

SPECIAL MEMORIES OF MY CAREER AT  
GENERAL MOTORS

JOSEPH M. COLUCCI

RETIRED EXECUTIVE DIRECTOR  
GENERAL MOTORS RESEARCH AND  
DEVELOPMENT CENTER

JUNE 27, 2017

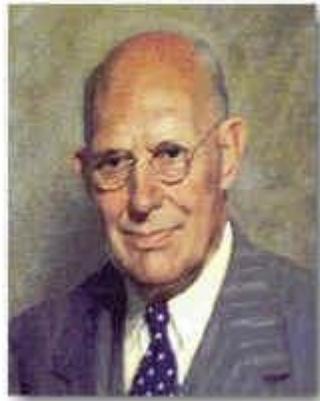


## GM RESEARCH LABORATORIES JOURNEY FROM DAYTON TO THE GENERAL MOTORS TECHNICAL CENTER 1909 - 1955



Charles F. Kettering's first laboratory, 1909-1911, in a barn in Dayton, Ohio. This was the birthplace of an improved automotive battery ignition system and the electric self- starter.

Charles "Boss" Kettering



First home of GM Research Corporation, Moraine City, Ohio, 1921



In 1929, GM Research moved to Michigan, in the Argonaut Building on West Milwaukee Avenue in Detroit.

In 1955, GM Research moved to the newly established GM Technical Center in Warren, MI.



The iconic spiral staircase in the lobby of the GM Research Administration Building

Pictures from: "75 YEARS OF INSPIRATION, IMAGINATION AND INNOVATION," JUNE 1995

## SPECIAL MEMORIES OF MY CAREER AT GENERAL MOTORS

I was blessed to have had an extremely interesting and satisfying career at General Motors, mostly spent in the Fuels and Lubricants Department of the GM Research Laboratories. The people I worked with made it a pleasure to go to work. Their technical accomplishments were outstanding and helped make GM, the auto industry, and the world a better place.

Their accomplishments have been documented in “The GMR-GM R&D Fuels and Lubricants Department – Its History and Accomplishment,” SAE Paper 2016-01-0176, April 4, 2015, and rewarded with the 2017 SAE Arnold W. Siegel Humanitarian Award.

In addition to their accomplishments, the people, and others to whom my position gave me access, provided many memorable and often humorous stories that are the basis for this memoir. It has often been said that, “A day without humor is a day wasted.” Hopefully, what follows will provide some days with humor.

The stories that follow are in roughly chronological order. They are intended to promote pleasant memories for all who read them. In no sense are any intended to disparage my fond memories of all who are named and written about.

Joe Colucci, June xx, 2017

## TABLE OF CONTENTS

- ESCAPING CALTECH AND JOINING GMR
- OPENING DAY
- NICK GALLOPOULOS – THE GREEK SAGE
- GMR MANAGEMENT IN 1959
- DO YOU HAVE AN OBERLIN CONNECTION? – DOC WITHROW
- PROVING GROUND INITIATION CEREMONY
- CHARLIE BEGEMAN – MY MENTOR
- JOHN CAPLAN
- BILL AGNEW – A THINKING MAN’S THINKING MAN
- THE INFAMOUS AUTO-US PUBLIC HEALTH SERVICE MEETING
- THE THREE WISE MEN OF AUTO EMISSIONS
- CHARLES S. (CHUCK) TUESDAY – ATMOSPHERIC CHEMIST
- “FINISHING SCHOOL AT HARVARD”
- GMR SYMPOSIA
- FAMOUS VISITORS TO GMR – JOHN GLENN
- A DYNAMO FROM INDIANA
- A MOUNTAIN CLIMBING PHYSICIST FROM TEXAS
- ERNIE STARKMAN – GM’S FIRST ENVIRONMENTAL VP
- BOB EVERETT – A HAPPY-GO-LUCKY GUY
- JACK BENSON – A MICHIGAN FARMBOY TURNED ENGINEER
- DR. ERNST WYNDER - SLOAN KETTERING INSTITUTE
- CANOE TRIPS
- F&L “CELEBRATIONS”
- “THOSE STINKING DIESEL BUSES”
- PAUL CHENEA –ACADEMICIAN GMR VP
- GMR “GARAGE SHOWS”
- “CAPTAIN CATALYST” – DICK KLIMISCH
- ED COLE – A REMARKABLE ENGINEER/EXECUTIVE
- DAVID COLE – THE ACADEMIC AUTO INDUSTRY SAGE
- FRED HARTLEY – ED COLE’S OIL INDUSTRY CONFIDANT
- BOB STEMPEL – AN ENGINEER’S ENGINEER
- PETE ESTES – THE EVER SMILING GM EXECUTIVE
- ALEX MAIR – A TRULY UNIQUE EXECUTIVE
- THE PICTURE NOT TAKEN
- 60 MINUTES – DAN RATHER

- BRIAN TANIGUCHI – JAPANESE-AMERICAN ENGINEER
- SUCCESS AWAY FROM GMR
- MMT – THE REST OF THE STORY
- JOE BIDWELL
- NILS MUENCH – THE ULTIMATE SAILOR
- HOWARD KEHRL – FATHER OF THE INFAMOUS OLDS DIESEL
- TWO SUPER SUPERVISORS
- SHIRLEY SCHWARTZ – A CHEMIST WITH A BENT FOR MATH
- SIMON TUNG – TRIBOLOGY WIZZARD FROM TAIWAN
- NEW CAR PREVIEWS
- FRED POTTER – CLEAN FUELS ADVOCATE
- BERT STRIEGLER – A TRUE FRIEND IN THE OIL INDUSTRY
- ROBERT (BOB) FROSCHE – THE MAN FROM NASA
- GINO SOVRAN – A SCHOLAR AND AN ATHLETE
- JIM GAGLIARDI – A FRIEND FROM FORD
- CHARLES A. (CHUCK) AMANN
- BOB EATON - GM’S GIFT TO CHRYSLER
- PACKAGE PASSES
- SELLING CARS TO EXXON
- THE RED CORVETTE CONVERTIBLE AND THE FRENCHMAN
- “ALL WORK AND NO PLAY MAKES JACK A DULL BOY”
- SAE - ANOTHER PLAYER IN MY CAREER
- LINOS JACOVIDES – ELECTRICAL ENGINEER SUPREME
- ANDY BROWN - A REMARKABLE ENGINEER AND MANAGER
- KOREAN MEMORIES – IT WAS A GAS
- THE MATING DANCE WITH CALIFORNIA OIL COMPANIES
- ROGER SMITH AND THE TRIP TO THE WHITE HOUSE
- AIR QUALITY IMPROVEMENT RESEARCH PROGRAM (AQIRP)
- THE UNOCAL RFG PATENT LAWSUIT
- GM’S GLOBAL WARMING TASK FORCE
- DAN HANCOCK – POWERTRAIN EXPERT/MANAGER
- PAT SCHULTZ – CAN I GET MARRIED?
- LEONARD EVANS – TRAFFIC SAFETY GURU
- KEN BAKER – GM R&D “INSIDER” VP
- ANDY CARD – THE MAN WHO WHISPERED IN GEORGE W’S EAR
- “ARE YOU COLUCCI?” - OR THE WRONG PURPLE SUITCASE
- UNFORGETTABLE HOTEL MEMORIES
- MISADVENTURES WITH COMPANY CARS

- CHIEF CONTACT WITH AC DIVISIONS
- SECRETARIES – THE UNSUNG HEROINES
- DO YOU KNOW MARY BARRA?
- IMMIGRANTS AT GMR AND GM R&D

## ESCAPING CALTECH AND JOINING GMR

Early in my senior year at Michigan State, I began to think about grad school. The head of the ME Dept. advised me to apply to Princeton, Caltech and Stanford, saying, “You’re a good student – shoot for the best.”

Surprisingly, I was accepted at all, and all provided financial support. My choice came down to Caltech and Stanford because they were in a part of the USA, California, that I had heard a lot about it, and had never been to. Caltech was the final choice because they provided slightly more support.

My year there was an adventure. The undergraduate students were brilliant, and those that took the grad courses I was in got A’s, while I was happy to squeak through with B’s and C’s. The faculty was fantastic. The thermodynamics Professor, Alan Acosta, had me in awe during the first quarter as he derived the laws of thermodynamics starting with a bunch of ping pong balls in a bucket.

In the Spring of 1959, I flew from Los Angeles across the country for the first time as part of an interview trip with GE in Cincinnati, DuPont in Buffalo, Texaco Research in Beacon, NY, and GMR at the Tech Center. The trip was very worthwhile. It convinced me that I didn’t want to work at either GE’s or DuPont’s manufacturing plants, and at Texaco’s woefully inadequate R&D facility. My choice was GMR, and luckily, they also wanted me.

Now, the task was to complete my final term at Cal Tech, receive my MSME degree, and drive across country again with my wife Sue to Michigan (we had driven from East Lansing to Pasadena the previous September, and it only took us five weeks).

There was one course that could stand in the way of this, an advanced calculus class that I did not have a clue about. I had managed to squeak through the two previous terms with a C grade. But now I was terrified of the final exam, which the professor, a kindly 60’ish Italian man from New York City (two points in my favor) had announced would be an “oral exam.”

I had a job awaiting me at GMR, and Sue was pregnant with our first child. Much was at stake if I did not pass.

The night before the exam, I hardly slept. That morning, during the exam, Dr. De Luca could see I was terrified and pretty ignorant about the subject matter. He stopped the inquisition, and asked me a simple question, “Are you planning to stay on at Cal Tech for a PhD?” Instantly, I responded NO.

He replied, “OK, I’ll pass you.” I heaved a sigh of relief, thanked him, took leave of his office, and then of Cal Tech. As they say, “The rest is history.”

I’ve often thought that what Professor De Luca did was one of the kindest things that anyone has ever done for me.

## OPENING DAY

In late June of 1959 I started at GMR in the College Graduate in Training Program (CGIT), which rotated new professional employees through three or four departments on a three month cycle. After spending three months each in Engineering Development and Mechanical Research, I arrived in Fuels and Lubricants, and concluded that I’d like to stay there. They agreed.

Also joining GMR on the same day were Don Brownson, Dick Davison and Don Stivender. All of us except Dick became GM life employees, Stivender and me at GMR-GM R&D, and Brownson at GMR, Buick, Detroit Diesel and GM Powertrain. Don and his wife Glenda became lifelong friends with Sue and me. Don and I became members of the F&L Department.

Dick Davison’s wife, Marcie, was also pregnant, and they became friends with Sue and me. Marcie, however, could not get over leaving Connecticut, where she and Dick had gone to school, and where her family, doctor and dentist lived. Thus, whenever any were needed, Marcie was off to Connecticut. This became an expensive proposition, and it eventually led to Dick leaving GMR and joining United Technologies in Hartford.

There is one Dick story that is unforgettable. He opined that it was stupid to feed their infant daughter prunes, since they would only wind up in her diaper, and smell much worse.

A short divergence here. During my three months in Mechanical Research, I worked on an engine they were investigating, the Stirling Engine. It had been invented in the 1800s in Scotland by Robert Stirling, and back then it was seen as a

competitor to the steam engine. It was a very compact engine, but it's downfall for automotive use was sealing the high pressure hydrogen used as a working fluid.



During my three months in the Engineering Development Department, I worked on the gas turbine engine. My assignment was to measure temperature in an operating burner in a test cell. Temperatures in the cell exceeded 120 F, and we weren't allowed to spend more than 20-30 minutes in the cell at one time. I was

fortunate one day to get a ride in the futuristic Firebird III vehicle, powered by a gas turbine engine, and driven with a Unicontrol mounted between the driver and the passenger.

#### NICK GALLOPOULOS – THE GREEK SAGE

Nick grew up in Greece during the WWII Nazi occupation. After high school, the opportunity to go to school in the United States presented itself, and he jumped at it, landing in Austin, Texas in the early 1950s. After a semester at the University of Texas, he transferred to Texas A&M, where he received a BS in Chemical Engineering. From there to Penn State, where he received an MS, and met his future wife, Mary Frances (Marti).

Nick joined F&L early 1959, and I did so later that year. We and our families became friends, and that has continued up to the present.

Nick initially worked on lubricant additive research. After a few years, he left and joined Exxon in Houston. Again after a few years, he accepted a position, presumably doing R&D on additives, with a chemical company in Pennsylvania. When he got there, he learned that they had different plans for him, ones he didn't like or would agree to. He called Bill Agnew, F&L's Department Head, and asked if he could come back. Luckily Bill found an open requisition, and Nick returned.

In the 1970s, Nick and several others did the initial research to define how gasohol (10% ethanol in gasoline) performed in GM's vehicles. He became Assistant Department Head for fuels. Over the years, even after he became Department Head of Environmental Science and then Engine Research, we worked together on

many things. He was always a trusted confidant, and I could rely on him for objective, well thought out advice.

## GMR MANAGEMENT IN 1959

The top three people when I joined GMR in late June of 1959 were, Larry Hafstad, VP, John Campbell, Scientific Director, and Art Underwood, Laboratory Manager. They occupied the Executive Offices in the GMR Administration Building, a group of rooms that seemed out of reach to a young engineer.

Hafstad had come to GMR from the Atomic Energy Commission. Under his direction, GMR had a project to investigate an atomic car. It didn't get very far, literally and figuratively. Hafstad had an aloof demeanor, and his office privacy was protected by his Secretary, Alberta Harrington, someone with whom you did not want to get crossways.

John Campbell was one of the nicest people I've ever met. He had a great Boston accent, and a perpetual smile on his face. He was encouraging to all he met and spoke with, and he was a great role model. In the early 1960s, when the smog problem was heating up, Mr. Campbell one summer day asked Chuck Tuesday, who was researching the photochemistry of ozone formation, and me to go up to the roof of the Ad Building because he thought he had smelled ozone. Neither Chuck nor I could smell it. But, the episode was a good example of Mr. Campbell's curiosity about lots of things. Long after he had retired, he would often call me to either ask a question or check in on how things were going.

Art Underwood had a stern demeanor, and I don't think I ever saw him smile. One of his crowning achievements was the first "automated highway," on several miles of Mound Road outside of the Tech Center. With the "high tech" system controls of the time, the experiment demonstrated that vehicle throughput could be increased.

## DO YOU HAVE AN OBERLIN CONNECTION? – DOC WITHROW

This question comes up frequently for new residents at Kendal at Oberlin, Ohio (where Sue and I now live) when they are dining with veteran residents. It is not surprising considering that about 35% of Kendal residents do, either having gone to school at or taught at Oberlin College, or have parents, siblings or children who have done so.

When I was first asked the question, I had to answer, “No.” But, on further reflection, I do have an Oberlin connection, and it is a distinguished one. Let me explain.

My first boss after I joined the F&L in 1960 was Dr. Lloyd L. Withrow, or “Doc” Withrow as he preferred to be called. Doc was the exemplar of a true research scientist or engineer, and an outstanding supervisor. I and many other followed the examples he set.

Doc was an Ohio farm boy, as he put it, born in 1899. He attended Oberlin College, where he majored in Chemistry. Following graduation in 1922, he went to the University of Wisconsin, where he received a PhD in Physical Chemistry. He was then hired by a famous Ohioan, Charles “Boss” Kettering (the founder of the GM Research Laboratories), to do combustion research at the GM labs in Detroit.

Doc teamed with his co-worker Gerald Rassweiler, a physicist who specialized in optics. They became the first people in the world to take moving pictures of flame progression across the combustion chamber of an operating engine. They developed all of the equipment necessary to do so.

This completely revolutionized engine combustion research, and led to more efficient engines and better fuel economy. Engine combustion research around the globe now uses much more modern technology to study flames, but it all started with Withrow and Rassweiler.

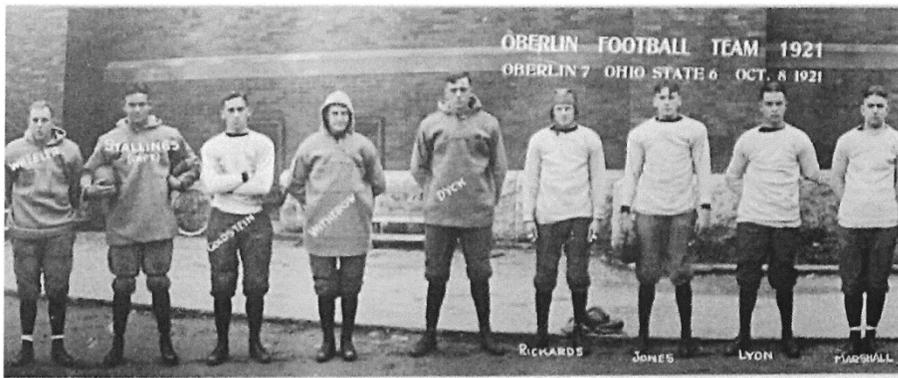
Ever since oil in the ground was discovered, there was concern that it would soon be depleted. Doc gave a marvelous lecture about the history of oil, detailing all the times that it was predicted to “run out.” Concern over oil has continued until the present, where there is now more discovered oil in the ground than ever before.

But, Doc also had another distinction. He was part of one of the most famous athletic teams in Oberlin College history, the 1921 football team that beat mighty Ohio State.

Doc loved to tell me the story. He’d proudly say that he played football while at Oberlin. I’d ask, “What position did you play?” He’d respond, “I was a 180 pound lineman.” I’d say, “Offense or defense?” He’d say, rather indignantly, “I played all 60 minutes.”

Thus he was on the field that memorable day, October 8, 1921, in Oberlin college sports history, when tiny Oberlin College rode the bus to Columbus, took the field against the mighty Ohio State Buckeyes, and came away with a thrilling 7-6 victory. The bus ride back to Oberlin must have been a joyous event for the team and its supporters.

The photo below, courtesy of Polly Carroll, a Kendal at Oberlin resident, shows “Doc” Withrow standing at Polly’s father’s right.



Polly Dyck Carroll's ^ Father

The aftermath of the big upset was that the big, bad Ohio State Buckeyes refused to play another school from the State of Ohio for many, many years.

So, yes, to answer the question, I am proud to say that I have an Oberlin connection.

## PROVING GROUND INITIATION CEREMONY

The F&L Department was responsible for the GMR Milford Proving Ground Facility. Its road system was used almost daily for tests involving vehicle performance with different types of gasoline.

As a new employee, in the summer of 1959 I was invited to the Proving Ground to see the facility and the road system. One of the technicians, Joe Cook, gave me a tour of the various roads, from the Belgian Blocks to test suspensions to the circular track to test performance.

It was a hot day before the advent of seat belts.

Joe was driving on the circular track in the highest speed lane at about 100 mph. I was holding on for dear life, when I looked over at him. He had a big grin on his face, and his hands were in his lap and not on the steering wheel. I was shocked, almost fainted, and felt nauseous.

On getting back to the office, Warren Wiese, a senior engineer, saw me and asked, “Would you like to go home?” Being hot and nauseous, I said YES!

### CHARLIE BEGEMAN - MY MENTOR

I was extremely fortunate to be teamed with Charlie Begeman, a senior member of the department. We shared a two-story laboratory in the RAB. It contained a spiral staircase, the only one at GMR.

One spring day, we tromped through the slush-filled employee parking lot looking for cars of specific vintage that Charlie wanted for a test program. On getting back to the lab, my feet were soaked. I took my socks off and put them into an electric heating device to dry. After a while, Charlie exclaimed, “Something is burning?” I shouted, “It’s my socks.” The synthetic fiber socks had fused into a ball, and I spent the rest of the day without socks.

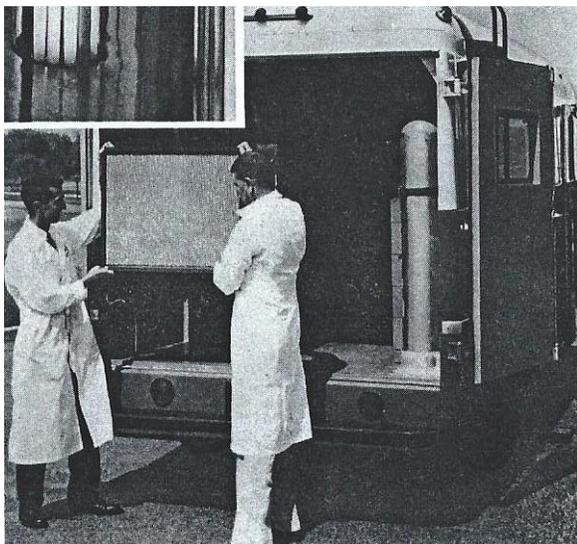
Charlie and I worked on a project that was not only interesting, but it provided me with an opportunity to be involved in a new and upcoming area, air pollution research, and the contribution of GM’s products to the public’s health and wellbeing.

Charlie was a meticulous researcher, and a great mentor and life guide. He and his wife Blossom made Sue and me feel at home in their home. Their optimistic attitude toward life and family helped shape ours.

The project’s goal was to determine the cancer causing potential of the emissions from GM’s products. Our part was to collect organic emissions from the exhaust of GM engines and from the atmosphere, and to concentrate and send them to our

partners at the Sloan Kettering Institute. Cancer potency would be determined from tests with mice in which the extracts were painted on their backs. Also being tested at the time were tars extracted from cigarette smoke.

My role was to help design and build a mobile laboratory which could be taken to several cities, Detroit, New York and Los Angeles and measure atmospheric carbon monoxide, hydrocarbon and lead



concentrations, while collecting particulate matter from the atmosphere. It was a fascinating opportunity for me.

Charlie and I made trips to New York and LA to find places we could park the laboratory, and obtain electrical connections to power it.

On one trip to Los Angeles, Charlie picked an Italian restaurant for dinner. He ordered spaghetti. When it came, it had very little tomato sauce on it. The ever practical Charlie, instead of asking for more sauce, asked for a bottle of ketchup. His rationale was that it was made with tomatoes, so what's the difference. The Italian heritage in me cringed.

One of my trips to New York occurred during the height of the Cuban Missile Crisis in late October 1962. The New York media extensively covered it, and I often went to bed wondering if there would be a tomorrow.

During the course of the project with SKI, a meeting was planned at their labs to oversee the results. Our plans to fly were cancelled because of bad weather, and we hurriedly obtained reservations on the overnight train to New York. For someone who had grown up using the New York subways, this was a new experience – my first trip on a “real” train. We all had sleepers, and they made the trip pleasant.

One of the SKI members reviewed their data from the tars that we had supplied and the tobacco tars. While he was doing so, ironically, he smoked a cigarette. The results were conclusive. Tobacco tars were worst by far, exhaust tars were considerably less carcinogenic, and atmospheric tars were by far least harmful.

Using this information, Charlie wrote an SAE paper about the overall study and its results. The paper was sent through the tortuous GM approval system. On the way it was brought to the attention of the then GM President, John Gordon, who ordered that all references to results from the tobacco tars were to be deleted. He did not want GM to be seen disparaging another prominent US industry.

Charlie then spent a good part of the Christmas holiday season rewriting the paper, which he presented at the SAE Congress in January 1963.

Charlie was an excellent bridge player, and I learned a lot from him. I also enjoyed listening to the religious debates between him, likely an atheist, and Ted Selby, an ardent Catholic. He was also an avid photographer, and loved taking macro pictures of flowers.

Unfortunately, Charlie died of cancer at a relatively young age. I've often wondered if all of the organic solvents he dealt with during his career played a role.

## JOHN CAPLAN

To say that John was the most enigmatic person I ever worked for would be putting it mildly. John was brilliant, and he knew it. In many ways his management skills were symbolized by a bull in a china shop. If John believed in what you were doing, he would support you to the hilt. If not, he would undiplomatically tell you, sometimes providing his rationale, sometimes not.

There are many stories I could tell about John. Here are a few.

F&L held an annual picnic for all department members, family and friends. In addition to socialization, food and beverages, there were games for all. One involved blindfolded couples, with the wife or girlfriend feeding the husband or boyfriend marshmallows from a brown paper bag. Unknown to the participants, the marshmallows had a thin coating of charcoal dust on them. When the whistle blew to end the feeding frenzy, the masks came off. John roared with laughter when he saw the other males in blackface. Then he realized his own face was also covered with charcoal, and he stormed off in a huff. (As an aside, Al Gilbert had organized the games. Shortly after, he transferred to Chevrolet Engineering. Don't know if the two events were connected.)

