

TRENDS JOURNAL

HISTORY BEFORE IT HAPPENS®

It's time for Blockchain Voting



► The sharp decline of Bitcoin and other major cryptos

IN THIS ISSUE

HISTORY BEFORE
IT HAPPENS®

TRENDS JOURNAL®

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Asian markets have been diving all year.

COVER STORY

Equity market meltdowns

Global Recession ahead. What can stop it? **3**

FEATURES

Blockchain voting

Voting process: mockery to Democracy. **6**

As forecast, pot is hot

It's about to explode. **9**

Gold vs. Cryptos

Invest or divest. **12**

Triangles of death: Economic disaster, social unrest

A contagion economic effect. **15**

The 5G gamble

Another risk to your health. **19**

Creativity

The new solution for midlife crisis. **22**

Our polluted oceans

New technology, social awareness making oceans' future brighter and soon. **24**

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WHAT IN THE WORLD IS GOING ON?

Each new day seems to bring with it a new geopolitical crisis, one more political debacle, more dire economic warnings, increasing social disturbance or another environmental threat. What does it all mean? What can be done? How will it end?

Gerald Celente's **Trends Journal®** is the only magazine in the world that pinpoints how today's current events form future trends and how they will affect your business, career, family and future... your life.

Founded by a political atheist, agenda- and advertising-free, and beholden to no one, the *Trends Journal* provides unbiased insights, analysis and forecasts of critical socioeconomic, financial, political, economic, business, consumer/retail, entertainment, technology, science and other trends that are fact-based, data-driven and on the cutting edge.

Gerald Celente's track record speaks for itself. He's been forecasting worldwide since 1980.

No one has been so right, on so many issues, so often! If you want to anticipate change, take proactive measures to seize opportunities and develop profit strategies, subscribe to **Trends Journal**. Read about "History Before It Happens" from the world leader in trend forecasting.

TRENDING

Campus depression

Mental health disorders rampant in college freshmen. **27**

Clean water

Cheap filter makes toxic water safe. **27**

Big brewers think outside the six-pack

Beverage market has become a free-for-all. **28**

Do household cleaners make infants obese?

New science underscores the risks. **28**

Growing your new heart

Harvard University researchers have grown a left ventricle of the human heart. **29**

Mechanical carpenters

Building robots that build buildings **29**

Drinkable sensors monitor tumor treatment

Swallow this to see your progress. **30**

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Wild swings hit U.S. markets, while many global markets are tanking.



Gerald Celente

Equity market meltdowns

Global recession ahead. What can stop it?

On 19 September, two days before U.S. equity markets hit new highs, we alerted *Trends Journal* subscribers to prepare for an Economic 9/11.

In October, the Nasdaq slumped 9 percent, its biggest drop since the Panic of '08. And the S&P 500 lost 7 percent, its worst month since September 2011.

And it's getting worse. On 20 November the S&P 500 fell into correction territory down 10 percent from its 21 September record-closing high, and more than 40 percent of S&Ps fell into bear territory, down 20 percent.

Sometimes I am reminded that I missed the great stock market boom following the Panic of 08.

Why did I miss the market rally?

Tracking trends is the understanding of where we are, how we got here and where we're going. In the history of the world, there was no such thing as negative and zero interest rate policy. There was no such thing as massive too-big-to-fail trillion dollar bailouts. There was no such thing as quantitative easing.

What I have been forecasting, is that the global financial Ponzi scheme that artificially boosted global

It was cheap money that artificially propped up equities and economies around the world and now it's more expensive money that's bringing them down.

equities will end, and the end is near.

MAINSTREAM MEDIA CATCHING UP TO TRENDS

Throughout the year, as mainstream media attributed equity markets swings to tariff and trade wars fears or any number of other false flag indicators, we had long noted, it was rising U.S. interest rates that would implode economies and markets worldwide.

With some \$250 trillion in global debt, much of it dollar based, as the dollar grows stronger and global currencies get weaker, the cost burden of servicing that debt grows heavier. Subsequently, as forecast, economies worldwide are slowing, stagnating and/or falling into recession.

And now, with the first strikes of Economic 9/11 hitting markets, Wall Street is going negative on Wall Street:

- Billionaire investor Paul Tudor Jones: "From a 500,000 feet viewpoint, we're probably in a global debt bubble... Global debt to GDP (Gross Domestic Product) is at an all-time high."
- Bridgewater Associates hedge fund magnet, Ray Dalio: "The world by and large is leveraged long ... these low rates have created an incentive to borrow money and buy stocks. That's what caused the market to go up."
- Goldman Sachs is forecasting the U.S. economy will slow to a crawl next year... particularly "in the

second half of next year as the Federal Reserve continues to raise interest rates."

- Moelis & Co. CEO Ken Moelis, is concerned about corporations that have loaded up on cheap debt during the era of zero-to-low interest rates and expects a wave of indebted companies to face serious challenges as interest rates rise.

- The International Monetary Fund warns that "Market excesses approaching a threatening level ... look no further than the \$1.3 trillion global market for so-called leverage loans," that may well crash "companies that are heavily indebted."

IT'S INTEREST RATES, STUPID

Add up what is being said and predicted at the top of the financial world:

"Global debt bubble."

"Low rates have created an incentive to borrow money and buy stocks."

"Corporations have loaded up on cheap debt during the era of zero-to-low interest rates."

"U.S. economy will slow to a crawl ... in the second half of next year as the Federal Reserve continues to raise interest rates."

"Market excesses approaching a threatening level... look no further than the \$1.3 trillion global market for so-called leverage loans."

No kidding! What a surprise! Just check the Trend Alerts, Trends in the News broadcasts and *Trends Journal* links on our website. "It's interest rates, stupid." It was cheap money that artificially propped up equities and economies around the world and now it's more expensive money that's bringing them down.

Finally, Wall Street and the mainstream business media are now flashing the bright warning signs we have tracked and forecast since February – the world cannot take higher interest rates and a stronger dollar. It took them until November to see the trend we identified 10 months ago: "Something behind market sell-off no one is talking about: Strong dollar." – CNBC, 12 November 2018.

Moreover, the U.S. rise in interest rates are hitting at a time when global economic growth is stalling. Economies in Emerging Markets and developed nations, whose massive debt is largely dollar based, will



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Wall street bracing for a rough ride in 2019.



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not have the GDP-generated revenue to pay down their rising debt burdens.

In China, the world's second largest economy, GDP growth has slowed to Panic of '08 levels and the Shanghai Composite Index is down some 30 percent and keeps falling. Overall, the MSCI Asian-Pacific Index has plunged into bear territory, down over \$5 trillion this year.

And China's credit growth slowed significantly in October, with corporate borrowing sinking to 150 billion yuan from 677 billion yuan just the previous month.... an alarming sign of sharply declining growth.

And the FTSE All World index is down over 7 percent, its worst performance since the peak of the 2012 eurozone crisis.

On the Emerging Market front, the MSCI Emerging Market stock index has tumbled 25 percent from its January peak.

The market weakness is represented as well by powerhouse exporter Germany, whose economy shrank in the third quarter for the first time since 2015. And despite what the mainstream business says, it had nothing to do with trade wars or tariffs. It had to do with shrinking economic growth: More consumers with less money to spend and heavier debt levels to payoff.

Japan also saw its economy shrink in the third quarter despite its central bank's buying spree to prop up their equity markets and economy. In fact, the Bank of Japan's total holdings hit \$4.9 trillion, which is bigger than the country's annual GDP.

While the United States' relatively strong GDP and

employment numbers suggest a healthy economy, the total debt incurred by Americans hit another record in the last quarter rising to \$13.5 trillion. And with total household debt now \$837 billion higher than its 2008 peak, when the last recession hit, America, like the rest of world, cannot take higher interest rates. 

