PERKINS CAPITAL MANAGEMENT, INC.

May 20, 2020

Dear PCM Clients and Friends:

First and foremost, we hope this letter finds you, your family, and loved ones healthy and safe.

Over the past weeks we have spoken with some of you; but far from everyone, as people have called about the crisis. Everyone here at PCM and our families are fine. Unlike much of the country, we have been here working and open more or less as usual. The big difference is that in the past we have met one-on-one most days with one or more company management teams who come in to PCM to introduce us to their business plans or, if we have met before or are a current investor, to update us on how they are doing. These meetings have been a critical component of our investment process. Assessing and valuing the potential of each specific investment opportunity and then answering the question: Is this management team making progress and doing what they said they would do? This has all changed to what are called Virtual NDRs (Zoom or other webinar phone based Non-Deal Road Shows), which is just a fancy name for an update. Dan and I have been here working every day with Nancy and others and have been updated by and spoken with most of the companies we have investments in for you. The rest of the team has been rotating between two people taking turns in the office while others work from home. With people sheltering at home, Wayzata's Lake Street closed due to construction, and our neighbor Starbucks closed, it has been very easy for us to be sheltered here as we work. We have so far cocooned ourselves from the coronavirus risk. Even as the country begins to open up more, we will likely continue to operate as we have: open and working; but somewhat sheltered until sometime after Labor Day.

As we all know, market volatility has surged during the beginning of this year to levels last seen more than a decade ago as the COVID-19 pandemic has swept the globe and prompted a significant shutdown of our economy and most major global economies, including Europe and Asia. Though the pandemic was the main cause of the historic volatility we've witnessed, the coronavirus outbreak was not the only source of volatility in the markets. Both a crushing worldwide decline in the price of oil and continued domestic political conflict have also impacted markets this year. In the past, low oil and gasoline prices would have been a positive for the U.S. economy, but a lot has changed in the past few years. The U.S. is now the largest oil producer in the world. With oil prices this low, many U.S. energy firms will have to reduce production and payroll beyond what would be required due to just the coronavirus crisis, which will hit both this important industry and the broad U.S. economy. Exacerbating the problem is the fact that most oil exploration or distribution companies have significant debt on their balance sheets. As a broad statement, the well run and well financed companies will work through all of these problems as they have in the past; the marginal companies may not.

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THE MARKET SCOREBOARD

Ranked by Q1 Return Indexes	% Return Q1 2020
NASDAQ Composite	-14.18
Wilshire 5000	-21.25
Dow Jones Industrial Average	-23.20
NYSE Composite	-25.96
S&P 500 Total Return	-26.70

Mid-Q2 Indexes Ranked by Return From March 31 - May 15, 2020 Indexes	% Return Mid-Q2 2020
NASDAQ Composite	17.07
Wilshire 5000	11.72
S&P 500 Total Return	11.08
Dow Jones Industrial Average	8.07
NYSE Composite	6.27

In late February, and throughout March, equity markets dropped sharply as new cases of the coronavirus surged around the world. The S&P 500 tumbled more than -25% from the mid-February highs to the late-March lows as "social distancing" measures began being implemented everywhere to stop the spread of the disease. Rising fears of the shutdown's broad and negative economic impact fueled the decline which became the worst waterfall decline on record! We were entering a period of STOP which would next certainly result in a period of recession; or perhaps worse. This COVID-19 anxiety driven decline produced a "washed-out" market which declined by the maximum amounts allowed by exchange rules several times, broke "circuit breaker" rules, and produced record negative extremes in sentiment, negative momentum and, of course, volatility. The circuit breaker rules were designed to limit declines and had not been triggered since 1997.

