CONNECTIONS

The EERI Oral History Series

George G. Mader

Laurie Johnson
Interviewer

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Earthquake Engineering Research Institute

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Table of Contents

The EERI Oral History Series vii

Foreword xi

Personal Introduction xiii

Chapter 1 Early Years in Southern California (1929–1947) 1

Chapter 2 Education and Military (1947–1956) 5

Chapter 3 San Mateo County Master Plan (1955–1958) 9

Chapter 4 Fulbright Grant (1958–1959) 13

Chapter 5 Return to Bay Area and Joining William Spangle and Associates (1959–1962) 17

Chapter 6 -Town of Portola Valley (1965–2010) 21

Chapter 7 State Involvement in Geologic Hazards (1969–1992) 31

Chapter 8 Stanford University (1970–2000) 41

Chapter 9 Involvement with the National Earthquake Hazards Reduction Program (1977–1978) 45

Chapter 10 Spangle Associates Research and Other Key Projects (1977–2002) 49

Chapter 11 International Experiences (1981–2006) 63

Chapter 12 GeoHazards International (2007–Present) 69

Chapter 13 Looking Back 73

Chapter 14 Family 81

Photographs. 85

Index 105

The EERI Oral History Series

This is the twenty-second volume in the Earthquake Engineering Research Institute's *Connections: The EERI Oral History Series*. EERI began this series to preserve the recollections of some of those who have had pioneering careers in the field of earthquake engineering. Significant, even revolutionary, changes have occurred in earthquake engineering since individuals first began thinking in modern, scientific ways about how to protect construction and society from earthquakes. The *Connections* series helps document this important history.

Connections is a vehicle for transmitting the fascinating accounts of individuals who were present at the beginning of important developments in the field, documenting sometimes little-known facts about this history, and recording their impressions, judgments, and experiences from a personal standpoint. These reminiscences are themselves a vital contribution to our understanding of where our current state of knowledge came from and how the overall goal of reducing earthquake losses has been advanced. The Earthquake Engineering Research Institute, incorporated in 1948 as a nonprofit organization to provide an institutional base for the then-young field of earthquake engineering, is proud to help tell the story of the development of earthquake engineering through the *Connections* series. EERI has grown from a few dozen individuals in a field that lacked any significant research funding to an organization with nearly 3,000 members. It is still devoted to its original goal of investigating the effects of destructive earthquakes and publishing the results through its reconnaissance report series. EERI brings researchers and practitioners together to exchange information at its annual meetings and, via a now-extensive calendar of conferences and workshops, provides a forum through which individuals and organizations of various disciplinary backgrounds can work together for increased seismic safety.

The EERI oral history program was initiated by Stanley Scott (1921-2002). The first nine volumes were published during his lifetime, and manuscripts and interview transcripts he left to EERI are resulting in the publication of other volumes for which he is being posthumously credited. In addition, the Oral History Committee is including further

interviewees within the program's scope, following the Committee's charge to include subjects who: 1) have made an outstanding career-long contribution to earthquake engineering; 2) have valuable first-person accounts to offer concerning the history of earthquake engineering; and 3) whose backgrounds, considering the series as a whole, appropriately span the various disciplines that are included in the field of earthquake engineering. Scott's work, which he began in 1984, summed to hundreds of hours of taped interview sessions and thousands of pages of transcripts. Were it not for him, valuable facts and recollections would already have been lost.

Scott was a research political scientist at the Institute of Governmental Studies at the University of California, Berkeley. He was active in developing seismic safety policy for many years and was a member of the California Seismic Safety Commission from 1975 to 1993. For his contribution to the field, he received the Alfred E. Alquist Award from the Earthquake Safety Foundation in 1990.

Scott received assistance in formulating his oral history plans from Willa Baum, Director of the University of California, Berkeley Regional Oral History Office, a division of the Bancroft Library. An unfunded interview project on earthquake engineering and seismic safety was approved, and Scott was encouraged to proceed. Following his retirement from the university in 1989, Scott continued the oral history project. For a time, some expenses were paid by a small grant from the National Science Foundation, but Scott did most of the work pro bono. This work included not only the obvious effort of preparing for and conducting the interviews themselves, but also the more time-consuming tasks of reviewing transcripts and editing the manuscripts to flow smoothly.

The *Connections* oral history series presents a selection of senior individuals in earthquake engineering who were present at the beginning of the modern era of that field. The term "earthquake engineering" as used here has the same meaning as in the name of EERI—the broadly construed set of disciplines, including geosciences and social sciences as well as engineering itself, that together form a related body of knowledge and collection of individuals that revolve around the subject of earthquakes. The events described in these oral histories span many kinds of activities: research, design projects, public policy and broad social aspects, and education, as well as interesting personal aspects of the subjects' lives.

Published volumes in *Connections: The EERI Oral History Series*

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Foreword

The interviews between George Mader and Laurie Johnson for this oral history took place in 2011 and 2012. Laurie, like George, is a planner, and she worked for eight years in the same firm as George, Spangle Associates.

In addition to acknowledging the work of Laurie Johnson, the role of Sarah Nathe, consulting editor to EERI, is also noted for her role in reviewing and editing the manuscript and preparing the index. Oral History Committee member William (Bill) Anderson also reviewed a draft of this document. George Mattingly was responsible for the page layout work of the publication. My Davidson, the Membership and Communications Manager of the Earthquake Engineering Research Institute, also assisted in seeing this publication through to completion.

Robert Reitherman
Chair, EERI Oral History Committee
May 2014

Personal Introduction

I am honored to have been asked to write this introduction to George Mader's oral history. So far, George's is the only one in the series that focuses on someone with a city and regional planning background. This oral history deepened my knowledge of George, furthered my respect for him, and triggered a flood of memories, a few of which are noted below.

It was the formation in 1970 of the California Legislature's Joint Committee on Seismic Safety that brought George Mader and me together. He agreed to chair the Committee's Advisory Group on Land Use Planning, and I agreed to do the same for the Advisory Group on Disaster Preparedness. We met occasionally through an Executive Committee composed of the general chairman, Karl Steinbrugge, and the other three advisory group chairs.

Our relationship continued when, in May 1975, Governor Jerry Brown swore in the first group of commissioners (including George) who were to serve on the newly created Seismic Safety Commission. I agreed to serve as the Commission's first Executive Director beginning in October 1975. George became one of the four Commission chairs that our staff supported during my six years there.

One memory was a weekend visit to the Istrian Peninsula on the Adriatic Sea (now part of Slovenia), following an NSF-sponsored meeting at Lake Bled in the Julian Alps. Names of coastal towns like Pula, Rovinj, Piran, and Novigrad once again come pleasantly to my mind. At the other extreme, and noted by George, was the termination of the initial director of the Southern California Earthquake Preparedness Project (SCEPP) because he had "ruffled some important local feathers," including those of the City of Los Angeles. Without that city's participation, the project would have failed. George's leadership achieved consensus among the Seismic Safety Commissioners, and I swiftly executed the decision.

I remember reading with great interest the report by the firm where George worked, Spangle Associates, *Land Use Planning After Earthquakes*, when I had just joined the federal Office of Emergency Preparedness (OEP) Region Seven (now FEMA Region IX) soon after the 1964 Alaska earthquake. That earthquake caused the tsunami that damaged Crescent

City and served as a major trigger for many earthquake activities in which I later became involved. Of personal interest was the report's inclusion of the City of Santa Rosa's post-1969 earthquake redevelopment efforts. The OEP regional office was located there, and our family lived near downtown Santa Rosa. We experienced some minor contents losses in the earthquake, and our young children and our dog were rather scared. I also knew the city manager (who later was appointed to the Seismic Safety Commission), so I saw firsthand how the redevelopment efforts helped revitalize the old downtown area.

