# HindeSight

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**Monkey Business – Reality, Illusion or Delusion**

It is an honour and great pleasure to be here before you all today. For those who have the good fortune of not knowing me, my name is Ben Davies. I am the co-founder and CEO of Hinde Capital, a UK investment management company.

I want to offer you what I believe to be a truism. A golden truism.

**The Desire of gold is not for gold. It is for the means of freedom and knowledge.**

There are over 30 nations represented here, all with their own cultures and idiosyncrasies; but I suspect we are all bound by one common denominator. We want certainty. But to have certainty we need to acquire knowledge.

Rene Descartes, hailed as the 'Father of Modern Philosophy', immortalised us all when he stated – 'cogito ergo sum'. Quite literally - I think, therefore, I am or as he preferred I am thinking therefore I exist. This was his first law of certainty. Objectively speaking certainty pertains to having perfect knowledge that has total security from error. Alternatively put - one's mental state of being has no doubt about the outcome.

Voltaire reputedly stated "doubt is not a pleasant condition, but certainty is absurd." I think we would all agree with that, which is why I believe the British liberal economist and philosopher John Stuart Mill had it spot on when he said, "There is no such thing as absolute certainty, but there is assurance sufficient for the purposes of human life." We all want assurances.

And so I come here today to impart an important piece of knowledge. Some assurance. So sacred is this knowledge that I deliberated at much length whether to impart it. But I have decided to throw caution to the wind and give you this assurance.

"Martinis are like a woman's breasts, one is not enough, two is just right; but three is just plain wrong...."

**A Golden Truism**

"The Desire of gold is not for gold itself. It is for the means of freedom and knowledge."

I revert back to perhaps this more suitable truism for today's talk.

I actually bastardised the words of the American philosopher Ralph Waldo Emerson. He was a champion of liberalism and the individual. Gold (or ownership of) enables one to be self-reliant, and independent of government and the state. Emerson actually said "the desire of gold is not for gold. It is for the means of freedom and benefit." I replaced benefit with knowledge, but why?

Knowledge - the classical definition specifies that a statement must meet three criteria in order to be considered knowledge: it must be *justified*, *true*, and *believed*. That definition sounds very much like having certainty. By acquiring knowledge can we find certainty? Can we predict an outcome from events known today? I actually believe we can.

**Grand Delusion**

I want to take us on a rather existential journey of financial markets.

**But first I want to show you a very brief video.**

*** What I am about to show you requires sustained attention and concentration.**

*** You will observe in this short video 3 people wearing white shirts passing a basketball to each other and 3 people wearing black shirts passing a different ball to each other.**

*** Your task is to count the total number of times the people wearing white pass the ball. Do not, I repeat do not count the passes by the players in black.**

***I want to emphasise that the counting task is difficult and that it requires total silence and concentration.**

**(*After the video state:* "Please remember how many passes the people wearing white made and don't discuss the video until the end of my talk.")**

*This might come as a shock, but everything you think is wrong. Much of what you take for granted about day-to-day existence is largely a figment of your imagination. From your senses to your memory, your opinions and beliefs, how you see yourself and others and even your sense of free will, things are not as they seem....*

These were the opening lines from a New Scientist article – titled the Grand Delusion. The video will illustrate that the oft cited colloquialism "my reality is not your reality" is true. And we define a truism as fact - ie reality. Told you I was going to get all existential on you.

We have 5 senses - sight, hearing, smell, taste and touch. These are our windows on the world, but after reading this article I realised how unreliable they are in depicting an accurate reality.

Take vision. A neurologist will tell you that every 5 seconds or so, you blink. Now unless you are thinking about it, as you undoubtedly are now (oh gosh I can't stop blinking), you don't notice the mini blackouts, because your brain edits them out.

Ron Rensink, a leading computer scientist and psychologist who has researched human vision and visual systems explains that our sensory perceptions, especially vision, is merely a figment of our imagination.

Our vision is akin to a movie as fast jerky movements of the eye known as saccades fixate on one spot for fractions of a second, before moving on. They occur over 3 times a second and last up to 200 milliseconds. Remarkably even though during these saccades we are effectively blind, our visual system somehow grabs a bite of high-resolution detail by which to mesh an *illusion* of completeness.

