



76 RESEARCH ALUMNI GROUP

Quarterly Luncheon November 1, 2016



(At left: The once proud, but now disgraced 76 Sign in purgatory). Our next 76 Research Alumni Group Luncheon will be held on Tuesday, November 1, 2016 at the Alta Vista Country Club in Placentia. If you were ever employed at 76 Research, or are a surviving spouse of a former employee, please come join us.

Our Luncheon activities will begin with visiting at 11:00, lunch at 12:00 and our program at 1:00. Our speaker, Herb Farrington, will answer questions about the new Chevron medical coverage. The cost for the lunch is \$22.00, and the money must be paid in advance. Please plan to get your checks to me by Saturday, October 29. If you make a reservation, but your plans change, please let me know by Sunday, October 30, so that I can make the necessary changes with the Club. If you don't call me by Sunday, you will be charged for the lunch (i.e., your check will be cashed.) For attendees who fail to make a reservation on time, the cost is \$25.00. Please make your check payable to Bill Mallett and send it to me at 1273 Genoa Place Placentia 92870, Phone 714 993-2102, Email: 76sDrBill@roadrunner.com

(((PLEASE CLIP AND SAVE THE INFO BELOW FOR YOUR REFERENCE)))

New Medical Plan: <https://medicare.oneexchange.com/chevron> or 844-431-7914

Chevron Corp.: www.chevron.com

CRA (Chevron Retirees Association): www.chevronretirees.org CRA has redesigned their home page and it is now a resource of many hot links to a wealth of information. Check it out.

Matching Gift Program: <https://chevron.yourcause.com>

HR Service Center (Mellon) <https://www2.benefitsweb.com/chevrontexaco.html>

For Benefits or other Human Resources related matters call the HR Service Center toll free at 1-888-TALK2HR (1-888-825-5247) between 6 a.m. and 5 p.m. PT, Monday through Friday, or check the Benefits Connection website through the HR2 website on the Internet at <http://hr2.chevron.com> (You need your SS# & PIN to talk to these people.)

CRA dental plan (MetLife): 1-800-942-0854

Chevron Express-Scripts Medicare 800-935-6215; Available 24/7.

*****IT'S THAT TIME OF YEAR AGAIN WHEN I SOLICIT CRA DUES FOR THE CURRENT FISCAL YEAR, 2016-2017. PLEASE SEND \$3.00 TO ME AT THE ADDRESS ABOVE. TNX**

76 TidBits (fm Dick Stegemeier.) When the 76 service station at Valencia and Imperial was built, even though it was a minor development, the Brea city fathers insisted that we do an outdoor art work as a condition of permitting the new Science & Technology Center in 1980. I argued that the new Administration Building was itself, a work of art---but to no avail. They said we had to do a work that couldn't be identified with Unocal. But then Jay Gordon, an engineer in the Gas Department uptown came up with the twisted three dimensional "76." We had it built in stainless steel by some metal worker, maybe even Abe Bullington. Voilla!! The city fathers never caught on until it was too late. It sure beats some of the stuff I've seen at the Los Angeles Museum of Modern Art. UNOCAL Lives!!!

(Editor's note: I believe it's the greatest art piece in Brea (Just a little bias there). The 76 station was demolished years ago but the art piece remains and now adorns the Starbucks which is at that location. If you have never seen it you should check it out. WRM)

QUANTIFYING THE IMPACT OF SHALE, Leslie Wei, RYSTAD ENERGY, 7/08/2016

UNCONVENTIONAL PRODUCTION is controversial due to environmental concerns, including water safety and earthquake activity, but while shale exploration is sometimes regarded negatively, it is important to consider the positive impact the shale industry has had on the domestic and global economy.

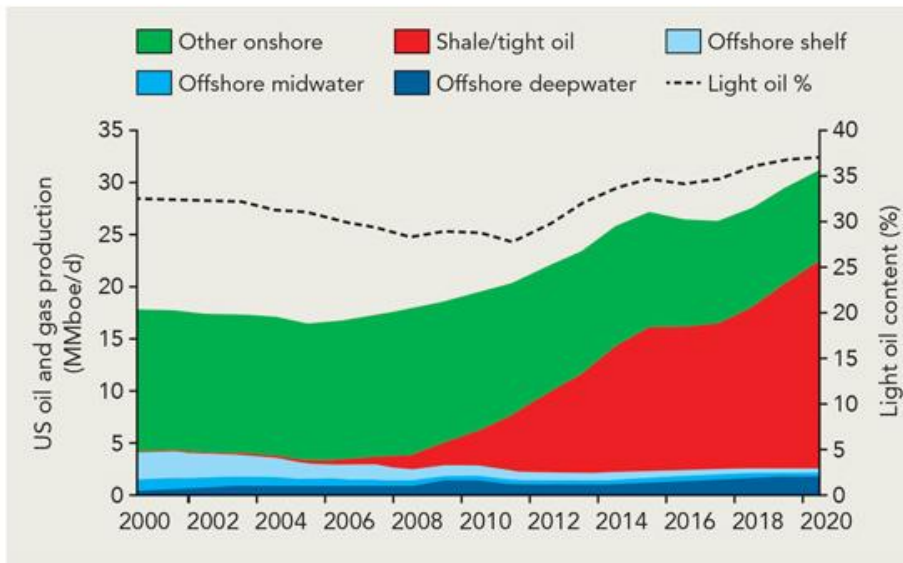
© Jim Parkin | Dreamstime.com



Oil and gas production in the United States can be broken down into two periods: pre and post shale. The timeline of each period is observable in Figure 1, which shows the oil and gas production in the United States split by the source of supply along with the light oil content. Before the "shale era," US production was decreasing, where the main contributor to production was conventional fields. During this period, the US relied heavily on oil imports and had to take measures to

secure a consistent supply of oil. The introduction of shale completely changed the picture; oil production grew from five million barrels to nine million barrels per day, which has reduced the US trade deficit. Oil imports now contribute to just 1/3 of the trade deficit compared to 2/3 of the trade deficit before the shale revolution, thus further strengthening the solidity of the US economy.