2020 was the worst waterfall on record

Waterfall Declines in Dow Jones Industrial Average

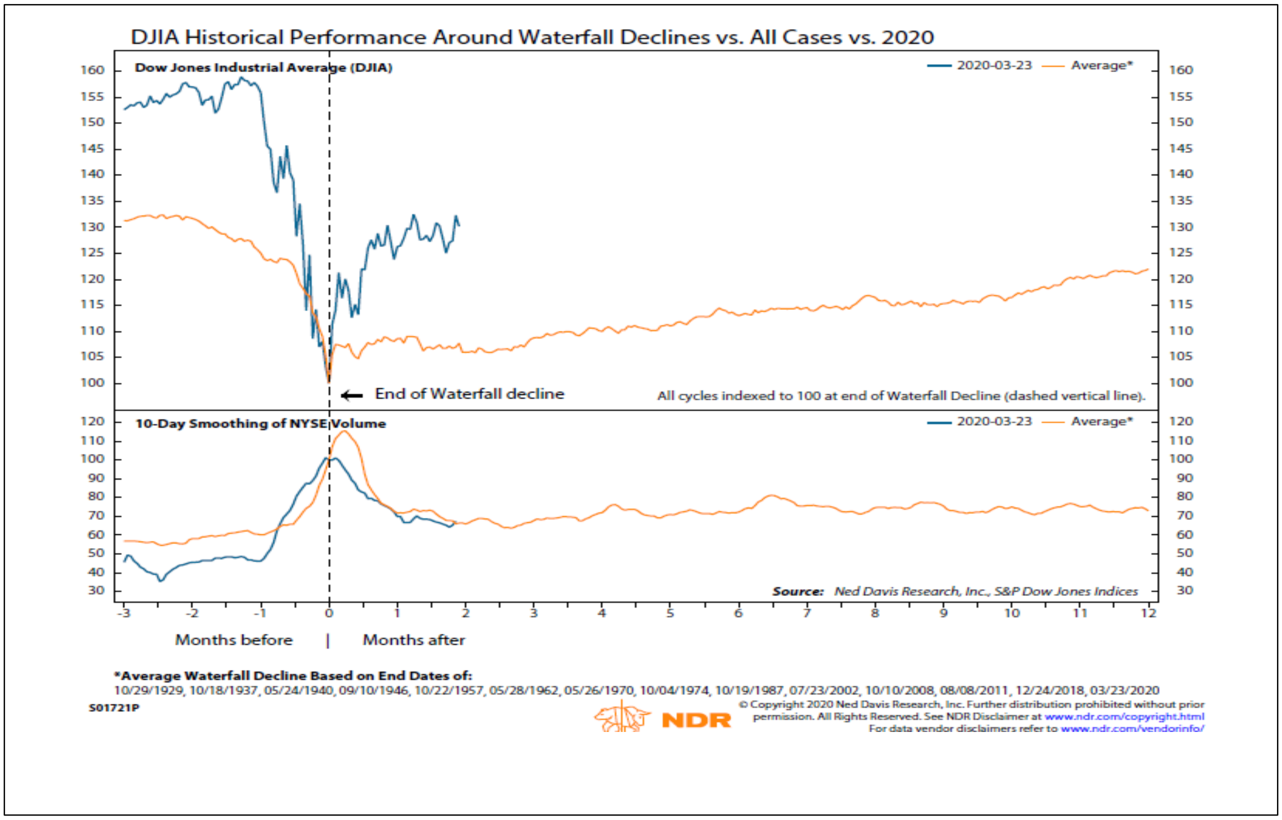
Waterfall Start Date	Waterfall End Date	# Calendar Days	DJIA % Change
10/10/29	10/29/29	19	-34.8
8/14/37	10/18/37	65	-33.8
5/9/40	5/24/40	15	-23.1
8/14/46	9/10/46	27	-18.4
9/3/57	10/22/57	49	-13.7
4/23/62	5/28/62	35	-16.9
4/9/70	5/26/70	47	-20.4
8/7/74	10/4/74	58	-26.7
10/2/87	10/19/87	17	-34.2
5/17/02	7/23/02	67	-25.6
8/28/08	10/10/08	43	-27.9
7/7/11	8/8/11	32	-15.0
11/8/18	12/24/18	46	-16.8
2/12/20	3/23/20	40	-37.1
Median		**43**	**-23.1**

2020 case not included in summary statistics. Source: S&P Dow Jones Indices

Ned Davis Research T_SSF20_15.1

After living, investing, and working in the investment business through five of the prior waterfall declines, starting with the 1987 decline, we certainly were not expecting to experience a sixth so soon; yet, here we are. This decline clearly was what in recent years has been described as a "black swan" event. Though there is still uncertainty and questions to answer, in the end we suspect that this decline will, like the others, be both similar and different. Similar in that we will recover and different in that each recovery takes its own form. This is what we are now experiencing.

