Philby's involvement with oil. Searching for new opportunities to enrich the king and himself, Philby pressed ibn-Saud to open the country to foreign exploration, but the king initially resisted his arguments.

Ibn-Saud had just completed the subjugation of the tribes and emirs of the Arabian Peninsula by the mid-1920s, after a seemingly endless war lasting more than a quarter of a century. In 1925, he had finally defeated his most dangerous rival, the emir Hussein, who had been abandoned by the British government that had once promised him the crown of the whole Arab world as a reward for his active involvement against the Ottoman Empire during World War I.

As the absolute master of the area, ibn-Saud imposed on his people a political-religious system based on a peculiar doctrine of Sunni Islam that his family had embraced in the eighteenth century, *Wahhabism*, which defined every aspect of human life in a restrictive and puritanical interpretation of the Koran, resulting in a strong aversion to foreign habits and lifestyles. The king's religious choice, however, did not depend on his family's traditions alone. It was also suggested by the urgent

need to infuse a common cultural element to a scattered and fragmented nomadic population, almost primitive in its habits, shaped by the hardships of daily coexistence with an arid and ungenerous land.<sup>6</sup> As a result, ibn-Saud was reluctant to invite foreign corporations to his newly established domain for fear of destabilizing the delicate cultural equilibrium he himself had established. Moreover, his strongest supporters in the long war to conquer the Arabian Peninsula, the Ikhwan tribes, were the custodians of a radical Islam whose ardent fury sought to eradicate any hint of foreign cultural influence.

Dressed in white robes, with "pointed beards and black antimony past around their eyes,"<sup>7</sup> the Ikhwan had become the subject of several horrible stories that well illustrated their blind destructive determination. According to one source, for example, when they

first entered Taif and Mecca they smashed all the mirrors they found in the houses, not from lust for destruction but simply because they had never seen such things before. Any visitor to Khurma will see the results of such behaviour—perhaps a fragment of mirror on a wall, somebody's share of the loot—or a window acting as a door because Bedouin do not see the point of windows—or half a door instead of a whole one. Or there may be a quarter or a third of a carpet on the floor, because one big one has been cut up into fair shares.<sup>8</sup>

Some of the Ikhwan's actions "were spectacularly bloody and dramatic,"<sup>9</sup> resembling those of contemporary terrorists because they did not hesitate to butcher men, women, and children during their raids against everything they deemed to be contrary to their values. Increasingly, their fanatical contempt for all things foreign to their culture became a source of discontent toward King ibn-Saud himself, who was held responsible both for promoting innovations like the telegraph, cars, and telephone, and for being too anxious to establish good relations with "impious" countries such as Great Britain.<sup>10</sup> Thus, the constant menace of Ikhwan tribes was an additional reason behind ibn-Saud's very cautious attitude toward any opening to foreign companies.

Yet the king himself had his own worldly needs to take care of, because by any standard he was a very poor monarch. His only sources of income were an annual salary granted by Great Britain<sup>11</sup> and revenues from the pilgrimages of the world's Muslims to the holy city of Mecca, which had come under his control in 1925. On the other side of the

ledger, his debts were high and growing, swollen by the need to maintain a court and social consensus among the Arab tribes. In 1928, ibn-Saud also had to finally confront and destroy the Ikhwans, whose radicalism risked undermining the consolidation of his kingdom and the king's very position. This last appendix of his life as a warrior further eroded his finances, and eventually the world economic crisis of 1929 took him to the verge of bankruptcy, as revenues from pilgrimages to Mecca dwindled.

According to Philby's own account,<sup>12</sup> it was ibn-Saud himself who reversed his original stance and asked the former British official to search for oil companies eager to invest in his country, which in 1932 he had named Saudi Arabia. For Philby, that was not an easy task. BP had already dismissed the first Saudi openings by arguing that the country presented no real opportunity to discover oil, and the company's dismissive judgment weighed like a boulder on the future prospects of the kingdom. Eventually, BP took part in negotiations for entering the country, but it was more interested in preventing others from accessing it than in the oil they did not believe was there. In reality, Philby was promoting competition for a goal that no one really wanted to pursue, but eventually a new player materialized: one of the old components of the dismembered Rockefeller empire, Chevron, which had already entered Bahrain.

