

OPUNTIA

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DARK POOLS IN THE BIG MUDDY EXCHANGES

by Dale Speirs

Bankers like to present themselves as sober, steady men who are the guardians of their customer's money. (Pause for laughter from the audience.) As history has demonstrated over and over again, bankers are in fact as gullible as the next man. More so, because the bankers are the ones who create the shaky investments to separate the sheeple from their money and worse yet, actually come to believe their own press releases. When the American housing market declined slightly in 2006, which in turn triggered a far greater drop in mortgage-backed securities that had been leveraged multiple times by banks and brokers, it was the bankers and traders who desperately wanted to believe. Lots of outsiders predicted the Panic of 2008 several years in advance, although few got the exact timing right. No insiders on Wall Street saw it coming. As indignant as the public were when the chain-reaction collapse of Bear Stearns, Lehman Brothers, and AIG brought down world markets, the reaction of the sophisticated traders on Wall Street was even greater. They were genuinely shocked. How could their computer algorithms fail them like that? Why were their nanosecond machines running amok? They had no idea at all.

The post-mortem of the Panic of 2008 showed that the root cause was an over-inflated housing market and too much toxic paper

issued to finance debts that could never be repaid. In America it happened within five months. In Europe it is happening now but in slow-motion over several years, such that it can't be called a sudden panic, but with the same results. All the commentary you may read on the Panic of 2008 and the Euro crisis boils down to one simple sentence:

"More money has been borrowed than will ever be paid back."

That's How It All Began.

The Panic and the Euro crisis have revealed one contributor to the problem, which didn't cause it but exacerbated it. After the turn of the Millennium, computer technology reached a tipping point where it was possible for bankers and brokers to own and operate machines that could execute market trades on a nanosecond scale. (A nanosecond is one-billionth of a second, a millisecond is one-thousandth of a second.) That led to the rise of the bots, which are computer algorithms that operate autonomously and do hundreds of thousands of trades per second. The people who owned those bots lost control of them, and still don't know, even to this day, what to expect from them. Other traders set up private trading exchanges to get away from them, with no public access or published charts of the trading. The whole financial industry makes its profits on insider information, and the last thing they want outsiders to see is the real prices of stock or commodity trades. This network of hidden trading helped make the Panic of

2008 worse, because no one could find out what was trading and at what price until the algorithms suddenly drove full speed into a brick wall. These hidden markets are known as dark pools, and since the Panic have spread worldwide, becoming more interlinked and more susceptible to crashes.

Scott Patterson is a Wall Street reporter who has recently published *DARK POOLS* (2012, hardcover), which looks at the past, present, and near-future of nanosecond trading. Interestingly, the problem with dark pools arose because of the bots being used in lit pools, which are the public stock and commodity exchanges that publish charts and trade out in the open.

Nanosecond computers are so fast that the speed of light becomes a physical factor in trading. A broker's nanosecond computer located a couple of metres closer to the stock exchange's computer can actually beat out a rival computer that is only a couple of paces further away from the plug-in socket of the exchange computer. Therefore all nanosecond computers are located in the same room and connected to the stock exchange computer by cables that are all exactly the same length to a fraction of a millimetre. Someone who bids or sells a stock from a computer across the street or across the country will be several milliseconds slower in responding to automated bids, allowing the bots to jump in and buy or sell ahead of the legitimate bid.

Suppose you bid \$10 for a stock. At the time you click on the bid key, the stock is selling for \$9.98. Your stockbroker's bot already knows this but you didn't because your computer is a millisecond slower. The bot jumps in, buys the stock for \$9.98 and sells it to you a split second later for \$10. Two cents doesn't seem like much, but when trillions of shares trade daily, it adds up.

This type of action is known as front running, which used to be illegal until the Wall Street banks paid the American Congress to do away with this and other laws enacted to protect investors after the Panic of 1929. Long-term investors who buy and hold stocks, or companies wanting to issue shares to raise cash, resented the rise of the bots. What they did in the early years of the Millennium was to set up dark pools, where no one knew who was offering what at what price. The bots were forbidden to operate in the dark pools.

Knee Deep In The Big Muddy.

The problem was that the computer programmers who created the algorithm bots eventually found ways to infiltrate the dark pools by modifying the bots. But everyone discovered another more serious problem. On 2010-05-06, the New York Stock Exchange crashed 800 points in less than a second. There was no fundamental cause; all the stocks crashed, whether blue chips such as General Foods or Procter & Gamble, or the latest speculative

issue. This was the first flash crash, and there have been several since. The NYSE management was forced to reverse all the trades of the flash crash, and the investors' lawyers leaped into action.