As can be seen in the chart below from Ned Davis Research, which graphically compares the recent waterfall decline with an all case waterfall decline average, the current decline was very steep and the resulting reaction up off what we now know as the end of the waterfall decline has also been very quick and steep.



In fact, the April 2020 recovery advance was also a record breaker, but on the upside. In April the S&P 500 started the month with a 4% decline then rallied 17% for the remainder of the month and ended with a monthly percentage change advance of +12.68% which was the best monthly advance by any month since January 1987!

A visual inspection of the chart above shows just how strong the recovery advance has been compared to the average. The recovery has now recovered approximately two-thirds of the decline. At this time, it is fair to say investors and the markets are still facing a level of uncertainty that we have not seen in over a decade. Positively, the U.S. government has acted quickly in a historically forceful way to support the economy as the Federal Reserve cut interest rates to zero percent and implemented several important measures to provide short-term cash and ensure there's plenty of capital for the banking system. Congress also passed multiple economic relief bills, the largest of which was a $2.2 trillion stimulus package aimed at providing support for business and their employees. These actions, led by the Fed, are the most aggressive monetary and fiscal stimulus packages seen in peace time. These actions were likely the reason for the market's current recovery and provided sufficient comfort to the markets to move forward off the late-March lows.

STOCK MARKET OBSERVATIONS

In several of our recent letters we wrote about the election cycle, our plow horse economy continuing on, and the continuation of a generally favorable market once investors began to see less election risk. We also have written about the Fed generally continuing its decade of accommodation despite its 2019 shift or "pivot" as it was called. Several times we stated that we did not expect a significant decline until the U.S. economy experienced a recession and that we did not anticipate a recession, when others did, in 2018, 2019, or even going into 2020 and 2021. But all of that was upended by the coronavirus, which has not only caused historic and unsettling volatility across the financial markets, but also upended normal society in a way none of us have ever seen before. For the economy it has meant a period of STOP and now a period of recession. It is important to point out, as Federal Reserve Chairman Powell stated in a recent interview, there was nothing "wrong" with our economy before the coronavirus hit. There was no tech bubble, no housing crisis, or banking crisis, like we saw in the last two recessions. Economic fundamentals were rather positive prior to this unprecedented shock, and that does offer some comfort.

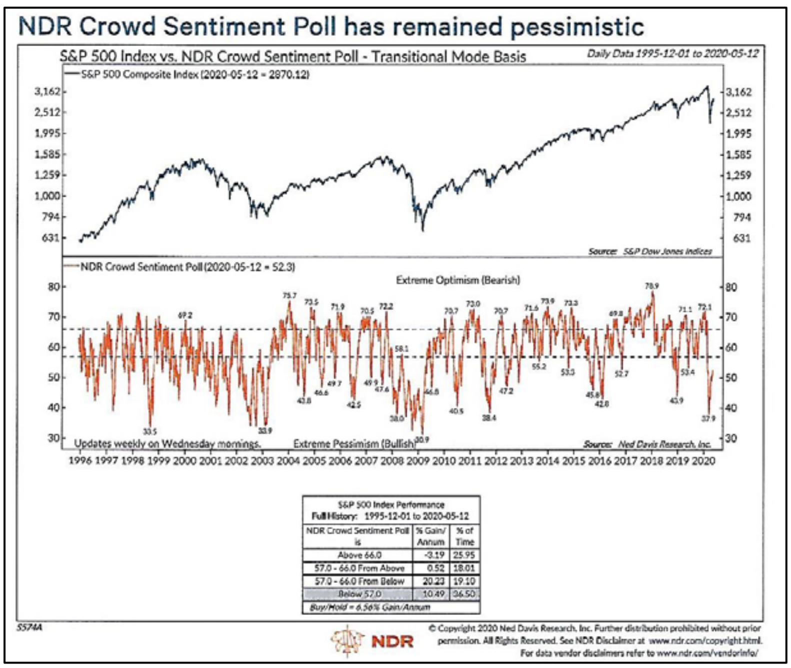
Given time, as the U.S. economy opens will it revert back to the 2019 economy? That is central question which everyone is asking and seeking to answer. Will the recovery be a V or a U? Or? Unfortunately, we are certain that at this time any answer to this important question would only be a guess.

