

SABBATICAL LEAVE REPORT
TRAVEL IN EUROPE AND THE CARIBBEAN REGION
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ACKNOWLEDGMENT

I wish to express my sincere appreciation and thanks to the Mt. San Antonio College--Faculty, Administration, and Board of Trustees-- for the sabbatical leave which I enjoyed during the spring semester of the 1976-1977 school year.

SERVICE STATEMENT

Some of the important benefits which I gained during the sabbatical and which I believe will increase the value of my service as a teacher are described in the following paragraphs.

A large amount of technical background material, which will be useful in my lectures and, hopefully, in future writing, was obtained by visiting schools, scientific and technological museums, and industrial installations.

I was delighted to be able to see at first hand many areas, institutions and artifacts that are the wellsprings of our culture and which are known, at least through reading, to every educated American. Additionally, my geographic knowledge was increased considerably--it is not really possible to know what the beaches and forests of Jamaica, the Scottish highlands, or the Rhine valley really look like without having actually seen them. Experiences of this kind help to improve my performance as both a lecturer and conversationalist--and a lot of a teacher's time is spent talking with students.

I saw at first hand the living conditions of many people in Yucatan, Jamaica, and Puerto Rico, and was told by an Indian post doctoral fellow at Göttingen that, although he had never visited the U.S.A., he had tried to obtain a fellowship in America so that one of his children would be born an American citizen. These and other experiences served to deepen my appreciation of my own country.

Lastly on the personal side, I feel that I am now a somewhat better adjusted person because of having had a substantial break in the 17-year-long routine of teaching introductory chemistry. And the degree of under-

standing between my wife and me has been strengthened by our having lived together very closely for an extended period and by the sharing of a great many new experiences.

SUMMARY

As proposed in my application for a sabbatical leave submitted in the fall of 1975, almost all of the allotted time was spent in foreign lands. We left home on February 6; and, aside from ten days in Florida (February 13-23), remained outside the continental United States until we landed at Logan International Airport in Boston on August 10.

Fourteen foreign countries and the Commonwealth of Puerto Rico were visited with the bulk of the time being spent in Great Britain and Ireland (52 days) and ⁱⁿ the German speaking regions of Switzerland, Austria, and West Germany (53 days). The complete list of countries visited, with the days spent in each given parenthetically, is: Mexico (7), Jamaica (7), Puerto Rico (7), Great Britain (42), Holland (7), Belgium (4), France (9), Spain (9), Switzerland (11), Austria (13), West Germany (29), Denmark (7), Sweden (3), Norway (6), and Ireland (10).

The following educational institutions were visited: Cambridge University, University of Cardiff, University of Manchester, Trinity College (Dublin), University of Geneva (Ecole de Chemie), Swiss Federal Institute of Technology (Zurich), Heidelberg University, and Georgia Augusta University (Göttingen).

Industrial facilities visited included the Reynolds Bauxite operations and the Barnett Estates banana growing and packing operations in Jamaica, Bacardi rum production in Puerto Rico, salt mining in Hallein, Austria, and the Carlsberg Laboratories and Brewery facilities in Copenhagen.

Scientific and technological exhibits ranging from simple pieces of apparatus used in making some of the great landmark experiments of physics

and chemistry to elaborate exhibition halls were inspected and/or toured at the Cavendish Laboratory (Cambridge), British Museum, London Science Museum, Royal Scottish Museum, University of Manchester Institute of Science and Technology, Philips Evoluon (Eindhoven), Heidelberg University, Deutsches Museum (Munich), and the Carlsberg Laboratories.

A partial list of institutions, places, and events which we visited or attended and which I consider to be of substantial cultural value includes these: Museum of Anthropology (Mexico City); Mayan ruins at Uxmal; Ponce Museum (Puerto Rico); National Gallery and Victoria and Albert Museum; Concert in Albert Hall and play in a London theater; Army Museum and Chelsea Hospital (where Sir Christopher Wren designed St. Paul's Cathedral; Westminster Abbey (RAF Memorial Window, Scientist's Group, and Poet's Corner); St. Paul's, Salisbury, and Exeter Cathedrals; Stonehenge; Kew Gardens; Stratford-upon-Avon; Edinburgh Castle; Rijksmuseum (Amsterdam); Ann Frank House; Belgian National Symphony concert (Brussels); Waterloo Battlefield; Organ concert in Notre Dame Cathedral; Louvre; Versailles; Chartres Cathedral; Prado Museum; Protestant Memorial Wall (Geneva); weekend in Grindelwald (Jungfrau and Eiger); Vienna Boys Choir and dining in Vienna Ratskeller; Rust, medieval village with storks nesting on the roof tops; Salzburg, Marionette Theatre, and the concert in Schloss Mirabel where Mozart gave concerts as a boy; Black Forest and Dinkelsbühl; trips up and down the Rhine by the Lorelei Rocks, Strasbourg and Cologne Cathedrals; Opera in Cologne; Open air concert in Bremen; Chekov play, Tivoli Gardens, Mermaid, and Copenhagen City Hall with statues of Niels Bohr and Hans Christian Andersen; Danish National Museum; Trondheim Fjord; and St. Patrick's Cathedral in Dublin.