In July 1933, ibn-Saud signed the royal decree granting the California company a sixty-year oil concession covering the whole eastern portion of the Saudi territory (the *al-Hasa* province), which in succeeding decades would become the richest oil area in the world. Even today, it holds more than 20 percent of the world's proven oil reserves. While the concession model was the same as those used in Persia and Iraq, Chevron was asked to pay in advance 50,000 pounds against future royalties and another 5,000 pounds as rent for the exploratory area.

It took Chevron a few years to realize that ibn-Saud's desperate need for money and the huge investments required for starting operations in such an inhospitable place as the Arabian Desert were too heavy a burden to bear alone. Chevron also lacked adequate market facilities to export Arabian oil, which was already flowing from Bahrain. That is why in 1934 the company relinquished 50 percent of its Saudi venture to a new partner, Texaco, which also acquired half of Chevron's Bahrain operation a year later. In its turn, Chevron acquired 50 percent of Texaco's downstream network east of Suez, which was reorganized in a new jointly owned company, Caltex.

What had begun against the background of concern over a looming oil famine had turned into Western control over all major oil-endowed countries in the Middle East, Saudi Arabia, Iraq, Kuwait, and today's Emirates, with BP already controlling Persia. By then, concern over future oil availability had also captured the attention of many other industrial countries, which moved to shore up their own energy security. European countries in particular started to impose high duties on imported oil products in the 1920s in an effort to stimulate the development of domestic refining industries. At the same time, Churchill's advocacy of oil production controls set a model for other governments.

France was the first European country to decisively imitate the British example. Enticed by the prospect of accessing oil in Mesopotamia, the French government of Raymond Poincaré conceived and promoted the establishment of a national oil company funded by private capital, but whose stock would be granted by the state. For Poincaré, it took a major effort to convince private investors that the uncertain Mesopotamian oil was worth the risk of investing large amounts of money, but he succeeded at last. Thus, in 1924, the *Compagnie Française de Pétroles* (CFP—the progenitor of today's Total) was established under the protective sway of the French government, which endowed the company with the share it had obtained into the Turkish Petroleum Co. Eager to avoid any foreign interference with its new national champion, the government also acquired a direct 25 percent stake in the CFP in 1928.<sup>13</sup>

Italy also coped with the problem of oil security. In 1927, under Mussolini's fascist regime, the Italian government established the *Azienda Generale Italiana Petroli* (AGIP—now incorporated into Eni) as a 100 percent state-owned company. Its mission was to develop “a national petroleum policy to secure sources of production both at home and abroad and to encourage domestic refining.”<sup>14</sup> To varying degrees, these examples of postwar nationalism were followed in other European countries such as Poland, Romania, the Netherlands, Norway, Sweden, and Denmark.<sup>15</sup> In 1919, the new Soviet government nationalized the entire Russian oil industry and eventually reorganized it into a state concern with a very aggressive operating arm, Russian Oil Products (ROP, 1925).

Germany presented a different situation. Strained by World War I and burdened by heavy war debts and reparations, the country came late to developing an energy strategy. Only after the rise to power of Adolf Hitler in 1933 did it begin to obsessively focus on the search for oil security. In fact, because Germany had no access to petroleum reserves.



it opted for independence from it. Since the 1920s, German scientists had perfected two chemical processes (*Bergius* and *Fischer-Tropsch*)<sup>16</sup> that produced synthetic fuels through the reaction of hydrogen with coal (“coal hydrogenation”). Although such products were far more expensive than those derived from oil, Germany embarked on a massive plan to build thirty synthetic fuel plants starting in 1936. This was done at the specific direction of Hitler, under the industrial leadership of the sadly famous chemical group IG Farben.<sup>17</sup> Eventually, this Nazi drive for energy independence would spawn legends and fantastic spy stories such as the movie “The Formula,” in which Marlon Brando told the movie’s protagonist how Germans had succeeded in finding a low-cost synthetic fuel whose formula had been hidden in a global conspiracy led by U.S. oil multinationals. Naturally, nothing of the sort ever took place. The simple truth was that coal hydrogenation was too costly and inefficient, yielding only modest results that were totally inadequate to solve the Nazis’ energy problems.<sup>18</sup>

But, despite all the anxieties surrounding the future availability of crude, and their impact on the shaping of national strategies after World War I, oil once again eluded all dire predictions. Far from running out, as had been so widely predicted, by the end of the 1920s oil once again flooded the world, just as in the glorious and foolish times of Colonel Drake and John D. Rockefeller.