Then and only then did the traders and bankers discover a fundamental flaw in the bots. The programming of each bot is different, depending on the brokerage or bank philosophy of trading. All have a trigger point where if the market drops more than a certain percentage, the bot sells all its stocks and sits out the decline until a new rise is seen. Day traders use trailing stops on each stock or commodity they own. A trailing stop is a certain amount of price decline at which the computer (not necessarily a bot; individual investors use trailing stops as well) is instructed to sell the stock.

Suppose you bought a stock at \$9 and it is now trading at \$10. If the market fluctuates sharply downward to \$8, you will lose your profit, so you put a trailing stop of 50 cents on your stock so the computer would automatically sell it at \$9.50. If the price went up to \$11, the automatic sell price would become \$10.50 because of the 50-cent trailing stop. A very nervous day trader would put a 10-cent stop on a \$10 stock so the computer would sell out at \$9.90. A long-term investor who bought it at \$5 might put a \$2 trailing stop on it if he thinks the fluctuations are just normal variation in the market. Since nothing moves in a straight line on any market, all stocks and commodities have

small fluctuations due to random chance. You do not want to put too small of a trailing stop on your stock because you would be knocked out by a one cent fluctuation and then have to buy back the stock at a higher price.

This is what intensified the Panic of 2008. Investors had bought stocks on margin (borrowed money supplied by the brokerage) and put trailing stops on the stocks. When Bear Stearns and Lehman Brothers had to make good on the toxic mortgage paper they had sold, the only way they could do it was to sell all their own investments. This crashed the market through the first group of trailing stops (such as the 10 cent trader in the example above), forcing those investors to sell out to meet their margin calls. The second wave of selling then dropped prices further and took out another batch of investors (the \$2 stops) who had placed larger stops that ordinarily would never have been triggered. You can see how this would escalate as each successive layer of trailing stops was broken through. Investors had to sell even their good investments to meet their margin calls, all of which are recourse loans. (Recourse loans are those you can't walk away from, and your creditor can seize your bank accounts, car, and personal property to make good the debt.) That is why blue-chip stocks and gold went down with the trash during the Panic. Gold quickly recovered and is selling almost twice as high as before the Panic, while stocks and bonds are still a couple thousand points below their pre-Panic high.

The first flash crash in 2010 was caused by a bot whose trailing stops had been placed too close to the average price and which at the same time had been buying and selling billions of shares per second. If a retail investor sells his 1,000 shares of General Foods, the market doesn't even notice. If a bot suddenly unloads billions of shares in a hundred different companies and then takes its money out of the market instead of immediately re-investing it, the market crashes. This set off a chain reaction of other bots running at nanosecond speeds, and in less than a second the market fell 800 points. This self-reinforcing feedback loop has happened again several times. Each time the stock exchanges reverse the trades, and the programmers tinker with their algorithms to make sure it doesn't happen again, or at least not for the same reason. -4-

Nanosecond trading is commonly referred to as high frequency trading (HFT) and looks to be with us for many years to come. Why not ban automated trading? Because the banksters make too much money at it with those nanosecond trades. Since the regulators and politicians are bought and paid for, they're certainly not going to upset their biggest campaign contributors. The system moves on, and even the lit pools are obscured by muddy waters. Today 80% of all stock and commodity trading is done by HFT bots without the intervention of humans.

The Captain Says We Gotta Move On.

Patterson begins his book with a dramatized version of one of the early HFT traders, Haim Bodek, dealing with a crisis in one of his machines, which kept messing up for no apparent reason. These computers have millions of lines of software code, so debugging them is considerably more difficult than figuring out why your laptop won't send a document to the printer. Patterson writes melodramatically, and I doubt he would make a good novelist. He is better when he sticks to straightforward narration rather than trying to depict the traders anguishing over their machines. Fortunately most of the book is the clear narrative style.