F1: TOTAL US OIL AND GAS PRODUCTION (MMBOE/D) AND LIGHT OIL CONTENT

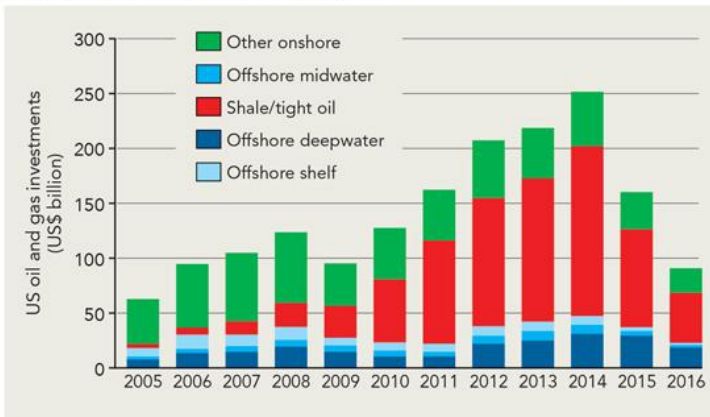


Source: Rystad Energy UCube

Shale also provides benefits to society through job creation and royalties and taxes paid to landowners and authorities. Figure 2 shows the historical investments (development and exploration) for both oil and gas fields in the US. Over the past five years, shale investments made up 50% of total US investment levels. During the same period, the number of jobs associated with oil and gas activities increased by approximately 300,000, according to the Bureau of Labor Statistics. In addition to

job creation, companies pay royalty, production tax, and income tax to the landowners and government for each barrel of oil produced. Government and landowner income from shale peaked in 2014 at US\$120 billion and dropped to about US\$31 billion in 2015.

F2: US INVESTMENTS (CAPEX+EXPEX)



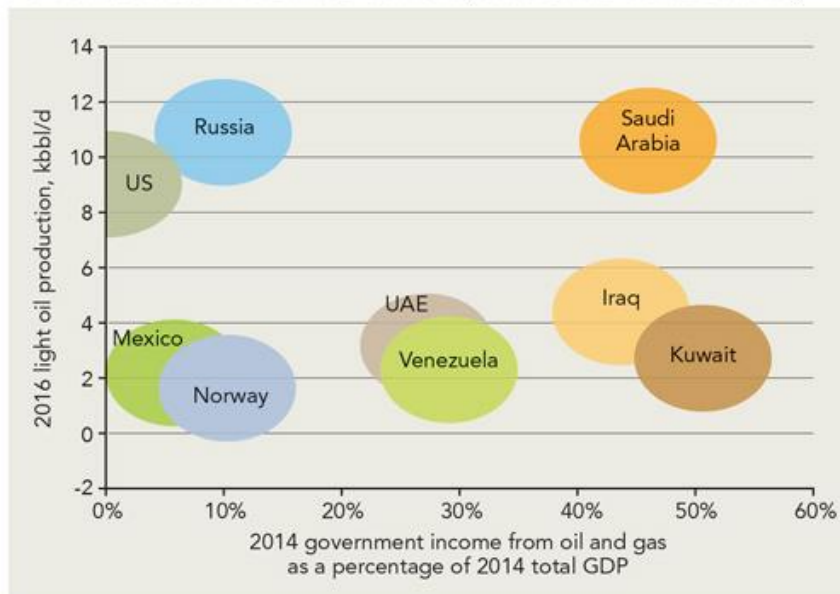
Source: Rystad Energy UCube

In terms of the global economy, shale plays an important role as the marginal producer, where it currently has 6% of the market share. Without shale, the call on OPEC would have gone from 33 million barrels to 38 million barrels in 2016, which indicates shale is a stabilizing factor for the oil price.

There are countries that benefit from each oil price scenario. A low oil price results in lower transportation costs and gasoline prices, which greatly benefit the developing

countries, while a high oil price affects the government income for oil exporting countries. Figure 3 quantifies the effect of the oil price on the top oil producing countries, showing the 2016 oil production along with the oil and gas contribution to the total GDP. The OPEC countries, Saudi Arabia, Kuwait, and Iraq, are the most exposed to income from oil and gas, where the income makes up more than 40% of total GDP. These countries will benefit the most once the oil price recovers. Of the top three producers, Saudi Arabia, Russia, and the US, the US and Russian economies are less affected by oil price fluctuations since 1% and 10%, respectively, of the GDP are dependent on oil revenues.

F3: TOTAL US LIGHT OIL PRODUCTION (CRUDE AND CONDENSATE)



Source: Rystad Energy UCube and analysis

The environmental impact will continue to present pushback for shale production in different societies. Nonetheless, the introduction of horizontal drilling and fracking has put the US back on the E&P map. With considerable growth in production over the last five years, the US has been able to move closer to energy independence and may be completely independent by 2020. The shale industry has also benefited other parts of the economy by creating 300,000 new jobs, which was important in the post-financial crisis period. In the global context, the introduction of

shale has geopolitical influence by lowering the oil price and offering stable oil price to developing countries.

