MuseLetter

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This month's Museletter is a collection of three pieces. The first two examine the impact of the Deepwater Horizon oil spill. The third is a tongue in cheek look at industry responses to peak oil.

Deepwater Horizon: The Worst-Case, Best-case, and Most-Likely Scenarios

Reports from the Gulf of Mexico just keep getting worse. Estimates of the rate of oil spillage from the Deepwater Horizon wellhead continue gushing (the latest official number: up to 60,000 barrels per day, with BP now saying the maximum potential leakage rate could be 100,000 b/d). Forecasts for how long it will take before the leak is finally plugged are pluming toward August—maybe even December. In addition to the oil itself, BP has (in this case deliberately) spilled a million gallons of toxic Corexit dispersant. Biologists' accounts of the devastation being wreaked on fish, birds, amphibians, turtles, coral reefs, and marshes grow more apocalyptic by the day—especially in view of the fact that the vast majority of animal victims die alone and uncounted. Warnings are now being raised that the natural gas being vented along with the oil will significantly extend the giant dead zones in the Gulf. And guesses as to the ultimate economic toll of this still-unfolding tragedy—on everything from the tourism and fishing industries of at least five coastal states to the pensioners in Britain whose futures are at risk if BP files for bankruptcy or is taken over by a Chinese oil company—surge every time an analyst steps back to consider the situation from another angle.

We all want the least-bad outcome here. But what if events continue on the current trajectory—that is, what if the situation keeps deteriorating? Just how awful could this get?

The Worst Case

For weeks various petroleum engineers and geologists working on the sidelines have speculated that the problems with Deepwater Horizon may go deep—that the steel well casing, and the cement that seals and supports that casing against the surrounding rock, may have been seriously breached far beneath the seabed. If that is true, then escaping oil mixed with sand could be eroding what's left of the well casing and cement, pushing out through the cracks and destabilizing the ground around the casing. According to Lisa Margonelli in *The Atlantic*, "There is the possibility that as the ground and the casing shift, the whole thing collapses inward, the giant Blow Out Preventer

falls over, the drill pipe shoots out of the remains of the well, or any number of other scenarios," that could make it virtually impossible ever to cap the well or even to plug it at depth via relief wells.

Read, for example, this comment at www.TheOilDrum.com, a site frequented by oil industry technical insiders who often post anonymously. The author of the comment, "dougr," argues fairly persuasively that disintegration of the sub-surface casing and cement is the best explanation for the recent failure of "top kill" efforts to stop the oil flow by forcibly injecting mud into the wellhead.

Concerns about the integrity of the sub-seabed well casing appear also to be motivating some seriously doomerish recent public statements from Matt Simmons, the energy investment banker who decided to go rogue a couple of years ago following the publication of his controversial Peak Oil book *Twilight in the Desert*. Simmons says, for example, that "it could be 24 years before the deepwater gusher ends," a forecast that makes little sense if one accepts the conventional view of what's wrong with Deepwater Horizon and how long it will take to plug it with relief wells.

Are these concerns credible? From a technical standpoint, it is clear that improperly cemented wells can and do rupture and cause blowouts. It's fairly clear that this is part of what happened with Deepwater Horizon. But is the well casing further disintegrating, and is oil escaping the well bore horizontally as well as vertically? We just don't know. And that is largely due to the fact that BP is as opaque on this score as it has been with regard to nearly every sensitive technical issue (including the rate of leakage) since its drilling rig exploded two months ago.

So far, up to 3.6 million barrels of oil have spilled into the Gulf. The size of the Macondo oilfield has been officially estimated as being anywhere from 25 to 100 million barrels. It is unclear how much of that oil-in-place would escape into Gulf waters if its flow remained completely unchecked, but it is safe to assume that at least half, and probably a much greater proportion, would eventually drain upward. That means many times as much oil would enter the Gulf waters as has done so until now.

Already, Deepwater Horizon is the not only the worst oil spill, but the worst environmental disaster in U.S. history. Multiplying the scale of this existing catastrophe multiple times sends us into truly uncharted territory.

Already, coastal ecosystems are being shredded; for a sense of how bad it is for wildlife in the Gulf now, just read "Biologists fear Gulf wildlife will suffer for generations." In a truly worst case, oil—and perhaps dissolved methane as well—would hitch a ride on ocean currents out to the deep Atlantic, spreading ecological destruction far and wide.