---

## CHAPTER 4

---

### The Oil Glut of the 1930s

Silently but relentlessly, several factors contributed to turn oil market conditions upside-down as the Roaring Twenties came to an end.

To start with, in the first three decades of the new century the oil industry underwent a sweeping technological revolution. At the turn of the century, what was considered the state of the art of the oil industry was poor and rudimentary. Exploration and production techniques were still largely dependent on the “good nose” of the wildcatters, with no contribution from geology or geophysics. Indeed, most wildcatters still believed that oil was contained in huge underground caves or lakes and would occasionally seep to the surface because of some inexplicable act of nature. All of them, moreover, continued to waste oilfield after oilfield by foolish drilling that rapidly exhausted the natural gas pressure, which was responsible for pushing the oil to the surface. The state of refining technology was equally poor, stuck in a primitive mode of oil distillation that consisted of simply heating the crude to higher and higher temperatures to obtain different-quality products at each stage. With this method, less than 50 percent of a barrel of crude could be used to obtain valued-added products such as gasoline, naphtha, kerosene, and gas oil.

The marriage between science and the oil industry was made possible by the praiseworthy work of individual scientists as well as institutions, among them the United States Geological Survey (1908),<sup>1</sup> and the *Oil & Gas Journal*, first published in 1902 (initially with another title) and still today an indispensable tool for all oilmen.<sup>2</sup>

The first major contribution of geology to oil exploration was the Anticline Theory, which revealed how natural gas, oil, and water are

trapped together in subsurface porous rock because of their specific gravity; the "trap" containing them forms anticlines, which are upward bulges in rock strata, sorts of underground hills whose peaks can swell the earth's crust leaving peculiar domes that are visible on the surface.<sup>3</sup> Confirmed by a major oil discovery in Oklahoma in 1913, the theory convinced oil companies of the need to establish specific geological departments within their organizations. Over the following decades, many hydrocarbon discoveries were the result of surface mapping of anticlines. (To date, nearly 70 percent of all oil discoveries have occurred in anticline formations.)<sup>4</sup>

The next leap forward in oil geophysics came after World War I, when petroleum geologists first engaged in subsurface analysis, or stratigraphy. Before this, the determination of what lay beneath the ground was largely an act of faith, as surface study was only able to suggest the probability of finding oil in a given place. In contrast, stratigraphy went deep into the secrets of the earth, through the drilling of exploration wells and the careful study of the resulting well logs, core samples, and other data. The new approach was applied after 1916, but only in the early 1920s was it accepted and adopted by major oil companies.

During the Great War, another fundamental discovery took place. As early as 1917, a study published by the U.S. Bureau of Mines had raised the possibility of getting more oil out after the primary recovery phase (which simply exploited the internal pressure created by the natural gas and water contained in the oilfield) by injecting natural gas into the reservoir.<sup>5</sup> This study marked the first intuition regarding so-called secondary recovery of oil. However, because of considerable controversy over production methods, it took more than a decade before secondary recovery methods were accepted and applied.

A fundamental impetus to their entrance into industry practice came in the 1920s, when the issue of conservation of U.S. reserves gained momentum in response to widespread expectations that they would be exhausted. At that time, wild drilling, which had been the rule since the inception of the industry, came under public scrutiny and was thought to be an alarming waste of underground resources. Secondary recovery began to be widely discussed, along with a closely connected principle of correct field development: unitization. The latter involved a core problem of the traditional legal framework that had characterized the infancy of the oil industry worldwide. Both in the United States and in Russia, the so-called rule of capture held that every oilfield was fair game to any

wildcatter, all of whom were free to extract whatever they could through their wells. This arrangement took no consideration at all of the unity of an oilfield. In particular, aggressive drilling on disparate parts of a single field rapidly exhausted the internal pressure that forced the oil to the surface, rendering the field unproductive. The correct remedy to this wasteful practice was to develop an oilfield through a unitary approach, i.e., by binding different drillers with a single plan of action and forbidding fragmentation of field exploitation.<sup>6</sup> Like secondary recovery, "unitization" took a long time before it was generally accepted by oilmen and eventually became the norm of the industry worldwide.