By the middle 2000s, algorithms were in widespread use. At first they concentrated on the buying and selling. After traders realized that outguessing a rival would increase profits even more, the Algo Wars broke out. Various rival exchanges wanted to get in on the action and take business away from the NYSE. Soon they all were using the same method, paying a fraction of a cent per share traded to the dealer. The result was a flood of trading since the brokers were, and still are, making more money from wash buying than the actual profit per share. Wash buying is another one of those things that used to be illegal; it is buying a share and then selling it a second or two later, then repeating the process. This makes the shares look like there is a hot market for them and presumably entices gullible outsiders into trying to get a piece of

the action. The stock exchanges also charged a fraction of a cent fee on the trade. The NYSE and NASDAQ between them made more than \$2 billion in trading fees in 2008.

By 2012 there were a dozen exchanges in the USA (Canada has two) and at least fifty dark pools. Just after World War Two, the average holding period for a stock was four years. In 2008, it was two months. In 2012, it was 22 seconds. That includes the slow-moving mutual funds and insurance funds which buy and hold, known as the whales, so if you take them out then the average holding time drops to two seconds.

Bodek couldn't find any bugs in his codes no matter how hard he looked. He finally cut out his machines from certain stock exchanges that seemed to be where his orders failed. It was then that an exchange representative talked to him, anxious to get his business back, and told him to change the way his bots executed their orders. Bodek had been using a standard type of order called a limit order (trailing stops are a type of limit order). What he didn't know and found out, was that many exchanges were allowing brokers to use special buy/sell orders with their bots, called, very appropriately and with unusual honesty, abusive orders. These were not advertised to dealers; you had to know somebody who would tell you and let you in on the system. They allowed orders to sit hidden in the queue, bump ordinary limit orders out of line, and then execute

when the bot wanted to, not because it had to because it was next in line. Buy orders in an honest market are ranked so the lowest one executes first, and sell orders so the highest one goes first. Abusive orders were line-jumpers who could insert themselves anywhere and force someone else to execute with them even if the abusive order wasn't the best one.

Imagine you want \$10 for your share. There is a \$10 bid from someone else, but you aren't allowed to see it because an abusive order forces its way in and buys your share for \$9.98. Imagine you want to buy a share for \$10. The abusive order blocks any \$10 seller from seeing you and sells you the share for \$10.02. Since no one buys or sells one share at a time, multiply that difference by a thousand or ten thousand or however many shares you're trading. As a bonus, the abusive order bot picks up a fraction of a cent per share from the exchange for executing the trade. It's legal, the exchanges are behind it, and so are the Wall Street banksters. There's no use in becoming indignant about it because your opinion means nothing to anyone over there.

The traditional reason for going public was to raise debt-free cash from the sale of shares, to be used in building factories and hiring employees. Prior to the Millennium, an average of 530 companies per year went public and started trading their shares on stock exchanges. Nowadays it is about 125 companies, as the business owners realize how much the market is being manipulated. The

total number of publicly traded companies has fallen by more than half in the last decade. Some were bought out by others, some failed, but many returned to privately held equity in disgust at how their share prices were being manipulated. The quality of companies has changed as well. Instead of companies that provide useful goods and services for the real economy, modern public companies operate in the fake world of financial speculators and social media (such as Facebook, which ironically was trashed by the bots on its first day as a public stock).

Waist Deep In The Big Muddy.

Patterson then switches to the story of Joshua Levine, again overly dramatized. In 1986, Levine was one of the original computer geeks, a gangly kid who wanted to beat the NYSE with computers. In those days, trades were still done on the floor of the stock exchange with shouting and hand signals. Levine and his boss Sheldon Maschler were both thinking of ways to get around the closed shop of the NYSE by using computers. After the 1987 market crash, the NASDAQ exchange required that its brokers use a computer system called SOES for trades of a thousand shares or less. Maschler and a friend named Harvey Houtkin saw that they could use it as outsiders to repeatedly buy and sell a stock two or three times a minute and make a profit on the small increments. (No nanosecond computers in those days of course.)

The big traders had to watch thirty or more stocks at a time manually, so they couldn't spot all the trading opportunities like someone concentrating on just one stock. Maschler and Houtkin were originally partners but had a falling out. Mashchler was a second father to Levine, who helped him out by souping up his computers to outstrip the human trading that was still going on at Goldman Sachs and the other big brokerages. Levine wrote the first market maker display, that allowed his co-workers to see all the trades on one screen and execute any good ones at the tap of a key called the Monster Key. He then wrote the first algorithm, called The Watcher, which automatically calculated the spread between orders and allowed the trader to execute the order faster than the human traders on the stock exchange floor could. Other freelancers began using The Watcher. Levine made one final revision, called Jump Trades, which allowed freelancers on The Watcher to match buy and sell orders directly with each other and bypass NASDAQ completely.