For the economies of coastal states, a worst-case leakage scenario would be utterly devastating. Not only the fishing industry, but the oil industry as well would be crippled, due to the disruption of operations at refineries. Shipping via the Mississippi River, which handles 60 percent of all U.S. grain exports, could be imperiled, since the Port of

South Louisiana, the largest bulk cargo port in the world, might have to be closed if ships are unable to operate in oil-drenched waters. Unemployment in the region would soar and economic refugees would scatter in all directions.

The consequences for BP would almost certainly be fatal: it is questionable whether the corporation can survive even in the best case (that is, if "bottom kill" efforts succeed in August); if the spill goes on past the end of the year, then claims against the company and investor flight will probably push it into bankruptcy. Americans may shed few tears over this prospect, but BP happens to be Great Britain's largest corporation, so the impact to the British economy could be substantial.

The consequences for the oil industry as a whole would also be dire. More regulations, soaring insurance rates, and drilling moratoria would lead to oil price spikes and shortages. Foreign national oil companies could of course continue to operate much as before, but the big independent companies, even if they shifted operations elsewhere, would be hit hard.

For President Obama, an environmental disaster of the scale we are discussing could have political consequences at least equivalent to those of the Iranian hostage crisis during the Carter presidency. Obama's only chance at survival would be an FDR-like show of leadership backed by bold energy and economic plans and ruthless disregard for partisan bickering and monied interests.

For the U.S. economy, already weakened by a still-unfolding financial crisis, a worst-case scenario in the Gulf could be the last straw. The cumulative impacts—falling grain exports, soaring unemployment in southeastern coastal states, higher oil prices—would almost certainly spell the end to any hope of recovery and might push the nation into the worst Depression in its history.

We would all prefer not even to contemplate such a scenario, much less live with it. It is irresponsible to inflict needless worry on readers on the basis of entirely speculative and extremely unlikely events. But the more we learn about the technical issues, and the worse news gets, the more likely this scenario seems. We all hope that a relief well will succeed in stopping the oil flow sometime around August, and that until then BP will be able to siphon off most of the oil escaping through the riser and damaged blowout preventer. But one has to wonder: is anyone at the White House seriously considering the worst-case scenario? And what should citizens be doing to prepare, just in case?

The Best Case

Even in the best possible case, the consequences of the oil disaster in the Gulf of Mexico will be severe and ongoing, as we have just seen.

What would make the difference between the worst and best cases? That difference would flow not just from a single factor, but from a confluence of many through three main tributaries: luck, competence, and courage.

If we are to see the best—which is just the least-bad—outcome from the Deepwater Horizon catastrophe, we will need some luck. We will need for there to be no major hurricanes in the Gulf of Mexico this season to disrupt oil recovery and relief-well drilling efforts. We will need the well casing deep below the seabed to maintain enough integrity so that relief wells can succeed in "killing" the original well. And we will need for the relief well drillers to intersect the initial Deepwater Horizon borehole on the first try.

Which is a nice segue to our second tributary—competence. Those relief-well drillers had better be well rested and highly skilled. Similarly, workers capturing the oil leaking out of the blowout preventer, and cleaning up the oil already seaborne, will need training and smarts. Let's hope that the engineers and technicians who are doing this important work are not overruled by profit-obsessed executives, as happened on the ill-fated Deepwater Horizon drilling rig in the days and hours leading up to its fateful explosion.

Courage is possibly the pathway to a best-case outcome that is most accessible to short-term human intervention, unless you happen to believe that we can dramatically influence our luck through some sort of collective cathartic ritual (might be worth a try, but how to organize it?). I'm willing to take for granted the competence of the good people working on the technical problems related to well-kill and cleanup. But courage hardly deserves to be taken for granted. True, some would say there's not much more we can do to increase our presumed will-power than we can to improve our luck: after all, our human choices are mostly constrained, if not tightly determined, by genetics and circumstances. No one knows just how much wiggle room we actually have in terms of free will and courage; but, if there is indeed some substantial amount, it might make all the difference in the world at this historic juncture.