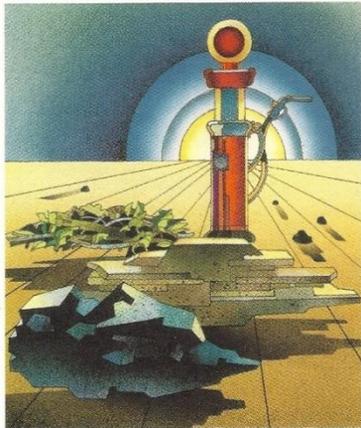
F&L had a very rigid report approval process; supervisor to assistant department head to department head. The process was slow and demanding, and led to excellent internal and external publications. My first internal report went from Charlie Begeman to John as assistant department head. It came back to me with only one comment and it was devastating. In the margin on one page, John had written, "DUMB!!" I read the page over and over and finally figured out he was right. By not telling me what was wrong, he forced me to think.

In the early 1960s, I was in Los Angeles with the mobile laboratory. John was there and he invited me to go to dinner with him and a salesman from Walker exhaust systems. Since I had use of a GM company car in LA, I volunteered to drive. We went to "Trader Vic's," a famous Polynesian restaurant in Beverly Hills. I enjoyed the meal and especially the rum drinks. I was a little tipsy as I drove John back to his hotel after the meal. I appreciated that John never mentioned it.

John rose through several levels of management at GMR, the last being Executive Director. While in the “wheelhouse,” he would often go to the office of one of his subordinates, walk in unannounced, pace back and forth while non-stop lecturing, and then walk out. Those of us subject to this ritual for the most part never knew what he was pontificating about.

I always thought that if anyone knew what John was talking about, it would be Chuck Tuesday, who knew John as well as anybody, and followed in his footsteps up the GMR management ladder. One day I was in Chuck’s office (he was my boss), when John burst in and went through the routine described above. When he left, I thought, “Aha!” I can ask Chuck what that was all about. His response was, “I haven’t the foggiest idea!”

**There’s no fuel  
like the old fuel.  
But there are  
alternatives.**



**GM** General Motors  
Research Laboratories  
Warren, Michigan 48090

In the early 1980s, GMR used a series of ads in Scientific American to polish its image to the outside world. One involved work being done in the F&L Department to utilize non-conventional resources to generate automotive fuels (see at left).

I worked with the ad agency rep to develop the ad and get it through the GMR approval process. I was speaking with the rep and he asked, “Who else’s approval do I need to get?” I went through a string of names, ending with John Caplan. As soon as it came out of my mouth the ad rep said, “Shit!” John’s reputation had preceded him.

At John’s retirement party, I told the above story. Those laughing loudest at it were John and his family.

## BILL AGNEW – A THINKING MAN’S THINKING MAN

Bill had an illustrious career; before GMR, at GMR and after GMR. He was an excellent combustion researcher, mentor, manager, thinker and friend. His management style was non-confrontational and based on working with people to get the best out of them.

During WWII, while a student at Purdue, he was drafted by the Army and sent to Los Alamos to work on the Manhattan Project. While there, he worked on development of the ignition system to activate the plutonium in the “Fat Boy” bomb that leveled Nagasaki on August 9, 1945, leading to the end of WWII. He was part of a team sent from Los Alamos to Hanford in Washington State to bring back the plutonium that was used in the bomb. He carried out many ignition test explosions on a mountain side, and subsequently concluded that they contributed to his hearing loss later in life.

After the war he returned to Purdue, where he received his BS and PhD in ME, and then joined F&L. He undertook fundamental combustion studies using a laboratory burner and mass spectroscopy. He demonstrated preflame reactions both in the burner and in an engine cylinder, and showed how tetraethyl lead affected combustion. Bill also identified some of the chemicals responsible for diesel odor.

Bill was part of the F&L team doing the initial investigations to reduce vehicle emissions and develop the catalytic converter/unleaded gasoline combination to meet the then strict 1975 exhaust emissions standards.

He was head of F&L, and then the Engine Research Department, before becoming a Technical Director. While he was department head in March 1970, I met with him to tell him I had an offer to join Fred Bowditch in GM’s newly established Automotive Emissions Control activity. I was very interested in this opportunity. Bill asked me to “wait a month.” When I asked “Why?” he responded, “Wait a month.” Trusting in Bill, I spent an anxious month wondering what was going on. At the end of the month, he told me that I was promoted to Assistant Department Head of the fuels side of the department. Bill would become Head of Engine Research, and Chuck Tuesday head of F&L. My trust in Bill had been rewarded.

Upon retiring, Bill devoted himself to improving STEM (Science, Technology, Engineering, and Mathematics) education in primary and secondary schools.

He is the “father” of the SAE’s A World in Motion Program, which to date has exposed about 5 million children around the globe to the wonders of the STEM subjects by involving them in hands on projects to demonstrate various physical and mathematical principles. He also developed and introduced into the unmanned Intelligent Ground Vehicle Competition for college engineering students, two important components, the design report and the GPS-following requirement. Teams from all over the world have participated in this annual event, which Bill helped organize and run for many years at Oakland University, near his home.

Bill now lives in a retirement community in East Lansing, Michigan. He recently came to Kendal, and with a Kendal resident who had also been at Los Alamos, they spoke about their memories of the Manhattan Project. The talk was very well received.

## THE INFAMOUS AUTO-US PUBLIC HEALTH SERVICE MEETING

In 1967, the auto industry was in the midst of discussions with the US Public Health service regarding forthcoming auto emission standards and the technologies for meeting them. During that summer, a meeting involving the Automobile Manufacturers Association and the US PHS was held at an isolated location in the northwest corner of lower Michigan, at the Shanty Creek Lodge in Belaire. (Many years later it was the location for several of GM’s management “pep talk” meetings,)

John Middleton led the US PHS delegation. I remember him as a reasonable man, willing to listen and negotiate. Several of us from F&L (Bill Agnew, Marv Jackson and I) gave presentations, as did reps from other auto companies. The meeting was supposed to be “hush – hush,” with no press presence. That appeared to be the case until sometime afterward, when the xxxx hit the fan. Headlines in the Detroit and Washington, DC newspapers spoke about the auto companies collaborating with the US PHS. John Middleton was the fall guy, and he was fired.

The meeting gave me the opportunity to meet many people from the other auto companies, and these contacts proved valuable during my career. One afternoon, Bob Everett, also from F&L, and I played a round of golf with Bob Campeau of Ford and Dan Hittler of American Motors. It was fun and the calm before the storm previously described.

## THE THREE WISE MEN OF AUTO EMISSIONS

As mentioned in a previous story, Fred Bowditch led GM's Automotive Emission Control group, which became part of GM's Environmental Activities Staff in the early 1970s. AEC's main duty was to work with regulators, EPA and CARB primarily, to ensure that regulations were reasonable and achievable in the time frame legislated. Ford and Chrysler had similar activities led respectively by Don Jensen and Charlie Heinen.

Fred was an engine researcher, and he was well known for the quartz window he inserted in a single-cylinder engine for observing the combustion process. I knew Fred well since he and I shared an office before he left F&L. I highly respected and admired him, as I did Don and Charlie.

Don was a Californian, and while at Berkeley he was an outstanding basketball player. He had worked for the State of California on their vehicle emission control efforts, and was an ideal person for Ford to hire. After retirement he wrote a weekly column for the Detroit Free Press providing, in a humorous sense, advice for an enjoyable retirement. He published the columns as a book, "The Last Big Challenge-Retirement!" I have read and really enjoyed it. It is available on Amazon.

Charlie Heinen was a true character. He had a bushy mustache and a cigar in his mouth most of the time. While Ford and GM agreed that the path toward meeting the forthcoming 1975 emission standards was the catalytic converter/unleaded gasoline combination, Charlie insisted, primarily because it was a cheaper option, that Chrysler's "lean-burn engine" was the way to go. It wasn't! Chrysler eventually followed GM, Ford and the rest of the auto industry.

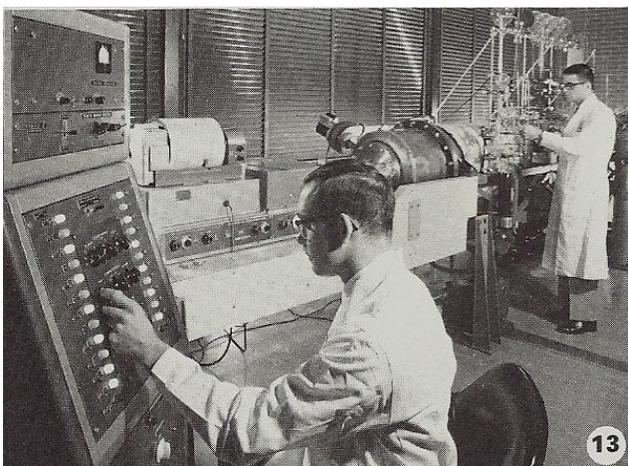
Fred worked for several VPs, Ernie Starkman (see later vignette), Dave Potter and Betsy-Ancker Johnson, before leaving GM and joining the Automobile Manufacturers Association in a similar position. He and Betsy were like oil and water; they didn't mix.

Fred's wife taught kindergarten at Northwood elementary school in Royal Oak. My oldest son was one of her students. For many years thereafter, she would ask about Mike.

## CHARLES S. (CHUCK) TUESDAY – ATMOSPHERIC CHEMIST

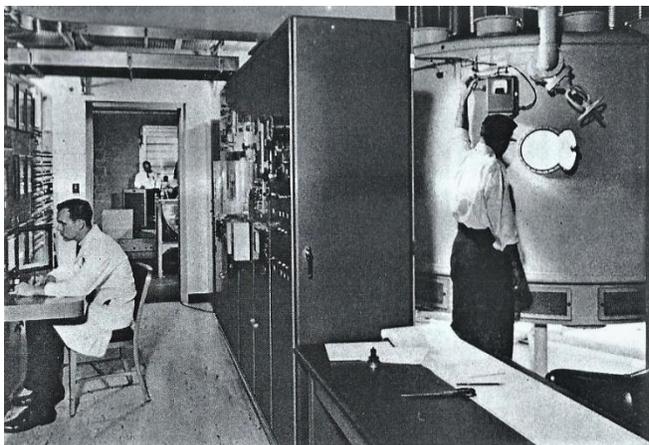
Chuck made his mark studying the photochemistry of atmospheric smog formation. He had graduated after WWII from Hamilton College in central New York State. One of his classmates was Peter Falk, who gained fame playing the raincoat clad Columbo on TV for many years. Chuck received a PhD in Physical Chemistry from Princeton in the early 1950s, and joined the F&L Department.

He designed the atmospheric chamber, shown below, for studying the photochemistry of ozone (one of the main constituents of smog) formation under conditions duplicating the Los Angeles atmosphere on a smoggy day. It was filled with a gaseous hydrocarbon and nitrogen oxides mixture that was irradiated with bulbs that lined the inner walls and radiated like the sun.



With this apparatus Chuck discovered that increasing NO<sub>x</sub> concentration was beneficial in reducing ozone formation. The implication was that reducing vehicle NO<sub>x</sub> emissions might be counterproductive. However, regulators decided that other health effects of NO<sub>x</sub> were important, and developed NO<sub>x</sub> emission standards.

Chuck was very instrumental in the development of the “Smog Chamber,” shown on the next page. It was designed to duplicate the Los Angeles atmosphere. Diluted exhaust gas from a vehicle operating on a chassis dynamometer in an adjacent room, was pumped into the chamber early in the morning, and irradiated for about eight hours to reflect what happens in Los Angeles. In addition, there were “eye ports” around its periphery which allowed humans to expose their eyes to the smog that developed and rate the intensity of their eye irritation (something that would be a no-no today). With the Smog Chamber, the impact of different vehicle emission control systems on smog formation was studied.



As mentioned earlier, Chuck became Department Head in 1970. In 1972, during a major GMR reorganization, he became head of two new departments, Environmental Science and Physical Chemistry, and I became head of F&L, which returned to its traditional research on fuels and lubricants. Chuck's job was to find new heads for these departments. He

did so, and was rewarded by being promoted to Technical Director, and eventually Executive Director. He retired in 1992, and I replaced him.

#### “FINISHING SCHOOL AT HARVARD”

During the summer of 1972, GMR management sent me to Harvard for a two-week course in technical management. I was the GMR “guinea pig” for this; others from GMR followed.

The course was memorable for many reasons.

1. It was held in the hallowed halls of Harvard, and attendees slept and ate at campus dorms.
2. It was held at a time when GM was receiving lots of unfavorable press. I often had to stand up for GM. Good training.
3. The attendees were all “up-and-coming” fairly young technical managers from a vast cross section of industrial America. While there I met several from major oil companies whom I dealt with later in my GMR career.
4. The lecturers were uniformly excellent, and one was especially brilliant. George Cabot Lodge, son of prominent politician Henry Cabot Lodge, gave several lectures about business that had us enthralled.
5. Several of the lecturers overloaded us with reading assignments each night. Most of the reading was useless. The lesson was to be able to discriminate because during your career, you'll have to prioritize.

From this I developed a system to prioritize my numerous assignments from my bosses at GMR and GM. When I received a written assignment, I'd read it and decide whether or not it needed fast attention. If it didn't, I put into a desk drawer. At the end of the month, if I had heard no more from the sender, I tossed the original notes.

## GMR SYMPOSIA

Starting in 1957, GMR held an annual symposium on a topic of current interest not only to GM, but to society in general. The object of the symposia was to gain recognition of the wide scope of GMR's interests, and to increase its reputation in scientific, academic and governmental circles. Invitees were from the previously mentioned groups, and from GM. The symposia covered two days, with sessions in the GMR auditorium, and a banquet on the first night. Departments submitted proposed topics, and it was generally considered an "honor" to have yours selected.

I was involved with two – the first in 1967 was about atmospheric photochemistry; a lively topic at the time with the advent of vehicle emission controls. Chuck Tuesday was the organizer and chairman, and I was Tuesday's "Friday." It was a great opportunity for me, doing everything that Chuck didn't want to do, which was a lot and a good education for me. I don't remember much about the individual talks, but I do remember the banquet speech at the Pontchartrain Hotel in Detroit, given by GM President, Ed Cole.

The second symposium, "Future Automotive Fuels – Prospects, Performance, Perspectives," was held in 1975, and co-chaired by Nick Gallopoulos and me.

Our major task was to put together the speakers and program. One memorable aspect involved a trip to the University of Wisconsin in Madison to speak with Phil Meyers, a very prominent expert in automotive engines. We had flown into Chicago, rented a car and drove to Madison in a driving snowstorm, extending the length of the drive by a couple of hours. Phil provided great advice on the program and speakers.

Except for one hiccup, the program went off well. The speaker on biofuels was terribly unprepared, and had to be asked to leave the stage.

We did several things that were different. A booklet was prepared with cartoons and sayings about the nation's concerns over petroleum supply and alternative fuels. And, instead of having a serious banquet speaker, we invited a humorous one, Dr. R. C. Bates from Michigan State University. His topic was, "How to Fuel a Heart Attack."

The annual symposia continued for many years until budget constraints put a halt to them.

## FAMOUS VISITORS TO GMR – JOHN GLENN

Over the years, many famous people visited GMR to learn about what we were doing. There were numerous people from Congress, international guests (among them the mayor of Venice, whom I helped host because I was Italian), Michigan Governor William Milliken, and the one I most remember, astronaut and then Senator, John Glenn. I was fortunate to speak with him on two separate visits.

In 1962, John Glenn was the first American to orbit the earth and in 1998 he became the oldest person in space as a member of the Discovery space shuttle crew.



In 1970, while he was becoming involved in politics, he visited GMR. I spoke with him in the Smog Chamber. He was interested and asked good questions. He later sent me a signed note that said, “The whole area of smog formation is extremely difficult to understand unless there is an opportunity to see the work you are doing. Needless to say, your work will have a tremendous impact.”

Glenn’s next visit was in 1991, while he was Senator from Ohio. The Senate was looking at legislation affecting the auto industry. We spoke about what GM was doing to reduce vehicle emissions and improve fuel economy. Again, after the visit he sent a note. This one said, “I intend to make use of this valuable information as the Senate considers issues related to the automotive industry.”

John Glenn is a true American hero. I consider myself especially fortunate to have spoken with him twice.

## A DYNAMO FROM INDIANA

Merrill Haviland grew up in a small town in Indiana. He left Purdue in 1956 with BS and MS degrees in Mechanical Engineering and joined the F&L Dept. For years he teamed with John Rodgers studying friction using several laboratory devices that they had designed.

From there he became the leader of our efforts to develop better automatic transmission fluids (ATFs) and tests to evaluate fluid performance. GM’s DEXRON trademarked ATF became the industry standard. GM licensed the

DEXRON label as a means of increased income, and now also uses it for GM recommended engine oil.

In the mid-80s, during a GM “downsizing,” Merrill and several others took the opportunity to retire “early.” For some, Merrill, Norm Hunstad and Dick Kabel, it was an opportunity to pursue other activities and stay active. Merrill joined the Exxon Chemical team in Southfield, and had a successful second career, until he finally retired. He was the first of many “retired” F&Lers to have second careers with oil, additive and test lab companies. Included are: Norn Hunstad, Dick Kabel, Jim Linden, Don Smolenski, Simon Tung, Sid Clark and Jack Benson.

Merrill had married his high school sweetheart, Phyllis. Sue and I socialized with them and spent many enjoyable evenings together. Sadly, Phyllis had a difficult heart condition. Merrill cared for her for many years until she finally passed. It was a very difficult time for Merrill and his three children.

Merrill was my go-to guy when I had questions about transmissions and fluids. He enthusiastically answered my questions with a stream of words, even when all that was required was a simple yes or no answer.

Merrill was “vertically challenged.” For years there was a continuing joke between him and George Nebel, who often had a hard time staying awake. If Merrill was standing and speaking at an F&L event, George would interrupt with, “Merrill, stand up.” If George was speaking, Merrill would interrupt with, “George wake up.”

While at Purdue, Merrill proudly played in the marching band. Years later, he joined the alumni marching band, continuing a music avocation that started many years earlier.

## A MOUNTAIN CLIMBING PHYSICIST FROM TEXAS

Wayne Daniel was one of the most fascinating people I have ever known. He was raised in Amarillo (a-mar-illa), Texas, and graduated from the University of Texas with a BS in Physics. Although he could not swim, and didn’t like the water, he was in the US Navy. His wife, Peggy was a delightful lady. She agreed, with some encouragement from Wayne, to spend their honeymoon in one of the most isolated and desolate places in the USA, Big Bend National Park in southwest Texas.

Wayne's fascination with the great outdoors led him to become a mountain climber, a hobby that he has pursued through his career at GM, and during retirement. His vacations were mostly spent climbing in the Grand Tetons, often joined by John Rodgers and Merrill Haviland, and their families.

Upon joining F&L, he was one of the first people to study engine combustion and the production of exhaust emissions.

Wayne partnered with Joe Wentworth for much of this research. They are shown in the photo, Joe on the left and Wayne on the right.



Wayne's meticulous research discovered that the "quench layer," a thin film attached to the combustion chamber walls, was a major source of exhaust hydrocarbon emissions. Wayne and Joe were great examples that one didn't need a PhD to do outstanding research. They jointly received the SAE Horning Award in 1955 and 1962, and Wayne received the Arch T. Caldwell Award in 1968 and 1971.

Wayne was innately curious. In the early 1960s he and I were on separate business trips to the west coast, and we met. Wayne was fascinated by a natural phenomenon called the "green flash." When the sun sets as it goes below the horizon over the ocean, there is a brief time when one, if lucky, can see the flash. We were driving on a Pacific Ocean road close to sunset. We parked, and as luck would have it, we saw the "green flash."

Late in his career, Wayne transferred to Engineering Staff, where he worked on advanced engine design. After retiring, he moved to Minden, Nevada, in the foothills of the Sierra Mountains, where taxes were low and he could pursue mountain climbing. He designed his new home, and in the lobby, it included a model of Foucault's Pendulum, which he also designed and built.

Wayne loved puzzles, and he became a world-class puzzle designer and manufacturer of wood puzzles. Likely, he was one of the first to utilize computers in their design. They ranged in complexity from simple six-piece Burr puzzles, to large geometric shapes that were works of art. One of his designs, "The All Five Puzzle," was written about in the New York Times. It was a series of four

geometric puzzles nestled together into the fifth puzzle, the outer shell. It contained no voids.

I received one as a gift from my wife. One of my grandsons took it apart, and I have yet get it back together. I have many of Wayne's puzzles and have spent numerous enjoyable hours with them.

While enjoying retirement in Nevada in the 1990s, Wayne was asked by Kia Motors, if he'd like to spend a year in Korea consulting for them on their future engines. This was a once-in-a-lifetime opportunity. Wayne and Peggy agreed to go, and they spent a year in Seoul. After returning he described his time at Kia as disappointing. For the most part he did little consulting. It turns out that Kia was taking the year to find out if he could help them. They concluded that he could and offered to retain him for another year. He said no and returned to his beloved mountains in Nevada.

This leads to the final bit about Wayne. He had a desire to climb a mountain somewhere in the world that had never been scaled before. After extensive research, he settled on a mountain on Baffin Island, in the Arctic Ocean north of Canada. He convinced his daughter and two sons to go with him. They spent the most part of a year planning the trip, and collecting the supplies (food, equipment, etc.,) they would need for the week they would spend isolated on Baffin Island.

They flew to the closest city in Canada, and chartered a plane to take them to the island. It would return one week later, and it did. Wayne and his children had successfully climbed their mountain, and they returned home to a delighted Peggy. Remember, this was done before widespread use of cell phones and GPS, so there was no outside communication to rescue them if necessary.

#### ERNIE STARKMAN – GM'S FIRST ENVIRONMENTAL VP

The culmination of the trip described above with Wayne Daniel was a visit to the Mechanical Engineering Department at UC Berkeley. There we met with the Head, Ernie Starkman, and a young professor, Bob Sawyer. Both would play important roles in GM's and my future.

Starkman and his students were researching, as was Wayne, engine combustion as the source of vehicle emissions. Both Ernie and Bob later became heavily involved with vehicle emissions regulations and concern for a cleaner environment. Ernie was a member and then Chairman of CARB's Technical Advisory Board. He was an excellent choice as the first VP of GM's Environmental Activities Staff.

Ernie strongly advocated for an appropriate building at the Tech Center for the new staff. Since a site on the lake was not a possibility, he asked for a small forest in front of the building with a pond and a waterfall. He got it.

Ernie was effective in his new role, as he exerted a major influence in the areas of air pollution and safety requirements and legislation, often as a congressional witness, defining the practicable limits of regulations in terms of technological and economic feasibility.

In January 1976, he was shoveling snow at his home and suffered a fatal heart attack. At the time he was President-Elect of the Society of Automotive Engineers.

Bob Sawyer had a very distinguished career at UC Berkeley, and is now Professor Emeritus. He became a strong advocate for reduced vehicle emissions and cleaner air. Our paths crossed many times. When the Auto/Oil Program was formed in 1989, I asked Bob to become a member of the scientific advisory panel, formed from academia with highly reputable and forthright people. Bob and the panel served us very well. They wrote a significant article for Science magazine highlighting the importance of the study's results for obtaining cleaner air.

Bob served as an advisor to the EPA, and in 2005 he was appointed by Governor Schwarzenegger as Chair of the CARB. Two years later the Governor fired him. Bob was going faster in trying to reduce California's greenhouse gas emissions than the Governor wanted. Bob later wrote Arnold a scathing letter decrying the Governor's retraction from being an environmental advocate.

In 1999, Sue and I were on vacation in Northern California, and spent a couple of glorious days in Yosemite National Park. One morning at breakfast, I looked across the room and saw Bob and his family. Small world!

Bob was a great environmentalist, and a world-class hiker. He has hiked the Appalachian and other daunting trails.

#### **BOB EVERETT – A HAPPY-GO-LUCKY GUY**

Bob was a mechanical engineer from Duquesne University in Pittsburgh. He had played varsity basketball, and he was an excellent golfer who was fun to play with.

He worked on engine-fuel relationships. Once he was working on a carburetion problem with the new Chevrolet Corvair. For whatever reason, the doors could not be opened. So Bob, acting like a contortionist, stuffed his 6'4" body through an open window into the driver's seat, and continued the testing.