I had opportunities to work with George and Spangle Associates on several other activities, including a trip to Mexico City after its 1985 earthquake, where we focused on temporary housing and housing reconstruction. Another was studying the ways in which the volcanic threat (and earthquake swarms) in the Mono Lake, California area in the 1980s affected land use and emergency preparedness measures. Lastly, we joined to evaluate the roles played by the recovery and reconstruction element of the Los Angeles Emergency Response Plan after the 1994 Northridge earthquake.

My affection and respect for George Mader continue. I find him to be a clear communicator, a good listener, an excellent researcher, a decisive manager, and a committed mentor to younger people starting out and advancing in his profession. EERI is indeed lucky to have George among its members.

Robert A. Olson
July 2013

CONNECTIONS

The EERI Oral History Series

George G. Mader

Chapter 1

Early Years in Southern California (1929–1947)

There were no freeways and little traffic. Most families had only one car. Kids rode bikes a lot and used streetcars and buses.

Johnson You were born in 1929 in Southern California. What brought your parents there?

Mader My mother was born in Minnesota, my dad in Pennsylvania, both in 1904. They came out to California with their parents in the early 1900s and spent their early years, including high school, in Pasadena. They were musicians by training. Dad was an organist and, at the age of 11, played the organ in the church where his dad was the pastor in Easton, Pennsylvania. Mom had her background primarily in piano but also in organ.

We lived in Glendale. Dad played at a large church on Wilshire Boulevard, the Immanuel Presbyterian Church, which in its

heyday was quite a major church, right near the well-known Ambassador Hotel. He had a national reputation as an organist, teacher, and composer. Mom, besides raising two children, kept her hand in the organ world and played at several churches in the Los Angeles area.

So, I come from an artistic family background. Mom was incredibly talented in many things that she could do with her hands in addition to her music. In his later years, Dad turned his creative talents to writing poetry. He also took up painting and produced largely interpretive and abstract works. Also, I recall the break they took in later years, spending a year in Europe. Dad played organs of various periods in a number of churches while in Europe.

Our parents were very broadminded and created a wonderful home for us in many ways: intellectually, artistically, and with respect for the world.

Johnson What was the age difference between you and your brother?

Mader Bill was five years older than me. From his early years, he had the ability to draw and an imagination that eventually led him into architecture, where he did some very fine work after graduating from the School of Architecture at the University of Southern California (USC). The first house he designed was for our family home in Glendale. It is considered an outstanding example of contemporary architecture of the period.

Johnson What was it like to be raised in Southern California in that era, seeing all the transformation in the region during those years?

Mader At that time, Glendale was an incorporated city with a population of about 80,000. We were next to Burbank, Eagle Rock, Los Angeles, and Pasadena. But the world was so different then. The statement that "you could be in the snow in the mountains at the beginning of the day, and at the beach in the afternoon" was really true. We didn't have smog, just beautiful blue skies. You could be outside most of the year. That was a golden period in Southern California.

There were no freeways and little traffic. Most families had only one car. Kids rode bikes a lot and used streetcars and buses. I could walk to the end of our block in Glendale and catch the red streetcar, and ride to Pershing Square in the center of Los Angeles. As a kid, that was pretty neat.

We were very much a part of the beginning of World War II. We lived near the Grand Central Airport in Glendale, and the Lockheed airport was in the adjacent city, Burbank, where the Lockheed airplane factory was located, so, as new planes were being rolled out, we would see some of them being flown. I particularly recall seeing the new P-38 being tested near our home, with one cockpit, two booms or fusilages each with an engine, and a twin tail.

This was a really exciting time. We would ride our bikes down to Grand Central Airport and watch the training of pilots in Stearman biplanes for the Army Air Corps.

After the bombing of Pearl Harbor, we had blackouts during which we drove with our car lights dimmed, and we had to put up blackout curtains in our homes. Gasoline and food were

rationed. We took cooking fat to the market to be used in the production of ammunition. We were very much aware of the war because Japan was just on the other side of the Pacific.

When my brother was drafted, our whole family went down to the draft board office near Glendale to see him inducted. Glendale was kind of an enclave, so I couldn't believe the people we saw. I saw people from parts of Los Angeles that I had never seen. That was when the "zoot-suiters" were in. They had these big baggy pants tight at the ankles, big gold key chains down to their knees or beyond, and hats with very wide brims. I had never seen anyone in Glendale dressed like that before.

At any rate, those war years made a strong impression on me. We would gather around the radio, look at the dial, and listen intently to President Roosevelt's "fireside chats." The nation hung on his every word. It was a very powerful time, and everybody felt they were part of the war effort.

Johnson Where did you and your brother go to school?

Mader We went to public schools in Glendale. We lived near a complex of an elementary, intermediate, and high school. We could walk to all of them from our home. They were located on an alluvial slope leading up to the Verdugo Mountains.

Johnson You love the outdoors. Did your family also enjoy the outdoors? Did you go hiking in the mountains then, as you do now?

Mader My dad in particular imparted a love of nature. He grew up in Pennsylvania in a family that included a professor of biology. We have great pictures of dad playing with snakes draped around his neck. Our folks loved the outdoors, but Dad worked so much that there were very infrequent times for recreation. As an organist, he had to play at church services, teach students, and have time to compose. Teaching was essentially a seven-day-a-week schedule.

We did have one special outing where we would drive up into the San Gabriel Mountains past Mount Wilson to Charlton Flats and cook hamburgers outside under the pine trees. This was a big event. We didn't take long trips like people do today, and I don't think that a lot of people did at that time. For one thing, the cars in those days were minimal compared to cars today. The radiator would often boil over in hot weather, and they did not have air conditioning.

Johnson What values did you gain from your parents and your family?

Mader Oh, the values they reflected will never leave me. There are the aesthetic values; appreciation of the natural environment; values of appropriate things to do; concern about bigger questions, not just little questions; concerns for national issues and international issues; respect for life and others; and freedom to discuss topics with them. They were very approachable. I can't imagine parents who would be more giving to children than our folks were. They were reasonably demanding at the same time, but that's necessary, so you can't fault them for that. As you may know, they died prematurely as innocent victims in an automobile accident in 1971.

Johnson I didn't know that.

Mader They were living at Leisure World in Orange County and Dad was still teaching some. They were on the freeway and a truck coming toward them blew a tire, went over the center divider, and it was a head-on collision. My wife Marjorie and I and our kids were back in Wisconsin at the time at her family's cottage where there was no phone. The Sheriff came out to the cottage in the middle of the night to inform us. That was the worst experience of my life.

They were 67, very fit for their age and enjoying life where they were. I recall shortly afterward that, when we were walking in Newport Beach where my brother lived, one of his young kids said, "The accident was on 7/7/71." That date is one I wouldn't ever forget. The trucker was at fault and our attorney asked if we wanted to go to court. Bill and I decided that we didn't want to involve our family, including our kids, in a court scene. My parents' legacy needed to end on a higher level than in a court battle. One of the saddest things to me is that our kids didn't really get to know enough about their outstanding grandparents.

Johnson How old were you and your children when it happened?

Mader I was 42 and our oldest son Steve was 11, Ann was 8, and Philip was 5. So the kids did have some memory of their grandparents, but not much. Mom would come up to the Bay Area and help with the kids periodically. One of the nice things was that Mom and Marjorie became very good friends. They talked on the phone a lot. That isn't always the case with mothers and daughters-in-law. We would hop into our little VW bug and drive down to Southern California rather frequently, so that the ties would be maintained not only with my folks but also with my brother and his family.