An educated guess was made by the economist, Robert Shiller, when he said in a webinar we listened to that in his opinion a V-shaped economic recovery was not a high probability scenario; but a possibility if there was a breakthrough in treatment. Shiller also commented that Covid-19 virus was a true exogenous shock, a plague which had put us into a wartime situation.

I think a more informed guess to this question can be found in Fed Chairman Powell's 20/20 interview this past Sunday and in his subsequent testimony to Congress. I felt his interview was thoughtful, knowledgeable, and showed a compassionate understanding of the important issues ahead of our economy; a reflection of his strong, timely, and forceful leadership of the Fed at this time. In his interview he felt that the greatest risk to our economy were what he described as "unnecessary bankruptcies" by businesses and individuals who had immediate liquidity issues due to the coronavirus pandemic; but not more persistent solvency issues. Businesses who have problems because they are shut down. Individuals who cannot make their home payments without their paycheck. When pressed about the timing and "shape" of a recovery he would not give a specific direct time line; but I think you could see he felt the administration's "message," which is that we will see visible recovery in the third and fourth quarters would be just a beginning and that it would take into 2021 to see a more clear visible recovery. He was also quite clear that the portions of the economy which require more physical interaction and represent 20% of our economy would take longer: restaurants, airlines, and sports.

What was most important is that the Fed made a clear commitment, and it is made credible by their quick and forceful response to this crisis. He has stated: "We are committed to using our full range of tools to support the economy in this challenging time even as we recognize that these actions are only a part of a broader public-sector response." He has signaled that interest rates will be at zero for some time when stating, "We expect to maintain interest rates at this level until we are confident that the economy has weathered recent events." In his 20/20 interview he stated, "We're not out of ammunition by a long shot." So again: "Don't fight the Fed."

In our letters to you we have also mentioned the Wall Street saying: "Don't Fight the Tape." In an up market this is often optimistically morphed into: "The Trend Is Your Friend." These comments almost beg the question: "So what about now?" Or as rephrased in a research piece by Ned Davis Research: "Does the historic rally eliminate the need for a retest?" We feel the simple straightforward answer is clear: No. Based on our experience, the strength which we have had off the lows does not eliminate the need for or eliminate the likelihood of a correction during the next several months which would go back and test the lows. There is historical market precedent for bigger retracement rallies, and this one has been historic, to be followed by milder retests.



Corrections also serve to reduce or correct excess optimism during an advance. The longer-term chart to the left by Ned Davis Research, which goes back to 1996, shows that despite the record advance off the lows, people are still extremely pessimistic. This is consistent with prior major selloffs and would be expected. In the normal recovery period from a bear market or a waterfall decline, a period of time, or a time consolidation is as important as a price consolidation. As discussed in the Market Scoreboard section, the price recovery off the lows has been outstanding. It would be unusual, especially with the summer months ahead and the coming uncertainty of the Elections, for the market to keep going up at its current pace and not take a breather. In fact, it would not be healthy for the long-term trend of the market.