Throughout our travels, we continually met interesting people who apparently enjoyed conversing with us as much as we enjoyed conversing with them. Alas this statement does not apply in its entirety to the French people, but the difficulty lay in the fact that we had absolutely no knowledge of French, and apparently almost all the French have absolutely no knowledge of English! To list the large number of people with whom we had conversations ranging in length from a few minutes to several hours duration is impossible, but this cultural exchange formed a most important and enriching part of my sabbatical.

A more detailed country-by-country account of my sabbatical experiences is given in the pages which follow.

DETAILED SUMMARY

Mexico 7 days February 6 to 13, 1977

My sabbatical began with a flight to Mexico City on February 6, our first deep penetration into Mexico. Here we saw the Zocalo (Great Central Plaza of Mexico built on Aztec ruins created by the Army of Cortez), walked through Alameda Park to the Benito Juarez Memorial, rode the Metro (a relatively new, efficient and remarkably quiet subway), and spent almost a full day at the Museo de Antopologia. The latter is a superb museum devoted to pre-Columbian anthropology.

In Yucatan we had our first contact with the tropics. Banana and sisal (hennequin) plantations, "cut and burn" jungle maize fields, adobe cottages with thatched roofs (some with elaborate television antennas), and, of course, the tremendous stone edifices erected by the Mayas at Uxmal before 1000 A.D. are some of the interesting features of this region. Mayan culture is still extant here--the Mayan people are distinguished by their comparatively small size, distinctive costumes, characteristic architectural forms, and speech.

To casual travelers such as ourselves, the great economic gap between the people of Mexico and those of the United States was obvious. Furthermore, it seemed to us that the ratio of young people (under 20) to older people is much higher in Mexico than it is in the United States. In fact, the age distribution in the general Mexican population seemed to us to be similar to the age distribution found in a Southern California housing tract in 1955. Hence we suspect that the "illegal alien" problem will be with us for at least quite a few more years.

Florida 10 days February 13 to 23, 1977

This was a region of the Continental U.S.A. that I had never before visited. We rented a car and toured southern Florida from coast to coast and from north of Lake Okeechobee to Key West. Noteworthy features of this region were the Keys, Everglades National Park, Corkscrew Swamp, and the Florida agriculture. The latter included a great deal of cattle raising, vast fields of winter vegetables (many almost totally destroyed by freezing weather), citrus groves (also apparently rather badly damaged), and numerous sugar cane fields. The burning of a cane field prior to cutting with the huge clouds of smoke and flames 40 feet or so high must surely be one of the most spectacular sights in American agriculture.

While in Florida we managed to prepare our 1976 Federal and State income tax reports by working in the evenings and on one long rainy day.

Jamaica 7 days February 23 to March 2, 1977

Jamaica provided even greater contrasts to our familiar environment and way of life than did Mexico. First, the climate is tropical and, even though late February is in the midst of the "dry season", the humidity was high and there were occasional rains. Secondly, even though we certainly knew in advance that the population of Jamaica is largely black, it was a bit of a shock to find ourselves suddenly immersed in an almost totally black society--even after just having finished reading Alex Haley's "Roots".

Aside from the cultural experience of being in an ethnically very different though English speaking country, visits to two commercial enterprises in Jamaica stand out in my mind. The first of these enterprises was a very large bauxite mining operation by Reynolds Metals Inc., an American corporation. The second was the banana and cane growing

plantations of Barnett Estates, Ltd. of Jamaica. The personnel of both organizations were quite hospitable and seemed to be genuinely glad to show their operations to an American teacher. In fact, we were surprised and delighted to be asked to lunch at the home of the chief financial officer of Reynolds Jamaica, William Hartley.

The Reynolds mining operations at Rio Ochoas are highly mechanized and feature a conveyer belt system about six and a half miles long to transport ore from the mine to the freighter loading docks. The belting for this system had been supplied by British Goodyear under a guarantee of "a 10 year service life or the transport of 125,000,000 tons of ore-- whichever comes first." The belting had met both stipulations and seemed to have lots of "tread" left!

Ore was being obtained by strip mining. This, of necessity, required considerable "rearranging" of the landscape. However, the "mined out" areas were being graded to smooth contours and an apparently good vegetation cover had been established on much of this land.

With the exception of a limited number of American technical and management people, the plant personnel were almost entirely Jamaican.

Reynolds was also raising livestock--cattle and hogs--on the parts of their extensive land holdings that were not involved in the actual production of aluminum ore. This livestock appeared to be of outstanding quality. According to the company representative, the stock was raised and sold on the local market on an approximately break-even basis in order to (a) make the presently unused land (for mining) productive and (b) to demonstrate that high quality livestock can be produced in Jamaica if modern animal husbandry techniques are employed.

Despite these "good citizenship" practices by Reynolds, the Jamaican political situation seemed to be such that the plant people, Jamaican as well as American, were worried over the possibility of the government taking control of the mining operations.

We were given a general tour of the Barnett Estate banana-growing operations by Peter Kerr-Jarrett who spoke with an "Oxbridge" accent and drove a beat-up Land Rover. Mr. Kerr-Jarrett is a white Jamaican in his early thirties and is Field Superintendent for Barnett. He said that he had obtained his education in England and in "the States." The latter, it developed, meant Yale.