After my folks' deaths, students and friends of my parents established the Ruth and Clarence Mader Memorial Scholarship Fund that has been in existence for 41 years now. We hold periodic national organ performance competitions and also sponsor research on the organ and compositions for the organ. It has been a nice surprise to me that it has kept going for so long. It is a non-profit organization, with the board of directors made up of outstanding organists. All board members pitch in to do the work.

Chapter 2

Education and Military (1947–1956)

As a boy, I spent many days hiking in and discovering the San Gabriel Mountains behind our home in Glendale as well as on the eastern side of the Sierra Nevada. With this background in the natural environment and how it is used, I decided to major in geography at UCLA.

UCLA (1947–1952)

Johnson How did you decide where to go to college and what to study?

Mader When I graduated from Herbert Hoover High School in 1947, I didn't know what I wanted to do. My brother had been in the Army Specialized Training Program at Ripon College, a small liberal arts college in Wisconsin. He said, "George, why don't you go there?" So I did go to Ripon. It's ironic that Wisconsin happens to be the state my wife is from but, of course,

I didn't know her at that time. And it's interesting: as I look back on that small liberal arts college, I had some of the best teachers that I've ever had. In basics like math, English, French, chemistry, they were all really good. To this day, I remember my English teacher. In fact I wrote to him not long ago, telling him how much I appreciated what he had done in teaching us how to write and think 50 years ago! But after one Wisconsin winter, I decided to return to California and enroll in UCLA.

Johnson Was it easy to transfer to UCLA in those days?

Mader Yes, the tuition was minimal and all you needed from high school was a B average, two years of a foreign language, math through geometry, and a few other courses. I could drive from Glendale to UCLA so we didn't have to pay for me to live there. It was an economic choice and a fine university.

Johnson What was your undergraduate major and how did you choose it?

Mader As a boy I spent a lot of time in the mountains. With this background in the natural environment, I decided to major in geography at UCLA. I graduated in 1952, but I didn't know where my training would take me. That was until my brother Bill, an architecture student at USC, again advised me and said, "George, why don't you come over and listen to Simon Eisner, a city planner teaching at the architecture school?" I listened to his lecture and was very impressed. What Mr. Eisner did sounded like something I would like to do. I also went to some lectures given by the then-planning director for the City of Los Angeles. I thought city planning would be a good application of my background in geography and would allow me to be proactive in improving the environment. Also, I wanted to work for the public interest. You want to make things better for people, that's the essence of what you should do as a city planner.

Si Eisner was a wonderful man and a great planner who consulted with many cities in Southern California. His two sons also went into planning and architecture. One son, Richard Eisner, headed the Bay Area Regional Earthquake Preparedness Project and worked for the Governor's Office of Emergency Services for many years.

Military (1952–1954)

Johnson You then went into the military. Was there a draft then?

Mader No, but as I recall, a draft was expected because the Korean War was going on. The question was: Do I want to be drafted or do I want to take advantage of the ROTC program? So I went down to the recruiting officer at UCLA to find out what the options were for officer training. He suggested the infantry. I opted for the Army Quartermaster Corps.

I went back to Fort Lee, Virginia, for training, where I got my second lieutenant bars. During my two-year commitment I got to see quite a bit of the United States. Assignments included time at the Utah General Depot; the Electronic Proving Ground at Fort Huachuca, Arizona; and at Fort Ord and Camp Hunter Liggett here in California. Following this, I was required to stay in the army reserves for several years where I could be called to active duty if needed.

Johnson You did all that in just two years?

Mader Yes, two years. When they were calling up the quartermaster officers to go to Korea, the class before mine had to go. When they got to my class, they didn't need more officers, so I didn't go. The next class also went to Korea.

University of California (1954–1956)

Johnson When you finished up your army service, did you go back to Southern California?

Mader No, I didn't. When I was in the service, I was thinking about what to do when I got out. I learned about the new graduate city planning program at U.C. Berkeley and corresponded with T.J. "Jack" Kent, who was chairman of the department. The program had been in existence for only a few years. I was excited to meet Jack since he was an outstanding planner and had been the planning director for the City of San Francisco.

I applied and was admitted to the two-year graduate program in City and Regional Planning. We had about 15 students in the class and excellent instructors: Kent, author of the *Urban General Plan*[1]; Catherine Bauer Wurster, a housing expert, who was the wife of the architect William Wurster; Don Foley, a sociologist; Mel Webber, an economist; and Francis Violich, a landscape architect. Jack had tailored the faculty to cover the topics he thought important in a graduate program, supplemented by special courses in other schools including Engineering and Architecture. I was fortunate to be able to enter the program.

Afterward, Jack wanted me to go back to Southern California because he thought people down there needed to know about the urban general plan, a special interest of his. The problem was that I began to like the Bay Area more and I had met my future wife, Marjorie, who was living in Marin County. Also, I had worked between my first and second year in graduate school for the well-known city planner, William (Bill) E. Spangle Jr., on the San Mateo County-wide Master Plan Project and had a job waiting for me there.

So, it just made more sense to stay in the Bay Area. At that point, Los Angeles was getting to be more crowded and the air quality was not as good as it had been. My folks never tried to talk me out of staying in the Bay Area, but I suspect they wished that we had relocated to Southern California to be near them. I did have a chance to work for Victor Gruen in Los Angeles, an excellent city planning consulting firm. Marjorie and I went down, were wined and dined, and looked around at where we could live. We visited a nice coastal community just north of Santa Monica, but when we thought of everything—schools, congestion, and so on—we decided to stay in the Bay Area.

Johnson How about your brother? Did he stay in Southern California after he graduated from USC as an architect?

Mader Yes, Bill stayed in Southern California. He started his own practice and

1 T. J. Kent, Jr., *The Urban General Plan*, Chandler Publishing Company, San Francisco, California, 1964.

raised a family of three boys. They lived out in Reseda in the San Fernando Valley first, and then gravitated down toward Newport Beach, and eventually out toward Palm Springs. They moved around a bit. Bill became the chief supervising architect for the Irvine Corporation, where he had major responsibility for overseeing the development of the new community of Irvine. He had to evaluate proposals from developers. He was often caught in the middle: on one side was Irvine wanting to sell or lease property, and on the other was the developer who wanted to build something. He had to stand up for good design and try to bring the two sides together.

Johnson Was there ever much interaction between you two professionally, with you as an urban planner and him as an architect?

Mader No. While we had many good discussions about architecture and planning, we didn't work together professionally.

Chapter 3

San Mateo County Master Plan (1955–1958)

I went into planning because I wanted to help cities improve their environments to better serve their residents.

Johnson You are one of the few non-engineers invited to have your oral history recorded by EERI. What would you like people to know about your career as an urban planner working in the field of seismic safety?

Mader Circumstances were such during the 1970s and 1980s that I may have been the major spokesperson in the U.S. for the use of geology in city planning. I emphasize the word "may."

I went into planning because I wanted to help cities improve their environments to better serve their residents. My education and first planning work focused on the larger picture of cities, that is, the overall layout and design of cities and urban regions.

Johnson How did you come to know Bill Spangle and work for the County of San Mateo?

Mader Bill had posted a notice in the Department of City and Regional Planning at UC Berkeley asking for someone to work for him during the summer. I went and interviewed with Bill. Fortunately, he hired me. I worked for him in the summer of 1955, and our association lasted until his death at age 86 in 1998.

Johnson Where was his office then?

Mader San Mateo County had rented a house near the county courthouse in Redwood City for the new County-Wide Master Plan Project. We were purposely separate from the county offices so we wouldn't be disturbed by day-to-day planning questions. We were the "ivory tower" planners looking ahead 35 years, so they had to keep other people away. We had a small staff that varied from six to eight people.