In conjuring up this "completeness", the visual system has to do something quite remarkable. It has to predict the future. Without this future projection you would be unable to catch a ball, dodge flying objects or walk around without crashing into things.

So surely this means we can predict certainty? If the brain makes an accurate prediction of events then surely I as a market practitioner will be able to predict an outcome of markets in our complex financial system? Like you all I want answers.

**Quantum Physics**

Last year I was invited to speak at the Committee for Monetary Research and Education. There I touched on Heisenberg's Uncertainty Principle. I want to reintroduce it here.

In quantum physics this principle states that certain pairs of physical properties, such as position and momentum, cannot be simultaneously known to arbitrarily high accuracy.

The physical example Heisenberg used was the following. The more precisely you try to determine an electron's position, the less likely can you determine its momentum. A forecast of the electron's trajectory is therefore subject to unavoidable inaccuracy. And herein lies the issue with macroeconomics (and by extension financial markets). One cannot be deterministic. Events are not causally determined by previous events alone. A known event does not predict a known outcome.

Although much can be learned from this theory, this is where the analogy ends. The act of experimenting with the electron and measuring position did not alter the outcome. In a human system the very act of forecasting or predicting an outcome actually influences that very outcome. This we call the feedback mechanism. It is encompassed in a theory many will know as "reflexivity."

Reflexivity refers to the circular relationships between cause and effect, what the philosopher Karl Popper referred to as the Oedipal effect (mothers, beware) -- an act of self-reference where examination or action bends back on itself.

Take the interaction between beliefs and observations in a marketplace. If traders believe that prices will fall, they will sell, thus driving down prices, whereas if they believe prices will rise, they will buy, thereby driving prices up. "Self-fulfilling prophecy" is another term you could ascribe this to.

If only markets were so simple.

Karl Popper believed that even scientific knowledge does not qualify as the ultimate truth. Rather, scientific theories should be accepted as provisionally true as no amount of corroborating evidence can rule out the possibility that some contradictory evidence will turn up in the future.

We are all capable of acquiring knowledge but we can never have enough knowledge to allow us to base all our decisions on knowledge. It follows that if a piece of knowledge has proved useful, we are liable to overexploit it and extend it to areas where it no longer applies so that it becomes a fallacy. One known fact today is that even in the age of information technology no society can have perfect information. No one person can likely understand everything. And even if they could, it would influence their interaction inside and outside the marketplace.

I believe that George Soros coined the phrase a 'fertile fallacy' -- meaning that imperfect knowledge creates first a self-reinforcing cycle and then a self-defeating cycle. It is how bubbles are believed to arise.

Market prices always distort the underlying fundamentals; mistakes can become "fertile fallacies" and change reality in a feedback loop, causing bubbles.

Cyclical behaviour of boom-bust is understood by most now. Rational behaviour becomes irrational in the thickening of the maddening crowd until the crash wakes us from the insanity. We understand it but we still can't predict when the cycle collapses. The very reality that we get it alters our fertile fallacy. It invalidates it.

I said all this at the CMRE. I also said maybe there is a predictive market model but we just don't know it. After all, we have imperfect knowledge.

I was right I do have imperfect knowledge - as since this speech I finally sat down and read a book by the prominent physicist Didier Sornette. He found we could at times predict outcomes.

**Econophysics**

In 2003 he published what I believe is a seminal piece of work, 'Why Stock Markets Crash? Critical Events in Complex Financial Systems.' It is a study of a complex system - financial markets. It draws from a wide range of disciplines, both natural and social sciences. Sornette set out to disprove the theory that complex systems are not predictable and that to comprehend them you have to look at them in their entirety, not compartmentalised into their single components. It is a case of the sum is truly greater than the parts.

It was his work as a geophysicist that led him to understand that 'failures' in natural phenomena were observable and translatable empirically to the 'failures' that occur in financial markets. In 1991, whilst working on Arianne 4 and 5 space rockets, he realised that the rupturing of the composite materials, Kevlar-matrix and carbon-matrix that constituted the pressure tanks on the rockets, was a cooperative phenomenon. The 'ruptures' in the bonding structure of these materials, were analogous to financial crises. They were the 'ruptures' of the market.

Sornette showed empirically what many of us who traded or invested in markets for these past few decades intuitively believe. The underlying causes of market crashes will be found in the preceding months and years, in the progressively cooperative behaviour of participants. Effective interactions between investors and speculators alike, lead to accelerating price point higher: the bubble. This is the *critical* point at which the market crashes.