Bob loved to tell stories. A favorite involved a pet dog that he and his wife had recently acquired. During the middle of the night, Dottie woke him and told him the dog, who was being “potty-trained,” needed to go outside and do his duty. Bob, in pajamas and a robe, took the dog out front to a fire hydrant for the dog to use. The dog did not do as expected. Instead of the hydrant, he used Bob’s leg! I suspect the dog and Bob both learned a lesson. Whenever Bob told this story, he would roar with laughter.

One night as I was walking down the RAB hall to go home, the door to the ladies room opened and Bob popped out right in front of me. Again, he roared with laughter at his mistake.

In the late 1960s, Bob and I were at a meeting in New York City. After dinner we went to a local movie to see the smash comedy hit, “The Graduate.” It was very funny, and Bob’s raucous laugh got everyone in the theatre laughing.

After I joined the F&L management team, I would often send notes with the following words on them, “Please handle.” Bob received more than his share. When he left the department to join the Automotive Emission Control Group at Environmental Activities Staff, he gave me a gift. It was a cut-off paint brush handle with the words, “Please handle” written on it.

#### JACK BENSON – A MICHIGAN FARMBOY TURNED ENGINEER

Jack grew up on a farm in northern Michigan, where he developed an interest in mechanical things. After receiving BS and MS degrees in Mechanical Engineering from the University of Michigan, he joined F&L in 1964.

He once told me this story about his recruiting visit at Ford Research. After spending most of the day with technical people, his last stop was Personnel. The manager was late arriving, and apologized to Jack. He was delayed at a meeting planning a reorganization, and he said with a straight face, “Ford will continue to reorganize until we have a stable organization.” How prophetic! Ford, GM and almost every other company has followed this mantra. What seems good and stable today can be a disaster five years from now. On May 22, 2017, the morning news revealed that the Ford CEO, Mark Fields, was being replaced. The reorganization continues.

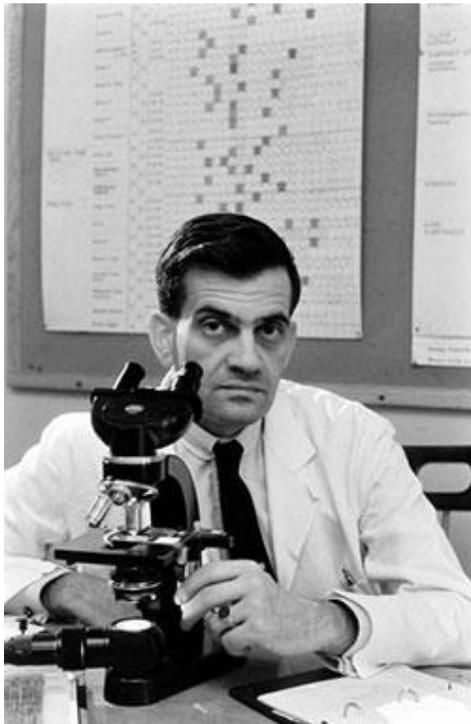
Luckily for us, Jack turned down Ford to come to GMR.

In the early 1970s, GM had a very serious field problem with plugging of exhaust gas recirculation valves that were part of the system to reduce vehicle NOx emissions. Jack was asked to unravel the valve plugging mechanism. Also working on the problem was a young engineer at Cadillac by the name of Tom Stephens. Tom had an outstanding career at GM, rising to Vice Chairman.

While Jack was working on the EGR problem, we were asked by Chuck Brady to come to Engineering Staff to brief his boss, the VP Frank Winchell. Frank was well known as a hard-nosed manager. He opened the meeting by forcibly telling us that he didn't want any xxxx, only the truth. I guess we did so, because Winchell was pleased at the end of the briefing.

Winchell, like so many of GM's top management, had pet projects. One that F&L got involved with during the energy crisis of the 1970s, was a powdered-coal fueled gas turbine engine for trucks. We looked into how the fuel might be obtained, and quickly concluded that it was a "dumb" idea. Pulverizing the coal was possible, but distribution and storage for vehicular use would be daunting issues. Yes, powdered coal in the short term could be burned in a GT engine, but the particulate emissions were a problem and the vanadium in the coal would corrode the turbine blades. Winchell eventually gave up.

#### DR. ERNST WYNDER - SLOAN KETTERING INSTITUTE



Dr. Wynder, at left, was one of the most fascinating people I have ever known. He was born in Austria of Jewish heritage. His family immigrated to the USA in the late 1930s. He was an epidemiology and public health researcher who, among other things, studied the health effects of smoking tobacco. His 1950 coauthored publication of "Tobacco Smoking as a Possible Etiologic Factor in Bronchogenic Carcinoma: A Study of 684 Proved Cases" appeared in the Journal of the American Medical Association. It reported one of the first major scientific studies identifying smoking as a contributory cause of lung cancer.

He was a handsome man of the world and his name was often in the society columns of the

New York newspapers. One spoke about his relationship with the beautiful movie star, Kim Novak.

I invited Dr. Wynder to come to GMR and give a lecture about his research. This was during the time when the dangers of smoking were becoming evident, and many people at GMR were still smokers. I think he had an impact on them.

During his presentation, he stopped and asked the audience to look at the four people sitting around them. He then stated conclusively that in 20-30 years at least one would be dead of lung cancer. The audience was shocked. And, subsequently, many stopped smoking.

Being an epidemiologist, he knew the power of statistics. He told this story about a study using monkeys. He said, "33% of the subjects had a positive reaction, 33% had no reaction, and the third monkey ran away." The audience roared.

## CANOE TRIPS

In the middle 1960s Tom Verdura proposed that interested F&Lers take a springtime canoe trip on a river in the northern part of the Lower Peninsula. The idea received considerable interest. It was a good way to greet spring with a great bonding exercise. With Tom's leadership and planning, it happened. Over the years, we canoed a number of rivers, including the Rifle, Au Sable, Pere Marquette, Pine, Manistee and Little Manistee; several more than once.

At the time of the first trip, John Caplan was department head. When asked if he'd like to go, he replied, "Have you selected a motel?" When learning it was a camping trip, he declined, much to the amusement of many, and the relief of all.

Basically, the trip involved leaving work early on Friday, carpooling to the selected river and camp site, and setting up camp. Meals were cooked at the camp site that evening. A large fire was started. "War stories," some true and others fabricated, were told around the fire, a few libations were consumed, and the tired group eventually retreated to their tents and sleeping bags.

The next morning after breakfast, we drove to the "put in" site upstream of camp where the rented canoes awaited us. The day was spent canoeing downstream, usually 5-6 hours, in the frigid waters, frequently involving rapids and fallen trees. Of course there were a few spills, which made the events more memorable, and provided major coffee break discussion topics during the weeks that followed.

Usually there were about twenty brave volunteers, with two in each canoe. Most had had little or no experience, especially in fast running water. We all learned quickly, but for some of us, it was not quick enough.

On two trips my partner and I managed to get “baptized” in the cold river. I don’t remember ever being as cold as when I first hit the water and went under. In one instance, my partner, to slow our progress, reached out and grabbed a branch overhanging the water. Little did he know that the canoe would keep going, and we would be dumped in the icy-cold water. In the other instance, we leaned and fell out of the canoe. It continued downstream and wedged itself under a log in several feet of water. It took a monumental effort by 6-8 people to free the canoe since it had to be pulled upstream against the flowing river. We were smart enough to wear life vests, and to carry an extra set of clothes and our lunch in waterproof containers, usually WWII Army ammo boxes.

Several of the trips involved portages around log jams. One was pretty long and difficult, and several people decided it would be their last trip.

At the end of the canoeing, we’d return to camp, and follow the routine of the previous night. On one Saturday night, a bunch of exhausted people sat around the camp fire drinking brandy and other libations, while watching ants leave their homes in rotted logs and perish in the fire. Hard to believe what would entertain a group of exhausted and half-sober engineers and scientists. John Agnew, no relation to Bill, especially enjoyed seeing the ants creep from one end of a log to the other. John was an ME professor at Purdue, and a department consultant.

#### F&L “CELEBRATIONS”

F&L developed a reputation for “no holds barred” luncheons and dinners to celebrate and honor people when significant events occurred, such as marriage, retirement, transfer, leaving GM, etc. The objective was to have fun at the expense of the person being recognized. Speakers would recite different, usually humorous aspects of the person’s life and career. In the end, the honoree got time to refute and say whatever he/she wanted.

One of the first celebrations I attended was Doctor Withrow’s retirement party in 1962. I was amazed that one of the speakers was Pete Estes, then Pontiac General Manager, and destined to be GM President.

I was so “honored” twice; first when I was promoted to Executive Director in 1992, and second when I retired in 1995. Both events were memorable for me.

## “THOSE STINKING DIESEL BUSES”

For many years GM was a major supplier of city transit buses. Manufactured by GM's Truck and Bus Division and powered by Detroit Diesel Division's 2-stroke engines, they offered much better fuel economy and low speed acceleration, both desirable in stop and go city traffic. However, in the 1960's, a major issue threatening their sales was the smoke and odor emissions that enveloped people on the urban sidewalks and streets, especially as the bus accelerated away from a stop. Odor and smoke emissions were also concerns with other diesel engine uses.

F&L was given the task of figuring out how to make diesel-powered buses more acceptable. The task was assigned to two young engineers, Jerry Barnes and Joe Colucci. They were to work closely with Truck and Bus and Detroit Diesel. Before describing the project and its outcome, let me spend a few words about Jerry Barnes.

In October, 1957, while a senior at Michigan State University, I was selected by Pi Tau Sigma, the mechanical engineering honorary society, to represent MSU at their convention, being held at MIT, in Boston. While there, I met the Purdue rep, and we hit it off. It turns out that Jerry Barnes and I had been married on the same day, August 31, 1957. We both were seniors, and we both had an interest in vehicles, engines and the growing environmental issues related to vehicles and their uses. After the convention ended, we continued to correspond via snail mail (this was some time before the advent of e-mail) for several years. Jerry stayed at Purdue, receiving his PhD in 1962, and I went to Cal Tech for an MS and joined GMR.

One morning in mid-1962, I was sitting at my desk when Warren Wiese, a senior engineer in F&L, walked through my office/lab with an interviewee. Lo and behold, it was Jerry Barnes. We talked for a while. Jerry later told me that our conversation was one of the reasons he accepted F&L's job offer.

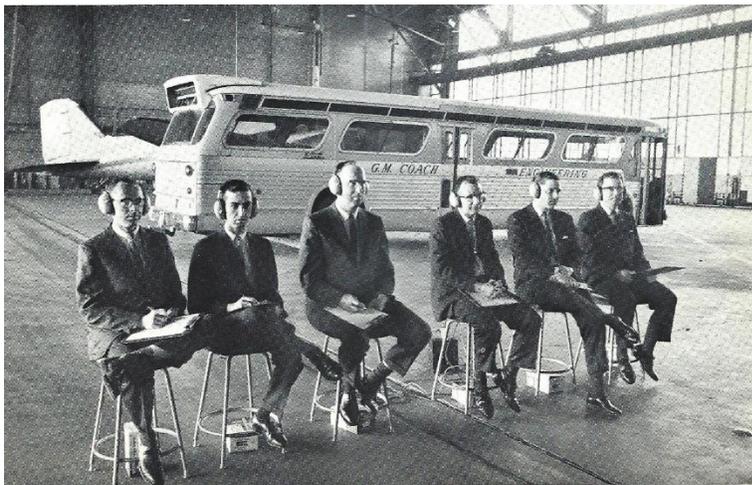
Back to diesel emissions. Jerry carried out a single-cylinder diesel engine study to learn how diesel fuel composition affected the intensity of diesel odor emissions. A glass mask confined a small sample of diluted diesel exhaust to the nasal area, allowing a yes/no decision on the detection of an odor.

A picture is shown on the next page. With current OSHA standards, this would not be acceptable today.



Our joint project also involved evaluating the impact of three transit bus exhaust system designs: the then current production curb side discharge; a vertical exhaust pipe extending above the roof at the rear of the bus; and an exhaust diffuser mounted on the bus roof and extending the length of the bus.

To evaluate these designs, we needed a large facility through which we could drive a city bus without endangering the observers and other occupants of the facility. After some searching, we initially settled on and used the GM Corporate hangar at Detroit City Airport. It had floor-to-ceiling doors at both ends, allowing the bus to enter and exit, and stop at varying distances from an odor panel. The full-height doors also facilitated flushing the exhaust sample from the previous test from the test area, minimizing sample carryover from test to test. The panel of volunteers (see picture below), wearing ear muffs to mask the bus location and facing away from the bus, answered a simple question: in the test period (usually one minute), did the panelist detect the exhaust odor? Jerry had researched a statistical analysis technique previously used to evaluate human responses to odor, sound levels, taste sensation, and other human reactions to various stimuli. This analysis was used for both the single-cylinder engine and the full-size bus studies.



As might be expected, some observers found humor in this use of the hangar, and in moving the test vehicle to and from the airport.

Inexperienced as we were, some of us learned to drive the bus to and from the airport. However, people waiting at the bus stops along the route did not enjoy seeing a relatively empty bus drive

past them as they waited for a ride to or from work. Some expressed their irritation vocally when they weren't picked up as they expected.

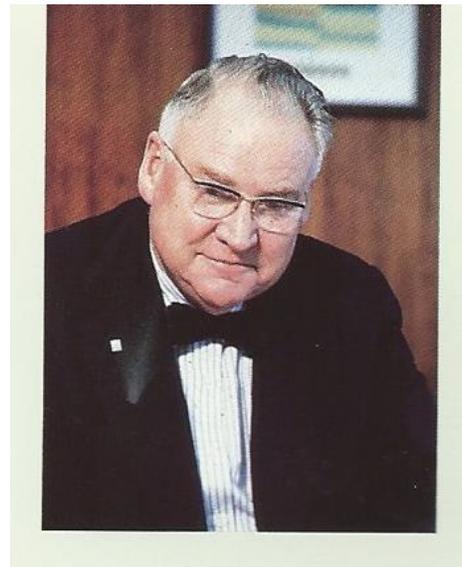
On another occasion, as we set up the test for that day, GM staff at the airport were expecting the arrival of a casket of a GM executive who had recently died. Several people thought we were an "honor guard" awaiting the arrival of the deceased.

We eventually found more convenient testing facilities at the Milford Proving Ground, in a facility known as Areaway 4. A majority of our testing was done there. The results from both test facilities conclusively showed that a vertical exhaust pipe considerably lessened public discomfort from diesel bus odor and smoke emissions. GM and other bus and over the road diesel-powered vehicle manufacturers have adopted and now almost universally use such designs.

Jerry's career path led from F&L to the new GMR Physical Chemistry Department in 1970, where he worked on the development of catalytic emission controls. In 1980, he joined the Automotive Emission Control group of the Environmental Activities Staff, where he worked on regulatory issues, both vehicle and facility, for both U.S. and overseas operations.

Jerry and I remain friends. He and his wife, Joy, live in retirement in River Falls, WI, while Sue and I live in Oberlin, OH.

#### PAUL CHENEA –ACADEMICIAN GMR VP



Paul served as VP of GMR from 1969 to 1982. He was a huge man in many ways; intellectually, physically and personally. He had an encompassing vision of the future, and he brought increased focus to environmental, safety and societal issues. Almost all of his career before coming to GM had been in academia, including at Michigan, Purdue and MIT.

Paul wanted to know more about the people at GMR and what they were doing. Thus, he established a system of semi-annual reviews of each department, during which six to eight department members spoke about their research.

They were affectionately called "Chenea Reviews."

During one of F&Ls reviews, an engineer was describing his research to evaluate the impacts of engine oil constituents on the performance of exhaust emission control catalysts. Paul asked a question, and before the engineer could respond, answers came from Paul's two Executive Directors, Joe Bidwell and John Caplan. They were as different as night and day, and they were very competitive. They went on for a couple of minutes until Paul could not take it anymore. He emphatically said, "Would you two please shut up – I want his answer not yours!" They shut up, and were quiet for the rest of the review. Several of us often look back on this incident as the highlight of all the reviews the department had.

Paul had a quirky sense of humor.

1. In the mid-1970s, GM came out with the very small Chevrolet Chevette. Paul labeled it as "GM's contribution to birth control."
2. In the late 1970s, I went to Paul's office to tell him that the EPA had approved ethanol, up to 10% by volume, as a gasoline additive. Paul appreciated his wine and whiskey. His response to me was, "Oh, what a waste."
3. When speaking about MIT grads, Paul said, "It takes about ten years for them to get over it." Having a son and a daughter-in-law as MIT grads, I agreed whole heartedly with him.
4. During meetings when he was bored, Paul like many of us, liked to "doodle." But, unlike anyone I ever knew, Paul's doodling was solving differential equations.

Paul also wanted to generate more camaraderie among the GMR management team. He started a monthly off-site luncheon held at the Fox and Hound Restaurant in Bloomfield Hills. The speakers usually were upper management GM execs who brought their knowledge of the workings of GM.

The most memorable speaker was John DeLorean, who had been an excellent engineer, and VP of Pontiac and Chevrolet Divisions. John excelled in line management, but he had been "promoted" to an upper staff position and he was floundering and bored.

Contrary to the typical GM button down executive, John was a jet setter and wore stylish, expensive clothes. Appearance was critical to him. At the time of the luncheon, he had recently married Kelly Harmon, a beautiful Hollywood starlet. Her father was Tommy Harmon, an All American and Heisman trophy winning football player from the University of Michigan.

John started his presentation by stating, “You don’t know how lucky you are to have me here today. This morning my gorgeous, young wife called and pleaded for me to come home. She said the time was ripe to make a baby. And, I came out to talk to you instead!”

He went on to give a talk about his vision of a perfect future world that he hoped to create.



Soon after the talk, he parted ways with GM, and founded the DeLorean Motor Car Company. He designed a very distinctive stainless steel car (see at left), but sales were insufficient to meet expenses. He took desperate measures, including involvement with drug sales, to keep it alive. It eventually failed as did his marriage to Kelly, and he served time in jail for his drug involvement.

## GMR “GARAGE SHOWS”

Another legacy of the Chenea years was the annual GMR Garage Show. It was essentially a “dog and pony” show to demonstrate to GM’s upper management and Board of Directors, all of the excellent things that GMR was doing for GM. Our goal was to leave them feeling good about us, ensuring a nice budget for the next year. This approach worked for many years until the mid-1980s when GM’s financial “leaders” were more interested in what you are doing for me this year and next year. Their short-term focus was not consistent with the mission of a research laboratory, and it started the decline in GMR’s effectiveness.

The content for the show was obtained by GMR management reviewing projects with each department head, and then selecting about 20 to appear in that year’s show. Each project selected was visually demonstrated on a large backboard, with a table in front containing other display material. The department head was charged with putting together a 3 minute (not a second longer) presentation to tell what had been done and how it would benefit GM. Let me tell you that putting together an effective 3 minute talk is much more difficult than a one hour lecture.

After one day of presentations to the brass, another day was devoted to personnel from GM’s staffs and divisions, and the last day to GMR employees. The system

seemed to work, except for the incident described later in the vignette about Ed Cole.

For many years, included in the Corporate Management Group was “Tony” DeLorenzo, VP of Public Relations. He could care less about technology; his only mission was to keep GM out of the news. Usually, after several stops on the tour, Tony would conveniently be called away by a phone call. He never returned.

A great benefit of the Garage Shows was that it gave department heads the opportunity to meet GM’s brass. These connections for many of us proved invaluable.

#### “CAPTAIN CATALYST” – DICK KLIMISCH

As part of Paul Chenea’s vision for a more environmentally conscious GMR, in the late 1960s, the F&L department hired a number of excellent chemists and chemical engineers to work on developing catalytic emission control systems. Among them were Dick Klimisch, Kathy Taylor, Jim Schlatter, Louis Hegedus, and Frank Williams. Two, Taylor and Hegedus, eventually became members of the National Academy of Engineering.

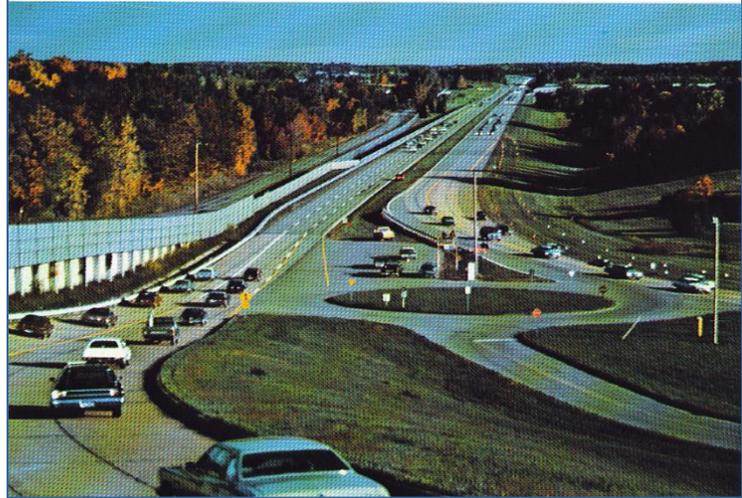
Dick, from a small town in Iowa, received his PhD in Chemistry from Purdue and joined DuPont. Sometime later, he answered the call from GMR and became a critical part of GMR’s and GM’s programs to implement catalytic emission control systems. Along the way, he picked up the affectionate nickname, “Captain Catalyst.”

In the early 1970s, while I was Assistant Department Head, Dick reported to me. He was unhappy with his advancement. I had to calm him down and gave him the same advice Bill Agnew had given me earlier, sit tight.

Several years later Dick became head of the recently established Environmental Science Department. In 1974, the introduction of catalytic emission control systems was about to be derailed by claims that sulfate emissions from these vehicles would pose a significant threat to public health. Dick helped organize, with EPA, and auto and oil companies, a major test at the Milford proving grounds. Hundreds of vehicles with catalytic emission control systems fueled with unleaded gasoline of the then common sulfur content, drove around for days.

Atmospheric sulfate concentrations were measured. They were much lower than what had been predicted from modelling. “Captain Catalyst” and his crew had saved the day.

Dick subsequently left GMR to become Executive Director at Environmental Activities Staff. While there he reported to Dr. Betsy Ancker-Johnson, who



was not the easiest person to work for. Dick managed to successfully survive his stint with Betsy.

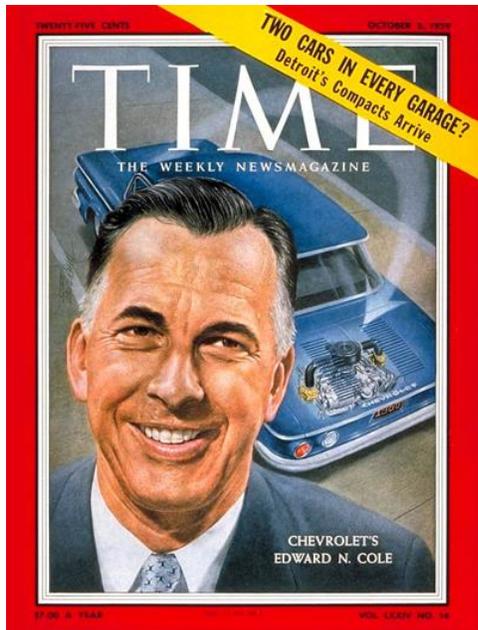
Upon “retiring” from EAS, he joined the Automobile Manufacturers Association where he became VP of Engineering, working for Andy Card, who Dick greatly admired. I did also. Andy later became Chief of Staff for President George W. Bush. More about Andy in a later vignette.

Dick “retired” from the AMA to become VP of The Aluminum Association, Inc. From there he did his last retirement. In retirement he is doing something that I greatly admire. For many years, he has taught science in some of the worst schools in the Detroit School System. And, he’s still doing it.

#### ED COLE – A REMARKABLE ENGINEER/EXECUTIVE

Mr. Cole had a remarkable career at GM, as an engineer/executive and a leader. He was responsible for many outstanding successes, and some flaming failures. They typify the type of person he was; not afraid to take a risk, contrary to many of his counterparts.

Early in his career in the late 1940s, he was Chief Engineer at Cadillac. His team developed their “state of the art” V-8 engine. In the 1950s, as Chevrolet Chief Engineer, he was responsible for designing their small block V-8 engine. It was an outstanding success, is still produced with significant updates, and has had the largest production, over 100 million, of any engine in the history of the auto industry.