Bill Spangle had received the first degree in City and Regional Planning from UC Berkeley in 1938. In fact, he developed the degree program in use at that time. He was one of the most forward-thinking planners in the San Francisco Bay Area, as well as the nation, in those years. He worked not only on San Mateo County's first master plan, but also was a key planner on the state development plan, which Governor Edmund Brown, the first Governor Brown, Pat, supported.

Johnson Was that the first statewide plan?

Mader Yes, it was a first effort at a statewide plan, and while it was never adopted by the state, it did have some influence on future planning in the state. That was Bill's level of thinking: not just local planning but planning for the future of the entire state. He also helped develop the Bay Area Regional Transit Plan. The work on the state plan and transit plan occurred after Bill completed the county-wide plan and had opened his consulting business in 1959.

Some people have called Bill a "planner's planner." He was an excellent technical planner with great foresight and a real grasp of what urban planning is about. He was a thorough professional, a great taskmaster and teacher. I learned a tremendous amount from him and was fortunate to have him as a mentor and friend. I couldn't have asked for more than that. Bill was an outstanding person. He did a lot for the planning community, both for the profession and for communities. In 1992, the American Planning Association (APA) named Bill a "Planning Pioneer."

Johnson My time at Spangle Associates was after Bill had retired and you had assumed the helm as president. But, he would still come in fairly regularly and often offered really practical and highly insightful advice as I worked on planning commission reports, research concepts, and such.

Getting back to your work with him on the San Mateo County-Wide Master Plan Project; was this the first comprehensive plan for the county, and what did it entail?

Mader Cities in the county had their own plans, but we were trying to put together a coordinated plan to guide the county and cities in looking ahead 35 years. This had never been

done before for the county. We worked with representatives of all of the cities and unincorporated areas. It was a typical general plan in that it dealt with all land uses and circulation proposals. Our plan called for a system of communities on the San Francisco Bay side of the peninsula south of San Francisco as well as along the coast.

Now, here is a major problem—how do you look ahead 35 years? How do you project the population? We made the best population projections we could using a very good consultant demographer. Projections are usually based on extrapolations from past trends and assumptions as to future trends. Even with extreme care, however, projections often are not very accurate.

Johnson You estimated more than what actually took place?

Mader Yes, we projected a total population of 800,000 by 1990 for the County of San Mateo; however, the census for 1990 reported only 650,000. Current population projections for the county are for nearly 800,000 by 2025. Thus, our projection for 1990 probably won't be reached until close to 2030, about 40 years later than we had projected. To accommodate our projections, we planned an outer Bayshore Freeway. Now, with the interest in the natural environment, nobody would even consider that, especially with the advent of the Bay Conservation and Development Commission. We also showed development coming down the coast from San Francisco to Half Moon Bay and even down to Pescadero. In order to accommodate the projected growth, we had to use that much land. We were assuming rather low densities, probably lower than would be accepted today. But we did try to arrange land uses around circulation systems and community centers, all the time paying attention to topographic conditions.

Johnson Thinking about geology and earthquake hazards, it sounds like your planning perspective was very topographically oriented at that time. What was known about faults and landslides then? And did the plan include the notion of lowering development density in less stable and potentially hazardous areas?

Mader What we did know was that it's difficult to develop in steep terrain, given the need for grading, more expensive construction, and the resultant destruction of the natural environment, along with drainage and erosion problems. Since the difficult terrain was at some distance from the circulation system and community centers, we planned for low-density residential land uses in the hills. The planning theory is to plan for high densities near transportation, commercial, and industrial areas.

But we did not really talk much about landslides or earthquakes. I've looked back in the original plan, developed in the mid 1950s, and I found that there's hardly any mention of these matters. We mainly talked about physical planning relative to terrain and location. We were not really thinking about earth science issues. A lot was probably known about these issues, but I believe that information was holed up elsewhere, with geologists, geology professors, and the USGS. That information hadn't found its way into the planning arena at that time.

Johnson What were some of your job responsibilities on the plan or other projects in that early period of time?

Mader Among my responsibilities on the County-Wide Master Plan was analyzing and planning for all land uses and transportation facilities. We wanted to distribute all development, including residential areas, commercial centers, and industrial areas, to be consistent with a desirable overall county plan as well as with local community plans. Our staff included Marty Boat, a sociologist, who worked on the population and economic analysis. We also had a very good designer, Harlow Hudson, an architect. I did pretty much what I would do working for a city on a general plan but for a much larger area. I was learning all the time. This was all before we had computers. We met regularly with the Advisory Planning Council formed by San Mateo County that included representatives from all 16 cities there. This was critical to the plan's success.

Johnson Were you involved with the project all the way through to the end, and when was the plan adopted?

Mader I stayed with the project until the plan was adopted by the San Mateo County Board of Supervisors in 1958. Subsequent to that initial adoption, the plan has been continually revised over the years. Unfortunately, the county doesn't play a strong role in overall planning since its role with respect to the cities is largely advisory.

Johnson Did your first job meet your expectations?

Mader Yes. It was a great experience and I learned a lot.

Johnson Did you feel you were working in the public's interests since you mentioned you were in an "ivory tower"?

Mader Yes I did, because we had representatives from the cities involved in the project on an Advisory Planning Council. We reported to the Council, worked with them, got a good feeling about how the communities wanted to develop and their reactions to our ideas. The work met my expectations even more than I had anticipated.

Chapter 4

Fulbright Grant (1958–1959)

Marjorie thought it would be a great experience to live in a foreign country. Why not apply for a Fulbright Grant to study city and regional planning in the Netherlands?

Johnson After the San Mateo County Master Plan was finished in 1958, what did you do next?

Mader Marjorie and I were married in 1956. I was working for San Mateo County, and she was working as a reporter for the *Redwood City Tribune*. Marjorie thought it would be a great experience to live in a foreign country. Why not apply for a Fulbright Grant to study city and regional planning in the Netherlands? I thought this was a real reach but, nonetheless, I applied for a Fulbright Grant to study in Holland. After a scary but successful interview by Professor Konrad Krauskopf, a geology professor at Stanford, we did receive the grant.

Johnson What was your interest in Europe?

Mader I knew that the Netherlands had strong local planning and also strong national planning. And I was interested in seeing new towns in England, the plans for Greater London, and new towns in Sweden, Denmark, and the Netherlands. I also learned

that for a Fulbright grant to study in the Netherlands, you didn't need to know Dutch. The Fulbright program was a way for European countries to pay back the U.S. for assistance during World War II.

Johnson When did you go and how long were you there?

Mader We left in 1958 on the *New Amsterdam*, an old ocean liner without stabilizers, sailing from New York to Amsterdam. As grantees, we got the lowest class of cabin that was in the bottom of the ship. According to the captain, it was the roughest crossing he had made in his long career crossing the Atlantic. Unfortunately, Marjorie got quite sea sick, but we did arrive safe and almost sound. It was not the best start.

After the Fulbright orientation, we settled in Delft, a city between The Hague and Rotterdam, where I studied at the Technical University of Delft. I attended regular lectures in Dutch, which was only partially satisfactory. However, the three American students at the university were assigned to a graduate assistant who spoke English, Kees Post. He did many things for us, which made the experience much more worthwhile. In particular, we went to the Provincial Planning Offices, somewhat similar to states or counties in this country, which had a major role in planning for the Netherlands. We also went to city planning offices where we learned about Dutch city planning in some detail.

