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## As Prices Soar, Doomsayers Provoke Debate on Oil's Future

**In a 1970s Echo, Dr. Campbell  
Warns Supply Is Drying Up,  
But Industry Isn't Worried**

### Charges of 'Malthusian Bias'

By **JEFFREY BALL**  
 Staff Reporter of THE WALL STREET JOURNAL  
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BALLYDEHOB, Ireland -- As he sat last month in his book-lined study, Colin Campbell got a phone call that made him shriek with joy.

"Holy Mother!" he yelled after he put down the receiver. "The good ol' moment's arrived!"

The call had brought word that the price of crude oil was shooting up -- a climb that, in the days that followed, would take it to near \$50 a barrel. To Dr. Campbell, a 73-year-old retired oil-industry geologist who lives in this coastal Irish village, this was sweet vindication. It meant that the "moment" he had been predicting for about 15 years -- the beginning of the end of the age of oil -- might finally be at hand.


Dr. Campbell is at the center of a small but suddenly influential band of contrarians known as the peak-oil movement. They see cause for alarm in the fact that since the early 1980s the world has been pumping more oil out of the ground than it's been finding. By as early as next year, they say, humanity will have reached a point of reckoning: It will have extracted half the oil it will ever get. Once that "peak" is reached, Dr. Campbell says, global oil production will start falling, never to rise again.



The peak would mark the end of cheap oil. Although people would probably keep using oil for another century or so, prices would steadily rise. To maintain economic growth, the world would have to become radically more energy-efficient, shifting quickly to alternatives such as solar and nuclear power. If the switch wasn't fast enough -- an outcome Dr. Campbell thinks more likely -- the global economy would screech to a halt.

"The perception of this decline changes the entire world we know," says Dr.

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**HOT SUMMER**

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**Chart the rise<sup>3</sup>** in oil prices through the summer months.

[U.S. Can Free Itself From Oil, Report Says<sup>4</sup>](#)

Campbell, whose wife affectionately calls him Mr. Doomsday. "Up till now we've been living in a world with the assumption of growth driven by oil. Now we have to face the other side of the mountain."

People have been incorrectly predicting oil's demise since the industry's early days, and the peak-oil movement has yet to make a serious dent in the energy policies of the U.S. and other developed nations. But the debate is flaring up with new intensity because of some powerful forces changing the geopolitics of oil, among them the rise of an oil-guzzling China and persistent instability in the Middle East and Russia.

The oil industry calls Dr. Campbell a crackpot. Since he began writing about a looming peak, the industry notes, he has progressively postponed his predicted date, from 1995 to 2005. This roughness of the numbers, the industry says, points to a more fundamental problem with the peak-oil theory: It underestimates the power of technology to find more oil -- indeed, to broaden the concept of oil itself.

That this debate can occur points to a striking fact: Nobody really knows how much oil exists. More to the point, nobody knows how much can be gotten out of the ground. Much of the oil lies in places with volatile politics, including the Middle East, Russia and Africa. Further complicating the calculation: Beyond the pool of conventional oil that the industry can easily extract today lie vast stores of hydrocarbons that, until recently, haven't been thought of as oil. Among them: tar-soaked sands in Canada and oil-laden shale rock in places including the western U.S.

So far, over the approximately 150 years since the first oil well was drilled, the world has burned through about 900 billion barrels. Dr. Campbell thinks the world will be able to pump out about that much more. The industry, however, contends Dr. Campbell is being far too pessimistic. Exxon Mobil Corp., for instance, estimates there are something like 14 trillion barrels of fossil fuel still in the ground, including the tar-soaked sands and other nonconventional forms. It figures the industry can extract a good chunk of that.

If Dr. Campbell and his colleagues are right, then nations should rush to promote fuel efficiency to minimize economic upheaval. If they're wrong, but the world follows their advice anyway, then huge sums of money could be wasted jumping to alternative energy sources that, while environmentally friendly, would be more expensive than oil.

"We're running out, but not in any important way. We're running out so slowly it doesn't matter," says Michael Lynch, an oil-industry consultant who has emerged as a leading critic of the peak-oil theorists. At some point, the world will shift from oil to other energy sources, Mr. Lynch agrees. But he says there's plenty of oil to ensure that transition will happen smoothly -- long before the world hits the last drop. The world, he notes, "changed from horses to cars, and we didn't run out of oats."