While General Manager at Chevrolet in the 1950s, he had the vision of a small vehicle with an air-cooled rear engine. GM produced the Corvair for several years. A picture of Mr. Cole and the Corvair on the cover of Time magazine shortly after the vehicle was introduced with much acclaim, is shown at left.

GM produced the Corvair until its safety was questioned by Ralph Nader in his book, "Unsafe at Any Speed." Sales fell and production was stopped.

As President of GM, Mr. Cole led corporate efforts to meet the forthcoming 1975 vehicle exhaust emission standards by developing the catalytic converter and forcing the oil industry to produce the unleaded gasoline needed to keep it working. His speech at the SAE Congress banquet in 1970 started the ball rolling. He followed up with one-on-one meetings with top executives of the major oil companies and tetraethyl lead suppliers, laying out all the data GM had, much of it obtained by F&L, to support the decision. To say that these meeting were "exciting" is to understate the obvious.

While the catalytic converter was being developed, Mr. Cole had the staffs look at two other long-shot technologies for reducing vehicle emission. One was using a canister containing a hemoglobin-type chemical to capture carbon monoxide in the exhaust gas, as it did in human blood. Needless to say, the concept was not workable for a variety of reasons.

The other was to use ammonia, NH<sub>3</sub>, as a fuel. Cole realized that if engines could burn a fuel not containing carbon, such as ammonia, there would be no carbon monoxide and hydrocarbon emissions. The good news was that NH<sub>3</sub> was burnable, at least in a single-cylinder research engine. The bad news was that it was difficult to store, it was toxic, and commercial distribution to consumers would be close to impossible. He soon forgot about it.

Mr. Cole also needed to get government on our side. He made frequent trips to Washington, DC and he invited members of Congress to come to GMR to learn what we were doing. During one of these visits, I was fortunate to speak to a group about our progress and how we were measuring vehicle emissions. One of

my comments was that use of the catalytic converter would essentially eliminate committing suicide in a garage because carbon monoxide emissions were so low.

Back in the early 70s, men wore their hair long, and so did I. After my presentation was over, and the group had moved on to the next stop, Mr. Cole came up to me, put his hand on my shoulder, and whispered in my air, “Great talk Joe. Get a haircut!” His hair was much shorter, and in a more executive like style, unlike what John DeLorean later strutted around GM with. I did not get a haircut, and luckily I survived at GM.

As a follow up to the above, many years later at the SAE Congress, I spoke with Dolly Cole, Mr. Cole’s widow. I told her the above story. She laughed and said she had an addendum. Ed and Dolly had a beautiful teenage daughter. When young men came calling, Ed would go to the front door and greet them. If they had long hair, he would send them away.

In the early 1970s, Mr. Cole saw the need for another GM small car. To maximize fuel economy and performance, he wanted a small, high-output engine. He believed the one most suitable to fit under the hood was the Wankel Rotary Engine. It was a very unconventional choice since it used a triangular rotor in an enclosure, and not the conventional piston/cylinder configuration.

During a Corporate management review of major projects at GMR, one display was another engine concept, the Swash Plate Engine, on which GMR was working. Cole saw it, and he went ballistic. He cancelled the project on the spot and announced that all effort be placed on the Rotary Engine. GMR, and others in GM did so. However, a major problem with controlling exhaust hydrocarbon emissions could not be solved, and GM never produced the engine.

Mr. Cole was a pilot. In 1977, after he retired, he was flying his plane in a fog, got disoriented, crashed and died. I was in Joe Bidwell’s office when we heard the news. Joe had worked as Mr. Cole’s assistant, and he, along with many of us in and out of GM, were devastated by the news.

## DAVID COLE – THE ACADEMIC AUTO INDUSTRY SAGE

It is appropriate that I write about Dave at this point, since he was Mr. Cole’s son.

I met Dave in 1962 when he was a summer intern working in F&L. He was studying Mechanical Engineering and Mathematics at the University of Michigan. He obtained BS, MS and PhD degrees. At the time he must have consciously

decided not to go to work in the auto industry, where his father was already legendary, a decision that I highly respect.

Dave joined the Mechanical Engineering faculty in 1965, and taught there for many years. In 1978, he was named director of the Office for the Study of Automotive Transportation in the College of Engineering. In 1982 OSAT was transferred to the University of Michigan Transportation Research Institute. He was appointed research scientist at UMTRI in 1991. Over the course of time he became extremely knowledgeable about the inner workings of the auto industry, and he became the go-to person when the media needed information. He retired from teaching in 2000, and in 2003, he founded the Center for Automotive Research.

During the auto industry's collapse in late 2008 and early 2009, CAR and Dave Cole were thrust into the spotlight as Washington debated whether to bail out the industry. President Barack Obama's automotive task force asked Dave and other representatives from CAR and UMTRI to provide input on how to handle the crisis.

Dave argued vehemently that bankruptcy filings by GM and Chrysler would be disastrous for the U.S. economy. He called politicians "ignorant" for suggesting bankruptcy as a solution. He argued in favor of a U.S.-financed "bridge loan" that would allow the companies to restructure, saying at the time that bankruptcy for GM and Chrysler would "kill Michigan." His message was heard.

Dave is currently chairman of AutoHarvest, an organization created to facilitate the flow of intellectual property in and out of the auto industry and within the industry. He is also chairman of Building America's Tomorrow, an organization aimed at increasing the number of K-12 students considering careers related to manufacturing

Dave and I have maintained our friendship over the years. We have had friendly debates involving the athletic teams from our alma maters. Dave and the U of M usually won those involving the football teams; I and Michigan State usually won those involving the basketball teams.

#### FRED HARTLEY – ED COLE'S OIL INDUSTRY CONFIDANT

When planning for unleaded gasoline, Ed Cole secretly had an ally in the oil industry, Fred Hartley, President and CEO of the Union Oil Company of California. The two were very similar in nature; they were hard driving executives not afraid to take a risk. Both were members of an exclusive business executives

club that met in the mountains of California. In exchange for providing Mr. Cole with tactical information on the impacts to refiners of taking lead out of gasoline, Hartley got the jump on planning for unleaded gasoline.

In the early 1960s, I was looking through files in the F&L office, when I came across a paper that had been written years earlier by two young Union Oil engineers, Fred Hartley and Claude Brinegar (who became Secretary of Transportation in Gerald Ford's cabinet). It was about the promise of oil shale. Union Oil had large holdings in Colorado (see later vignette). Their optimism over oil shale never panned out.

In the 1960s, Harley became infamous over a statement he made after a Union Oil drilling platform near Santa Barbara blew out and left beaches soaked with crude oil and dead wildlife. Hartley said, "What's a few ducks?" He was vilified by the media.

In the late 1970s, after the introduction of the Olds diesel engine, I organized a series of upper level oil company meetings for Pete Estes, the GM President. At the meeting with Unocal, Estes started with his introductory comments. He was abruptly interrupted by a Hartley tirade about his station wagon with an Olds diesel engine. He said that the engine started too slowly, and that it endangered him if he was trying to escape from a mugger.

Estes, ever being the diplomat, tried to calm Hartley by offering to replace his vehicle, at no charge, with the newest model having a greatly improved cold starting system. Hartley refused, stating that, but for the starting system, he liked his vehicle and wanted it fixed. Estes agreed to do so. I worked with engineers at Olds and at Union Oil to facilitate fixing the engine. My guess is that the fix cost lots more than the replacement vehicle.

## **BOB STEMPEL – AN ENGINEER'S ENGINEER**

Bob was an outstanding engineer, manager, communicator, inspirational leader and friend.

He joined Oldsmobile in 1958. He had various design experiences, including heavy involvement with the 1966 Toronado, the first modern front-wheel drive vehicle.

I first met Bob in 1970 when he and I were members of the GM Exhaust Emissions Control System Subcommittee. It was obvious from these meetings that Bob was a man on the move. Shortly thereafter, he was appointed an assistant to GM

President Ed Cole. He became intimately involved with the development and production of the catalytic converter/unleaded gasoline system.

After unleaded gasoline became the fuel of choice, Ethyl Corporation, with their sales of tetraethyl lead about to disappear in the USA and Canada, planned to introduce an octane improving additive containing manganese. This was about the time GM and the auto industry were about to switch to monolithic catalytic converters. F&L ran a test and conclusively demonstrated that the manganese combustion products would plug the front face of the converter, preventing exhaust gases from passing through. We provided the plugged converter to Bob, and he showed it in Congressional testimony. The manganese additive was never approved for commercial use.



Bob became Chevrolet Director of Engineering, General Manager of the Pontiac Motor Division, Managing Director at Adam Opel AG, and in 1982, and Chevrolet General Manager. In 1984, he was promoted to VP and Group Executive in Charge of the Buick-Oldsmobile-Cadillac group. At that time, GM top management also appointed Lloyd Reuss to the

same position at the Chevrolet-Pontiac-GMC group. It was a “competition” to see who would succeed Roger Smith as Chairman and CEO.

Bob won the competition and in 1990 he was named Chairman and CEO. Reuss got second prize, being named President. Many of us on the technical side of GM were absolutely delighted, having engineers, and not bean counters, in charge of GM.

It turned out to be a mistake. Bob was caught in a whirlwind of the declining GM. He needed to cut costs and trim staff. He could not force himself to it to the depth that was needed, having too much empathy for the employees, salaried and non-salaried, who would be out on the street.

Bob’s anguish was apparent to me when he, Dennis Minano of Legal Staff and I flew to Washington, DC to attend an Auto/Oil meeting at the American Petroleum Institute. When I got on the company plane I saw that Bob looked horrible. I asked if he was OK, and he replied, yes, which was obviously not true. He got

through the meeting, we flew home, and shortly thereafter, he was admitted Beaumont hospital with extreme exhaustion.

In 1992, he was fired by the Board of Directors during a crisis after GM had lost \$7 billion the previous year. In retirement he joined Energy Conversion Devices, becoming its Chairman in 1995 and staying until 2007. ECD was involved with design of nickel-hydride batteries, candidates for future hybrid and electric vehicles.

During his tenure at ECD, I asked him to speak at a conference in San Antonio that I was helping to organize. He gladly accepted. The night before his talk, there was an outdoor reception on the River Walk. I asked Bob if he wanted me to introduce him to some of the people. He declined, and showed how effective and personable he was in circulating and introducing himself. He gave a great talk the next morning.

#### PETE ESTES – THE EVER SMILING GM EXECUTIVE

Pete succeeded Ed Cole as GM President. The first time I knew of him was at Dr. Withrow's retirement party in 1962. At the time, he was head of Pontiac. He came to the party and spoke about Dr. Withrow, telling why he thought very highly of him.

In 1977, when Estes was President, I arranged for him to give a luncheon talk to the annual meeting of the American Petroleum Institute. This was during the time when much scorn had been placed on GM for selling new Oldsmobile cars containing Chevrolet engines, and not telling either the buyers or the dealers.

The morning before the talk, Estes was scheduled to speak at a Chicago area Olds dealer meeting, obviously before a hostile crowd. He invited me to go along. I was amazed by how skillfully he defused the anger among the dealers. He went on to explain how GM would atone for it, even though the Chevrolet engine was essentially equivalent to the Olds engine.

At the API luncheon, Estes was introduced by Maurice Granville, the Texaco Chairman. Pete charmed the audience with his talk about GM's plans and how they might affect the oil industry.

As an aside, I could relate numerous stories about how backward Texaco was as one of the biggest oil companies in the world. For example, while Granville was Chairman, all capital expenditures over \$25,000 had to be approved by the Chairman, an awful policy for developing self-reliant executives.

Estes also had periodic meetings with top level oil company executives to keep them informed of GM's product plans and how they might require changes in oil's products. At one meeting, he had just returned from the Middle East on the then new SST. He was like a kid in the candy store telling about it and its exciting supersonic speed.

At all of the meetings we handed out a list of all participants by name and job title. At a meeting with Mobil, upon looking at the list, one of their executives started to laugh. His title had been misspelled; instead of saying, "Environmental Conservation Coordinator," it said "Environmental Conversation Coordinator." He said it was the best description of his job that he had ever seen.

### ALEX MAIR – A TRULY UNIQUE EXECUTIVE

Alex was one of the most intriguing and interesting executives that I ever knew. He was one of the many GMI grads who populated GM's upper management. He was reported to have a "photographic" memory, which served him well during his career.



After GMI, he cruised through Chevrolet winding up as Director of Engineering before going to Pontiac and GMC as General Manger. From there he became Group Executive of the Technical Staffs in

1978, with an office in the GMR Administration Building. There, with his eye for the opposite sex, he was often seen in the Personnel Department chatting with their young female staff.

Alex was an innately curious man with numerous interests, both within and out of GM. He presumably never wrote anything, and did all of his communicating verbally. Alex was an outspoken critic of the quality of GM's products, and often said that improved quality reduces cost and increases sales. Shortly after assuming his role at the Tech Center, he ordered a side by side teardown of a Honda and its counterpart GM vehicle.

The results were striking. For example, the Honda connecting rod had been cast to shape requiring no additional machining, and it weighed considerably less. This was almost universally true. GM's management viewed the exhibit, but was slow to change what GM had been doing, which led to the horrible downsized vehicles produced in the early 1980s in response to the Arab oil embargo. GM eventually got the message. One wonders how long it would have taken if Alex hadn't insisted on the teardown comparison.

There are many stories about Alex. Below are a few.

1. Alex was along on a trip to Grand Junction, Colorado to see shale oil production prototype facilities (see following vignette). On arriving at the hotel, we were greeted by the manager, who was a beautiful lady about 40 years old. I had arranged to take the group on a tour of Colorado National Monument, a short distance away. All but Alex went; he begged off saying he was tired and needed to get some rest.
2. The American Chemical Society asked if I would arrange for a GM executive to speak about GM's plans for alternative fuels at their meeting in Washington, DC. I asked Alex and he agreed. We went to Washington, and were eating lunch when he cautiously said to me, "Joe, don't turn around, but don't we know the lovely lady sitting behind you?" I slyly turned around, saw a beautiful girl, and told Alex I did not recognize her. Shortly after, I went to the men's room. Upon returning, Alex was at her table having a lively conversation.
3. Soon after GM introduced its ill-fated Olds diesel engine-powered vehicles, Alex arranged for his wife to drive one. On a very cold mid-January morning, he stormed into my office and told me, "Fix the problem!" His wife had started the car and driven about a mile away from home, when it stalled and would not restart. Diesel fuel is highly paraffinic, and at low temperatures wax crystals form and plug the fuel filter, leading to stalls and disgruntled customers. We rapidly mounted a program and eventually, with help from the oil industry, "solved" the problem.
4. Alex was fascinated by machinery. He bought a small, old hydroelectric power plant on a river in Western Michigan, and with his son proceeded to renovate it into a working operation. He enjoyed telling me, and others about it, and of course we listened.

5. Alex had a philosophy about the GM stock granted to him as bonuses and incentive payments. He sold it as soon as it was possible, following GM's rules. He likely made out better than those of us who held on to our stock.

## THE PICTURE NOT TAKEN

The Arab oil embargos in the 1970s turned the world upside down. Cheap Middle East oil had kept the worldwide economy going. Now it wasn't available. When it became available it was very costly.

Two groups that were shaken down to their roots were the auto and oil industries in the USA. General Motors was, to use Elvis' song title, "All Shook Up." GM hastily started programs to make smaller, lighter, less fuel consuming vehicles, and to seek non-petroleum resources for their future fuels. The latter activities came under F&L's bailiwick.

The oil industry in the US had major holdings in coal, and natural gas. They hastily set up programs to explore converting them into liquid fuels, which were the most desirable form for vehicular use. The western states, especially Colorado and Utah, had extensive oil shale resources, and they also could be converted to liquid fuels. In addition, the US Department of Energy marshalled considerable resources to find these "new" automotive fuels.

GM was most anxious to get its hands on these new fuels to see how they performed in our engines. In addition, GM's management needed to know more about how and where these fuels would be produced.

On one trip, a group went to Ashland Oil in West Virginia to learn about their programs for turning coal into liquid hydrocarbons. While there we drove through the local hills and saw the devastation caused by strip mining. On the other side of the coin, lunch in their executive dining room was one of the best I've ever had.

On another trip, we arranged for a group of executives to go to Grand Junction in northwest Colorado to see pilot plants producing shale oil (the liquid) from oil shale (the rock).

The first, a Union Oil facility, used a large above ground retort to heat the mined and crushed oil shale and remove the liquids released from the shale rock. The second, an Occidental Petroleum facility, used a large underground cavity to obtain the shale oil. This "in situ" process required removal of shale rock so that a large

chamber was created. Shale rock was added to the chamber, a fire was lit, and the extracted shale oil was collected.

Nick Gallopoulos and I orchestrated the whole migration. A company plane was reserved, lodging arrangements were made in Grand Junction, and a vehicle large enough to hold 10 people was rented. Therein lies the gist of the story.

As you might expect, our first choice for a vehicle was a GM van. None of the rental agencies in Grand Junction had one. After much fretting, a Ford van was reserved.

After flying to Grand Junction, and a sightseeing trip to the Colorado National Monument, we settled into the motel. Next morning after breakfast, we piled into the van and drove out to see both facilities. We had great briefings, learned a lot, and headed back to the Grand Junction airport. That is when the real fun started.

As I was driving back, I noticed that the engine's power was fading, not a good sign. Luckily this occurred near an exit of the interstate highway, close by a service station. I made the decision to get off and see if we could get the problem fixed.

The van glided down the ramp toward the service station. It came to a dead stop about 100-150 feet from the station. What do we do now? Can you imagine, nine GM executives (I was in the cab steering the van) pushing a stalled Ford van into the service station. What a picture that would make!

Once we got into the service station, most of the GM execs, many of whom were engineers, started fumbling with the engine to see what was wrong. I didn't want to get involved. Instead, I went to a phone booth (remember those days with no cell phones) and called the rental agency.

As soon as I described the situation, they told me they knew what the problem was. They had recently received a load of bad gasoline containing sediment, and many of their rental vehicles were having problems with plugged fuel filters. Somewhat ironic that a fuel-related issue caused our problem.

The agency sent a replacement vehicle, we got back to the airport and flew back to Detroit, a whole lot wiser about future auto fuels from oil shale, and with a good story to tell.

Now back to the title of this essay. Nick Gallopoulos and I have long since regretted that we did not have a camera to take pictures of the nine GM executives

pushing the stalled Ford van into the service station. We could have easily sold them to any of the major Detroit newspapers. But, the day after they had been published, we would be out on the street looking for new jobs.

#### 60 MINUTES – DAN RATHER

As mentioned earlier, the Arab oil embargoes placed GM in a difficult position. GM needed its vehicles to be able to operate on whatever future fuels might be available. With the US having large coal resources, methanol, or methyl alcohol, received a lot of attention since it could be made from coal (this was before concerns over carbon dioxide arose).

F&L looked into its use both as a gasoline blending agent, and as a near neat fuel. Methanol's had high octane quality which could be exploited. It also was very toxic and not easily evaporated, which made engines using it difficult to start.

Norm Brinkman was given the assignment of developing two engines using methanol, one fuel injected and one carbureted. He did an excellent job, and the fuel-injected engine was placed in a vehicle.

At the time, the CBS show 60 Minutes was preparing a segment looking at the US's response to the Arab oil embargo. They learned of GM's work with methanol, and asked our Public Relations people if they could come for an interview. This caused all sorts of consternation. 60 Minutes had a reputation for embarrassing some of their interviewees in the edited versions that they aired.

GM eventually decided to take a chance, and I was selected to work with the 60 Minutes crew, and Dan Rather. It turned out to be a fascinating experience.

Rather proved to be personable, inquisitive and interesting. During the lulls in the taping, he told me about his recent trip to the Middle East, his encounters with President Nixon, and about his outlook for the forthcoming 1976 Presidential election.

A large part of the interview took place in the car as I drove it on the Tech Center roads. Rather sat in the passenger seat. The camera woman lay across the floor in front of us with her head at Rather's feet and her feet tucked under my legs. She look up at me and filmed as Rather interviewed me. How she ever got down there still amazes me. A camera was also mounted on the hood so that I could be filmed from that perspective.

All-in-all Rather and crew were with me for several hours, and they must have taped at least an hour. Obviously, I was anxious to see the show. It was to air on Easter Sunday in 1976. My family and I were in Houston on a vacation trip, and they complained when I said we were going back to the motel to see 60 Minutes. The kids rather (no pun intended) do “fun” things than see their dad on TV. We watched. The 15 minute segment had about two minutes of my interview.

I must have done OK because there was no adverse blow back.

#### BRIAN TANIGUCHI – JAPANESE-AMERICAN ENGINEER

Along with methanol mentioned above, F&L in the 1970s looked at other potential gasoline blending agents for reducing emissions and extending supply. Methyl tertiary butyl ether (MTBE) was one. It had outstanding octane quality, low vapor pressure, and since it was made using methanol, it was another way of using coal as an auto fuel.

Brian was hired to investigate MTBE, and he did an outstanding job. Brian was from Fresno, CA. He had BS and MS degrees in ME from Stanford, and later an MBA from Berkeley.

His family had a fascinating history. His parents were born in the US but raised in Japan by relatives while their parents continued to work in the US. During WW II they were trapped in Japan and separated from their parents who were interned in US detention camps. Both in their teens, Brian’s mom worked in a munitions factory, and his dad was in the Japanese merchant marine and survived two ships that were sunk. After the war, they met during the return voyage to the USA to be reunited with their parents, and they married soon thereafter. Brian’s parents ran a plant nursery in Fresno.

Brian was a bachelor, and Sue and I often had him to our home for holiday dinners. He was charming and personable, and seemed to have everything going for him. However, after working in F&L for about four years, one day he came into my office and said, “Joe, I love working here and the people in F&L. But, I have to return to California. Many people in the Detroit area are still fighting WW II.” I could not argue with him.

Brian joined Chevron and spent the rest of his career in California and on assignments in the Netherlands, Singapore, and Australia. We last saw him in Singapore about 15 years ago on a combined business/vacation trip. We went to dinner with Brian and had a great time catching up with his life.

## SUCCESS AWAY FROM GMR

Brian Taniguchi was not the only person who left F&L and achieved success. Organizations need to be proud of these people who put their GMR learning to good use. Below are several examples.

Fred Parks - He was a PhD Mechanical Engineer from Missouri Rolla who joined F&L in the mid-1970s. He did single-cylinder engine research collaboratively with Russ Stebar. One of their main projects was to operate the engine with hydrogen added to the mixture for lean operation, and to determine its impacts.

Fred was smart, personable and had a quick wit. It was obvious that he had ambitions, and they exceeded what could soon happen at GMR. At an SAE meeting in St. Louis, while eating lunch, I saw Fred having lunch with Rod McConnell, who ran ARI, an auto fuels and lubes test laboratory in San Antonio. I said to myself, "Fred is gone," and he was.

Fred eventually succeeded Rod, then moved to EG&G's (the parent company) headquarters in Boston, and he wound up running it. After leaving EG&G he ran a biotech company in Minneapolis.

Frances Lockwood - Fran joined F&L in 1978 after receiving her PhD in Chemical Engineering from Penn State. She also was smart and personable. One day at lunch she told the story of how her husband cooked dinner the night before. "He took out a can of Spaghetti O's, put it in a sauce pan, got the hair dryer, turned it on and warmed the food, and put it on the table for us to eat."

After two years, Fran joined Martin Marietta in the Baltimore area. She told of buying an old estate in the country. After living there for a while, they were poking around the gate house, and discovered a body that had been there for a long time. What a welcoming event!

Fran moved on to Pennzoil where she became a VP, and then to Valvoline where she is now Senior VP for R&D.

Joel Kopinsky - Joel joined F&L after receiving his PhD in Chemical Engineering from the Univ. of Minnesota in 1985. He had immigrated to the USA from South Africa. He despised their apartheid system, and it was a major reason for his leaving.

Joel was brilliant; one of the smartest people I have ever met. He did some of the first modeling of how fuel hydrocarbons are absorbed on the charcoal in evaporative emission control canisters, leading to more efficient systems.

After three years he left and obtained an MBA from Columbia. He then co-founded a firm, The ITB Group, located in Southfield, MI. Two of their main consulting areas are automotive fuel systems, and vehicle emissions, subjects that he cut his eye teeth on while in F&L.