This version eventually gave birth to the Island in 1996, the first automated trading system that let dealers buy and sell directly from each other without having to go through the NYSE or NASDAQ. Island dealers did not use the traditional open-outcry system that the old stock exchanges still used, where humans shouted across a floor or made phone calls to each other to make the trades. The Island allowed algorithms to contact each other directly, making dozens of trades per second without human

intervention. Island also showed trades in real time for everyone for free, not just dealers, so retail investors who wanted to day trade could do so. Even today, if you are a retail investor you have to pay a subscription for exchange quotes. (The quotes displayed on Yahoo Finance and other free Websites are delayed by fifteen minutes, useless for day traders.) Island charged \$1 per trade regardless of the size of the trade, far cheaper than the NYSE and NASDAQ, who in any event wouldn't let a retail investor trade directly on their exchanges without a broker's licence. 1997 was the year things changed in lower Manhattan. The federal government forced all exchanges to go to automated order matching by computer. The first bid that matched an ask price got the trade. In the old system, the bid from the trader's drinking buddy got the lowest ask price, while the trader's retail customers paid the highest ask price from another trader who had gone to school with him. It was the epitome of the old boys network. They looked after each other at the customer's expense and froze out the small traders. Now anyone could buy or sell if they had a computer and the right software.

Neck Deep In The Big Muddy.

Soon other people realized that they could create their own bypasses around the exchanges. One of these pools, created in Chicago by Jerry Putnam, was called Archipelago.

He asked Levine if he could link it

to Island as well as the obligatory NASDAQ link, and Levine said yes. Others saw what was happening and began writing their own code and building their own pools. People began linking their pools to each other so that if there wasn't a bid match on their pool, their computer would automatically route the bid to other pools until it found a matching ask price. Because NASDAQ was still the exchange of record, they had to report their trades there, but since the actual process took place in a pool, NASDAQ didn't get any transaction fees. The exchange executives fought the electronic traders, but with Uncle Sam looking over their shoulders, they couldn't stop them. Many others jumped into the water. Michael Bloomberg, later to become Mayor of New York City, started a pool. So did another broker, later to become an inmate, Bernie Madoff. The exchange brokers, used to their old boy network, fought a rearguard action but were destined to lose their privileges.

As a result of the spread of personal computers, new types of trading developed. Day traders were those who flipped stocks constantly but always sold out for cash at the end of the day and started anew the next morning. Momentum traders began following the charts and data series that were now freely available to everyone in real time, buying on up-trends and short-selling on downward charts. They kept their stocks for days or weeks, chasing trends up.

Just as this was happening, the dot.com bubble started to inflate. The new tech companies traded only on NASDAQ, which for all its other faults was willing to list start-ups when the stodgier exchanges would not. The volume of electronic trading hit the stock exchanges like a tsunami, sweeping away the old open-outcry methods and forcing everyone to convert, whether they wanted to or not. Dull pension plans trudging along with 5% returns had to convert when pensioners wanted to know why they weren't making 50% like the others. Hedge funds, which originally were supposed to act as counterbalances to the markets, had no choice but to flip tech stocks, elsewise the managers and traders would be given a pink slip.

The big boys also noticed. Goldman Sachs, Merrill Lynch (as it then was; a decade later it would be destroyed by the Panic of 2008), and Morgan Stanley were a few of the big firms who wanted to take control of all those electronic orders and get the trading fees. Levine decided to introduce a new feature to keep his customers and encourage others to come to him. He would pay the traders 1 cent for every hundred shares they offered for sale on Island, and charge the buyers 2.5 cents for taking the trade (still far cheaper than the previous \$1 charge). Island gave a penny of that 2.5 cents to the seller and kept 1.5 cents as its profit. At the time, just before the Millennium, it didn't seem that much of a money-maker, but as computer speeds increased steadily in

the first decade of the 2000s, the number of trades soared. At first, brokers spoke in terms of trades per minute, then as the technology sped up, trades per second.

All At Once, The Moon Clouded Over.

