

**SON OF  
ENTROPY SQUARED**

**BY**

**PETER C. MAYER**

***PERSONAL MEMORIES OF A SON OF A  
CHEMIST, JOSEPH E. MAYER, AND A NOBEL  
PRIZE WINNING PHYSICIST, MARIA  
GOEPPERT MAYER***

**SON**

**OF**

**(ENTROPY)<sup>2</sup>**

**BY**

**PETER C. MAYER**

**DEDICATED TO**  
**MARIA ANNE WENTZEL,**  
**DAUGHTER OF**  
**ENTROPY SQUARED**

## Forward—Who are Entropy and Entropy?

This book is a collection of vignettes remembered by the son in reflection of the human side of two very human people. It is written mostly to be fun; my upbringing was mostly fun. Well, not really. It contained a lot of fun and would have been mostly fun if my misbehavior did not require my father's heavy-handed discipline and my mother's usually more subtle discipline. Like most of us, any statement about upbringing being fun must be qualified with "aside from the consequences of my misbehavior."

Most who knew Maria Goeppert Mayer and Joseph E. Mayer agree that their human characteristics equaled and were part of their scientific accomplishments. There is a building with a special seminar room at the University of California at San Diego, both named after my parents. My mother, in 1963, was the second woman to earn a Nobel Prize in physics and the third to earn a Nobel Prize in science. My father earned numerous awards and there is a Joseph E. Mayer Chair of Theoretical Chemistry at the University of California at San Diego. In the first half of his career, Joe performed experimental chemistry as well.

My parents' jointly authored book, *Statistical Mechanics*, was an excellent book. It was published in 1940 and, in 1960 and 61, classmates at Caltech referred to Mayer and Mayer. (My father completed a second edition in 1977.) Entropy is an important concept in thermodynamics, the subject of the book. Most physicists and chemists would recognize the reference,  $(\text{Entropy})^2$ , and correctly guess who is the Son of  $(\text{Entropy})^2$ . When I changed my field from physics, a classmate found it a pity that there would never be a Mayer, Mayer and Mayer.

My father was the better scientist. To explain, the Nobel Prize is not for a person's whole achievement but for an impressive piece of work. My mother was not very productive but most of what she authored was very high quality with a remarkably impressive note earning the Nobel Prize.

### *Nepotism Prohibitions*

A son of a long-term colleague of my parents observed that Maria would have been more productive without nepotism prohibitions interfering with being hired. The nepotism prohibitions interference with productivity, however, was of a second order. Since there were always top scientists in addition to my father who appreciated her, even the patronizing she received early in her career probably had limited impact. Joe's encouragement and respect were critical. She was usually not paid by the universities where my father served. Nevertheless, these universities provided her the intellectual stimulus of great universities by providing her an office, access to university facilities, particularly faculty seminars, and faculty interaction. These universities received at a low price—at a steal—her instruction, the stimulus she provided, and inclusion with her journal bylines "The Johns Hopkins University," "Columbia University," and "University of Chicago."

A comment is in order. The motive for prohibitions against hiring couples was mostly not anti-feminist. The depression at the time of Joe's first job produced customs and rules to discourage participation in the labor force; the memory of the depression remained in many customs and rules through the early 1960's.

Her instruction and inclusion with her byline became pricier during her last year

at the University of Chicago and later at University of California at San Diego. In response to the University of California offer, which included a half time salary for Maria, University of Chicago gave her a full-time full professorship. A reason, probably the principal reason for Joe and Maria accepting the California offer, was expressed in a letter to me from my mother, "It would be nice to garden all year."

### *How True Are the Stories?*

To judge the accuracy of some of the stories, my father was definitely not a braggart. Therefore, stories that can only have come from him likely understate his positive accomplishments and, perhaps, overstate his foolishness. He would annoy me by responding to my corrections of a story with "don't spoil a good story with the truth." In this case, however, he usually did not practice what he preached. My mother was less bombastic than her husband, Joe, in her story telling and not a braggart.

From story corrections and additions from relatives, however, my memory may cause inaccuracy with respect to detail. The sense of the stories, however, is quite accurate.

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**THE BEGINNING,  
GÖTTINGEN  
PRE-WW II**

## **The Hollisters**

My father, while dining in the Göttingen Ratskeller ... .

Oh! For those who are unfamiliar with German towns, the translation for Rathaus is city hall; usually, the Rathaus cellar contains a Ratskeller, a quality restaurant, often the best in town. The time Joe spent in the Ratskeller while in Göttingen is illustrated by, in 1950, while having dinner in the Göttingen Ratskeller, my father asked for a particular waiter who served us.

My father, while dining in the Göttingen Ratskeller, noticed an American couple enjoying themselves and speaking German. My mother's correction to the story was, "you said 'a California couple.'" Dad tended to avoid Americans; they interfered with part of his education, to learn German, and he didn't like chronic complainers. He approached the couple and was given ice cold shoulders. "What a nice looking couple, but they are most unpleasant" or something less kind. Later, the couple, Joe and Kay Hollister, approached my father and asked him to join them. They, too, did not like chronic complainers.

Kay would party with her husband and Joe in bars where no respectable German lady would go. My mother said she would never have gone to these bars. Kay would walk home—sometimes singing—and at times with a Joe on each arm. When Kay was middle aged and I was a large young man, I learned not to even appear to match her drinking. One time when I over-drunk with her, she told me my father had the same effect on her in Germany.

Later, while my father was introducing my mother to the American West, they

wrote every Hollister in the Santa Barbara phone book. Each put their letter in Joe Hollister's box at the Hollister Estate Company—pretentious for Hollister Ranch—office. My parents received a letter from Kay that included the instruction to stop at the Gaviota Store for directions on how to get to the ranch house.

At the Gaviota Store, in response to the request for instructions to go to the Hollister Ranch, "You came from the North? You have been on the Ranch for the last 100 miles."

There were several exchanges of the tenor and containing, "We would like to have instructions to go the ranch house."

"Why do you want to go to the ranch house? It is on a long, narrow, difficult dirt road; besides, the road is private."

In exasperation, my father said, "we were told by Joe and Kay Hollister to ask you for instructions."

"Oh yes [deep breath], Mrs. Kay told me about you. ..."

Still later, when further exploring and showing their children the American West, my parents often stopped to see the Hollisters. As children, both my sister and I liked the couple and as an adult, I would often visit the widow, Kay. While in high school, I worked one summer for Joe's brother on the Ranch and two years, while in college, I spent Thanksgiving with his brother.

A tale about the lad, Joe Hollister, was the major component of a Joe Mayer, this is the way to behave, lecture.

"When Joe Hollister was about your age, he walked through an open gate that usually was kept closed. He decided to close the gate. Later, his

father and other cowboys tried to drive a herd of cattle through the closed gate."

As a lad, I required the addition of the punch line—"leave things, in particular doors and gates, the way you found them"—to explain the story.

## **That American**

I was dating the daughter of a fellow student of Maria's at the University of Göttingen. The first thing the daughter said to me after Christmas vacation was "I know who you are!"

"What do you know about me that you did not know before?"

"Well, I know who your father is!"

"Okay Nickie, what's the story."

"There were few women students at the University of Göttingen and only one really feminine student. That American came and purchased a car and took her away." At one point she suggested that it was a sports car and I corrected her. The car was an Opal—at the time, the cheapest German car—with a bad clutch. As a post-doctoral fellow, my father had a little more money than the graduate students but, more significantly, he had more gumption.

Later Nickie said, "My father said, 'be sure to tell Maria's son that Joe had an American directness that charmed all of us.'"

### *Background*

Being feminine relates to my mother's upbringing. Some biographies credit my grandfather of telling Maria, "I do not want you to be a women." This claim is garbage. He said, "I want you to be more than a women." All to many university women at my mother's time chose not to be a woman as was often the case of science and engineering majors even a generation and more later.

My grandfather was a pediatrician. To show that he wanted Maria to also be a



woman, he had her attend his lectures on child rearing. Further, for all his female patients, including my mother, he vaccinated for small pox high on the thigh so that the ugly scare—at that time three scars—would not be visible when wearing a sleeveless dress. Surely, he wished—but did not expect—all his girl patients to also have interests outside the house.

For the readers who have not had a small pox vaccination, an older person may show you the, now faded, scare from the vaccinations. To vaccinate for small pox, one puts—usually below the shoulder—a viscous liquid containing the cowpox virus. Then the inoculator takes a pin or needle and makes numerous pricks or small cuts within a circle under the liquid. The pricks and the reaction, a nasty pox, leave a scare. To minimize total scaring, revaccinations were made on top of the old scare. For most people alive today, the vaccination left a single scare the size of a dime (US ten-cent piece). However, in earlier times the process described was done on a triangle of circles, leaving an unattractive triangle of three scares, each about the size of a nickel (a US five-cent piece). The triangle of scares, indeed, stood out. I have seen such a triangle on the shoulder of a Palauan lovely who was vaccinated during Japanese governance.

### *In Confirmation*

As confirmation of Maria's fellow student's observation, a friend of my father while both were in graduate school told the following.

"I saw Joe with your mother when she was pregnant with one of you [I have a sister]. As I approached them, she looked like a German hausfrau, not at all the kind of woman Joe would marry.

At a later time, I saw Joe with a lovely woman and wondered if Joe had a mistress. As I approached, Joe said, 'I believe you have met my wife' and Maria said, 'oh yes, we have met.'"

### *And More*

A biographer credits my sister as saying men were putty under my mother's influence. I believe my sister would agree that the limits of language make this assessment an understatement. After all, she witnessed more often than I, my mother or a driver in a car in which my mother was riding being let go by a policeman intending to give a traffic citation. I never claim that growing up observing my mother's master ability to mold men has made me immune to feminine manipulation but I claim that, unlike most men, it never happens without my knowing it.

Something I have not noticed, perhaps because of my own gravitating, but women have reported that in later years men would gravitate towards my mother whenever she entered the room. There was a very rude visiting professor at the University of Chicago. Eventually, he was rude to my mother. My mother's reaction was to be glad to be part of the club. At least some of the male professors reaction was particular anger because he acted his rude way to a women, spoken in a tone I would use for a women I found womanly.

## Small Tales

### *Meeting the Awful Flirt*

A biographer credits my father when meeting Maria as finding her an awful flirt. An observation from my mother's side may explain the degree she appeared to Joe to be a flirt. After meeting Joe asking to be a boarder at her mother's house, Maria spoke to her mother. "Is he like Stanley" (a former American boarder who recommended that Joe inquire about being a boarder at the Göppert's). "Yes, but I believe he is much nicer."

### *Remember Middle School Humor and Watch Your Language*

One evening, Joe fully cooperated with a competitor for Maria insisting on speaking English. When arguing who would take Maria home, the competitor agreed to my father's "heads I win; tails you loose." Mother seemed to enjoy the antics. I am unsure if she fully understood the bet Joe proposed.

### *If you hiccup ...*

"Maria, if you hiccup one more time, I will give you a pineapple!" My mother really enjoyed even unripe pineapples. (Until at least 1950, pineapples shipped as fresh pineapples were pineapple rejected for canning for not yet being ripe.) Having already bought the pineapple, Joe gave her a pineapple even though Maria failed to perform the act. I hope that at least once in her life she had as good a pineapple as the local one that reminded me of this story. As children, neither my sister nor I received the nickel (US five cent piece) offered for hiccupping one more time.

## **The Opal**

The Opal was an automobile, not a gem, although it may have been a gem for courting. It had a noisy bad clutch. In the Opal on the back roads around Göttingen, my father taught my mother how to drive. "Auch Maria, you have to have the right relaxed attitude, have a cigarette." She let the cigarette burn until she had burns between her fingers.

At the time in Germany, the driving test not only included driving around and parallel parking, but also backing around a town square and knowledge of the workings of a car. At the time cars were much less reliable, much simpler and parts more visible than presently.

When my mother took the test in the Opal, she started driving around and was instructed to return and park.

"Aren't you going to have me back around the square?"

"No, anyone who can drive a car with that clutch knows how to drive. You pass."

The next day, the car was taken to have the clutch repaired.

## **Der Schwan and the Ferry**

My father took my mother to, Der Schwan, a very classy restaurant in Einbeck am Weser. (The restaurant had its reputation intact in 1957 and currently has a website.) During dinner he told her "I went to the American Counsel to inquire about sponsoring your immigration."

"Under what status?"

"As my wife."

To get to Der Schwan from Göttingen, they used a small ferry with a single operator. (I picture the ferry as one attached with two cables to a pulley on a cable hung across the river with the river current driving the ferry. To change the direction of travel, a cable from one end of the ferry to the pulley is lengthened while the other is shortened.) They inquired when the ferry would close that evening.

Being their engagement night, they stayed at the restaurant until after the ferry was scheduled to shut down. So they returned to Göttingen by a longer route.

Sometime right after World War II, Dad visited Germany; I suspect as a consultant for Ballistics Research Laboratory, Aberdeen Proving Grounds. He met the ferry master who scolded him, saying he kept up all night waiting for the two of them to return. My father replied—probably in a manner that anyone who really knew Joe Mayer would recognize as sheepish and contrite—with "Sorry. It was the night that my wife and I became engaged. When we chose to return, it was late and we thought you were closed, so we took the long way."

About seventeen years of anger melted.

## The Dinner

Following Der Schwan, of course there was a dinner at Maria's mother's house—where Joe was a boarder—to celebrate my parents' engagement. By mistake, it was scheduled on the maid's day off. There are somewhat different versions of the rest of the story; I choose the one I find most plausible.

Mother was in tears being helpless in the kitchen while my father was doing most of the cooking and some of the other work, such as setting the table. My father's response to mother's helplessness, "As expensive as maids are in the United States, I promise to hire a maid, ...as long as you remain a physicist!"

### *And Many Dinners to Come*

Years later on Thursday, a maid's day off in my parent's house, mother and dad are having cocktails. "Peter," mother would say, "preheat the oven to 350 degrees and put the meatloaf in the oven and set the timer for one hour. Be sure that the potatoes are around the meatloaf." Later, "put the string beans in the pressure cooker with a half cup of water. Heat the pressure cooker to cook and cook for two minutes; oh by now you know the rest. The platter and serving bowl are on the kitchen table."

Another night, "broil the steak fourteen minutes on each side [my parents would purchase two-inch thick or thicker steaks]. Rub both sides of the steak with garlic if you like."

The responsibilities expanded and the instructions shrunk over time.

It was the same way for my older sister before my time and for a while on alternating Thursdays with me. My mother saw to it that neither of her children would

have her experience of being helpless in the kitchen!