ABOUT THE AUTHOR

Leslie Wei is an analyst at Rystad Energy. Her main responsibility is analysis of unconventional activities in North America. She holds an MA in economics from the UC Santa Barbara and a BA in economics from the Pennsylvania State University.

O&GJ, Houston, 7/26/2016, By Robert Brelford: ExxonMobil Corp. will add a new unit designed to increase production of ultralow-sulfur fuels at its 345,000-b/d refinery in Beaumont, Tex. Due to begin construction during this year's second half, the project will involve installation of a 40,000-b/d selective cat-naphtha hydrofining unit (SCANfining) to produce gasoline that will meet the US Environmental Protection Agency's Tier 3 gasoline sulfur specifications, which take effect Jan. 1, 2017, ExxonMobil said.

To be ExxonMobil's largest capital investment in more than a decade at Beaumont's refining operations, the unit addition will improve product yield as well as help increase energy efficiency at the plant, said Fernando Salazar, manager of the Beaumont refinery. Licensed by ExxonMobil, SCANfining hydroprocessing technology is a catalytic hydrodesulfurization process based on a proprietary catalyst system developed specifically for selective removal of sulfur from fluid catalytic cracking (FCC) naphtha that limits olefins hydrogenation to preserve octane content.

The SCANfining unit at Beaumont is scheduled for startup in 2018. The company, however, did not disclose a cost estimate for the project.

Ongoing expansion

This latest project at Beaumont follows ExxonMobil's 2015 announcement that it will expand the refinery's capacity to accommodate increased processing of light crudes from US shale. Intended to add capacity for advantaged domestic crudes as well as to improve overall energy efficiency at the complex, the proposed 20,000-b/d expansion is due to be commissioned sometime in 2017, the company told investors on May 25.

Alongside the Beaumont refinery's crude unit expansion, ExxonMobil also is executing work to capture price-advantaged US crude supplies at its 500,000-b/d Baton Rouge, La., refinery, including projects to increase the plant's ability to process a wider slate of feedstock, as well as improvements to midstream infrastructure at the site. ExxonMobil plans to complete the feedstock and logistics flexibility projects at Baton Rouge by yearend.

Jay Campbell, 7/26: Yesterday morning (07/25/16) I got in touch with Bill Schaeffer's wife, Mel, and she told me that Bill was still in Casa Bonita Convalescent Center in San Dimas, so I decided to visit



him. Upon my arrival at the center, I met up with Mel (and their granddaughter, Tamatha). They had driven over to see Bill and it was great to finally meet up with Mel after so many years!

Mel and Tamatha wanted to take pictures with "Gramps" so I had Tamatha take one with the three of us, which is attached. After about 15 minutes, they had to return home, so Bill and I continued talking "in the garden" for quite awhile before moving back inside to his room.

Bill was doing well – he is still in a wheelchair and not able to put much weight on his feet, but was mentally sharp and we talked about many things, mostly the market and politics. He will likely be at Casa Bonita for several more weeks before he will be allowed/able to go home.

BILL WILL BE 90 YEARS OLD ON SEPTEMBER 1st! Please keep him and his family in your thoughts and prayers!

Fred Swingle, 7/21: We just moved to the Portland, OR area to be closer to our daughter and grandson. Now the likelihood of us making it down to SoCal has gotten smaller, but I still appreciate all of your work keeping everyone current on our "post Research" lives.

Howard Simpson, 7/20: I seem to always think my friends are going to live forever, or at least longer than me, so I was saddened by the news about Kess's loss of Lois, and his degrading health. To me, Kess was not just a supervisor. He was a guardian, psychiatrist, philosopher and friend. His understanding and patience during the middle '70s made the difference between my having a good career at Unocal, and possibly having to bail out and settle for a menial career elsewhere – not to mention trying to keep my sanity. The short version is that I was the only one stupid enough to submit a proposal about solar energy after Fred Hartley said that Exxon was doing something with it so why

weren't we? I wasn't trained in the right areas and assumed we would hire people who were. That didn't happen.

But eventually Jay Switzer was brought on board and paired with Dave Delesandro – but not before I essentially “lost it” trying to work in the area by myself with too little training when I thought I already had some groundbreaking ideas in hydrotreating. I have also probably always had an anxiety disorder that didn't really bother me too much as long as I wasn't too worried about stuff. But this was aggravated when some research and expert opinion indicated that it was probably going to be 30 years before solar energy would be feasible. And I didn't think the Company would make a sufficiently big commitment anyway. So I worried...

But solar energy was eventually abandoned, and Jay left and became a professor emeritus in materials science (I think) at Missouri.

Anyway, I'm grateful for the positive effect all of my friends there had on me throughout my career - especially Kess.

Like everyone else, I'm advancing in age too. I've had a tremor problem for awhile now – somewhat in general, but mostly with my left (dominant) hand. The emotional effects of this can be handled with medications, but the tremor itself cannot.

But this problem is not without a certain amount of humor. Everyone in my family but me is right handed. So when I was drawing and coloring with my six-year-old granddaughter some years back, I was having trouble staying in the lines with my left hand. When I tried to explain the problem to her, she simply looked at me and said “use your right hand – its easier.” So I've learned to write fairly well with my right hand.

Another thing I do is go visit church members who are confined to their homes or in care facilities. A high percentage of them have Alzheimer's. The first time I visited one of the ladies so afflicted, I took a card so I could doodle things to talk about if the conversation went south. I was pretty shaky. When I tried to explain the problem to the lady with Alzheimer's, she just looked at me for a minute and said “If you weren't so uptight you wouldn't have this problem.”