Island, Archipelago, and other high-speed pools ran into a problem just after the turn of the Millennium. The algorithms were now running so fast that many dealers refused to do business on those pools because they couldn't make any profit. Those dealers preferred to handle retail accounts from DIY day traders sitting at home in their basement den. Known as "dumb money" to the traders, the home traders had their trades skimmed or front-run for a few pennies here and there by the dealers. This made no difference to the retired plumber who took a flyer on 100 shares of Microsoft, but when the dealer multiplied that by millions of customers, it started to add up. These pennies were on top of the fees charged to retail customers, say \$2 or \$3 for the trade, and a monthly fee for the account and its "free" charts and data.

Meanwhile, in the dark pools, a new generation of algorithms was coming to the fore. The first generation simply matched buy and sell orders. The next generation, which came to be called the bots, were more complex software designed to observe the trends in the market, not on a daily or weekly cycle, but by the minutes or seconds depending on how fast they were. The bots then

predicted how the market was going and acted on it, changing their buy/sell behaviour without human intervention. They were programmed to read real-time news feeds such as Reuters and Associated Press and actually interpret the news as good or bad for a given stock, then buy or sell on that basis. As speeds ramped up, humans could not only not keep up in practice, they couldn't even keep up in theory. The bots became self-programming, deciding on their own what they would do.

By 2003, dealers located in another state or country noticed they were losing trades to faster bots. It wasn't that these bots had better software, it was that for the first time in history the speed of light became a practical consideration for daily business. Computers were now so fast that their physical location mattered. At the speed of light, it may only take a millisecond for a signal to cross an ocean or continent, which didn't matter when computers operated in tenths of a second. For nanosecond computers though, a millisecond is an entire Ice Age coming and going while waiting to close the transaction. Co-location was born. Dark pools and stock exchanges alike offered space to dealers who wanted to put their computers in the same room and hook them directly into the pool or exchange computer.

Another thing began happening with the bots: spoofing. There was, and still is, no charge for canceling a bid or ask if the order hasn't yet executed.

The bots were programmed to put in layer after layer of stock orders at various price ranges. (A layer is a group of orders that are posted at each nanosecond of trading.) This would mislead investors into thinking that a market was rising or falling, depending on whether the layers were buy or sell orders. The spoofed orders would be instantly cancelled before they were executed, but a day trader in another state or country wouldn't see that for several seconds. A flood of fake buy orders made it look as if the market was rising. The day trader would click on buy, and be surprised that after he bought at the higher price that the other buy prices suddenly disappeared and he had paid top dollar based on a fake chart. There's no use in becoming indignant about it because your opinion means nothing to anyone over there.

This was all part of the long-range trend of the pools turning into their enemies. Computer trading had begun as a way to get around dinosaurs like NASDAQ and NYSE. Over time, the big stock exchanges had no choice but to computerize. Over time, the pools grew into large corporations that drifted into the same behaviour as their elders. The two met in the middle and became each other. The first priority for everyone on Wall Street (and Broad Street where most of the pools were located) was to keep the trading fees coming in. It has never mattered to a broker whether the market rises or falls because he makes his money on the trading fees. Thus the markets are designed to accommodate the dealers, not the retail customers.

Island was bought out by another pool called Instinet, which in turn was bought by NASDAQ. Levine, the idealist who started it all, left the field. What was originally done with a few racks of blade servers now took multi-million dollar machines that had to be tended 24 hours by technicians. Only the biggest brokers and banks could afford it. In 2005, Archipelago merged with the NYSE to create NYX. The NYSE no longer exists as a non-profit organization of brokers, although the name is still used as a brand name. It is now technically a pool itself, run as a private company, not a mutual. In 2006, the legion of NYSE typists who manually typed out all the trades on paper were laid off. Outsiders learned for the first time that one reason the NYSE was so slow was because all of the computer orders that came in were printed out, then handed to typists for re-typing onto a different form after the trade was done.

The danger was that the stock exchanges and dark pools alike were totally dependent on transaction fees. NASDAQ and NYX, now being private corporations, no longer had to look out for the best interests of anyone other than themselves. By 2007, the pools and exchanges had only one other concern besides making money, and that was to speed up the number of transactions per second. The more transactions, the greater their income. During the Panic of 2008, none of them lost money because they got the fee regardless of how their customers fared.

As an example, the Getco pool was making more than \$9 million per day from penny fees during the Panic. The HFT traders were in control. Or so they thought.

We Heard A Gurgling Cry.