What we need to prepare for and understand is that a test of the lows is normal, is expected, could be fairly dramatic, but would be part of a long-term bottoming process. The Dow Jones Average is currently over 6,300 points above its March low; a 50% retracement would be a dramatic 3,000 plus point correction. Sounds like a lot, but during a couple days last week there was a 4.5% correction, which was over 1,000 points. In terms of the S&P 500 we are 780 points or 35% above the 2200 low, so a 50% retracement would be around 400 points. Since the rally from the March 23 low is the strongest of any post-waterfall rebound, as seen in the chart at the top of page three, it would not be unreasonable to give some of that back for a period at some point between now and the elections. The correct way to look at this is that it is just part of the process; what we are going through.

We mentioned in our introduction that we have, as we always do, but even more so, spent our time talking with most of the companies we have invested in for you. I think we are extremely fortunate that these are sound companies with positive business opportunities as the country opens up. The crisis will affect most companies this current quarter. Longer term the healthcare, software, and technology companies we often discover to invest in are the beneficiaries of positive new change and will continue to grow. Some of them have products which are in greater demand due to the crisis. One area we are extremely pleased to have significant investments in are the suite of diagnostic companies we have invested in for most clients. The COVID-19 diagnostic test issues, which have been documented in the news, just reinforce the critical need and investment opportunity for diagnostic tests in medicine: viruses, cancers, and all infectious diseases. This is an area we will continue to research for investment opportunities and will educate you on in future updates.

At this time, we need to "look across the valley" and remember the forward-looking nature of the equity markets, and its well-documented history of turning positive long before a crisis or a recession ends. The market looks ahead and typically bottoms 4 months before the end of a recession (whose dates are often restated later), 6 months before sales start up, and 9 months before an earnings recovery. Michael LaBella of Legg Mason is quoted as finding that over the last 80 years, the equity market has turned up on an average of 107 days – some three and a half months – before a recession ended. In the financial crisis of 2008-09 the market bottomed out on March 9, 2009 at an S&P 500 of 677 (that is 3.25x the recent March 2020 low), yet the recession continued through June. But by June 30, the S&P 500 was already at 919, up 36% from the trough. The plain fact is that the average return for the S&P 500 over all the recessions since 1950 is a positive 3%. How is that possible? The market turned up long before the recession ended. In these troubled times we need to remember to look ahead into the future.

It is our opinion that this crisis will not be solved by government; but rather by the companies around us, our free enterprise system which they operate within, and their employees and owners – we Americans. We see this every day with the announcements around us. It was not the CDC diagnostic test which saved the day; but rather the work and investments brought up to speed quickly by both large and small companies. For many American companies this is a time to learn, change and innovate. As Warren Buffet said at Berkshire Hathaway's recent annual meeting, "You can bet on America."

COMMENTS FROM THE RECENT BERKSHIRE HATHAWAY MEETING

From time to time in our letters, we have reprinted the complete comments made by Warren Buffett at Berkshire Hathaway's annual meeting. This year we are sharing with you several of his comments which we feel seem pertinent to investing in today's virus environment.

Good businesses:

If you bought into a business, it's going to deliver what the business produces. And the idea that you're going to outsmart the person next to you, or the person advising you can outsmart the person sitting next to you is, well, it's really the wrong approach.

What we've learned from 50 or 60 years of operating businesses that if you can find a great business that doesn't require capital, when it grows, you've really got something.

Bet on America:

Anything can happen in terms of markets, and you can bet on America, but you have got to be careful about how you bet, simply because markets can do anything.

Paying off high interest debt is better than any investment idea:

I mean, if I owed any money at 18% the first thing I do with any money I had would be to pay it off. It's going to be way better than any investment idea I've got.

I would suggest to anybody that the first thing they do in life is, and they can get to something else later on, but don't be paying even 12% to anybody.

Equities will outperform in the long run:

You know, at least in my view, you know that America's tailwind is not exhausted. You're going to get a fine result if you own equities over a long period of time..... Equities are going to outperform that bond. They're going to outperform Treasury bills. They're going to outperform that money you've stuck under your mattress.

Right psychological approach & fear:

If you really had a farm, and you had this neighbor, and one day he offered you $2,000 an acre, and the next day he offers you $1,200 an acre, and maybe the day after that he offers you $800 an acre, are you really going to feel that at $2,000 an acre when you had evaluated what the farm would produce, are you going to let this guy drive you into thinking, "I better sell because this number keeps coming in lower all the time?" It's a very, very, very important matter to bring the right psychological approach to owning common stocks.

