



PERKINS
CAPITAL
MANAGEMENT, INC.

April 25, 2019

Dear PCM Clients and Friends:

It is with heavy hearts that we tell you that on April 6 our father, Perk, passed away. All of us here at PCM will miss him dearly. We have all worked here together with Perk for a great many years; most of our adult lifetimes. He was both a father and friend to Dan and me. He was also the “boss;” but so much more for everyone here at PCM as we all respected him and enjoyed his friendship, and for some he was like a second father as well. Nancy worked directly with Perk at Piper Jaffray in the 1980s before joining Dan and Perk when they started PCM in 1985. Harry joined PCM in 1987, after working with Dick at Piper Jaffray



here in Wayzata. Dick joined in July 1990 after 12½ years with Piper Jaffray. As the business grew during the 1990s, it was a time when we worked seven days a week to keep up with a growing business. With this growth, Sue joined us from Piper Jaffray in 1991. Julie, who had known and worked for Perk since she was younger, joined PCM in 1992, and became Perk’s administrative assistant in 1997. Cathy, Jodi and Elise all joined in the early 1990s and are an important part of the PCM team. We have all lost and will miss our dear friend.

Perk was always a hard worker, but he did make time for his family and friends. Dan and I remember trout fishing with Perk in Southern Minnesota at what we called “Hidden Valley.” The three of us would load up in the red Volkswagen Beetle with a full car top carrier and off we would go on our adventure. At the end of each school year as summer began, Perk would pick us up

with our fully loaded fishing boat and we would go to catch lots of walleye on our annual Canadian fishing trip to Lac de Mille Lac. In those days we were all skinny enough to sit abreast across the front seat of the boat. There was, of course, much duck hunting at Paynesville and Perk’s Dumbell Lodge--lots of ducks back then! Then there were all the many years working together at PCM; as a team, as father and sons, but also as individuals with a contribution to make. There was also so very much more with other family members; as family was important to Perk.

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INVESTMENT MANAGEMENT

What we have experienced during the past two weeks as people have reached out with condolences is an even greater understanding of the important impact Perk had on others by also including them in his life; both professionally, in business, and personally. What is profound is that he impacted people in ways which changed their lives and the lives of their families positively; and for some, for many years to come. People have expressed to us that he made an important difference to them; and they are grateful for it. He will be remembered by many. Thank you from all us in Perk's family and at PCM for reaching out to us. We value and are comforted by your condolences, your kind offerings of appreciation, and your fond stories about Perk.

Perk gave us a great beginning here at PCM. As clients, and friends who care about us, we want you to know we respect that beginning. Over the past 34 years, we have all worked hard and learned much together. PCM will continue on and we will continue to work hard for our clients. What we do here is our passion, it is what we do, and we have proven ourselves at it. We enjoy serving you, our clients. We are stimulated by and engaged in meeting with companies, evaluating investments and professionally managing diversified investment portfolios.

At PCM our history has included several large chapters which, as one would expect, have been influenced by "the market." We have done our work through these periods regardless. During our first chapter we were fortunate to have the expansive period and exceptional market of the 1990s into the top in the market around the year 2000 driven by the overvalued technology stocks. Then there was the transition from this top into a largely difficult market from 2000 into the 2008-2009 bottom; a generational event for the economy and "the market" which led to the "lost decade" in passive investment returns. After 2009 there was a period where investing was ruled by fear and only the largest most recognizable names which paid a dividend were considered to be investable. Now during the past couple years, there is the beginning of interest in investing in growth again; companies beyond the FANG (Facebook-Amazon-Netflix-Google) companies. We believe this interest in growth will continue for some time into the future. At PCM, since our beginning, we have said that we invest for our clients in companies which we believe to be the beneficiaries of positive change, either a company's specific change (a new product or new leadership) or significant external positive change; like the aging of the population, the internet, or computerization. Today we see much positive change to invest in. Despite the negative political environment, there is regenerative medicine, a new need for genetic diagnostic testing companies, the medical device needs of an aging population, or the benefits of software to organize businesses to make them more profitable; just to scratch the surface. There is so much new and positive change going on around us. And even change in large companies where it is often more about focusing on margin growth to make a more profitable business than strong top-line growth to produce more positive safe long-term investment returns for its shareholders.