The last revolutionary change in exploration and production techniques in those years was "seismic prospecting." The idea was relatively simple: the setting off of small explosive charges on the surface would create energy waves that would bounce off "rock interfaces underground, which allowed the shapes and depths of all kinds of underground structures to be plotted"<sup>7</sup> with geophones or seismographs. The pioneer of this technique was an outstanding figure in the twentieth-century oil industry, Everett DeGolyer (the man who had been the pivotal figure behind Pearson's success in Mexico). He refined a system used by German scientists and later developed a method based on "refraction seismic," the first success of which was the discovery of the giant field of Seminole (Oklahoma) in the 1920s.<sup>8</sup> Since then, seismic has remained a basic component of hydrocarbon exploration, eventually evolving into the contemporary three- and four-dimensional seismic prospecting used today.

While oil exploration and production techniques were experiencing radical innovations, oil refining was also shaken by a major revolution: thermal cracking. Introduced by William Burton in 1913, the new process made it possible to crack heavier oil molecules into lighter ones, which could be then further treated to extract additional volumes of gasoline and other light products. This afforded the industry greater flexibility in "manipulating" crude, instead of simply separating its main components as simple distillation did. Thermal cracking was mainly responsible for the terrific shift in the proportion of gasoline derived from the average barrel of oil in the United States, which passed from around 15 percent in 1900 to 39 percent in 1929.<sup>9</sup> According to some estimates, "it would have taken nearly 268 million additional barrels of crude oil to produce by straight-run distillation the approximate 52 million barrels of cracked gasoline produced entirely by the Burton process between 1913 and 1919."<sup>10</sup>



Together these technological breakthroughs contributed to an overall increase in both the supply of crude oil and the quality of petroleum products.

In addition to the contribution of breakthrough technologies, new waves of oil came onto the market. Soviet oil production rapidly recovered from its wartime and post-revolutionary blackout, rising from a low of 75,000 barrels per day in 1918 to 275,000 bpd in 1929.<sup>11</sup> The Bolshevik government had also forcefully pushed the newly created state oil company to aggressively reenter the international markets with a policy of price discounts aimed at displacing major companies such as Exxon, Shell, and Mobil. At the same time, new large discoveries in the United States revealed how poor a science was the would-be art of predicting natural resource endowments, while the first Middle Eastern production was coming on stream and that of Venezuela was soaring. In all, global world oil production jumped from 1.5 million barrels daily in 1919 to around 4 million in 1929, registering an annual compound growth rate that far exceeded that of consumption.

This dramatic growth in world oil output took place in a landscape of hypercompetition that was not limited simply to a quest for foreign supplies. In fact, both the upsurge in consumption and the emergence of gasoline as the leading product of the industry had prompted a major reshaping of oil companies in keeping with four strategic goals: access to oil resources, vertical integration, size growth, and retail development. At the beginning of this process, many corporations were either purely upstream operators (such as Exxon and, to a lesser extent, Amoco and Mobil); others had a mixed profile, such as Shell and BP. As a consequence, companies short on oil reserves began to strive to acquire companies and assets that would enable them to supply their refining and transport networks, while those with ample upstream positions moved to develop their own downstream operations. Furthermore, in the new age of gasoline all of them suddenly realized they had to win over the end consumer in order to secure outlets for their production systems, and this required a completely new orientation toward marketing.