During World War II, the Dutch suffered by not having enough food. After the war, they were of a mind to conserve their land for agriculture. A major feature of the national plan was what was called the Randstadt, or Ring City, in the western part of Holland. The concept was to keep urban development on the rim of this large area and preserve the center for agriculture.

Another planning concept was the development of polders in the Zuiderzee, a large shallow bay in the north part of Holland protected from the sea by a 20-mile-long dyke. Within the Zuiderzee, the Dutch first built reed mats, and then weighted them with rocks until they sank to the bottom. With this foundation, they then dumped dredged material to form a dyke around each polder. Then they pumped the water out of each polder. Following that, over a period of years they nurtured the soil until it could be productive farmland. The effort was for agricultural purposes and nothing else. However, over the years, with increased importation of food and the demand for housing near Amsterdam, urban development has encroached on some polders.

In Holland, most new development is in areas with a high groundwater table, so housing and other projects usually have to be built on pilings. Therefore, city expansions are very expensive, something that can't be done easily. At the same time, these costs are an incentive to build in compact communities and leave more land for agriculture. The constant sounds I remember when we lived in Delft were: boom, boom, boom—the almost never-ending symphony of pile drivers.

Johnson Did Marjorie accompany you on your trips around Holland?

Mader Not to the planning offices so much, but we bought a tomato-colored 1958 Volkswagen Bug in the U.S. for $1,200 that we

picked up in Copenhagen. It had a canvas top you could slide back to see the sky. We did not realize when we agreed to pick the car up in Denmark how important those Danish license plates would be. WW II was fresh in the minds of the Dutch, and if we had had German license plates, we would not have been at all welcome. Whenever we had a chance, we took trips within Europe. We visited historic cities in Italy, explored remote areas in Norway, enjoyed Paris, visited well-preserved medieval towns in Germany, and skied in Austria—you name it. We had a lot of time to travel on weekends, and then we'd both take a week off for a special trip.

It was a very meaningful year. I would recommend to anyone that if you have the opportunity to go and live in a foreign country for a year, you should do it. You get to be part of the community and learn how the country works. Marjorie learned to shop without a supermarket. She went to separate shops for the green grocer, the meat market, the fruit market, and the baker—everything about shopping was different. She also helped teach Dutch children at a local school. We wouldn't trade that year in Europe for anything. Both Marjorie and I felt we learned so much.

Johnson A devastating storm affected Holland in the 1950s. It was probably right before you went there. I think it was 1953. The storm caused a lot of flooding, and their recovery and rebuilding experience was quite informative to planners in New Orleans after Hurricane Katrina. After those storms, the Dutch studied their flood risk and how to manage it, recognizing that they had a lot of land near or below sea level.

George Mader Yes, at the mouth of the Rhine, near Rotterdam, extensive dikes with huge floodgates were built to prevent waves coming in and flooding the area around Rotterdam. This was a major national effort.

As I previously mentioned, a long dike was built to shut off the Zuiderzee from the ocean. It also protects inland areas from flooding and has allowed the Zuiderzee to build up fresh water over a period of time.

Johnson You also traveled to see new town planning in London and other places in Europe. How did your thinking about planning in the European context shape your views? What major impressions did you come away with?

Mader First, I learned a lot about the history of cities in Europe, which I used in teaching in later years at Stanford. We saw the wonderful collection of cathedrals in Europe, which in and of themselves are great studies. We also looked at new towns, particularly in Great Britain, Harlow being one of the major ones at the time. We also visited the new town of Vallingby in a wooded area west of Stockholm, Sweden, a wonderful example of controlled planning and development. A high-speed rail brings people from the heart of Stockholm to the center of the town, and then many residents can walk to their homes. It was a good example of coordinated rail planning and distribution of new development in compact settlements. They have been providing for bicycles and pedestrians for generations in much of Europe, another endeavor in which they are light-years ahead of us.

The Dutch had a culture of biking throughout the war, as well as during their very difficult recovery after it; bicycles were always more of a necessity than a piece of recreation equipment. In Copenhagen a couple of years ago I was looking at the bikes at the train station. They are not the bikes we see around here, but the kind where you sit up vertically, very properly, you have a place to put things on the back, and you ride around town.

Johnson What were some of the big lessons you learned from your year abroad?

Mader New development in Holland was by means of major city expansions. In these plans, they took great care to try to reproduce a sense of place that would remind people of the areas in which they had previously lived. This did not leave as much room for innovation as we found in Sweden.

While Sweden did a great job of land use planning, in my opinion they didn't produce architecture of the highest quality. On the other hand, I think Denmark had great architecture while not doing as good a job of overall planning. The English new towns had some of the best land planning, but lacked great architecture. I found these contrasts and the reasons for them fascinating to ponder.

I had seen a lot of very controlled development, well-designed and well-executed, but when I drove down the long boulevard on the San Francisco Peninsula, El Camino Real, with its helter-skelter strip commercial development, I found it rather refreshing to see such variety. In perspective, I learned that it's difficult to plan a community from scratch and get the sense of variety and history that is so valuable in cities that grow up over a period of time. In highly planned new urban environments, a few people may plan for a large area rather than, as is normally done in this country, a lot of people each planning or developing small parts of the area over a span of time. The chance for variety derived from a complex of decisions and over a span of time does not always result in the prettiest picture, but may be a more interesting, comfortable one.

I came back feeling the need to be careful and not put too much of a straitjacket on things by overly rigid planning; allow individual expression within reason. I thought I'd come back and say, "Let's build some more single-design new towns," as I had seen in Europe, but this was not the case.

Johnson What happened when your year was up? Did you come straight back to the U.S.?

Mader Fortunately, we came back on a newer ship, the *Empress of England*, which had stabilizers. It wasn't a bad trip except that, on the last day, food poisoning broke out. Marjorie got violently ill and had to be taken off the ship in a wheelchair when we landed in Montreal. Our VW, which had been on the ship with us, was sitting there at the bottom of the gangplank. We got Marjorie and our suitcases into the car and made a quick exit out of Canada to my cousin's home in Rochester, New York, then back home so Marjorie could recover.

Chapter 5

Return to the Bay Area and Joining William Spangle and Associates (1959–1962)

We have always liked having a small firm where all planners can do interesting and innovative planning work rather than administrative work.

Johnson When you came back to the Bay Area, what did you do and where did you live?

Mader I took a job with the San Mateo County Planning Department. Since Marjorie and I didn't have much money when we returned, she worked at the Emporium during the Christmas rush, wrapping packages. We found a very nice "story book" house to rent next to a creek between San Carlos and Redwood City. It was owned by an old Italian family, which is a whole story in itself.

Johnson How did you get a job back at the county when you returned?

Mader I just went and applied to the planning department and they hired me. They put me in charge of the current planning division, which meant handling zoning matters, subdivisions, and development projects. I had a small staff under me. The first day I got there, Larz Anderson, who was assistant planning director said, "George, there are some guys at the counter. They want to do a certain project—go out and talk to them." That was baptism by fire. I worked for the county for several years and had chances to work with the planning commission and the board of supervisors. The Planning Director, Frank Skillman, was a fine person and planner; it was a privilege to work under him.

Johnson When you were working on the County-Wide Master Plan Project, did the county have long-range planners in their planning department or were the planners mostly involved with current planning work?

Mader Some planners were thinking about long-range planning, but there wasn't much of an effort or much money put into that approach. The County-Wide Master Plan Project was funded by a Section 701 grant from HUD, the federal Department of Housing and Urban Development. It was special money that went into the effort, and our planning team was located in a different building and separate from the rest of the planning department. I suppose if the county hadn't had the 701 grant, the project would not have happened at that time. The 701 federal grant program was instrumental in getting planning programs and general plans started in many cities and counties across the country in the 1950s and 60s.