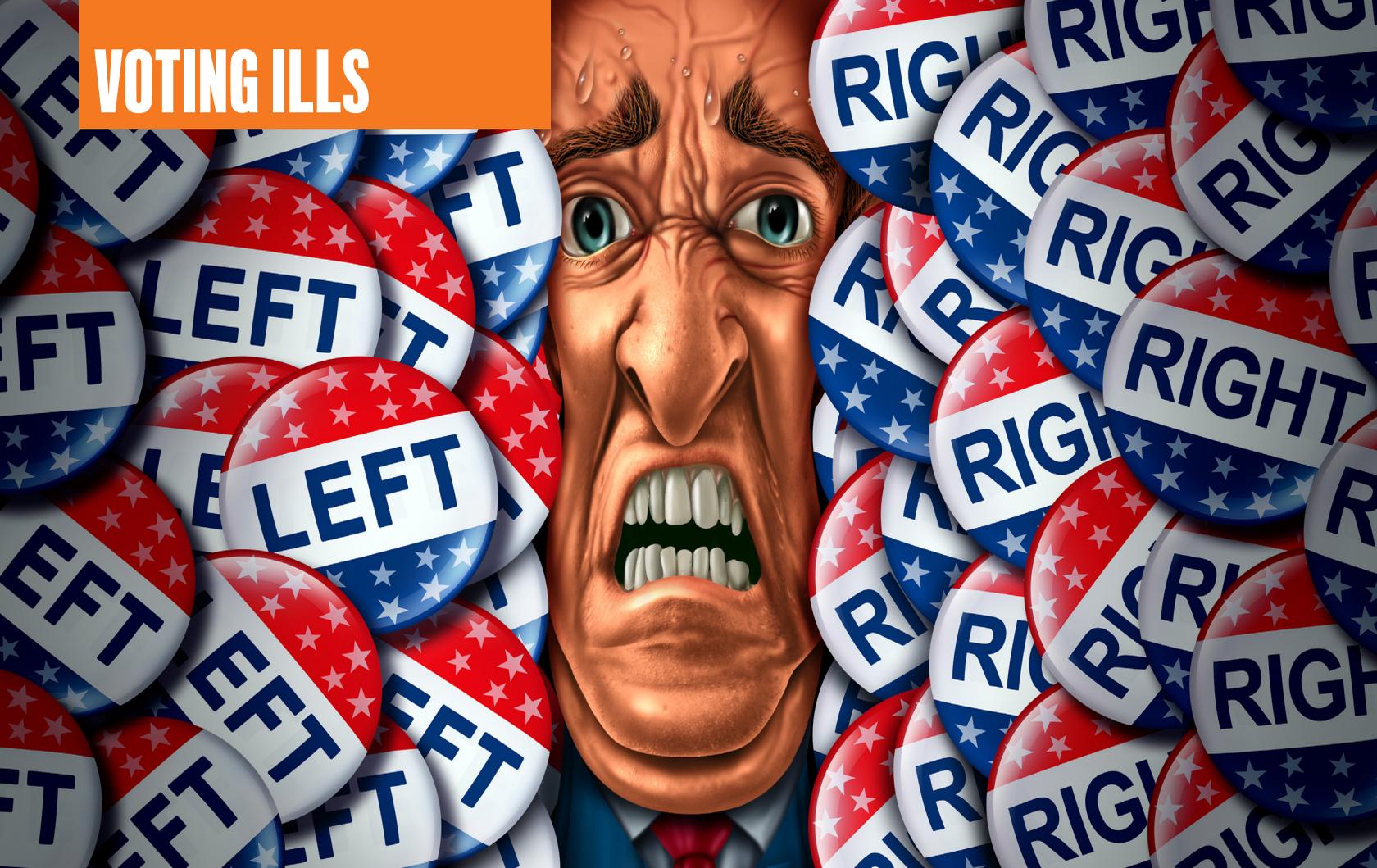
TREND FORECAST

What can delay an Economic 9/11 terror strike? At this juncture, the same measures that were taken that have artificially pumped up stock and real estate markets to soaring heights following the Panic of '08: Cheap Money. More rounds of lowering interest rates and more trillions of Quantitative Easing.

Indeed, it was not basic economic fundamentals that put the world on the path of recovery following the Great Recession. It was the central banks injecting heavy doses of monetary methadone to boost failing economies and financial markets.

Yet this time, considering the \$250 trillion massive debt load weighing down the global economy, another monetary drug fix will only push markets up temporarily before they OD.

Therefore, as the economic health of these money-drugged induced economies worsens, demand for gold, the ultimate safe-haven asset will increase. We maintain our forecast that gold prices' bottom range is around \$1,200 per ounce and prices will not spike until gold solidifies above \$1,450 per ounce.



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It's time for Blockchain voting

Rotted, antiquated voting process in the U.S. is a mockery to Democracy

It's a sick joke. America! The land of the “Exceptionals.” The home of “We’re #1.” “Geek Central” Silicon Valley Techno-wizards... a nation with voting systems on par with Zimbabwe...or maybe worse.

Some two weeks after the mid-term elections in the United States, critical high-profile gubernatorial, Senate and House races have remained unresolved. Besieged by lawsuits and claims of fraud and incompetence, despite who wins, as with the infamous Florida “hanging chad” election that gave the 2000 presidency to George W. Bush, the credibility of each outcome will be tainted.

In the United States there is no united voting system. Instead, each state’s politicians create the system they think is best. They select machines not

because of the most advanced, un-hackable, reliable ballot-counting technology, but rather from voting machine makers who contribute the most to their political campaigns.

Take a look at the photos, listen to the news, read the newspapers: From New York to California from North to South, voting machine breakdowns; frustrated citizens waiting hours on line to vote; confusing ballots that are hard to fill out and difficult to understand.

And then when the polls close, election volunteers,



The midterm elections in the U.S. drew a record high 113 million voters.

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usually political party members, use #2 pencils and grade school rulers to line up and count votes. Missing ballots conveniently disappear and tens of thousands of calls to hotlines to complain about voting irregularities marked the November 2018 election across the self-proclaimed world's greatest democracy and technology leader.

From its rotting and crumbling roads, Third World rail systems, dilapidated airports, dangerous electrical grids and poisoned water/sewer plants... America's archaic voting technology and protocols are failing.

With limited faith in the credibility and effectiveness of voting systems, this election saw an unprecedented 6,500 lawyers and voting "specialists" from both political parties deployed across 30 states to "monitor" ballot access and counting.

Voter turnout for the 2018 midterm elections hit a new high with some 113 million votes cast, about 48

percent of all eligible voters, up from 38 percent who voted in 2014's mid-term elections.

And now, with each day of new headlines illustrating both the incompetency of the election officials in charge and the obsolete, broken down voting system, the already low trust the public had in voting has sunk to new lows.

WELCOME TO THE 21ST CENTURY

It's time to vote online and do away with the centuries-old voting system of waiting on line and filling out ballots with crayons and magic markers.

Of course, the kneejerk reaction from the establishment, continually ignoring the decades of their failing voting systems is: Online voting is unsecure and can be hacked.

As we have long forecast, Direct Democracy in the form of online voting is the answer to not only correct the casting and counting of votes, but to make it easier and more direct for We The People to exercise their rights.

Indeed, we identified Blockchain Democracy as one of our Top Trends for 2018. We forecast that voting irregularities will grow more severe, especially when the system is taxed with higher turnout as it was this mid-term.

In making our forecast last December, we stated: "Blockchain technology, will prove a secure, accurate system for online voting."

Trust in the technology is growing across myriad fields because Blockchain encrypts data, thus preventing the record of transactions from being hacked or altered. The technology is being embraced by the biggest banks and financial institutions, insurance giants, new technology companies, major industries and an increasing number of governments worldwide.

In fact, international banking giants Deutsche Bank, HSBC, Bank of China, Standard Chartered and others have accelerated efforts to launch Blockchain platforms and have begun to test global transactions using the technology.

Direct Democracy in the form of online voting is the answer to not only correct the casting and counting of votes, but to make it easier and more direct for We The People to exercise their rights.

If trillions of dollars can be transferred in milliseconds across the globe, voting systems can be designed to count a few million votes over the course of day..

Therefore, if trillions of dollars can be transferred in milliseconds across the globe, voting systems can be designed to count a few million votes over the course of day.

Even though we can bank online, pay for virtually anything online, get a college education online, put your personal health records online... the longstanding mindset that electronic voting systems are unsafe is another lie promoted by political parties to serve their self-interests.

In the digital new world of smartphones and apps, from Baby Boomers to millennials, and especially for Generation Z – and the new ones yet to be born – the digital sphere is where they live, work and put their trust in. Thus, the centuries old failed voting system of today is not only inadequate and corrupted, it's anathema to virtually every aspect of today's virtual world.

BIGGER THAN BLOCKCHAIN

Beyond just voting online during election time, the larger and more potent trend, Blockchain Democ-

racy, will make politicians and the current election process obsolete by diluting the power of political parties and putting the power in the hands of We the People.

For example, the most advanced model of Direct Democracy is practiced in Switzerland and is growing. There online voting gives citizens a direct say in not only electing politicians but voting on everything from municipal budgets to ethics policies.

Global IT service provider Luxoft Holding, Inc., for example, has partnered with the City of Zug and Lucerne University of Applied Sciences in Switzerland, and successfully launched the world's first Blockchain-based e-voting system used in a major city.

But in the U.S., while West Virginia became the first state in the nation to use Internet voting with Blockchain technology in a federal general election, piloting the program for military and other voters living overseas to vote in the midterms, its Secretary of State Mac Warner stated there are no plans to extend the program to regular voters. **TJ**



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Casting votes the old-fashioned way in Arlington, VA.

TREND FORECAST

The West Virginia trial was, buy its own assessment from Warner, a “complete success.” But the political elites will not extend it because, as noted earlier, that will give power back to people.

But as trust in Blockchain technology to support online voting continues to grow, and dissatisfaction with political institutions accelerates globally, Blockchain Democracy will gain momentum.

As evidenced by populist movements spreading across the globe, citizens of the world are disgusted with ingrained political systems, in which elected officials carry out the will of special interests, enriching themselves with bribes and payoffs (deceptively labeled as campaign contributions), rather than serving the public's interest.