I guess there are amusements everywhere, to balance all the suffering and discomfort. Take care. Best regards, Howard

Great Timeless Truths:

In my many years I have come to the conclusion that one useless man is a shame, two is a law firm, and three or more is a government.

John Adams

If you don't read the newspaper, you are uninformed. If you do read the newspaper, you are misinformed. (How true is that!!!)

Mark Twain

Suppose you were an idiot. And suppose you were a member of government. But then I repeat myself.

Mark Twain

I contend that for a nation to try to tax itself into prosperity is like a man standing in a bucket and trying to lift himself up by the handle.

Winston Churchill

A government which robs Peter to pay Paul can always depend on the support of Paul.

George Bernard Shaw

Foreign aid might be defined as a transfer of money from poor people in rich countries to rich people in poor countries.

Douglas Casey, Classmate of Bill Clinton at Georgetown University

Giving money and power to government is like giving whiskey and car keys to teenage boys.

P.J. O'Rourke, Civil Libertarian

Government is the great fiction, through which everybody endeavours to live at the expense of everybody else.

Frederic Bastiat, French economist (1801-1850)

I don't make jokes. I just watch the government and report the facts.

Will Rogers

If you think health care is expensive now, wait until you see what it costs when it's free!

P.J. O'Rourke

In general, the art of government consists of taking as much money as possible from one part of the citizens to give to the other.

Voltaire (1764)

Just because you do not take an interest in politics doesn't mean politics won't take an interest in you!

Pericles (430 B.C.)

No man's life, liberty, or property is safe while the legislature is in session.

Mark Twain (1866)

Talk is cheap...except when government does it.

Anonymous

The government is like a baby's alimentary canal, with a happy appetite at one end and no responsibility at the other.

Ronald Reagan

The only difference between a tax man and a taxidermist is that the taxidermist leaves the skin.

Mark Twain

What this country needs are more unemployed politicians.
Edward Langley, Artist (1928-1995)

A government big enough to give you everything you want, is strong enough to take everything you have.
Thomas Jefferson

We hang the petty thieves and appoint the great ones to public office.
Aesop

DeVere Erb's passing, 8/3/2016: Bill, this note is from Jon Hansen, the son-in-law of De. I told Jon that De was respected and liked by many at the Brea Unocal laboratories. Wayne Miller

Wayne, As a follow up to our conversation last night, here are the details of my father-in-law's (DeVere Erb) passing. DeVere passed away on Sunday evening (July 31st). It was a peaceful passing as he had some of his children and grandchildren at his bedside. The services for Devere will be held this coming Saturday, August 6th at 12:30 PM. The services will be held at:

Church of Jesus Christ of Latter Day Saints, 210 W. Livingston Ave., Placentia, CA 92870

The family has chosen not to hold a public viewing. DeVere will be buried next to his wife Ruth in the Evergreen Cemetery located in Springville, UT. A graveside service will be held on Tuesday, August 9th at 10:00 AM. Wayne, thank you for your concern and your friendship. Jon Hansen

Connie Cron, 8/3: HI BILL..... Sorry to hear of the passing of De Erb and in the process learned of his wife, Ruth Erb, passing in 2009. I knew them both. I'm thinking of their children at this time.

Hugh Haven, 8/8: (Re De Erb passing.) This is sad news, the passing of a good friend and partner at Union Oil. Thanks for the email. Regards, Hugh

Mike Utt, Chevron selling former Unocal properties, 8/5: Chevron is selling up to \$5 billion in Asian assets in an effort to raise cash, according to [The Wall Street Journal](#). This is part of a plan to raise \$10 billion globally from asset sales in order to cut costs and adapt to the lower global price of oil
Chevron is looking to sell:

- Its stake in an offshore oilfield production venture with CNOOC Ltd., China's state-owned oil company. This alone could sell for as much as \$1 billion.
- Geothermal assets in Indonesia, which is attracting bids of more than \$2 billion.
- Natural gas field assets in Thailand.

The proposed sales would mark a meaningful reduction in Chevron's footprint in oil and gas production in Asia, according to The Wall Street Journal.

O&GJ, Washington, DC, 8/09/2016, by Nick Snow: The [American Petroleum Institute](#) launched a fresh advocacy campaign aimed at reforming or repealing the federal Renewable Fuels Standard. "Our campaign will focus on how higher ethanol mandates can hurt consumers, potentially raise costs, and possibly void automobile warranties," API Downstream Group Director Frank Macchiarola said. "We

are urging policymakers to put the interest of the American consumer first,” he told reporters during an Aug. 9 teleconference. “The broken RFS mandate aims to force consumers to use high ethanol blends they don’t want and don’t need. Nearly 90% of vehicles on the road today were not designed for higher ethanol blends, such as E15. And many automakers say that using E15 could potentially void new car warranties.”

Ethanol levels should be set at no more than 97% of the national fuel supply in the near term to protect consumers while ensuring that ethanol-free gasoline remains available to those who want it, Macchiarola said. “API has joined a chorus of voices sounding the alarm on the potential problems created by the burdensome ethanol mandate. From recreational boaters and motorcyclists to environmental groups and food groups, an ever-increasing number of Americans are saying ‘No More’ to the ethanol mandate,” he indicated.

There’s growing bipartisan agreement in Congress that the RFS program is a failure, the API official said. He noted that HR 5180, which Reps. Bill Flores (R-Tex.), Peter Welch (D-Vt.), and two other US House members introduced this spring ([OGJ Online, May 12, 2016](#)), now has more than 100 cosponsors.