## **The Wedding**

In Germany, as in many other countries, only civil weddings have status in law. A church or other religious wedding is a frill. My parents accommodated the demands from their mothers (both my grandfathers were deceased when my parents married) and agreed to the frill of a religious wedding. However, the wedding must be held in the house, not in a church, and there must not be a sermon.

My father, with mother's concurrence, stated that the civil ceremony was much more impressive and appropriate than a church wedding. It took place in a room in the Rathaus. (Rathaus translates as city hall but has a different feel and sense than the English translation. The Rathaus is usually an elegant old building often, and in Göttingen, with an excellent restaurant in the cellar.) Mostly my father with the concurrence of my mother described the ceremony as solemn and unemotional. The mood was as if set by the question, "Are you sure you want to take this major step in your life?" The old men in robes officiating impressed Joe more than old or young ministers in robes. Mother described a mural wrapped around the wall representing the stages in a person's life from birth through marriage to death.

An aunt of my mother was very familiar with church law and knew a Lutheran wedding was not permitted for a person who has not been christened. The idea that my father would require an emergency christening before the Lutheran wedding produced considerable amusement. The minister asked this aunt whether Joe had been christened. Her response, "I suppose so."

And no sermon, no such luck. My father recalled observing Alois, a ceramic lion



cub, looking as skeptical as he felt. (Later to me, the cub had the benign look you would expect of Alois, a lion who was brought up by sheep and eventually married one named Shelastika.)

### *An Aftermath*

A relative of my mother named his son after Joe. In the German Lutheran church, the names for christening were limited to a list of saints. To the minister performing the christening of the son, this relative insisted that the name of his son's namesake was Joe and Joe was a good American name. The minister asked if he was sure that Joe was not an abbreviation for Joseph.

"It is not; his name is Joe."

"Is it a Christian name?"

"Well, Joe was married in the Lutheran Church."

### **"The Scenery Is Still Beautiful"**

Before the outbreak of World War II, my mother, with Joe, would return to Germany.

An impact of the slow progress of the disaster on people is from Joe. During an after dinner or similar conversation, my father made a statement. He was asked "how do you know?" His reply was to the effect, "there have been many articles on the subject in our newspapers." The reaction was a skeptical, "but this makes Roosevelt look good." There was a sigh of acknowledgement when Dad asked, "Don't you remember when there was a free press in Germany? Roosevelt is not popular in the American press."

I learned much of the history of the progress to disaster from stories about conversations between Maria and her mother.

After the rise of Hitler, Maria's answer to, "How do you like the new Germany?" was "The scenery is still beautiful." In one shop, the owner said "Oh" and when the other customer left, he went from behind the counter to lock the door. His address to my mother changed from formal German to her childhood nickname, "Tell me truthfully, Miesie, isn't it awful?" My mother's smile could speak volumes.

As my response, the letter accompanying turning-in my draft card out of protest over the Vietnam War contained about the following, "when a relative returned to her native Germany in the 1930's, her response to 'how do you like the new Germany' was 'the scenery is still beautiful.' Our scenery is still beautiful and, furthermore, the Civil Rights Revolution may produce the first society where distinct racial groups live with mutual respect and tolerance. The War has also hurt the progress of this revolution."

The last trip, that for Maria's mother's funeral, Maria returned without Joe. On the ship leaving Germany after her mother's funeral, Maria sang the *International* out of rebellion, not praise.

## **Shipping Furniture**

This vignette is included less as a story of my parents than as an illustration of national pettiness.

For some reason, not by request, my father in the late 1940's was on the mailing list of the Soviet Union embassy and some Satellite embassies for glossy periodicals. After my father once said it is sometimes interesting to see what they have to say, I would often look at these glossy magazines.

In about 1950, the United States stopped the circulation of these magazines in response to restrictions in circulation of the US counterpart in the Soviet Union. My parents found this so silly but then recalled an incident involving Hitler's Germany and the United States. Hitler forbade the transfer of financial assets involved in a bequest out of Germany. Therefore, much of my mother's inheritance was used to ship some of my grandparents' furniture to the United States. They would have shipped much less without the restriction on transfer of financial assets.

Sometime after this grandmother's death an American judge forbade the transfer of bequeathed financial assets to Germany. His position was that he did not know the legality of his action, but he did not wish to allow such a transfer when Germany did not allow the reverse transfer. My parents found this action silly but it turned out that Hitler's Germany stopped the ban on the transfer of bequeathed assets. Unfortunately, the ban on Soviet and Satellite embassies mailing publications did not have the desired effect of lifting the ban on the United States embassy publications.

**GÖTTINGEN**

**AFTERWARDS**

## **Silly Old Lady**

While with my parents in Germany in 1950, there was a silly old lady whom my mother demanded I be nice to. My mother said she would tell me why later. She never did and I understand why my mother would not want to tell me when there was a chance that I might blurt out to the lady, "Is it true that ... ?"

I made the connection at a dinner table conversation in Chicago. Mother described a woman who was a silly old lady before the war and—when I saw her—after the war. As Maria put it, "She was the last person I thought would keep her eyes open and be aware of what was going on." When trains on the way to a concentration camp stopped at the city where she lived, the seemingly silly old lady took toys to the children on the train. She did all a person without position could do.

Yes, mother, of course I should have been more than nice. The example of this silly lady who risked so much in a country with so little hope contributed to my risking mere jail time in a country with such hope—as represented by the very un-Nazi Civil Rights Movement—and, as a whole, with such freedom. I turned in my draft card during what I still consider an immoral and stupid military adventure, the Vietnam War. In my letter accompanying my draft card, I referred to this silly old lady as a relative. I was so disappointed when I learned that this lady was not my relative.

## Two Physicians

When my family moved to Chicago, my parents were treated by a physician who would not send bills. My father repeatedly requested billing. Finally, with his convincing sternness, my father wrote, instructing the physician to bill or the family would find another physician. The reply was similar to "All right, in the future I will bill you my usual rate. I haven't been billing you because I know [Maria Stein or Ruth Wichelhausen or both]." He probably wrote no more. Maria Stein and Ruth Wichelhausen were two German Jewish connected physicians whose immigration my parents sponsored. Maria Stein was half Jewish—enough for Hitler—and Ruth's husband was Jewish. My parents also sponsored Ruth Wichelhausen's husband.

Maria Stein would send me books for Christmas. From my wife asking about a Christmas gift label in one of my books, it was found that Maria Stein was also an old friend of my wife's. With our renewed correspondence, she labeled herself as my oldest friend—true on two accounts. The renewed correspondence led to my paying last respects when she was ninety-six. During my last respects, I learned that Maria Stein accompanied the other Maria, my mother, during a school vacation to a conference attended by my grandfather.

My sister with family live close to a very good friend of Ruth Wichelhausen. Ruth would stay every Christmas with this friend, during which time my sister and family have enjoyed Ruth's company. Once during this time, I had the pleasure of having dinner with Ruth. Joe and Maria's only granddaughter, Tania-Maria, on her sixteenth birthday received a nice silver candy plate. The next birthday she received another.

Upon receiving the third, the granddaughter asked wherefore the lovely plates; what is their meaning? Ruth Wichelhausen explained that Tania-Maria was the youngest generation of the family that sponsored her and her husband's immigration. She further explained that her husband's family had all been taken to concentration camps and that these plates were the only remaining possessions from his family. Now six of these plates are exhibited in Tania-Maria's home with a silver pitcher inherited through the Marias [Tania Maria duBeau].



## **Family Education**

In a dinner conversation, my sister discussed meeting a distant relative of mother, Wolfgang Göppert. (Well, I have no memory whatsoever what his name is; I never met him.) In the conversation, my sister and I learned that Joe paid for his education. Joe said that Wolfgang insisted on treating the contribution as a loan and that, at the time of telling, Joe was glad. As Joe put it, "with the economic growth of post-war Germany, he has done very well, driving a Mercedes, etc."

Since the discovery of the support for Wolfgang was an odd circumstance, there may have been others; no one will ever know.

**ABERDEEN**

**AND**

**WAR**

**STORIES**

## **Context of Aberdeen Proving Ground and War Stories**

In 1939, my father learned he was not going to receive tenure from Johns Hopkins University. Given this intelligence, he sought positions elsewhere and accepted a position at Columbia University. Given that the person responsible for Joe not receiving tenure was unlikable, Joe was very proud to steal his thunder. Before being informed officially of not receiving tenure, he told the chap of his acceptance of an Associate Professorship, a tenured position, at Columbia University [Daughter of Entropy Squared, Maria Anne Wentzel].

As an aside on this matter, many years latter, probably in the 1950's, after my parents move to Chicago, mother saw the gentleman across the room at a reception. She wanted to thank him, first for hiring Joe, and second for wanting to fire him. The person, however, disappeared before Mother could talk to him.

During U. S. involvement in World War II, however, my father's principal work was with the Ballistics Research Laboratory at Aberdeen Proving Grounds in Maryland [Mentroll et. al].

My father's statement about working on a nuclear bomb project was, "I want to win this war, not the next." He later believed he was wrong. However, consider a problem I give economics students involving opportunity cost. I write this story about a relative and instruct, "use the concept of opportunity cost to show why this relative might have been correct." Answer: the opportunity cost of the talent used for developing the bomb is the talent's use for "conventional" weapons. With this talent

used for conventional weapons, some of these weapons would have been developed earlier, maybe leading to an earlier completion of the war.

When assessing this maybe, remember there was also a war in Europe. To illustrate, this section contains a story of the first use of a kind proximity fuse in Okinawa. Suppose this weapon was available earlier, say at Normandy and during the taking of Saipan, Guam and Iwo Jima?

(When more Pacific World War II veterans were alive, I would warn my students, “When I make this argument, Pacific veterans do not even listen to me and yell that I am too young to know anything. I do not dare speculate on their behavior towards you if you make the same suggestion.”)

Part of my father’s work was in developing proximity fuses. Proximity fuses refers to any means to have shells with shrapnel explode over the target, rather than on impact, which means after burying themselves into the ground.

He made one trip to the Pacific theater as a civilian “weapons’ expert.” Some of the physical/environmental aspects of the “war” stories I only learned after I moved to Guam. As he explained, he had lots of questions about things he saw and was embarrassed that he never found the answers. As Joe put it, he was very busy and the people whom he asked about things and who were stationed at the locations were also busy. I will add that most of these people surely lacked my father’s healthy curiosity. How many of these people, upon their child’s later observation that Scorpio along the Southern horizon in Chicago was an unimpressive constellation, would respond with,

“When it is higher in the sky and, therefore, brighter in the South Pacific, it is a very impressive”?

During the Korean War, Joe made a trip, similar to the World War II trip, to Korea.

### **Joseph E. Mayer, the Administrator**

Joe Mayer rarely took administrative positions; when someone would inform my wife or me that a university catalog listed Joseph E. Mayer as Chairman of the Department of Chemistry, I knew he was satisfying an obligation by taking a rotating position. I recall his being offered an administrative position at White Sands Missile Range with a high enough salary that he could not reject it without consideration and discussion with family. A claim that others and I liked to make over cocktails (but I do not really believe) and Joe liked to accept is that the following incident is the reason he never became a science administrator.

A Dr. X at Aberdeen when dealing with administrators, acted on his temper in an extreme way. My father was acting administrator while the person who held the administrative position was on leave. (I picture the regular administrator as being a military officer.) Dad was real proud that he had no run-in with Dr. X—until ... . While the regular administrator was on Aberdeen Proving Grounds being debriefed but yet to return to his position, Dr. X came into Joe's office and walked along a book shelf and took each book in a row and threw it at Joe. Joe said that Dr. X was so clumsy that he had no trouble dodging the books when necessary.

#### *Good or Bad for American Science?*

Was it good or bad for American Science that my father never became a science administrator? Although I address the question, beyond stating that the answer is not trivial, I will not venture an answer. Of course, if Joe's career became science administrator, American science would have lost a large part of his research and

teaching.

As a project administrator, Joe would have been poor; his curiosity and understanding was too broad. Joe described the good project administrator as a person so narrowly focused on his project that he was convinced that it, alone, would win the war. Such a project administrator would fight beyond reason for resources for his project.

As an administrator above the project level, however, Joe's breath and curiosity would be a benefit. Further, consider the person described in these vignettes. Dad's direct manner with kindness would have been an asset, as it was in Göttingen. He was not shy about showing his sense of fairness. He correctly interpreted people's feelings more often than many of us.

Sometimes, a benefit as an administrator would have been Joe's legendary temper that also usually cooled immediately, unless the confrontation was planned. That is, he expressed his feelings verbally but, if his habit were to throw books, he would throw only one. A planned angry confrontation usually reflected his convincing sternness more than his anger. He had limited tolerance for nonsense—except as humor—and none when it involved bickering. When my sister and I bickered, we were promptly both sent to our rooms. I am familiar with a planned and extended confrontation Joe had simultaneously with my parents' maid and the caregiver for Joe's infirm mother. Joe's infirm mother lived with my parents for over a year. Dad firmly and angrily demanded a stop to the bickering between them. Mother was afraid that both would quit but both remained in their employment and the bickering stopped or was

hidden. As part of his sense of fairness, Joe would feel contrition and, if necessary, would make a major effort to apologize when he felt he was wrong. With the familiarity with people under his governance, I doubt his anger would often be misplaced.



### **Royal Blue—from New York to Maryland**

My father would spend a three-day weekend in New Jersey with a day or two at Columbia University. I remember running down the stairs to greet him when he arrived—I guess Thursday evening.

When going to Aberdeen, like others, he would board the Royal Blue train of the Baltimore and Ohio Line and take a Pullman bunk early in the evening, long before the train left the station.

One time, two noisy gabbing women entered after many of the others had gone to bed. They kept gabbing in spite of many “sh—, we are trying to sleep.” In the morning on these trips, Dad always got up, washed, shaved and dressed, finishing as the train entered the station. He made the Pullman porters uncomfortable and they would try to hurry him. This time a colonel also was completing his morning chores as Dad was completing his. The Pullman porters were more concerned about the Colonel since they knew dad’s habits. The colonel was clearly waiting for dad to leave.

As the train was slowing at the station, my father looked back and saw the colonel fill three paper cups with water and precariously carry them down the isle as the train was slowing. He dumped the cups into the bunk with the two women.

## **This and That at Aberdeen Proving Grounds**

I recall a number of small stories about Joe's time at Aberdeen Proving Grounds during World War II.

### *Car Used for Commuting in Aberdeen*

The following is about consumer decision-making under restricted availability, including rationing.

