

The Prophet of Petroleum...

and the end of exponential growth, 'a blip in the span of time'

BY LEON KOLANKIEWICZ

The sheer audacity and impudence of M. King Hubbert's seminal 1956 speech to the American Petroleum Institute (API) still boggle the mind six decades later. In late 1955, Marion King Hubbert, Ph.D., then an innovative — if not iconoclastic — 52-year-old petroleum geologist with Shell Oil's geophysical laboratory in Houston, received an invitation from the Southwest Section of the API to deliver the keynote address at its March 1956 meeting in San Antonio, Texas. The API asked Hubbert to provide an overview of the world's energy outlook. They should have been careful what they asked for.

As Hubbert prepared for the speech, reading up on all the latest literature he could find about the world's oil and other energy resources, he determined to do exactly what had been requested of him — even if it meant delivering a message to these assembled oilmen and petroleum engineers that they would not have expected to hear, nor wanted to hear. Though his proposed speech packed rhetorical dynamite, he gave it the anodyne title "Nuclear Energy and the Fossil Fuels." He prepared a paper to accompany it, which, per procedure, he furnished in advance to the API and his employer Shell Oil.

In the days before the meeting, the API issued a press release about Hubbert's upcoming speech that included his dire prediction: "Production of oil and gas in the United States will reach its peak in about 1965 and will decline thereafter at a rate comparable to the preceding rate of increase."

To a nation grown accustomed to, complacent about, and dependent upon doubling its oil output every seven years — as it had for an entire century since Colo-

nel Drake's initial 1859 well in Oil City, Pennsylvania — this message that the era of exponential growth in oil production would soon end was shocking and heretical. And now Hubbert was about to proclaim it in the heart of the lion's den, as it were, in the petro-state of Texas and to the very industry that took such pride in supplying a raw material so critical to America's continuing development and prosperity.

THE ORACLE OF OIL A Maverick Geologist's Quest for a Sustainable Future

By Mason Inman

New York: W.W. Norton and Co., 2016
413 pages, \$29.95 hardcover



M. King Hubbert was about to go rogue.

At about 10 a.m. on March 8, 1956, Hubbert found himself sitting on the stage at San Antonio's Plaza Hotel ballroom, listening as the city's mayor gave his opening remarks to the audience. Hubbert was up next. All of a sudden he noticed someone gesturing for him to leave the stage. He got up from his seat and hurried out to the hallway to be told that there was an urgent telephone call for him from Shell's headquarters in New York City. On the other end of the phone line was the executive assistant from Shell's public relations office. He had seen the press release of the speech and had gone through the roof. Now, he pleaded with Hubbert to "tone down" the "sensational" aspects of his address, especially the part about U.S. oil production peaking in 10 or 15 years. That's just "utterly ridiculous," insisted the executive assistant.

"Hubbert pushed back, saying his paper was simply 'straight-forward analysis.' Finally he said, 'Listen, the Mayor is giving a talk, I'm on next. Can we close this off?'

"Please tone it down some," the man said.

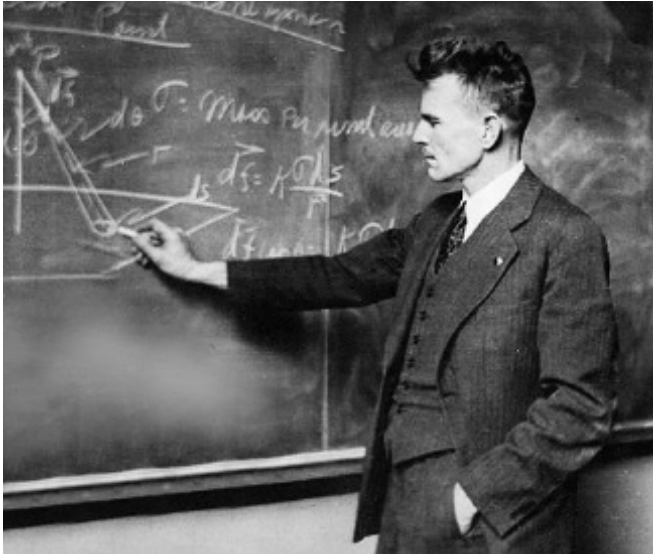
Leon Kolankiewicz is an environmental scientist and national natural resources planner. He has a B.S. in forestry and wildlife management from Virginia Tech and an M.S. in environmental planning and natural resources management from the University of British Columbia. He is the author of Where Salmon Come to Die: An Autumn on Alaska's Raincoast.