Asked if he had studied the American Fuel & Petrochemical Manufacturers proposal to move the collection point for Renewable Identification Numbers, which are credits to help refiners and other obligated parties meet biofuels credits, farther downstream ([OGJ Online, Aug. 5, 2016](#)), Macchiarola said API strongly opposes the idea. “It’s an interim move that would solve nothing while introducing more complexity into the system by increasing the number of collection points,” he said.

Macchiarola also said that while API has contacted both major parties’ presidential campaigns about the issue, it believes it’s more effective to contact the public directly with an educational campaign and hope voters reach out to members of their congressional delegations with their concerns. “A lot is said during political campaigns and a lot of policies are laid out that may not be workable in the long run,” he said. “Our approach is to provide the public with the best information about what is needed. It’s not targeting anyone specifically, simply informing the American consumer.”

Frank Riddick, 8/14: I regret and am sorry to have missed the August luncheon. But I've had a turn for the worse. As you know I have an irregular heart-beat, atrial fib. It has been acting up lately and I have had several times where I have almost passed out. I have restricted my driving to only very necessary essentials and off the freeways. Doctors say they are doing all they can to control this condition and they admit it is life-threatening... Pat's condition seems to have plateaued - still unable to stand or walk. Never thought we would be living such a nightmare! But one never knows exactly what life holds for us.....Hope all is going well for you and yours. Give all the retirees my best wishes. Prayer is the only hope... Take care, and Semper Fi, Very Ol' Frank

Eden Rousseau, 8/18: I'm sorry to report that my Granddad, **Arnold Kelley**, died on April 3, 2016. Granddad was born March 31, 1917. He was determined to make 99, and he did. Granddad spent most of his time avidly following the stock market, and reminiscing about his life's work at Union Oil.

The services were held on April 7th at Washburn-McReavy Hillside Chapel in Minneapolis. The viewing was followed by a phenomenal eulogy highlighting the wonders Granddad witnessed in the



century of his lifespan. After the service he was interred beside his wife Lois, his parents, and siblings in the Kelley Family plot at Hillside Cemetery. Granddad was survived by his son Michael Kelley, daughter Julie Slocum, grandchildren Eden Rousseau, Bryan Fritzges, Paul Kelley, Leanna Rossi, and brother Joseph Kelley.

I'm attaching a few of the photos from his time at Union Oil for you and your readers to enjoy.
Wishing you health and happiness,
Sincerely, Eden Rousseau

More from Eden, Arnold Kelley's

grandson: Granddad did continue to receive your Newsletters. He developed macular degeneration 14 years ago. Though he got all the latest treatments he still suffered an acute loss of vision. Reading, even with all the best medical aides available was a grueling experience for him. The vision loss was the one part of aging that Granddad could never reconcile himself with. As I'm sure you know he was a self reliant and proud man of his generation. So, having someone read to him rankled him. We did the best we could, and finally got him to embrace audio books. Once that happened he was a voracious listener.

Also, could you please tell John Duir granddad very much enjoyed the Christmas cards he sent every year. When he could no longer write his own responses he simply refused to send a card. For some unknown reason he didn't like dictating his personal correspondence. I thought he would love that, a bit like being back at Union Oil with a secretary. But no dice.

As for the eulogy, it is hard to pinpoint exact stories. Some Examples: Transportation - cars were scarce when he was growing up in 1917, now everyone has them; Communication - switchboards and party lines compared cell phones; Electricity - I remember Granddad talking about the oil lamps on the wall of his childhood home. Ice boxes for food storage. His mother hand washing all the family's clothing. Storing eggs in "liquid glass to preserve them. Hunting and eating squirrels during the depression years; The dreaded outhouses; The Berlin wall. Which was of particular interest to Granddad since he was over there on a Union Oil trip and had his own stories about how unsettling it was; The dawn of the computer age. Which as you know Granddad was involved in from the beginning as an early adopter of desktop computers for the Research Department. The eulogy was chocked full of those kinds of stories, and contrasts. It was quite uplifting. I feel Granddad would have been pleased. Eden



The cake reads:
 Unicracking, Union Oil,
 Diamond Anniversary.
 Obviously a tribute to the
 new Unicracking process
 and Union Oil's 75
 anniversary in 1965.

L to R: 1. Arnold Kelley,
 Manager of Refining
 Research; 2. Roland
 Hansford, Inventor of the
 Unicracking catalyst, 3. ??,
 4. ??, 5. Hal Huffman,
 Associate Director of
 Refining & Products
 Research, 6. ??, 7. Milt
 Lee, Manager Patent Dept.,
 8. Fred L. Hartley, CEO &
 President Union Oil Co. 9.
 ??, 10. Bill Bradley,

Director of Research Department, 11. ??

Sandy Minner, 9/1/16: Here are a couple of photos from our mini-Products Research reunion today. Harry Thomas (Unocal Marketing Industrial Lube engineer) also joined us. It was great seeing



everyone,
 including
 some I hadn't
 seen in 21
 years!



Harry Thomas, 9-3-16: Thanks to everybody for the great get together opportunities last Thursday and today. Special thanks to Sandy for getting some of us off our dead ends and for the pizza today. I enjoyed seeing all those who came out and missed a few who couldn't make it.



Frank Riddick, 9-3: Thanks for the invite and the nice photo of those attending. Wish I could have made it, but I have health problems that restrict my mobility. Best wishes to all and Semper Fi.