This kind of agriculture was fascinating. There is a surprising amount of applied chemistry involved in modern banana production including selection of the proper quantity and balance of fertilizer, herbicidal treatments to control weed growth, sprays to control both insect attacks and various diseases of banana plants, post-harvest fungicidal treatments to prevent spoilage by molds during shipment, and finally chemical control as well as temperature and humidity control of the atmosphere during shipment and holding (to ensure proper ripening and to prevent spoilage).

Barnett Estates has operated for more than 200 years in Jamaica, chiefly in cane and sugar production and more recently, the past ten years, as a banana producer. In contrast to Reynolds, Barnett uses a great deal of hand labor. Kerr-Jarrett said there were over 140 miles of hand-dug drainage ditches. These ditches were about 10 inches deep and about 18 inches wide. The digging operation was just now being mechanized.

In the banana packing shed, packed fruit was being stacked eight crates high by set-off men. No pallets were used. The packed fruit was then hand loaded, crate by crate, onto trucks to be hauled to the docks

some three miles away. When I not very tactfully asked about a fork lift for the loading operation, Kerr-Jarrett said, "Yes, we have certainly considered that sort of thing. But to mechanize our loading operations would only mean that we would use fewer men. And our unemployment rate is already far too high--we try to take care of our people insofar as we can." Perhaps he had a point there!

We rented an Avis car in Montego Bay and returned it to Kingston when we left for San Juan. This was a somewhat worrisome experience as the islanders follow the British custom of driving on the left. However, we drove very cautiously and suffered no casualties!

Puerto Rico 7 days March 3 to 10, 1977

Spanish is the street language of Puerto Rico. But after 79 years, the American influence is so pervasive that we felt we were almost back in the "lower 48." Puerto Rico is a large island and the climate is tropical but a bit more temperate than that of Jamaica.

Among the best remembered experiences in Puerto Rico were: Visiting Old San Juan and El Moro, an immense harbor fortress begun early in the 16th century; the trips across the island between San Juan by "publico" service (a large Chrysler operated by a licensed owner-driver as a combination taxicab and nonscheduled bus); Ponce beaches and bird life, art museum, fire station, and Don Quixote Restaurant; tour of Bacardi rum production facilities at Cataño (parenthetically, this is a modern plant under apparently good chemical and microbiological control with an average daily production of about 23,000 gallons of rum, and while Bacardi is the largest, it is by no means the only distillery in Puerto Rico!); dinner

and an evening with Sr. & Sra. Jaime Taridos. (Sr. Taridos has a general law practice in San Juan and we talked about the political and economic situation in Puerto Rico at some length. The Taridos' felt that the only possible course that made economic sense for Puerto Rico was to remain as a U.S. commonwealth with the goal of eventually becoming the 51st state).

Great Britain 40 days March 11 to April 20, 1977

The first half of our stay in Britain was spent in the London area. A good description of London is beyond my literary abilities. I'll simply state that it is the most cosmopolitan city that we have ever visited. It has been an inhabited place for more than 2000 years, and landmarks of historic and cultural significance are present wherever you turn. We found the people to be friendly and helpful; they seemed to regard Americans more or less as long, lost cousins.

By Southern California standards, the weather was reasonably abominable--the sun almost never appeared during our three weeks in London; some rain fell about every other day on the average, and the temperature almost never got above 12°C. (50°F.--the British are further along the road to metrication than are the Americans). However, I was pleasantly surprised to find that London was much cleaner than I had expected. Truly remarkable progress has been achieved in air pollution control. Neither the characteristic eye-smarting of the Los Angeles Basin nor the throat-irritating sulfurous odor of coal smoke was present in the London atmosphere.

At first we made sight seeing trips about London on the famous double decker buses, but soon began to use the convenient and rapid subway for point-to-point travel. London is much more of an open city than say,

downtown, Los Angeles, Chicago, or New York, in that there are no high rises and there are numerous green parks, squares, gardens, and the like. Some of the institutions and landmarks which we saw and/or visited are: Buckingham Palace, Parliament, Thames River and bridges, Tower of London, Trafalgar Square (with the statue of the one-eyed admiral with the empty sleeve looking down from high above), Westminster Abbey, St. Paul's Cathedral, National Gallery, Victoria and Albert Museum, Chelsea Hospital and Army Museum (where the lamp of Florence Nightingale is preserved), Hyde Park, Kensington Gardens, and Kew Gardens. I spent four days in the British Museum and London Science Museum in the Science/Technology Sections.

We attended a concert in Albert Hall and saw "The Mousetrap", the play that has enjoyed the longest run in London Theatrical history. We made one day trips to Dorking with its gardens and hedges and to Stonehenge (erected ca. 2100 B.C. according to the most reliable radiocarbon dating method). Salisbury Cathedral and Old Sarum were also visited. I also made a trip to Cambridge University and visited Professor W. H. Andrews at the renowned Cavendish Laboratory (many pieces of original equipment used in the classical experiments delineating the size and nature of atoms in the period from 1890-1940 are displayed at the Cavendish Laboratory and in the London Science Museum).

The supreme posthumous tribute afforded British citizens is burial and/or memorialization at Westminster Abbey, and some nine or ten scientists have been so honored. These include J. J. Thomson and Ernest Rutherford, famed for their roles in the development of modern chemical theory. To my surprise, I found that Charles Darwin is also memorialized in the Abbey.