Then he asked, ‘By the way, how many copies of that paper have been distributed?’

“‘Five hundred,’ Hubbert told him.

“‘Oh.’”

It was too late. The cat was out of the bag.



Dr. M. King Hubbert, geophysicist and prophet, 1903-1989

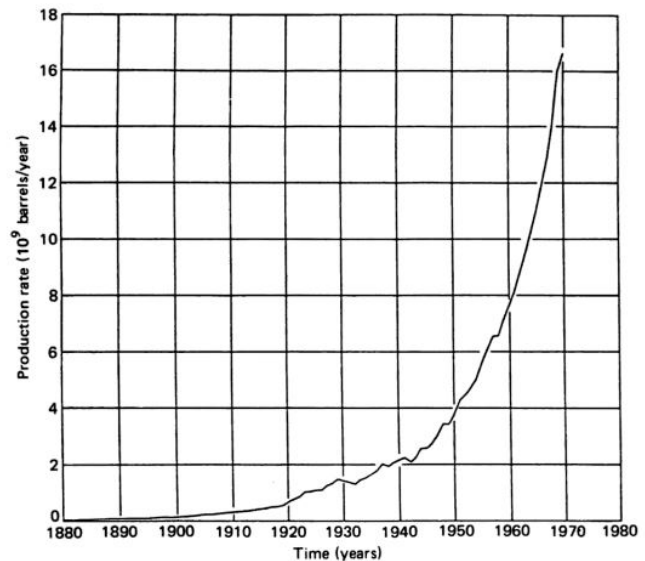
This story and many others are recounted with verve and great relish in an engaging, highly readable biography of the remarkable Dr. M. King Hubbert by Mason Inman — *The Oracle of Oil: A Maverick Geologist’s Quest for a Sustainable Future* (W.W. Norton and Company, 2016, 413 pages). Inman is an Oakland-California based science writer who focuses on energy, climate, safety, and food issues. He has previously been published in *Science*, *Nature*, *The Economist*, *National Geographic News*, and *New Scientist*, among other periodicals.



Mason Inman, author of *The Oracle of Oil*

Hubbert hustled back to the stage and proceeded to give his speech “with no modification whatever,” he later recalled. “When I got back to Houston, I found that the tension was very high around the office.... Apparently all hell had been going on during my absence.”

In his talk, he depicted the stages of extraction growth along a bell curve, and showed how the inversion or inflection point from concave to convex could be used to predict when the growth rate would stop and the extraction rate would peak and then begin to fall.



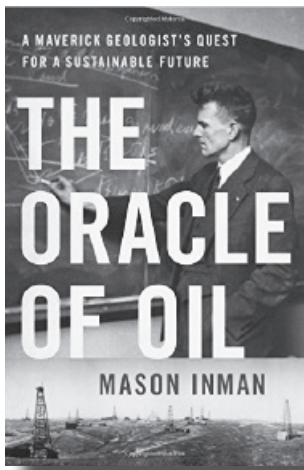
World production of crude oil, 1880 to 1970 — When confronted with a climbing curve like this, depicting seemingly inexorable exponential growth and suggestive of limitless resources, it takes an independent, analytical mind to challenge conventional wisdom and predict that the curve will soon change direction.

Knowing that oil production had to both start and end at zero simplified the mathematics. Thus, with an estimate in hand of total recoverable oil reserves, Hubbert could predict when the peak of Lower 48 States (excluding Alaska) oil production would occur. He used the range of estimates for total ultimate oil recovery (production) from the most highly respected geologists of the era — 150 to 200 billion barrels. Then, simply graphing the curves and “counting squares,” he demonstrated that the Lower 48 States production would likely peak between 1965 and 1971. Many of his colleagues thought he was nuts.

In fact, domestic Lower 48 production of conventional crude oil peaked in 1970.