It would take courage, will, and foresight, for example, to begin building a new economy in Louisiana and the other Gulf states. Take away both fishing and the oil industry and there's not much left (other than some gambling in Biloxi and the tantalizing varieties of sin and jazz in the French Quarter). That's why even the devastated fishers in south Louisiana still staunchly support more drilling. But oil production in the Gulf of Mexico is near its peak for a number of reasons, not least of which are declining discoveries and depletion of existing oilfields. The oil industry will be leaving the building fairly soon no matter what political decisions are made, and no matter how soon the current oil spill is capped and cleaned up. So: what can the Gulf states do for an economic encore? Any realistic answer will consist of a plan based on the harvesting of renewable resources at sustainable rates—but an economy that operates on that basis will have little use for highways, suburbs, and shopping malls. It will take a lot of courage for anyone—President, Governor, Senator, or Mayor—to utter this uncomfortable truth.

It will also take courage to do something similar for the U.S. as a whole—to set specific priorities for reducing oil dependency, and to begin a historic shift from car-centered transport and industrialized food systems. And the only way an American politician at the national level will ever be able to successfully exercise such courage is first to overcome the political influence of the fossil-fuel, automotive, road-

building, and agribusiness cartels. That power shift will itself require both courageous leadership and sustained political grass-roots organizing. A reversal of certain Supreme Court decisions giving corporations all the rights of human persons would be more than helpful along the way.

If only such courage were on display, all sorts of problems could be addressed. Reducing our reliance on oil would help rein in climate change, air and water pollution, resource depletion, geopolitical intrigues, foreign wars, probably even highway accidents. Almost everyone agrees we ought to do this—so let's just screw up our gumption and get it done!

Ah, if only it were so easy. Chalking the sticking point up to lack of courage is a handy way to put leaders on the spot while ignoring the character and constraints of the system that selected them and got them to where they are in the first place. As Jon Stewart pointed out in a devastatingly funny and sad segment June 16, each of the last eight U.S. presidents has called for energy reform—including an end to oil imports and the development of renewable energy sources. And for the past forty years, U.S. oil imports have continued to grow and renewables have continued to provide only a relatively insignificant sliver of total American and world energy. Is the problem really a lack of courage, or could it have something to do with an entrenched political-economic system with an autoimmune disorder that makes it resist needed reform as though it were some invading disease?

Oh dear, we've just run out of options! If we don't believe much in luck, take competence for granted, and discount the potential of courage to make much of a difference in the current situation, there's not much left to hope for. What will be will be.

The Most Likely Scenario

Which brings us to the most likely scenario. As we've just seen, the best case is highly *unlikely*. Most Americans agree on the need for a major shift of energy policy, but if either party in Congress or the President actually undertook to make such a shift happen, both the corporatocracy and a sizeable section of the electorate would (at least metaphorically) have these leaders' heads on pikes by sundown. For confirmation, we need look no further than a *New York Times*/CBS poll just released; the first paragraph of the related *Times* story reads:

"Overwhelmingly, Americans think the nation needs a fundamental overhaul of its energy policies, and most expect alternative forms to replace oil as a major source within 25 years. Yet a majority are unwilling to pay higher gasoline prices to help develop new fuel sources."

Translation: "Solve our energy problems for us—just don't ask us to bear any inconvenience while you do it. We're happy with our comforts and don't want to be disturbed."

The trouble is, those comforts are about to be taken away no matter what anyone does, and we will all be very disturbed indeed when that happens. If we don't wean ourselves off of oil, nature will

accomplish that task for us through simple depletion of the world's remaining high quality, cheaply accessed deposits of non-renewable petroleum.

Texas geologist Jeffrey Brown has rather facetiously offered his own "plan" to reduce U.S. reliance on foreign oil: it is based on the fact that oil exporters are using an ever-greater proportion of what they produce to satisfy growing domestic demand for fuel. That means that even if world crude oil production can remain on its current plateau of about 75 million barrels per day for another decade, the amount available to importing countries will inexorably dwindle. And this in turn will lead to bitter competition among oil importers for the remaining world export capacity. We can already tell how that contest will likely go:

"U.S. net oil imports fell at 4.3% per year from 2005 to 2008 (from 12.5 million barrels per day to 11.0 mbpd), while [China and India's combined] net oil imports rose at 9% per year from 2005 to 2008 (from 4.6 mbpd to 6.0 mbpd). If we extrapolate these two trends, at these rates Chindia's net oil imports would exceed U.S. net oil imports some time around 2013. It's also helpful to express Chindia's net oil imports as a percentage of (2005) top five net oil exports. Chindia went from importing the equivalent of 19% of the combined net oil exports from Saudi Arabia, Russia, Norway, Iran and the UAE in 2005 to importing 27% of their combined net oil exports in 2008. If we extrapolate this trend, Chindia would be net importing the equivalent of 100% of the combined net oil exports from Saudi Arabia, Russia, Norway, Iran and the UAE some time around 2019."