We at PCM are excited to go forward. There are many promising companies to invest in. And as Perk has taught us, much work to be done.

MINNESOTA'S 2019 WINTER

Once again, we get a chance to write about the weather in the opening paragraphs of this quarterly letter. This February was the month of the "Big Snow" exceeding the previous recorded amount in the month of February by 12.5 inches. Likewise, Eau Claire, Wisconsin, just 105 miles east had record snow as well, breaking their previous high amount in February by 25 inches. These statistics are shown in the tables here:

TWIN CITIES		
Rank	Amount (in.)	Year
1	39.0	2019
2	26.5	1962
3	24.2	1909
4	23.7	1967
5	19.7	2004, 1936
7	18.4	2014
8	17.8	1893
9	17.3	1989
10	16.5	2001

EAU CLAIRE		
Rank	Amount (in.)	Year
1	53.7	2019
2	28.2	1936
3	27.0	1893
4	24.3	2004
5	21.6	1945
6	20.2	1971
7	18.9	1922
8	18.8	1929
9	18.5	1967
10	18.0	1926

Daily Snowfall Records Set in the Twin Cities:
 February 7th: 5.9" (previous 4.1" in 2001)
 February 10th: 5.9" (previous 4.3" in 1953)
 February 12th: 5.5" (previous 3.2" in 1940 & 1965)

Daily Snowfall Records Set in Eau Claire:
 February 5th: 7.7" (previous 7.0" in 2019)
 February 7th: 4.4" (previous 3.8" in 1981)
 February 12th: 9.5" (previous 4.1" in 2000)
 February 24th: 11.8" (previous 10.4" in 2017)

In addition to all the snow, we had rain, then cold which froze the highways, and snow again,



resulting in vehicles in the ditch or running into each other. We also got fog which made the visibility near zero resulting in multiple vehicle pile-ups. The picture is a multi-vehicle pile-up near Eau Claire, WI of 131 vehicles, which also resulted in a 500-car backup. But one of the consequences of this snow is flooding as the snow melts. There have been floods, with rivers reaching flood levels near past records, although not as bad as the 1965 flooding.

A MESSAGE FROM PERK

Many years ago, Perk gave to one of his grandchildren a handwritten note of rules to live by. We are sharing this with you as our message from Perk.

PERK'S TEN COMMANDMENTS

- I Believe what you see
- II Believe in yourself
- III Be who you are
- IV WORK HARD
- V I Can't is NOT Acceptable
- VI NEVER Give Up
- VII Be Polite and Respectful
- VIII Don't Burn Bridges
- IX It is OK to Be Skeptical
- X ALWAYS Have a Backup Plan