CELEBRATION OF LIFE FOR DR. BILL SCHAEFFER, 9/14: Mel and her family have decided to honor the life of “Dr. Bill” with a Party Boat Cruise of Newport Harbor on Saturday, October 1. The cruise will be conducted by **ELECTRA CRUISES** (3439 Via Oporto, Newport Beach, CA 92663). The phone number there is 949-723-1069 and the web address is: www.electracruises.com Attendees should arrive around 12:00 (noon) and the cruise will take place from about 1:00pm to about 3:00pm. There

will be a full buffet with an open bar, a wine bar (courtesy of Glenn, the son and vintner) and a dessert bar. Entertainment will be provided. In order to reserve the correctly-sized vessel and to have an adequate supply of food and beverages, Please RSVP.

John Bickel, 9/21: Bill, please add me to your retiree list. As of May 12, I have been retired. Also, I will be 65 in March. I am receiving a lot of Medicare mailings. If someone or others in the retiree group helps out on researching all of the info looking for the best plans to consider, I would be interested in learning about the plans. (Welcome to the club John & come to the Luncheon November 1)

Rensselaer Polytechnic Institute, 9/16/2016, By Mary L. Martialay: Rensselaer Polytechnic Institute has been awarded \$2.2 million in funding from the U.S. Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) to develop innovative ion conduction materials for next-generation renewable energy conversion and storage technology. The award is part of a \$37 million package of funding from ARPA-E in support of 16 innovative new projects as part of the new Integration and Optimization of Novel Ion-Conducting Solids (IONICS) program. IONICS project teams are paving the way for technologies that overcome the limitations of current battery and fuel cell products. The IONICS program is focused on creating high-performance parts built with solid ion conductors – solids in which ions can be mobile and store energy – and processing and integrating these parts into devices to accelerate commercial development. In particular, IONICS projects will work to improve energy storage and conversion technologies in three categories: transportation batteries, grid-level storage, and fuel cells.

At Rensselaer, Chulsung Bae, associate professor of chemistry and chemical biology and a member of the New York State Center for Polymer Synthesis and the New York State Center for Future Energy Systems, will lead an effort to develop highly ion conductive, chemically stable, and mechanically durable alkaline membrane materials. Such membranes will serve as a critical component in next-generation fuel cells designed to allow efficient and clean conversion of chemical energy directly to electricity.

Curt Breneman, dean of the School of Science at Rensselaer, said that the work builds on the history of involvement in fuel cells at the New York State Center for Polymer Synthesis and the New York State Center for Future Energy Systems. In fact, most current fuel cell designs are based on an alternate acidic membrane approach that incorporates technologies refined at Rensselaer. The hydroxide approach, using alkaline conditions, is now seen as more promising and, with this award, Rensselaer will have a major role in the development of these technologies as well. "This is part of a nationwide push to develop better fuel cell technology, and our strong background in fuel cell research and our forward momentum in new energy technologies is being recognized with this award," Breneman said. "Rensselaer has a research focus in energy, environment, and smart systems, and this work is a clear outgrowth of that focus. Chulsung Bae is a rising star in this area, and we are proud of the work he is doing."

Bae will lead an effort with a team of researchers from Rensselaer and partners at Georgia Tech, Xergy, and Proton Onsite. "To be successful, a fuel cell membrane needs to be highly conductive – facilitating the flow of charge carriers – as well as chemically stable and mechanically durable," said Bae. "Our work shows that high-performance alkaline conductors can improve efficiency and lower the cost of energy conversion technology. It's cheaper, better, and more durable."

The water repelling backbone of the membrane allows hydroxide ions to pass through extremely small channels while preventing it from swelling and sustaining structural damage. By using a polymer chain requiring fewer fluorine-based components, the team expects to reduce production costs. Side chains attached to the backbone facilitate the passage of hydroxide through the electrolyte.

The use of alkaline membranes in electrochemical reactions avoids the need for expensive platinum catalysts and allows the use of less expensive, Earth abundant metals as catalysts, offering huge economic advantages in renewable energy technology.

At Rensselaer, this research is enabled by the vision of The New Polytechnic, an emerging paradigm for higher education which recognizes that global challenges and opportunities are so great they cannot be adequately addressed by even the most talented person working alone. Rensselaer serves as a crossroads for collaboration — working with partners across disciplines, sectors, and geographic regions — to address complex global challenges, using the most advanced tools and technologies, many of which are developed at Rensselaer. Research at Rensselaer addresses some of the world's most pressing technological challenges — from energy security and sustainable development to biotechnology and human health. The New Polytechnic is transformative in the global impact of research, in its innovative pedagogy, and in the lives of students at Rensselaer.

About Rensselaer Polytechnic Institute

Rensselaer Polytechnic Institute, founded in 1824, is America's first technological research university. The university offers bachelor's, master's, and doctoral degrees in engineering; the sciences; information technology and web sciences; architecture; management; and the arts, humanities, and social sciences. Rensselaer faculty advance research in a wide range of fields, with an emphasis on biotechnology, nanotechnology, computational science and engineering, data science, and the media arts and technology. The Institute has an established record of success in the transfer of technology from the laboratory to the marketplace, fulfilling its founding mission of applying science "to the common purposes of life." For more information, please visit <http://www.rpi.edu>.