Again, in reaffirming our forecast, the only obstacle to Blockchain Voting is the people's will to make it happen.



As forecast, pot is hot It's a global trend on the fast track and it's about to explode

A cannabis store's billboard in Seattle, WA.

Wikipedia

The Midterm elections in the U.S. marked yet another significant step forward for legal marijuana across the globe, advancing a trend we identified three years ago: Money Reefer Madness.

We had forecast that both recreational and medical marijuana would become increasingly accepted by the global community.

Why? Simple. The same reason they ended prohibition in the United States back in 1933. It wasn't as though all of a sudden the Women's Temperance Movement that was against drinking booze lost its temperance. It was a loss of tax revenue! The more booze sold the more money states made.

Same true for marijuana. It wasn't as though the politicians who passed laws that locked up tens of millions of pot smokers and gave them life sentences in jail for getting busted three times no longer considered it a dangerous "gateway drug" that would lead to heroin addiction. It was tax revenue! Like alcohol, the more marijuana sold the more money states made.

And, it's worldwide.

AURORA®

SETTING THE CANNABIS INDUSTRY STANDARD



(top) Auroramj.com (bottom) Wikipedia

(above) Aurora reps can be found at many conferences and conventions, and not only cannabis focused events. Here you see an Aurora booth during the Calgary Woman's Show at the BMO Centre on the Calgary Stampede Grounds. (below) THC infused "Medical Edibles."

In October, Canada became the latest country to legalize recreational marijuana, joining Uruguay and the Netherlands where recreational pot is legal. Marijuana is already legal for medical use in Australia, Puerto Rico, Poland, Czech Republic, Croatia and Macedonia. And in Turkey, citizens are allowed to grow marijuana for personal medical use.

Further, while in most countries cannabis is still illegal, a significant number will not prosecute for personal use. For example, in Jamaica, Columbia and Chile, cannabis is not legal but decriminalized in most forms.

And recently, Mexico's incoming government submitted a bill to allow medical marijuana and recreational use. The bill would also permit companies to grow and sell marijuana, allow possession of up to 30 grams, and cultivation for private use. Smoking pot in public places would also be permitted.

MIDTERM GAINS MEANINGFUL

In the U.S. midterm elections, legal marijuana scored multiple wins, showing once again that resistance is weakening and even hardcore opponents can't make the anti-pot, reefer madness argument stick anymore.

Michigan voted to become the tenth state to legalize recreational marijuana, and the first Midwestern state to do so. Illinois Governor-Elect J.B. Pritzker made legalization a key component of his victorious campaign.

Western and northeastern states have led the way on legalizing marijuana, but the victory in Michigan powerfully demonstrates the national reach of this movement," said Maria McFarland Sánchez-Moreno, executive director of the Drug Policy Alliance.

Identifying where the trend is leading, Sanchez-Moreno said, "With such overwhelming public support for marijuana legalization, even including majorities of Republicans and older Americans, there's only so long that the federal government can continue to hold out."

The possibilities to legalize recreational marijuana increased in New York on Election Day, as Democrats, who have expressed support for legalization, took control of the state Senate, now the dominant party in both state Houses and the governor's mansion.

Shipping with Canada Post may result in delayed delivery times due to possible service disruption.

DRIED CANNABIS CRUMBLE EXTRACTS ACCESSORIES

Sort by: CBD

| Product | THC | CBD |
|-----------|------------|----------|
| Trutiva™ | <1% | 12 - 18% |
| Avidekel™ | 0.3 - 0.8% | 11 - 15% |
| Orellium™ | 5 - 8% | 9 - 14% |
| Midnight™ | 6 - 11% | 8 - 13% |
| Equiposa™ | 7 - 11% | 7 - 11% |

Help

And voters in Utah and Missouri voted to legalize medical marijuana.

And, according to a recent Gallup survey, two out of three Americans (66 percent) now support the legalization of marijuana, including a majority of Republicans (53 percent) and, for the first time, a majority of voters over the age of 55 (59 percent). Support is strongest among Democrats (75 percent) and young adults between the ages of 18 and 34 (78 percent).

THIS "SESSION" IS OVER

Significantly, the midterms brought another victory to legal weed: powerful, anti-pot Congressman Pete Sessions of Texas lost his seat. He was the head of the House Rules Committee, where he was able to block any vote on marijuana legislation. A Democrat will now head that important committee.

And Attorney General Jeff Sessions, a celebrated anti-pot voice who once said, "Good people don't smoke marijuana," was forced to resign the day after the Midterms by President Trump.

Speaking to law enforcement officers in March, Sessions alarmed pro-cannabis advocates when he said:

"I reject the idea that America will be a better place if marijuana is sold in every corner store. And I am astonished to hear people suggest that we can solve our heroin crisis by legalizing marijuana — so people can trade one life-wrecking dependency for another that's only slightly less awful... Our nation needs to say clearly once again that using drugs will destroy

your life."

Thus, pro-cannabis industry analysts feared the Trump Administration would move to enforce federal anti-marijuana laws.

However, we predicted a different future. In our Winter 2017 *Trends Journal*, one of our Top Trends was "Reefer Money Madness. We had forecast that "...Trump will not squander resources waging a Marijuana War."

And, while President Trump has stated that legal recreational use was "bad," and he felt "strongly about it," he also said: "In terms of marijuana and legalization, I think that should be a state issue, state by state." **TJ**

TREND FORECAST

The trend is global. The momentum is strongly in favor of marijuana legalization.

Besides not locking up people and ruining their lives for getting high on what is clearly not proven to be a "gateway drug," the many health benefits of marijuana are now being recognized both scientifically and by those who believe if the planet can feed us, it can heal us.

Among the generally affirmed medical uses at this early stage are the ability to help ease the opioid epidemic, treat seizures and neurological disorders, control nausea in cancer patients, pain control for arthritis and other conditions.



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Gold vs. Cryptos

Invest or divest... here are the facts and trend lines

By Jonathan Cho
CONTRIBUTING WRITER

The crypto community is built on the idea that Bitcoin is digital gold and has the potential to become world money. It's done so usually by disparaging not only fiat money but physical gold, creating a line of contention between Bitcoin and the precious metal upon which much of its design is based.

This kind of divide is problematic because it's focused more on one side winning than on impartiality to separate facts from fiction and come closer to an objective understanding of the trend.

It's resulted in crypto supporters glossing over important issues and distorting realities, to such an extent that little else but significantly lower prices will be enough to release them of the convictions that keep them so tied to their HODLing philosophy.

To supersede gold, Bitcoin must be better than gold. In one regard, Bitcoin is—physical gold lacks borderless transferability. This is a deficiency in mod-

ern times because of increasing efforts by governments to restrict capital outflows, and thus to restrict the ability to move gold freely.

But otherwise, gold has a major quality Bitcoin lacks—demonstrated intrinsic value, independent of environment and time. And it is this quality that must be properly understood to comprehend why Bitcoin is problematic as money.

MEANING OF STORED VALUE

For anything to survive as money, it must be a store of value. You need to be confident that the

purchasing power you store is maintained not only over time but despite any political, social or cultural changes. This independence of environment, or non-arbitrariness, is what “intrinsic” refers to. That value is not merely declared or bestowed upon by any person or group is critical to ensure confidence that the purchasing power you store can be relied upon to be there if you leave it unattended over a long period.

Gold has industrial uses, but these are largely immaterial as they pertain to money—most are recent, like in microchips, and others are due to phase out, like in dental fillings. Gold’s true value is its immutable beauty.

Beauty is a very real, non-arbitrary end-value, woven into the fabric of human experience as much as love, wealth and happiness. One can no more dismiss the value of beauty in objects like gold than a man can dismiss the value of beauty in a woman, nor a woman the value of beauty in her material surroundings, whether today in Asia or in the story of Helen of Troy 3,000 years ago.

That gold has been prized for its beauty for thousands of years, across cultures isolated by continents, shows that gold’s value is not arbitrary to time or environment but intrinsic to itself. It cannot be removed by human declaration or social disapproval.

And gold’s naturally limited supply allows its beauty to be quantified in purchasing power, a value that’s remained within a range of consistency unmatched by any other form of money used. This is critical because its intrinsic value and limited supply together gives confidence that you can always sell it later at a price comparable in purchasing power to what you paid for it, as much as you can expect that people will continue to value beauty in the opposite sex.

Bitcoin, however, is different. Bitcoin was designed using the parameters of gold. Even terminology like “mining” was lifted, and later its visual representation, a gold coin with a “B.” But for all these parameters, Bitcoin cannot take what gives gold timeless, non-arbitrary value—beauty.

WHAT CRYPTO MISSES

This is what crypto supporters miss. A wedding ring store keeps a ledger to track of the rings in inventory. The tally marks in the ledger refer to the rings they have. It’s the rings that are of value, not the tallies that refer to them. No one wants the tallies if they don’t refer to the rings.

But Bitcoins are the tallies themselves. There’s no actual value to them—they don’t refer to anything,

and that they exist on a distributed ledger is meaningless if Blockchain is open-source freeware and can be created ad infinitum.