In Aberdeen Joe kept an old square-shaped Dodge. I remember finding it really old, nice and funky when I saw it after the War with a vague memory of seeing it earlier. The car was a dirty grayish black color. My parents other car was a 1941 Ford. I do not trust the dollar figures in the following. It was probably for sale because it was a big car that used lots of gas and gasoline was rationed on a per car basis. My mother said that when seeing it for sale for eighty dollars, they had to buy it because it had four new tires. The tires were worth \$100.00; furthermore, tires were difficult to find and their sale rationed. They sold the car for more in nominal terms after the war and my mother was amazed that the new owners drove it from New Jersey to California.

### *Buzz Bomb Versus V2*

Dad was consulted to interpret the intelligence about the German rockets. The information from spies contained inconsistencies. Perhaps only after the assault by the V1 rockets or buzz bombs and the first use of the V2 rockets did intelligence analysts realize there were two rockets being developed. As two rockets, not one, the intelligence information fell into place.

### *A Sharpshooter and a Tank*

A tank demonstration involved its operation while being assaulted by all sorts of ordinance. Unexpectedly, the tank stopped. A sharpshooter, who had studied the tank before the demonstration, shot a hole in the fuel tank with an infantry rifle. A vent on the front of the tank provided access for the bullet. Should the sharpshooter be praised for finding and showing the weakness in design or criticized for delaying production by forcing a change in design?

### *One Proximity Fuse Story*

One design for proximity fuses was to have the shells explode after so many rotations of the shell. (The term rifle, which characterizes all modern guns and canons, means that the bullet or shell spins around the direction of travel, maintaining the bullet's or shell's accuracy.) The shells of none of the vendors satisfied specifications for time from launch to explosion. All, but shells from one prominent manufacturer, however, exploded at a consistent time after launch. The error was that the proving ground design did not take account that the speed of rotation of the shells decreases as the shells travel. Shells were accepted from all but this one manufacture. The manufacturer with shoddy work challenged the rejection in the courts on grounds that none of the accepted shipments met specification. For a long time, the family did not buy any product from this manufacturer.

### *"But we Treat Dogs Better than you Treat your Neighbor"*

This story illustrates the reservoir of civility that played an important positive roll in the South's overcoming Jim Crow. Recognition of this civility may contribute to a guts

understanding of the quiet and undramatic positive response without self-promotion of many southern Whites to the Civil Rights Movement and a guts understanding of the establishment of the New South. As an example of undramatic positive response without self-promotion, during the early sixties, southern White money rebuilt the black churches torched in Birmingham Alabama.

(As an aside, I told my father of learning about the southern White money rebuilding the torched churches from a Black Southern Christian Leadership Council companion after an unpleasant exchange with a Birmingham cop. Dad made an observed that I did not: I was told of the White money to prevent me from becoming prejudice against Southern Whites.)

Two army recruits were arguing. A New Yorker said, "you Southerners treat Colored People like dogs."

"Yes, we treat them (actually, the N word was used) like dogs but we treat dogs better than you treat your neighbors."

I have told this story to Blacks returning to the South, often after several generations, because, with an understatement born out of caution, my father's observed that the Southerner may have been right. That is, I know one reason why they are returning.

### *Does Urban Life Corrupt?*

When driving to work in Aberdeen, Joe would often give rides to people, mostly military recruits. He observed that rural youth usually had more courtesy than urban and that blacks tended to be more courteous than whites. Northern urbanites, when leaving the

car, would often show no thanks and even slam the door. The northern urban blacks showed only a little more courtesy.

## **Officers' Observation Post**

My father was an observer with officers shortly subsequent to establishing one of the Okinawa beachheads.

### *He Who Has Real War Stories Doesn't Tell Them*

I doubt that my father had a real war story but there is one story I heard only once that involves grunts experiencing real war stories.

He described watching a line of soldiers attempting to take a Japanese position and being beaten back. The next day, the line took the position.

Once while having dinner at Don the Beachcomber, the background music was taps played with flourish on Hawaiian guitars. The flourish was sufficient that I did not recognize the tune. My father became stiff and my mother asked, "that is taps, isn't it?" He recalled the playing of taps for the burial of dead soldiers in Okinawa. I believe they were those killed in this battle.

### *My Father Loved Telling Non-Real War Stories*

A story from the same observation post was heard many times.

A type of proximity fuse first used in Okinawa was made to explode with shrapnel over the target by a microwave pulse. These shells were not working; they exploded all along their trajectory. My father and others at the post learned that the proximity fuses were working correctly at the other beachhead. My father would make a point of denying credit to himself and would credit a colonel for suggesting, "I wonder if the radar on the ships is of the same frequency as the pulse for the shells." Indeed, that was the case.

## **Civilians and Prisoners of War**

Official Japanese propaganda to Japanese troops and civilians was that, upon capture, the Americans would torture and kill them. Like most effective propaganda, the claim of torture and murder had a large element of truth. To put Dad's stories describing US troops in the Pacific in perspective, however, there were also cases of exemplary and better, even heroic, behavior to protect prisoners and civilians. Nisei code-breakers would enter the enemy camp to persuade Japanese to surrender rather than commit suicide. At least on Saipan, local people captured earlier in the war were used to broadcast with loud speakers in the local language, pleading for the local population not to commit suicide. My Dad's assessment from the following stories was, if Americans can act as he described, so can any people. I fear that the accuracy of that assessment about Americans is just about Americans at that time.

In Okinawa, to protect prisoners of war, an army unit was promised a case of whiskey for every live prisoner of war. The higher staff had to change the promise to a case for every prisoner of war alive two days after capture. By that time, the prisoner was out of this unit's hands and would not be killed or seriously injured by them. The same unit entered into a village with tanks. When women, children and old men tried escaping by climbing a cliff, the tanks blasted away at the cliff. (He once emphasize to me that he saw this happening.) He believed that an attempted or actual suicide bombing by an individual youth climbing on a tank with an explosive provoked the behavior.

### **Don't Do That**

In Okinawa, my father was doing archeological research on a battlefield; that is, he was investigating battle debris and collecting some to learn more about Japanese weapons. He heard a bang and a whistle pass by his head and looked up. He saw a flash in a cave, again heard a bang and a whistle. He shouted, "don't do that!" After the third shot, he decided to move to put a boulder between him and the cave.



## Guam

Joe came to Guam from Okinawa, sleeping on mailbags in a cargo plane. In the morning he got all spruced up to go to the office and discovered he was far enough behind the front that people celebrated Sundays. He went to a beach for a swim and lay in a shade of a tree to rest. He looked up and decided, although he knew little about coconuts, that it was unwise to leave his head under one.

Years later, on my first weekend on Guam, I took a break and walked on the University of Guam Marine Lab reef and took a swim. When my boss learned of this, he mildly blanched and gave me a photocopy of an article from *The Guam Recorder*. The conclusion of the article was that the reef is quite safe except for an ignoramus like myself at the time. Stonefish hide in the sand and have very venomous spines; cone shells have a poisonous sting, some are very toxic. Other animals with toxic spines were not included in the article.

When I sent the copy of the article to my father, he wrote, "Oh, I was told about some of these animals and about toxic sea serpents. I was very skeptical." There are sea serpents in the Pacific although not on Guam. Sea serpents are very venomous.

## Ulithi

My father and I were talking to three co-eds on the University of Guam campus. When they said they were from Ulithi, he responded with "I have been there."

"On what island?"

Although I did not know that Joe had been in Ulithi, I knew the answer, "In the middle." Ulithi is a beautiful large atoll; the fleet for the invasion of the Philippines assembled inside Ulithi.

He later told me that on one of the islands there was a most impressive thatched building being used as a bar. The building was probably a men's house. Then, I recalled the story about the bar. He never described the building before.

A large number of military men and Joe went ashore to the bar. They stood in line to exchange money for a chit. Then, they stood in line with the chit to buy a drink. Then, with drink in hand and drinking, they stood in line to buy a chit; and etc. etc. and so forth.

When time to return to the ship, they were too drunk to climb the Jacob's ladder to board the ship so they boarded by being lifted in cargo nets. That is, all but officers. Being lifted on deck by a cargo net was too undignified for an officer. The officers had a place on island to sleep and climbed the Jacob's ladder the next morning.

Many years latter, I met other Ulithi co-eds sitting at exactly the same place and I had to tell the story.

## **New Guinea**

In New Guinea native stevedores teetered while putting a heavy piece of cargo on their heads and ran with the cargo to the location where it was wanted. My father asked, "Are they working so hard because we are watching?"

"No, they always work so hard."

At another location, he asked, "Are these from a different tribe? They look different."

"No, they are women."

To defend my father, they may have also been from a different "tribe" or location. Often "one talk" or, as New Guineans say to outsiders, "people from the same place," have distinct appearances that are also very distinct from other New Guineans.

These stevedores would work for three months and purchase western niceties such as radios and toilet seats. How they used some of these things, who knows?

## **Retaking of Corregidor and Gas Warfare**

My father was present during the retaking of Corregidor, Philippines, by United States troops. The Japanese were in the tunnels and the United States possessed the exits of the ventilation ducts. The United States was pouring lit gasoline down the ducts that the Japanese extinguished with blankets. My father suggested using pentane gas instead. The hoses were already prepared to deliver the pentane down the ducts when the command received a message to inquire of the scientific advisor whether pentane is poisonous. Joe demurred. The message was repeated. Joe reluctantly stated that pentane, as all petroleum gasses, was somewhat poisonous. The responding message was, "do not use."

Another part of the story is, that although Americans built the underground labyrinth, the invading troops did not have the plans for the tunnels. The plans were top secret and locked up in Washington. Because of this experience, my father speculated, although did not believe, that the information on the nuclear bomb provided to the Soviets by Fuchs and other spies was in a safe in Stalin's office and never given to the scientists who could understand and use the material.

## Notes on Korea

A few short things from Joe's Korean trip during the Korean War.

### *Night Air Reconnaissance*

A means of night reconnaissance from a plane involved a flare, which lit after the parachute carrying it opened. The parachute shielded the observer's eyes and camera from the glare of the flare. The image from the camera just as the flare lit might catch soldiers with branches on their backs falling forward. Once fallen, the soldiers would look like bushes. Clever and simple technique of reconnaissance, but the Chinese managed to march undetected.

### *"Oh, They Are Much More Clever with Machinery than Americans"*

Conversations similar to the following were reported upon Joe's return from Korea.

"What are Koreans like?"

Joe's response, "Well, like Americans."

"Surely they are different from Americans."

"No, they are like Americans."

"There must be some way in which they differ from Americans."

"Oh, they are much cleverer with machinery than we are."

Laughter.

If you ever looked under the hood of a taxi in a third world country, you know what Joe meant and that he is correct. (When you live in the environment, however, you learn that most of these improvising mechanics do not understand maintenance; that is, preventing the need for repairs and planning for repairs. Examples of

maintenance are changing oil and having an extra fan belt because fan belts break.)

*Japan is Beautiful*

He did not find Korea attractive. The mountains were bare from people stripping all trees for firewood. Firewood sold in markets was tree branches. Later, I was able to inform him that, in South Korea, the mountains have become covered with forests. In his short time in Japan, he found the country beautiful.

**SARAH  
LAWRENCE  
COLLEGE**

## **Maria and Sarah Lawrence College**

When Joe accepted a position at Columbia University in 1939, Mother, after an association with Columbia, in January 1941 took a position with Sarah Lawrence College. Sarah Lawrence was a women's college. The faculty position was part time until the 1945-1946 contract and she made clear "When my children are sick, I am sick." World War II interfered with an intended workload allowing significant time with her children. She was glad to fight Hitler; however, by joining the Manhattan (the nuclear bomb) Project although she regretted the extra demands on her time. A letter of February 7, 1944, during a year's leave she stated, in comparison with teaching at Sarah Lawrence, "spending at least 40 hours a week in the laboratory is rather strenuous when combined with two children." (This has the sound of everyone's wartime understatement when it comes to personal sacrifices.) She worked first on Manhattan only and later including commuting between New Jersey and Los Alamos, New Mexico.

Initially, she was hired temporarily to teach one mathematics course to replace a sudden resignation. Although all evaluations except one from her interview were very positive, there was anxiety in hiring her since her previous experience (and subsequent experience) in instruction was only with graduate students. The 1942-43 catalog had Mrs. Mayer instructing Introduction to Physics and, jointly with Mr. Miller (Henry Miller), Physical Chemistry. She also instructed mathematics the second semester.

In September 1943, Dr. Constance Warren, President of Sarah Lawrence College, received a letter from Harold C. Urey containing "I am writing this letter to request a



leave of absence for Dr. Maria Mayer, ... . Dr. Mayer fits almost uniquely into the particular part of the program which we must carry out." At the time, Professor Urey was Director of Research for what we now know as a subproject of the Manhattan Project, separating the two isotopes of uranium.<sup>1</sup> So Sarah Lawrence missed her for a year and she missed Sarah Lawrence. She returned for the 1944-1945 academic year and remained through December 1945, when the family moved to Chicago.

Since little is written in Maria Goeppert Mayer's biographies about her teaching at Sarah Lawrence, this section goes beyond personal stories, including research of documents from the Sarah Lawrence archives.

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<sup>1</sup> The two isotopes of uranium, 235 and 238, are chemically identical, so cannot be separated by ordinary chemical means. To make a nuclear explosion, one needs a concentration of 238.

## **Sarah Lawrence College**

Sarah Lawrence was established as a two-year college in 1926, principally as a feeder to Vassar. The first class was admitted in 1928, graduating in 1930. The College's first graduate was in 1929. In 1931 Sarah Lawrence was chartered as a four-year institution but maintained a two-year degree through 1946. My mother felt that the abolition of the two-year degree was a mistake.

"[A] central goal at the founding was to educate young ladies of good families to take their proper place in polite society. ... A centerpiece of the education was something called 'productive leisure,' an activity with which each student had to occupy herself for eight hours a week. Among the possible options: French conversation, modeling, art appreciation, crafts, make-up, athletics, music, tap dancing—and also natural dancing—observing stars, typewriting, shorthand, literary club, bird club, public speaking and gardening" [Kaplan, 2005].