By 2009, outsiders began worrying about how the HFT traders were manipulating markets with their bots. Goldman Sachs et al assured everyone that this time was different. The greatest concern of critics was that the bots had increased the volume of trades so much that if they suddenly stopped trading at once, they would crash the market. Such a thing would never happen, said the banksters, the same people who told investors three years before that house prices always go up and therefore mortgage-backed securities were a safe investment.

On 2010-05-06, the stock market dropped suddenly. No one knew why. Bosses were called out of meetings, traders huddled around computers, and no one knew anything about anything. Every HFT trader had the same panic strategy: sell out instantly at any price and stop trading until the market settled down. This strategy had been programmed into the bots, and it was small consolation that they followed it exactly as written. The traders operate under a law that forbids them from bidding zero or quitting trading completely, but the loophole was that they only had to bid one cent to buy a stock. Shares that normally traded

between \$20 to \$100 suddenly were bought for one penny. Conversely, sell bids went to \$99,999 (the maximum a share can trade for). Apple was trading at \$250 at the time, so bots offered it for sale at \$99,999.

In exactly the same way that a power grid failure spreads because local electricity generators cut themselves out of the system when one is overloaded and fails, so it was for the pools. One pool became overloaded with quotes and cut itself out of the market so it could recover. That sent the flow of orders elsewhere and overloaded the next vulnerable pool, so it was cut out. As one pool after another overloaded, the surge of orders that would have normally gone to them went elsewhere. In seconds there was a tsunami of buy and sell orders sloshing across the financial system, trying to find someplace to execute. In the cut-off pools, the bots kept running but bid only one cent or asked \$99,999.

It took five minutes before the exchanges halted all new trades for five seconds, giving the bots time to recalculate at nanosecond speeds and re-set their algorithms. It worked, and the market quickly recovered. After a conference call that lasted several hours, exchange officials cancelled all trades for prices that fell more than 60% during that five minute fall off the cliff. And, of course, the litigation lawyers went to work. The American Senate held hearings, as they always do. Fingers were pointed, and others pointed back.

Retail investors took note and began unloading their stocks or mutual funds, an outflow that continues to this day. So many investors left the field that today about 80% of all stock trading is done between bots because no one trusts the pools.

Stuck In The Old Quicksand.

Not only did HFT traders not learn anything from the Flash Crash, the brokers continued full speed. Although the brokerages and banks still have offices on Wall Street, no trading is done there anymore. A facility the size of several football fields and costing \$500 million, across the river in Mahwah, New Jersey, was built. A giant co-location facility was installed, with the NYX computer in the centre and clusters of brokerage pods surrounding it. Each pod rented for \$10,000 per month, and the dealer's computers were connected to the NYX with cables all exactly the same length to the micrometre. The heat generated by the nanosecond computers is so great that they have to be cooled by 50-cm water pipes. Similar facilities arose around the world.

The subsequent flash crashes affected only one market at a time. As the pools and exchanges link up worldwide, there is one looming fear that brokers and bankers have named the Splash Crash. It is only a matter of when, not if, a chain reaction occurs from someone's malfunctioning algorithm or a backhoe operator digging up a fibre-optic cable. Then all the markets worldwide

will go down, or, even worse, keep running but garble all the trades and the data.

Patterson wraps up his book with a look at current trends. The bots are constantly being modified. Dealers are now using data mining, churning through petabytes of data about everything, because something in there might affect a company's performance. If meteorological data shows the Asian monsoon is late, buy rice contracts. If job sites show a sudden uptick in resumes from Apple programmers, then the bot will short APPL stock. When restaurant reservations uptick on Wall Street, that would indicate the market is doing well. Remember that the published stock prices are useless; it is what they are selling for on the hidden dark pools that matters, but the pools don't publish their results for outsiders.

There are two methods of investing: technical analysis and fundamentals. Technical analysis is looking at charts and data tables and trying to predict how the curves will bend in the next few seconds or minutes. Fundamental investing (such as I do) is buying and holding on for several years on the basis of long-term trends. I own petroleum investments because of Peak Oil, and have safe-deposit boxes with physical gold and silver because of central bank currency printing. I don't trade stocks because fundamentals don't matter there anymore.

HFT trading began as technical analysis, with computers replacing humans. In the last year or so, the bots have become mostly equal, and the dealers have more and more difficulty making a profit. In a rather delicious piece of irony, the more advanced dealers are now trying to write algorithms that will predict which stocks to buy and hold for the long term, rather than buying and then selling it a couple of seconds later. Those who originated computer trading wanted to level the field for the retail investor, but instead converted the big banks into high-speed juggernauts.