Warren Wiese – Warren was mentioned earlier. He left F&L to join the GMR Executive Department, and then transferred to Frigidaire Division in Dayton, eventually becoming Chief Engineer. His career path then took him to Harrison in New York State, where he became Director of Engineering.

#### MMT – THE REST OF THE STORY

It was earlier mentioned that Bob Stempel, in Congressional testimony, helped seal the fate of MMT. Its fate was conclusively decided based on results from a massive vehicle test program that was run at the request of EPA, after Ethyl Corp., the MMT producer and seller, had applied for a waiver to permit its use in gasoline.

EPA's statisticians originally asked for a fleet of several hundred cars to each accumulate 50,000 miles with several MMT concentrations, and a baseline fuel with no MMT. The auto and oil companies were to pay the enormous bill. They convinced EPA that 64 cars would be sufficient. It was still the largest program of its type to be run at that time.

I had to go to the Executive Committee of the Automobile Manufacturers Association (AMA) to get the funding approved. The Committee realized the drastic consequences to all future catalytic emission control systems if MMT was permitted. Funding was approved.

The test vehicles, representing a cross section of US manufacturer's products were sent to the Riverside Raceway in California, where mileage was to be rapidly accumulated. Periodic emission tests, representing the EPA approved certification schedule, were done at a near-by test laboratory. Everything appeared to be going well until the test lab brought the entire program to a halt. They had run out of funds, and were requesting new funding equivalent to the original amount.

With “my tail between my legs” I went back to the AMA for approval. After I was raked over the coals, especially by Herb Misch of Ford, it was approved. The program restarted and when it finished, the data overwhelmingly showed (in spite of Ethyl’s objections) that MMT was bad news, and EPA denied the waiver.

A CRC (Coordinating Research Council) committee oversaw the test program. One of its periodic meetings in August 1977 was held at the Riverside Raceway. Also there that day was the famous movie star, Paul Newman, who had an avid interest in auto racing.

That evening, the operators of Riverside, both former NFL football players, invited us to Les Richter’s house for dinner and cocktails. They regaled us with stories of their NFL days. One involved Jim Brown, the Cleveland Browns all-star running back, who is widely believed to be the best football player ever. Les said that the San Diego Charger’s coach, Sid Gilman, had a “reward” for the San Diego player who could put the opponent’s best player out of the game by whatever means possible. Les said they tried to kill Jim Brown, but never had success. He labeled Brown as the toughest player he ever played against. Both Jim Brown and Les Richter are in the NFL Hall of Fame.

The morning after the dinner, the CRC Committee was having lunch in a local restaurant. One of us noticed the newspaper headline, “Elvis Dead.” It was a memorable meeting in several ways.

## JOE BIDWELL

Joe was an engineer’s engineer. He had been head of GMR’s Engineering Mechanics Department, went to Engineering Staff, became an assistant to GM President Ed Cole, and then returned to GMR in the late 1970s as Executive Director. Joe once told me that John DeLorean was the best engineer he ever knew at GM.

Joe was very personable and friendly, and had a smile on his face most of the time. He could just as easily give you a compliment or a kick in the butt, and have you feel good about both. We were fortunate that F&L reported to him for many years.

Joe had the idea that GMR needed to tell the media about what we were doing to utilize alternative resources for our future fuels. Thus we had a major press event at GMR. A picture from that event is on the next page.

Joe' hobby was flying. He was very meticulous about the care and feeding of his plane. After he retired to Arizona, he would fly back to Michigan every summer for its annual checkup with the only mechanic he trusted. After the mechanic retired, Joe stopped flying.

## NILS MUENCH – THE ULTIMATE SAILOR



Nils joined GMR in 1963 as head of the Physics Department. He had served in the US Navy submarine corps during WWII. He had a PhD in Physics and a law degree. It seemed to me that this was a holding place for Nils, and that he would eventually become GMR VP. I was wrong, but Nils did rise to Executive Director.

Nils was a demanding manager, and was “feared” by many of his subordinates. When I became Executive Director, Nils and I worked well together, and my appreciation for him grew.

Nils was a world-class sailor, with many connections in the America’s Cup community. One was the famous skipper, Dennis Connor, who won four America’s Cup races. One year, Nils marshalled the resources at GMR to do modelling of Dennis’ boat to improve its performance.

Nils and his boat “Moonraker” were annual participants in the Port Huron to Mackinaw, and Chicago to Mackinaw races. He became friends with JP McCarthy, a famous Detroit radio personality, and he often was interviewed about the races.

After he retired from GM, Nils accepted a position as Director of Research for an MIT think tank called Leaders for Manufacturing. Concurrently, he started feeling poorly, and was eventually diagnosed with “non-Hodgkin’s” lymphoma, which the doctors told him was incurable. The doctors didn’t know Nils. He wouldn’t accept their bleak outlook. He extensively researched his cancer, and worked with a group of doctors to develop an experimental vaccine made from one of his numerous tumors. Miraculously, the vaccine worked, and Nils was declared “cancer-free.”

Nils eventually moved to Key West, Florida where he lived out his life enjoying board sailing and sailing.

## HOWARD KEHRL – FATHER OF THE INFAMOUS OLDS DIESEL

Mr. Kehrl started his GM career in 1948 as a CGIT at GMR. He had positions at Cadillac and Chevrolet before becoming Chief Engineer and then General Manager at Oldsmobile in 1972. In 1974 he became Group Executive in charge of the Technical Staffs, and in 1981 he became Vice Chairman of GM.

During the 1970s in an attempt to improve fuel economy, Mr. Kehrl directed Oldsmobile to develop a diesel engine using their gasoline V-8 engine as the starting point. The diesel engine gave considerably better fuel economy. In addition, at the time the project was started, diesel fuel in the USA was cheaper than gasoline. Both were expected to provide incentives for the public to purchase GM vehicles with diesel engines. However, the fuel price advantage soon disappeared as the government raised federal taxes on diesel fuel. F&L had warned Mr. Kehrl that this was about to happen.

The Olds diesel initially was a success, with over 300,000 sold in 1981. However, the success was short-lived due to declining gasoline prices, the limited availability of diesel fuel at neighborhood fuel stations, and a growing reputation for unreliability and anemic performance, which damaged US sales of diesel-engine powered light-duty vehicles for the next 30 years.

After Pete Estes retired, Mr. Kehrl assumed the mantle as the GM top-level executive dealing with the oil industry. I had the opportunity to work with him on various issues with the oil industry, and arranged high-level executive meetings at GMR for him and his counterparts at the major oil companies. He was very supportive.

He communicated mainly through what lovingly became known as “Kehrl notes,” written with a bold felt tip pen on yellow paper. I received many.

After he retired from GM, he sent me one final Kehrl note. On it he wrote, “You were one of my favorite people in GM.” I was delighted to receive it.

## TWO SUPER SUPERVISORS

F&L was extremely fortunate to have two outstanding supervisors, Bob Belling and Gus Mitsopoulos, for their technicians and mechanics. I was extremely pleased to work with both of them.

Bob and his people were responsible for maintaining the engine dynamometer facilities used for testing powertrain (engine, transmission, axle, transaxle, etc.)

lubricants and developing tests to measure their performance. Bob was the dynamometer wing “guru” and people from many other departments often sought his help and guidance.

Bob was a baseball addict. He and his sons played, and he managed teams. I loved chewing the fat with Bob discussing the Tigers and Bob’s baseball activities.

Gus always worked at our Milford Proving Ground facility. He was supervisor for many years until his retirement about five years ago. Equipped with only a high-school education, he became a guru about vehicle testing, especially vehicle emissions testing in which he got in on the ground floor. For many years he built and maintained the F&L emissions test facility as the “gold standard” for GM. He also developed evaporative emissions tests that became standards for the industry.

People who either worked at the MPG facility, or did project work there, all



became members of Gus’s “Greek Army.” A Greek flag proudly flew over building, which Gus periodically pushed to expand and modernize to keep up with the technology and the growing and diversified work load. He installed GM’s first hydrogen refueling facility, shown at right, to service GM’s fuel cell development fleet.

Gus was heavily involved with local politics in Genoa Township, MI. After his wife of many years passed, Gus remarried Li Lian, a Chinese emigrant who had been his real estate agent. They went to China for a traditional Chinese wedding. Gus was in his glory, and brought back a DVD of the wedding that many of us watched with great delight.

Li Lian and Gus have subsequently taken trips all over the world on cruise trips. She has opened up a new world to Gus, one he never imagined existed.

Bob Belling and Gus Mitsopoulos both received the GMR Award of Excellence, the highest honor that a non-professional employee at GMR could receive. For both, it was well deserved.

#### SHIRLEY SCHWARTZ – A CHEMIST WITH A BENT FOR MATH

Shirley was a delight. She had three degrees in Chemistry, and had taught after receiving her PhD. She joined F&L in the 1970s from Wyandotte Chemical,

where she worked on industrial lubricants. She joined our Engine Oil Group, and she had great success in many areas.

Shirley was a mom (three children), great athlete (table tennis, tennis, volleyball, cross country skiing – she competed on a state-wide and national level), linguist (French, German, Spanish, Japanese), writer and optimist. She learned Japanese in a class a GMR, and subsequently gave a paper in Japanese in Japan. She was known for her prodigious appetite, but it fit well with her hyper-activity.

Her first project involved mayonnaise! In the mid-1970s, F&L was exploring methanol as a fuel. Engine lubrication was very different than with gasoline. Unburned methanol in the crankcase was beat with the engine oil into a mayonnaise like emulsion that was not a good lubricant. Shirley discovered this phenomenon, and she explored ways to better lubricate the methanol engines, which never went into production.

In the early 1980s, Dave McLellen, Corvette Chief Engineer, asked F&L to work on a system that would tell the very fussy Corvette owners when to change the oil. This would be a great project on which to work because Dave agreed to supply the test cars, Corvettes.

Shirley and Don Smolenski were assigned to the project; Shirley to develop an algorithm using engine oil temperature and number of engine revolutions at each temperature, to determine when to change the oil, and Don to do the vehicle test work to validate the model. Their Engine Oil Change Indicator system was patented and used throughout the range of GM vehicles, including obviously Corvettes. It has been used for many years and has saved GM vehicle drivers money by avoiding unnecessary oil changes. It has also saved untold quarts of engine oil.

Shirley and Don received GM's highest technical honor, the Kettering Award, for their work. Shirley was also recognized in many other ways including; SAE Fellow, member of National Academy of Engineering, Michigan Woman's Hall of Fame.

While at GM, and after retiring, Shirley, a prolific writer, wrote a regular column titled *Love Letters to Lubrication Engineers* in the journal of the Society of Tribologists and Lubrication Engineers.

Sadly, even a vital person such as Shirley was not insulated from dementia. She spent her final years with it as it progressively worsened, and she passed in 2016.

## SIMON TUNG – TRIBOLOGY WIZZARD FROM TAIWAN

For many years, Simon was Shirley's office partner. He joined F&L in 1982 after receiving a PhD in Chemical Engineering from Rensselaer. Simon did pioneering work on automotive powertrain tribology and lubrication engineering. In 2003 GM R&D appointed him as a Technical Fellow to lead advanced energy efficient technology lubricant research programs.

Upon retiring from GM in 2008, Simon joined the Taiwan Industrial Technology Research Institute as General Director. He managed R&D in their Energy and Environmental Research Laboratories. He made significant contributions in green energy, energy storage systems, hydrogen fuel, biofuels, and greenhouse emission reduction. He said he enjoyed the work and travelling around the world, but the pay was awful compared with what he earned at GM.

Simon was a prolific author with 186 publications. He holds 25 patents involving tribological materials and innovative methods for reducing friction and wear in powertrain components and manufacturing process.

Simon is a Fellow of the SAE and the Society of Tribologists and Lubrication Engineers. His father was an engineering professor in Taiwan. In 1988, he and Simon each presented papers at the STLE annual meeting. I doubt if this father/son act had occurred before or since. Simon received the Gold Award from the Engineering Society of Detroit, and the SAE Edward N. Cole and Franz F. Pischinger Awards for automotive engineering innovation.

There is another side to Simon. Shortly after he was hired, he and his wife, Li-Hsia invited Sue and me and our three children to their apartment in Sterling Heights for a Chinese dinner. Li-Hsia's family had owned a Chinese restaurant in Fortaleza, Brazil. All family members could cook. Her two brothers prepared the meal that day, and we all agreed that it was one of the best, if not the best, Chinese meal we have ever eaten.

We got to know Simon's mother during her visits to the USA. Sue was a travel agent. On a trip to Taiwan, Simon's parents showed up at her hotel, and became her tour guides for the day. Neither spoke the other's language. Sue said they got along great and she had a marvelous tour. On Sue's last morning before leaving, Simon's mom showed up at the hotel with two scrolls (one for Sue and me and one for Shirley Schwartz and her husband) that she had painted of typical Chinese

outdoor art. On Sue's return home we opened them. They were beautiful, and ours hangs on our wall until this day. Ours at the top said, "Mr. and Mrs. Colucci," the other said, "Mr. and Mrs. Shirley Schwartz."

One day after I had retired, I asked Simon what Li-Hsia was doing. In his fractured English he replied, "Li-Hsia teaching A,B,Cs." I replied, "What?" He repeated, "Li-Hsia teaching A,B,Cs." He explained, Li-Hsia teaching Chinese to American Born Chinese children.

Simon's adventure has a new chapter. He has accepted a position to teach at Tsinghua University (the most noted one in China), in Beijing. He will be following his dream to teach tribology to young people.

## NEW CAR PREVIEWS

In the late 1970s prior to the public new model introductions, GM would put on a small new car preview at the Tech Center. One year, Norm Hunstad and I went together. We strolled around looking at the cars, and then came to a halt, as we stood before a new Buick model, show below, that neither of us could believe.



It had a striking resemblance to the Batmobile, popularized in a recent TV series and movies. Neither of us could believe that GM would produce such an unconventional (ugly) vehicle. They did. The public didn't like it, and it was soon out of Buick's product lineup. They should have paid attention to Norm's and

my opinions.

Norm was an assistant department head in F&L for many years. He was a stickler for proper English and he was an excellent editor. One of his favorite sayings was, "Eschew excess verbiage."

Norm was proud that he was part of an SAE committee that switched the date of the annual SAE Congress in Detroit from the middle of January to April. Many SAE members were thankful for the change, which avoided potentially horrible mid-winter weather.

## FRED POTTER – CLEAN FUELS ADVOCATE

Fred and I met in the mid-1980s when he became involved with a newsletter focused on the increasing interest in gasoline quality and the use of oxygenates. Fred had been raised in Upstate New York. He had a BS in economics and history from the State University at Oswego. After college he went to Washington, DC and interned in the DOE, before embarking on a career in clean fuels.

Fred asked me to speak about GM's thoughts on oxygenates at a conference he had organized. At that time, another organization, run by Roger Smith (not the GM one), also asked me to speak at their conference. Roger called, and my secretary in amazement said, "Roger Smith is on the phone." She assumed it was the GM Chairman. I turned this Roger down.

I agreed to speak at Fred's conference because he came across to me as forthright, personable and dedicated. That started a close relationship that endured until his untimely passing in 2012.

Fred's passion for environmental issues and cleaner fuels was the glue that held us together. He was smart, strategic and well-connected in Washington, DC and throughout the entire oil and oxygenate industries. I often referred to him as "a great schmoozer," since he had access to Senators, Representatives, EPA, company chairmen, etc.

I spoke at many of his conferences over the years. Fred grew his business rapidly, from newsletters to conferences to consulting, and it eventually was acquired by Hart Publications, where he continued to work.

Fred's contacts with the refinery technology industry proved invaluable during our crusade to lower gasoline sulfur content. He knew from talking with them that, contrary to what the oil industry was saying, costs would be considerably less. Fred and I organized a conference where this message came out loud and clear to the EPA, and low-sulfur gasoline became a reality.

After retiring, I was asked to consult for Hart. Fred and I organized numerous conferences in the USA and in Brussels. We successfully brought the message of clean fuels to Europe.

Two measures of Fred's contacts are below.

1. He was invited to former President Bush's Kennebunkport estate in Maine to play golf with the President.

2. He arranged a letter in 1995 from President Clinton congratulating me on my retirement from GM.

Fred had a difficult childhood; his father left his mom and several children when Fred was very young. He often looked at me as a father figure, and I was please to help him.

As a measure of the wide respect Fred held, several quotes upon his passing are given below.

"Fred Potter remained a stalwart of peace and sobriety. He engaged the parties on so many issues involving sensitive and conflicting points of view. I knew him for years, and yet, I did not know his politics. Or his critics. Or anyone who disliked or did not respect Fred. Remaining relevant and fully in the game of controversial issues while keeping the high regard of all parties is highly unusual. But then Fred was a highly unusual person." - William K. Reilly, EPA Administrator (1989-93)

"Those of us who worked with him as a professional colleague and, more importantly knew him as a friend, are blessed and very fortunate. And both those who knew him and many who never met him will continue to benefit tremendously by his work to build a better energy future for America." - Charles T. Drevna, President of the American Fuel & Petrochemical Manufacturers Association

"Fred Potter was one of the most beloved figures in an otherwise tough town. He did more professionally to bring the oil and auto industries into the 21st century of clean air, facilitating an era of cooperation unheard of for decades before he came on the scene. His contribution to the environment was thus singular - unmatched by any individual I know or, I am tempted to add, any organization. He was not known to the wider public, but for the world he so influenced he will never be replaced." - C. Boyden Gray, former White House counsel to President George Bush, and U.S. Ambassador to the European Union.

My friendship with Fred will long be remembered. I considered him as another son. Sue also got to know him very well and she also treasured him.

## BERT STRIEGLER – A TRUE FRIEND IN THE OIL INDUSTRY

Over the years I dealt with numerous people at all levels in the oil and additive industries. Most relationships were cordial, but some could be contentious.

Since GM and the oil industry were often on opposite sides of an issue, I needed to have some oil people that I felt I could trust to give me the truth. Bert Striegler was one.

I met Bert in the 1980s. We had similar jobs; he was responsible for fuels and lubricants for Conoco, and I for General Motors. Bert and his people would come to visit us in F&L. Bert and I developed a friendship that lasted for many years while we worked for our companies, and after both retired in the mid-1990s. There was much more to Bert than his technical skills, creativity, friendliness and marvelous personality. He was also a humanitarian.

This was made clear at a dinner that Sue and I had with him and several others while attending an SAE meeting in Toronto in the late 1980s. After eating, Bert started to tell us about an epiphany that he and his wife Bev had many years ago while living in Houston and watching the evening news on TV. The story told about the plight of Cambodian refugees during the turmoil in Southeast Asia and the difficulty placing them in homes in the Houston area. Bert said he looked at Bev, and she at him, and they said, “We can help.” They had been going through a difficult time in their lives with their only child, a daughter caught up in drugs. They needed a diversion and they found one.

Bert went on to describe what he and Bev had done to integrate many Cambodian refugees into the Houston community through his relentless dealings with numerous organizations, including local churches. He became an advocate for the refugees, and met with State Department officials in Washington, DC to encourage them to admit the refugees into the USA. He also went to the Far East, visited refugee camps and developed a relationship with the exiled King of Cambodia. As a result of his efforts, the Cambodian community in Houston grew and thrived. With Bert’s advice and counsel, many of the immigrants and their children gained education and college degrees. They looked at him as a “papa san” and he and Bev shared their family’s lives, including weddings, birthdays, etc. He and Bev were revered by the Cambodian Community.

The best part of this story is that when their daughter found out what her parents were doing, and the success that they were having, she cleaned up her life and rejoined the family.

Many times after hearing this heartfelt story, we tried to convince Bert that he should write a book about it. He steadfastly said no, not wanting to bring attention to himself. Inwardly, Bev and he had to be extremely proud of what they had

accomplished, knowing that it was greatly appreciated by the numerous Cambodians who benefitted from their help and went on to become successful in life and contribute to American society.

There are also other memories of Bert and Bev. Some are briefly described below.

API (American Petroleum Industry) Forum in Dearborn, MI, April 1990 – Bert and I were asked by the program chairman if we would present talks to the gathering of several hundred people from the auto and oil industries. Our topics were similar; Bert's title was, "What Can the Auto Industry Do in the 1990's – An Oil Man's Perspective," and mine was "What Can the Oil Industry Do in the 1990's – An Auto Man's Perspective." Needless to say, we both enjoyed it, as did the audience.

Visit with Bev and Bert in Brady, Texas, spring 1994 – After Bert retired, he and Bev moved back to Brady to Bev's family home, a marvelous wooden bungalow on the main street. They both couldn't wait to get out of the hustle and bustle of Houston, to a more sedate retirement lifestyle. I was attending a conference in San Antonio. After the meeting, Sue and I drove through the beautiful Hill Country to Brady. Bev and Bert were marvelous hosts, providing us with great food, conversation and a tour of Brady. Two memorable parts of the tour were; visiting the Brady museum where Bert was a trustee and a contributor, and driving by their infamous neighbor's (Billie Sol Estes) house which was next to theirs. Bert was very excited about showing me his shop in an out building. I was amazed. It was a full machine shop where Bert made miniature engines to use in powering model airplanes, vehicles, etc. His creativity and workmanship were unbelievably good. One final memory of this visit. Bev for lunch one day made her special recipe sausage soup. It was delicious. She gave Sue the recipe, and we've been eating it ever since.

Visit with Bev and Bert in Rochelle, Texas, spring 1996 - After another trip to San Antonio several years later, I went to visit Bev and Bert at their new ranch house in Rochelle. I think it had always been Bert's goal to have a ranch, and he was absolutely delighted. He had a small herd of cattle. One morning after breakfast he told me one of the cows was about to give birth, and he wanted to find her to see if she needed "help." We jumped into the tractor and drove around the ranch, and never found her. After I returned home, he called and told me that he had found the cow and the calf, and that he had named the calf, "Joe."

For years, we exchanged emails and Christmas messages with Bev and Bert. After Bev passed, this continued until about three years ago when we lost contact with

Bert. We recently learned that he was still alive, and that he was suffering with severe dementia. A sad ending for a very vital person.

Bert certainly deserves to be remembered. He left his mark, not only on automotive fuels and lubricants, but on Conoco, on Sue and me, and on society. He and Bev will always remain two of our favorite friends.

## ROBERT (BOB) FROSCHE – THE MAN FROM NASA

In many ways, as GMR VP, Bob was “a fish out of water.” He succeeded Paul Chenea in 1981 and served until 1992, when he retired to the Kennedy School of Government at Harvard. Bob was a theoretical physicist, and his intellectual capacity was large. In many ways that was a hindrance at GM, where most of the technical and engineering management were GMI grads, and Bob didn’t fit the mold.



Bob had an illustrious career before coming to GM, including serving as NASA Administrator under Jimmy Carter. Bob led the Space Shuttle Program.

I remember when the Challenger disaster occurred in 1986 – he was devastated having known some of the astronauts that perished.

Bob tried to make GMR a more “collegial” and less formal place to work. He had limited success. He thought GM management was screwed up (he may have been correct) but he could not change it.

Soon after he arrived at GMR, he initiated a series of meetings with the management of every GMR department. After the meeting with F&L, Bob concluded that since we were doing so much R&D closely allied to the interests of GM Powertrain and vehicle divisions, we did not belong at GMR. It became our goal to convince him that we did, and we did.

Bob’s greatest success at GMR was likely Project TRILBY, which brought the concept of systems engineering (used at NASA) into the design of vehicles. With the advent and proliferation of electronics and computers in automotive vehicles in the early 80s, vehicle design became more complicated. TRILBY was started to investigate how this could be done more efficiently.

When Project TRILBY was completed in 1988, the GM Systems Engineering Center was formed, and all future GM vehicles have since been designed using concepts developed in Project Trilby.

I'm almost certain that Bob was involved with my nomination to the NAE. I was extremely pleased that he showed up at the induction ceremony in Washington, DC in 2001.

## GINO SOVRAN – A SCHOLAR AND AN ATHLETE

My first assignment in 1959 during the CGIT program was in the Engineering Development Department, where they were working on automotive gas turbine engines. One of the engineers was Gino Sovran, who became a prominent thermodynamicist and aerodynamicist, and a life-long friend. Gino is the only person I know of who was a member of a sports hall of fame and a fellow of a technical society.