Although some of the options under "productive leisure" might take a form making them legitimate mainline college activities and others are probably valid vocational training activities, the change away from finishing ornaments started early with the removal of the productive leisure requirement in the 1930's. However, in the 1942-43 catalog included a course, under psychology, "Child Development in Our Culture" that seemed to have a large component of legitimate college level academic matter but also concerned how to raise children and get help for family problems, etc. The fine arts section of the catalogs through 1943-1944 contained dance as recreation, but not as a credit course. Through the 1944-1945 the catalogs contained a family-

spending course, Consumer Economics. This was at a high level for such a course, including finance. The second semester was general economics. The catalogs in 1942-43 through 1945-1946, under The Natural Sciences and Mathematics, included courses on "Marriage and the Family" and "Marriage in Wartime." "Marriage and the Family" remained in the catalog through the 1947-48 academic year. From a conversation with an alumnus from the 1970's, the students in the 1970's laughed at the purpose "to educate young ladies from good families to take their proper place in polite society." Current students (2006) are aware of and amused with this statement of purpose.

The hiring of my mother and the chemist instructor, Henry Miller, was part of the process of including academic intelligence in the finished product.

I am sure that there is no firm date of Sarah Lawrence's transformation from a finishing school to a fine college. Given the quality of some of the faculty and the quality of students reflected in my mother's fondness for the students and her description of some, there probably never was the intermediate step of a college. Kaplan [2005] in her history, *Becoming Sarah Lawrence*, represents the transformation from "to educate young ladies of good families to take their proper place in polite society" to the current Sarah Lawrence producing thinking adults as a continuum. She represents the influence of John Dewey and his progressive movement in instruction as a common thread of the education provided by Sarah Lawrence throughout the College's history. Two factors, however, were probably germane to the transformation: after having the same President since a year after founding, the College acquired a new President in 1945 who served until 1959; and in 1946, Sarah Lawrence temporarily

accepted male students under the GI bill.

The College became fully coeducational in 1968.

## **Maria as Part of Sarah Lawrence and Sarah Lawrence as Part of Maria**

In a 1994 convention, I met a Sarah Lawrence professor. I told her, "my mother is ... and ..." As an interruption I received, "Yes, and we know that she once instructed at Sarah Lawrence." For dedication of a new science building in 1994, the College had Peter J. Price [1994], a theoretical physicist with IBM TJ Watson Research Center, prepare a biography of my mother. Of course the later acknowledgements and kind references from Sarah Lawrence concerning my mother are also a matter of bragging. Remembering Maria Goeppert Mayer as an instructor at Sarah Lawrence was necessary, however, to make the connection to the Maria Goeppert Mayer of the international news.

The contents of a letter of November 8, 1963, from the President of Sarah Lawrence College follow.

Dear Mrs. Mayer:

I want to send you the congratulations of Sarah Lawrence College on your receiving a Nobel Prize. There was a spontaneous burst of applause in faculty meeting a few days ago when I spoke of it.

Many members of the faculty have spoken warmly to me of your time here. The College is of course honored that you number it among the places where you have made a contribution.

Sincerely,

Paul L. Ward

Her reply of November 21:

Dear President Ward:

Thank you for your kind expression of congratulations on behalf of Sarah Lawrence College.

It is extremely gratifying to be remembered by my friends and colleagues during this eventful and rewarding period of my life.

Sincerely,

Maria Goeppert Mayer

Proof of memory of my Mother at Sarah Lawrence between her resigning and her receipt of the Nobel Prize lies in a third of a page résumé for my mother dated May 31, 1950. No source was given for the résumé; a note on the carbon from the Sarah Lawrence archives states, "Sent to Miss Constance Warren, at her request." Miss Warren was President Emeritus of Sarah Lawrence at the time and was President during most of my mother's tenure.

Correspondence to my mother included warm salutations and complementary closes—such as "My dear Mrs. Mayer," "Yours very truly," "Very sincerely yours," "Very cordially yours"—that only partly reflect the less curt writing of the 1940's compare with the beginning of the twenty-first century. The body of the letters include "writing to express our appreciation of your work," "very happy about your work," "we are very eager to have you with us," "very happy" or "great pleasure" in reference to an offer or mother's accepting such and "delighted to know you will be with us for the rest of this year."

Sarah Lawrence was asked to give my Mother a year's leave of absence for the 1943-1944 academic year to perform war work. Parts of a letter of October 1943 reflecting Maria Mayer's feeling about instructing at Sarah Lawrence follow. The letter is addressed to Miss Constance Warren, President of Sarah Lawrence.

I would have liked very much to have seen you and said au revoir to you personally, but it seems that this will have to be done by letter.

It is very sad for me to interrupt my work at Sarah Lawrence, but I hope it is only temporary. The contact with the girls at the college has been very pleasant indeed and each year I have enjoyed my work more. Teaching and the things it brings with it, namely, the human contact with a group of eager and interested girls is a wonderful supplement to doing research work; all of which lead up to the fact that I hope to be back with you again.

If told ... that if my leaving now imperiled the possibility of my return to Sarah Lawrence, the personal sacrifice demanded is too much and I would rather try and fight my draft ... .

All my inquiries around Columbia did not unearth any physicist, but I trust that [name of person] will prove to be reasonably satisfactory substitute. He is taking over a very bright and interested group of girls which I simply hate to give up!

The response included

... wish you all happiness in your work. I know how satisfying it must be to have such a feeling of making a direct contribution to the war need.

I shall be very glad to register your desire to return another year with the Advisory Committee on Appointments. Your leave of absence this year will in no way affect the situation. Each person who is not on a three-year contract is reconsidered, as you know, at the end of each year and you will be reconsidered just as though you were here.

In expressing her desire to return to teaching at Sarah Lawrence in February 1944, my mother wrote, "I would like to return to my work at Sarah Lawrence. ... I have missed very much the teaching as it is done at Sarah Lawrence—not the mere imparting of knowledge, but the human content of developing personalities."

I believe that the importance she found in "the human content of developing personalities" reflected two aspects: she chose to be more than a woman—that is, still a woman—and therefore could appreciate the finishing aspect of Sarah Lawrence—

especially those finished products who were more than ornaments—and that she appreciated the human content of being a human being.

In August 15, 1945, resignation letter my mother was extremely accommodating.

My husband has accepted a professorship at the University of Chicago and expects to start there on February first. ... In short, I would like to leave the College after the first semester. If, however, no suitable physicist can be found to take my position, I would be willing to stay 'til the end of the year.

It appears to me to be inadvisable for the College to look for a "substitute" to fill out for just one semester. ... I do hope that a satisfactory permanent successor for my position can be found.

It might prove easier to find a physicist now, at the beginning of the year. In that case I would be glad to resign immediately.

In view of today's news it should not prove too difficult for the College to receive the services of a competent physicist. May I make a few suggestions of names that occur to me? There is firstly

Mrs. Charlotte Houtermans.

I include the name of Mrs. Charlotte Houtermans from her list because she, indeed, replaced my mother. During subsequent visits to Sarah Lawrence, mother was thanked for suggesting Dr. Houtermans as her successor. Her letter concluded with

The work at Sarah Lawrence has been very enjoyable and interesting. I am very sorry indeed to leave, but I have no choice in the matter.

Very sincerely yours,

The reply from the new President, Harold Taylor included, "In view of the fact that the students in choosing your courses have been choosing you, we would prefer to keep you with us at least for the first term."



## Maria Goeppert Mayer's Physics Class

A review of the Sarah Lawrence course catalogs from 1942-43 to 1945-46 shows the evolution of the physics class of Mrs. Mayer—as she is listed as instructor of the course—to what Peter Price calls in quotes, “‘physics for poets’” [1995]. The description in the 1942-1943 catalog for Mrs. Mayer's *Introduction to Physics* was straight forward, “A short introduction in mechanics, heat, and sound. The principal stress of the course is on physical optics, electricity, radioactivity, and transmutation of elements.”

This early description, however, may show better than the later catalogs the substance behind the later catalogs' reference to “Science as a liberal art.” If written by a less qualified instructor, the description might appear as a Mickey Mouse smattering from different sub-fields of physics. A clue to course's substance is the inclusion of the on the frontier subjects of the time of “radioactivity, and transmutation of elements.” Although, as a single course, the depth of understanding in any sub-field would be limited, the understanding acquired would be firm and, to the extent possible, integrated with the other sub-fields. The properties of light and sound would probably be integrated through a description of wave mechanics. The student would likely understand at an automatic level the identity of the electrons of electricity and in orbitals around nuclei and in the beta particles of radioactivity.

Smattering science courses with lectures by prominent professionals can serve well for general education and as fine early professional courses. High-school chemistry and physics courses, without the benefit of prominent professional instructors, have to serve this function for the Caltech freshman, and freshmen in science and engineering

at other Universities. At the college level, the possible quality of smattering courses was demonstrated well to me by three Caltech's sophomore quarter length general science courses. These courses covered geology, the types of biology researched at Caltech and astronomy—the last I did not take. As far as general education, I still bore people and amuse myself by pointing to a formation and saying such things as, "Look! An intrusion! I did not expect such within a body of volcanic rock." I am sure that many of my mother's Sarah Lawrence students in their old age still exhibit similar behavior. As far as a professional base, I took further courses in biology and geology and the general science courses in the fields served me well.

The description of the Mrs. Mayer's *Physics* in the 1943-1944 catalog appears to have been written by the catalog editor (probably a good thing, since she was granted leave at the beginning of the academic year to work full time on the Manhattan, nuclear bomb, Project.)

The first glimpse of "physics for poets" is found in the 1944-1945 catalog. The description of Mrs. Mayer's *Fundamental Physical Science* follows

"The course presents man's knowledge of the universe and the atoms which compose it. It deals, consequently, with subjects which are basic to the sciences of astronomy, geology, chemistry and physics. Science is treated as a liberal art rather than pre-professional training. The course is, however, prerequisite for further work in either physics or chemistry. The laboratory work contains chemistry and physics as well as observation of stars. No previous preparation in mathematics or science is required."

The description in the 1945-1946 catalog is extended and the last paragraph explains the importance of a broad, integrated course as pre-professional training.

"The course presents man's knowledge of the universe and the atoms which compose it. It deals, consequently, with subjects which are basic to

the science of physics, chemistry, astronomy, and geology. The inter-relation between the sciences, especially between physics and chemistry, is stressed; the unity of physical science as a field of human knowledge is emphasized, rather than its arbitrary divisions.

The general student who approaches science as a liberal art will acquire a basic knowledge and understanding of the physical world and of the relation of science to modern life and thought.

For the student who intends to do further work in any of the sciences the course is especially important since it will not only present an introduction into his special field of endeavor, but also lays the ground work of the basic concepts of science which are needed for a thorough understanding of any one branch. Laboratory work deals with physics and chemistry and can be adapted to the special interest of the individual student. No preparation in science or mathematics is needed."

(As an aside, the exact same course description remained for several years under the instruction of Charlotte Houtermans.)

Occasionally, students would bring up the possibility of using the knowledge about radiation and the transmutation of elements to make weapons. My mother was mum when some students, correctly, speculated that she was working on developing such weapons. A major goal was for students to be able to understand news reports, far from a simple matter. Until the mid 1970's, science reporting was horrid, almost always uninformative or wrong. The label "atom" bomb for a nuclear explosion is an illustration of the lack of science in science reporting. Mother was very pleased when she learned that, after the bombs on Hiroshima and Nagasaki in early August 1945, some of her students gave community lectures explaining the nature of the nuclear explosions. Given the science reporting of the time, these lectures were essential for most of the listeners' understanding.

The Sarah Lawrence College Alumni Magazine (Oct. 1945) implies students' specific preparation for understanding possible forthcoming reports of a nuclear bomb.

"Following the government's announcement of the new weapon, descriptions of the potentialities of atomic power doubtless struck a familiar note to those students who heard Mrs. Mayer describe the role of science in post-war planning at a round-table held last spring. Hampered by the secrecy which necessarily surrounded the research, Mrs. Mayer nevertheless endeavored at the time to acquaint students with the bombshell that was to change *a//* future plans of the world.

From the students response to the news reports of the bomb it may have seemed that they were primed to interpret specifically that news. However, this is highly unlikely! Her students would have been equally prepared for interpreting news about a dramatic sonic weapon.

## **Sarah Lawrence Experiments and Our Home**

Although my mother was very much a theoretical physicist, her teaching at Sarah Lawrence included experiments to demonstrate scientific principles and properties. I regret that only during this writing, not while she was still alive, did I realize that a write-up of her collection of these experiments would be useful for teachers of science, especially to liberal arts students, for schoolteachers and for others. She mentioned replacing fifteen amps fuses with twenty amps fuses. (Yes, I am aware that this is a fire marshal's nightmare.) She also said she used soap bubbles, in one case to combine the oxygen and hydrogen from water electrolysis. When contained by a soap bubble, rather than by something harder, the combination makes a benign explosion when lit.

She used one of her collection to demonstrate the existence of air pressure to my sister and me. Take a soft metal container with a lid with an effective seal. In our case, it was an empty container for turpentine with a screw lid. Put small amount water in the container with the lid off and heat water to boil, leaving it boiling long enough to have steam—water vapor—replace the air in the container. In our case, a stove was used; in a teaching lab a Bunsen burner would be used. Remove from heat—well, turn off the gas—and put on the lid securely enough to be sealed. The container implodes.

Thanks to my mother, as a science demonstration for school and boy scouts, I electro-plated a dime with copper from a penny. I attached the penny to the positive electrode of a dry cell battery and the dime on the negative. (Once upon a time, there were dry cell batteries with knurled nuts to attach wires to the terminals. These dry cells were used for simple electric equipment, such as door bells and lights for models

of buildings, for school science experiments, and for children to play with low voltage electricity.) Both coins were put in the same beaker with a solution of copper sulfate. One could remove the copper plate on the dime by reversing the terminals for the coins.

My mother's interest in astronomy from teaching at Sarah Lawrence resulted in the family purchase of a three-inch reflector telescope that gave many evenings of family education and entertainment. My earliest memory of my showoff obnoxiousness was at a presentation on stars at a Unitarian Sunday school. I was six plus years old or less. Most often, before anyone had a chance to respond to presenter's question, I blurted out the answer.

**THE  
MANHATTAN  
(NUCLEAR BOMB)  
PROJECT**

## **Fighting Hitler**

Parallel to her life at Sarah Lawrence College, my mother was contributing to the war effort through work on the Manhattan (nuclear bomb) project, first only on Manhattan and later on Manhattan and commuting between New Jersey and Los Alamos, New Mexico. With expressed misgivings of not being at Sarah Lawrence, she took leave to work full time on the project during the 1943-1944 academic year. Although she never expressed the feelings, I am sure she had misgivings that the use of the bomb to defeat Hitler would bring such destruction to her homeland. As an illustration of misgivings, I remember a family discussion with guests at a later time where Joe spoke of my parents finding unfortunate that a town that they really loved had to be bombed because of a ball-bearing factory. Upon visiting Germany after the war, they were glad to learn that the ball-bearing factory was in the valley and the medieval town above the valley was unharmed.