And The Epilogue From Pete Seeger.

*“Well, I'm not going to point any moral;
I'll leave that for yourself
Maybe you're still walking, you're still talking
You'd like to keep your health.
But every time I read the papers
That old feeling comes on;
We're waist deep in the Big Muddy
And the big fool says to push on.”*

ZINE LISTINGS

by Dale Speirs

[The Usual means \$3 cash (\$5 overseas) or trade for your zine. Americans: please don't send cheques for small amounts to Canada or overseas (the bank fee to cash them is usually more than the amount) or mint USA stamps (which are not valid for postage outside USA). US\$ banknotes are still acceptable around the world.]

[SF means science fiction. An apazine is a zine for an amateur press association distro, a perzine is a personal zine, sercon is serious-constructive, and a genzine is a general zine]

Statement #401 to #403 (The Usual from Ottawa SF Society, 18 Norice Street, Ottawa, Ontario K2G 2X5) SF clubzine with letters and reviews. Always strong in astronomy news, such as the 50th anniversary of Alouette 1, Canada's first satellite and still in orbit.

Vanamonde #893 to #902 (The Usual from John Hertz, 236 South Coronado Street #409, Los Angeles, California 90057) Weekly single-sheet apazine, with comments fannish and otherwise.

Brooklyn! #78 (US\$10 cash for four issues from Fred Argoff, Penthouse L, 1170 Ocean Parkway, Brooklyn, New York 11230-4060) No particular theme for this issue, just a look at various loci around Brooklyn, including rapid transit stations, architecture, and Brooklyn slang.

It Goes On The Shelf #34 (The Usual from Ned Brooks, 4817 Dean Lane, Lilburn, Georgia 30047-4720) Reviews of obscure books, some old, some new, some bizarre, and others just a bit off the beaten path.

The Ken Chronicles #25 (The Usual from Ken Bausert, 2140 Erma Drive, East Meadow, New York 11554-1120) Perzine with accounts of fixing a car door but not so successful with an Epson printer, a surprise birthday party, mis-labeled maple syrup, and travels thither and yon.

Cuneiform #2 (The Usual from Frederick Moe, 36 West Main Street, Warner, New Hampshire 03278) This is actually an apa compilation, not just a single apazine. Cuneiform is devoted to the Papernet, be it zines or real mail, as well as lesser known books, philosophy, and personal musings.

EOD Letter #24 (The Usual from Ken Faig, 2311 Swainwood Drive, Glenview, Illinois 60025-2741) Lovecraftian apazine, this issue having reviews of several weird fiction collections related in one way or another to HPL.

I Keep Interrupting Myself #17 (The Usual from Loran Frazier, Box 600, Golden, Colorado 80402) Perzine starting off with coffee house stories and going into the collection of sales tax tokens. The tokens are not seen nowadays but back when you

could still buy something for a penny, fractional cent amounts of state sales taxes were paid using tokens denominated in mills, which were tenths of a cent. They were called mills because they were thousandths of a dollar. Alberta has never had a sales tax so there are no tokens from here. I was quite interested to read this as at one time I was a numismatist (and still have my coin collections gathering dust) although I gave it up to concentrate on philately. One of my sub-collections was coins depicting cacti, which included the Arizona mill token showing a saguaro. I bought some in bulk and discovered some had die cracks in them, so I did a study on them which was published in ERROR TRENDS COIN MAGAZINE in 1981.

The Fossil #354 (US\$10 per year from The Fossils, c/o Tom Parson, 157 South Logan, Denver, Colorado 80209) This is published by a group of zine historians. Alas, issue #354 is the obituary of long-time servitor to the society Guy Miller, who died suddenly on 2012-09-15 at age 86. He started publishing zines in 1943 and was active in many apas over the decades.

Grunted Warning #16 (The Usual from Stuart Stratu, Box 35, Marrickville, New South Wales 2204, Australia) Collage zine of newspaper clippings with weird news that never made it to your local station.

Christian New Age Quarterly V20#3 (US\$3.50 from Catherine Groves, Box 276, Clifton, New Jersey 07015-0276) A thematic article on the final stage of life, and letters of comment.