Gino was raised in Windsor, Canada before WWII. He was a scholar and an outstanding all-around athlete, especially in basketball and track. He likely would have been a member of the Canadian Olympic basketball team in 1940 and 1944, but WWII intervened.

Gino played at Assumption, now Windsor College from 1943 to 1945, where he was the team's leading scorer and captain, and then for University of Detroit in 1945-46,

In 1946, Gino joined the newly formed Toronto Huskies professional team that competed in the Basketball Association of America (which later evolved into the National Basketball Association), for their first and only season.

He was inducted into the University of Windsor Alumni Sports Hall of Fame (1997) and the Canadian Basketball Hall of Fame (2002).

Realizing that he could not earn a living playing basketball, Gino earned a PhD in ME from the University of Minnesota. He then joined GMR, where he had an illustrious career, resulting in his being named a Fellow of the Society of Automotive Engineers. Even after he retired, and well into his 80s, Gino was writing SAE technical papers.

Gino as a “young” man was 6’4” and about 225 pounds, all muscle and no fat. He could run like a deer. During the 1960s, GMR had both fast pitch and slow pitch softball teams. Gino was the fast pitch pitcher, and he was essentially unhittable.

Many GMR Departments had slow-pitch teams. During one game, I was the pitcher for the F&L team, and I faced Gino. He hit a “frozen rope” to left center field, and went flying around the bases. I wound up covering third base. On looking up for the throw, I saw 225 pounds of Gino flying at me, all of 115 pounds. I instantly made a decision to protect my body and my family – I backed off the base and let him slide in uncontested.

Gino and I both loved basketball. During the early 1980s we started to go to Piston games together. For about thirty years we shared partial season tickets, and got to know each-others families. We were fortunate to see the great Piston teams win three NBA Championships.

After retirement, Gino, Jim Gagliardi (a friend from Ford who had met Gino during grad school), and I met every other month for lunch at the Beverly Hills Grill. Here we were, three ancient Italians, sharing stories about our ancestors in Italy, our families, our careers and politics. Jim and I were liberal Democrats, Gino a conservative Republican, so these debates were lively.

Jim and Gino both died within the past several years. I miss them both.

#### JIM GAGLIARDI – A FRIEND FROM FORD

As mentioned in the previous story, Jim was a great friend. He spent his entire career at Ford, working his way up to heading Ford’s Powertrain Research operations. Jim developed a reputation for being smart, pugnacious, volatile and difficult to work for (more on this later). He also became Henry Ford’s trusted go to guy when questions regarding powertrain technology were at issue.

I first met him at a Coordinating Research Council (CRC) meeting in the late 1960s, when automakers were starting to push for unleaded gasoline. The discussion from the oil members focused on why their industry could not do it (Amoco was already selling one unleaded grade). I could see Jim fuming as they went on and on. Finally, he could not take it any longer, and he emphatically said something like, “I tired of listening to your bullxxxx excuses. Get you act together and get the xxxxing lead out of gasoline.” His language was colorful, to say the least.

In the 1970s, a young engineer, Wally Wade, came to GMR. He was a Vietnam War veteran. I met him during his CGIT assignment in F&L. Wally found a home in the Engineering Development Department. After several years, he left, and joined Ford working for Gagliardi. For many years after that, whenever I saw Jim he would tell me, “How could GMR be so xxxxing stupid as to let Wally Wade leave and join Ford?” I had no answer. Wally had a great career at Ford, became

an outstanding powertrain expert, and was elected to the National Academy of Engineering. Ford won that one.

Jim was a demanding boss. His reputation was widely known as evidenced by this story that he loved to tell. His daughter was on a college student tour of Europe. One evening, another girl on the tour started to talk about her dad's horrible, difficult boss at Ford Powertrain. Jim's daughter instantly piped up, "He is my dad!" Jim would laugh whenever he told the story.

Jim's hobby was bird watching, and he travelled the world doing so. On a trip to Kenya, he met a couple who lived on Deer Lake, where Sue and I lived. We knew them. Small world.

#### CHARLES A. (CHUCK) AMANN

Like Gino Sovran, I first met Chuck in 1959. Throughout his successful career at GMR, he was a leading force in General Motors' and the automotive industry's efforts to improve engine efficiency, reduce emissions, and evaluate numerous alternative power plants.

Chuck was involved in design, analysis, simulation, and experimental research on a broad range of engines and devices. These included automotive and aircraft gas turbine engines, reciprocating internal combustion engines (Otto- and diesel-cycle), Rankine- and Stirling-cycle engines, various supercharging techniques, and air-cushion vehicles. The main focus of his research was to understand how the combustion process and thermodynamic and fluid mechanic principles could be utilized to improve engine efficiency and reduce engine emissions.

Chuck and I were both department heads in the 1970s and 1980s, and we interacted a lot. We became good friends, and I developed a great appreciation for his honesty and frankness.

Throughout his career, and with his family, he stressed, "To your own self be true." He was not afraid to take contrarian positions in discussions, whether at work regarding technical issues or at home with his family discussing life.

When his son Rick was in kindergarten, he was asked what his dad did. He replied, "He walks and he talks and he thinks a lot."

When Chuck "retired" from GM in 1991, he formed a consulting company called KAB Engineering. The name stood for "keeping Amann busy," and it is a small exposition of Chuck's wry wit. In retirement he maintained his strong interest in engines, their emissions and fuel economy, automotive propulsion alternatives, alternative fuels, energy resources and their supporting infrastructures, and the threat of global warming. He continued to write, and provided numerous technical

papers and lectures for the SAE's Historical Committee. By the time of his last lecture, Chuck was confined to a wheelchair. But his determination was still strong. He was wheeled to the stage by his son Rick and gave another outstanding talk.

Among the many honors Chuck received during his career are election to the National Academy of Engineering and as a Fellow of the SAE.

In the middle 1980s, my wife and I bought a house on Deer Lake in Clarkston. We now had a home in Beverly Hills and a cottage on Big Lake to sell. I was in California on business when I got a call from my wife that the realtor had an offer from a young couple that wanted to purchase using a land contract. Sue was very leery because her father had once been burned by a land contract sale. I suggested that we ask the realtor to arrange a meeting.

At the meeting we were exchanging pleasantries, when the young lady asked me, "Who do you work for?" I replied GM, and she said, "My dad also works for GM. Where do you work?" I said at the Tech Center, and she said, "My dad also works at the Tech Center. Which staff?" I said the Research Labs, and she said, "My dad also works at Research. What do you do?" I replied that I was a department head, and she said her dad was also a department head. I then asked, "Who is your dad?" She replied, "Chuck Amann." I said the sale is done. I knew that no child of Chucks was going to default on a deal, and Barbara and Peter did not.

As a postscript, the cottage on Big Lake was sold to Paul Melcher, the GMR personnel manager. Now I ask, what are the odds of selling two properties to people where you work?

#### BOB EATON - GM'S GIFT TO CHRYSLER

In the 1970s, Bob and I were young engineers at the Tech Center, Bob at Engineering Staff, and me at GMR. He made his mark as Chief Engineer of the X-body cars, a series of downsized vehicles intended to improve quality, fuel economy and customer acceptance. In 1982 he became VP of Advanced Engineering, and in 1986, Group VP in charge of the Technical Staffs. In that capacity he made organizational changes that essentially blew up the management structure at GMR.

Bob learned that things moved slowly at GMR, inhibited largely by the five layers of management, from Assistant Department Head to VP. He abolished two layers, Assistant Department Head and Technical Director, leading to disgruntled employees and early retirements. In retrospect it was a good move, one that was sorely needed, and one that the GM Corporation should also have copied.

One day while eating with Bob, he said he had asked his teenage son at dinner the previous night, “Would you like to go skiing in the Alps next winter?” His son beamed and said yes. Bob replied, “Pack your bags, we’re leaving for Switzerland on Sunday.” He had been named President of GM of Europe, headquartered in Zurich.

While he was there, Chrysler started to look for a successor for its Chairman, Lee Iacocca (the name predestined him to be Chrysler’s Chairman – I Am Chairman Of Chrysler Corporation America). Iacocca managed in a dictatorial style. The Chrysler Board was looking for someone with a more inclusive management style. Bob was the surprise selection. A friend who was a high-level Chrysler executive later told me that Eaton was more inclusive, and was well liked.



Eaton was the Chairman and CEO of Chrysler from 1993 until 1998. He was heavily involved with the “merger” of Chrysler Corporation with Daimler-Benz, forming DaimlerChrysler. It was advertised as “A merger of equals,” which it never was. Eaton was eased out in 1998, and given an isolated office in the building at the Chrysler Tech Center that in 1999 became home to the Walter P. Chrysler Museum.

After Eaton had been ousted, a friend and I on behalf of a fund raising drive for the SAE Foundation’s A World in Motion Program, visited with Bob to ask for a donation. He agreed and made a very generous donation with one condition; “Don’t ever come back for more.” We didn’t.

While Eaton was Chrysler Chairman, I ran into him at their exhibit at the Detroit Auto Show. With Bob was Christopher Birroni-Bird, director of Chrysler’s fuel cell vehicle development program. They were anxious to tell me about it, with Bob emphasizing that Chrysler was making great progress even though they did not have a research organization. (The truth be told, most of the progress was made by Chrysler’s consultant, Arthur D. Little).

In an ironic move, and to complete the trade that sent Eaton to Chrysler, in 2000, Birroni-Bird joined GM R&D. He worked with Larry Burns to develop the Autonomy, Hy-wire and Sequel “skateboard” vehicle concepts.

## PACKAGE PASSES

Every organization has what I for years referred to as “administrivia.” This covers a multitude of sins, including at GMR, package passes.

They were to be used whenever an employee wanted to take either their own, or company property out of the building at the end of the working day. The signed pass was given to the security guard in the lobby, he/she inspected what you had to make sure it agreed with what was on the pass, and you happily left.

Over the years, I signed numerous passes. I often wondered what became of them. I still don’t know.

The most interesting one involved a diaper bag full of smelly diapers. YES! One F&Ler’s wife had recently given birth, and they spent an evening visiting another F&Ler with their young child, who was obviously not yet toilet trained. I was asked to sign the pass to allow the diaper bag to exit the building. This was in the early 1980s when Ronald Reagan was President. On a whim, I signed the pass with his name, expecting that there might be repercussions. I also wanted to test the system to see if anyone was paying attention.

Guess what? I never heard a peep.

## SELLING CARS TO EXXON

During the 1980s, shortly after the introduction of engines with new port-fuel injection (PFI) systems, a major field problem developed. Brand new cars were experiencing horrible driveability, and some were actually stalling after less than several thousand miles. What was causing this disaster that was likely to kill PFI systems, and potentially cause billions of dollars in warranty costs? Car companies were actually buying back the troubled vehicles.

On inspection of the failed injectors, small amounts of carbonaceous deposits were found on their tips. The deposits constricted fuel flow, depreciated driveability, fuel economy and performance, and increased hydrocarbon emissions. F&L and others in GM, other car companies, gasoline suppliers and gasoline additive supplier companies mounted an extensive effort to fix the problem.

Exxon especially was in panic mode. Their gasoline was implicated in many of the driving problems, and sales were dropping. They sent a delegation to meet with F&L. They needed to purchase a bunch of GM cars for a test program using fuels with improved detergent additives. During the meeting, I contacted Oldsmobile and helped arrange for the quick sale and delivery of the needed vehicles to Exxon. Thus, I added to my list of duties, “car salesman.”

The F&L team, led by Jack Benson, determined that the deposits formed in stop and go driving, where the engine was often shut down. In this condition, a small film of gasoline was left on the hot injector tip. It turned into the carbonaceous deposit that restricted fuel flow and caused the problem (see photos below).



Why hadn't the problem been uncovered in the millions of miles of road testing that had been done? The testing did not include the stop and go driving under which the deposits formed. It was mainly high speed, around the clock driving to put on lots of miles to test system durability. Future testing incorporated stop and go driving.

Shortly after F&L started working on the problem, Mobil asked to come and talk with us about their new gasoline detergent additive, which they had shown to prevent PFI deposits. They convinced us that it would work, and said they would soon start an ad campaign touting its merits.

We now needed all other gasoline suppliers to use additives like Mobil's. To pressure them to do so, I wrote a letter that Howard Kehrl, GM Vice Chairman sent to top execs throughout the oil industry. It said that GM would soon publish a list of recommended gasoline brands for use in its cars with PFI systems. To get on the list, they had to bring F&L data to show that their additive was effective.

The "blackmail" letter worked, and supplies of effective gasoline increased. PFI injectors were redesigned to make them less prone to plugging, and PFI systems were saved. After about a year, the "good gasoline" list was discontinued. It had done its job.

Gasoline for years has generally contained sufficient detergent additives to keep engines running well. As engine and fuel system design has become more sophisticated, the need for even better fuel additives has increased.

Auto makers, including GM, now have a "Top Tier" additive classification. Gasoline with this label, found on the pump and in Owner's Manuals, contain detergents providing "5 times the protection" of those that just meet EPA performance limits.

## THE RED CORVETTE CONVERTIBLE AND THE FRENCHMAN

In the late 1970s AMC was in trouble, and Renault came to the rescue. Renault sent a large team to Detroit to integrate the two companies, including a group of engineers led by Françoise Castaign, who later became VP of Chrysler's Powertrain Operations, and was a main cog in the founding of the Detroit Science Center and First Robotics.

Among the Renault people at AMC was Jean-Marie Reveille, who with his wife, Sylvie, and three young sons moved into a house across the street from us in Beverly Hills.

The two families became good friends, and the friendship still exists, long after they all returned to France.

Jean-Marie was a car nut. One June evening, I brought a new bright red Corvette convertible home and parked it in the driveway.



Jean-Marie saw it there, came over and walked, in an admiring fashion, around it several times. I went out and asked if he'd like to drive it. He said no. I asked again, and again he said no. Finally, I said, Jean-Marie I know you'd love to drive it. I handed him the keys, got in the passenger seat, and went for

the ride of a life-time.

He took the car on to 13 Mile Road and headed west like a bat out of hell, swerving back and forth across the road to check the handling. This went on for about 10 minutes. On returning, he got out of the car, handed me the keys, and said, "I have driven a Corvette. I can now go back to France." Which he and his family eventually did.

One evening Sue and I went with Sylvie and Jean-Marie to a small theater in Detroit to see the outstanding play, "Piaf," about the life of the legendary French chanteuse, Edith Piaf. We had seats in the front row. After the show, as people were filing out, I asked Jean-Marie what he thought of it. In a clear, loud French accented voice, he said, "Great xxxing show." Upon hearing this, the audience roared.

Several years later, Sue and I were on vacation in Europe, and met Jean-Marie and Sylvie in Strasbourg. We drove, in a Renault of course, around the Alsace-Lorraine countryside touring wineries, and medieval cities. Whenever we passed a

small German car, Jean-Marie would point at it and emphatically say, “Piece of xxxx!”

To prove that the apple does not fall far from the tree, the oldest son, Thierry, obtained a PhD in Mechanical Engineering from Cranfield Institute in England, and now works for Renault Motorsports. The second son Benjamin, also an engineer, works for the French Institute of Petroleum (*Institut Français du Pétrole, IFP*). The youngest son, Frederique, is a member of the French international gendarme, traveling around the world to protect the honor and glory of France.

Sadly, Sylvie and Jean-Marie divorced many years ago.

“ALL WORK AND NO PLAY MAKES JACK A DULL BOY”

Throughout my career, and after retiring, I believed that one should take all of their vacation time. It was a renewal process, and I encouraged F&Lers to make use of their vacation. The department and GMR/GM R&D would survive while they were gone.

In 1975, my family and I took a five week summer vacation traveling through National Parks west of the Mississippi. Before I left, Chuck Tuesday asked me to give him my itinerary so that he could contact me in case of an “emergency.” I refused to do so, telling him that if others in F&L could not handle it that I had failed. He backed off.

One of my favorite vacation activities was an annual ski trip to Colorado with several friends; Don Brownson, Alan Zengel, who was the manager of the Coordinating Research Council in Atlanta, and Ray Champion from Exxon in Houston. We’d meet in Denver, get a vehicle (often a courtesy one from GM), drive to Frisco, and spend the next four days enjoying the magnificent skiing and scenery. There were many excellent dinners, several with friends like Jim Holzwarth, GMR retired Technical Director, and Frank Walters, Chrysler retiree and former SAE President. Frank was in his 70s, and he was still one of the most graceful and best skiers on the slopes.

In the 1970s, Sue and I used our vacations to expose our three children to the wonders of the United States. Back then we usually had a large Chevrolet station wagon with plenty of room. They were gas guzzlers, and we averaged less than 10 miles per gallon. Over the course of these vacations, Sue and I managed to visit 49 of the 50 states; North Dakota still beckons us. In the 1980s, after all the kids were off to college, Sue and I started to travel internationally, and that continued for about 30 years. We’ve been to over 50 countries, and to all continents except Antarctica.

## SAE – ANOTHER PLAYER IN MY CAREER

As with many people in the auto industry, the SAE (Society of Automotive Engineers) played an important role in my career.

I first went to an SAE meeting in Detroit in 1962; a bunch of us from F&L used Bob Wilkens', an F&Ler and SAE member, name to register. Not really a "kosher" thing, but we were all young engineers. It was interesting as we walked through the exhibits to see people gape at all the people with the same name.

By the next year, I was an SAE member, as I continue to be in retirement. The F&L Department became one of the most significant organizations in writing and presenting SAE papers, many of which won best paper Awards. Many F&L members became SAE Fellows, more I believe than any other organization. I also got involved with SAE committees involving fuels and lubricants. Through them my contacts in the auto and oil industry greatly expanded.

At the SAE Congress banquet in the early 1980s, the speaker, Lee Iacocca smoked a horrible cigar that almost polluted the entire banquet hall. At the next meeting of the SAE Fuels Committee, Jack Benson and I proposed banning smoking at all of their paper sessions. It was approved; SAE picked up on it and later banned smoking at all of their meetings.

In the middle 1980s, I was visited by Bob Eaton and Max Rumbaugh, SAE's Executive VP. They thought the top SAE Fuels and Lubricants committee was floundering, and they wanted me to become its Chair. To their surprise, I turned them down. Even though several F&Lers had been involved with the committee for years, I had not been involved with it, and didn't feel it would be well received if I all of a sudden was placed into the top role. I think Bob and Max were surprised by my decision, but they respected it.

In the early 1990s, I served a three year term on SAE's Board of Directors. I felt it an honor to have been selected. But, at the first meeting I attended, which was somewhere out west at a resort, I was very disappointed by what was going on. Committee members were more concerned with socializing and setting up golf dates, than with the business of SAE. I complained to the Board Chair, Lamont Eltinge, and things started to change at the next meeting. Board meeting became much more business oriented, with some time for "fun."

In the late 1990s, I was asked to join the SAE Foundation Board of Trustees. This was a role I gladly accepted, and I was a trustee for about 15 years. It was a very worthwhile activity. The Foundation's main role was to do fund raising for all of SAE's educational activities, such as A World in Motion, the student design competitions, etc. The bulk of the Trustees were retired people with lots of

experience with SAE and management, and plenty of time to serve. Many of the Trustees, Bill Birge, John Leininen, Don Abelson, Dan Hancock, and Arne Siegel became long-term friends.

I quickly learned that fund raising was not easy. I proposed a fund raising drive with SAE Fellows. Even though we worked hard at it, the results were disappointing. At the time, AWIM was growing quickly, and additional funds were needed to support the growth. I proposed to the Trustees that we needed to go after bigger fish; the Corporations that SAE members worked for. Thus, a very successful fund raising activity started, and it still continues. I am proud to say that GM became the largest contributor, and that Rick Wagoner, the GM Chairman, became the spokesperson for the fund raising.

The Foundation, once a year, had a meeting at an interesting site somewhere in the USA or Canada, except for the meeting in Turin described in the vignette about Dan Hancock. Wives and significant others came to these meeting, some of which were held in Quebec, Canada, Sedona, Arizona, Beaver Creek, Colorado, West Yellowstone, Montana, and Kananaskis, Alberta. Mornings and early afternoons were devoted to business, and the rest of the day to fun.

One of the Trustees, Arne Siegel, deserves special recognition. Arne was an auto safety expert. He and his wife, Steffi, had a passion for charity. The SAE Foundation and the State of Montana benefitted greatly from their generosity. Their motto was, "Give a little, take a little, and we'll all be better for it."

Arne and Steffi established several SAE Awards, including the SAE Siegel Humanitarian Award, which the F&L Department received in 2017 for its numerous contributions to society on a worldwide basis. Sadly, on June 23, 2107, Arne while at his home in West Yellowstone, Montana, suffered a stroke and died. He certainly will be missed.

#### LINOS JACOVIDES – ELECTRICAL ENGINEER SUPREME

Linos was born and raised in Cyprus, an island in the Eastern Mediterranean which for years has been a problem between Greek and Turkish Cypriots, an unfriendly relationship that is still unresolved. He left Cyprus to go to the University of Glasgow for BS and MS degrees in EE, and then to Imperial College, London for a PhD.

Linos then joined GMR to work for the legendary Paul Agarwal in the Electrical Engineering Department. His innovations span more than 40 years and include the development of a 1,000-horsepower induction motor drive and a 4,000 horsepower generator for locomotives. He and his team also developed automotive electronic systems including exhaust oxygen sensors, micromechanical accelerometers, fuel

injectors, electric power steering and permanent magnet motors for propulsion. The design tools he developed during the 1970s are still in use for producing drives for today's electric/hybrid vehicles.

Linos was head of the GM R&D Electronics and Electrical Engineering Department, and then was transferred to Delphi. As Director of Delphi Research Labs, he helped establish their R&D organization. Unfortunately, during the economic crisis that resulted in Delphi's bankruptcy, he was asked in 2007 to close it down.

In "retirement" he served as a consultant (Paphos Consulting) and became a Professor of Electrical Engineering at Michigan State University. He is a member of the National Academy of Engineering, and has served on numerous National Research Council committees evaluating future automotive technologies. He is never afraid to take a contrarian position, especially on electric vehicles.

I knew Linos while we both were at GMR. Our friendship greatly expanded after he left Delphi, and he and his wife, Katy, and Sue and I have a great friendship which still continues. Discussions over numerous subjects, including politics and travel, have been fascinating and exciting.

#### ANDY BROWN - A REMARKABLE ENGINEER AND MANAGER

Shortly before he retired, Bob Frosch brought Andy to GMR as Director, Research Administration & Strategic Futures. I had first met Andy early in his career as an engineer at Manufacturing Staff. He had climbed the ladder there before coming to GMR.

Andy and I worked closely together and I gained great respect for his drive, focus, smarts, personality and commanding presence. He was the hardest working person I knew. We teamed together on a Ken Baker request to evaluate the strengths and weaknesses of GM R&D's activities, and recommend how to proceed for its future success. Many meetings were held with Directors and Department Heads; they were frustrating because all of them tried to protect what was theirs, and not look at the big picture. Andy and I could not get them to agree on much; it was like trying "to herd cats." Disappointingly, in spite of Andy's and my efforts, the project would do little to change the technological structure of GM R&D.

Throughout my career, I found the attitude described above to be prevalent throughout the GM organization. Managers at all levels strove to maintain what was within their moat, with little or no concern for the big picture.

Andy left GM R&D to become Director of Engineering at Delphi, and subsequently VP and Chief Technologist. He became Linos Jacovides boss at Delphi; Linos also had great respect for Andy. In 2002, Andy was elected to the

National Academy of Engineering, and in 2010, he became President of SAE International. He has served on numerous governmental and corporate committees, and taught at several universities. During my retirement, I served with Andy on several National Research Council Committees concerned with new technology for the USA's truck fleet.

Andy retired from Delphi two years ago, and was named to Delphi's Innovation Hall of Fame. In "retirement" he remains hyper involved.

### KOREAN MEMORIES - IT WAS A GAS

1987 was a very significant year for the Republic of South Korea. It was a Presidential election year and there was considerable turmoil, largely by student groups. Also, it was the year before South Korea was to host the Summer Olympics. They were looking at it as a coming out party to show the world that Korea was now a player on the global scene. The South Korean government was doing everything possible to maintain a good image and to attract worldwide participation and attendance at the games.