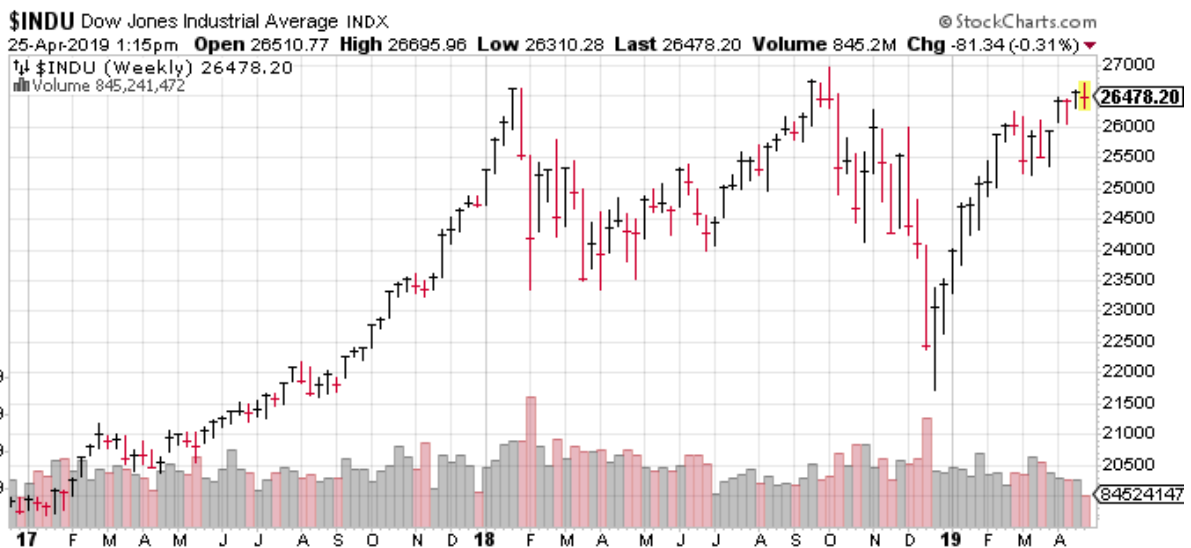
THE MARKET SCOREBOARD

Ranked by Q1 Return Indexes	% Return Q1 2019
NASDAQ Composite	16.49
Russell 2000 Total Return	14.58
Russell 3000 Total Return	14.04
Russell 1000 Total Return	14.00
Wilshire 5000	13.66
S&P 500 Total Return	13.65
Value Line Composite	12.84
NYSE Composite	11.63
S&P Small-Cap 600 Total Return	11.61
Dow Jones Industrial Average	11.15

Wow! What a return from the December lows! The first quarter of 2019 gave us an abrupt and strong return up from the 4th quarter decline which ended in the late December bottom. Every equity index was up dramatically and the quarter ended on a bullish note. The S&P 500 total return of 13.65% was its best first quarter of the year since 1998. The NASDAQ Composite, which is a market-cap-weighted index, had the best return of the 10 indexes in the table. They were all mirror images of last quarter; down from early October to the Christmas Eve day low and then with a “v bottom” straight back up forming a big V.

STOCK MARKET OBSERVATIONS

In our Q4 letter written in early January we concluded by stating: “At this time, it feels to us that we are in the process of completing a correction which was expected to occur in 2018 but, certainly, was a greater percent decline in one month than expected. New bull market highs have followed the lows in each of the previous three corrections since 2009 by an average of about 4.5 months. So, in summary, the current market looks like prior corrections, not the early stage of a bear market.” We still feel this way. Fourth quarter was a dramatic bump along the way in an up market. We continue to be in a bull market and 4.5 months into the new year the markets are back at the old highs.



What is interesting about the decline in the fourth quarter of 2018 now that we can look back at it is that it was not unusual. It was dramatic at the time, more than expected and a greater percent in one month than typical. In our January letter we laid out: “So far this correction has not been sufficiently different in time or price than the three prior corrections since the 2009 bottom to be considered more than a tough correction. The three corrections since 2009 were in 2010, 2011, and 2015 with a decline of 16% in the 2010 correction, 19.4% in the 2011 drop and 14% in the 2015 decline.” We also said: “The same is true for the broader Russell 2000 and its 25.8% drop; where this 2018 decline was more consistent with the prior declines of 20.5% in 2010, 24.6% in 2011 and 26.4% in 2015.”

What is also not unusual is that the financial press and many investors continued during the past quarter to look back and worry that this correction was the start of something much worse and predicted an immediate negative future. This angst continues. Yet, what we feel is important is that corrections of this nature are cleansing for the market and create the fear and uncertainty which has fostered the old Wall Street saying, “Climb a Wall of Worry.” They are simply part of the zigs and zags which make up the market’s picture over time. This picture is an upward dance of two or three steps forward and one backward; then repeat again a little different. But the same dance.