This is the problem fiat money has—fiat was receipts that referred to redeemable gold, that became receipts that refer to nothing. Their only value is the value the government declares them to have, which depends on people maintaining confidence in the



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Are cryptos real money?

government to not mismanage it.

This has never succeeded, because governments are run by people, who have proven historically incapable of preventing self-interest, ignorance and irresponsibility from interfering with sustainable management of an unbacked money.

And herein lies the rub. The value Bitcoin has is predicated on confidence as well, as with fiat, in people to behave counter to historically demonstrated human nature. While fiat depends on confidence in government, Bitcoin depends on confidence in technologists, governments, and holders to behave in ways people never have.

This reality is simply less obvious, because it’s shrouded behind techie lingo, Blockchain hype, and lottery-ticket greed, resulting in a maze of rationalizations to defend a jenga-like structure.

The root of this problem is that bitcoin violates a timeless principle of money—alchemy cannot turn lead to gold. This is less about lead and gold than the principle that something of inherent value cannot be created from nothing. If it occurred, greed would cause the supply of gold to inflate to the point it held no more value than that of lead.

A modern equivalent is central banks “creating money out of thin air,” an almost cliché saying, and a fact that motivated the creation of Bitcoin. But the problem isn’t central banks. The problem is human

involvement in the control and management of a money supply. Gold's value is intrinsic and thus outside the control of humans, but Bitcoin's isn't—human involvement exists throughout the ecosystem.

Confidence in Bitcoin rests on confidence on three pillars: Blockchain as a technology, Bitcoin's security, and Bitcoin's user network. If one falls, the others fall, and all three are completely unstable.

The first pillar is confidence in the premise that Bitcoin's Blockchain limits its supply, such that inflation will never destroy Bitcoin's value. Nominally, this is true—Bitcoin's supply is fixed. But the supply of Blockchains isn't. And because Bitcoin is merely a tally on a Blockchain, anyone can create another Blockchain with the same tallies and call them digital gold.

2K CRYPTOS IN MARKETPLACE

This is what has happened. There are now over 2,000 cryptocurrencies, and while none are Bitcoin itself, they compete based on minor variations to the parameters of their Blockchains.

This is the equivalent of creating an endless supply of new non-gold precious metals apart from silver, palladium and platinum. There's also been divides within Bitcoin itself.

Bitcoin has “forked” nearly 100 times due to infighting and greed, resulting in a new version of Bitcoin on a new Blockchain, with a comparable supply to the original, with every split. This is the equivalent of physical gold dividing into two metals, one the original and one the “new gold,” each with the entire supply of the pre-fork gold, with each side claiming to be the better.

People overlook this as inflation because the price of Bitcoin has trended up over years, but the reality

will catch up to people eventually as Bitcoin's price continues to fall partly in response to the expanding supply.

Ultimately, anyone can create his own cryptocurrency, and this will continue to occur so long as doing so is a call-option to riches. To believe that Bitcoin's supply is truly limited is to be blind to this, and confidence should crumble as this reality becomes recognized.

The second pillar of confidence is in Bitcoin's security. The idea is that its history of transactions and current allocation across holders is immutable because it's too costly to take over 51 percent of Bitcoin mining power and change the record.

This is because Bitcoin has the longest history of any crypto and thus the largest user base and the most miners. But this is not secure, as it relies on two beliefs: first, that Bitcoin will always be the biggest cryptocurrency. But the first is rarely the last in technology. Technology evolves, and no user network will stay loyal to an outdated, less capable Blockchain if a better one exists, no more than people stayed loyal to MySpace.

Second, it relies on the belief that the cost of a 51% attack is prohibitively high. The cost is estimated to be around \$40 billion. While most individuals can't afford this, Bitcoin's biggest competitor can—governments. To think that governments will simply relinquish their monopoly on money when central banks can print the money to corrupt Bitcoin's Blockchain is to succumb to wishful thinking, that those in power give up that power easily.

The third pillar is confidence in the size of the network. The belief is that Bitcoin's network of users is so large that it will always be there, to prevent a total collapse in Bitcoin's price, to keep the cost of a 51% attack high, and to attract more users. The problem is these notions are predicated on faith that Bitcoin's short nine-year history has created an unalterable trajectory.

The majority of Bitcoin's users don't use Bitcoin but merely hold it hoping to get rich, which makes the network even more fragile than MySpace's.

With MySpace, there was no cost to maintaining an account. But if the main motivation for Bitcoin holding is financial, if the price continues to fall, holders will leave the network far faster than MySpace users abandoned it. And as the public experiences first-hand the value of Bitcoin collapse, confidence that Bitcoin can store value will collapse, too. **TJ**

TREND FORECAST

Confidence in a money without intrinsic value is tenuous, and history has shown that once it's lost, it's lost for good. No unbacked money has survived because human involvement always means human mismanagement, and holders of Bitcoin are in the early stages of discovering that now.

But because Bitcoin and others like it are likely to fail doesn't mean cryptocurrency technology also will. Unbacked cryptocurrencies are not an end in themselves but likely a transitional technology, to couple with real-world assets to allow trustless, encrypted transferrability of securities and hard assets like gold, that to this point have had difficulty adapting to a modern age that's increasingly less local and more digital.

Those who understand this will be able to sidestep the further losses coming in the crypto market.



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There are North and South America triangles of potential economic and social disaster that are growing potent.

Triangles of Death: Economic disaster, social unrest

These emerging markets can trigger a contagion economic effect

"Global Economic Slowdown Deepens" read the 14 November front page Wall Street Journal headline. It's real. And while some nations are slowing down, others are diving deep into economic and social despair.

No clearer example than what's going on south of America's border down Mexico way, where several thousand escapees who left their economically depressed homelands, are trying to get into America in hopes of finding jobs and living better lives.

Triangle #1: El Salvador, Guatemala and Honduras have formed the Northern Triangle of Central America where hundreds of thousands of migrants flee their economically depressed, crime-ridden countries and their corrupt, dysfunctional govern-



A display outside of a Brazilian currency exchange displays the status of the Real.

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ments to seek safety and job opportunities.

Doctors without Borders reports, “A pattern of violent displacement, persecution, sexual violence and forced repatriation akin to the conditions found in the deadliest armed conflicts of the world today.”

They also note that 92 percent of these migrants who reach the United States, suffered some form of violence either in their countries or when they traveled through Mexico, another nation in decline, despair and inequality that not only offer no comfort for fleeing migrants, they are detaining, arresting and deporting them back to their native countries.

Indeed, with the richest 1 percent of the population owning almost half of the country’s wealth, according to the Organization for Economic Cooperation and Development, Mexico, with one of the highest rates of inequality among developed countries, offers no “Hope and Change you Can Believe In” for those escaping similar conditions.

And, settling in Mexico, where it is fighting its own war against drug cartels that have killed over a quarter million people over the last decade, provides no relief from the violence they are escaping.

Further, Mexico’s homicide rate continues to set yearly records, while its military is accused of carrying out executions with impunity to quell workers and students fighting government corruption and economic inequality.

Triangle #2: Argentina, Brazil and Venezuela, are forming the southern triangle of economic, political and social death.

Sinking deeper into recession, rising violence on

the streets, massive social protest, rampant government corruption ... the threat of dictatorial governments and massive emigration and immigration to varying degrees affect these countries and threaten stability throughout the region.

Indeed, considering their size and military strength, violence could explode beyond South America, not only accelerating the migrant wave north, but igniting a war that will be felt throughout North America.

ARGENTINA: BAILOUT COMES WITH HISTORIC INTEREST RATE

Argentina’s President Mauricio Macri, who when elected in 2015 was championed as the nation’s economic savior by the business and political establishments. However, during his regime, the nation has fallen deep into recession, its peso is down some 40 percent against the dollar and its central bank’s interest rates have spiked to 70 percent, making it nearly impossible for small businesses to borrow money.

In a desperate effort to stop the economic bloodbath, Macri signed and the Argentinean government signed off on a \$57 billion line of credit from the International Monetary Fund.

While it’s bad news for Argentina, it’s good news for the IMF. This verifies the quote, “When the world around the IMF goes downhill, we thrive,” said IMF Chief Christine Lagarde. “We become extremely active because we lend money, we earn interest and charges and all the rest of it, and the institution does well. When the world goes well and we’ve had years

of growth, as was the case back in 2006, and 2007, the IMF doesn't do so well both financially and otherwise," she boasted.

How does it get paid back when the country's economic growth is slowing?

Austerity?

To pay off the massive IMF debt load, in November, Argentinean lawmakers approved an austerity budget for 2019 that cuts social spending by 35 percent to make the debt payments and imposed a value-added tax that hits consumers.

With inflation at 45 percent and up 34 percent from last year, and 28 percent of its 43 million people living in poverty, the massive and violent street protests that erupted as Macri's government slashed public services, government jobs and proposed other

deep budget cuts will escalate, and military imposed clamp downs to stop them will accelerate.