A crash will occur because the market has entered an unstable phase and is not dependent on external disturbances (trigger) to do so (although associated triggers are observed). An analogy will help to illuminate this concept:

If one holds a ruler vertically on one's hand, without constant adjustment the ruler is clearly unstable and an innocuous movement or breath of air can send the ruler earthward bound. The proximate action is not really the cause but the endogenous structure that has prevailed in the months before, is. It is an internal process not an external one that enables the crash. It is a process constructed by the *self-organising dynamic* of the market as a whole.

Sornette throws a spanner in the notion of Gustav Le Bon which was that people are unpredictable. In Gustav’s book "The Crowd" this French psychologist observed the behaviour of the masses. He introduced the Law of Mass Action or Mentality: when it comes to the effect of social behaviour on the intelligence of individuals, 1 + 1 is often less than 2 and sometimes considerably less than zero. Now we can actually predict these numerical outcomes.

**Distorted Monetary Systems**

However what happens to a potential outcome when we observe action beyond the natural dynamic of market, ie when there is distortion?

Intervention in or manipulation of markets by the state is such a distortion; it can postpone the day of reckoning for years or even decades. It creates a false sense of equilibrium that ultimately gives way to disequilibrium and heightened instability.

Now if I haven't lost you all, I would like to say I believe markets can be described as complex dynamic systems that may switch between regimes. Markets move in and out of balance on varying temporal horizons. They naturally overshoot and undershoot but this behaviour tends to become excessive in a systemic way when they are deliberately distorted.

A market may stay in a state of homeostasis when it is devoid of new information. Then when information complexity increases market participants resort to collective and imitative behaviour. This herding can lead to excessive price movement. If not corrected such behaviour leads to a loss of traders' heterogeneity and, at a critical point, a crash occurs.

Confronted by a complex financial system – that of fiat money – individuals have shown inertia ie homeostasis. But as individuals begin to obsess about the validity of credit and the monetary system so we have begun to see an incremental rise in gold ownership. This has led to an inexorable rise in the gold price and an ongoing demise in the value of paper money.

Until now this has been a slow process but the world is undergoing a global phenomenon, a shift from 'aurophobia' - a fear of gold to a golden epiphany. An awakening if you will.

**Gold Masking**

Let me elaborate more.

Earlier I mentioned that saccades, are fast eye movements. In our vision we suffer from saccadic masking or suppression. This is the phenomenon in visual perception where the mind selectively blocks visual processing during eye movements in such a way that neither the motion of the eye (and subsequent motion blur of the image) nor the blind gap in visual perception is noticeable to the viewer.

The phenomenon was first described by Erdmann and Dodge in 1898, when it was noticed that an observer could never see the motion of their own eyes. This can easily be duplicated by looking into a mirror, and looking from one eye to another. The eyes can never be observed in motion, yet an external observer clearly sees the motion of the eyes.

Governments have induced their own version of saccadic masking - a gold masking. The necessity for gold as sound money has been suppressed/ manipulated in the mindset of individuals, despite centuries of evidence suggesting otherwise. GATA talks are as much about the subliminal effects of propaganda as they are used to deflect our attention away from the reality that gold is money, as they do about the actual physical suppression to keep gold prices low. I consider the former perhaps even more insidious than the latter.

This homeostasis has become so engrained in us that it has been reflected for a long time in financial markets, after all markets are the product of a myriad of human thoughts and behaviour. They mirror mankind.

But how can markets be stable when the value by which they are measured is in an amorphous and corruptible state. What is the value of a barrel of oil, a tonne of wheat or corn? How can we value it and plan production safely when we do not know the true worth of the unit of account that measures it – ie the worth of the numeraire.

**The ultimate manipulation of markets is a function of control of this numeraire. Market participants are merely deluded by an illusion of value.**

We have not experienced free markets -- that is, the invisible hand -- for decades. The recent failure of markets to predict uncertainty was not a failure of free markets but a failure of fiat money and socialism. Gold, as our very own Chris Powell (GATA) never tires of telling me, is the centre of the universe, and truth be told I never tire of him saying it.