Her children knew that we were fighting Hitler, not Germany. She remained very German. This was reinforced after the war with a monthly family ritual of wrapping CARE packages for mother's friends and relatives. At worst, the statement, "we are fighting Hitler, not Germany," was a more accurate simplification than "we are fighting Germany." In retrospect, it is the simplification that should be accepted now; for Hitler to scare us enough, we must recognize that Germany was the most civilized country in the first half of the twentieth century and, actually, this alone does not scare us enough.

Based on weak evidence and knowing who my mother was, she suspected or



knew that a similar statement would be appropriate for Japan; for Japan, naming Tojo is poorer than naming the Japanese military leadership as a whole.

My mother let me know that Japanese immigrants and their descendents were not our enemies. My parents with friends showed displeasure with hysterical anti-Japanese feelings by writing a letter to the editor of the *Baltimore Sun* in December 1941 or January 1942. The letter stated that out of patriotism and to show proper hatred for our enemy, the Japanese flowering cherry trees in Washington D. C. should be cut down. Given outraged response at the idea of cutting down the beautiful trees, they were forced to write a follow-up letter explaining that the position was sarcasm and what they were ridiculing. As Maria's son, I knew, before it was knowledge among my peers, of the heroism and quality of the Nisei 100th battalion and the 442 Regimental Combat Team.

My mother's work with the Manhattan project resulted in good stories and the two of us sharing observations of one of my Caltech professors who worked at Los Alamos during the war.

## **Lobsters**

During lunch, while working in Manhattan on the Manhattan Project, she would sometimes shop for dinner for her family or for items for herself. She became very annoyed that guards were required to inspect and put their hands through packages that she carried out at the end of the day. She expressed this with, "I must shop for myself and family and I do not like people knowing what I purchased."

One noon, she purchased live lobsters for the family. Note that Atlantic lobsters have large and strong claws. Now, preparation for sale includes holding the claws shut by stout rubber bands. Previously, a wooden wedge held the claws shut. The wedge was put in a space on the back of the claw that closed when the claw opened. She removed the wedges and when leaving that afternoon, she demanded that the head of security inspect her packages. (I am sure that my image of her demanded that General Groves, principal administrator of the Manhattan Project, inspect the packages is a bit exaggerated.)

From that time, "no Mrs. Mayer, you may pass" (without package inspection).

## Living in Los Alamos

For her stays in Los Alamos, mother was first lodged in a women's dormitory. The story is that, previous to my mother's residence, a man took his horse into the dormitory to join in the fun. Therefore, there was a rule against male presence in the dorm. This resulted in combat boots being dropped on the floor at five AM, since the security detail arrived at six. Mother pleaded that men be allowed in the dorm so she would not be awaked by dropped and walking boots at five AM.

The reaction was "that's an awful place for you to live." She was given a two-bedroom house and, like most in Los Alamos, she had an Indian or Spanish maid clean once a week. ("Spanish" refers to Spanish speakers who were in New Mexico when the named changed from Nuevo Mexico.) Los Alamos was dusty. Maria said she could see her footprints if she entered the vacant room before the maid came. A Brit, who was collecting Navajo rugs for his return to Britain and—he claimed—kept them double on his floor, lent Mother rugs.

I recall three short remarks germane to her social life:

- Martinis were made with sherry due to the shortage of dry vermouth;
- When Klaus Fuchs was found to be a spy after the war, she and many others had the same after-the-fact reaction: yes, Fuchs could be spy since we did not really know him; one Englishman who first learned that a physicist who graduated from Bristol University was a Soviet spy, reacted with "it must be Klaus Fuchs," again, because of a feeling that he did not know him.

After my freshman camp at Caltech, I wrote my mother that Richard Feynman was the most interesting person I had ever met. She responded with some stories about Los Alamos and said that, if I felt that way, I had excellent taste.

## **Intersection—War Stories and Manhattan Project**

### *My Father's Story*

After traveling throughout the Western and Southern Pacific, Dad returned to Hawaii. He went to the post office and requested letters addressed to him, care of general delivery. Dad clearly just returned from a long sojourn in the Western and Southern Pacific, being unshaven and jaundice color from long use of an anti-malaria drug. Dad said he has never seen a man look more apologetic than the postal clerk when he said, "I returned a whole stack of letters two days ago with a note saying not claimed."

So he made a person-to-person phone call to New Jersey. (For those who do not recall when long distance calls were expensive and had to be placed through an operator—one could make calls to a person—person-to-person—for a premium rather than station-to-station. The intention was not to pay for the call if the person was not available and someone else answered the phone. A person-to-person call could also serve as a detective service. To find an individual, one could make a person-to-person call addressed to the person but using the phone number of someone like his father.) The call was forwarded to Los Alamos where the call was interrupted by security before significant conversation. My father, however, with knowing that the family was safe in New Jersey and mother was safe in New Mexico, stopped trying to phone mother.

### *My Mother's Story*

My mother, however, was frantic. Through a series of phone calls, she was able to talk to Joe. Before talking to Joe, the censor gave instruction, "be sure not to discuss troop movements," etc. etc. Her reaction, "I haven't spoken to or seen my husband for over

four months, do you expect me to ask about troop movements?" She found that Joe was well. At the end of their conversation, Joe asked what was her phone number. Maria was about to say "P. O. Box 1663, Santa Fe, New Mexico, and try to persuade the operator that this box has a listed phone number" when the censor interrupted. Joe phoned New Jersey to get a phone number.

*Note on P. O. Box 1663*

Every thing that occurred in Los Alamos during World War II was said to occur in Post Office Box 1663, Santa Fe. Babies were born there as others died in the Post Office Box. Providing the Los Alamos phone number was contrary to security regulations so one told the operator that one was phoning P. O. Box 1663, Santa Fe, New Mexico. Sometimes, with great effort, it was possible to persuade the operator that P. O. Box 1663 had a listed phone number. My mother did leave a phone number in New Jersey with our housekeeper, however.

Once, when others and I looked skeptically during a story about births and deaths in the box, my mother said that it was a very large post office box. Although I understood her humor, I still have an image of an uncertain sized but large door with post office box combination lock. The door opens on a storeroom with fluorescent light and a light colored linoleum floor.

## **The White Sands Bomb**

My mother wanted to witness the test bomb but she was not in Los Alamos at the time. She arranged a code with a person so she could call Los Alamos and find the date of the test and go to Los Alamos to see it. During July 1945, however, security cut all phone communication in and out of Los Alamos. The belief—likely correct—was that the prospective event was too exciting for people to be silent. So she did not see the test.

After the fact, or even from the point of view at the time, was strong security after the bomb's development desirable? If the Japanese knew that the United States possessed such a weapon and—very importantly—sufficient material to make more in sort order, would Japan have sued for peace before the United States used it? Was there a way to let our enemies know without being so sloppy with security that the information would be taken as intended misinformation by the Japanese recipients?

My mother kept a piece of fused sand from the White Sand's test in a cardboard jewelry box how one might keep ring or a small broach. The fused sand was kept between two absorbent cotton pads and the box was kept in a bigger jewelry box along with jewelry. At one party while mother was showing the fused sand, I touched it. I could not understand why I was made to wash my hands, thoroughly.

## **Our Dog's Name**

Elements heavier than uranium have a larger atomic number, number of protons or positive charged nuclides in the nucleus, as well as larger atomic weight, the sum of all nuclides—protons and neutrons. These elements, at least on earth, have to be manufactured. Based on—what turned out to be accurate—speculative theory, the isotope of weight 239 of the element with number 94 was believed, for weapon development, to be the most interesting of these elements. That is, it was believed to be useful to make nuclear explosions and was later used in the Nagasaki bomb. After first manufacture, the element was named plutonium.

There was a fairly non-transparent code that scientists used to discuss elements; it was to give the last digit of the atomic number followed by the last digit of the atomic weight. The code was fairly non-transparent except that the important isotope and the one most discussed had number 94 and weight 239. The code gave a readily understandable inverse of the atomic number, 49. Upon hearing forty-nine, my mother objected that the code was too simplistic to be of any use until a person tried using the code to discuss other isotopes.

Shortly after the war, we acquired a dog. Although my mother objected that the name Plutonium Forty-Nine belonged to a black dog, the abbreviated name, Pluto, stuck. I am the only one who remembers that his first dog license had the number 49.

## **Revelation and the End**

One day while staying at Wauwinet, Nantucket, the family walked to Quidnet to meet with the landlord of previous summers—at least that was an excuse for the walk. While in her house, the former landlord said, “I suppose you’ve heard of the Atomic Bomb.” (I do not remember this at all; I am sure that the conversation was meaningless to me.) Not having a radio in our cottage and rarely receiving a newspaper, no we had not. I suspect that this conversation took place August 6, 1945. It took place between the Hiroshima and Nagasaki bombings.

Making understanding difficult was that what became the “atomic bomb” was not an atomic explosion but a nuclear explosion. Heaven knows what an atomic bomb or explosion would be although a conventional or molecular bomb could be called atomic with a little less strain on reality than so naming a nuclear bomb. My father’s belief that work on the nuclear bomb would win the next war, not this, did not help.

The meaning was finally understood.

When returning to Wauwinet my sister, and I were required to walk ahead out of earshot. I remember being tired and wanting to walk with my parents and being hurt that I was not allowed to. My sister, being six years older, seemed to have a general idea why we were required to walk out of earshot. At that time, my mother explained to my father the status of work at the Manhattan Project.

My parents borrowed a radio. This was the first and one of the rare times I remember them paying attention to a radio. They listened to news reports involving the war with Japan. (The other times I recall my parents paying attention to the radio were



during political conventions in 1952, '56 and 1960 and during the Joseph McCarthy hearings. They paid less attention these times than in Nantucket) Back to Nantucket, I recall that there was a second one of something important. I understood the meaning of Japanese surrender.

Some days after surrender, a Wauwinet theater put in mothballs at the beginning of the War was taken out of mothballs for an evening of amateur performances. I only recall laughing with the audience at funny sounds when a summer neighbor from Chicago, Mr. Adler, performed by sitting on a chair speaking incomprehensibly. (My mother told me later that, for her, it was meaningless, not German or some other foreign language.) My mother observed to Joe, correctly, that Mr. Adler must be Dr. Mortimer Adler. At the time, Mortimer Adler was a professor of philosophy at the University of Chicago. That Mr. Adler was from the University of Chicago was of interest because Joe had accepted a position at University of Chicago commencing February 1, 1946.

**JOE**

## Travel, Pre-Maria

### *Silver Mining*

One summer while he was in high school, my father with other lads took a car trip. In order to fund needed car repair, they worked at a reopened silver mine. New technology enabled economically squeezing more silver out of the mine. The workers were housed in tents in a valley below the mine. Three streets of the ghost town nearer the mine were refurbished. The lowest street contained whorehouses. The middle street contained poker parlors. In these parlors, the players sat at a big round table and the dealer, with a revolver as a side arm, sat on a high stool above the table. (My father, at first, called a seven foot diameter stout solid walnut round dining room table acquired with the late nineteenth century Chicago house and later moved to California, a poker table.) My father was sure the games were honest. The top street contained some homes of the foremen and administrators of the mine and churches.

After exploring the rest of the town, the lads decided to investigate one of the churches. People were rolling on the floor, shouting halleluiah, perhaps speaking in tongues, and shouting "Jesus saved me!" "Jesus save me!" and other similar phrases. Shortly after entering, the preacher, or whoever was at the podium, pointed to one of them—my father says he is glad it was not at him—and shouted "you there, you there, confess your sins!"

### *Joe, the Sugar Chemist*

After graduating from high school, dad worked as a sugar chemist during a sugar beat harvesting campaign in Utah. I believe this involved routine assaying of beat juice

samples.

He was a boarder in the house of a Mormon man's second widow. His fourth widow moved in with his second widow. My grandmother believed that Joe almost converted to Mormonism. This would have been true if Joe's refusal to believe in magic did not extend to disbelieve in an activist God. He was impressed, however, with the decent social interaction and high morality induced by and associated with the Mormon religion. He emphasized that when the Mormons practiced polygyny, it was under a strict moral code. Earlier wives must approve of any additional wives and, after the first wife, the man must show that he is able to support additional wives. Further, Mormon polygyny evolved in part to deal with a moral problem. The Church was particularly successful in converting Scandinavian women who, upon conversion, migrated to Utah. Unattached women in a frontier agricultural community have difficulty having a good life or even surviving. Joe also enjoyed the Church sponsored dances.

A problem developed when the second widow asked how Joe was going to pay for his board. The contract with the company included payment of board. He eventually spoke to a lawyer who said it would not be a problem to win the case for non-payment of board although Joe might not receive full compensation. It would not be a problem until the lawyer determined that the Mormon Church owned the company. No lawyer in Utah would take the case.

I have learned of more recent similar cases. A person with a large claim was able to hire a San Francisco lawyer. Unlike for a Utah lawyer, a threat to the practice of a San Francisco lawyer of a Mormon boycott is like a threat to an elephant of rape by a

flea. One Mormon who was challenging a Church company with a San Francisco lawyer was asked how he could reconcile being a Mormon and challenging the Church in court. In his way and from his experience he expressed Joe's feelings, "The Mormon religion I learned from my mother is one thing, the Church organization is another." Joe's wording was closer to "the social interaction of Mormons and in the Mormon community was pleasant and moral; the church as an organization, however, was very corrupt."

### *Grandma's First Gray Hairs*

Before his post-doctorate position in Göttingen, my father owned a motorcycle. Later, when a neighbor purchased a car but kept his motorcycle, the neighbor said that the motorcycle is so much sportier than a car. My father's response to my mother's skepticism was "it is, you did not know me when I had a motorcycle." I believe that he was glad that I was not interested in a motorcycle since he very rarely, if ever, talked to me about once owning a motorcycle. I do not know how Joe took to my riding on a bicycle on the roads around Chicago before and while in high school. My grandmother claimed that she acquired her first gray hairs when Joe bought the motorcycle.

### *Onion Soup*

This probably took place after meeting Maria. He and another person took a wine trek, hiking down the Ruhr valley. One evening, they arranged to stay at an inn and when asking where they could have dinner, they were told across the river at the next town. When the two looked crestfallen, the owner said, well I can give you onion soup. They agreed to have the soup even though it sounded unsubstantial and were glad to discover that French onion soup is a hardy meal.

For one birthday dinner I requested a meal of Onion soup as Joe learned to prepare by observation and I have imitated his recipe when having onion soup parties.