Before the war, gasoline was sold by grocery, hardware, and general stores. The company credited with conceiving of the first dedicated albeit modest drive-in gas station, in 1907, was a small enterprise operating in St. Louis. But with the advent of the Roaring Twenties and the explosion of individual transportation, each company needed to characterize its own product and make it available to potential clients

through a vast network of specific and branded selling points. A fierce competition thus ensued to secure the main transportation routes by setting up brand-name, drive-in gasoline stations, each one courting the client with appealing advertisements and small but useful gifts (like maps, for example). By the mid-1920s all oil companies had become highly visible thanks to their widespread networks of stations holding their product brand as a flag. Sometimes, the brand name did not correspond to the name of the mother company but was a simple invention intended to grab consumers' attention; yet over the years, the powerful as well as familiar image it transmitted to millions of clients worldwide convinced oil bosses to adopt it as the company name.

Along with drive-in stations, the transportation revolution in the United States introduced other popular features that would change the landscape of the contemporary age. One of these was the establishment of the first drive-in restaurants, whose progenitor is generally considered Dallas's Royce Hailey's Pig Stand (1921);<sup>12</sup> along with it, the 1920s also saw the birth of the first hotels explicitly created for and devoted to car drivers, the Motor-Hotels—or simply *Motels*—the first example of which was probably established in 1926 in San Luis Obispo, California.<sup>13</sup>

This transformation of the industry into its modern shape involved a vast process of mergers and acquisitions, favored by its growing capital intensity. Searching for new oil sources around the world, developing adequate refining systems, and controlling end markets through transport infrastructure and gas stations all required huge up-front capital expenditures whose returns were usually considerably delayed—as D'Arcy and Pearson had experienced first hand. In the meantime, high fixed costs already incurred obliged small-to-medium operators to sell their products at almost any price to keep the cash flow coming. Yet a prolonged crisis was always a fatal blow for those among them with scant financial resources, which made them easy prey for stronger companies.

Mergers and acquisitions proved a quicker and more profitable way to achieve integration, scale, and market presence than building them step-by-step. The companies that won the survival game emerged as the majors of the twentieth-century oil business, among them Exxon, Shell, and BP at the top, followed by Chevron, Texaco, Gulf, Phillips Petroleum, and few others. Yet even this concentration process did not boost large companies' ability to face a new oil glut. And at the end of the 1920s they finally realized that their self-destructive competitive struggle was once again generating the risk that had been Rockefeller's obsession.

Just before the rising oil tide became a flood, the largest oil companies acted to prevent the situation from spinning out of control by forming the first global oil cartel ever, known as the "As Is" agreement. Negotiated in the Scottish castle of Achnacarry in 1928 by the predecessors of current-day Exxon, BP, and Royal Dutch-Shell, the pact committed each company to freeze the existing status quo among major international companies by fixing their sales on global markets and tying their pro-quota increases closely to consumption growth.<sup>14</sup>

At the same time, a complex system secretly devised by the Achnacarry participants would perversely influence international oil pricing for many years to come. Called the "Gulf-Plus system," it fixed the price of the cheaper oil produced outside the United States at that of oil in the Gulf of Mexico (the main U.S. export point), plus the standard freight charge for shipping oil from the Gulf to its market. All this amounted essentially to the imposition of a phantom freight charge designed to protect the more expensive American oil and keep world prices high.<sup>15</sup> Many other companies endorsed this system, which was applied even by American oil companies selling oil to Allied Naval forces during World War II. What Rockefeller had done by himself was now being implemented by a group of prominent oilmen. However, the extent of the ensuing oil crisis made it impossible for the three giants and their associates to control anything.

The earthquake hit suddenly in the form of the Wall Street crash in 1929, which abruptly deflated United States and world demand for oil; then in 1930 an independent oilman, Dad Joiner, discovered the largest American oilfield ever in the sandy hills of eastern Texas. No name could be more appropriate for the new miracle of nature than "Black Giant," which made Texas the top producing area in the world, to the tune of 900,000 barrels per day in 1931, while total American output stood at 2.4 million bpd and global production had dropped to 3.8 million.<sup>16</sup> For Texas, "Black Giant" heralded the second oil boom portrayed in the James Dean movie "Giant" and a phase of leadership in global production that would last for about thirty years. But for oil companies, it was merely a nightmare.