The second half of our stay in Britain involved a good deal of traveling, mostly by rail. We traveled across southern England to Penzance and Land's End, up to Cardiff and across southern Wales to Fishgard, then northeast through the Welsh mining and sheep-raising country to the industrial midlands of England (Manchester, Liverpool, Stoke-on-Trent), on to Edinburgh, north to Aberdeen on the east central coast of Scotland, northwest to Inverness, then down through the Scottish highlands to Glasgow, and finally back across Central England to Stratford-upon-Avon and London. From London we caught a train to Harwich and took the ferry to Hoek Van Holland.

Again it simply isn't within my powers of expression to adequately describe this kind of trip in a short report. Among the items that were especially noteworthy to me were: The general beauty of the green countryside with the hedge rows and countless sheep; The Cornish tin mines which had been worked since before the beginning of the Christian Era and are believed to have been the major prize sought by the Romans when they invaded Britain; A statue of Humphry Davy erected in the town square by the citizens of Exeter in grateful remembrance for his invention of the miners' safety lamp (both the tin mines and miners' lamp are mentioned in many general chemistry books); Bleak smoke-blackened cities where the Industrial Revolution began and now containing many outmoded and abandoned factories; Visits to Cardiff University and to the University of Manchester, and conversations with Professor Cardwell (specialist in the history of science and technology) and with R. G. Manders, Assistant Curator of the Manchester Science museum (he is a chemist and also a train buff who knew about the old red car of Los Angeles); Visits to the Royal Scottish

museum in Edinburgh with its excellent exhibits tracing the development of energy production and utilization from the steam engines of Newcomen and Watt to the nuclear reactors and solar converters of today; The east coast of Scotland with huge piles of pipe and other materials destined for the North Sea oilfields. (About 34% of the British oil needs were coming from the North Sea wells at the time, and the goal was "100% by 1980"). Some especially interesting experiences/activities of a non-technical nature were the Church in Exeter that was consecrated in 1065 and was still in use; The tavern in Exeter where Sir Francis Drake reputedly learned that the Spanish Armada was about to sail; A visit to Lochness and Edinburgh Castle; A weekend spent as the guest of Robert and Anna Paterson in Greenoch (he is a bank official and she is a teacher); and lastly, a day spent at Stratford-upon-Avon home of the "Immortal Bard".

Holland and Belgium 11 days April 20 to May 1, 1977

Delft, Amsterdam, Doorn, Eindhoven, and Brussels were the principal stopping points on our bus-rail itinerary through the Low Countries. The weather by this time had become much more spring-like in that there was, despite frequent showers, a great deal of sunshine. Tulips, hyacinths, crocuses, daffodils, and the like were in full bloom everywhere.

We had been somewhat concerned about being unable to speak the language in Holland, but our fears were quickly allayed. Essentially all the Dutch people who meet the traveling public can and do speak English. Dutch school children who intended to go on to a university level education were formerly required to study three foreign languages--usually English, French, and German. But in recent times the standards have been relaxed somewhat and only two foreign languages are now required!

On the purely technical side, I spent a full day at the Phillips Company in Eindhoven. This was a surprisingly new and modern appearing city. One of the citizens told me that the city owed its appearance to the fact that during World War II the American and British Air Forces had partially leveled it in an effort to drive the Germans out. Then, as they departed, apparently out of pure spite the Germans had leveled what was left of the city. Consequently Eindhoven had been largely rebuilt from the ground up since the war. Philips is the European equivalent of RCA and General Electric, and Eindhoven is dominated by Philips' plant, office, and laboratory buildings.

Philips maintains a marvelous science museum and exhibition housed in a building built in the shape of a giant mushroom and called the Evoluon. One feature of this exhibit is a huge model of an atom about four meters in diameter featuring randomly roving lights as electrons with a glowing fluorescent nucleus that pulses and twists randomly. (What a great lecture demonstration!) The emphasis is on the development of Communications Technology, but basic chemistry and physics are superbly presented. There is also much excellent material on technology and the environment dealing with wastes, air pollution, population and space, the growing food problem, etc. There is no selling of Philips or obvious attempt at propagandizing the viewer--just highly pertinent information presented in many interesting ways.

We enjoyed Delft a great deal. It is a relatively small, almost medieval appearing city famed for its high quality china, and we were able to see the various stages in the manufacture of this product. Delft is the sort of place that is described in travel books--with canals, narrow cobblestone-paved streets, open-air market (Thursday) with astounding displays of flowers, produce, and merchandise, plus a calliope! The market is located on the city

square and is flanked by the "Neue Kirche" (new church) begun in the 14th century on one side and by the city hall (a magnificent gilt-decorated structure) on the other side. The home of Anton van Leeuwenhoek, inventor of the compound microscope, is apparently still used as a private residence just as it was when Leeuwenhoek lived there in the 17th century. The house is within a block of the railway station and is marked with a simple blue and white plaque.