Johnson How was the county's planning department structured when you worked there, compared to how a planning department might look today?

Mader Much of the work was similar because it relates largely to the general plan, zoning matters, and the subdivision of land. There has been an increase in planning for downtown revitalization and land reuse since that time. Also there is more emphasis on making provisions for affordable housing. One of the biggest differences, however, stems from the adoption of the California Environmental Quality Act (CEQA) in 1970, and the National Environmental Policy Act (NEPA) in 1969. All major planning projects in California now have to be evaluated pursuant to CEQA. These analyses can double the time it takes to complete a project while, at the same time, planning departments still have pressing current and long-range planning projects. In San Mateo County, as in other counties, the county tries to be a leader in planning, but the independence of cities makes this leadership role extremely difficult to carry out.

Johnson So, cities pretty much dictate their own future now?

Mader Yes. In the past, there have been efforts at establishing a regional government that would provide guidance to the entire San Francisco Bay Area. These attempts were never successful because local governments want to preserve their independence. There are several agencies, however, that work to provide coordination. The Association of Bay

Area Governments (ABAG) promotes regional planning, but members are not bound to ABAG decisions. The Metropolitan Transportation Commission (MTC) has a major role in directing federal funds for transportation. MTC can work to get cooperation in a regional transportation plan. Also, since the state now sets housing numbers that local jurisdictions must meet, there is some benefit for communities going together and doing joint housing plans. A lot of planning is similar to the 1950s and 1960s, but the planning world is more complex due to rapid growth, new regulations at regional and state levels, and the greatly increased concern for the environment.

Johnson What made you leave San Mateo County and join up again with Bill Spangle?

Mader I found that working in a large organization like San Mateo County was not my cup of tea. There is a certain mentality about big organizations that I don't like: "Well, its coffee time. Let's all go down to the coffee shop together and drink coffee." It was highly repetitive and largely boring to me. I suppose that I also had my fill of large organizations after having served in the army.

Bill Spangle had started his consulting practice in 1959, and so we talked when I decided to seek a change. He didn't have the San Mateo County planning contract anymore. He was doing all the planning for the Town of Woodside. I liked the variety of work he was doing and wanted more independence, so that is how I made my decision to work for Bill again in 1962, after working for about two years with the county.

Over the years, we prepared plans for many other communities. For instance, we prepared the general plan for South San Francisco as well as detailed district plans for parts of that city including development along the waterfront, much of which has now been accomplished and developed. We did a plan for Burlingame and development adjoining the San Francisco airport, some of which has taken place. We also prepared a plan for Sausalito, which was focused largely on the waterfront. We worked with an outstanding landscape architecture firm—Eckbo, Dean, Austin & Williams—known as EDAW for many years and now part of AECOM. They were all leaders in landscape architecture in the Bay Area and beyond. That was an interesting project. We worked on plans to redevelop Marinship in Sausalito, where ships were built during World War II. Sausalito was an interesting community to work for, and I think the plans we prepared for the waterfront were very good.

Our staff remained small, usually between five and eight people. We have always liked having a small firm where all planners can do interesting and innovative planning work rather than administrative work.

Johnson Weren't your first offices in an old school building?

Mader Yes, for a while, the firm occupied rooms in an unoccupied public school located on El Camino Real in Menlo Park. Next, we moved to offices on Woodside Road in Redwood City, a little more upscale than the vacant school. Next, we gravitated out to offices on Alpine Road in Portola Valley. That location was close to Bill's home and our

home in the planned community of Ladera. Neither of us lived more than five minutes from our office. We kept the office in Ladera for a long time until our landlord planned to rent large spaces for medical offices, at excessive rents. Following that, we moved the office to downtown Menlo Park where we are now. This is an excellent location, close to freeways and the train to San Francisco.

Chapter 6

Town of Portola Valley (1965–2010)

I was fortunate to be named town planner in 1965, almost immediately after incorporation of Portola Valley.

First General Plan

Johnson When did you and Spangle Associates first get involved with the community of Portola Valley? And was it still an unincorporated area of San Mateo County?

Mader As we were finishing the Master Plan Project for the county, we were paying particular attention to the Town of Woodside and the adjacent unincorporated community of Portola Valley. That involvement morphed into another Section 701 grant to the county to prepare a general plan for the planning area that included the community of Portola Valley and part of the Town of Woodside. Our firm then prepared the plan, working with representatives of these communities before Portola Valley was incorporated. Some of the representatives were subsequently active in the incorporation of Portola Valley in 1964, and some were then elected to the first town council.

When Portola Valley incorporated in 1964, it had a brand new general plan prepared with input from those who formed the first town council. This was a huge advantage for a new city because it incorporated with a new general plan that embodied the planning objectives that were articulated in the arguments for incorporation. The new general plan set the community off on a good path.

Often, when communities incorporate, they do so with a certain amount of disagreement. When Portola Valley incorporated, it did so with one major objective: to preserve the natural environment of the valley. Then, with the plan and the development and adoption of regulations designed to implement the plan, Portola Valley was off to a very good start. You couldn't ask for a better planning situation.

Town Planner Role

Mader I was fortunate to be named Town Planner in 1965, almost immediately after incorporation of Portola Valley. I continued in that role until 2010, when I was named Town Planning Consultant, and Tom Vlasic of our firm assumed the town planner function.

Johnson You, Tom, and Spangle Associates have served in a consulting capacity to the town, not as staff.

Mader Yes, we have served on contract as consultants since 1965. Our firm does all but the more administrative planning work. We're not like a consultant who comes in and does a few things here and there and leaves. We do most of the day-in and day-out planning as well as long-range planning.

Integration of Geology into Planning

Johnson When I joined Spangle Associates in 1988, you were working on a National Science Foundation grant that ultimately resulted in the publication of the book, *Geology and Planning: The Portola Valley Experience*[2]. It describes the formation of the town's geologic review process and accompanying regulations. What happened in Portola Valley that was different? How did it happen?

Mader Here I have to give some background and talk about one individual, my geologist friend Dr. Dwight Crowder.

Dwight Crowder was a scientist at the US Geological Survey (USGS). He lived in Portola Valley. He rode his bike round trip to the USGS office in Menlo Park each day, a distance of about 16 miles, in the late 1960s until his premature death in an automobile accident in 1970, where he was the innocent victim. This was almost 50 years ago, well before the current craze of many people riding bikes. I mention this to point out that he was a real individual. Dwight was unusual in that, while he was a scientist, he had an interest in advancing public policy. My experience was that most geologists wanted to talk about geology, but they didn't want to talk about how to use geology in making planning decisions. At that time, there was very little conversation between geologists and urban planners; they lived in different worlds.

2 George G. Mader, Thomas C. Vlasic, and Penelope A. Gregory, *Geology and Planning: The Portola Valley Experience*, William Spangle and Associates, Portola Valley, California, 1988.

Let me paint a picture. Dwight was a tall thin guy, well over six feet. The Portola Valley Town Council met in what had been a stone roadhouse for locals in the distant past. Dwight would come and sit at the back corner of the room as the council would go through its long agendas. At the end of the agenda, Dwight would raise his hand, "Mr. Mayor, I would like to talk about the San Andreas Fault that runs through the town," and people thought, "Good grief, where did this guy come from?" They seemed to think that geology had no relevance to the day-to-day running of the town. But Dwight kept this up. Also, our office became a stop on his daily bicycle route. He would say, "George, you know, we really need to get things in regulations to deal with geologic hazards." I thought, "Dwight, I have pressing planning matters, don't bother me with this far off problem."

Johnson So, it was not a topic in the beginning of the town's formation?

Mader It was not originally a concern of the town.