Which will leave the U.S. out in the cold (with only a little help from Canada), relying almost entirely on its own domestic oil production—which can't grow much even if we drill in every last offshore wildlife refuge. Finally, mission accomplished! We'll be almost entirely off of foreign oil in only a decade. And getting there won't require political courage.

If the best case is highly unlikely, the worst case is probably overblown. In the first section of this essay, I discussed concerns that the Deepwater Horizon well casing and the cement supporting that casing within the borehole could be disintegrating deep underground; if that is the situation, it might be difficult or impossible to "kill" the well with the relief wells now being drilled. At this point, no one outside of BP's management and technical staff knows if such concerns are justified. On the bright side: A couple of the old hands at www.TheOilDrum.com have pointed out that, if problems with the casing were that serious, we'd be seeing significant oil leakage from around the well borehole, outside the riser—but that's just not apparent in real-time shots from the ROV cameras.

If the casing holds out, relief wells should work. But will they do their job by August? This hurricane season is projected to be a very active one, so a most-likely scenario would include at least one significant work stoppage due to weather, pushing the final well-kill back at least a month, perhaps even to December. Weather is also likely to disrupt oil-capturing efforts in a most-likely scenario, and could dump oil-soaked Gulf waters on coastal communities and habitat.

In short: the most-likely scenario is very, very bad for wildlife, BP, Britain, Obama, the economy of the southeastern states, indeed for the overall U.S. economy. A year from now, we will be further down the road Jeffrey Brown has mapped for us, with China and the U.S. competing a little more openly for access to oil and other resources. The most-likely scenario certainly includes lots of political dithering, grandstanding, and scapegoating over the next many weeks—all to vanishingly little practical effect. In a year's time, we will still be living in the shadow of Deepwater Horizon. Nearly everyone will be convinced that U.S. energy policy is in even worse shape than they believe it to be today. And in twelve months very little will have changed in terms of national energy strategies or priorities.

Which is why individuals, families, neighborhoods and communities need to be thinking about how they're going to formulate their own energy and economic plans, starting now.

A Tepid Plea for Unspecified Change

Last night's presidential speech on the Gulf of Mexico oil spill had been pre-billed by the *Washington Post* as Barack Obama's "Jimmy Carter moment." But reading any of Carter's speeches (a good one to start with is that of April 18, 1977 side by side with last night's bromide is an invitation to nostalgia and bitter disappointment.

President Obama offered up one promising paragraph:

"For decades, we have known the days of cheap and easily accessible oil were numbered. For decades, we have talked and talked about the need to end America's century-long addiction to fossil fuels. And for decades, we have failed to act with the sense of urgency that this challenge requires. Time and again, the path forward has been blocked—not only by oil industry lobbyists, but also by a lack of political courage and candor."

It sounds for all the world as though the President is about to unleash a grand program on the scale of the New Deal—an energy Moon Shot, a rousing call-to-arms reminiscent of December 8, 1941. But this is what follows:

"So I am happy to look at other ideas and approaches from either party—as long they seriously tackle our addiction to fossil fuels. Some have suggested raising efficiency standards in our buildings like we did in our cars and trucks. Some believe we should set standards to ensure that more of our electricity comes from wind and solar power. Others wonder why the energy industry only spends a fraction of what the high-tech industry does on research and development—and want to rapidly boost our investments in such research and development. All of these approaches have merit, and deserve a fair hearing in the months ahead. But the one approach I will not accept is inaction. The one answer I will not settle for is the idea that this challenge is too big and too difficult to meet. You see, the same thing was said about our ability to produce enough planes and tanks in World War II. The same thing was said about our ability to harness the science and technology to land a man safely on the surface of the moon. And yet, time and again, we have refused to settle for the

paltry limits of conventional wisdom. Instead, what has defined us as a nation since our founding is our capacity to shape our destiny—our determination to fight for the America we want for our children, even if we're unsure exactly what that looks like. Even if we don't yet know precisely how to get there, we know we'll get there."