The symbol for gold – is an eye in a circle – from the Egyptian for the Sun God - Ra. It means all seeing. The steady rise in the price of gold is that of knowledge. Gold is all knowing. Like our own visual cortex is gold predicting an outcome?

I believe we are witnessing a final transition phase of the global financial system. There is only one outcome and of that I am certain of. As Ludwig von Mises so eloquently stated:

"There is no means of avoiding the final collapse of a boom brought about by credit expansion. The alternative is only whether the crisis should come sooner as the result of a voluntary abandonment of further credit expansion, or later as a final and total catastrophe of the currency system involved."

**Liberal Economics**

Mises was a liberal economist and by exploring the work of Liberal economists, more specifically Austrian Economists, one can outline how a debased numeraire distorts everything.

They theorise that interest rates reflect a particular preference of human beings, namely *time preference*. Humans prefer to have things now than in the future, and are prepared to borrow money at interest to obtain them. When we lend something, we demand to be paid interest. This forms the basis of the theory of investment, production and use of capital.

The Austrian school of thought enables one to understand that economic decisions are inherently personal. Value does not exist in things, but in the minds of the individuals who value them. Trade occurs and prices emerge precisely because people value things differently. Markets steer goods to their most valued uses. Private ownership is essential to achieving the best results.

Government / Central Bank intervention, will disrupt this highly complex market process and invariably produce perverse results. Inflation is such a policy mistake brought about by setting interest rates too low.

**Setting of interest rates at face value may appear to be an indirect manipulation of prices but in reality it is a price control extraordinaire.** Like other economic goods, there is a *supply* of money and a *demand* for it, and money has its *price* (interest rate). The price of money is expressed a little oddly – not in terms of the value of goods that will exchange for one unit of it (how many loaves of bread for a dollar), but the number of units of money that exchange for the other goods (how many dollars for a loaf); and we talk about its *purchasing* power rather than its price. Yet the purchasing power of money is a price like any other, decided by how people value it, through the pressures of supply and demand.

If you set the price of money too low, you are encouraging individuals and corporations to borrow as there is no perceived cost to them - the interest rate is so low right now it feels like free money to people and it is, until it is used elsewhere. A parallel universe of overinvestment and overconsumption occurs simultaneously, until such time as the rate of savings cannot support it. Simply put, one runs out of potential capital.

This is exactly what Central Banks have achieved. They have lowered rates around the world below the market interest rate which would normally reflect consumer preferences. Public and private sector borrowings have been so egregious that they have run out of true savings and are reliant on creating infinite amounts of money (out of thin air) to replace hard earned savings. If the economy could thrive on such money, life would be very simple. In fact if it was that simple why would any of us ever work? It would all be play time.

This increase in the supply of money has set off an avalanche of price changes which has torn through markets, drawing resources first to one place, then another, creating real and destructive changes. Money is not *neutral*.

Central Banks are a form of cartel. The US may own the reserve currency status but the fiat monetary order under Bretton Woods II has encouraged a collaboration on the fixing of money prices.

Unfortunately the criticism levelled at capitalism's supposed failings are not a function of failed free markets but of state intervention in the supply of money. The failing of the banking system is the product of meddling in the true or real rate of interest which has distorted all pricing mechanisms in the production of both credit, resource availability, manufactured goods and services. This has been a global phenomenon.

"We are all Keynesians now" - if only Nixon had supplanted the word Austrians for Keynesians, perhaps then we would not have been in the mess we are today.

Mises did not much approve of mathematical models and statistics, citing them as being too unreliable. But like all polymaths, he realised he could learn much from other fields of knowledge. Sornette's use of physics and mathematics illuminated the impact of scale invariance and power laws in predicting market crashes. Mises would have been impressed.

Scale invariance - not an intuitive concept - is a feature of objects or laws that do not change if scales of length, energy, or other variables, are multiplied by a common factor. A snowflake is an example of scale invariance - it has fractals that when magnified 3 or 4 times show self-similarity. They are identical irrespective of size.

**The Internet Reformation**

It is this scale invariance that is observed in the collaborative sharing of information. It can escalate at an exponential rate.

The internet provides us with knowledge that can be shared. The way we handle information is a much more user generated and personal experience before the internet. The internet provides subjective analysis not the directed and didactic views of the monopolised press.

