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This month's Museletter is my Foreword to Matthieu Auzanneau's excellent new book Oil, Power, and War: A Dark History published by Chelsea Green Publishing. For information on where to get hold of a copy see the links at the end.

Foreword to Oil, Power and War

*Come and listen to my story 'bout a man named Jed
A poor mountaineer barely kep' his fam'ly fed
And then one day he was shootin' at some food
And up through the ground come a-bubblin' crude.
Oil, that is. Black gold. Texas tea.*

*Well the first thing you know old Jed's a millionaire.
The kinfolk said, "Jed, move away from there."
They said, "Californy is the place you ought to be,"
So they loaded up the truck and they moved to Beverly.
Hills, that is. Swimming pools. Movie stars.*

(Paul Henning)

Perhaps the most instantly recallable verse on the subject of petroleum, the theme-song lyric to the hit 1960s television series "The Beverly Hillbillies" tells a tale of sudden wealth. It is a perfect touchstone for the real story of humanity's experience with liquid hydrocarbons.

In the real story, riches consisted both of the billions accumulated by the great magnates of the petroleum industry—including John D. Rockefeller, J. Paul Getty, H. L. Hunt, and Charles and David Koch—and also the quickly growing economic output of industrial civilization once it came to be fueled by oil. This novel source of energy spawned entire new industries—notably the automotive, aviation, and plastics industries—while revolutionizing existing ones (agriculture, forestry, fishing, shipping, manufacturing, lubricants, chemicals, paints, dyes, cosmetics, road paving, and pharmaceuticals). It propelled humanity into an age of mobility and rising expectations.

But sudden acquisition of wealth is just the initial theme in both narratives—that of "The Beverly Hillbillies" and that of the modern industrial world. The saga of Jed Clampett and his family is a comedy in which city slickers try to siphon off some of the Clampetts' fortune. While Jed, Granny, Ellie May, and Jethro always manage to get the

better of the various grifters and hangers-on they encounter, we suspect that their affluence may be transitory and that the final episode may see the Clampetts return to shooting squirrels in order to fill Granny's soup pot.

Similarly, the real story of oil is of fortunes lost, betrayal, war, espionage, and intrigue. In the end, inevitably, the story of oil is a story of depletion. Petroleum is a non-renewable resource, a precious substance that took tens of millions of years to form and that is gone in a comparative instant as we extract and burn it. For many decades, oil-hungry explorers, using ever-improving technology, have been searching for ever-deteriorating prospects as the low-hanging fruit of planet Earth's primordial oil bounty gradually dwindle. Oil wells have been shut in, oilfields exhausted, and oil companies bankrupted by the simple, inexorable reality of depletion.

It is impossible to understand the political and economic history of the past 150 years without taking account of a central character in the drama—oil, the magical wealth-generating substance, a product of ancient sunlight and tens of millions of years of slow geological processes, whose tragic fate is to be dug up and combusted once and for all, leaving renewed poverty in its wake. With *Oil, Power and War*, Matthieu Auzanneau has produced what I believe is the new definitive work on oil and its historic significance, supplanting even Daniel Yergin's renowned *The Prize*, for reasons I'll describe below.

The importance of oil's role in shaping the modern world cannot be overstated. Prior to the advent of fossil fuels, firewood was humanity's main fuel. But forests could be cut to the last tree (many were), and wood was bulky. Coal offered some economic advantages over wood. But it was oil—liquid and therefore easier to transport; more energy-dense; and simpler to store—that turbocharged the modern industrial age following the development of the first commercial wells around the year 1860.

John D. Rockefeller's cutthroat, monopolist business model shaped the early industry, which was devoted mostly to the production of kerosene for lamp oil (gasoline was then considered a waste product and often discarded into streams or rivers). But roughly forty years later, when Henry Ford developed the automobile assembly line, demand for black gold was suddenly as explosive as gasoline itself.

Speaking of explosions, the role of petroleum in the two World Wars and the armament industry in general deserves not just a footnote in history books, but serious and detailed treatment—such as it receives in this worthy volume. Herein we learn how Imperial Japan and Nazi Germany literally ran out of gas while the Allies rode to victory in planes, ships, and tanks burning refined U.S. crude. Berlin could be cut off from supplies in Baku or North Africa, and Tokyo's tanker route from Borneo could be blockaded—but no one could interrupt the American war machine's access to Texas tea.

In the pages to follow, we learn about the origin of the decades-long U.S. alliance with Saudi Arabia, the development of OPEC, the triumph of the petrodollar, and the reasons for both the Algerian independence movement and the Iranian revolution of 1979. Auzanneau traces the post-war growth of the global economy and

the development of consumerism, globalization, and car culture. He recounts how the population explosion and the Green Revolution in agriculture reshaped demographics and politics globally—and explains why both depended on petroleum. We learn why Nixon cut the U.S. dollar's tether to gold standard just a year after U.S. oil production started to decline, and how the American economy began to rely increasingly on debt. The story of oil takes ever more fascinating turns—with the fall of the Soviet Union after its oil production hit a snag; with soaring petroleum prices in 2008 coinciding with the onset of the Global Financial Crisis; and with wars in Iraq, Syria, and Yemen erupting as global conventional oil output flatlined.

As I alluded to above, comparisons will inevitably be drawn between *Oil, Power and War* and Daniel Yergin's Pulitzer-winning *The Prize*, published in 1990. It may be helpful therefore to point out four of the most significant ways this work differs from Yergin's celebrated *tour de force*.