BRAZIL: RECESSION OVER, LARGER CRISIS LOOMING

While Brazil emerged from its worst recession in over a century, the financial crisis is far from over. The Brazilian real is down some 12 percent against the dollar this year and the country's unemployment rate hovers around 12 percent.

And now, with Brazil's new President, Jair Bolsonaro, a former army captain who praised the authoritarian military dictatorship that ruled the nation from 1964 to 1985 – and who has filled his cabinet with military officers – the nation is being braced for a round of austerity measures.



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As the Brazilian Real continues to decline the destitute population of cramped shanty towns such as Favela da Rocinha, Located in Rio de Janeiro, Brazil will continue to rise.

On the economic home front, Brazil's business community, which endorsed Bolsonaro during the election, supports his promise to overhaul Latin America's largest economy by employing Milton Friedman principles to restructure the economy and address the country's huge budget deficit.

Thus, he will slash government spending, cut social programs, pensions and benefits, reduce government jobs, sell off state-run companies and reduce taxes that will mostly benefit the largest corporations.

As with other nations whose governments have imposed strict austerity measures in times of economic decline, as social unrest against the measures escalate, police and military crackdowns will intensify.

Further, on a regional level, Bolsonaro has expressed his disdain against the Venezuelan government, saying that country should no longer be a member of Mercosur, the South American trade block, and that he would break diplomatic ties with Venezuela.

Also, Argentinian President Macri has planned to report Venezuela's government to the International Criminal Court at The Hague for alleged crimes against humanity.

And adding to growing speculation that Colombia and Brazil are planning to topple Venezuelan President Nicolás Maduro, Columbia's Vice President Marta Lucia Ramirez, whose country is facing an influx of over a million Venezuelan refugees, warned of, "growing unrest and anarchy that will spread across the region."

Homeless man asleep on the streets of Caracas, Venezuela.

Voatz



TREND FORECAST

As the "Global Economic Slowdown" deepens, the explosive elements within the Triangles of Death, when ignited, will not only spread civil unrest, they may also trigger wars across the region... and beyond.

Should the governments of Argentina, Columbia and Brazil team up to take out the Venezuela government – with the assistance of the United States with its long history of inciting, planning and supporting military coups and social unrest through South and Central America – they all have enough weapons of mass destruction to destroy a good part of life on Earth.

Subsequently the current migrant move to the U.S. will explode into a human wave unprecedented in history.

VENEZUELA: EXODUS AND HYPERINFLATION

Venezuela, derisively labeled the Congo of South America, is marked by deepening economic depression and exploding emigration. There is a fast-growing scarcity of food, medicine, clean water, housing and other basic staples of daily life.

Its currency, the bolivar, is essentially worthless, with the IMF projecting Venezuela's inflation rate to hit 1,000,000 percent in 2018.

When people lose everything, and they have nothing left to lose, they lose it. Thus, with an unemployment rate nearing 40 percent, crime is rampant. With crime pervasive and its murder rate the second highest in the world, some 2.3 million Venezuelans have fled the country since 2015, many moving to nations throughout South America.

The failure of the government to meet the basic needs of its citizens has been catastrophic. Venezuelans have lost an average of 24 pounds each because food is so scarce. Major diseases and health conditions, from cancer to malaria, are on the rise.

CONTAGION EFFECT

While each country has a different, unique set of determinants of its downward economic and social trending, should the turmoil across both the north and south triangles spontaneously erupt, the explosive effects will spread far beyond the region.

These factors, unlike any in recent history, will destabilize the region, lighting the fires of a contagion effect. **T**



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5G cellular expansion is increasingly raising health concerns.

The 5G gamble

Another wireless advance, another risk to your health

By **Bennett Daviss**, CONTRIBUTING EDITOR AND **Derek Osenenko**, EXECUTIVE EDITOR

The coming fifth generation of wireless communication technology, 5G for short, promises to make everything better. Except your health.

5G is designed to make wireless service faster and more connected, while also being cheaper and using less energy. It's possible, because 5G uses shorter wavelengths that can send data as much as 1,000 times faster than today's 4G standard.

As there are broader market pressures now, demanding a data-dense environment, 5G will be necessary for a world in which every building, appliance, retailer, and customer will be linked together through the Internet. Every car will be exchanging data with every other vehicle in its neighborhood, not to mention the computers that will control traffic flow.

Also, unlike 4G signals, 5G waves are directional.

4G waves broadcast every message in all directions, wasting energy and potentially causing interference with other nearby signals. The faster 5G waves are "aimable", broadcasting in one direction. As a result, many more 5G antennas can be mounted on the same pole than 4G technology allows.

To grasp these minor miracles, we'll need 5G-enabled devices. They won't be on the mass market until about 2020, but telecom companies are already busy preparing for that day.

Verizon has partnered with Cradlepoint, a wireless equipment company, launching a demonstration program called "Pathway to 5G for Business". Verizon is also offering 5G pilot tests in Houston, Sac-

clean phones



Decrease in latency:
Delivering latency as low as 1 ms.



Connection density:
Enabling more efficient signaling
for IoT connectivity.



Spectrum efficiency:
Achieving even more bits per Hz with
advanced antenna techniques.



Traffic capacity:
Driving network hyper-densification
with more small cells everywhere.



Experienced throughput:
Bringing more uniform, multi-Gbps
peak rates.



Network efficiency:
Optimizing network energy consumption
with more efficient processing.

A Cradlepoint
infographic touting
the improvements
of a 5G network.

Cradlepoint

ramento, Los Angeles, and Indianapolis. AT&T has already tested its 5G network in Waco and Austin, Texas, and has expanded to other locales, targeting 400 markets initially. T-Mobile and Sprint aren't far behind.

But these shorter waves don't travel as far. So, to make a fully enabled 5G world, transmitters have to be mounted, well, everywhere.

5G providers talk about mounting their transmitters on streetlight poles and traffic lights. One study estimates that in urban neighborhoods, every 12 houses will need a separate antenna to handle the load.

IT'S A MASSIVE GAMBLE ON YOUR HEALTH

And that's where the health concerns begin. People have been bathed in radio waves for more than a century. But most of us have never lived a few yards away from a radio station or a cell tower. Now virtually all of us will.

That constitutes a giant experiment in public health – and we're the lab rats.

This experiment comes at a time when the idea that wireless telecom's electromagnetic frequencies (EMFs) can cause chronic ailments is becoming less and less controversial.

In 2006, a letter from public health researchers Gerd Oberfeld and Orjan Hallberg to the journal *Electromagnetic Biology and Medicine* first warned that an increasing number of people claim illnesses

rooted in sensitivity to EMFs. The researchers forecast that half the population of developed countries could see their health impacted by the waves.

In 2014, Dominique Belpomme, a clinical oncologist at Paris Descartes University, found data proving that sensitivity to EMFs, "...can be objectively characterized and routinely diagnosed by commercially available simple tests," and that EMFs cause inflammation, oxidative stress, autoimmune conditions, and poor sleep, conditions that afflict an increasing number of us.

Magda Havas, a biologist at Ontario's Trent University, estimates that 3 percent of the population has severe reactions to EMFs and another 35 percent are compromised by them: sleeping poorly, feeling depressed, unable to concentrate, and being anxious. More extreme symptoms can include heart trouble, dizziness, nausea, and difficulties with movement.

This range of symptoms may expand with 5G blanketing the planet.

5G's short, weak waves are absorbed into the skin, instead of deeper in the body. Sweat ducts in the skin have been shown to act as little antennas, conducting signals deeper inside the body, possibly disrupting the nervous and endocrine systems. In some studies, exposure to EMFs has caused skin irritation, leading some to worry that constant exposure to 5G could lead to skin diseases, including cancers.

It gets worse:

A 1994 study found that exposure to 5G-like micro-



It is now well documented that cellular networks negatively affect many animal populations including bees and migratory birds.

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isde.org

waves promoted cataracts in rats.

In 2016, Armenian researchers found that a 5G microwave environment retarded the growth of single-cell organisms and also could increase resistance to antibiotics in some bacteria.

The US National Institutes of Health's National Toxicology Program revealed that rats exposed to EMFs for nine hours a day over two years developed unusual brain and heart tumors and sustained damage to their DNA. In a 5G world, such exposure might become typical for us, with 5G routers and other devices dotting our homes, neighborhoods and workplaces.

Several investigations have found that steady exposure to EMFs harms birds and disrupts their nesting behavior, disorients bees, and damages plant and tree growth, including sparking a stress response in wheat, altering its biochemistry.

HEALTH RISKS ARE REAL

Those concerns, among others, have led the International Society of Doctors for the Environment, with affiliated organizations in more than 25 countries, to call for suspending 5G's spread until its health effects are better understood.

Also, more than 200 EMF scientists in 41 countries have signed onto the International EMF Scientist Appeal, which highlights myriad studies indicating health dangers associated with low levels of wireless radiation. The scientists want 5G's progress halted until these studies can be confirmed or proven wrong.

Public discomfort about 5G's effects on human health and the natural world has led the state of Hawaii to threaten to hold companies installing 5G systems liable for any resulting health damage.