Let's hope Google and Facebook do not fall foul of this Murdoch syndrome. However I suspect their monopoly on internet content will ultimately corrupt them and harm the freedom of information. Monopolies in the private sector are just as pernicious as a State monopoly.

Until then Libertarians can rejoice. Gold protagonists too.

We have sought reassurance through knowledge, because not since the arrival of the Gutenberg printing press has humanity been so challenged by the printing of monetary notes. Oh, the irony -- Gutenberg was himself a goldsmith by training. I am sure that he could never have envisaged the abuse the financial printing presses would have on mankind's development.

Interestingly his invention was a powerful positive for the Protestant Reformation, as equally positive I believe as the Internet Reformation is in assisting movement away from fiat currency to gold and a potentially sound monetary system.

The Monetary schism is growing wider by the day.

Owning gold by definition is an inverse function of not owning paper money. The more individuals switch their holdings of money, the faster this process will proceed. This is an example of scale invariance at work which if it observes power laws can accelerate exponentially. Let me use a little bit of mathematical certainty to show you why?

**Mathematics and Certainty**

I want to round off with some short term mathematical certainties for where the gold price is heading. I recently read an invigorating book on mathematics. Invigorating Mathematics. Surely that's an oxymoron. The book by Marcus Du Sautoy - The Music of The Primes popularises maths for the innumerate. It tells a thrilling saga of the quest for the riddle behind prime numbers.

Prime numbers are the very atoms of arithmetic. The primes are those indivisible numbers that cannot be written as two smaller numbers multiplied together. Every molecule in the world can be built out of atoms in the periodic table of chemical elements. A list of primes is the mathematician's own periodic table. 2, 3 and 5 are analogous to helium, hydrogen and lithium. But for all their simplicity they provide an illusion of order.

Primes seem the most mysterious numbers in the known universe. Look through a list of primes and one will find that it is impossible to predict when the next prime will appear. Mathematicians over millennia have gone insane trying to solve this riddle. As Sautoy puts it - "at the centre of mathematics, the pursuit of order, mathematicians could only hear the sound of chaos."

**Reimann Hypothesis**

It is the Reimann hypothesis, proposed by Bernhard Reimann in the 1850s, which implied results about the distribution of the primes. It was the closest conjecture to a valid theorem. But it has to this day not been proofed. Mathematical parlance for a certainty.

But why should we care for such certainty? Our internet security depends upon the Reimann hypothesis not being solved for sure. The RSA public key cryptography algorithm invented by Ron Rivest, Adi Shamir and Len Aldeman (hence the initials RSA) - think VeriSign, EMC corporation - is predicated on the primes.

If you place an order on the internet, your computer is using the security provided by the existence of prime numbers with hundreds of digits. Apparently to date over a million primes have been put to use to protect e- commerce. It works because each prime is unique and the next prime in the series is not predictable.

There is a very real commercial interest in knowing the proof of the Riemann hypothesis. Business security and information on all of us depends on it. Mathematicians such as RSA can build these codes, but they can't break them. Unless someone is holding out on us. Maybe Google? Gold owners fear not, keep your bar list of allocated gold offline and your safe will not be cracked.

Unfortunately I wasn't able to crack the code over the summer so I thought I'd use a simpler method to make a gold forecast, namely Benford's Law. I thank Dr Engelhardt (a fellow fund manager) for bringing this to my attention, which I was reminded of when doing our work on Silver Criticality and power laws.

**Benford's Law**

Otherwise known as the first-digit law, Benford's law states that in listings, tables of statistics, etc., that a randomly selected number is more likely to have a small lead digit as ‘1’ or ‘2’ rather than a larger one. The law uses a base scale of 1 to 9.

The digit 1 tends to occur with a probability of ~30%, much greater than the expected equal probability distribution of 11.1% (i.e., one digit out of 9). Larger digits occur as the leading digit with lower and lower frequency, so the number 2 has a predicted frequency of 17.6%, 3 - 12.5%, 4 - 9.7%, 5 - 7.9%, 6 -6.7% , 7 - 5.8%, 8 - 5.1% and to the point where 9 as a first digit occurs less than 5% of the time.

Benford's law is another example of a power law at work. Like all power laws it is not uniform in its distribution. Unlike the bell curve, the distribution of numbers is skewed. A few numbers observe higher populated frequencies, whilst the rest are populated very lightly. These lowly populated numbers representing 5/ 6 / 7 sigma events. Rare events that Sornette predicted could occur at a critical point - a crash.