WRM, 10/1: The Celebration of Life cruise of Newport Harbor to honor and remember our very good friend Bill Schaeffer was held today. The event was hosted by Bill's son Glenn, former CFO of Mandalay Bay Resorts in Las Vegas and currently owner of Mahana Winery and Vineyard in New Zealand. In attendance were Bill's wife Mel and many members of the Schaeffer family, and from Unocal Research were Henry and Ann Woebken, Dave and Susan Gaudio, Dave and Joanie Mears, Gary Graham and wife, Jay Campbell and wife, Dick Tait, Joann Olivier with her son Steve and his wife, Frank and Judy Booth and Bill and Masuko Mallett. Good food, good wine, fun entertainer, good camaraderie, nice cruise around the harbor and good way to remember Bill. Thanks Glenn and Mel.

"Stuff from Chevron", October 3, 2016, **To:** Alan Horan <awhoran@verizon.net>

Subject: RE: OneExchange: Chevron Website - 2017 Medicare Related Insurance Plans

Hi All, I am pleased to advise that cost data and coverage provisions for Kaiser are now available on the OneExchange website. There shouldn't be any reason to delay appointments with OneExchange Benefits Advisors. I also learned from OneExchange that cost data for AARP – UHC coverage is not shown on the OneExchange website since the costs vary based on the effective date of Medicare Part B coverage and whether an individual is a smoker or a relatively recent former smoker. Also, the

provisions of Medicare Gap Plans are standard. The difference between insurance carriers is premiums and the rating method used to determine their premiums, i.e. community rated, issue age rated or attained age rated. Community rated generally charges the same premium to everyone who has the same Medigap policy, regardless of age or gender; premiums typically increase because of inflation and other factors. Issue age rated bases the premium on the age of the individual when they purchase the Medigap policy; premiums typically increase because of inflation and other factors. Attained age rated is generally based on the individual's age at the time of issue and their age at the time of renewal each year; premiums may also increase because of inflation and other factors.

Please let me know if you have questions. Regards, Al

Alan W Horan, Chair, Benefits Committee, Chevron Retirees Association, Tel (972) 964-1787

E-Mail awhoran@verizon.net

From: Alan Horan, Sunday, October 2, 2016: **Subject:** RE: OneExchange: Chevron Website - 2017 Medicare Related Insurance Plans. Hi All, If anyone is interested in obtaining a quote from AARP – United Healthcare they should phone OneExchange at 1-844-266-1392, Mon – Fri, between the hours of 7 AM and 8 PM, Central Time. It's important that the retiree or survivor contact OneExchange rather than go directly to AARP – UHC in order to obtain Chevron's contribution. Please let me know if you have questions. Regards, Al,

Jim Friberg, 10/8: We took the bus to Nuremberg...almost 4 hrs and very nice countryside. We got to the station, took a taxi to the river, 15 min got onboard have a room at the end of the ship, a suite no less! Nothing like Regent or Crystal. They have a long way to go to come close to this.

The taxi driver looked Armenian and he spoke English with an Armenian accent. So I asked him where he was from, he said from Persia (He didn't say Iran) I said are you Armenian he said no, but people say I speak Farsi and English like an Armenian!!! Then he said I know Armenian musicians, Khachaturian, Chknavorian, and Armenians have an instrument called duduk...then he proceeded to sing Garoun, Garoun Garouneh, siroun siroun sirouneh ...with the right melody, etc. It was hilarious! He said he had been there for 31yrs and married to a German. He talked about the latest German resolution, about the Armenian genocide and the Turkish protest against this. It was a most interesting ride. Don't forget to tell G about this. She'll get a kick out of it.

(More experiences of our Research friends signing up for med insurance for 1/1/2017)

From Ray Evans, 10/11: Thanks Bill for the heads up on the OneExchange enrollment procedure.

Immediately after the September 29 meeting with OneExchange, I called to make the appointment for an enrollment interview, and the earliest date I could get was Nov. 25th, so Unocal retirees need to call now! (If you don't make an appointment until later than this, the paperwork may not be finished in 2016 and your med coverage could be delayed until sometime later in 2017. WRM)

Based on the September 29 meeting and the Union Oil Alumni Meeting at Steven's steakhouse with Herb Farrington talking about the Unocal (Chevron) medical plan changes, I have come to the conclusion that in my case, I no longer make medical plan payments to Unocal (Chevron), and they will be making payments into my HRA account. I will be able to continue with the Kaiser's Medicare advantage plan and there will be no monthly cost to me with OneExchange. Of course I will get the final

facts on November 25, but will be interested in what other retirees have experienced as the enrollment process continues.

I also concluded that for older(78+) retirees and those with health problems, the Medigap plan F is the way to go. If enrolled this period, there is no precondition check(Guaranteed Rights) for rates going forward. But there will be Medical Underwriting in the future, which could make it very expensive.

All of this will make for interesting discussion at our next Unocal luncheon.

Connie Cron, 10/11: I guess I was a lucky one. I had my telephone appointment at 6:15am yesterday. It took almost 2 hours to complete the paper work. The 2 people I talked to at OneExchange explained each step and then I got to say, "I Connie S Cron agree to ..." whatever it was.

Dave Breen, 10/13: I want to thank you very much for keeping me on your mailing list. My CRA chapter president does not send emails to us so we would not be in the loop if it were not for you. The information below and the attachment was most helpful. We called last week and our appointment date is 12/3 - so we must have our ducks in a row by then.

(Is this good, bad, or just more government meddling?)

Bill Calls on U.S. to Support Tribology, by George Gill, "Lube Report", October 12, 2016: An Ohio congressman introduced a resolution in the U.S. House of Representatives that calls tribology critical to the U.S. economy and urges the federal government to support innovation in the field. Rep. Tim Ryan (D-Ohio) introduced the legislation – H. Res 916 – on Sept. 28 to the House, which referred it to the Committee on Science, Space and Technology, a first step toward becoming law. Ryan co-founded the House Manufacturing Caucus to examine and promote policies to help expand American manufacturing. "The caucus works to highlight the vital role American manufacturing plays in the U.S. economy, as well as to educate members and their staff on ways Congress can work to ensure that America remains the global leader in manufacturing," he told Lube Report in an emailed statement. "Tribology and lubrication technology plays a direct and significant role in these efforts."