In our reading we saw an interesting market index return table produced by *Furey Research Partners* which showed how bad quarters have a high probability of being followed by strong returns in the next quarter and beyond over the next one, three and five years.

After Bad Quarters A High Probability of Strong Returns

Quarter	Quarter Return	Forward Return			
		Quarter	Year	3-Yrs. (Ann.)	5-Yrs. (Ann.)
Jun-70	-29.9	28.4	60.0	5.5	7.8
Dec-87	-29.1	19.1	25.0	5.4	15.1
Dec-08	-26.1	-15.0	27.2	15.6	20.1
Sep-90	-24.5	5.1	45.1	28.2	21.7
Sep-46	-24.3	2.5	-1.3	0.8	13.1
Jun-62	-24.0	2.9	25.5	16.5	21.2
Sep-11	-21.9	15.5	31.9	21.3	15.8
Jun-40	-21.7	12.0	15.2	29.3	30.6
Sep-02	-21.4	6.2	36.5	24.1	18.8
Sep-01	-20.8	21.1	-9.3	13.7	13.8
Dec-18	-20.2				
Sep-98	-20.1	16.3	19.1	5.0	7.5
Average		10.4	25.0	15.0	16.9
Median		12.0	25.5	15.6	15.8
Max		28.4	60.0	29.3	30.6
Min		-15.0	-9.3	0.8	7.5
% Positive		91%	82%	100%	100%

Source: Furey Research Partners and FactSet; as of 12/31/18; CRSP 6-8 Decile Index returns for 1940-1978 and Russell 200 returns for 1979-2018

Another market analyst Susan R. Berge, who we read, in her March 25, 2019 letter, when describing how pullbacks, like we experienced, create a healthy environment for future advances, went on to submit what we thought was an extremely interesting observation. This was that:

“In terms of duration, the briefest major advances from off-presidential election year bottoms in the past were the following:

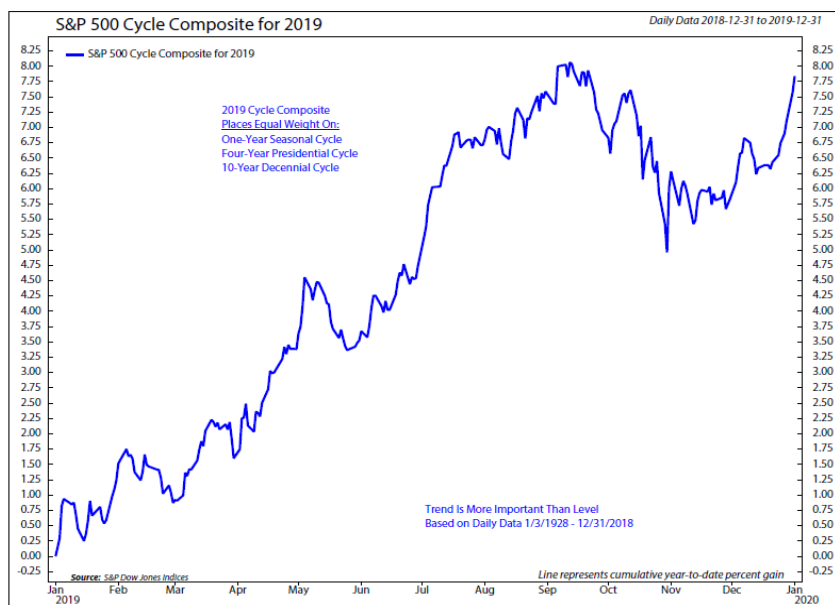
- 1) December 1974 – September 1976 1 year, 9 months
- 2) June 2006 – October 2007 1 year, 4 months
- 3) August 1998 – January 2000 1 year, 5 months

The other 11 advances from major off-presidential election year bottoms since 1962 have lasted 2-3 years or longer.