TRENDPOST

With governments reluctant and industry unwilling to slow the pace of 5G expansion, it will be up to individuals to be guardians against the waves' potential hazards. What you can do:

Buy wireless radiation detectors, similar to little Geiger counters, to find and avoid spots where 5G waves are concentrated.

Use radiation protection coatings and blankets, such as a Radiation Glove, on your wireless devices.

Don't let your electric utility install a smart meter on your house, and tell it, in writing, that if it does, you will hold it responsible for any resulting health damage to you and your family.

Decide whether 5G is something you really need. If it's not, don't buy 5G devices. Let Apple and other manufacturers know your decision.

Demand that your local and state governments enact legislation protecting the public from potentially harmful 5G hazards.

California's legislature has freed individual towns to write their own 5G rules, and at least three have stopped 5G's expansion inside their borders until the towns review research and pass more permanent ordinances.

But 5G is the foundation of an emerging trillion-dollar economy for connection and communication. It will continue to roll on, even while science, with its slow and relentless rigor, amasses data about its effects on us, on our food, and on our world.

Meanwhile, 5G is a global gamble, with human health as the stakes. **TJ**



Queensland Ballet
Artistic Director Li
Cunxin leads a class
using dance to promote
general health among
the aging population.

Braceworks.ca

Creativity: The new solution for midlife crisis

By **Doug Grunther**
CONTRIBUTING WRITER

As a culture, we're so busy grappling for solutions, racing to conclusions and viscerally reacting to what's on the screen in front of our faces, that we're bypassing the deeper, interior assets of the human brain.

According to Gallup pollsters, only one-third of Baby Boomers and Gen Xers feel engaged in their work. This has a significant effect on the U.S. economy, as disengaged workers are twice as likely to call in sick or be diagnosed with depression. But in an interesting trend, millions in their forties and fifties are coming to grips with midlife crisis in the digital age by utilizing their creative juices.

As reported by journalist Laura M. Holson, creativity classes and seminars for those in their forties and

fifties are a growing trend. Unlike the previous solution for many Baby Boomers, who sought material solutions to their midlife crises with perhaps a sporty new car, or a quick emotional fix in a marital affair, a popular solution now is to find more creativity in life.

DEFAULT AND DIVERGE

Helping to further ignite this trend, neuroscientists are on the forefront of discovering what actually happens in our brains during the creative process.

Psychologists have known for decades that creativity is a successful antidote to anxiety and depression. But those who are not born with natural creative talent are not encouraged by our culture to develop it. From grade school through high school, the curriculum is based primarily on rote memorization, rational thought, getting the one right answer, and fitting in. This is antithetical to the more open-ended intuitive role played by creativity.

Randy Bruckner, a psychologist at Harvard's Center for Brain Science and two medical colleagues recently published an article, "The Brain's Default Network," summarizing decades of brain imaging by neuroscientists world-wide.

They discovered an anatomical portion of the human brain system that is only active when individuals are not focused on completing specific external tasks, such as writing an email. Thus, the name "Default Network".

The default network activates when we engage in internally focused thought, such as envisioning the future, or considering the perspectives of others. From studying thousands of brain images, neuroscientists can trace electrical charges in specific portions of the brain that use memories and associations as building blocks for mental stimulation, as compared with the portion of the brain which focuses laser-like on specific external goals to be accomplished.

It is now understood that the default network is an adaptive feature of our brain, which uses past experience to generate 'out of the box' novel and creative brainstorming.

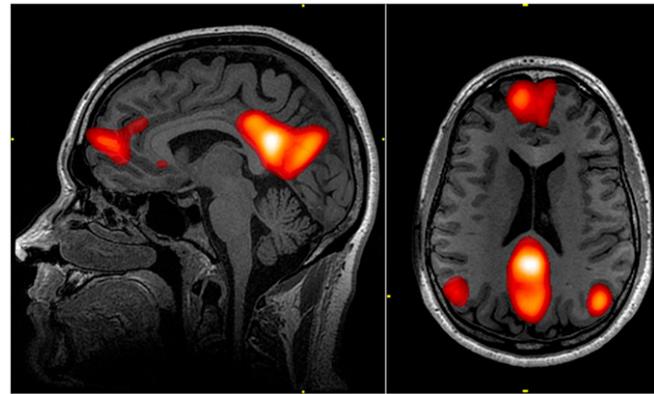
Neuroscientists often describe this phenomenon as "divergent" thinking. It requires that we disengage from the external world (and the ubiquitous digital screen we have become addicted to) and travel inward, to the default network. In other words,

TRENDPOST

New research coming out on a regular basis shows that feeling creative and having a sense of purpose are as important to health as diet, exercise, genes and even social networking.

As a result, businesses will become more aware of the economic cost of having workers who are bored and emotionally unfulfilled. Ontrendpreneurs will use this as an opportunity to monetize ways to bring creativity and engagement into the workplace.

As millennials have consistently been polled as preferring worthy experiences over material objects approach their forties, this trend will accelerate. Look for news about organizations such as Encore.org, which connects middle-aged people with meaningful work.



Wikipedia

This highlighted MRI shows the parts of the brain activated while operating the default mode network.

contrary to just about everything we were taught in school, daydreaming and divergent thinking are both a potential boost for creativity and a healthy antidote to stress and anxiety.

BENDING, BREAKING, BLENDING

David Eagleman and research colleagues in the Department of Psychiatry and Behavioral Science at Stanford are studying how modern computer technology is changing the ways our brains access information.

Collaborating with musical composer Anthony Brandt, Eagleman cites creativity and ingenuity as the qualities of the human brain which not only set us apart from other species through evolution, but which offer crucial mental assets even the most advanced computers can't provide.

The three qualities they cite which make divergent thinking a key to human creativity are bending, breaking, and blending.

Bending is what jazz musicians do when they improvise unpredictably on a tune they've played hundreds of times. Breaking is when you disassemble something into pieces and re-arrange the parts into a different whole, as demonstrated by Picasso and Cubism. Blending is when you combine two or more ideas which aren't normally thought of as connected, as when the Wright Brothers figured out motorized aviation from working on bicycles and gliders.

Bending, breaking, and blending are qualities the brain can apply to a midlife crisis, regardless of any lack of natural talent for music, art or invention. It just takes some practice.

Here we see the convergence of two trends. Neuroscience's use of modern techniques such as magnetic resonance microscopy to better understand how the brain generates creativity, and the growing desire to deal with midlife crisis through meaning and creativity. **TJ**



Wikipedia

Crushed and baled water bottles await pickup at the recycling center on the US Army Camp Arifjan, Kuwait.

Our polluted oceans

New technology, rising social awareness begins healing process for oceans.

By **Bennett Daviss**
CONTRIBUTING EDITOR

"If the ocean dies," said Paul Watson, founder of the activist group Sea Shepherds, "we die."

The oceans aren't in hospice care yet, but they qualify for a bed in the intensive care ward. And we're also on the waiting list.

Only about half the oxygen we breathe comes from trees and other ground-rooted plants. The other half is released into the air by phytoplankton, microscopic plants floating on or near the seas' surface. These vital, invisible organisms are what gives the sea its greenish tinge. If phytoplankton begin to disappear, the amount of oxygen in the air will shrink at a time when there are more and more people needing to breathe it.

Phytoplankton, along with other sea creatures and the oceans themselves, absorb and hold about 50 times more carbon dioxide than our atmosphere. Unhealthy seas would be less able to keep that CO₂ out of the air, making it harder for land-based life forms like us to breathe.

About half the world's population depends on seafood for a significant amount of the protein they eat and more than 500 million people depend on the fishing industry for their livelihoods. As more and more fisheries approach exhaustion, the food supply for billions of people is threatened.

Also, phytoplankton are the foundation of the oceans' food chain. Threats to their survival indirectly threatens ours. In short, sick oceans mean a growing number of more hungry and oxygen-starved people.

OCEANS IN INTENSIVE CARE

Three factors have left Earth's oceans in need of intensive care:

First, humans are carbonizing the atmosphere. We spewed a record 45 billion tons of carbon dioxide into the air in 2017, according to the Global Carbon



System 001, recently launched from San Francisco, was designed as a type of trash strainer to aid in the cleaning and eventual clearing of the Great Pacific Garbage Patch.

theoceancleanup.com

Project, a nonprofit venture coordinating the work of governments and academics. More than a third of that carbon is absorbed into the seas, where it reacts with water to form carbonic acid. The acidic seawater corrodes phytoplankton's protective shells, risking their survival – and, therefore, that of the oceans' entire food chains. Studies are finding 20 percent less phytoplankton in the Indian Ocean than 60 years ago.

And more carbon in the air causes the oceans to warm. Warmer waters disrupt habitats of sea creatures. Most dramatically, it causes coral reefs to bleach and die, destroying these unique ecosystems that support an array of marine life, including many species of fish we eat.

Second, our rising population is eating more fish – more than twice as much per person compared to 50 years ago. At least a third of the world's fisheries are collapsing, most notably the Canadian North Atlantic's cod fishery, which led to Canada's ban on cod fishing in 1992. Two studies in 2015 noted that cod were once again increasing in numbers there, but added that warming ocean temperatures were making it harder for them to thrive and reproduce.