Translation: "I don't have a clue what to do; but, if anyone else has some good ideas, I'm all ears."

Look: I want Obama to succeed; I want it earnestly, even desperately. And so I hate to be critical. It's true that we've all got to work together to solve our energy crisis, and that means rising above partisanship. But leadership is sorely needed here, and leaders must set definite goals.

Jimmy Carter at least had a plan. He proposed lofty objectives and investments: targeted reductions in oil imports, an energy security corporation, a solar bank. In contrast, Obama's strategy seems to be to avoid specifics while insisting that we Americans will somehow overcome our oil dependency because . . . well, because we're Americans. We've gotten through other scrapes throughout our history as a nation, so why not this one? "I demand action," the President seems to be saying, "but I'm unwilling to say what that action should be."

Yes, we Americans have risen to meet previous challenges. The problem is, we haven't been doing so well in dealing with the energy crisis, which has been going on for at least forty years—since 1970, when U.S. oil production peaked and began declining. Despite complaints, exhortations, and hand-wringing from both Democratic and Republican administrations, very little has actually been accomplished. America continues to import more oil, and to burn enormous amounts of coal and natural gas—and the monetary, geopolitical, and environmental prices we pay for these depleting fuels just keep escalating. Mr. Obama seems to say that now something has changed, but it would be nice to know what, and why, in a lot more detail.

The reality is that nothing significant has been done to deal with our energy crisis because tackling it will require fundamental changes to our economy—to our transport and food systems, even to our financial institutions. Until we are willing to honestly face the fact that an "American dream" based on ever increasing rates of consumption of non-renewable resources is a dead end, and that we will have to dramatically cut back on energy usage in order to make a transition away from fossil fuel dependency, all discussion about renewable energy, efficiency standards, and energy research is fairly pointless.

Call it the Carter Curse. Ever since the great peanut farmer-President scolded the American people about the need to reduce consumption in his famous series of cardigan-clad homilies, leaders have shied away both from telling the American people the truth about just how dire our energy dilemma really is, and from proposing any remedies powerful enough to make a difference. Instead we get only whimpers about our "addiction to oil" and timid suggestions to raise fuel economy standards another notch. It is assumed that if any President

actually told it like it is—the way Carter did—he or she would suffer the same fate. Carter's plan, after all, was ignored by Congress and ridiculed by candidate Ronald Reagan, who trounced Carter in the 1980 election.

Maybe the Carter Curse is real. Perhaps straight talk about energy is political suicide. But if nobody at least tries—if no one has the courage to make specific proposals that are commensurate with the scale of the challenge that faces us—then the political survival of the current office holder is essentially irrelevant. If no one is willing to confront the Carter Curse head on, then in effect we face a failure of our political system that will ensure a failure of our economic system, our food system, and our transport system.

I keep hoping that's not the case, but hope needs to be based on evidence from time to time, and I'm not seeing any.

FREE!!! Oil Exec Quote Generator

In a recent video interview, former Shell Oil Company President John Hofmeister let loose the bracing forecast that, if the world economy shows signs of improvement, petroleum "will surpass $100 a barrel either at the end of this year or during the first half of 2011," with prices "staying in the triple digits until an alternative source of energy begins to replace liquid fuel." For careful listeners, an even bigger bombshell came toward the end of the interview: "I think over the next 5 to 10 years we will peak in the production of what's called conventional or easy oil. . . . We will not in anyway peak relative to the resources left in the earth. But the resources left in the earth will be higher risk and higher cost to produce, which will increase the cost basis on which ultimately gas prices are set."

So there you have it. Worldwide production of "conventional" oil will peak and drop off frighteningly soon. But, not to worry: "We will not peak relative to the resources left in the earth."

Huh? Did Hofmeister just endorse the Peak Oil hypothesis, or deny it? And what does he mean by saying that "the resources left in the earth" will not peak? After all, we're talking about depleting, non-renewable resources here; does Hofmeister intend to imply that there's more oil in the Earth's crust today than there was a couple of hundred years ago before we extracted and burned that last trillion barrels? Weird.