**Michael Lynch**

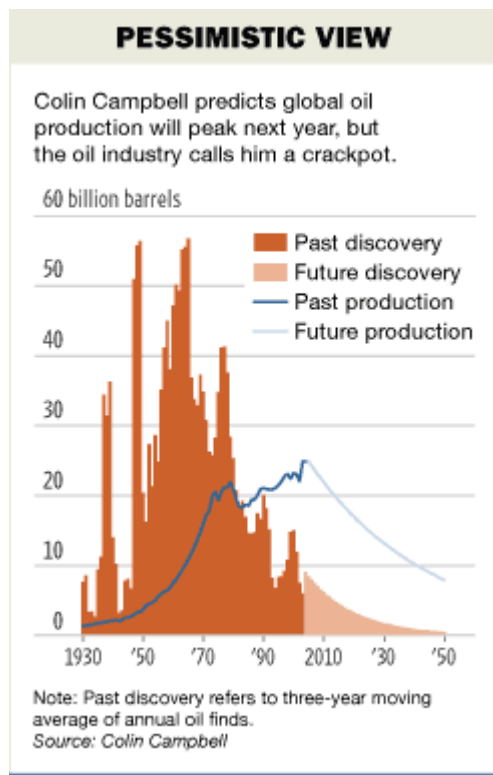
For years, Dr. Campbell has been visited in Ballydehob, a village of about 300 people southwest of Cork, by a stream of visitors he describes as "fringes" -- among them a Louisiana woman who drives a van powered by vegetable oil and a British couple moving to Australia to live off the land.

### **Mainstream Attention**

But suddenly Dr. Campbell is receiving mainstream attention. In the past few months, he has spoken before a joint committee meeting of the British House of Commons and addressed about 200 J.P. Morgan Chase & Co. investors by conference call from Ballydehob. This month two officials from AB Volvo, the truck and engine maker, visited from Sweden. His theory, if right, would force vehicle makers to revamp their lineups.

Also this month, PFC Energy, a respected Washington energy-consulting firm, released a report essentially endorsing Dr. Campbell's gloomy prediction. PFC puts the peak a bit further out than Dr. Campbell does -- sometime between 2010 and 2015. But Michael Rodgers, the PFC senior director who coordinated the report, agrees with Dr. Campbell that the precise year of the peak is less important than the conclusion that it is coming.

Mr. Rodgers says PFC officials debated whether to stake their reputation on the side of those whose pessimistic predictions have been wrong before. But they concluded that the decline in global oil discoveries has become so pronounced that the industry can't count on technological breakthroughs to bail it out in time.



"Part of the problem that Campbell suffers from is that he's been saying this for 20 years. People have gotten to the point where it's like the boy crying wolf," Mr. Rodgers says. "We believe his current predictions are closer to being accurate than they ever have been before. But unfortunately, because he's said this so often, people are skeptical."

No one disputes that for the past two decades, the world has been pumping out more oil than it has found in new fields. And consumption is rising quickly, meaning the gap could widen. By 2030, predicts the Paris-based International Energy Agency, global oil consumption will jump to 120 million barrels a day from 82 million barrels a day now.

But critics such as Mr. Lynch argue there's every reason to assume that discoveries will revive. They contend that the decline in discoveries since the 1960s isn't an inexorable trend but an artifact of economic forces. Today's supply crunch, by pushing up oil prices, should give the industry an incentive to figure out how to extract more of the oil still in the ground.

Dr. Campbell's analysis is clouded by his "conservative, Malthusian bias," charges Mr. Lynch, 49, who works out of a bedroom office in his house in Amherst, Mass. Mr. Lynch's clients include the U.S. Department of Energy as well as Saudi Arabia's national oil company, Aramco. Mr. Lynch has written several papers that pick at the peak-oil theory in painstaking detail. His latest one, complete with a three-page bibliography, alleges "a pattern of errors and mistaken assumptions presented as conclusive research results."

Dr. Campbell so dislikes Mr. Lynch that he has declined invitations to appear with him in debates. "It's like asking a doctor to talk about medicine with a faith healer," Dr. Campbell says. He calls

Mr. Lynch "the high priest of the flat-earth economists."

Alarms that the world is running out of oil have long been sounded. In 1875, just 16 years after Edwin Drake drilled what's generally regarded as the world's first commercially successful oil well in Pennsylvania, the state's chief geologist warned that it soon would run out of oil. He was wrong.

### **Hubbert's Graph**

Today's peak-oil theorists are the intellectual descendants of the late M. King Hubbert, an American oil geologist. In 1956 he published a foreboding graph featuring a bell-shaped curve. At the time, the U.S. still was the world's top oil producer, while production was still ramping up in the Middle East. Dr. Hubbert figured that the rise and fall of oil production in a nation would follow the pattern of a single well. A peak in oil discovery would come first; then, years later, production would peak as engineers got out the oil. Once discoveries started falling, production would too -- but only after a gap of about 40 years, Dr. Hubbert estimated. Since discoveries in the continental U.S. had peaked around 1930, his graph showed production peaking around 1970 and then dropping off.

Dr. Hubbert was derided when he released the graph, which came to be known as Hubbert's Peak. By the early 1970s, however, the facts had proved him right. The U.S. no longer produced the bulk of the world's oil. Production was rising fast in Middle Eastern nations, the Soviet Union and South America.