Third, the oceans have become the world's trash collector. The 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, an international treaty, forbids the deliberate dumping of wastes created aboard ships or planes crossing the oceans.

Since then, the US and other countries have passed many laws banning the dumping of sewage, chemical, and industrial wastes into the seas. And the 1972 Convention was replaced in 2006 by the more comprehensive "London Protocol". But the seas are still swimming in trash, including an estimated five tril-

lion pieces of plastic.

Plastic bottles wind up in street gutters and wash into sewer systems where processing plants often can't manage them. The debris is then flushed into rivers, eventually drifting into the sea. Paper and plastic blow off the decks of ships. Fishing boats lose nets. Winds pick up loose plastic bags and carry them offshore. Stuff happens.

Because paper and plastic float, the oceans' currents take the trash on a continuous world tour. The most infamous result is the Pacific Garbage Patch, now twice the size of Texas, a trash vortex that's trapped and held in place between California and Hawaii by the intersection of several currents. The Central Gyre system of currents guides a spiral of trash through the Gulf Stream into the Atlantic Ocean. Three other massive floating dumps have been globally charted.

But the plastic doesn't just idly float. As the plastic begins to degrade, the nuggets look like fish eggs to scavenging birds. The plastic pieces become smaller and smaller and are ingested by an array of marine life, clogging their digestive systems. A 2018 Greenpeace study found plastic microparticles in 90 percent of 39 brands of sea salt in grocery stores.

Eventually, the granules carpet the sea beds, smothering or otherwise disrupting fragile under-sea habitats and ecosystems. Turtles, birds, and fish become entangled in loose fishing nets floating just below the waves and starve or drown. The oceans become deserts.

TECHNOLOGY THE SAVIOR

But now, technology is sailing to the rescue. According to Dutch inventor Boyan Slat, his innovative System 001 has passed its latest test on the high seas.

Slat has created a 2,000-foot floating plastic boom with a curtain-like attachment. The curtain hangs ten feet down from the boom. The ends of the boom can be weighted, allowing currents to push the lighter center into a U shape. Alternatively, the U can be created by ships stationed at each end of the boom, pulling the ends forward. Plastic bits drift into the U and gather against the curtain, staying trapped so trash barges can skim up the debris.

The curtain is solid, not a net, so birds and sea life won't become tangled. A gentle current washes down toward the bottom of the curtain, guiding fish and other critters down and out. But the current isn't strong enough to counter the plastics' buoyancy, so the trash stays in place, ready for removal.

The approach makes sense. Research has found that most of the oceans' plastic waste spends time hovering in the top two feet of water. Scooping it up before it can degrade into the microparticles that rain down on the seabed, or that sea life ingests, is useful triage.

But System 001 is a Band-aid on a bullet wound.

"Once plastic gets into the ocean, it's impossible to get it all out," says John Hocevar, a marine biologist and director of Greenpeace USA's Ocean Campaign. "We have to keep plastic from getting into the oceans in the first place." He's right.

In that department, Mr. Trash Wheel is on the job. It's a garbage barge parked where Baltimore's Jones Falls River meets the Atlantic Ocean. A boom strung across the river snags trash drifting down toward the sea. A water wheel on the barge is turned by the river's current and operates a mechanism that draws the stopped trash to the barge and up into it for disposal.

Since wading into the river in May 2014, Mr. Trash Wheel has skimmed 1,000 tons of waste out of the river and kept it from the sea.

More sweeping efforts are underway. The European Union and Costa Rica have voted to ban single-use plastic items, from fast-food forks to plastic grocery bags. Britain is mulling a similar move.

This past September, McDonald's UK began swapping out plastic straws for paper ones. It will do the same across Europe and the US in 2019. The change will have heft; it's estimated that in the US alone, 500 million plastic straws are tossed in the trash every day.

Accompanying that effort, initiatives are under way to reduce the billions of plastic bottles trashed every year, an estimated 35 billion in the US alone. Greenpeace is fostering conversations among drink and bottle makers, retailers, and food giants such as Nestle and Unilever that could scale back excess plastic and packaging. Already, food service giants Sodexo and Aramark have pledged to do the same.

Their combined promises could ripple to consumers and up and down the supply chain.

TURNING POINT MOMENT

In October 2018, a breakthrough initiative, coordinated by the Ellen MacArthur Foundation, joined together about 250 organizations, including giants such as Unilever, Colgate and Coca-Cola, to stop the flow of plastics into the oceans.

Consumer product companies that have joined the effort account for about 20 percent of the world's plastic packaging.

The consumer products companies involved promise to make all plastic packaging recyclable or compostable by 2025 and will issue annual public reports on their progress. They also will cut back their use of "virgin" plastic, which is newly-manufactured plastic, usually small pellets known as nodules, that have not yet been made into a product.

Recycling processors also are committed, and municipal governments have signed on to create legal and regulatory frameworks to ensure that recyclable plastics actually get recycled.

This isn't just lip service. SC Johnson has tested selling Windex refills to wean consumers from always buying new squirt bottles. In Indonesia, it has opened eight recycling centers that pay locals for plastic collected from rivers and beaches. Johnson then will use the collected plastic to make new packaging materials.

As the issue of plastic pollution floats onto the front page, food markets will offer more bulk dispensers and more refill stations, especially for spring or clean water. Greenpeace's Hocevar sees a sign of hope in PepsiCo's recent purchase of SodaStream, which makes a gadget that lets you carbonize plain water and add flavored syrups to make your own sodas at home.

"SodaStream gives people the ability to make great-tasting beverages while reducing the amount of waste generated," PepsiCo chair Indra Nooyi said of the acquisition. "That focus is well-aligned with 'Performance with Purpose', our philosophy of limiting our environmental footprint."

Ultimately, lawmakers must step in to regulate the runaway problem of single-use plastics. Environmental advocates are talking with members of Congress and see hope for meaningful legislation within five years, perhaps carried by Federal legislators who led the passage of the 2015 Microbead-Free Waters Act. 

TRENDPOST

These early steps, initial conversations and innovative technologies around saving the seas will gain strength and momentum. We forecast they will converge before 2030, to change our norms and behaviors around the dangers to the oceans, including throwaway plastics. Inventors, investors, and Ontrendpreneurs who recognize this emerging long-term trend toward ocean-sensitive consumer behavior can be poised to profit.



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Signage promoting mental health awareness and support on the campus of the University of Wisconsin Madison.

Campus depression

Mental health disorders rampant in college freshmen

A survey of more than 14,000 college freshmen in 19 colleges across eight countries found that a third of the students reported symptoms consistent with a diagnosable mental health disorder, according to the American Psychological Association.

Major depression was the most common disorder, evinced by 35 percent of the respondents; 30 percent admitted symptoms that indicate a generalized anxiety disorder.

TRENDPOST

Colleges are investing heavily in amenities such as gyms and campus cafés to compete for students but are giving short shrift to counseling students in their transitional first year of college. This situation will persist, because the stigma of mental illness as a personal weakness or sign of inadequacy lingers in our cultural consciousness.

Colleges will begin to invest more in students' mental health support services (and less in in-dorm hair salons) when they realize that those investments will result in fewer dropouts and more graduates, which translate into a more efficient use of college resources. Meanwhile, parents should be prepared to recognize the signs of mental illness in their college-age children and take steps to get them help.

However, only 20 percent of the students sought help at their college counseling centers, the study notes, in part because the centers lack the staff to handle the load.



A liquid metal droplet with flakes of aluminum oxide compounds grown on its surface. Each 0.03mm flake is made up of about 20,000 nano-sheets stacked together.

unsw.edu.au

Clean water

Cheap filter makes toxic water safe

Clean water is becoming scarcer at a time when the world's population is growing. Now, scientists at the University of New South Wales and the Royal Melbourne Institute of Technology in Australia have found a way to make dirty water clean enough to drink.

The researchers have developed a simple filtering sheet that cleans up dirty H₂O.

The Aussies found that when they drop a piece of aluminum into the liquid form of the metal gallium, which occurs near room temperature, layers of solid aluminum oxide form along the gallium's liquid surface. The aluminum oxide forms into thin sheets that can be "harvested" and used as water filters.

The sheets are very porous, but the pores are tiny enough to let clean water through while filtering out lead, oil and a variety of other toxins. The best news is that the process is simple: pour contaminated water into the neck of a bottle stuffed with one of these filtering sheets and wait for a minute or two

TRENDPOST

Finding enough clean water to sustain the world's increasing population remains one of the future's great challenges. The Australian discovery can be a significant step toward overcoming that challenge.

while the water drips through. The filtered water is ready to drink.

More good news: while gallium isn't a common metal, it's not consumed in the reaction, so the same container of gallium can be used indefinitely to make many filters. Because the reaction uses virtually no energy, the filters can be produced for a few cents, compared to the usual water filtration systems that can run \$100 or more.