Amsterdam is, of course, one of the grand old cities of Europe. Highlights of our visit were a canal boat tour of the city, the Ann Frank Museum, and Rijksmuseum (National Museum) featuring masterpieces of the Dutch Masters including "The Nightwatch". Again we were surprised at the openness of such a large city and were delighted to find that it was quite easy to move from point to point within the city on public transportation. Even in crowded Holland great efforts have been made to make the cities livable by providing greenery and parks in abundance.

Brussels is another grand old European city. There are ornate palaces and government buildings with beautifully landscaped formal gardens and parks-- the tulip displays were, in my humble opinion, even better than those in Holland!

Language was a problem as the Belgians definitely do not all speak English. My wife's fair German and my awful German didn't help much either. Belgium has two national languages, Flemish and French. The magnitude of the European language problems can be appreciated from this information. There are about as many Dutch and Belgian people (23,000,000) as there are Californians. They live in an area somewhat smaller than that included in California south of Los Angeles. There are three languages spoken in this

area--Dutch, Flemish, and French--and all three are mutually incomprehensible.

We relaxed a bit in Brussels doing such things as simply walking about the downtown area enjoying the 16th century guild halls about the city square, the shops, markets, and risque statuary, and shopping for a lace tablecloth. In the evening we went to a concert by the Belgian National Symphony. The next morning we took a short bus trip out to the scene of the Battle of Waterloo where Napoleon was defeated by the Duke of Wellington on June 18, 1815.

France 9 days May 1 to May 10, 1977

On May 1 we activated our Enrail passes and caught the 1143 TEE (Trans Europa Express) to Paris--a marvelous smooth-riding first class train that made the run from Brussels to Paris in about two and one half hours, passing through some of the bloody battlegrounds of World Wars I and II en route.

In Paris our language problems became notably more difficult. Frenchmen not only do not generally speak English, but most of them are apparently somewhat amazed that anyone else would speak any language other than French.

In Paris we secured a third (?) class hotel accommodation on the Left Bank and set out to see the city. Paris is really magnificent--everyone should see it! We walked about three blocks, crossed one of the Seine bridges and were on Isle de Cite about 250 metres from Notre Dame. When we entered the cathedral about five o'clock in the evening, the sunlight was streaming through the great stained glass windows and an organ concert was about to begin. And it was indeed a moving experience to hear the peals from the mighty organ ringing throughout the immense structure.

The next day we were off to the Louvre. It, like the Smithsonian and the British Museum, cannot really be seen in a single day, or in a week for

that matter. However we managed to see a great many art treasures including the Winged Victory of Samothrace, Venus de Milo, The Gleaners (Millet), and of course, The Mona Lisa (she is still smiling).

Versailles was next on our agenda and we spent a day in this opulent palace set amidst the landscaped grandeur of the French Kings Louis XIV, XV, and XVI.

After Paris the next stop was Chartres for the Cathedral, then to Bellac to see a bit of French provincial life. Although we had picked Bellac more or less at random, it proved to be a good choice, and we spent three happy days there exploring the little city (about 20,000 population) and the nearby countryside. The French reputation for good food was certainly sustained here, and we can heartily recommend the Hotel Central and its dining room in Bellac. Bellac is about 40 kilometres from the much larger city of Limoges (of fine China fame). In the evenings, people come all the way from Limoges to dine at Hotel Central.

From Bellac we traveled a somewhat zig zag route through the farmland and vinyards of southwestern France via Limoges, Perigeux, and Bordeaux to Hendaye on the Spanish border.

Spain 9 days May 10 to May 19, 1977

Spain was a cultural and recreational interlude. We boarded a luxurious "Talgo" train at Irgun for Madrid. Spain was the only country that we visited where a boarding pass was required for the trains, and military guards appeared to be posted at all the stations. The first class Spanish trains were the most elegantly furnished in Western Europe, but the roadbeds seemed to be the roughest even though the trains were running noticeably slower than those in other European countries.

We spent a couple of days in Madrid and visited the Prado, one of the world's great art galleries. I think the works of Goya impressed me more than any other art that I saw in Europe.

From Madrid we proceeded to Valencia on the Mediterranean, caught a ferry to Ibiza and Formentera in the Balearics, and spent four days soaking up sunshine and doing a bit of birding. Unfortunately Louise contracted food poisoning from the local seafood, and this marred our stay in Spain. We flew to Barcelona and from there caught an express "Talgo" to Geneva.

Switzerland 11 days May 19 to May 30, 1977

We arrived in Geneva after a very long day traveling from Barcelona through much rain-soaked and partially flooded country in France. Switzerland is, like Holland, very clean and orderly--and it is amazingly beautiful. Geneva is the headquarters of various international organizations such as the Red Cross, has spectacular modern office buildings, and features the world's tallest fountain on the lake front. We did a day long walking tour of the city and visited the "Ecole de Chemie" of the University. I found a young biochemistry professor who spoke English and who volunteered to show me about the place. The students were mostly first year medical students and appeared to be doing work in chemistry corresponding to about that of the sophomore or junior level in a four year school in the U.S.A.