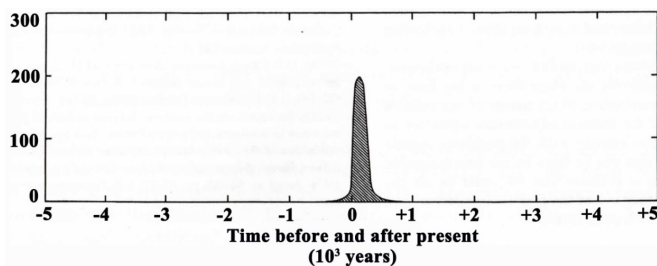
The prescience of Hubbert’s 1956 prediction would not be appreciated for more than another decade and a half, until the Arab Oil Embargo of 1973–1974, an attempt to punish the United States by the Arab petro-states for American support of Israel in October 1973’s

Yom Kippur War, also known as the Arab-Israeli War. The supply disruptions, sharp hikes in gasoline prices, long lines at gas pumps, and economic duress were soon to be lumped under the label “Energy Crisis.” It was a shock to ordinary Americans to feel that our fate was no longer in our hands. Most of us had long been asleep at the wheel and were oblivious to resource limits; most were avid believers in what Hubbert’s later friend Stewart Udall, Secretary of the Interior under the Kennedy and Johnson administrations, was to call the “myth of superabundance.” Yet if U.S. crude oil production had continued climbing as it had for more than a hundred years, the Organization of Petroleum Exporting Countries (OPEC) would not have been able to exercise that monopoly power over the global petroleum market and exert such geopolitical leverage.



Hubbert did something else extraordinary. According to energy writers David Room and Steve Tanner, drawing on a 1989 oral history interview with Hubbert at the Niels Bohr Library of the American Institute of Physics in College Park, Maryland, Hubbert also plotted global production of all the fossil fuels (oil, natural gas, coal) onto a graph with a time scale of 10,000 years or 100 centuries: 5,000

years into the past and 5,000 years into the future. Hubbert called man’s use of these non-renewable energy resources, “a unique event in human history, a unique event in biological history. It is non-repetitive, a blip in the span of time.” He cited nuclear power as a possible savior, a view he would eventually abandon as his concerns grew about disposal of increasing quantities of radioactive wastes.



In describing this graph in a 1974 report to the Committee on Interior and Insular Affairs of the U.S. Senate, Hubbert himself wrote:

A better appreciation of the brevity and exceptional character of the epoch of the fos-

sil fuels can be gained if we view it in the perspective of a longer time span of human history than we have considered heretofore. In Fig. 10 the complete cycle of exploitation of the world’s total supply of fossil fuels, coal, and petroleum, is shown on a time scale extending from 5000 years in the past to 5000 years in the future. On such a scale, the Washington-Monument-like spike in the middle of this range, with a middle-80% spread of about three centuries, represents the period of exploitation of the fossil fuels in the much longer span of human history. Brief as this period is, having arisen, as we have seen, principally within the last century, it has already exercised one of the most disturbing influences ever experienced by the human species in its entire biological existence.

“Exponential Growth as a Transient Phenomenon in Human History,” by M. King Hubbert, in *Valuing the Earth: Economics, Ecology, Ethics*, 1992 (Daly and Townsend, eds.), MIT Press.

The 1956 issue of *Production Practice*, API’s journal of record, carried Hubbert’s San Antonio speech and paper as the lead article. In it, he wrote: “the discovery, exploitation and exhaustion of the fossil fuels will be seen to be but an ephemeral event in the span of recorded history.” Hubbert’s incontrovertible logic and conclusions influenced the MIT systems analysts who eventually applied computer simulation modeling to the “world problematique” and wrote the best-selling and controversial 1972 book *The Limits to Growth*. But his influence extends much further still. Indeed, anyone in recent decades who has acknowledged that perpetual growth on a finite planet is an “impossibility theorem,” to quote the late physicist Al Bartlett, owes a debt to Hubbert.

As author and climate activist Bill McKibben wrote in a blurb on the back cover of Inman’s *Oracle of Oil*:

This is a remarkable account of a remarkable man — and for that matter of a remarkable moment in American history, when we began to realize there were limits to our endless expansion.