1. The most obvious difference between the two books is simply one of timeframe. *The Prize's* narrative stops in the 1980s, while *Oil, Power and War* also covers the following critical decades, which encompass the dissolution of the Soviet Union, the first Gulf War, 9/11, the U.S. invasions of Afghanistan and Iraq, the global financial crisis of 2008, and major shifts within the petroleum industry as it relies ever less on conventional crude, and ever more on unconventional resources such as bitumen (Canada's oil sands), tight oil, and deepwater oil.
2. More importantly, unlike Daniel Yergin, Matthieu Auzanneau displays a keen understanding of the central role of energy in society and the economy, and therefore of oil's pivotal significance in the unprecedented economic growth that occurred during the 20th century. All manifestations of human power, whether economic, military, or political, are physically grounded in energy. Power, after all, is energy over time (one watt equals one joule per second). Therefore a recounting of political, economic, and military history—even one that concerns itself with the history of the oil industry—will fail to successfully trace the sources, routes, and consequences of power if it is not based on a sound understanding of how energy works. In order to appreciate oil's role in recent history, we must begin by understanding it as a concentrated, cheap, and portable store of energy. Yergin understands that oil is a valuable commodity, but *The Prize* never quite manages to explain why it is valuable, or why it is so closely linked with military, economic, and political power. Because Auzanneau begins his Introduction with an explanation of oil's energetic qualities, the reader is far better prepared to understand the historic human power plays centered on this remarkable substance.
3. Yergin unfailingly tells the story of oil from the perspective of the winners—the major oil companies, the oil barons, and the Anglo-American elites who have shaped global economic and political realities for the past century and more. Auzanneau brings an outsider's perspective, one that is far more critical of, for example, U.S. political interference in Iran in the early 1950s. While Yergin repeats the usual explanation for the 1970s oil crises (greedy Arabs and Iranians), Auzanneau digs deeper

and shows why falling U.S. oil production provided a motive for American policy makers to quietly convince their Arab client states to hike prices so as to enable U.S.-based oil companies to earn higher profits. Yergin acts essentially as a cheerleader for the oil industry; Auzanneau is a journalist who is aware of the enormous ecological and social consequences of our dependency on petroleum.

4. Finally, unlike Yergin and other historians of the oil industry, Auzanneau frames his tale of petroleum as a life cycle, with Germination followed by Spring, Summer, and Autumn. There is a beginning and a flourishing, but there is also an end. This framing is extremely helpful, given the fact that the world is no longer in the spring or summer of the oil era. We take petroleum for granted, but it's time to start imagining a world, and daily life, without it.

Taken together, these distinctions indeed make *Oil, Power and War* the definitive work on the history of oil—no small achievement, but a judgment well earned.

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Over the past decade, worrisome signs of global oil depletion have been obscured by the unabashed enthusiasm of energy analysts regarding growing production in the U.S. from low-permeability source rocks. Termed "light tight oil," this new resource has been unleashed through application of the technologies of hydrofracturing ("fracking") and horizontal drilling. Total U.S. liquid fuels production has now surpassed its previous peak in 1970, and well-regarded agencies such as the Energy Information Administration are forecasting continued tight oil abundance through mid-century.

Auzanneau titles his discussion of this phenomenon (in Chapter 30), "Nonconventional petroleum to the rescue?"—and frames it as a question for good reason: Skeptics of tight oil hyper-optimism point out that most production so far has been unprofitable. The industry has managed to stay in the game only due to low interest rates (most companies are heavily in debt) and investor hype. Since source rocks lack permeability, individual oil wells deplete very quickly—with production in each well declining on the order of 70 to 90 percent in the first three years. That means that relentless, expensive drilling is needed in order to release the oil that's there. Thus the tight oil industry can only be profitable if oil prices are very high—high enough, perhaps, to hobble the economy—and if drilling is concentrated in the small core areas within each of the productive regions. But these "sweet spots" are being exhausted rapidly. Further, with tight oil the energy returned on the energy invested in drilling and completion is far less than was the case with American petroleum in its heyday.

It takes energy to fell a tree, drill an oil well, or manufacture a solar panel. We depend on the energy payback from those activities to run society. In the miraculous years of the late 20th century, oil delivered an averaged 50:1 energy payback. It was this, more than anything else, that made rapid economic growth possible, especially for the nations that were home to the world's largest oil reserves and extraction companies. As the world relies ever less on conventional oil

and ever more on tight oil, bitumen, and deepwater oil, the overall energy payback of the oil industry is declining rapidly. And this erosion of energy return is being reflected in higher overall levels of debt in the oil industry and lower overall financial profitability.

Meanwhile the industry is spending ever less on exploration—for two reasons. First, there is less money available for that purpose, due to declining financial profitability; second, there seems comparatively little oil left to be found: recent years have seen new oil discoveries dwindle to the lowest level since the 1940s. The world is not about to run out of oil. But the industry that drove society in the 20th century to the heights of human economic and technological progress is failing in the 21st century.

Today some analysts speak of “peak oil demand.” The assumption behind the phrase is that electric cars will soon reduce our need for oil, even as abundance of supply is assured by fracking. But the world is still highly dependent on crude oil. We have installed increasing numbers of solar panels and wind turbines, but the transition to renewables is going far too slowly either to avert catastrophic climate change, or to fully replace petroleum before depletion forces an economic crisis. While we may soon see more electric cars on the road, trucking, shipping, and aviation will be much harder to electrify. We haven’t really learned yet how to make the industrial world work without oil. The simple reality is that the best days of the oil business, and the oil-fueled industrial way of life, are behind us. And we are not ready for what comes next.

How could a story so essential to our understanding of the present and recent past be so poorly understood by such huge swathes of the general public? *Oil, Power and War* helps enormously by offering us a sweeping yet also detailed view of how we got to this juncture. Where we go from here, as always, is up to us.

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