A huge oil glut submerged the market, and crude prices in the United States plummeted to a few cents per barrel in the summer of 1931, down from around three dollars in 1920, and two dollars in 1925.<sup>17</sup>

The more time passed, the more it seemed the crisis would neither ease nor end. Anarchy ruled in the Texas oilfields, and even the deployment of

the National Guard failed to quell the production fury of the oilmen. The other American oil-producing states were prey to chaos as well, starting with Oklahoma, the largest producer after Texas. In 1931-1932, Texas even charged a state entity, the Texas Railroad Commission, with the task of regulating output with a system of mandatory quotas for each producer, but the effort failed. Because of a constant overestimation of the supply effectively needed to cover demand, the Commission's rationing system failed. Moreover, independent producers eluded their quotas by resorting to massive smuggling of crude—soon dubbed "hot oil." After decades of fiercely defending their oil production from any federal interference, the American states had to confront reality. Simply put, the crisis was too big for them to manage, and they had to cede control to Washington.

By then, federal intervention in the economy was the credo of the new Democratic administration of Franklin Delano Roosevelt, elected president in 1932. Oddly enough, oilmen found an unexpected ally in one of the key figures of Roosevelt's "New Deal," Secretary of the Interior Harold Ickes. Long an enemy of oil concerns and always distrustful of what he considered their penchant for intrigues, Ickes was nevertheless convinced that—as he once said—American civilization could not have existed without oil.<sup>18</sup> Paradoxically, it was not the purported scarcity of "black gold" but its ruinous overabundance that was the threat to this civilization, and that risked destroying its irrational producers as well.

Ickes's reaction was to impose a federal system of quotas for each state, which his office would enforce. A part of the framework of Roosevelt's National Industrial Recovery Act (NIRA), the quota system fell apart when the U.S. Supreme Court rejected NIRA in toto in 1935. However, Ickes's campaign for restraining oil production was successful on other fronts. That same year, the U.S. Congress passed a law banning "hot oil" commerce. At the same time, the U.S. Bureau of Mines, part of the Department of the Interior, began to suggest voluntary quotas to each producing state, on the basis of its own forecasts of future demand. Finally, states agreed among themselves to cooperate on exchanging information and tuning their respective plans accordingly. Together with a duty imposed in 1932 on imported oil and refined oil products—intended to keep cheap foreign oil from flooding the American market—the complex regulatory architecture worked. Prices slightly recovered by about 1935, hovering at around one dollar until the end of World War II.<sup>19</sup>

During this period, the Texas Railroad Commission would become the backbone of U.S. oil control, though without any formal power or written mandate. By leveraging Texas's overwhelming leadership in oil production, the Commission succeeded in imposing its influence on all other states. The organization that was born out of chaos and informal agreements turned out to be a very successful and enduring pillar of the oil world. Until 1971, it would perform its duty as the *de facto* arbiter of American crude by deciding when to switch on and off its taps.<sup>20</sup>

Ironically, the regulatory system envisaged by U.S. authorities in the early 1930s would serve as a stimulus and a model for the future founders of OPEC, a cartel that Western countries deplore today.<sup>21</sup> Also ironic, and lamentably so, is the fact that the collapse of the oil market and the wounds it inflicted on its operators made the notion of scarcity seem unreal, in spite of the long-lasting political consequences it prompted, especially in the Middle East. For the moment, however, the most direct consequence of the new market situation occurred in Mexico. And it was a milestone in the evolution of the oil industry.

After the fall of Porfirio Diaz, the continual quarrel between the new revolutionary government and foreign companies had moved through a spiral of reciprocal recriminations and unresolved claims. The situation worsened as companies shifted their investments towards the much more promising and lower-cost Venezuela, which under the Gomez dictatorial regime offered them red-carpet treatment. Consequently, while the Venezuelan oil sector boomed, Mexican output dived, thereby intensifying the anti-foreign feelings of all Mexicans. The sudden crash of the global oil market deepened the crisis, rendering foreign oil companies even more hard-line in their dealings with the Mexican government and unwilling to make any concessions. The final curtain to that protracted conflict fell as a probe and radical son of the revolution, Lorenzo Cardenas, was elected president of the Republic in 1934.