I'm not recommending that people buy stocks today or tomorrow or next week or next month. I think it all depends on your circumstances, but you shouldn't buy stocks unless you expect, in my view, you expect to hold them for a very extended period and you are prepared financially and psychologically to hold them.

HOUSEKEEPING

We are planning on updating you again around July 22, back in line with our normal quarterly updating schedule. Before then, if you have any specific questions, please give us a call or call in and schedule a time to talk. Enclosed with this mailing is an additional brief report of your investment account as of May 15. We are also including our annual offer of Form ADV and our privacy notice. As a final matter, we want to inform you that PCM applied for and received an SBA Paycheck Protection Plan Loan of $117,000.

This month's cartoon speaks to the questions or "reservations" many have as we begin to open up again.

Sincerely,

Richard C. Perkins, C.F.A.
President
Portfolio Manager

Daniel S. Perkins, C.F.A.
Chief Operating Officer
Portfolio Manager

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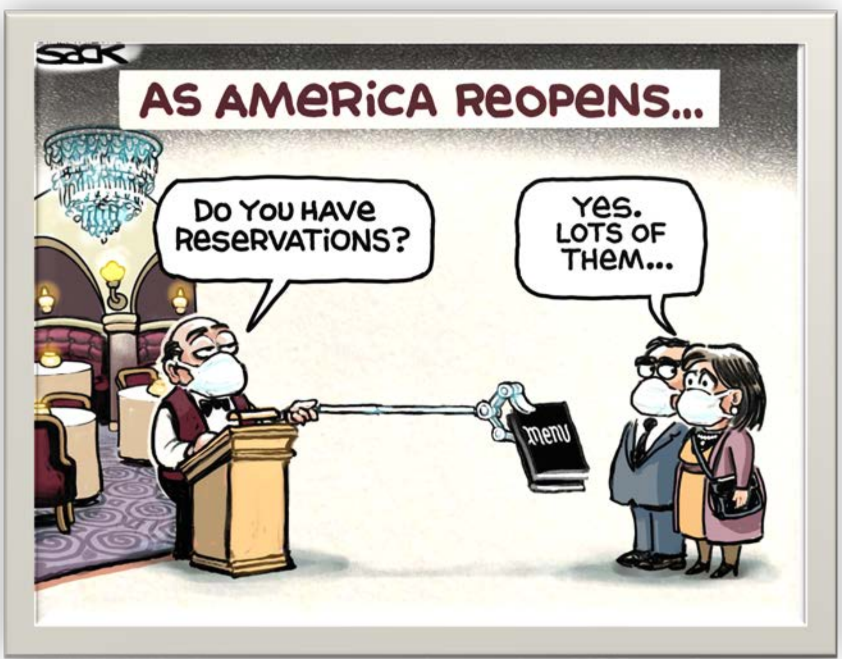

OLE AND SVEN

On a winter morning, Ole took off for church alone since Lena had been sick. It so happened a sudden blizzard made driving impossible and so Ole and the preacher were the only ones that made it. The preacher decided to deliver his sermon anyway, which turned out to be an hour long and somewhat boring.

After the service was over, the preacher turned to Ole to see if he had a comment. “Vell, Reverend,” said Ole, “I don’t know any ting about preaching. But I feed a lot of cattle on my farm. And if only vun critter shows up, I don’t dump da whole load of feed.”

Ole got a job as a policeman. His first assignment was to take a criminal to jail. As Ole took the man into custody, the man pleaded to Ole, “Can I just go in this donut shop and get some donuts? When I’m in jail, I won’t have a chance to have donuts for a long time.” Softhearted Ole said, “OK, I’ll vait for you out here.” Well, the prisoner went into the donut shop and escaped out the back door. A month later, he was re-captured and Ole was assigned to take him to jail. The man again pleaded with Ole to let him go into the donut shop for some donuts. But Ole, reflecting on his previous experience, declined. “Oh no,” said Ole. “You von’t fool me again. Dis time I’ll go in for da donuts and you vait out here.”