South Korea was planning to switch the entire country's gasoline supply from leaded to unleaded, to accommodate their forthcoming new vehicles with catalytic converter exhaust emission controls. Since I had been involved with this switch in the USA in the 1970's, the GM people in South Korea invited me to come and meet with government officials, and to present several lectures. (As an aside, North Korea is still one of the few countries using leaded gasoline.)

In the months leading up to the trip, there were media reports of violence in South Korea related to the forthcoming election. I communicated my concerns to Rick Colcombe, the head of the GM delegation working jointly with the Korean car company, Daewoo, to develop small cars. Rick repeatedly assured me that "all would be safe," and he encouraged me, and two others with different missions, to come, as we did.

We stayed at the Seoul Hilton Hotel (shown below), a very elegant place.



On Monday morning, Daewoo provided a car and driver to take me to their facility in Incheon, about 20 miles away. Upon leaving the Hilton, we encountered traffic like none I had ever experienced in the USA. Even though the driver was skillfully weaving through it,

I feared for my life. He finally noticed my apprehension and said to me in excellent English, “Don’t worry, I do this every day and I’ve not yet had an accident.” My concern was slightly relieved, we got to the plant safely, and he proved to be an excellent driver for the rest of my stay.

On Tuesday afternoon, after returning to the Hilton, the three of us staying there took a short walk. Little did we know that there were student demonstrations close by. To get them to disperse, the military used tear gas. The cloud blew to where we were walking, and we got our first exposure to it. Let me say now, my nose revolted and it was not pleasant.

One evening during the week I went to dinner with the brother-in-law of Changsoo Kim, an engineer in F&L. It was at the Lotte hotel, with an indoor water falls. I sampled the traditional Korean dish, “kimchi,” a volatile sort of cold slaw. I was warned to not eat much, and I thankfully didn’t.

The student demonstrations became more intense as the week went by. We had planned a “celebratory” dinner for Friday night at the Hilton’s restaurant. However, the Daewoo people decided to pass because they did not want to get involved, a smart move. That afternoon, after our final trip back from Incheon, there were intense demonstrations at the Hilton. Upon entering the hotel, we got our second, and more intense dose of tear gas.

There were now four of us, including Rick Colcombe, trapped in the hotel. It was a hot summer day, and the heat in the hotel was further intensified because the air conditioning had been turned off to prevent the tear gas from being inducted into the air supply. With nothing better to do, the four of us went to the top floor of the hotel, and looked out a panoramic window at the rioting occurring in the street below.

It was very ritualistic. There were about one hundred students on one side. They would break cobblestones into small pieces, and advance toward the military tossing stones at them. The military would retreat. However, after passing the “imaginary line in the sand,” the process reversed. The military with their protective shields and tear gas canons, would march toward the students, spraying away at them. Again, after the imaginary line was reached, the process reversed.

We watched the process repeat numerous times until we decided it was dinner time. We were the only people in the dining room, and it was hot. We ordered, took off our suit coats and ties, and toasted our visit. A commotion started in the lobby, just outside the restaurant. Our waiter informed us, “The students have taken over the lobby.” We cowered and prepared for the worst to happen, but nothing did. The students maintained control of the lobby for about an hour, sang patriotic songs, damaged nothing, and peacefully left.

The next morning, on our drive to the airport, we saw carcasses of burnt out vehicles, and other damage, so the riots were not entirely peaceful. Our flights home were uneventful, and our memories were everlasting.

Postscript - One of the presumed benefits of a trip to Korea was to get a tailor-made suit inexpensively at Itaewon, an “infamous” district of Seoul. The three of us took the opportunity to do so. After an initial fitting and deposit on the first visit, and a tryout of the almost finished suit on the second visit, my suit was to be delivered to me and paid for at the Hilton on Friday night.

When returning to my room after dinner that night, the message light was on. I called the desk and was told the suit delivery man had been sitting in the lobby for several hours (through the student demonstration). I asked for him to come to my room.

As a token of my appreciation for his dedication to the task, I offered him \$20. He very politely refused to accept it, saying it was his job to see that the suit was delivered.

Having grown up in New York City, that would never have happened, and that is likely the case in most of the United States. His actions greatly increased my respect for Koreans.

## THE MATING DANCE WITH CALIFORNIA OIL COMPANIES

In the late 1980s, the State of California, in order to improve its air quality, was proposing draconian measures, such as banning petroleum-derived fuels, including gasoline. If you were an oil company, whose biggest assets were petroleum and refineries, this was alarming.

One afternoon, I received a phone call from Gene Spitler, my counterpart at Chevron. Gene asked if GM would agree to work cooperatively with WSPA (Western States Petroleum Association) to develop a gasoline-fueled LAER (lowest achievable emissions rate) vehicle, which they were hoping would help avert the State's plan.

I said I would have to check with GM's top management. I sent a note to GM President Bob Stempel, and he agreed to let us get involved. Before returning Spitler's call, Nick Gallopoulos suggested that we incorporate changing gasoline properties into any plan developed. GM had some evidence that this would help reduce emissions.

I called Spitler and said GM would meet with WSPA, but that investigating the role of gasoline properties would be have to be involved. Gene's immediate response was, "Oh xxxx!"

WSPA eventually agreed, and a team from GM went to Unocal's Research Laboratories in Brea, California for the planning meeting. During the meeting, Ron Seitz of GM's Industry Government Relation's Staff checked in with his counterpart in Sacramento. He learned that WSPA was lobbying the State for tighter vehicle emission standards. When we learned of this double cross, we announced that the meeting was over and that GM would not work with WSPA. (Subsequently, Ford and Chrysler also turned them down.)

On returning to the Tech Center, I sent a note to the GM management. It said, "We went through the mating dance with WSPA, but were unable to consummate the relationship." The note was easily understood, and received praise from all but one GM Exec. Dr. Betsy Ancker-Johnson, VP, Environmental Activities, chastised me for my "sexist" comments.

## ROGER SMITH AND THE TRIP TO THE WHITE HOUSE

Roger Smith was a polarizing figure as Chairman of GM. He was almost dictatorial, and his vision of a "new GM" by buying EDS and Hughes might have

led to the later financial problems of GM. But, Smith played a major role in making my concept of reformulated gasoline a reality.

After the WSPA episode above, I wrote a paper stating that it would be in the best interests of the US oil industry to modify gasoline composition to produce fewer emissions. The paper went over like a lead balloon in the oil patch.

It was about this time that the papa Bush administration was considering modifications to the Clean Air Act. Jim Johnston, GM's Washington VP, obtained a copy of my paper. Jim was looking for a way to stick it to the oil industry and get them to play a role in reducing vehicle emissions. He took the paper to the Bush administration, and they latched on to it. Reformulated gasoline became a part of the Clean Air Act of 1990.

Jim also got the paper to Roger Smith. Roger used it as a wedge to get the oil industry committed to the Auto/Oil Air Quality Improvement Research Program, which became the largest vehicle emission test program ever carried out. It developed the data used by EPA and the California Air Resources Board to define their reformulated gasolines.

But, before the A/O Program could commence, it needed the support of the Bush Administration. A meeting was held at the White House with John Sununu, Bush's Chief of Staff. Also present were Roger Smith, me, the Amoco Chairman Richard Morrow and his research VP, Keith McHenry. Keith and I had been selected as co-chairmen of the A/O Program.

Sununu, being a PhD Nuclear Engineer from MIT, started by quizzing Keith and me to see if we knew anything. After he was satisfied that we did, he said, "What can we do for you?" Members of the Bush team applied pressure on the oil companies to follow through with reformulated gasoline, even though they claimed, as usual, that it was too costly to produce.

The White House meeting was held one day after GM's executive conference in Traverse City. I flew from there to Washington on the GM plane with Roger Smith. Contrary to my expectations, he was friendly and humorous, a side that he never showed to the outside world.

I had had a previous experience with Smith, and I'm glad that he didn't remember it. About five years earlier, I made a presentation to the GM Product Policy Group advocating that GM should extend the oil change interval for all of its products.

We had technical data to support doing so, and we would get a competitive jump on GM's competition.

Roger jumped all over me, and read me the riot act. I assume he didn't want to face backlash from GM's dealers as customers lessened their visits. Obviously, the proposal went down the drain. But since then, GM's oil change interval recommendations have greatly expanded, aided in large part by the Engine Oil Change Indicator, invented in the F&L Department, and discussed earlier.

### AIR QUALITY IMPROVEMENT RESEARCH PROGRAM (AQIRP)

As just mentioned, I was chosen to co-chair the program, initially with Keith McHenry, and after Keith's untimely passing, with Jack Wise, the Mobil R&D VP. AQIRP was set up such that the two industries, auto and oil, each had one vote in decision making. This was easy for the autos, with reps from each of the Big Three Companies. But, there were 14 oil companies (this was before the consolidation in the oil patch). It was sometimes difficult for them to come to consensus because most decisions involved future gasoline composition, and they would individually reflect on how their differing refining systems would be affected.

The program convincingly established the adverse effects of certain gasoline properties, including sulfur content and distillation properties, on vehicle emissions and air quality. All results were made public in numerous reports, the cover of one



is shown at right.

The oil companies were especially troubled because reducing gasoline sulfur content, according to their internal studies, would be very expensive.

Several incidents during the course of the program deserve mentioning.

At a meeting at API Headquarters in Washington, DC during the summer of 1989, Duane Smith from Arco, made an announcement. At this time, the oils were still skeptical that reformulated gasoline had a future. Duane said that Arco was having a press conference on the steps of the Capitol Building to announce that

they would soon market in California a series of clean, reformulated gasolines. Their internal program to evaluate the proposed gasoline was called, "Colucci

gas,” in deference what I had proposed in a paper earlier that year. Arco’s announcement took the wind out of the sails of oil industry resistance to clean gasoline. They showed that, at least for Arco, it could be a commercial venture. Also, Arco received tons of favorable publicity for being in the forefront on clean gasoline.

The oil company representatives often tried to lobby me to stop advocating for severe sulfur reduction. Four that leaned real hard on me because their giant oil companies “could not afford it,” especially since their refineries “were not profitable,” were Jack Wise of Mobil, Clarence Eids of Exxon, Jim Street of Shell, and Dixon Smith of Chevron. All represented giant integrated international companies that annually reported large profits. Refineries were “unprofitable” because company accountants shifted the profits to the “upstream” (crude oil production and sales) portion of their business. Unprofitable refineries fit nicely on their “crying towels” when regulations affecting refineries were proposed.

The oil industry was insisting that reducing gasoline sulfur from 300 ppm to 30 ppm, as was being proposed by EPA, would cost 10-15 cents per gallon. We were very skeptical. Along with Fred Potter, a clean fuels advocate at Hart Publications, a conference was organized to get the truth for EPA. Representatives from independent refinery technology companies, to a person, insisted that costs would be no more than several cents per gallon. EPA was convinced and implemented the 30 ppm sulfur standard.

#### THE UNOCAL RFG PATENT LAWSUIT

One of the basic premises of AQIRP was that all of the information obtained would become publicly available. This, however, did not preclude any of the participating companies from doing their own research and keeping it private.

One company, Unocal, did so. It undertook a research program to develop its own reformulated gasoline. In addition, Unocal applied for patents on the compositions of its gasoline. However, for several years this was largely unknown to the AQIRP participants and to CARB. This was disturbing to CARB because Unocal had participated in numerous discussions with CARB that led to the development of the rules for California’s Phase 2 RFG.

In 1996, the six major gasoline marketers in California (ARCO, Chevron, Exxon, Mobil, Shell, and Texaco) jointly sued to have the Unocal patents invalidated. Their rationale was that the patents were not based on new information and that the

patents mirrored the gasoline that GM had proposed in 1972 to improve vehicle cold starting.

A jury trial was held in Los Angeles in the summer of 1997. I had been retained as an expert witness by a patent law firm representing the oil companies. I essentially spent the entire summer travelling to and from Los Angeles, preparing for my testimony and then testifying.

During the first day of the trial, the judge made a startling decision; she reversed the plaintiff and the defendant. Instead of the oil companies suing to have the patents invalidated, she said the trial would have Unocal suing for patent infringement. Much of the California Phase 2 gasoline made until then did have properties similar to those in the Unocal patents.

The jury, mainly average people from the community who could not understand the technical arguments presented by the oil industry attorneys and witnesses, eventually found in favor of Unocal and awarded damages of 5.7 cents per gallon of infringing gasoline. This resulted in billions of dollars of fees for Unocal. The oil companies appealed the decision without success. Their attempt to get the case heard by the United States Supreme Court failed.

Some oil companies paid significant fees to Unocal, while others learned to blend gasoline to get around the patents, albeit at higher cost.

The irony is that Unocal was no longer a gasoline producer. They had sold all of their refineries to Chevron, one of the companies bringing the initial suit. Chevron eventually got rights to the patents, and made them publicly available, no longer collecting infringement fees.

After the trial ended, I concluded that the oil industry lost on the first day of the trial. Unocal's three attorneys walked in, followed by an army of attorneys from each of the oil companies involved and from the firms representing them. This was David and Goliath in the eyes of the impressionable jury. With little old Unocal being David, and the army of lawyers from the oil industry being Goliath. David won again.

## GM'S GLOBAL WARMING TASK FORCE

Starting in the early 1980s, the GMR Physics Department began following the science of global warming, because if it was occurring, there would be serious consequences for GM and the auto industry. As the issue heated up during the

1980s, GM decided to take a deeper dive into what it could mean for GM's future products and the technology they might use.

In 1989, Gary Dickenson, VP of the Technical Staffs, appointed me to lead a GM task force to investigate the technology that might be needed. This was at the same time as when I was working to set up the Auto/Oil Program, and I was both mentally and physically stressed out.

The task force also had a team of consultants from Arthur D. Little to help guide the process. After, to me, a very difficult process, a report was written. It was disappointing to me because of the vagueness of its findings and recommendations.

At the time, Dr. Betsy-Ancker Johnson, VP of Environmental Activities Staff, decided that GM needed to sponsor a conference to let GM's executives and external invitees know that GM was on top of the situation. I was asked to speak about the results from the Task Force. I described technologies that might be needed, but were well beyond GM's normal thinking time frame. The recommendations were not taken seriously and disappointingly, soon faded away.

Since then, GM has mostly turned a blind eye toward global warming and climate change. They joined with the naysayers decrying the overwhelming support from the scientific community that climate change is real. However, to meet the ever tightening CAFE standards, technologies mentioned at the 1989 conference began working their way into GM's products and plans.

GM has recently become more open minded about climate change.

#### DAN HANCOCK – POWERTRAIN EXPERT/MANAGER

In 1992, I was in London at a FISITA (international automotive engineering association) meeting to give a paper about the Auto/Oil Program. Someone came up behind me, tapped me on the shoulder, and introduced himself. It was Dan Hancock a young engineer from GM Powertrain. His boss, Jack Schmidt, had sent him. That was the start of a friendship that still endures.

Dan had an illustrious career rising through numerous positions to become VP of Engineering at GM Powertrain.



I got to know him best when we served for many years on the SAE Foundation Board of Trustees. For most of the time, Dan was Chairman. He was the most effective person that I have ever seen in running a meeting, getting all of the opinions out on the table and driving to a consensus to which everyone could agree.

The Foundation Board every year held one of its quarterly meetings at an interesting location, to which wives, husbands and significant others were invited. The Board met each day through lunch, and then joined the rest of the attendees for afternoon and evening “tourist” activities. Two memorable ones are described below.

Beaver Creek, Colorado – The meeting was held in the summer in a hotel near the ski slopes. For dinner one night, Dan invited all to his home on the slopes nearby. Dan and his charming wife, Vicky, shared the home with Dan’s GMI classmate, Lou Hughes, who also had a very successful GM career.

The setting was magnificent, as well as the home, and all enjoyed the views, food and conversation.

Turin (Torino) Italy – This summer meeting was held at a small hotel in the Tuscan Hills near Turin. It was memorable for many reasons.

In 2000, GM had bought a 20% interest in Fiat. Dan was appointed head of the joint GM-Fiat program to develop more efficient small engines. At that time, working for Dan was Bruce Peters, whom I had hired into F&L many years earlier to do research on improving engine combustion.

Sue and I took the train from Florence to Asti, a famous wine city. On getting off the train, we noticed a couple walking toward us. Much to our surprise, it was Bruce and his wife Maggie, whom Dan had asked to pick us up. On the way to the hotel in La Morra, we stopped for a delightful lunch.

After arriving at the hotel, I went to the pool. While there, Dan showed up, took one look at the ancient Italian in the baggy swimsuit, and nicknamed me “the Godfather.”

One afternoon, we drove through the beautiful Piedmont hills to a famous winery, where we had a delightful tour and sampled the wines. One evening, we went to the Museo Nazionale dell'Automobile in Torino, and had an outstanding reception wandering through the displays, ending up with dinner and a concert of opera songs performed by the husband of one of the Board members. Sue later told me that she thought the museum was great – an extreme compliment coming from her.

After the meeting ended, Sue and I spent a couple of days in Turin acting as tourists. Even in the summer, from Turin, we could see the snow-capped Alps in the distance. One evening, Maggie and Bruce invited us to their apartment and then to dinner. Bruce was excited to show me an old East German made Trabant car that he had purchased, and hoped to bring back to the USA after the ban on importing vehicles without emission control and safety features expired.



He now has it in his retirement home in Washington State. (In 2016, Dan visited Maggie and Bruce, and went for a ride in the mint condition, “blue smoke” spewing Trabant.)

Dinner at the local restaurant was an “Italian feast,” with numerous courses and wines. It was the end of a memorable SAE Foundation Board meeting.

### PAT SCHULTZ – CAN I GET MARRIED?

In the late 1970s, a recent college graduate was hired to work as a technician in F&L. She worked with Bruce Peters. The best way to describe her was perky. In 2008, when Pat celebrated 30 years at GM, I wrote this poem for her.

“A Tale of Patricia Tylecki Schultz”

It was thirty years ago, a date you’ll want to know,  
That a charming young girl, came in to see Joe.

With a perky presence, and sweetly smiling,  
Pat’s resume to Joe, was totally beguiling.

Pat wanted a career change, working at EDA was strange.  
To Joe she pleaded, hoping she would be needed.

Joe swallowed the bait, hook, line and sinker.  
For he was then known, as the great Italian thinker.

The next thing she knew, Patricia Tylecki had been hired,  
For you surely must know, that Joe was inspired.

The rest is now history, except for this mystery,  
Why, with not much progress to show, after two weeks, Pat was back to see Joe.

With a twinkle in her eye, she spoke of a plan,  
Two weeks off to be married, Jim Schultz was the man.

Magnanimous Joe, said “give it a go.”  
Pat smiled and ran out, and gave a happy shout.

“Married to GM, married to Jim,  
Oh what a fix, I’ve got myself in!”

Thirty years of love, that’s Pat and Jim,  
Living happily after, enjoying adventures every day.

Pat and Jim, and Sue and I have remained good friends to this day. We started a tradition many years ago, to celebrate Jim’s and Joe’s August birthdays with a dinner in a nice restaurant. There have been many memorable meals.

#### LEONARD EVANS – TRAFFIC SAFETY GURU

Leonard is one of the world’s top traffic safety experts. He came to GMR in 1967 with a DPhil in Physics from Oxford. He was from Belfast, Northern Ireland. I always found it fascinating to speak with him.

He made his mark studying the newly founded science of traffic flow in the GMR Theoretical Physics Department with Dr. Robert Herman, its founder. From there he expanded his vision to traffic safety. His two books, “Traffic Safety and The Driver,” (1991) and “Traffic Safety,” (2004) have become classics.

One of Leonard’s premises, which he has well documented, is that the greater number of traffic fatalities in the USA per mile driven than in most of the rest of the world is due to our overconcentration on use of technologies like air bags, and our lack of emphasis on policies that address the behavior of drivers (voters).

Much to the dismay of GM and the National Traffic Highway Safety Administration, he has shown that the most effective traffic safety device is the lap/shoulder belt system, and that air bags provide only marginal benefits. He was one of the first to recognize that air bag inflators could do serious harm to undersized passengers when activated. This led to redesigned systems that take into effect the mass of the person “being saved.”

Leonard has published and lectured extensively. His accomplishments have been recognized with membership in the National Academy of Engineering, and election as a Fellow of SAE and other technical societies. Since “retiring” in 2000, he has pursued his professional activities as a one-man organization, Science Serving Society.

There is another side to Leonard, he is an “adventurer.” He has been to the North Pole, and he has seen the Titanic from a submersible.

As they often say, behind every great man is an equally great woman. Leonard’s wife Wendy is a petite, charming lady who just happens to be a fantastic art historian and lecturer. Sue and I have heard her bring art alive at many lectures.

#### **KEN BAKER – GM R&D “INSIDER” VP**

After Bob Frosch retired, Ken a “car guy,” was brought in to get GMR more tied in with the operating divisions, working together on short-term and not long-term activities. There was a significant refocus from basic technical research to strategic directions for the auto industry; aligning the basic and applied research to significant competitive opportunities. Ken was unlike previous GMR VPs. He did not have a PhD, and he didn’t have a research background. But, he knew better than they how to navigate the GM system, and relations with the operating divisions became more focused.

Ken was also in charge of GM’s electric vehicle program. In response to California’s forthcoming requirement for Zero Emission Vehicles, GM decided to produce a small, two-seat electric vehicle, and sell it as a GM vehicle, and not with a division brand name.

Ken’s team did an excellent job putting together the EV1, shown schematically below.



But its cost in limited production was much too high for even GM to absorb. In 2003, the program was officially shut down. Several thousand vehicles had been produced for lease, and most were “repurchased” and crushed at the end of the program, a sad ending.

In the late 1990s, after I had retired, Jack Wise, now retired as Mobil Oil VP of R&D, asked me if I could arrange for a GM speaker to come to the Mobil annual executive conference, being held in Puerto Rico, and speak about electric vehicles. I contacted Ken and he agreed to speak and to bring an EV1 with him. The Mobil Chairman, Lou Noto, was a “car guy” and very much wanted to drive an EV, thinking that it performed like a golf cart. Mobil also invited my wife and me to attend, and we spent a lovely week in Puerto Rico.

On the morning of the test drive, Ken drove the EV1 to the front of the hotel where Noto was waiting. Noto got in to drive it, accompanied by Ken. They were gone for about 10 minutes. Upon returning, Noto was extolling how good the car was; great performance, handling, acceleration, etc., and quiet. The EV1 had won him over.

However, the threat of electric vehicles to gasoline use, a primary concern for Mobil and the rest of the oil industry, has yet to materialize, even though it is getting closer with the significant improvements made in electric vehicles in recent years.

Ken had a penchant for entrepreneurial initiatives. Upon leaving GM &D, he was selected to lead a venture intended to broaden GM's revenue base and serve as a vehicle to accelerate technology commercialization.

Ken was replaced as GM R&D VP by Larry Burns, who had started his GM career at GMR in the 1970s. Ken had a series of jobs after leaving GM, and was a success at all.

## ANDY CARD – THE MAN WHO WHISPERED IN GEORGE W’S EAR

Andy is probably best known as the person who informed President Bush of the terrorist attack on 9/11/2001 by whispering in his ear, "A second plane has hit the second tower. America is under attack." Bush was at an elementary school in Florida speaking with the students. At the time Andy was Bush’s Chief of Staff.

I first met Andy in the 1990s when he was President and CEO of the American Automobile Manufacturers Association. He had a BS in engineering, had served in the House of Representatives, and also served as Secretary of Transportation for papa Bush. While he was at the AAMA, I arranged for him to give a co-keynote address at one of Fred Potter’s conferences in Washington, DC. He spoke very convincingly about the need for cleaner fuels. His co-keynoter, Red Caveney, President of the American Petroleum Institute, was less convincing in defending the oil industry’s hard line stance against cleaner fuels.

After the AAMA was dissolved in 1998, Andy became GM’s VP of Government Relations. In this capacity he again helped as GM and the auto industry continued their battles with the oil industry to obtain better fuels. Even though I was retired at the time, I stayed involved as a consultant to GM R&D.

Andy was friendly and diplomatic, but he could be hard as nails when needed. Dick Klimisch, who worked directly for Andy at the AAMA, has said that Andy was his favorite boss.