## **Discussion of Paranormal Seemed Paranormal**

One evening, Joe was pontificating to guests about the possible basis for seemingly supernaturally caused nearly identical simultaneous creations by different people when any way for the people to communicate was unknown. About the only things I could not imagine my father discussing are matters with any hint of a paranormal cause for anything. I later determined why my father might be interested in this case from a story told by my sister.

Joe described uncannily similar poems by two poets published simultaneously. The subject matters were the same and many of the couplet rhymes were identical. Joe liked that the two poets were more curious to find what happened than angry or accusatory. It was found that the less prominent poet had published the poem earlier in an obscure magazine. The prominent poet sent a letter of congratulations but obviously had forgotten about it. Joe's conclusion was such paranormal phenomena were probably, in fact, unconscious plagiarism.

Why would a person, who simply cannot accept or even dream of accepting the existence of magic—rather than slight of hand—consider the proof or disproof of a set magical happenings a matter for discussion?

When asked for something at a conference, my father would ask the person to write. I believed that the reason was that the person needed the favor of my father's assistance but did not need the favor of my father remembering to do something. This was certainly a reason but another reason was probably more important.

At a conference a student was discussing his Ph. D. project with Joe. My father

did not understand what he was saying. About a month later, Joe was sitting at his desk and thought, "this is an interesting idea," and he wrote it up. The student's dissertation advisor phoned Joe and asked how Joe dared steal the idea from his student. Needless-to-say, Joe was deeply embarrassed and ashamed. Joe would ask people to write so he would be less likely to make the same mistake again.

Joe's interest was not in the paranormal but in unintentional plagiarism, *his* unintentional plagiarism.



## **Wine and Prohibition**

### *Baltimore Police*

Maryland was one of two states to never ratify the Eighteenth Amendment to the constitution, the Amendment that ushered in Prohibition. My parents heard that if you asked a Baltimore policeman where there was a restaurant that served wine, you would be informed. My parents tested this proposition. The policeman responded with "you asked where there is a restaurant. Down the street at the next corner in the building basement there is a restaurant." When asking in the restaurant for wine, no verbal nor non-verbal response was given but a teapot with two teacups appeared.

### *Winemaking*

For winemaking, my parents separated grape skin and seeds from the pulp and juice in their washing machine. For weeks after separating grape juice and pulp from the seeds and skin, the washerwoman was frustrated by purple spots on Joe's white shirts. (I suppose that before my memory, Joe wore nothing but white shirts. What will surprise those who knew Joe after the two moved to California in 1960, previous to the move, he nearly always wore white coarse cotton tailored shirts with two button-down flap pockets. He would have them made, two dozen at a time. Within my memory, he always wore such shirts until my sister and I, with trepidation, purchased a summer sports' shirt for Father's Day in 1956.)

During prohibition, yeast was labeled with "not for making alcoholic beverages." People who have more recently lived in Saudi Arabia are familiar with the ruse. So my parents purchased wine yeast in Germany and had it packaged with a label stating "not

for making alcoholic beverages.” Just adding wine yeast to the juice and pulp was wasteful, since the wild yeast would dominate the fermentation. The way Joe addressed the problem was to sterilize a quart of juice through heat and grow the wine yeast in this quart. Pouring this quart with a well-established wine yeast culture into the larger amount of juice and pulp would initially provide enough wine yeast so that this yeast would dominate the culture.

They found that the yeast defined the taste of the wine more than the grape.

When I asked Joe what vats he used and for suggestions on buying wine yeast, he recommended that I buy Gallo wine, “it is easier and tastes a little better.” (Note: to an American, the Gallo brand epitomizes cheap wine.)

## **You Know, The John Ford**

In the earlier days of commercial airline flights, sometimes liquor was available on the flight and sometimes not. My father would carry a silver flask with brandy. On one flight, he offered some brandy to the person next to him. The person put out his hand to shake my father's and said, "I am John Ford, you know, The John Ford."

"I am Joe Mayer, you know, The Joe Mayer" As Joe put it, "we were even." Joe was searching his memory of the Detroit Fords as a conversation similar to the following took place.

"Do you know who is John Wayne?"

"No."

"Have you heard of Clark Gable?"

"No."

"Have you heard of Olivia de Havalland?"

"No."

"Surely you have heard of Carey Grant"

"No."

"Betty Grable?"

"No."

This went on until "Have you heard of Sonja Henie."

At that point Joe understood but was not going to admit it. "Sonja Henie: oh Sonja Hinie's; of course I know and have met Sonja Henie, herself; she owns and runs a Norwegian restaurant on 42<sup>nd</sup> Street in New York. Sonya Hinie's has the best

smorgasbord on Thursday evenings."

"If all were like you, Hollywood would go broke."

"If all were like I, Hollywood would have to make good movies."

### **Never Fly in a Lockheed L-188 Electra Turboprop**

While waiting in an airport, a man sat down next to a gentlemen near Joe and explained why he never flies in Lockheed Turboprop airplanes because of the accidents this model plane have been involved in; etc., etc. and etcetera.

Then the man sat down next to Joe and started to go through the whole spiel when Joe said an authority in statistical mechanics equivalent of, "I am not sure if one has marginal cost pricing in this case. The concentration ratios are high but there are negligible barriers to entry. Even the goodwill barrier is low and the economies-of-scale barrier is nonexistent! However, it would take time before the entrant would acquire a significant market share and the present-value of short-term profits may be greater than the present-value of maintaining the market share. Would all the firms agree that the present-value of short-term profits is greater than the present-value of maintaining market share?"

The man stood up, moved away and was watching Joe with great worry until Joe left on his flight.

## **Are You Afraid of Hummingbirds?**

Perhaps the first addition to my parents' new California house was hummingbird feeders. As dusk was approaching, Joe would ask guests "Are you afraid of humming birds?" and take them to the feeders.

(My father would shine spotlights on the feeders to enhance hummingbird color. Much of the color of hummingbirds is not from dyes or the color of feathers but differential reflection. Some feathers have a thickness equal to a small number of light wavelengths—perhaps one wavelength or less. Light would reflect off both sides of the feather. Some light would reflect off the front surface and some would go through the feather and reflect off the back surface. This results in enhancing reflections for some light wavelengths and canceling reflections for other wavelengths. Different wavelengths of light produce different colors. When seeing both reflections, the enhanced wavelengths or colors show.)

As dusk approached, hummingbirds would swarm around the feeders. I doubt anyone was really afraid, but I found the hummingbirds disconcerting and if bumblebees acted this way, I am sure many would be afraid. They would dart from one stationary position to another—from, say, in front of a person to the right of the person's ear. (For a physicist, it was as if they were darting to different quantum states. This reference, I will not try to explain.)

## **Memories for Fathers' Day not Found Elsewhere**

The last conversation with my father included, "You have been a good son."

"Yes, in the last years I have been a good son but I have caused you a lot of trouble." When he demurred but speechless, I told him the response of a college friend of mine whom he knew gave to a similar comment about causing Joe a lot of trouble, "Have you looked at any other son, including your classmates at Caltech?"

"I was lucky to have had you for a father."

"I was lucky to have had you as a son."

I meant everything I said with doubt of the accuracy only of the response I gave for him for "but I caused you a lot of trouble." The "I was lucky to have had you as a father" was an understatement!

During the same visit with Joe, I cleaned up after his being incontinent. I said nothing. I regret not telling him "Although I do not enjoy seeing you incontinent, I hope your attitude is 'I cleaned up after Peter enough, it is about time he cleaned up after me.'"

While I was in high school, Joe would often drive me to school. I was quite capricious when he would drive me. Some mornings he was up early and drove me and some not. We would pick up fellow students at bus stops. I remember an older student commenting on a physics problem and my father trying to explain the answer while driving and moving his finger over the windshield as if drawing diagrams. (I believe it was something that when not driving and with a chalk board he could explain better than any high school physics teacher.) I asked the student to please not bring up such

things while my father is driving; his driving while trying to explain the problem scared me. "Yes, he was distracted from driving."

A story I would have loved more when I was in high school than when I heard it many years later is from a chemistry classmate of Dad while the two were working on their Ph. D. at University of California at Berkeley. This classmate at a party was being made silly by the passions of a lovely female. This classmate remembers Joe saying firmly, "you're drunk; if you are not, say that you are!"

While I was in high school we discussed possible careers. I was interested in science, particularly biology. He very much encouraged my interest in biology, in part, because he felt that the most interesting scientific work at the time was in biology. Furthermore, unlike new things he learned in his own field, he could explain to me the contents of lectures he attended covering biology. With a large increase in my grades in my junior year in high school, he encouraged me to apply to Caltech.

I enjoyed cooking and was good at it. I would credit Dad for teaching me how to cook. I learned that anything good is better cooked with wine. When I was a freshman in high school, he wrote me from Hong Kong, "I taught you that anything good is better cooked with wine. Well, ginger is a very good spice. It is used with a little sugar" (I now prefer honey.) I use ginger when cooking duck or goose and sometimes for other cooking. (As a response many years later after moving to Guam, I wrote, "you taught me that anything good is better cooked with wine and later you wrote about ginger. Well anything good is even better with coconut milk." I then explained what was coconut milk.)



Dad suggested that I consider becoming a chef. Cooking instruction in Chicago high schools was limited to “Foods” as part of the Home Economics curriculum. I might have acted on the suggestion if I were surrounded with the culinary arts instruction currently available on Guam—the superb programs in the high schools, at the Community College, and a restaurant periodically providing instruction to children.

Currently, students in high school have expressed doubt to me about parent and other adult career advice. As one student put it, “I am unsure if they are talking about me or what they would like to do if they were my age.” I tell them to listen closely to any advice that is out of character for the person giving it. I tell how significant was the suggestion from my Father, a University of Chicago professor, that I become a chef. (Cooking, woodworking or home repair as a hobby were natural for him; as professions, these were not.)

In a discussion about how customs agents may sense a person’s dishonest answers by their look, he described how a British customs agent went through his baggage with a fine tooth comb after he was asked whether he brought any gifts. He could not explain that the guilty look on his face was because he felt he should have brought gifts.

When some people excused a Professor Y with that he was bright, my father responded with “No! He is a fairly good scientist but this is only a small part of life.” Most know this but many, with limited academic experience and who hold the academic world in awe, do not believe this. This quote from Joe gives me an edge beyond my personal credentials. For example, when someone described with bewilderment a

person as, "He has a Ph. D. in physics but is so dumb." I responded with "I have a Ph. D. in economics and my father has a University of California professorship in theoretical chemistry named after him; I know, as my father would put it, 'the ability to acquire a Ph. D. in a particular field is but a small part of life.'"

**MARIA**

### **Congratulations on Passing the Abitur**

When I graduated from high school, my mother told me she did not attend her graduation party because too many of her classmates cheated.

She told another story when I gave an onion soup party in her honor at Berkeley. In Germany, one receives a high school diplomat and, to enter the university, one must pass the Abitur, which includes an oral exam. The Abitur is only roughly equivalent of the American SAT exams. Because of what was available to girls in Germany at the time, the Abitur was not given at her school, so she and some classmates had to make a special provision to take the exam.

All the girls became quite worried when almost all the boys taking the exam at the time failed, until a man said, "you have no reason to worry. The boys are here because of personal omissions; you are here because of your school's omission." He then mentioned some very demanding theorem, which worried the girls. So mother said, there is a room with a blackboard, let's go through the proof of this theorem. Indeed the oral exam included questions on the theorem.

In during leave-taking, Professor Henry Rosovsky, who latter had an even more impressive career at Harvard, congratulated her for passing the Abitur.

## **Maria the Snitch**

I believe when mother was in high school, in her father's early death throws, Maria's father had a kind fit where he was conscientious but could not move, at least not in any way he wanted to. In bed, upon recovery from the initial fit, he said that he always felt that the men taking Jesus off the cross in a specific painting were carrying Jesus so awkwardly. He felt the same way about the people carrying him up the stairs (to the bedroom).

Her father asked for pen and paper so he could write his will. Mother was of some help and when her father started writing a list of small items that he wanted to give to specific cousins, nieces and nephews, mother said "nothing here is controversial or will be disputed, please let me write the list."

Later, one time he took some medicine and said, "look Miesie what I do with the medicine and poured it down the sink." Unlike when she brought him forbidden cigars, she said that she had to tell his physicians about what he did with the medicine. Their response was not to be concerned, "he probably knows what is wrong with him, we don't." Autopsy showed a brain tumor so advanced that if found during an operation, the surgeons would have closed the wound and not attempt to complete the operation.

### **Maria the Road Bandit**

In the summer of 1934 or 1935, Dad decided to take my mother on a car trip through the American West. I have given reference to this trip elsewhere. On the last leg, the night they would return home to Baltimore, they saw a restaurant with a marquee "Steak Dinners, \$1.29" or whatever was a reasonable price at the time. They spent their last dollars on this dinner. Then they came across a toll bridge, toll 25 cents. Mother said, "Joe, step on it."

### **"In God We Trust" and "Liberty"**

When my mother first came to the United States, she took a streetcar. At the time, the conductor collected fare by coming to the seated passengers and having the passengers put the correct coin into a coin collection container with a slot designed to accept the correct coin only. In order to avoid having to determine which coin, mother gave the conductor a dollar of paper money. She was given change and was confronted with the coin collection container. When puzzled, she was told "ten cents." She looked at the coins and all she could find written on them was "In God we trust" and "liberty." After considerable conductor and Maria frustration, the conductor took the coin out of mother's hand.

For those reading this in the United States, take coins out of your pocket or purse, look at them, and skip the rest of this paragraph. For others, there is no numbers on US coins. In small script is written "one cent," "five cents," "one dime," "quarter dollar," and "half dollar" as appropriate. The last coin I have not seen in years but was common in earlier times. "Dime" is an American idiom for ten cents. There is no reason for my mother, although fluent in English, to know this idiom. To make matters more confusing, the coins listed by increasing size are ten cents, one cent, five cents, twenty-five cents and fifty cents.

Leading to inclusion of this story in this collection, a store, for tourist benefit, had taped under a glass-topped counter the four currently used coins in order of value and labeled them 1¢, 5¢, 10¢, and 25¢. (The principal market for tourists on Guam is Japan and the secondary markets are Taiwan and Korea.) I laughed at the sight with

appreciation and in memory of my mother's story.



## **Maria, the Experimentalist**

Mother was trained as a theoretical physicist with little experience or training in any laboratory. (In a way, this is surprising, because her theory was closely centered on explaining or predicting specific experimental results.) Therefore, shortly after she received her doctorate, Joe recommended that she work for R. W. Wood (Robert Williams Wood). Later, Joe expressed misgivings about the recommendation.