Fadeaway #31 to #32 (The Usual from Robert Jennings, 29 Whiting Road, Oxford, Massachusetts 01540-2035) The highlight of #31 is an extensive history of the Tarzan radio series. It necessarily has to cover the novels and comic strips because ERB was one of the pioneers in multimedia. He realized that the different formats would help sell each other, and he viewed the radio series not as an end in itself but as a means of selling the Tarzan novels. #32 reviews some reprint editions of old-time comic strips and facsimile editions of rare pulp magazines. Also numerous letters of comment.

Alexiad V11#5 (The Usual from Lisa and Joseph Major, 1409 Christy Avenue, Louisville, Kentucky 40204-2040) Lots of book reviews and letters of comment, as well as trip reports and horse racing notes.

The Life Of Rodney - Year 64 #1 (The Usual from Rodney Leighton, 11 Branch Road, RR 3, Tatamagouche, Nova Scotia B0K 1V0) Perzine and fanzine reviews.

Mormo Zine (The Usual from Turn The Page Books, 2009 - 1 Street, Baker City, Oregon 97814) Minizine with interview of the

founder of PyratePunx, a DIY organization of volunteers who organize punk rock bookings in various venues. The organization has chapters in various locations and sets up a template for them on how to book rock bands systematically. This should help avoid disasters and let the attendees enjoy a good volunteer-run event. Sounds like something a few SF convention fans should take note of.

Kobb Log #1 (The Usual from Kobb Labs, Box 30231, Pensacola, Florida 32503-1231) Newborn apazine, with introductory remarks and reviews of some oddball movies.

Night Train To Mundo Fine #6 to #7 (The Usual from Frederick Moe, 36 West Main Street, Warner, New Hampshire 03278) Thoughts on life in a world of apps, and a look at the history of Santa Claus.

Banana Wings #50 to #51 (Editorial whim from Claire Brialey, 59 Shirley Road, Croydon, Surrey CR0 7ES, England) Very fannish SF fanzine with commentary on conventions and fanzines, and lots of letters of comment.

Paper Radio #12 (The Usual from Frederick Moe, 36 West Main Street, Warner, New Hampshire 03278) Articles on the start of international radio, the first broadcast from a train, pirate radio, and some personalities of alternative radio. **-15-**

BCSFAzine #471 to #473 (The Usual from British Columbia SF Association, c/o Felicity Walker, 3851 Francis Road #209, Richmond, British Columbia V7C 1J6) SF clubzine with letters of comment, event listings. #471 has an essay on bad video game design, and #472 has one on the failure of furry fandom to evolve.

One Minute Zine Reviews #5 (The Usual from Frederick Moe, 36 West Main Street, Warner, New Hampshire 03278) The title says it all; brief reviews of alternative-scene zines.

Probe #153 (The Usual from Science Fiction and Fantasy South Africa, Box 781401, Sandton 2146, South Africa) SF clubzine with short fiction, science news, and various reviews.

SF Commentary #83 to #84 (A\$100 from Bruce Gillespie, 5 Howard Street, Greensborough, Victoria 3068, Australia) The final Papernet issues, as Bruce can no longer afford the \$1,200 printing and postage bills for these beautifully produced 80-page large-format zines with colour card covers. #83 goes into depth about the novels of Philip K. Dick, an extensive debate about Connie Willis's novels, and a very large letters of comment section. #84 covers the early days of Australian SF fandom, a tribute to the late SF author Harry Harrison, an extended review of the vampire film LET ME IN, and a review of the boxed DVD set of THE PRISONER.

SEEN IN THE LITERATURE

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Archibald, S., et al (2012) **Evolution of human-driven fire regimes in Africa.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 109:847–852

"Human ability to manipulate fire and the landscape has increased over evolutionary time, but the impact of this on fire regimes and consequences for biodiversity and biogeochemistry are hotly debated. ... Much emphasis has been placed on the positive effect of population density on ignition frequency, but our model suggests this is less important than changes in fire spread and connectivity that would have occurred as humans learned to light fires in the dry season and to transform the landscape through grazing and cultivation. Different landscapes show different limitations; we show that substantial human impacts on burned area would only have started about 4,000 B.P. in open landscapes, whereas they could have altered fire regimes in closed/dissected landscapes by about 40,000 B.P. Dry season fires have been the norm for the past 200–300 kiloyears across all landscapes. The annual area burned in Africa probably peaked between 4 and 40 kya. These results agree with recent paleocarbon studies that suggest that the biomass burned today is less than in the recent past in subtropical countries."