## “ARE YOU COLUCCI?” - OR THE WRONG PURPLE SUITCASE

The roar echoed across the cavernous arrival hall at Tokyo’s Narita Airport. It was loud, clear and obviously from the lungs of a huge man. It had me quaking in my tennis shoes. “Are you Colucci?” kept ringing in my ears.

How did I get into such a predicament? The story starts several months earlier at the JC Penney store at the Oakland Mall in Pontiac, Michigan. My wife, Sue, always entranced by a sale, was there to look at and purchase a hard-sided suitcase with wheels. Since we were frequent global travelers, she thought it would be good to have. What made it even better was its color, a vibrant shade of purple halfway between lilac and a true purple. She figured no one else would have such a suitcase, and it would be easy to spot at baggage claim.

In 1992, I was invited by the Shell Oil Company affiliate in Japan to give a lecture at a conference they were holding in Tokyo in the spring of the following year. I readily accepted since there would be many of my Japanese and international

friends at the conference, and the topic was near and dear to my heart, clean gasoline for reduced vehicle emissions.

While discussing what suitcase to take, my wife said she had the “perfect” one. Obviously, it was the purple suitcase, and I readily accepted her suggestion.

The 14 hour non-stop flight from Detroit to Tokyo was tiring to say the least, especially since I have a difficult time sleeping on planes. The plane never seemed to get there, and finally it did. Warily, I dragged myself off and to the baggage claim area. After a few minutes, the purple suitcase arrived and I felt relieved. I took it off the carousel, passed through customs, and decided to take the bus to my hotel (I had heard that the taxi fare would be steep).

After buying my ticket, I got in the bus line. Again the wait seemed like an eternity, but after about 20 minutes the bus arrived. I grabbed the suitcase handle, and looked down at the name tag. I was astonished to learn that there was more than one of these purple suitcases on the plane from Detroit. The tag had another person’s name on it!

I panicked. What do I do now? Visions of chaos danced through my head. What do I do for clothes? What do I do with the wrong suitcase?

I walked back to the arrival hall, found an attendant, and presented her with my dilemma. She pointed me across the hall to the lost baggage office. I could see four people standing there, with a purple suitcase in front of them. The large man in front, seeing me walking toward them, was repeatedly bellowing, “Are you Colucci?”

Meekly, I walked up to them and said, “I am Colucci, and I think I have your suitcase.” The reply, in a surly tone was, “And we have yours!” Under his breathe I could hear him add, “You idiot!”

After apologies were made and accepted, the suitcases were switched, and the five of us made our way to the bus for the ride to our Tokyo hotels. While on the bus we chatted, and a remarkable sequence of things unfolded.

- The couple, whose suitcase I had snatched, sat directly in front of me on the flight.
- The man who bellowed at me worked for General Motors at the Technical Center in Warren, Michigan, as I did.

- The man and his wife lived in Clarkston, Michigan. Sue and I also lived in Clarkston.
- Our wives had bought the suitcases on sale at the same JC Penney's store.

After getting to our hotels, we never saw each other again. The conference, and my presentation went well, and I did see lots of friends from Japan, Germany and the USA. At one of the meals we were served Kobe steak, which at that time in Tokyo, probably cost about \$100 per person, enough for five meals in the USA.

All in all, it was a memorable trip. The purple suitcase was hardly used again. And, I learned an important lesson. CHECK THE BAGGAGE TAGS!

### UNFORGETTABLE HOTEL MEMORIES

All of us have stayed in numerous hotels and motels. Some leave indelible memories. Here are two of mine.

#### Traymore Hotel, Atlantic City, June 1971

With the last several years bringing so much attention to Donald Trump, it seems appropriate to reflect on a hotel stay in Atlantic City, New Jersey, where he left an indelible imprint.

After the EPA was established in 1970, one of its first acts was to propose national air quality standards for numerous pollutants, including several directly associated with automotive emissions. General Motors had an interest in seeing that they were soundly established, and John Heuss, George Nebel and I wrote a paper reviewing what EPA had done. The paper was to be presented at the Air Pollution Control Association (APCA) annual meeting in Atlantic City, New Jersey in mid-June 1971.

Having heard lots about Atlantic City, I was looking forward to my first visit. It was a sweltering Sunday evening when I took a cab to the Traymore Hotel. On the way I asked the cab driver if it was a good hotel. He instantly replied, "I wouldn't say so." When I asked why, he said, "They're going to knock it down in the near future."

On entering the steaming hotel lobby I found a chaotic scene. Numerous people were milling around the front desk trying to check in. I impatiently stood in line, checked in, and waited as the desk clerk shouted, "Bellman."

A disheveled half-human arrived in a soiled bellman's suit that hadn't been cleaned in ages. He grabbed my bag and grumpily said, "Follow me!" On arriving at my non-air conditioned room, he opened the door, turned on the light, (a single light bulb hanging down from the ceiling), threw my suitcase on the bed, walked over to the window and opened it, came back and stuck his hand out for a tip. I begrudgingly obliged, glad to see him go.

The room was sweltering. I went into the john to wash up and brush my teeth, and noticed what I thought was green wallpaper. Turns out that the walls were covered with mold caused by water leaking down from the bathroom above.

Needless to say, I did not get a good night's sleep. Next morning I checked out and found a seedy motel down the street that was light years better than the Traymore. I stayed there until the end of the convention.

I have often wondered why the APCA selected the Traymore. All I can figure is that they were given a very favorable rent on the meeting rooms, which also were seedy and not air conditioned.

I have never been back to Atlantic City, even though it had a renaissance in the 1980s due to renewed interest in gambling and newly built hotel-casinos, some under the auspices of The Donald.



The Traymore was demolished in April 1972. Fittingly, it was replaced by a parking lot. At that time, it was the largest controlled implosion of a building in the United States. A picture is shown at left.

### Copacabana Beach Hotel, Rio de Janeiro, Brazil, January 1980

With 2016 being the year of the Summer Olympics in Brazil, it seems appropriate to look back at my first trip there, and some surprising things that happened.

In 1979, General Motors affiliate, GM do Brasil (GMB), in Sao Paulo, Brazil, invited two of us to spend a week in Brazil, tutoring their engineers on developing

engines to run on alcohol. In response to the Arab oil embargos of the 1970s, and to prepare GM for a possible alternative fuel, Norm Brinkman, an F&L engineer, had developed two vehicles to run on methanol, which could be made from the US's ample supplies of coal. GMB wanted to do similarly, but using ethanol made from sugar cane, which was readily available in Brazil.

One night, Larry Beaham, the GMB Director of Engineering, took Norm and me to dinner at a Japanese restaurant. The meal was excellent. Larry told us about the major Japanese presence in Brazil. They came a century ago to help develop the agricultural industry, which likely led to enhanced sugar cane production and then to ethanol. After dinner, Larry took us to his penthouse apartment, and the views of Sao Paulo from there were spectacular.

After a week of discussions in Sao Paulo, we spent the weekend in Rio, before flying home. We stayed at a nice hotel on Copacabana Beach.

GMB made arrangements for us to see an Oba-Oba show at a local nightclub. This was a classic form of Brazilian entertainment, with lots of beautiful, long-legged, scantily clad ladies doing traditional Brazilian dances. It sounded fascinating. I asked what time it started, and was told two o'clock. I said two in the afternoon? The response was, no, two am Sunday morning. The first surprise. The Brazilians love their nightlife.

Norm and I took a cab to the club. On entering we were in the prototypical "smoke filled room." Second surprise. The air was choking, but we persevered. The show was as advertised. We had a couple of drinks while watching it, and when it was over we were more than ready to head back to our hotel. On arriving we were accosted by prostitutes (not a surprise). After fighting them off, we entered the hotel lobby

By now it was about 3:30 am and we were both beat. Arriving at the hotel elevators we were amazed to learn that they were not working. Third surprise. We approached a bellman, and he told us, "Come back in 30 minutes." I asked, "Where is the staircase," and he responded, "No stairs." I knew this could not be true.

After finding the staircase we walked up the 30 flights, yes 30, to our room, further exhausting us and pushing us to our limits.

We undressed and hopped into our beds, hoping to get some much needed sleep. As we did, the elevator bell rang to let someone off on our floor! Fourth surprise.

I fell asleep, and woke up shortly after with a pounding headache, a result of the smoke filled room and the drinks. After ambling into the john to take a couple of aspirin, I turned on the faucet to get a glass of water. As the water poured out, the faucet fixture came off and created a geyser in the room, spraying water everywhere. Fifth surprise.

I got on the floor, opened the closet under the sink, and thankfully shut off the valve, killing the geyser.

After taking the aspirins, as I went back to bed, I took a look out the window. What I saw was amazing. Between the hotel and the beach there was a boulevard, and then a series of parks that extended the length of Copacabana Beach. The parks were filled with football (soccer) fields, all were lit, and all had games ongoing at 4 am. Sixth surprise. Brazilians love their “futebol” 24 hours a day.



I crawled into bed, and thankfully got several hours of sleep. After breakfast, with swimsuits on, we went to the beach, and experienced a marvelous sight. Even at mid-morning, the beach was filled wall-to-wall with people of all shades, from the

whitest white to the blackest black, with every shade in between. Seventh surprise. They were all having fun, socializing, playing beach volleyball and swimming.

January is mid-summer in Brazil, and it was very warm. Can't say that about the water. Eighth surprise. I got in up to my ankles, froze, and went back to the beach. Norm managed to get in a swim.

The rest of the day was spent touring Rio and the surrounding area. It was a great day with no more surprises. On Monday we flew back to the USA.

That was the first of numerous trips to Brazil, for work and for pleasure. None of these trips had the surprises of the first one.

On one subsequent trip, GMB arranged several meetings. One was in Brasilia, the Capital city. We met with government officials to discuss unleaded gasoline and other fuel issues. The other meeting was with Petrobras in their downtown Rio high rise office building, again to talk about unleaded gasoline and other fuel issues. Since then Petrobras has grown into one of the world's largest and most corrupt oil companies. It is at the center of the giant scandal now going on in Brazil.

At lunch that day we went to a seafood restaurant on Copacabana Beach. The waiter asked if I'd like lobster. My mouth watered as I said yes. A few minutes later, he came back with apologies from the chef who said they only had small ones. When he came back with the lobster, I almost fell out of my chair. The one lobster tail was so large that it hung over both sides of the plate. I devoured as much as I could of the absolutely delicious and fresh lobster.

## MISADVENTURES WITH COMPANY CARS

For most of my career at GMR and GM R&D, I, and many others, were fortunate to drive cars provided by GM as a perk. I would drive a brand new car every three months. In return, I would provide feedback on quality, performance, operational issues, etc.

Below are my misadventures with three cars, two caused by my goofs, another by a failing of the car.

### 1993 Buick Riviera

In December 1993, Sue and I met my daughter, her boyfriend, and his five year old daughter in Park City, Utah for several days of skiing. In the early morning while on the way to Detroit Metro airport, we turned on an interior light for Sue to read. This plays an important role in what eventually happened.



On arriving at the airport parking lot, I decided not to take my bulky bunch of keys with me. Instead, I decided to take only the key fob. Upon returning, I would use

it to open the car door, get the keys from the glove compartment, start the car and drive home. Again, this plays an important role in what eventually happened.

After a delightful several days in Utah, we flew home, arriving in Detroit about 10 pm on a cold, rainy, snowy, windy, miserable night. The courtesy car drove us to the parking lot. Upon arriving at our car, I hit the button on the fob to open the car doors and turn on the lights.

Guess what? The locks didn't open and the lights didn't come on. It then hit me. While on the way to the airport, we had not turned off the interior lights. We now had a stone dead battery! And, we couldn't charge it because we couldn't open the hood unless we had access to the car's interior. What do we do now?

Aha! I remembered that Buick had a 24/7 emergency call number. I used the phone in the lot exit booth, and called Buick. The response was, "We are closed for the night, and will open at 7 am." Not what I'd call an emergency number.

What next? We needed to get into the car, and the only way to do it was to break a window. Luckily, they had tools in the booth. I borrowed a hammer, and walked back to the car. Sue had been "patiently" waiting, and she glared at me when I returned. I first tried to break the driver's side window by pounding on it as hard as I could, with no success. Well, let's try the passenger side window. That worked and glass splashed all over the car's interior.

I manually opened the door, retrieved the keys from the glove compartment, shut off the interior lights that had been left on, and unlatched the hood. The parking lot attendant jumped the battery, and the car started.

Sue decided to sit in the back seat where there was no broken glass, and where she thought it would be warmer. To keep us from freezing, I slowly drove home, arriving about midnight. As you might expect, Sue was not a happy camper.

The next morning I drove to work. I pulled into the company car garage. Upon seeing the broken window, the supervisor asked me "Colucci, what did you do?" After reciting my tale of woe, he said he'd have the window fixed, and get me another car to drive.

Thus ends misadventure number one.

Two postscripts.

1. On all subsequent trips, whether for business or pleasure, I took the car keys with me.
2. New technology on cars shuts down the lights after a given time so as to not drain the battery. Too late for me.

### 1993 Pontiac Firebird Trans Am

In September, 1993, we went on vacation to the Canadian Maritimes, flying from Windsor, Ontario to Toronto to Halifax. Before we left, Sue asked if we should take her nondescript Chevrolet Geo to the airport, and not my decked out, glossy, Pontiac Trans Am. My reply was that we were going to an airport in Canada, and not Detroit Metro, and that the car would be safe there. Famous last words.



After a marvelous trip through Nova Scotia, Prince Edward Island, and New Brunswick, we flew home. Our luggage did not make the plane to Toronto, and we were reassured that the airline would get it to our home in Michigan.

On arriving in Windsor, I suggested that Sue wait at the terminal while I retrieved the car. As I walked to the car, I had a funny feeling - the car seemed to be higher off the ground than it should be. Low and behold, when I got to it I saw why - it was sitting on three milk crates, and three expensive magnesium wheels were gone. And, this was a safe airport!

On returning to the terminal, I told Sue what had happened, and she rightfully said, "I told you so!" I proceeded to find the police station in the airport to report what had happened. The officer replied, "That never happens here." But it did!

Next, I called the company car coordinator to ask what I should do. She said to call the local Pontiac dealer, have them get the car and contact her for the billing to replace the stolen wheels. I did so, and stressed that a tow truck would not work because of the missing wheels, and to bring a flatbed truck instead.

I guess American English was not well understood in Canada because after 30 minutes, a tow truck arrived. After seeing the error in their ways, they called for a flatbed truck. When it arrived, they managed to load the car. On getting to the exit booth, the young man there insisted that we pay for the 10 days of parking. He had

been instructed by the manager to never let a vehicle out without paying. I blew my top, and asked to speak with the manager. Eventually, he conceded that the bill did not have to be paid.

Turns out there was some good in all of this. It had taken a couple of hours, and our luggage had arrived.

When all of this had started, I called my son at home and asked him to come and get us. He arrived soon after we claimed our luggage, we drove to a local restaurant, and then drove home.

Two postscripts.

1. Listen to your wife.
2. The bill for replacing the three fancy wheels and fixing other minor damage was over \$3,000.

#### 1995 Pontiac Sunbird Convertible



It had always been my desire to drive a convertible. However, for safety reasons, convertibles had not been produced for many years. In the middle 1990's, GM again started production, and I took advantage of the opportunity to order one. It would come in June 1995, and allow me to drive it for the several summer months until I retired on October

1, 1995. Little did I know that this plan would not work.

The car didn't arrive in June, July or August due to unforeseen production problems. It came in early September and I was delighted. The first chance to drive it was to Metro Airport early one morning with the top up because it was chilly out. After a brief trip to Washington, DC, on the way home the top was down, the wind was flowing through my hair, the feel of the sun was delightful, and I was in Seventh Heaven. I thought, four more weeks of this bliss.

After returning home, I hit the "top up" button. Nothing happened. I hit it again, and again nothing happened. When desperate, go to the Owner's Manual. I found the emergency procedure for raising the top, and with Sue's help we tried to raise it. Nothing happened.

Completely frustrated by this time, I decided to put the car in the garage and drive it to work the next morning with the top down.

Guess what! The next morning it was raining, not in torrents, but enough to get me good and wet. I started my normally 40-45 minute drive to work in the rain with the top down. I drove down I75 toward work in the slow lane. You can imagine the looks I received from drivers in cars passing me. “Why is that idiot driving in the rain with the top down?” rang loud and clear to me.

On getting to the GM Tech Center, I pulled into the garage. The first words out of the garage supervisor’s mouth were, “Colucci, what have you done this time?” After I explained, he tried to get the top up, without any luck.

He obtained another car for me, I changed into the dry clothes that I had brought with me, and went to my office.

Two postscripts.

1. I never saw the convertible again. At least I had one blissful drive with the top down.
2. Luckily, I retired, and my misadventures with company cars ended.

## CHIEF CONTACT WITH AC DIVISIONS

After I was promoted to Executive Director in 1992, Ken Baker appointed me as the chief contact with what was still the AC Divisions. As such, I was the go between in “selling” GM R&D’s technology and cooperation to the AC Divisions.

AC at the time was becoming a global organization, with several facilities in Europe. It was decided that several of us, myself, Dick Moreau, also an Executive Director, and Kit Green, Head of the Biomedical Sciences Department, should meet with AC in Germany and also Opel.

Kit and I spent a weekend in Paris touring the city before heading to Wiesbaden, Germany, which was going to be our base city. While in Paris, I learned a lot about Kit as he told me tales of his days as a CIA Case Officer in Southeast Asia during the Cold War. He was well educated, with a PhD and an MD. We had a great time visiting museums and walking the streets of Paris.

Upon arriving in Wiesbaden late on a rainy, foggy night right out of a spy movie, it was decided to get a bite to eat. We found a restaurant next to a “Turkish Bathes” place, and we should have been leery. On entering, we found it filled with men in

outfits that should have made us suspicious. The only woman there was the bartender. She had a “butch” haircut, and looked like she could pick any of us up by the neck and toss us out the door without breaking a sweat.

While Moreau and I scanned the limited menu, Kit decided to case the joint. When he got back, he confirmed that we had found a gay bar! After bratwurst and beer, we quickly headed back to our hotel.

On one day Dave Viano (who worked for Kit and was in Europe as a liaison), and I made a trip to an AC facility about 60 miles away, to see the work they were doing to develop emission control systems for the European market. After the visit, we drove back to a small town near Wiesbaden, where we were supposed to have dinner in a local restaurant with a group from Opel. Dave found the town, but we could not find the restaurant.

While in the town square, we saw an elderly lady walking toward us. Dave, with his limited command of German, asked for directions, she complied and went on her way. After driving around and not finding the restaurant, we were again back in the town square, but on the other side. The lady was now making her return trip across the square, and she saw us there. Dave rolled down the window to ask her for directions again. But, before he could utter a word she went into a tirade that, roughly translated, went like this, “You dummy, can’t you follow directions! I told you where to go. You are now parked in front of the restaurant. Enjoy your dinner!”

And, we did.

Before I retired in 1995, I had a meeting with Fritz Henderson, who was an executive assistant to the AC General Manager, John Battenberg. Fritz impressed me as a focused, smart young executive on the rise in GM. Little did I know then that in March 2009, during another one of GM’s difficult times, the Obama Administration as part of the GM bail out deal, forced Rick Wagoner, the Chairman and CEO, to resign and replaced him with Fritz Henderson.

Henderson’s tenure was short, as he resigned under pressure in December 2009.

## SECRETARIES – THE UNSUNG HEROINES

Throughout my career in management, I was blessed to have a series of outstanding secretaries. Like nurses in hospitals, and teachers in K-12, they are the true unsung heroines.

Individually and collectively they provided encouragement, a pleasant atmosphere, a scolding when needed, protection from bosses, kept me on schedule, etc. while carrying out all of their normal secretarial duties.

Linda Lamar and Melenda Hunter worked as a team in the F&L office for many years. I don't know if there is any connection, but all of their children, and many of the children of our technicians, went on to receive college degrees and responsible jobs. Maybe the engineers and scientists in F&L, and elsewhere in GMR, set examples for these children to follow.

Dotty Fedelem was my secretary for a couple of years when I was an Executive Director at GM R&D. She was very professional. She was an excellent golfer, and was also a Michigan State alum.

Several years after he retired, I asked Bob Frosch what he missed most about GMR. Without hesitation, he replied, "My secretary." Enough said.

#### DO YOU KNOW MARY BARRA?

At the SAE Congress in April 2014, I asked a long time GM friend and member of the SAE Foundation Board of Trustees, Don Abelson, if he knew Mary Barra. Several months earlier, Mary had literally and figuratively shattered the glass ceiling at GM when she was appointed President and CEO. She is now also Chairwomen, and likely the most powerful woman in US business. GREAT!

Back to Don's answer. He smiled at me and said, "She was a process engineer in the Fiero plant in Pontiac when I was General Superintendent of Manufacturing and she worked in my organization. She was a very good young engineer."

#### IMMIGRANTS AT GMR AND GM R&D

At GMR and GM R&D throughout my career, there were numerous excellent researchers from around the world, who had immigrated to go graduate school, and then joined our staff. They made excellent contributions to the success of the departments in which they worked, to GMR, GM R&D and GM. They came from Europe, Asia, the Middle East, Africa, etc. Not only did they bring their intelligence, they brought their culture, to the betterment of all who associated with them.

I want to focus on three from India, each of whom left their mark on the F&L Dept., and lasting favorable impressions on me.

Ather A. (Art) Quader - After receiving his PhD in ME from Wisconsin, Art one day showed up at GMR and asked for an interview. He was hired into F&L on the spot and went on to do significant single-cylinder engine research exploring the lean operating limits of engines. He essentially wrote the bible in this area, and he individually, and with Bruce Peters, wrote numerous SAE papers, some winning SAE Awards.

Art was a Muslim from mainly Hindu India. I remember when he went back to India for a traditional arranged marriage. The colorful ceremonies lasted several days, and Art proudly showed numerous pictures when he and Parveen returned.

Flash ahead at least 20 years. Art's daughter after graduating from high school, spent a year with relatives in India to better understand the culture. Upon returning, she went to the Univ. of Michigan, and then on to law school. While there, she met an Indian-American man, and they decided to get married. Art and Parveen had a traditional Indian wedding ceremony for them at a large hall in Bloomfield Township. Sue and I were fortunate to be invited and to sample the Indian food and see the colorful costumes.

Also invited were relatives from India. Many did not come because they had picked out, in the traditional Indian manner, a husband for Art's daughter. By now, she was more American than Indian, and she refused their offer.

Ashok (Alex) Sapre - Alex emigrated from Bombay to Oklahoma State, where he received his PhD in Energy Resources Engineering, before joining F&L. He came during the 1970s when the world was in turmoil after the Arab oil embargoes, and we were trying to understand how non-petroleum resources could be utilized to provide future automotive fuels. He did an excellent job.

After many years in F&L, Alex joined the energy economics group of Economics Staff. From there he went to EAS as an assistant to Dr. Betsy Ancker-Johnson. She and Alex worked well together. When Alex's wife, who could not abide the cold Michigan winters, decided she wanted to move to California, Betsy found Alex a job at Hughes, where he worked until retirement beckoned. Sadly, his wife died suddenly after moving to California. Alex raised their teenage daughters.

Raghuma (Sam) Reddy - Sam also emigrated from India, and received his PhD in Chemical Engineering. He joined F&L in the late 1970s, and was immediately thrust into solving the stalling problem with the Olds diesel engine, described earlier. Sam worked to develop fuel additives which would lower the temperature

at which the paraffin molecules in the fuel would condense. After that problem was “cured,” Sam showed his versatility when we involved him with making GM’s evaporative emissions control systems more efficient. He did a fantastic job, redesigning the canister, and developing models to predict and improve canister efficiency. He became GM’s number one evaporative emissions expert, and since retiring, he has traveled the world advising regulators and others.

I wrote the three cameos above as examples of what immigrants have brought and can bring to the United States. I recently went through the list of 2017 inductees into the National Academy of Engineering. About 50% were born outside of the US and are now citizens.

Yet, our current government wants to limit immigration. Even if it supposedly applies to selected countries, it will discourage all immigrants. I wonder if the people who established the anti-immigration policy have ever read the words below, which are found on the Statue of Liberty.

*“Give me your tired, your poor,  
Your huddled masses yearning to breathe free,  
The wretched refuse of your teeming shore.  
Send these, the homeless, tempest-tossed to me,  
I lift my lamp beside the golden door!”*

JM Colucci 6-27-17