In 40 short, compelling chapters that are a pleasure to read, Inman covers Hubbert’s fascinating life and career from its humble, hardscrabble origins on a small farm in a poor, remote part of rural Texas to his 1989 death in urbane Washington, D.C. at the age of 86. In spite of their poverty, Hubbert’s parents, especially his mother, valued education and supported his. At the

tender age of 17, the young Hubbert sold one of his few belongings, a cow, for 25 dollars, so that he could attend community college 150 miles away. He worked at college to support himself and made a very favorable impression on his teachers. Eventually, this led to an opportunity to attend the prestigious University of Chicago and major in geology. Over the course of his long career, he worked there, at Columbia University, Shell, Stanford, UC Berkeley, and the U.S. Geological Survey, with whose director he clashed about just how much oil was left in the United States and how long it would last.



Late in his life, Hubbert poses with a poster of his famous “pimple.”

Oracle of Oil is full of great stories that give a sense of the man, who from the very beginning, exhibited a strong independent streak. As Inman puts it, Hubbert earned a reputation as something of a rebel. Early on, he rejected his Methodist upbringing and later remembered what he called the “hocus pocus” of traveling fundamentalist preachers who passed through his neck of the woods in rural Texas, mesmerizing his credulous neighbors with their fervent, literal interpretations of the Bible.

Inman discusses Hubbert’s long association as a young, idealistic (if somewhat naïve) intellectual and scientist with Technocracy, a social movement of the early twentieth century which peaked in the early 1930s during the Great Depression. Technocrats believed in replacing businessmen and politicians with scientists and engineers who had the technical expertise to manage the economy, in something like a modern version of Plato’s “philosopher kings.” Hubbert eventually distanced himself from Technocracy, and the movement itself faded under the impacts of the New Deal, World War II, and the prosperity of the post-war period.

Inman relates that M. King Hubbert was a strong and early advocate of human population stabilization. Indeed, he and his wife Miriam opted not to have any

children themselves due to their concerns about over-population. At a University of Minnesota conference in 1969, organized to discuss and debate the pros and cons of nuclear power, Hubbert referred to fossil fuels as a “‘jackpot of energy’ that wouldn’t last.” While Hubbert still supported nuclear power at that time, he argued that neither it nor any other energy source would allow for infinite growth. He said:

It has become mandatory to stabilize the world’s population and industrial activity at a level that earth’s resources can stand. We may even have to drop the population back to some livable level.

In the last decade or two of his life, Hubbert also became a staunch proponent of renewable energy sources like solar and began to worry about what releasing all that carbon dioxide from fossil fuel combustion would do to the Earth’s climate.

In the final chapters of the book, Inman discusses the “fracking revolution” that cornucopians such as many economists, some fossil fuel corporate executives, and the editors of *The Wall Street Journal* have loudly insisted renders Hubbert’s predictions and the whole concept of “peak oil” obsolete and quaint. Ironically, Hubbert himself was an early scientific researcher on hydraulic fracturing decades earlier. But this was well before the innovation and widespread application of horizontal drilling that allowed vertical oil and gas wells to turn 90 degrees and follow and frack a horizontal layer of shale for a mile or two. Tapping into hydrocarbon resources trapped in non-porous rocks by combining these technologies has allowed domestic oil and gas production to spike in the last decade. If he were alive today, Hubbert himself, like the Post Carbon Institute’s Richard Heinberg and his other intellectual descendants, would surely argue that these “new” hydrocarbon resources will barely budge “Hubbert’s pimple” on that long-term graph depicting the fixed and finite spot of the fossil fuels in the wide sweep of human history, a mere blink in the eye in the vast span of geologic time.

We are living in a time of extraordinary and perhaps abrupt transitions, phase shifts, and tipping points. M. King Hubbert was an extraordinary visionary who foresaw and helped shape our response to these times. Ultimately, he was not a doomsayer, but a man gifted with foresight who stubbornly held onto guarded hope that, with the right leadership, direction, and sacrifice, humanity and our planet might still emerge from these troubled, turbulent times into a better, more durable future. A worthy biography, one appreciative of this prophet’s contributions, was long overdue. And we should be appreciative of Mason Inman for providing it. ■