

The Differential Deception

by Lynn Andrew

The world today is unique. No time in history have humans blanketed the earth with brain power. International cooperation in science, technology, and business have achieved astonishing efficiency in agriculture, manufacturing, and distribution, spurred by massive demands for better food, shelter, transportation, communication, medical services, etc. What we thought were limits have been surpassed over and over again—not to mention products that were priceless a few years ago now being cheap enough to flood the world—all in spite of chronic political turmoil.

We live at a jungle frontier in time, and none have been successful in forging far ahead. We do not know in absolute terms what humankind is capable of doing with the planet or what human ingenuity can make of its resources. Doomsday forecasters predict rock-solid limits and pronounce disastrous results of more growth, but they have nothing to base their calculations on other than past history from which no adequate model can be built. So they lean heavily on recent differentials.

In order to extrapolate from history we need a model that continues to work in the future. One thing history proves is that estimates of what is possible are seldom accurate: scientifically established impossibilities became possible; dreams of the futurists remain mostly dreams. No one besides God has a handle on the future. It is impossible for us to know where the world stands in an absolute sense other than by divine revelation. But that doesn't keep the professional and amateur prognosticators from trying, and neither does it discourage people from listening to them.

People have never questioned whether doomsday is coming. They only seek to find out which doomsday scenario is correct. They watch developments and try to match events to expected outcomes. Since no one knows what our statistics mean in an absolute sense, differentials are the only tools we have—changes are all that can be reported. This is the

nature of news reporting and all that it can be.

People are fearful of the world's systems breaking down and wondering if now is the time to prepare for catastrophe. So lacking anything better, current events are used to estimate where we are in absolute terms. But these changes, or differentials, are poor predictors of the future. Only if you had a model that takes into account whatever is yet to be discovered could differentials help; and that is what we do not have. If you try to work it out in your head, you will always be badly mistaken because of the complexity that leads to counter-intuitive outcomes.

Since the world is far too complex to model in terms of first principles, we have to settle for differentials if we must try to have a sense of where we are headed. For example, an increase in the number of earthquakes is taken as being significant in its own right; but without knowing what the world can absorb and how additional quakes will affect everything, we really have nothing to justify this: there is no way to judge the absolute significance of any particular rise in earthquake frequency.

Furthermore, differentials are fundamentally deceptive: they exaggerate. To demonstrate this, draw a graph of some statistic. It doesn't matter what it is. Make up a line plotting something on the vertical axis against time on the horizontal scale. Measures of complex things usually have a ragged appearance when graphed on a frequent basis. But for the purpose of this demonstration, make the line as smooth as you like; only have it change its slope suddenly at least once: one or two little kinks or knuckles—something to make it look a bit realistic.

Now if this line represents something that everyone is interested in—like the count of active wars, say—knuckles reflect the news: they occur at least when a new war starts to brew and then when it escalates into something major. At the point where the brewing starts, your line will tilt upwards a bit and then level off at an increment of one after the war becomes officially counted as a war. The line makes this tilt upward, goes through the transition period at some angle, and then levels off at the new count of active wars. The slope changes at points where extraordinary events occur: big news events; events that change the world.

The curve you have drawn represents the true picture (relatively, not in an absolute sense because, as in the count of wars, even if it is a true number it has no absolute meaning in the context of everything else). What we get in news reports is the differential: something has happened. The differential curve shows changes in the true curve. If you're familiar with elementary calculus, you recognize the terminology. When the slope kicks upward a bit, the differential plot suddenly and dramatically jumps to a new level. Then when your curve comes to its new level the differential suddenly drops back to zero. It gives you the jitters.

Without troubling to think about this, we view the world in terms of its differentials. Daily news reports are collections of differentials, not a pictures of reality. The integral of the differentials is reality. The integral smooths everything out and offers the possibility of short-term extrapolation. But the impression of being at the cutting edge to the future is lost in the integral. The differential is the commercially-viable news product that seems to satisfy the demand to know where the world is headed.

Some things are reasonably predictable because they're cyclical or involve a cyclical component. One cyclical model is a sinusoidal function. What is the curve of its differentials? It's another sine function 90-degrees displaced from the first. So the differential curve is zero exactly when the reality is at its maximum or minimum: the news is quiet when real things are extreme and extreme when things are normal.

If you don't know this you can be deceived. For example, if slight variations in annual solar activity are cyclical, the years when change is most rapid are the average, and the years when change is small are the most extreme and ready to go the other way.

This is why doomsday forecasters who base their estimates on differentials without having an honest model are always wrong—usually very much wrong—and why in spite of that they're guaranteed a perpetual market for their books among the mathematically challenged who see no problem with their method. Whether those authors are sincere or whether they're laughing all the way to the bank I leave to your homework.