In our view, the market is in the early stages of a major advance which is likely to last at least 1-2 years.”

The briefest advances off a low and subsequent rebound like we are experiencing with the strength and breadth thrusts we experienced during the past quarter have been 1½ years in length with many other advances lasting up to 2 to 3 years or longer; but there is always that caveat with normal 7% to 10% or larger corrections along the way. We need to keep this in mind despite the noise around us. There is nothing a market can do which is more bullish than go up with breadth.

This market is following the Ned Davis Research Cycle Composite for 2019 which we published last quarter and we publish here again suggesting a continuation of the current positive trend through



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2019. Last week the Conference Board reported its Leading Economic Indicators Index showing the economy rose in March with the best result since last September. It has been our opinion for some time that despite the financial news media almost daily calling the US economy “late-cycle,” both the markets and the economy will continue to enjoy positive growth in 2019 and now into 2020. We do not anticipate a change in trend and a tougher market until we have a recession. With the recent apparent shift in Federal Reserve policy and

an economy which plows along, we see a market staying modestly within its current trend; a generally positive environment for individual companies who can show positive growth.

As the addendum to this letter we honor Perk with his obituary, two special poems written by his Auntie Hilma, the lyrics to Frank Sinatra's song "My Way," which could have been written for Perk, and a few of his favorite jokes.

Sincerely,

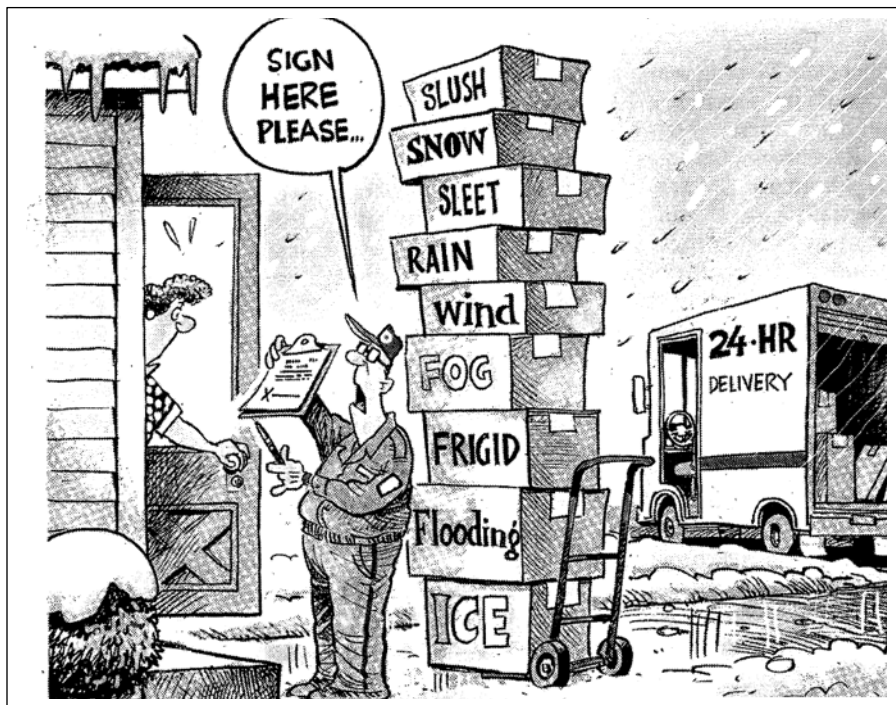
Richard C Perkins

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

Daniel S Perkins

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Executive Vice President
Portfolio Manager

RCP:DSP/jah



Richard W. Perkins, "Perk"



Age 88, of Long Lake, MN, passed away on Saturday, April 6, 2019.