In Zurich at the Swiss Federal Institute of Technology I was again fortunate in finding a teaching assistant, Dieter Hametner, who wanted to practice English. He had been an AFS exchange student in Ohio and was happy to show me about "Albert Einstein's Alma Mater." Dieter was in his fourth year of doctoral work, which in Switzerland normally requires four to six years beyond the bachelor's degree. The beginning undergraduates appeared to be doing

work roughly comparable to that of our Chemistry 1B or Quantitative Analysis courses. But I gathered that Swiss university prep schools may be a bit more rigorous in chemistry than most U.S. high schools. As at Geneva, the school buildings were rather ancient, but the equipment and instruments were very modern. There were lots of Mettler instruments; and to my surprise, there were some U.S.-made Perkin-Elmer and Beckman IR spectrophotometers on hand. German was the language of instruction at Zurich; however, I was assured that the language competency of Swiss first-year university students was such that an instructor could assign a supplementary text written in English if he chose to do so!

From Zurich we made excursions into the Swiss countryside. One trip, suggested by Fred Burri, was to Grindelwald at the base of two celebrated mountains, the Jungfrau and the Eiger. Here we were awakened by cows with bells, hiked amid wildflowers to a glacier, heard alpen horns, rode cog railroads up into the high mountains, and generally enjoyed a long and memorable weekend in the Alps.

Austria 14 days May 30 to June 13, 1977

From Zurich we journeyed through the Alps, along lakes and fast-flowing rivers, through numerous tunnels to the "Olympic City" of Innsbruck in the Austrian Tyrol. From Innsbruck we went to the nearby mountain village of Mutters. Here we had a great opportunity to practice German although the Austrian version of German, like the Swiss version, differed markedly from the German that we had learned.

Mutters is an interesting place. Houses fronting on the main street have quarters for cows. The portion of a given house where the people live

can be distinguished by the window boxes, usually containing geraniums. The whole village is neat and clean--the buildings are freshly painted or white washed. Nearly every household has a garden where flowers as well as vegetables are cultivated.

It rained a great deal during our stay in Austria. Judging from the hay-making efforts, this was quite normal. The climate over a large part of Central Europe (and also Scandinavia) is too wet for cut grass to dry on the ground, and fuel is too expensive for artificial drying. Hence the cut grass must be put on various types of racks to dry. Since hay for the dairies is an essential part of the economy, hay drying racks are a characteristic sight in these areas.

By early June the pressures of the summer tourist season in Vienna were becoming quite noticeable--we went to the Opera House but decided not to attend since seats where we could both hear and see the performance cost the equivalent of \$36.00 apiece. However, we enjoyed this famous old city of ornate old buildings, relics of the once mighty 650 year-old Hapsburg empire which ended in 1918. Among other things we attended the Vienna Boys' Choir and dined in the Ratskeller.

We made a one-day trip to Rust which is a very old town only a few miles from the Hungarian border, with a large colony of storks that nest on the downtown rooftops.

Salzburg, situated in a narrow river valley with a medieval castle on the heights above the city, is a gem which we thoroughly enjoyed. The cathedral (Dom) in Salzburg is quite recent; it was begun in 1614--just a few years before the Pilgrims landed at Plymouth. It has no stained glass, but does have beautiful crisp, fresh looking murals.

Salzburg, birthplace of Mozart, is very much a center of musical culture. We attended a Chamber music concert in Marmosaal des Schlosses Mirabell, played in a little hall where Mozart once gave concerts with his father and sister. We also saw the Salzburg Marionettes and I quote from my notes made the same evening: "The operetta (marionettes) was Die Fledermaus by Johann Strauss--it was superb--I didn't know that marionettes are really a first-rate art form. The music was, of course, recorded, but it was probably the best 'hi-fi' that I've ever heard."

The salt mines of Hallein are only a few miles from Salzburg. Our trip to the mines was strenuous but rewarding. It involved a short train ride, a cable car ride for a mile or so up about a 60° slope, walking down and up a steep trail to the mine, and much walking and sliding through mine tunnels. Salt had been mined, more or less continuously, at Hallein for at least 2,500 years and large amounts are still being extracted. About 20% of the production is used for food preservation; the remainder is used to manufacture other chemicals.

West Germany 29 days June 13 to July 12, 1977

Munich was our next major stopping point after Salzburg. Despite its large size, Munich is also a clean, open city in which we could move about rather easily on the subway and tram system. The special attraction in Munich for me was the Deutsches Museum, one of the great scientific technological museums of the world. I spent a great deal of time there, visiting the museum on four different days while Louise visited some schools and protected workshops for the handicapped.

A rather grim reminder of the Hitler days turned out to be the fact that the mentally handicapped were all under 40 years of age! Although her

observations were limited, Louise feels that the Germans, possibly out of remorse, are now caring for their handicapped better than we care for ours.

We made some excursions into the country about Munich. One was to Dinkelsbuhl, a village in which the buildings, mostly dating to the 16th and 17th centuries, are being preserved. The ownership is private but the architecture is "frozen", and a property owner cannot make alterations or additions without the prior approval of a governmental board.

On the way to the Black Forest we stopped at the ancient city of Ulm and found that a "Fest" celebrating the 600th anniversary of their cathedral was in progress. There was a booth manned by American military personnel selling hamburgers. Germans were distributing anti nuclear energy leaflets, but the general atmosphere was one of carnival.

Our weekend in the Black Forest (Schwarzwald) was spent at Hintergarten, a lovely village with several hotels and many hiking trails--a great place to relax.