Anyway, he does seem to have both denied and confirmed Peak Oil, using a clumsy bit of verbal jiujitsu. What's notable is that he came closer to admitting the awful truth than most sitting oil execs would ever permit themselves to do (there's evidently something wonderfully freeing about being a *former* corporateofficer). Most of Hofmeister's colleagues who are still in harness have an even more finely honed gift for evasion when it comes to discussing future petroleum supplies. Their standard line is that worries over an imminent peak and decline in world oil production are worthy only of derision—a point they cleverly drive home with a time-worn mischaracterization of the Peak Oil argument ("We're not running out of oil!") followed by a paean to the wonders of new technology.

It must be a terrible nuisance for these harried executives to have to keep formulating reassuring replies to ever-more frequent questions about future world oil supplies, and about the irritating environmental problems that seem to crop up increasingly as a result of extracting oil from ever-greater depths.

So, as a matter of public service, I would like to donate this Oil Exec Quote Generator to any CEO, President, or other official who might wish to put it to use. It can easily be made into a computer program that will randomize phrase choices so as to produce dozens of unique public statements (and will soon be available as a free iPhone app!).

Let's say you—as a corporate officer of BP, Exxon, Shell, Chevron, or . . . take your pick—have just been asked yet another annoying question about whether world oil supplies will be sufficient (for much longer) to maintain economic growth and stave off fuel price spikes and shortages, and whether environmental disasters like the Deepwater Horizon blowout underscore the importance of a rapid societal shift away from oil dependence. Boring! How to respond? Easy. Just fill in the blanks:

"We believe fears about Peak Oil to be . . .

a. unsupported by evidence.
b. utter rubbish emanating from cretinous doomsday cultists.
c. compellingly credible.
d. strangely arousing.

"People have been forecasting the end of oil . . .

a. for decades.
b. since the age of the dinosaurs—no, since the Big Bang.
c. with ever-greater urgency—especially since 2005, the year of maximum world crude oil production so far.
d. just to tick me off.

"Such predictions have always failed before because . . .

a. we've continued to find more oil, and we've found ways to get increasing amounts out of existing oilfields.
b. planet Earth is like a Hostess Twinkie, except the sweet creamy center is actually nothing but pure West Texas crude.
c. the early ones were premature and relied upon incomplete data.
d. we humans just plain deserve to have inexhaustible resources to satisfy our ever-burgeoning appetites.

"We now have technology capable of . . .

a. exploiting resources that are buried deeper, and that are trapped in less porous rocks, and that are of poorer quality, than ever before.
b. drilling from Houston all the way to Baghdad and back.
c. almost making up for rapidly declining production of affordable, high-quality oil from the old, giant, on-shore oilfields we've been relying on for decades.

d. confusing, entertaining, and distracting consumers so effectively that they completely ignore the obvious fact that their lives are entirely dependent on an utterly unsustainable system of non-renewable resource extraction.

"While it is true that drilling deeper and in more challenging environments involves greater risks . . .

a. we believe these risks must be weighed against society's undeniable need for a continued, reliable supply of fuel.
b. we are confident that governments and citizens will ultimately shoulder most of those risks and leave us and our investors free to profit handsomely from this one-time-only extraction of Earth's limited energy resources.
c. we've run out of relatively safe and easy places to explore for oil (we've looked under all the sofa cushions!), so from now on every new oilfield will just have to be a geopolitical, economic, and environmental roll of the dice—with ever higher stakes, and everyone a potential loser.
d. I'm really enjoying my multi-million dollar bonus from last year and I have a well-equipped luxury survival bunker in an undisclosed location.

"In all, we believe that the oil industry . . .

a. is well positioned to continue supplying the world's energy needs for decades to come.
b. is gradually starting to wind up shop, since most of the oil that's left to exploit is going to be prohibitively expensive to produce.
c. has made gazillions in privatizing profits from the extraction of humanity's common heritage of natural resources—thank you very much and goodbye.
d. is successfully maintaining a somnolent condition of helpless dependency among the general public; when I snap my fingers, you will awaken refreshed, with no conscious recollection of this interview.

See? It's so easy. You, an important corporate officer, can now save big $$ on hiring useless PR hacks—you can write your own speeches and press releases! Or, dear reader, if you don't happen to be an oil executive, you now at least know how to sound like one.