Perk was born in Westby, WI in 1930. The son of the town barber, Perk spent many summers at his Aunt Hilma and Uncle Harry's dairy farm in Bloomingdale, WI. After high school he attended Moler Barber School in Minneapolis; then with a young and growing family he worked his way through college as a barber cutting hair. He graduated from the University of Wisconsin, Madison with a BA in Finance in 1955 and a MBA degree in 1957. While working at a bank trust department in Chicago, he was offered the perfect opportunity for a small-town boy from Wisconsin with a strong interest in investments - employment and experience as the Assistant Endowment Fund Manager at the Mayo Clinic in Rochester, MN in 1958. This is where he gained his initial investment skills, doing fundamental research by day and technical chart analysis at the kitchen table by night. He was an early applicant into the CFA (Chartered Financial Analyst) Society, earning charter #1256 in September of 1966; today there are over 150,000 CFAs worldwide. In 1965 he packed up his family and left for a short stint as the Pension Fund Manager at Standard Oil of Ohio. In 1966 he moved his family to Orono where at Piper, Jaffray and Hopwood in Minneapolis he followed Minnesota companies and wrote a research piece entitled The Upper Midwest Review. With a partner who followed local food and agriculture companies he went on to help start Piper's research department and then Piper's institutional sales department. They followed mainly upper Midwest companies and he sold his ideas to institutional investors around the country and in the UK, Europe and Hong Kong. In 1985, tired of traveling, he started Perkins Capital Management with his two sons, Dick and Dan. PCM grew into one of the most well-respected small-cap investors in the country. Perk has been honored by Twin Cities Business Magazine as a director of the year and one of few Twin Cities business leaders to be given a lifetime achievement award. He served on over 20 boards, mainly small-cap companies, several of which became successful NASDAQ companies. He was instrumental in the formation of several private companies, including a bank holding company, and he gave back to his community by offering guidance and fundraising for non-profits. He also restored and donated his Aunt Hilma's farmhouse to the Norskedalen Nature and Heritage Center in Coon Valley, WI. He never planned to retire. He always said, "This is what I do. I don't golf." But he did catch a lot of walleyes and shoot a lot of ducks with his family and friends. Perk loved collecting antique duck decoys, hunting for morel mushrooms, and attending Jerry Jeff Walker's annual Camp Belize. He also enjoyed an annual pheasant trip which began as business but resulted in a 40-year friendship; this was Perk's way, business which often turned into friendships. He was fortunate to be sharp, active and engaged until he was called.

Survived by life partner, Dana Rocheford, sister Mary Ann Perkins, sons Dick (Wynne) and Dan (Patrice) and daughter Pamela Brown. Stepdaughter Bridget Rocheford-Kearney (Ron) and stepson Tony Rocheford (Charlene Hall); grandchildren: Sara Perkins (Zahir Zavari), Chris Blumberg (Kelly), Alli Folger (Kevin), Jenna Perkins (Peter Zimmerman), Liz Dawson (Jack), Richie Perkins (Mariko Blakely), Charlie Perkins, Aaron Brown (Kjerste Gast), Lizzie and Sam Rocheford: great-grandchildren: Ryan, Tyler, Christian, Gracie, Kiran, Sai, Olivia, his employees and many good friends. Preceded in death by parents Clifford and Harriet Perkins, Marilyn Perkins (mother of his children), Auntie Hilma and Uncle Harry Wold.

Visitation is 5:00pm – 7:00pm Thursday April 11, at David Lee Funeral Home, Wayzata. A second visitation will be held at Vosseteig Funeral Home, Westby, WI, on Friday April 12, 1:00pm – 2:00pm. Private service and interment. A celebration of Perk's life will be announced at a future date.

In lieu of flowers, memorials are preferred to PACER Center, YMCA Camp Olson, Longville, MN, or Norskedalen Nature and Heritage Center.