Heidelberg is, of course, one of the more famous of the old German university towns. Although still very picturesque, it is now quite a commercial center, and there is heavy auto traffic and heavy barge traffic on the Neckar River. There are also many American military personnel here; and the whole of Southern Germany seemed to be patrolled by low flying fighters several times daily.

I had written to Heidelberg in advance, but I was totally unprepared for, but very flattered by, the hospitality extended to me. Professor Robert Sundermeyer, director of the Inorganic Chemistry Institute at Heidelberg, spent an entire morning with me showing me relics of some of the famous men of the past who had worked at Heidelberg and discussing a wide variety of

topics. At his suggestion when I was ready to leave, we drove up to the top of the hill above the campus and walked a hundred meters or so along a walk in a park-like area--this was the famous philosopher's walk, along which many of the learned men of Germany--poets, philosophers, scientists, etc.--had walked.

After Heidelberg we were weekend guests of August and Gertrud Reinemer in Medenbach, a suburb of Wiesbaden. August is a distant relative of Louise. Neither August nor Gertrud spoke English, however we managed to communicate fairly well. August is 63 and is a retired insurance representative. He had been mobilized in 1940 and sent to Russia in 1941, was severely wounded in 1944, then sent home to recuperate and thus had survived the war. Gertrud had been a kindergarten teacher. They had two children, one of these is an engineer for duPont in Geneva.

The Reinemers took us on a long drive along the Rhine Valley and adjacent vinyard-covered hillsides. We visited the Lorelei Rock, the Denkmal (famous "Watch on the Rhine" memorial dating to Bismarck), and a church operated, but partially government funded, school for handicapped children.

Here, as in Holland, great efforts were made to keep the cities livable. Suburban sprawl was controlled by a rigid zoning system and building permits. Even though the Reinemers lived in a suburb only about six miles from downtown Wiesbaden, there was open space and farmland between their residence and Wiesbaden. There was also a large forest with hiking trails within ten minutes walking distance of their home.

Later we traveled down the Rhine by boat via Bad Kreuznach and Bingen, past the Lorelei and many castles, now mostly in ruins. It was a wonderful experience. By this time it was July and a great many tourists, including a goodly number of Americans, were on the Rhine boats. One whom we met was a cousin of Linus Pauling.

Our remaining time in Germany was devoted to visiting Cologne, Göttingen (the Georgia Augusta University), Bremen, and Eckernförde, a resort community on the Baltic Sea near Kiel.

Cologne is a large and highly industrialized city but the dominant feature of the city is the Cathedral (Köln Dom). At night the Dom is lighted very subtly, and it is simply awesomely beautiful. The Hohenzolleran Bridge, rather romantic in its own right, is a great place from which to view the Dom at night. One corner of the Cathedral had been temporarily repaired with some reinforced concrete structural work, but otherwise there was very little to remind us of the severe bomb damage that had been inflicted on Cologne.

Quite by accident we found a small plaque marking the site of the shop where Nikolaus Otto and his partner, E. Rangen, had built the first satisfactory internal combustion engine in 1864. In Göttingen a similar plaque marked the house of Robert Koch who probably deserves at least equal credit with Louis Pasteur as the founders of the science of bacteriology.

The Georgia Augusta University (Göttingen), despite its fame, is a relatively new European university, being only about two hundred years old. It, however, claims to be the first to have academic freedom in that, from its beginning, the research and writings of the faculty were supposedly subject to neither clerical nor political censorship.

After replenishing our finances at Bank of America and American Express and enjoying the sights of Bremen, including an excellent open air concert of popular music and a German language version of "The Prince and the Pauper," we continued on to Eckernförde on the Baltic Coast. Although there seemed to be almost no Americans, the place was jammed with vacationers. Eventually we found a place to stay in the home of Herr and Frau Bobsien. Herr Bobsien

(Ulrich) is a teacher of Latin and Gymnastics (physical education) at the Gymnasium (secondary school) in Eckernförde. Although Frau Bobsien's English was limited, his English was quite good and we discussed our respective educational systems and histories at considerable length. They had toured England and Scotland, and he had toured the eastern United States as a student with a choir group.

Even though we were now at about 54°30'N, the agricultural productivity appeared to be very high--and excellent small grain as well as lush pastures continued well up into Sweden and Norway. In fact, aside from that in Spain which was mostly rather arid, the agricultural land throughout Western Europe seemed to be highly productive. This was not in agreement with statements about "the worn out lands of Europe" that I had read in school books in my youth. I suspect that the chemical production of relatively cheap high nitrogen fertilizer has had a lot to do with this apparent regeneration of European agriculture.

Scandinavia 16 days July 12 to July 28, 1977

We were in Denmark for seven days, in Norway four days, and in Sweden for five days. Virtually all of our time in Denmark was spent in the city of Copenhagen. Although Scandinavia was generally rather expensive, we found the people to be friendly, and there was no serious language problem since English is a common second language in these countries. All elementary school children in Norway take English as a foreign language.

Highlights of the Copenhagen visit were two nights in the Tivoli Gardens (much better than Disneyland or Knott's Berry Farm), Carlsberg Laboratories and Brewery, the little mermaid at the harbor entrance, City

Hall with statues of Niels Bohr and Hans Christian Andersen, a Chekov play (we had met the cast while eating fish soup in a little restaurant-bar), and the Danish National Museum (Scandinavian Ethnology). In fact the whole city was fun to visit; the shops and the good food to be had here were especially enjoyable.