R. W. Wood was the experimentalist's experimentalist. He did not receive his Ph. D. from the University of Chicago because he had too little interest in certain theoretical issues to meet all requirements. Johns Hopkins hired him because, at the time, Johns Hopkins did not require credentials to recognize quality. (The Optical Society of America now has an annual prize named in R. W. Wood's honor.) The person, R. W. Wood, can be viewed in his collection of sketches with commentary, *How to Tell the Birds from the Flowers*. Another view is a letter from President Roosevelt—the first, T. R.—expressing regrets that he was unable to view R. W. Wood's boomerang collection. Since, upon search, I have seen references but not descriptions in writing of his pranks, I will repeat family stories, making this a vignette about the lighter dinner table and cocktail conversation in the Mayer household.

While my mother was in his office, a graduate student came in with two highly polished metal disks stuck together. Before the student started speaking, R. W. Wood set the fused disks with one disk down on the palm of his hand and let the student explain what the problem was. After the student was finished, R. W. Wood easily separated the disks. The response to the student asking how he did it was, "you just

have to know how." By warming only one disk with only the side on the palm of his hand, the expansion of this disk alone and some warping made the disks easy to separate.

R. W. Wood went to a costume party dressed as a devil with a live eel in his tail. Before or after the party, he stood on a street wearing the costume. Some young men cautiously and slowly approached him. As they got near, he spit into a puddle while throwing a piece of Sodium into the puddle. (Sodium bursts into a bright yellow flame in water.) The men hurriedly retreated.

R. W. Wood was staying in a boarding house in some European city. For this telling, the city is Vienna. He noticed that the day after a dinner containing a roast, or chops or other pieces of whole meet, the dinner included hash. After a dinner of chops, he put a nitrate salt that makes a very blue flame on the leftover chops on his plate. Sure enough, the next day, the dinner was hash. So while eating, R. W. Wood discussed the properties of the salt and its bright blue flame. Then he said he left some of the salt on his plate and held some of the hash in the flame of a table candle. Sure enough, a very blue flame resulted. R. W. Wood was evicted promptly.

After returning from Vienna, Bill Smith asked R. W. Wood whether he could recommend a place to stay in Vienna. "See if Frau von Greiner has a room and please tell her I sent you; she would like that." Bill Smith rented the room and just when staff was about to take his luggage to the room, he said, "Oh, by the way, R. W. Wood recommend this house to me." His luggage was immediately carried out to the street.

R. W. Wood listened to the bored guide who explained why the Emerald Pool, a pool associated with a hot spring in Yellowstone, is emerald color. After the guide and group left, R. W. Wood threw some copper sulfate on top of the spring. When the guide returned with the next group and started explaining "You can begin to hear the spring gurgling now. The water looks emerald because ... . My God! It has never been that color before!" [Daughter of Entropy Squared, Maria Anne Wentzel]

Now, why Joe later expressed misgivings about making the recommendation that Maria work for R. W. Wood.

My mother described R. W. Wood as the real "love and string and sealing wax" experimentalist. (I do not know if this was a standard expression or the creation of a physicist/song writer, Arthur Roberts, who worked on the Manhattan project. One of his songs bemoaning and making fun of experimental physics evolving towards the use of expensive equipment, the cyclotron as the specific case, contained "with love and string and sealing wax physics was kept alive.")

Mother was to measure the spectrum from burning sodium (it may have been another element). Every thing was set-up on a table in the middle of a room. R. W. Wood explained that you stick the grating on sealing wax here. (A grating is a piece of mirrored glass with closely spaced parallel lines etched on it. It disperses light much like a prism.) Then you put the tray with the sodium and spark source to light it here. Over there is the camera. Make sure that everything is lined up so that the camera records the spectrum.

Now that you are ready, you turn-off the room light (this light switch was across the room); then you open the camera shutter, then you go around the table to close the switch for the spark that lights the sodium. After that, you close the shutter and turn-on the room light. The film is ready to develop.

(Maybe it was after these instructions that Mother learned to swear in Höch Deutsch, or standard German, since the Plat Deutsch vocabulary, to the amusement of some students hearing her, is substantially identical to Anglo-Saxon.)

She went to Joe, nearly in tears, asking "what should she do?" Joe told her to have the shop make a light-tight box and put everything inside with the switches on the outside. R. W. Wood's reaction, "Maria, you are getting fancy, aren't you?" Mother, however, properly felt vindicated upon seeing the box being used many years later.

Mother carefully presented R. W. Wood with a table of the spectrum lines. R. W. Wood, apparently as a message of appreciation more than complaint, protested that he had to pay the Journal for extra pages to publish with the table. Speculation reigned in the family whether R. W. Wood was really so distant from theory that he did not recognize a simple log relationship in the data or for some other reason published the tables.

## **The Faltböt Club**

It was my mother who would tell this story. She found it easier than Joe to admit a subjective uneasiness.

A Faltböt is a collapsible kayak made by a German company and was a common river running and lazy paddling boat in Germany before (and after) World War II. There was a Faltböt club under the New Jersey side of the George Washington Bridge. (We lived in one of the many towns near the New Jersey side of the Bridge.) Before war was actually declared against Germany, my parents considered joining the club in order to have a place to launch their Faltböt in case war closed the George Washington Bridge. They could paddle to New York.

They just did not like the feel of the place and the people. Maria expressed a subjective uneasiness although she mentioned seeing a swastika. The club was closed as soon as war was declared for it was used for spying on shipping.

## **The Maniac**

When I was growing up, I believed that the maniac and the ENIAC (Electronic Numerical Integrator and Computer) were two different machines, not one and the same. The ENIAC was the first digital computer. By today's standards it was a monster, weighing over 30 tons. Mother did some work with John von Neumann on the ENIAC. Some tales I have not found elsewhere follow.

To preserve vacuum tubes, one avoided turning the ENIAC off and on whenever possible. To keep the ENIAC occupied, John von Neumann had it calculate pi to around 2,000 digits. When the humans got bored with the exercise, John von Neumann had the ENIAC determine the degree of randomness of the digits; that is, measuring the relative frequency of the different digits. Near perfect randomness was found, all digits seemed to have the same frequency. John von Neumann was but one dwelling on why the digits of pi should be perfectly random. Having the ENIAC continue calculating pi for a few hundred more digits, however, and checking again found the result an artifact of the particular number of digits of pi calculated.

Some connections for the ENIAC were like those of an operator controlled telephone switchboard. To connect a party making a phone-call to the desired number, the operator would take the wire for the caller and insert its metal-capped end into a socket for the desired number. When the call was finished, the operator would disconnect the wire.

A difficult repair of the ENIAC would be required when the janitor would pull out a wire from its connection while cleaning and then replace the wire in the wrong hole.

Needless-to-say, great effort was made to instruct the janitors to leave wires, which they accidentally pulled out while cleaning, be.

The ENIAC used IBM card input and output. IBM cards were about eight by three inches with a small part of the upper left corner cut off. Rectangular holes on the card were used to communicate with the computer. Computers used card input well into the seventies. My most recent memory of seeing IBM cards is as airline tickets. Those with post 1954 computer experience are unfamiliar IBM card output and with the Maniac habit of chewing up IBM cards.

## **Spitballs and Edward Teller, Father of the Hydrogen Bomb**

I include this because it represents Edward Teller as more human than nearly anything you are likely to hear about him and most of what you are likely to read. True, I like his politics even less than those of his nemesis, Linus Pauling. The stories about Edward Teller are included in this place because my mother and Teller knew each other longer than my father and Teller.

Through my being age six, in Leonia, New Jersey, Edward Teller was a frequent houseguest. He lived in Chicago. I found it hard to believe, but it was true what my mother said, that my sister and I would see him less in Chicago.

He had a loud and exuberant laugh. He would play a game of spitballs with my sister and me. On the top page of a pad of paper, straight horizontal lines divided the paper into seven sections. Sections were labeled by the days of the week in order from the bottom, starting with Monday.

From below the pad we would flip spitballs up the pad. The spitballs were tiny wads of paper held together by spit. The smaller and rounder, the better. The scoring depended on the day the ball landed. Sunday had a special score. Otherwise, I do not remember the scoring. When we tried to play the game without Edward Teller, it was not fun.

A reporter from Life for an article about Edward Teller extensively interviewed Mother. She observed that her children say, "The Chicago Teller is different from the Leonia Teller." He was much less fun, but I still enjoyed him. The reporter asked about Teller having family in Budapest. Initially, my mother demurred. When the reporter



persisted, my mother asked that this not be mentioned. Edward Teller provided some support to the family and he did not want the behind the Iron Curtain authorities to make a connection between him and the family. Mother lent *Life* a picture of Edward Teller taken in our Chicago yard pulling an African bow as if shooting an arrow.

To illustrate the depth of knowledge he would sometimes show, much later, shortly after the Israeli 1967 six-day war, I was entertained as an adjunct to my parents in his Berkeley home. Before the Israel's attack, reports from Israel referred to a partial military mobilization. According to Edward Teller, a Los Angeles *Times* reporter by-passed the Israeli censors with the report, "the partial mobilization is Ivory pure." No longer do all Americans recognize the meaning; however, for years Ivory Soap would promote itself with it being "99 and 44/100% pure."

## **Baseball**

In order for a University of Chicago Ph. D. student in physics to be accepted for writing a dissertation, the last step for receiving the degree, the student was required to pass a written exam, called the Basic. Later, an oral exam was also required. The Basic was six hours exam split into two parts. When there was a dispute among the faculty about the propriety of a problem, the question was given to Enrico Fermi to evaluate.

For one question, mother's reaction was "I don't understand it. I could never solve this question!"

"Oh Maria, it is really very easy."

Well, Enrico Fermi also could not understand the question. For both my mother and Fermi, it probably was not the difficulty of the problem but its reference to baseball that prevented the two from understanding and solving the problem. So, University of Chicago physics Ph. D's were not required to understand baseball.

## **The Two Marias**

Since during the summer when I was seven we were to spend a large part of the summer in New Mexico, it was explained to me that not all American Indians lived in tepees, wore feathered bonnets and were expert horsemen. It was so instilled that I almost felt none lived in tepees and ... .

Through an introduction of a common friend, we entered the house of the pottery maker, Maria Martinez of San Ildefonso. I was very excited to actually see an American Indian up close, maybe meet her and be in an Indian's house. I have an image of looking up at my mother and the other Maria and my mother saying, "I always wanted to meet you since my name is Maria too" and both laughing nervously. I remember feeling and awkwardly expressing to myself that Maria the potter is more like my mother than any woman I have met.

After my mother was deceased, I mentioned this observation to my sister who responded with "I thought I was the only one who noticed the similarity." A biography of the pueblo potter confirms our observation.

## Poles

Please, either read this vignette in entirety or not read another word. When and only when I am sure I have the time to tell the whole story, this may be my favorite story about my mother.

Because Maria was an ethnic German born in Kattowitz, which later became Katowice, Poland, in her United States naturalization hearing she was required to give up her allegiance to Poland. When liquor or banter loosened her tongue, she would regale in the pleasure she had in giving up allegiance to Poland and how she raised the status of Polish immigrants at her naturalization hearing by impeccable dress. She would complain about the city where she was born voting ninety percent to be German but becoming part of Poland.

After going around the world, she said, "I have now crossed the Oder-Neisse Line an even number of times." These rivers are the post World War I demarcation between Poland and Germany. Crossing an even number of times and being on the West side makes her more German and less Polish.

"What would happen, mother, if I married a Pole?"

"It would be alright if she were from near Warsaw."

Maria would quietly admit that the countryside voted for Poland, which may have contributed to both her children laughing at and making fun of her anti-Polish antics. (Until after World War I, the cities in Eastern Europe tended to be German while the countryside was Slavic.) Whatever the reason, I am sure that it was due to positive qualities in Maria, not in her children, that both her children made fun of her prejudice.

Years later, I learned from a phone conversation with my father that Maria was invited by Poland to a centennial celebration for Madam Curie. His response to my teasingly saying that the invitation upset mother was a firm, "Maria is very pleased with the invitation." A plausible report from this visit is that she sought to visit Katowice without success.

There was a reunion of Upper Silesian Germans. Upper Silesia contains Kattowitz or Katowice. The organizers asked whether she was the daughter of Dr. Friedrich Göppert who treated them as Children. If so, she was asked to please attend the reunion. She attended but refused the offer to have her way paid. She gave the reason she refused payment as the Upper Silesian Germans lost everything and she could not in good conscience accept payment from them. I am sure that there was also a more important unstated reason, which I explain later.

After the reunion, when I visited home, almost the first words from mother were in excited happiness, "Peter! None at the meeting of Upper Silesian Germans were interested in returning Upper Silesia to Germany. The whole purpose of the reunion was to say 'hallo, how are you,' reminisce about old times and to see how the others were doing in their new life." That is, it was like a class reunion. Although never said, I am sure that an unstated and the important reason Maria did not have the organizers pay her way is that she knew nothing about the organization and considered the possibility that the theme of the conference would be seeking return of Upper Silesia to Germany. She would not want to be obligated to any group that wished the return of Upper Silesia to Germany. None at the conference were interested in returning Upper Silesia

to Germany, ... except the American delegation, much to my mother's embarrassment. The American delegation wanted the return of Upper Silesia to be the focus of the conference.

## Another Reform

A woman scientist was very upset on what was written about her in a biography of another scientist. She made a special visit to our home to complain vociferously to my parents. An incident in the biography represented her as having real worry about the implications of the success of some work she participated in, relating to development of the nuclear bomb. Her worry as represented in the biography may have appeared girlish to some but was appropriate and was like her. (This part of the biography was eliminated in the second printing; good new-speak) I found her reaction as silly and childish—not in a good way—and after the incident, I learned that my parents found her reaction, at best, overblown. I am surprised that they did not say so to the woman at the time. Perhaps my parents, too, were too astonished to react.

A woman economist wanted me to over-reference her and quote her inappropriately in an article I was completing. My response to her objection on how she was included in the acknowledgements contained the following.

While in high school I looked inquisitively at my mother upon a younger women physicist leaving the house. This younger physicist was unreasonably upset by how she was represented in another person's biography. My mother told me that she used to demand recognition and recognition on her terms. She stopped when she realized that all her demands did was to hurt her husband's career. I add that if she really acted like this other women, which I doubt, she also hurt her own career. My mother concluded with, she "received all the recognition that she could ever want after she stopped demanding such."