Sven and Ole worked together and both were laid off, so they went to the unemployment office. When asked his occupation, Ole answered, "Panty Stitcher". "I sew da elastic onto ladies cotton panties."

The clerk looked up panty stitcher. Finding it classified as unskilled labor, she gave him $300 a week unemployment pay.

Sven was asked his occupation. "Diesel fitter" he replied. Since diesel fitter was a skilled job, the clerk gave Sven $600 a week.

When Ole found out he was furious. He stormed back into the office to find out why his friend and co-worker was collecting double his pay. The Clerk explained "Panty stitchers are unskilled and diesel fitters are skilled labor."

"Vhat skill?" yelled Ole. "I sew da elastic on da panties, Sven puts them over his head and says, "Yah, diesel fitter."

THE PAOMNNEHIL PWEOR OF THE HMUAN MNID

Aoccdrnig to a rsereaechr at Cmabrigde Uinervtisy, it deosn't mttaer in waht oredr the ltteers in a wrod are, the olny iprmoetnt tihng is taht the frist and lsat ltteer be at the rghit pclae.

The rset can be a total mses and you can sitll raed it wouthit a porbelm. Tihs is bcuseae the huamn mnid deos not raed ervey lteter by istlef, but the wrod as a wlohe.

Amzanig huh?

CAN COLD WATER CLEAN DISHES?

John went to spend a weekend with his 90-year-old grandfather. After spending a great evening chatting the night away, the next morning John's grandfather prepared breakfast of bacon, eggs, and toast.

However, John noticed a film-like substance on his plate, and questioned his grandfather asking, “Are these plates clean?” His grandfather replied, “They're as clean as cold water can get them.”

For lunch, the old man made hamburgers. Again, John was concerned about the plates, as they appeared to have tiny specks around the edge that looked like dried egg and asked, “Are you sure these plates are clean?” Without looking up the old man said, “I told you before, those dishes are as clean as cold water can get them.

Later that afternoon, John was on his way to town and as he was leaving, his grandfather's dog started to growl, and wouldn't let him pass. John yelled and said, “Grandfather, your dog won't let me get to my car.” Without diverting his attention from the TV, the old man shouted, “Coldwater, go lay down now, yah hear me!”

THE SILENT TREATMENT

A man and his wife were having some problems at home and were giving each other the silent treatment. The next week, the man realized that he would need his wife to wake him at 5:00 AM for an early morning business flight to Chicago. Not wanting to be the first to break the silence (AND LOSE), he wrote on a piece of paper, "Please wake me at 5:00 AM."

The next morning the man woke up, only to discover it was 9:00 AM and that he had missed his flight. Furious, he was about to go and see why his wife hadn't woken him when he noticed a piece of paper by the bed. The paper said, "It is 5:00 AM. Wake up."

LAST RIDE ON MY HARLEY

While riding my Harley, I swerved to avoid hitting a deer, lost control and landed in a ditch, severely banging my head. Dazed and confused I crawled out of the ditch to the edge of the road when a shiny new convertible pulled up, driven by a very beautiful woman who asked, “Are you okay?” “I’m okay I think,” I replied as I pulled myself up to the side of her car. She said, “Get in and I’ll take you home, so I can clean and bandage that nasty scrape on your head.”

"That’s nice of you,” I answered, “but I don't think my wife would like me doing that!” “I’m a nurse,” she insisted. “I need to see if you have any more scrapes and then treat them properly.” Well, she was very persuasive. Being sort of shaken and weak, I agreed, but repeated, “I’m sure my wife won’t like this.”

We arrived at her place just few miles away and, after a couple of cold beers and the bandaging, I thanked her and said, “I feel a lot better, but I know my wife is going to be really upset so I’d better go now.”

“Don’t be silly!” she said with a smile. “You can stay a while, by the way, where is she?”

“Still in the ditch with the Harley, I guess.”