Then, in 1973, the Arab members of the Organization of Petroleum Exporting Countries tightened their spigots, and the world panicked. The result: high prices, long lines and frequent shortages at gas stations across the U.S. and Europe.

Suddenly, the future of oil was an urgent international concern. Just as America's oil supply had gone into decline, skeptics warned, now the entire globe was beginning to run out of oil. In 1979, James Schlesinger, the Carter administration's departing energy secretary, declared that world oil production had nearly peaked.

Mr. Schlesinger also turned out to be wrong. The oil industry came up with new technology, including three-dimensional seismic imaging, to reduce the number of dry holes. Oil production continued to climb.

Dr. Campbell was pushing as hard as anyone to find new oil. He had entered the industry just as it was starting to boom in the late 1950s. For the next three decades, he rode the industry's rise, prospecting for oil from the mountains of Colombia to Norway's North Sea coast.

The insight that would transform him from oil hunter to oil skeptic came in 1989, a year before he retired. Backed by Fina, his final employer, he conducted a study for the Norwegian government on how much oil the world had left. The study calculated Hubbert-style curves for countries around the world and tallied them up. Dr. Campbell's conclusion, laid out in a 1991 book: World-wide oil production would peak around 1995.

Since then he has updated the calculations several times. In the mid-1990s, he says, he and a colleague switched from using publicly available data to a private consultant's database, which shows production by individual oil fields. That information, he says, prompted an alarming

discovery: The world's oil producers were finding a lot less oil than their official numbers suggested.

Oil producers report their hydrocarbon stocks in a category called "proved reserves," which means oil that's been found and can reasonably be expected to be extracted using current technology. It's seen by the market as a fundamental indicator of how well the oil industry is doing replenishing its stocks.

What oil producers should do, Dr. Campbell says, is add the entire capacity of an oil field to their reported reserves in the year they first tap the field. What they actually do is dribble that field's capacity into their reported reserves bit by bit over a number of years.

The problem with that incremental accounting approach, Dr. Campbell says, is that it gives the world the false impression that it has plenty of oil. It disguises the less-rosy truth, he argues, which is that massive oil-field discoveries are largely a thing of the past.

Mr. Rodgers, the PFC senior director, says he is convinced that Dr. Campbell's criticism is valid. He says oil production is either reaching a plateau or declining in 33 of 48 major oil-producing countries, including six of the 11 OPEC countries. Mr. Rodgers also points to a separate set of numbers. Over the past decade, he says, the percentage of major oil companies' exploration-and-production budget that has gone to exploration has dropped to about 12% from about 30%. That, he reasons, is because they have concluded that there aren't many more large caches of oil for them to profitably find.

"Despite the fact that we're in the highest oil-price era, the level of exploration is not increasing," Mr. Rodgers says. "The reason it's not increasing is that, in so many regions of the world, the fields have gotten so small that even though you might be able to drill a well and get a positive rate of return, the incremental value doesn't mean a lot."

Oil-industry executives reject this analysis. For one thing, publicly traded oil companies are required by the U.S. Securities and Exchange Commission to report their reserve additions in the incremental way that Dr. Campbell distrusts. That requirement, they note, reflects the reasoning that a pool of oil shouldn't be claimed as an asset unless its owner is able to pump it out. Being able to pump it out, in turn, means having developed the necessary technology, and having paid to put that technology into place.

More broadly, say peak-oil critics such as Mr. Lynch, whatever the truth about the past rate of discoveries of new fields, it's no sign of an impending geological limit. It largely reflects geopolitical constraints that have prevented the industry from fully exploring many oil-rich parts of the world, including Iraq and Russia. "It's a political change," Mr. Lynch says. "It's not geology that's causing that drop."

The industry continues to wring more oil from existing fields. Moreover, there are signs that some of the political constraints to new discoveries are falling in the face of rising oil prices. For more than two decades, OPEC generally has kept production well below its capacity to shore up prices, but recently it has opened its spigots wider. If prices remain high, oil-rich countries such as Russia and Venezuela will have more incentive to put aside their political problems and open up more fields.

Meanwhile, the industry is bullish that future improvements in its technology will enable it to

extract enough fossil fuel to stay ahead of demand. "We've got plenty of oil to last us for decades," says Alan Kelly, Exxon Mobil's general manager for corporate planning. "Now certainly, there has to be an end. But we're of the view that that's quite a long way out there."

Dr. Campbell thinks the industry is fooling itself. He is so convinced that an oil-induced financial crash is coming that he has moved much of his savings into low-risk Norwegian bonds because he believes Norway has more oil left than other big producers. "It's no use having bland statements about the power of technology," says Dr. Campbell. "I just want to know where and when."

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