A strange feature of these probabilities is that they are "scale invariant". For example, it doesn't matter whether the numbers are based on the dollar prices of stocks or their prices in yen or marks, nor does it matter if the numbers are in terms of stocks per dollar; provided there are enough numbers in the sample, the first digit of the sequence is more likely to be 1 than any other.

The larger and more varied the sampling of numbers from different data sets, mathematicians have found, the more closely the distribution of numbers approaches what Benford's Law predicts.

This distribution outcome seems counter-intuitive but apparently they occur frequently in electricity bills, street addresses, financial prices, population numbers, death rates, lengths of rivers etc. I would note for almost any naturally-occurring data set, the number 1 will appear first about 30% of the time.

Benford's law has been used as a forensic tool to test for fraudulent or random-guess data in income tax returns and other financial reports. It has been used with some success, as such forms of data should fit the law, and so analysts can detect falsified data. Let’s examine its predictive capabilities, using gold.

Benford's Law predicts Gold?

Benford’s law is a logarithmic function; thus any data set that involves constant rates of growth should follow the law. The Dow Jones or gold would be an example.

"If we think of the Gold price as 1,000, our first digit would be 1.

"To get to Gold with a first digit of 2, the price must increase to 2,000, and getting from 1,000 to 2,000 is a 100 percent increase.

"Let's say that Gold goes up at a rate of about 20 percent a year. That means that it would take five years to get from 1 to 2 as a first digit, forgetting compounding.”

"But suppose we start with a first digit 5. It only requires a 20 percent increase to get from 5,000 to 6,000, and that is achieved in one year.

"When Gold reaches 9,000, it takes only an 11 percent increase and just seven months to reach the 10,000 mark, which starts with the number 1. At that point you start over with the first digit a 1, once again. Once again, you must double the number -- 10,000 -- to 20,000 before reaching 2 as the first digit.

"As you can see, the number 1 predominates at every step of the progression, as it does in logarithmic sequences."

"If gold spent 1.5 year trading between 1100 and 1400 that is where approx 60% of occurrences are - remember 1 occurs 30.1% of time, 2 - 17.6% and 3 - 12.5%. So it follows that the next 40% of occurrences from 1400 to 1900 will take under 10 months"

So if that 1.5 yrs was from Sept 09 to Apr 11, then we should be converging on $2,000 sometime by end of year to Feb 2012......

The Tao deity Lao Tzu allegedly said "Those who have knowledge, don't predict. Those who predict don't have knowledge." Seems like a wise old boy to me.

What I do know and have stated before, is that it is a mathematical certainty that we have no hope of sustainable growth, fiscal pump priming or not, by which to repay our debt burdens All available and existing capital has been devoured through the excessive use of leverage and credit. Still further we have borrowed from future generations, but I do not fear for my children I fear for us all - now.

**Before I finally finish please re-call the video I showed you earlier. (It wasn't that long ago...)**

*** I want you to re-call how many passes you counted by the basketball players wearing white?**

***Did anyone see or hear anything other than those players?**

**50% or more in this room, if you have not already seen this video will not have seen or heard anything.**

**(Let's quickly view the video again)**

***This time I do not want you to count.**

***Who didn't see the monkey?**

**Let's just verify your reality - are you are under an illusion or a delusion?**

How many of you noticed when you got out of the cab at the Savoy hotel which way you drove in - on the right side or left side of the road?

Savoy Court is the only street in the United Kingdom where vehicles are required to drive on the right. This is said to date from the days of the hackney carriage when a cab driver would reach his arm out of the driver's door window to open the passenger's door (which opened backwards and had the handle at the front), without having to get out of the cab himself.

I warn us all - we must ask ourselves are we all suffering from our own saccadic masking, are we all looking in the same mirror unable to observe the rapid eye movement that blinds us to our reality. Has gold priced in our fears of a failing monetary system, and if not are the measures by which we value gold reliable or just fertile fallacies. It is incumbent on us all not to be selective in analysis.

Confucius stated - "To know that we know that we know, and that to know we do not know what we do not know, that is true knowledge." I wonder where the word confused is derived from.

At the end of the day it's all just monkey business. Isn't it.....

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