Johnson Was there consideration about the role of topography?

Mader Yes, but not about geology. But Dwight kept at it. I give so much credit to him. What he did was just amazing. In time, he convinced the council and me that we needed to do something about the geologic problems of the town. Then in 1967, the town council asked Dr. Crowder to recommend a geologic committee that would serve Portola Valley. That committee was appointed and included Dr. Ben Page of Stanford, and Dr. Bob Wallace and Dr. Earl Pampeyan of USGS, among others.

The committee made several recommendations to Portola Valley that the town accepted: 1) you've got to map the geology of the town to know what's here, and then you have to understand it; 2) you need a town geologist to administer the map and to advise the town and applicants as development takes place; and 3) you need regulations to see that projects properly take geology into account. So the town had guidance from some very good earth scientists on what needed be to done to set up a planning program based on earth science. As one early step, the town retained Professor William (Bill) Dickinson of Stanford in 1970 to map the San Andreas Fault that ran through the town.

Johnson When was the first town geologist appointed?

Mader Dr. Arvid Johnson, an engineering geology professor at Stanford, was appointed in 1968. The initial mapping was then done by graduate students, including James R. Rodine, under Arvid's supervision, but the main thing was to get the mapping started. The geology map of the town, continually updated over the years, has been a major guide to development. Also, under Dr. Johnson's guidance, a land movement potential map was prepared based on the geology map. The purpose of that interpretive map was to tell the layman the likelihood of ground failure due to landslides and faulting. Arvid deserves a lot of credit for pointing the town in the right direction. He was a leader at the time.

The land movement potential map is used constantly in the town for letting people know about potential problems on their property and for guiding developers. The town recognizes

the maps are not perfect, since they are based primarily on surficial geology information, so anybody can challenge the maps by having their own studies made. In a number of cases, the map has been changed based on more in-depth information, which is entirely appropriate. But this is all done in an orderly manner with the town geologist reviewing proposed changes and then making recommendations to the planning commission. The town has approved only those map modifications the town geologist has recommended.

This process has saved a lot of agony because you don't want to go into a battle with poor information; you want to have the best you can. The town mapping has been crucial. The role of the geologist was first filled by Dr. Arvid Johnson, as noted, then by Dr. Jon Cummings, a professor of geology at Hayward State College, (now California State University, East Bay), and is now filled by William Cotton and his firm Cotton, Shires & Associates. This all laid a wonderful foundation: good maps, having a geologist, and then working with the geologist in reviewing development proposals. The town also has a highly qualified volunteer Geologic Safety Committee made up of professional geologists and engineers from which advice can be sought.

The town's residents want to preserve the natural environment, as I mentioned earlier. Geologic hazards and the steep and complicated terrain work to the town's favor in its desire to limit the density of development. Residents want to keep the natural terrain and environment and what better ally than poor geology! The town allows people to build only on stable areas, not unstable areas.

Johnson I'm curious about the San Andreas Fault mapping project and how the town's elected officials responded to the resulting information.

Mader As I mentioned, early on, the town hired Bill Dickinson of Stanford University. Bill is recognized for his knowledge of earthquake faults. He is a very disarming guy. He looked like a cowboy with his jeans, big belt buckle, and cowboy boots, but he was an amazing field geologist. His mapping of the San Andreas Fault in the town has stood the test of time very well.

After he mapped the fault and the town council was informed of the hazards, the council appointed a committee to develop regulations for dealing with faulting. As town planner, I chaired the committee. Membership included Bill Dickinson, the town geologist, the building inspector, the town engineer, two engineering geologists, and a civil engineer. We developed a program of preventing development on the fault by establishing fault setbacks on the main traces of the fault. That was before the state adopted the Alquist-Priolo Special Studies Zones Act in 1972 (now the Alquist-Priolo Earthquake Fault Zoning Act) that also prohibited development on known active faults.

Over the years, the town's mapping of the fault has changed some. Most notably, a major change was the recent mapping of a site that had been occupied by a public school. That location was proposed as the site for a new town center. New mapping by William Lettis & Associates (now Fugro Consultants), however, discovered a pattern of en echelon faulting right through the site. So, we changed our

map and regulations to address this new pattern of faulting where it occurs. As a result of the mapping, the new town center was moved to the western part of the school parcel where it was recommended that it would be sufficiently removed from the faulting pattern.

Johnson So, with respect to the notion of setting back from a fault or creating, as you have called it, a layman's map to understand ground movement potential, were there other models that you drew from or was that pioneering work?

Mader To my knowledge, the land movement potential map was a new idea. Now, others who've been in this field for years might say, it's been done elsewhere, but to my knowledge, it was a new kind of map. With respect to the fault setbacks, again, to my knowledge, there were no other examples in California at that time. So, as far as I know, the work was at the cutting edge. How were we able to do innovative things? Portola Valley is made up of a lot of smart and wealthy people who respect good work. They respect science and are sophisticated enough to know the value of good information. They have been and continue to be willing to deal with these things where other communities might not. Also, and very important, Jim Morton was an extremely able and knowledgeable town attorney, willing to consider and endorse new types of regulations. It was a happy situation. Also, how lucky the town was to have local support of some Stanford faculty and geologists at the USGS—many of whom lived in Portola Valley. Stanford adjoins the town, and USGS is but a few miles away in Menlo Park.

Johnson Since the maps were prepared, have there been any significant ground failures that affected development but were not identified on the maps?

Mader Not that I am aware of. We did have some failures along Corte Madera Creek where the creek had cut into the hillside, but those undeveloped slopes were classified as unstable. We've had some small slides during heavy rainfall that may not have been shown on the maps, but nothing major. We currently have an interesting landslide in Woodside Highlands. The site is about three acres in size with a house and a secondary smaller residence on it. Almost the entire site has been sliding. The owner obtained estimates for trying to stabilize the site, but it is exceedingly expensive. The slide is threatening a road and the house below it. The lot was subdivided and buildings constructed prior to incorporation of the town. The town's maps show the slide. There is a real question whether a private party can pay for stabilization and have a saleable property. This is a serious inherited problem for which there is not a viable solution at this time.

Slope-Density Regulations

Johnson Besides the land movement potential map in Portola Valley, didn't Spangle Associates develop the notion of controlling the size of a lot, as well as the allowable floor area for buildings on a lot, based upon topography?

George Mader

We developed the idea of slope density regulations, which I believe were the first regulations of that type in the country. Bill Spangle came up with the concept to relate the density of development to the steepness of land. There are a number of good reasons

for this. For instance, on steeper land, more grading is necessary in order to develop the land for house sites and roads. The grading results in cutting more trees and vegetation and, if the land is unstable, exacerbates problems like erosion and potential landslides.

Also, as land gets steeper, it presents itself to the viewer from a distance, like looking at the side of a hill from a distance. If it's level land, you don't see grading and vegetation removal that takes place in the distance. Thus, grading takes on major visual importance on a hillside. If one decides to completely cover the land with the works of man, like on some of the San Francisco hills, you can do it, but then you lose the natural environment. If you want to leave anything of the natural environment, then you can't cover everything with asphalt, concrete, and buildings.

Using slope-density regulations reduces the problems I have mentioned. We developed slope-density regulations for Portola Valley going from, in one case, a base of one house per acre at 0% slope, up to one house per nine acres at slopes of 50% or over. These have become even more stringent over time.

One of the difficulties in using slope-density regulations is finding a way to accurately measure the steepness of slopes. It so happens that when we were doing work for Monterey County, we discovered a planner down there who had developed an ingenious way of measuring slope. All you need to do to measure average slope is to know the area, the length of contours, and the contour interval.[3] The nice thing then is that two people using the same map get the same slope measurement.