To Richard

Where is the little boy
Who tended the cats?
He's just grown up
And that is that.
He's still the best
Big boy you know,
So it matters not
If he's grown so

#



Happy Birthday to Richard

You were just a little fellow.
Twelve years ago today.
But your eyes were just as shiny
And we loved you right away.

But oh! The years go by so fast.
I try to hold them, too —
But little boys will grow up fast
In spite of what we do.

But it matters not because. You see,
Each year makes you more dear.
So a Happy Birthday to you now
And all thru a Glad New Year

'42

L. Auntie

MY WAY

Frank Sinatra

And now, the end is near
And so I face the final curtain
My friend, I'll say it clear`
I'll state my case, of which I'm certain

I've lived a life that's full
I've traveled each and every highway
And more, much more than this
I did it my way

Regrets, I've had a few
But then again, too few to mention
I did what I had to do
And saw it through without exemption

I planned each charted course
Each careful step along the byway
And more, much more than this
I did it my way

Yes, there were times, I'm sure you knew
When I bit off more than I could chew
But through it all, when there was doubt
I ate it up and spit it out
I faced it all and I stood tall
And did it my way

I've loved, I've laughed and cried
I've had my fill, my share of losing
And now, as tears subside
I find it all, all so amusing

To think I did all that
And may I say, not in a shy way
Oh no, no, not me
I did it my way

For what is man, what has he got?
If not himself, then he has naught
To say the things he truly feels
And not the words of one who kneels
The record shows I took the blows
And did it my way

And did it my way

NEVER USE COPIES

A young priest arrives at the monastery. He is assigned to helping the other priests in copying the old canons and laws of the church by hand. He notices, however, that all of the priests are copying from copies, not from the original manuscript. So, the new priest goes to the Bishop to question this, pointing out that if someone had made even a small error in the first copy, it would never be picked up! In fact, that error would be continued in all of the subsequent copies, by hand allowing many chances for error.

The Bishop says, "We have been copying from the copies for centuries, but you make a good point, my son." He goes down into the dark caves underneath the monastery where the original manuscripts are held as archives in a locked vault that hasn't been opened for hundreds of years. Hours go by and nobody sees the old Bishop. So, the young priest gets worried and goes down to look for him. He sees him banging his head against the wall and wailing, "We missed the R! We missed the R! We missed the R! His forehead is all bloody and bruised and he is crying uncontrollably. The young priest asks the old Bishop, "What's wrong, father?" With a choking voice, the old Bishop replies, "The word was "CELEBRATE!"

THE BATHTUB TEST

During a visit to a mental institution a reporter asked the director, "How do you determine whether or not a patient should be institutionalized?" "Well," said the director, "we fill up a bathtub, then we offer a teaspoon, a teacup, and a bucket to the patient and ask him or her to empty the bathtub." "Oh, I understand," the reporter said. "A normal person would use the bucket because it's bigger than the spoon or the teacup." "No." said the director, "A normal person would pull the plug. Do you want a bed near the window?"

A TERRIBLE CAR CRASH

After an awful car crash, an unidentified body was hauled into the morgue. The coroner thought it might be Ole, but was not certain. So he called Ole's best friends, Sven and Lars, to identify the body. Sven looked and wasn't sure, asking that the body be turned over. "Nope," he said, "dat ain't Ole."

The coroner then called in Lars. Who after viewing the body also requested the body be turned over, "Nope, dat shurr ain't Ole." The coroner shook his head, asking. "How can you two guys be so sure that isn't Ole, just by looking at his backside.

"Vell," explained Sven, "Ven Ole, Lars, an me vent anyvere people always said 'Heere comes Ole with dos tew assholes."

SVEN'S BUSINESS TRIP

"Yew know, Ole, when I vas in Yapan on business, I sent a telegram home to my wife, Hilda, saying dat I would be back a day early." said Sven. "And I rushed home from da airport and I found Hilda in da arms of my best friend, Lars! How could she do dat tew me?" "Vell," said Ole. "Maybe she didn't get yer telegram!"