The researchers aren't seeking a patent and are releasing their discovery free of charge to the world, so that the 1 in 10 citizens of Planet Earth who lack access to clean water, including those in Flint, Michigan, can benefit as easily and inexpensively as possible.

trending

Big brewers think outside the six-pack

Despite the thriving universe of craft beers, the U.S. market for beer is shrinking, as younger drinkers have a long list of coffees, teas, energy drinks, and more exotic beverages that distract them from plain old brew. That's one reason why total US beer sales fell 1 percent in 2017.

So, the biggest brewing companies are looking beyond beer.

Heineken's "Draft for Home" venture is delivering kombucha, a Siberian fermented tea, and cold brew coffees as new offerings. Last June, Molson Coors bought Clearly Kombucha; it was the conglomerate's first purchase of a non-traditional alcoholic beverage brand. Constellation Brands, which makes Corona and Modelo beers, invested \$4 billion in Canopy Growth, a Canadian medical marijuana venture founded just four years ago. Constellation now owns 38 percent of the company.



TRENDPOST

The beverage market has become a free-for-all. Companies such as Seedlip and Tost are making non-alcoholic spirits that taste like the real thing. Ceria Beverages and Rebel Coast Winery are turning out marijuana-infused drinks. In Japan, in May 2018, Coca-Cola premiered its first-ever alcoholic beverage, called Lemon-Do, a Japanese "alcopop" canned drink. Bottoms up.

As the industry's traditional silos break down, small specialty beverage makers, as well as some majors, will be prime targets for takeovers. Pepsi-Coors switchel, anyone?

Do household cleaners make infants obese?

A Canadian study suggests that the epidemic of childhood obesity may be caused in part by the chemicals in typical antibacterial household cleaners. The researchers theorize that such chemicals are absorbed through the lungs, skin, or mouth (babies taste everything) and find their way into babies' intestines. Once there, they kill off key elements of infants' gut bacteria, rendering children less able to process food normally. The result: overweight kids.

The analysis, done as part of the Canadian Healthy Infant Longitudinal Development (CHILD) study, looked at gut bacteria in 750 infants at ages three to four months. Then they tracked the children's weight as they aged to three years. The scientists controlled for a range of factors such as diet, family history, and even whether a baby was born normally or by Caesarian section.

The one correlation that held steady was between an infant's obesity and the long-term use of antibacterial cleaners. The more cleaners that were used in the home, the fatter the baby.

The results confirm those of another study, showing that toddlers with a high concentration of triclosan in the urine (a common antibacterial agent in soaps, cosmetics, and toothpaste), tended to have



New studies show potentially far-reaching health risks of babies exposed to cleaning products.

Shutterstock

more body fat. Researchers also have found that piglets who inhale aerosol disinfectants over time show alterations in their digestive tracts' array of bacteria.

The Canadian study also found that families who used more "natural" cleaning products tended to have fewer obese children.

TRENDPOST

The switch to organic foods, "nutriceuticals" and "green" cleaners will continue, as people realize the dangers that synthetic chemicals pose to living things and our environment. Marketing will more strongly emphasize products' green credentials, and retail prices for green products will stabilize, or even drop, as demand and supply rise. Environmentally oriented investment funds and advisors, such as GreenCentury, Natural Investments LLC, and Natixis Investment Managers will benefit.

Growing your new heart

Harvard University researchers have grown a left ventricle of the human heart.

And it started beating on its own.

In a lab, the scientists created a scaffold of nanofibers made of gelatin and a biodegradable plastic. Then they seeded it with living heart cells. After a few days, the heart cells had reproduced, covered the scaffold, and it started to beat.

Housed in a container simulating conditions in a

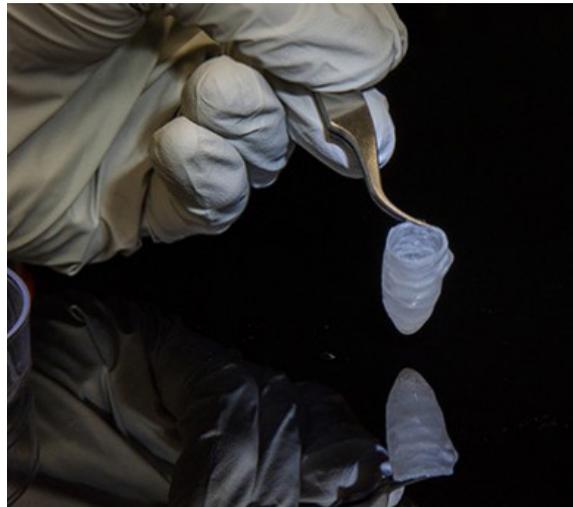
living body, the ventricle kept beating for six months. During that time, the researchers tested its reaction to adrenaline-like substances (it beat faster), inserted catheters to study various aspects of its behavior, and even induced a “heart attack” by poking holes in it.

Next, the scientists hope to grow a more complete heart and carry out more complex tests.

TRENDPOST

A lab-grown “research heart” could replace animal organs and heart-on-a-chip gadgets that are currently state-of-the-art in cardiac research. Ultimately, the project’s goal is to hasten the day when a person’s own heart cells can be used to grow a clone heart, to test its reactions to various treatments.

This also moves us closer to the day when new hearts can be grown to replace worn-out original equipment.



Produced at Harvard, this scale model of a left heart ventricle was engineered with a nanofiber scaffold and seeded with heart cells which began to beat only after a few days.

Harvard.edu

Mechanical carpenters

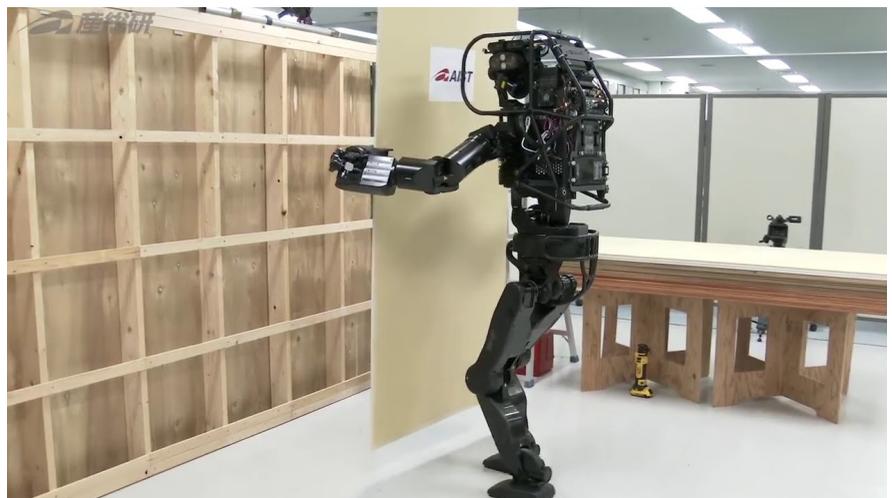
Building robots that build buildings

Anyone who’s had to manhandle a 4-by-8-foot sheet of plywood into place and hold it steady while nailing it to a wall will appreciate the construction robots developed at Japan’s National Institute of Advanced Industrial Science and Technology.

The humanoids are designed to ease the shortage of construction laborers in a nation with one of the oldest populations on Earth.

The robots are fastidiously accurate in their work, but also slow. That’s a flaw compensated by their ability to work double shifts seven days a week, all day long. (See *Trends Journal*, August 2018, Breeding Robots)

The robots aren’t designed to replace humans entirely. Instead, robots can take over simpler, labor-intensive jobs while people can spend their time crawling into tight spaces and doing other things that robots can’t do, at least yet.



TRENDPOST

Japan’s mechanical carpenters join brick-laying robots, giant 3D printers that lay down entire buildings, and other automated construction functions that have the potential to speed up work. This could control some costs, making housing more affordable for more people. The robots also could reduce the number of construction-site injuries, now 150,000 annually in the US alone.

HRP-5P construction robot.

Youtube.comw



Shutterstock

Drinkable sensors monitor tumor treatment

Instead of starting a cancer patient on a drug and then waiting weeks to see if it works, scientists at Switzerland's Ecole Polytechnique Federale de Lausanne have come up with an innovative way to speed up the news.

The team has created cubic electronic nanosensors coated with a substance that lets them pass through the intestinal walls and into the bloodstream. There, they travel to the site of sickness. Because the sensors' geometry matches the tumor's receptors, the sensors bind to the tumor. Then they start sending back signals that communicate the presence of drugs and the tumor's state of health.

The sensors will be electrically charged by an electromagnetic or ultrasound system outside the patient's body. The same system would be used to collect the sensors' data.

The researchers are working to shrink the sensors to about 10 millionths of a meter, about the size of a red blood cell. The task shouldn't be daunting, as electronic glucose sensors of that size have already been tested.

TRENDPOST

Nano-scale biological sensors are a growing research field and are already entering clinical practice. The challenge that has not been solved, or even widely discussed, is how to keep these microscopic electronic granules from becoming part of the waste stream that's flowing into our oceans and groundwater, ultimately ingested by sea life and those of us who don't need them.