Göteborg, Sweden, was our next stopping point. Louise visited two institutions devoted to care and education of handicapped children and adults during the day and a half that we spent in this old Swedish city. I attempted to do some sightseeing, but this was hampered by the almost constant downpour.

Halden, Norway, was our next overnight stop. This little city is in a heavily forested region and has the second largest pulp mill in Norway, a huge installation. There was a large waterfront area with great rafts and piles of logs, and rail yards with long strings of cars loaded with logs. Wood was obviously the mainstay of the Halden economy.

Many of the relatively cheap European hotels and pensions can also be described as fire traps. And the traveler can become somewhat depressed by reading the instructions about what to do in case of fire. If the halls are blocked by flames these usually boil down to: Remain in your room and try to seal the door with wet blankets, praying in the meantime that the firemen will come to your rescue in time. The little hotel in Halden qualified as a fire trap. However, they offered the traveler the means for really positive action in case of a dire emergency. Our room was provided with a coil of rope anchored to a stout eye bolt in the framing.

From Halden we proceeded north to Trondheim, stopping about two hours in Oslo, and eventually on to Steinkjer at latitude 64°N and at the upper end of Trondheim Fjord. Although we were still about two and a half degrees

from the Arctic Circle, it didn't get dark in Steinkjer, and I noted a reddish reflection on some clouds due to the sun at 11:25 p.m. on July 22.

The journey towards home began when we left Steinkjer by traveling southeastward across Sweden to Stockholm, with a two day stopover in Oster-sund in Central Sweden. The scenery in both Norway and Central Sweden was superb, somewhat reminding me of northern British Columbia and the Yukon region.

We reached London very late on July 29 after a long wait to get on the crowded channel ferry from Ostend to Dover. After a final day in London we flew from Heathrow to Dublin on Aer Lingus on July 31.

Ireland 10 days July 31 to August 10, 1977

As in Scandinavia we did a relatively large amount of traveling and exploring the countryside while in Ireland. We proceeded south from Dublin to Waterford, then westerly to Bantry, and finally up to Limerick for an overnight stay before boarding an Aer Lingus 707 for Boston.

After Scandinavia, Ireland was a great relief to our pocket books. Probably the best bed and breakfast place that we found on our travels was Darrymane House in Waterford. The charge, not including tip, for a nice room with a very comfortable bed and a superb breakfast amounted to the equivalent of about \$10.75 for the two of us. The proprietress, Miss O'Sullivan, was very nice and talked with us at some length about Irish history and politics. We highly recommend her establishment.

To me no part of the world is without charm and beauty, and the hilly green Irish countryside surely has its share of beauty. On the other hand, neither rural Ireland nor the Irish cities appear to be places where it is easy to earn a reasonably good living. And I suspect that that was the major

reason why one set of my great grandparents emigrated from Ireland to Ohio more than 150 years ago.

One of the overall impressions gained on the trip that was surprising to me was the degree of ethnic differences that seemed to be apparent within relatively short distances among populations that had surely had ample opportunities to mix in the past. I refer to differences that I thought I saw in appearance and manner, not just in language and dress. Of course, I had not expected a typical Basque to look like a typical Swede. But the surprising thing was differences in the British Isles and Ireland. The English appear to be different from the Scotch, and the Irish are different from either the English or Scotch.

One particular trait, that of red hair, seemed to be fairly rare in Europe except in three areas--Ireland, Scotland, and Scandinavia, particularly in Norway. Can this be attributed to the Vikings?

Another thing that was surprising to me, a native of "dry" Kansas, was how much of the national effort in various European nations went into the production and distribution of alcoholic beverages. Vast acreages of land in Spain, France, and Germany are devoted to wine grapes (we didn't visit Italy). There are many large breweries in Northern Europe, Britain, and Ireland--and huge bonded whisky warehouses in Scotland. As I recall, the beer production at Carlsberg-Tuborg was said to range from about two and one half million bottles daily in winter to about five million a day in summer. There are about six million Danes. Of course, a lot of this brew is exported, but then Carlsberg isn't the only brewery in Denmark!

Despite the clearly large per capita consumption of alcohol, in most European countries we saw few people who were obviously under the influence

of alcohol, that is, who were drunk. The three exceptions to this general rule were Scotland, Denmark, and Ireland. In all three of these countries, and particularly in Ireland, we saw quite a few drunks on the streets.

NOTES ON COST

For any of my colleagues who may be contemplating a sabbatical and are interested in costs, I include this information.

In our case there was a major reduction in personal income for the sabbatical period. My wife, who normally works, was on an unpaid leave of absence and I, of course, was on reduced salary.

We made an initial outlay of about \$3,600 for air line tickets, Britrail passes, and Eurail passes. We budgeted \$50 per day for Europe; and by exercising reasonable care, we were able to hold our costs for Britain, Europe, and Ireland to just a bit under this figure. The costs in Florida and the Caribbean region were a bit higher. The \$50 per day figure was for personal travel expenses and does not include expenses incurred while shopping for gifts or items to bring or send home.