Having campaigned for an across-the-board revision of all oil agreements, Cardenas forcefully embarked on a national crusade aimed at thoroughly reforming the whole sector and freeing it from corruption and foreign dominance. Companies' local managers realized that it was not possible to delay serious negotiations any further, but their distant and dull-witted headquarters rejected any compromise. This was the case, for example, of Anglo-Dutch Shell, the master of Mexican oil with nearly 65 percent of production. The company's local manager even resigned following his fruitless effort to convince Shell's chairman, the by-then old Henri Deterding, to reach a common understanding with Cardenas.

Sadly, he commented about Deterding's blunt rejection of his advice by underlining that he "was incapable of conceiving of Mexico as anything but a Colonial Government to which you simply dictated orders."<sup>22</sup> But the more time passed without any opening by foreign companies, the more insistent Mexican requests grew, to the point that they became partially unacceptable.

It was in this context that in 1938, in a dramatic and unexpected speech broadcast via radio, President Cardenas announced he had just signed a decree nationalizing the Mexican oil industry. Soon joy broke out throughout the streets of Mexico, as people saw in that decision the real dawn of freedom and national independence; on the other side, efforts by European and American oil companies to enlist their governments' support to block Cardenas' policy failed. In particular, the United States was far more worried that Hitler's Germany might approach Venezuelan leaders to obtain a advantageous oil supply agreement than it was moved by the outcry of its wealthy oilmen. President Roosevelt's decision to leave American companies to their fates was also underpinned by an ethical impulse, which he clearly outlined by saying

the United States would show no sympathy to rich individuals who obtained large land holdings in Mexico for virtually nothing.<sup>23</sup>

The Mexican game was over. On the ashes of evaporating foreign companies, Cardenas established a state oil company, *Petróleos Mexicanos* or *Pemex*, ushering in a completely new business model for oil-rich nations.

This experiment could not but encounter a wide range of difficulties. The new state entity lacked skilled technicians and competent managers, as well as the capital to self-finance the recovery of mismanaged or declining oilfields. Paradoxically, it was even compelled to reduce workers' salaries with respect to those of foreign companies and to delay implementation of any social programs initially envisaged because of the hardships it encountered early on.

Despite all of this, Cardenas's oil nationalization would represent until our day a powerful symbol of the collective psyche of the Mexican people, considered to be the completion of Mexico's revolution and the country's rise to real autonomy. As an expert pointed out:

The petroleum industry ranks with the presidency, Benito Juarez, and the Virgin of Guadalupe as one of the unifying symbols in a

nation riven by differences in language, geography, income, education, social class, and political loyalties.<sup>24</sup>

Yet Cardena's act was also a worrisome warning for the global oil architecture that the great oil companies had shaped over the first four decades of the new century.

---

## CHAPTER 5

---

### Cold War Fears and the U.S.-Arabian Link

By the eve of World War II, oil had assumed a very important role in modern economies as well as in military strategy. Nonetheless, as an energy source it still lagged far behind coal, which supplied 80 percent of the world's primary energy needs. The United States was the center of gravity for crude production, providing 3.6 million barrels per day, or more than 60 percent of the world output of 5.7 mbd. The whole Middle East was still in its infancy producing about 330,000 barrels per day, less than the Soviet Union and Venezuela, then respectively the second and third largest oil producers in the world.<sup>1</sup> World War II and the Cold War upset this panorama and paved the way for oil's rise to the status of the most vital resource of contemporary history. And once again, fears of oil security and scarcity played a crucial part in shaping this role.

On the many fronts of the war, oil proved to be the winning card in ground attacks and occupation, air campaigns, and naval battles. As part of their strategy, the warring powers devoted themselves to seizing oil-rich areas or denying their enemies access to them. That was the case, among many others, with Hitler's strategy to penetrate the Caucasus to control Baku's oil region, the Japanese takeover of oilfields in Borneo and Sumatra, and the Allied bombing of Rumania's Plotesti refinery complex to halt its supplying of Nazi divisions. By the same token, even brilliant military strategists could do nothing when their troops or vessels ran out of oil—as Germany's General Edwin Rommel was rudely shown in the desert lands of North Africa.

All of this carved into the mindset of postwar strategists the notion that no new war could be won without an ample and secure supply of crude. It was in the United States, however, that this awareness dawned