When I demurred, my mother responded with "I receive full recognition, not full pay." My memory is of looking up at her from the level of her thigh and thinking, "really mom; did you really ever act this way?" In high school, however, I towered over her.

## **Maria Göppert Mayer Strasse**

*The following is a slightly edited statement of thanks in May 1998 when I learned that University of Dortmund was naming a street after my mother.*

Pardon the delay in this letter of appreciation and my writing in English. My German mother did a better job of teaching my sister to speak German and did much better in teaching her to write German. Further, my German language skills have deteriorated by living in Asia and the Pacific since 1972, having the opportunity to speak German about once every three years.

My family and I are very pleased to have a street, Maria Göppert Mayer Strasse, named after my mother. Some may not realized how much my mother remained a German academician through World War II—where, as far as she was concerned, “we are fighting Hitler, not Germany”—and through migration ending in the very un-German climate of Southern California. She carried the aura of Frau Professor as an earned title, not a title by accident of marriage. Like many in the United States with the aura, she struggled to be approachable, the American side of such people. I have been told that because of her warmth she succeeded better than most.

Although I dispute the details of one of her biographers, we had candles on our Christmas tree that were lit Christmas and New Year’s Eve. Yes, in our house as in Germany, Christmas Eve was the important day. Because of my mother, in Kobe’s German bakeries in Japan, I recognized stollen and pfeffernüssen, enabling us to properly feast at Christmas time when living in Kobe.

My mother and my father would both be very pleased with Maria Göppert Mayer



Strasse. Except in the last years of her life when she began to fully recognize her accomplishments, she might have been embarrassed by the above comments on the name's appropriateness.

## **Lutheran**

My mother was in the hospital in 1943. In the entrance papers, by habit, she put her religion as Lutheran. She was quite upset and furious to be visited by a Lutheran minister who said from the pulpit that Harold Urey should be in church on Sunday instead of mowing his lawn. Harold C. Urey's Nobel Prize was just a small part of the person.

Ever since hearing this story in high school, if a medical or hospital form asks for my religion, I would put down "Non-Christian Scientist. Few food taboos." When questioned, I say that all you need to know is that I accept the efficacy of medicine and that my dietary restrictions are not likely to cause the kitchen staff grief. I do not state my fear of a visit from a rigid holy man.

For many years, I have not seen the request to inform the clinic or hospital of one's religion and dietary requirement questions are included. Hospital chaplain services from individual members of multi-denominational chaplain teams have often been pleasant and certainly not bigoted. Working with a multi-denominational team necessitates a level of tolerance and interest far beyond the capacity of the minister who visited Mother.

## **Memories for Mothers' Day, not Found Elsewhere**

Because it is so incongruous, I like to refer to my German mommy. I once asked a host who was speaking Cantonese with the waiter, "Please have the waiter bring chopsticks. I find chopsticks easier for cut-up food. I do not know why, but my German mommy taught me to use chopsticks." "I do not know why, but ... ." is my standard line when I ask for chopsticks. When in an East Asian environment I add, "and I am glad she did." The host ordered chopsticks and to the other guests said, "His German Mother was a Nobel Prize winner." Other times people who knew this about my German mommy let the phrase pass as a private joke.

Largely because of my mother's influence, when the family had Chinese take-out, we all ate with chopsticks for a while before retreating to forks. I remember her saying that "you may find chopsticks primitive, but the Chinese were using chopsticks when your ancestors were using their bare hands." To poorly verbalize my belief for why Maria taught us to use chopsticks, she wanted us to have basic social skills for all environments, especially in cultures she respected. Yes, a weakness for East Asian restaurants and living over half my life in East Asia and in what has been called America in Asia honed the basic skill taught by my German mommy; but I am very glad she gave me the basic skill to hone. Furthermore, when camping, one can make crud chopsticks from branches when one forgets flatware.

Whenever dinner was served to guests in our house on a white tablecloth and red wine was served, she would spill a small amount of wine and without comment put salt on the stain. (Salt was said to prevent permanent staining from red wine.) It took

me a long time to understand that the spillage was deliberate and its purpose.

Although, as discussed elsewhere, my mother did not learn to cook as part of her upbringing, she did learn to use a sewing machine. She showed me some shoe bags she made when she was a girl. She taught me how to use a sewing machine and when borrowing a sewing machine from a person who knows who my mother is, I love to say that my mother taught me how to use a sewing machine.

She recognized the relationship between the Cub Scout ranks and Kipling's *Jungle Book*. Since we only had a German translation in the house, she read it to me speaking English. (When she was younger, she would read French books to her father speaking German. Some of her language teachers were disappointed in her choosing to study science at the university over languages.) My father would chuckle, however, with some of her un-Kipling ways of expression, such as "The lion said 'damn it.'"

Maria had a Papagayo (an Arizona Indian tribe) basket filled with India head U. S. five cents pieces or nickels. One side of an Indian head nickel contains an American Indian in full headdress. When not living at home, I would collect these nickels and wrap them as a joke but not gag gift for my visit. She described these nickels as non-political and so American with the Indian and buffalo on the sides.

I described my mother's discipline as "*usually* more subtle" than my Dad's. Mother's occasional spankings with a hair bush were laughable, preferred to my father's hand. Furthermore, my father's verbal criticism could be devastating. The "*usually*" is because sometimes she was a big—from her child's perspective—tough scary lady. When my sister or I would tell a story of a biddy saying, "I will call the police" or

making another threat, her response was “that is terrible to threaten to call the police and not do it.” It was so clear that my mother would have preferred to have us driven home in a squad car than have us receive an empty treat. My mommy’s statement was “never make a threat unless you are prepared to keep it.” By her example, I add, “Never make a threat unless you have the means or power to keep it.” My first folding knife was given to me when found open by my mother. An open folding knife not in immediate use transformed the owner to a previous owner. As recently as a month ago, I received a pit in my stomach when I saw that I forgot to close a folding knife.

I have been asked explicitly and implicitly why I know that a particular woman’s nastiness to another is because of jealousy—sometimes with an applied or explicit “how could you know when you do not know or are unsure of why she is jealous?” “My German mommy taught us to recognized jealousy among what I now call mainland (U.S.) haole (Caucasian) women and I learned my lesson well.”

I sometimes say, “Believe it or not, my mother was a master of indirection.” This is plausible for a reader of this collection but is hard to believe for many of my acquaintances. She never told me to send flowers to a host or a family or person who is nice, instead she commented on how she appreciated receiving flowers. She would also leave garden flowers on my night table when I returned home from a long absence. Another pay-off is that I accept, not just graciously but with joy, a gift of flowers. I married a lovely who, as is too unusual, gave her boyfriend flowers.

When it is even clear to me that my brutal directness will not work, I ask, “what would my mother do?” Upon occasions, I have used indirect approaches, at a minimum,

for better effect than directness.

Particularly my mother's favorite inscription on family Christmas cards was "Season's Greetings." She threatened to wait until June to send the cards and stamp them with a rubber stamp saying "and a happy Fourth of July."

# **THE PRIZE**

## Dad and the Prize

Many Newspaper references to Enrico Fermi credit him with saying to my mother, “is there spin-orbit coupling?” and with this remark, Maria Goeppert Mayer was able to complete her theory which led to her Nobel Prize. This is probably true, but there is also a contrary story.

As background, before the simultaneous discovery of my mother and Hans Jensen, magic numbers referred to those numbers of protons or neutrons that produced stable nuclei. Stable nuclei are difficult to change by fusion—combining with other nuclei—or fission—that is, breaking apart. With the discovery—simultaneously with Hans Jensen—of an explanation for these stable nuclei, the numbers ceased being magic. Probably leading to the Nobel Prize, their theory, the shell model of the nucleus, was found to also explain other phenomena.

Mother talked to Enrico Fermi saying that she had an explanation for the magic numbers and presented her explanation. Enrico Fermi’s reaction was, “Maria, sleep on it.” Probably the next morning, a Saturday, she started to present her explanation to Joe. Before she finished, dad—in this case his sternness combined with love—stood up and said, “You are right. I do not want to hear any more. Go to your desk and write it up and let me see the first draft.”

By the time mother presented her work the next week at a seminar, her thoughts apparently were way ahead of dad’s reading. A faculty member reported to me that he was surprised to hear Joe ask questions as though he had not seen or heard the material before. The shell model was very much my mother’s baby; however



because my father wrote very clearly, it is suspected he had a role in the final draft sent to the journal. He stayed very much out of the way when she and the person who simultaneously developed the theory, Hans Jensen, wrote *Elementary Theory of Nuclear Shell Structure*.

Joan Dash in her two books [1973; 1991] reports that Joe had to push, harangue and outright bully Maria to have her write the article describing the ideas. Although I can find minor details that are untrue, my sister reports that the softer description in *A Life of One's Own* (1973) is accurate and that my sister did peak through the door to see why our father was haranguing as in *The Triumph of Discovery* (1991); and as stated in this book, my sister saw my mother sitting at the desk and my father putting a pencil in her hand to write. I know that my father had the patients and love to push, push and push, in anyway he felt necessary, to have a person to perform. He had the love and respect for my mother to push and harangue until he was exhausted and blue in the face. By Maria writing, the shell model remained her baby, but my father was the mid-wife for, what was initially, a difficult delivery.

## Effect of the Prize

I was a graduate student and teaching assistant at Berkeley when mother received the prize. An *Oakland Tribune* reporter interviewed me over the phone. He was the arrogant boisterous reporter from a late 1940's or early 1950's movie; of course, he received little information after his inquiries about my girlfriends. While a photographer from *Berkeley Gazette*, was taking photographs, I mentioned that I would have preferred learning that my mother had become healthy than that she received the Nobel Prize. This statement was quoted in the *Gazette*; I am glad that the national media did not pick this up. The photographer suggested that the Prize might make my mother healthier.

When I next saw my mother shortly after the reward ceremony, the photographer suggestion proved true: the Prize did not cure her, but did make her healthier. When I mentioned this to Mary Hendersen Hall, she pointed out that Joe did not notice this effect. As Joe put it to me, I see your mother all the time so change is gradual; I do not see big changes. Mary Hendersen Hall was writing a biography of my mother for *McCall's* and a longer one for *San Diego Magazine*.

Before the Nobel Prize in 1963, my mother would make low level complaints when receiving honors to the effect, "Joe deserves this honor as much as I; I am receiving this because I am a woman." This message weakened as she received honorary degrees in the early sixties. For the Nobel Prize, her statement was that the Nobel Prize was the top honor without the slightest reference to her gender. She ceased making any other references to gender with succeeding awards.

She still remained unassuming unless there was a very clear benefit to be otherwise. When a travel agent for a trip to New York suggested that he try to use mother's Nobel Prize to receive tickets from the New York Mayor's Office for a sold out play, both my parents said, "Please do." (The Mayor is given some complementary tickets to major play performances.)

## **Fur Coat**

About two weeks after the actual reward of the Nobel Prize, in a dry cleaning shop the man behind the counter, after realizing I was Maria's son, related the following.

"Your mother is very unassuming. She was having a fur coat cleaned that she needed for a trip. The plant was having some trouble doing the job on time. She kept coming into the shop and saying that she needed the coat for a trip. I thought it was a trip to San Francisco. The day before she was leaving, she came in and when it was not ready, she said, 'I am leaving tomorrow morning for Stockholm.' Then I realized which Mrs. Mayer she was.

'Sorry Mrs. Mayer—ah, ah—Dr. Mayer or Professor Mayer! I have your address and you live on Mount Soledad. Ah, Ah. I will have it delivered tonight. Don't worry.'

I called the plant and told them that I do not care how much overtime you have to pay, have that fur coat ready tonight and deliver it to her home. This is for the Nobel Prize winner Mrs. Mayer and she must have it before she leaves to Stockholm."

# MEMORIAL

## **In Memoriam of my Father**

For Dad's memorial service, I wrote two items which are preserved and unavailable in an archaic electronic format. These were read by the Professor James Arnold, the Master of Ceremony and person in charge of the service. The material, severely truncated by my memory, is presented below.

### *Joe the Father*

It was often a delight to have Joe Mayer as a father.

While Joe was sitting in the living room after dinner, his granddaughter, Tania-Maria Wentzel, at about age two and a half brought him a pad of paper and said "Joe, doggie."

Joe drew a dog that looked like a dog, a giraffe that looked like a llama, a giraffe that looked like a giraffe, a zebra and other animals.

When Marianne Simpson at about age six was watching a parakeet fly nervously into his cage, Joe explained to her that the parakeet was making a Riemannian transformation. The parakeet was outside cage and the parakeet was protected from the people by the people being inside the cage.

My mourning started when I last saw him. He was no longer smarter than I. I could only discuss part of the excitement and content of new things I learned. Before I left, we said most of the things we wanted to say to each other. He said, "I do not want to live forever, but I still enjoy some parties."

### *As Husband*

One Saturday, Maria started to explain the insight that led to her Nobel Prize. Before

she could finish, Joe said, "You are right. I do not want to hear any more. Go to your desk and write."

Maria's reaction to joining any organization was to ignore the invitation. Occasionally, Joe would say, no, that one you should join.

In the last years, mother was disabled. Because of Joe's caring, she was not crippled. He would hold her by the arm whenever the walking became uneven. My father could be patient in spite of nature.

Jim Arnold, correctly, disagreed with the last sentence. He said Joe was a complex person, both patient and impatient. I described in a vignette, "Dad and the Prize," an example of both his patients and impatient.

*Why are you here?*

I gave the material to Jim Arnold about two months before the service. I thought of what in addition I would say if I were to speak. I would have added something like the following.

Please, answer to yourself, "why are you're here?" (Pause) About half the answers are "because Joe Mayer was Joe Mayer, you jerk, you should know this better than anyone." For those who actually answered the question, there are probably as many answers as people. There is a reason that perhaps none of you gave but plays a part for all of you being here: his generosity. Although most stories that follow are about both my parents' generosity, since Joe wrote the checks, I associate these with him.

We purchased shoes, or at least my shoes, from a Russian immigrant cobbler

with a very small store. Once when entering the store with both parents to buy shoes for me, the cobbler asked Joe to help him have his son receive tuition assistance as an entering freshman at the University of Chicago. (My silent reaction was that my father had nothing to do with undergraduates and undergraduate administration, why trouble him so?) While the cobbler and Joe were in intense discussion, my mother and I purchased shoes for me, being waited on by the cobbler's wife.

Probably a year later, I learned that the cobbler's son was a straight A student at Hyde Park High School and my father made phone calls to the admission office and saw that the son received a scholarship.

I would then have told two stories written in the "Göttingen Afterwards" section of this collection.



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**AND**

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