Jean Laherrere

19 October 2009

My reply to WebHubbleTelescope for his comment on TOD 5865 "Comments on Scientific American's "Squeezing more oil from the ground" Posted by Luis de Sousa on October 19, 2009

WebHubbleTelescope on October 19, 2009 - 12:46am

The average size of oil discovery is 0.3 Mb for United States, 0.9 Mb for Canada and 740 Mb for the Middle East, 14 Mb for Africa, and 7 Mb for the world outside US & Canada. Again comparing the United States with the rest of the world is comparing apples and oranges!

For the USA the top 3% discoveries by volume contain 70% of the oil. One would think that since the average size of discovery in the Middle East is so large (740 MB), that they may have a significant fraction left if the Pareto law holds.

I can give an estimate if I can get a value for the total number of discoveries in the Middle East discovered so far. The formula is very straightforward. Total = Number *C * ln (MaxSize/C) where C is the characteristic size, which is about twice the average.

WebHubbleTelescope should know that Pareto is a power- law and is poor description of the fractal display of natural events

The fractal display for items is to list them by rank of decreasing size and the display in log scale of size versus rank.

Mandelbrot was the one who introduced the term fractal ;

The world is fractal but most people stop at looking at linear trend, finding a unique fractal dimension (Zipf), but are obliged to speak about multifractal to describe natural events as earthquakes, galaxies, urban agglomerations, oil reserves.

-Laherrère J.H. 1996 "Distributions de type fractal parabolique dans la Nature"-Comptes Rendus de l'Académie des Sciences- T.322 -Série IIa n°7-4 Avril p535-541

http://www.oilcrisis.com/laherrere/fractal.htm

-Laherrère J.H., D.Sornette 1998 " Stretched exponential distributions in nature and economy: fat tails" with characteristic scales" European Physical Journal B 2, April II, p525-539 : http://xxx.lanl.gov/abs/cond-mat/9801293 or

http://www.edpsciences.com/articles/epib/pdf/1998/08/b8019.pdf,

www.citebase.org/fulltext?format=application%2Fpdf&

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-Laherrère J.H. 2000: "Distribution of field sizes in a Petroleum System: lognormal,

parabolic fractal or stretched exponential?" Marine and Petroleum Geology 17/4, April, p539-546 http://www.elsevier.nl/cgi-

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In a fractal display, power law distributions are linear. Fractal displays are curved and not linear -earthquakes



-oilfield reserves in Niger Delta



⁻oilfields in the Gulf of Mexico



Ivanhoe & Leckie « Global oil, gas fields, sizes tallied, analyzed » OGJ Feb 15, 1993 reported the number of the fields and sizes reserves of the world and the US <u>http://hubbert.mines.edu/news/Ivanhoe_00-1.pdf</u>.

It is obvious that comparing US and the rest of the world (or Middle East) is comparing apple and orange



In this article I found that the fractal distribution of US gas fields was crooked (not well curved). I called Georges Leckie and he told me that Ivanhoe had confused some lines, omitting the line of 1000 Tcf. The corrected number then displays a perfect parabola. Finding when looking at the beauty of a curve that the data is wrong was one of my best discovery. No one has corrected the article.



It is obvious that the display is not linear and Pareto does not apply ! There is no way to estimate Middle East ultimate using US distribution and Pareto law.

Furthermore there is a King effect in some fractal distributions disturbing the handling of statistics.

-Laherrère J.H. 2000 ""King effect" in parabolic fractal distributions" 23rd Internat. Conference on Mathematical Geophysics « Extreme earth events » Villefranche June 18-23, poster