Tribology is the study of friction, wear and lubrication and the science of interacting surfaces in relative motion. Ryan said he introduced the legislation to emphasize the massive impact tribology has on the U.S. economy and how it can help provide solutions to critical technical problems in American manufacturing. "It can help improve energy production and use, transportation vehicles and infrastructure, greenhouse emissions, defense and homeland security, health care, mining safety and reliability and space exploration, among others," he said, adding that the resolution also seeks to highlight the need for increased R&D investments in tribology and related fields."

The resolution states that "approximately a third of the world's primary energy consumption is attributed to friction, and about 70 percent of equipment failures are blamed on lubrication breakdown and wear loss." It also says that solid lubricants and biodegradable and synthetic lubricants development from fundamental research are critical to a more sustainable future.

The resolution concludes by resolving that the House of Representatives:

- encourage federal agencies to develop and implement projects related to tribology;
- encourage formation of public-private partnerships to advance fundamental research and accelerate the development of tribology-related products and technologies;

- recognize the need for increased research and development investments in tribology and related fields;
- Encourage the National Academy of Engineering to conduct a comprehensive survey of the status of research and development in academia and governmental laboratories and recommend a course of action to accelerate innovations in tribology.

Ryan noted that “studies show that finding ways to minimize friction and wear through new technologies in tribology can have an enormous impact on the economy, amounting to nearly \$400 billion annually in the U.S. and up to \$2 trillion globally.”

Michael Zetts, Ryan’s communications director, told Lube Report, “Congressman Ryan will be continuing to push for more members of Congress to endorse this legislation, the committee to hold a hearing, and ultimately for this bill to become law. We are at the beginning of the process, but Congressman Ryan will be working hard to get it across the finish line.”

Ann Woebken, 10/11: I enrolled Henry and me into the Humana High Deductible Plan F to-day. It took about two hours by phone; but this way, you can ask questions right away, if you have any. The agents are extremely friendly and accommodating. We opted for a monthly debit from our checking account for the premium. Also Chevron's contribution shall be credited to our account.

Jerry Wessler, 10/11: I would like to stay with Express Scripts. However as I go through the plans I find that SilveRxscript is a much better deal for us. I was a bit leery because I had never heard of them. However, I learned they are part of Caremark which also owns CVS Pharmacy which is our go to retail Rx provider. Express-Script is in no better than 3rd or 4th place on my list now.

Mark Garrett, 10/11: What Ray Evans said appears to be correct. One question I will have on the Kaiser program is what happens with the Vision plan. Currently glasses are covered on the Kaiser plan that we have through Chevron. It appears that the new plan covers medical issues with vision but not glasses. Hence, you will need to sign up for a vision plan also. If you have the Chevron Retiree program for dental through Metlife I noticed that we can still have insurance through Metlife dental policy.

Bill Mallett, 10/16: I have not had my official “sign up” telephone conversation with OneExchange yet, I’m scheduled for 11/14; I am still looking online, reading, and an occasional phone call to get some answers. The first thing I had to square away was terminology. I had a Chevron Standard Plan. But, what was it officially in Medicare-eze. I knew I had a PPO, but was it a Medicare Advantage Plan or Medicare Supplement plan, I guess also referred to as Medigap. So once I got that squared away I started looking at the list of plans. One good thing about living in S Cal, because of our huge population you we access to every imaginable plan. And you can even have a really low cost HMO and most probably retain direct access to most of your previous doctors. So we have that going for us.

When I called OneExchange to get some specific questions answered, Krystle was very accommodating, very gracious, very sweet, the kind of input I have received from some of our other retirees who have called. But make sure you get all of your questions answered and know exactly what you are signing up for. I may be wrong but I thought she said that she gets a commission. If that is the case, of course she was nice. In my case, like I said, I called with a couple questions and the next thing I knew she was ready to sign me up for a plan. So, do your homework.



8-2-2016 Luncheon: Dave Krentzke, Ted Frankiewicz, Arnold Shugarman



Lynn Brown, Ralph Bauer, George Robinson



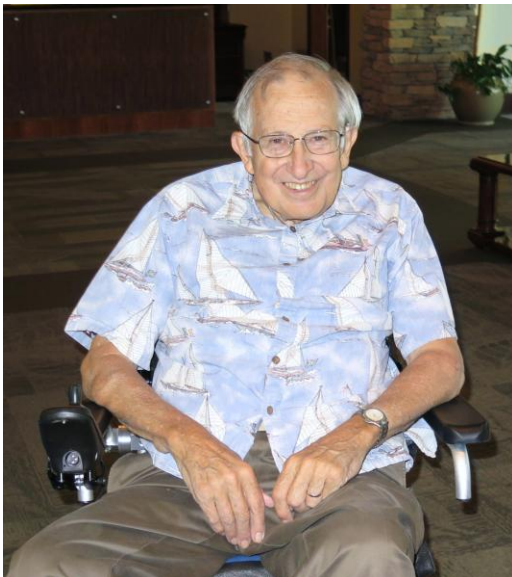
Tim Wusz, Jerry Wessler



Paul Helfrey, Dave Krentzke



Ann Young, Lana Brown



And, the one and only,
Jim Miller