Prior to that, one had to draw boundaries around the areas of a certain slope range and then try to average these. You can guess that no two people would get the same result. The new ingenious method of measuring average slope allowed expanded use of slope-density regulations. When you have that formula, you can devise regulations that relate lot size (density) to the steepness of slope.

When other communities learned about what we were doing with slope-density regulations, we were asked to help Santa Clara County do the same, also Morgan Hill and San Mateo County. When some cities in Southern California got interested in it, we prepared regulations for the cities of Claremont, San Dimas, Walnut, and Glendora.

There was a period when I was frequently going to Southern California advising cities about slope-density regulations. Now these regulations are much more common, but at that time they weren't.

Johnson Didn't Spangle Associates also get involved in the application of TDRs, or the transfer of development rights, to deal with development in hillside areas?

Mader Yes, we did in the city of Claremont. We proposed a system of transferring development rights, or credits, from one property to another. We worked with a very good attorney, Tony Rossmann, to

3 The slope-density formula used by Spangle Associates in slope density regulations is S = 0.0029IL/A, where S = average cross slope of a parcel in percent, I = interval of measured contours in feet, L = combined length of contours in feet, and A = area of parcel in acres.

help develop a technique of transferring development credits from one part of the hillside area to another. The area from which the credits are taken is then to be preserved as permanent open space.

Johnson So your application of TDRs was in dealing with geologically sensitive areas, such as hillside areas, landslide-prone areas, and erosion-prone areas. But TDRs are now used for all sorts of different applications, such as ensuring the perpetuity of agriculture by transferring development potential to other areas.

Mader Yes, and some of these are done through private agreements between property owners, as opposed to a government-sponsored program.

Portola Valley Ranch and Other Development Projects

Johnson You also applied some new hillside and hazard-related development concepts for a large residential project in Portola Valley: Portola Valley Ranch.

Mader Portola Valley Ranch was the first large residential development to take place after the town incorporated. The plan for development of this 453-acre site was presented to the town in 1973, well after the town had established slope-density regulations and had included geologic mapping requirements in its subdivision regulations. This was the first major test of these new town requirements.

When the developer came in, the mapped geology showed the San Andreas Fault bisecting the property and extensive landslide deposits on the steep western hillsides. At first, he attempted to locate development over most of the property. At that time, developers generally wanted to get as many lots on a property as possible. The typical subdivider would come in, get out his cookie cutter and cut out one-acre parcels over the entire property, which makes no sense when you have variations in the quality of the land. The successful developer, Joe Whelan, however, hired an excellent land planner/landscape architect, Tony Guzzardo, whose firm was in San Francisco. He worked with Joe and recommended clustering development on the eastern stable areas and leaving the western unstable areas undeveloped as permanent open space. This good idea caused a major problem because the minimum lot size for almost the entire town ranged from one to two-and-one-half acres.. Why was it at least one acre? In order to stable a horse on a person's property, the parcel must be at least one acre. Most people thought Portola Valley was a place for horse people. The Guzzardo Plan, however, proposed lots as small as about one-half acre.

At the staff level, we worked with members of the council and the planning commission in separate meetings to convince them of the value of this new way of development where you develop more in concert with the quality of the land. Finally, we got a majority to agree so the cluster development moved ahead. The project was very successful, with 205 houses on the 453 acres. Fortunately, Joe Whelan was an innovative developer and was willing to try things other developers would not. I had great admiration for him. We worked closely together to develop this. He went so far as to tether helium balloons at a potential water tank site in order to evaluate the off-site visual impacts.

Now, here is the irony. As I said, elected officials at that early stage were not happy with the idea of building on smaller lots while leaving large areas as open space. By now, however, a number of elected and appointed officials live in Portola Valley Ranch and love it. They have been converted. It's been a great model and very successful. It has won many awards and has been visited by planners and developers throughout the country as well as abroad. At that time, cluster subdivisions were an entirely new concept, particularly at such low densities. Now the town has a similar adjacent subdivision called Blue Oaks.

Johnson I recall the Blue Oaks project. I worked on it for seven of my eight years at Spangle Associates. How would you compare the Portola Valley Ranch and Blue Oaks projects, especially in terms of geologic issues and environmental concerns?

Mader In the Portola Valley Ranch project we were dealing for the first time with a development that was changed to recognize the geology of a site. In the Blue Oaks project, the town had already mapped the geology of the site and established guidelines for development related to geologic conditions. These maps showed the areas that could be developed and areas that were to stay as open space. The San Andreas Fault also passes through Blue Oaks. While this was preliminary mapping, the key major geologic criteria were in place. Also, by the time of the Blue Oaks project, CEQA had been well established. Consequently, the required environmental investigations had been increased many times. The Environmental Impact Report (EIR) for Portola Valley Ranch was short, no more than 100 pages, whereas the EIR for Blue Oaks was hundreds of pages. Also, citizen involvement had generally increased, largely due to CEQA. A lot more attention was given to all aspects of the development including homes. Blue Oaks is a very expensive project with a high level of design and development. I think the public is just generally more sensitive to development than it used to be, largely due to CEQA provisions. I'm not saying that's wrong, but it lengthens the amount of time and increases the amount of money necessary in order to get projects approved.

Johnson Tom Vlasic and the firm have also been very involved with the architectural and site design aspects of these and other projects in the town.

Mader Yes, Tom was heavily involved with the Portola Valley Ranch design and then implementation of the plan as houses were being proposed. He worked on setting up architectural standards and reviewing individual structures in great detail as the project went along. In doing this, he gained major stature within the town.

And with the Blue Oaks Subdivision, Tom has done the bulk of work from inception to approval and construction of residences. As with Portola Valley Ranch, continual coordination with the town geologist has been critical, especially with regard to landslides and the San Andreas Fault.

Tom has been the person most responsible for running the town's Architecture and Site Control Commission (ASCC), the body that has become important in seeing that all new development fits in with the desires of the town to

respect the natural environment. The ASCC is composed of residents and includes some professionals in the design field. Tom meets with them regularly, prepares their reports and leads them on field evaluations of projects as they take place. In 2010, he took over as Town Planner and oversees all the work performed by Spangle Associates in the town. He also leads the firm's planning work with other client communities.

Strength of the Town's Regulatory Framework

Johnson What has been the legal experience of Portola Valley and its innovative approach to regulating land use based largely on geology and environmental concerns?

Mader To date, I don't think there have been any significant legal challenges. First, the regulations must be reasonable. The fundamentals upon which slope/density regulations are based are reasonable. Also, I don't think anybody can dispute preventing people from building on unstable lands. As long as regulations are reasonable and properly enforced, it should be very hard to successfully challenge them.

Johnson What happens when the developer's geologist and the town's geologist have different views about the geology? How do elected officials and staff handle technical disputes?

Mader What we have found is that when there are differences, the town geologist and the applicant's geologist consult and, with additional investigations, generally end up agreeing. It is not uncommon for the town to end up changing its maps when better information has been presented. Bear in mind that the town's maps are largely based on surficial information. The pressure is always to make certain the mapping is of good quality, and then that normally solves the problem. By and large, the town wants to work with people to solve problems rather than being dictatorial based on poor information. Also, when the town has its own highly qualified geologist, his advice gives the decision-making bodies—the planning commission and town council—confidence when making decisions. Without that advice from a qualified person, decision-making bodies do not have the information they need to make informed decisions. So far, in Portola Valley this has not been a big issue, but you have to handle decision making in a very careful and deliberate manner.

Johnson This is a very scientific approach to planning. It works well in a town that's vulnerable and obviously geologically constrained as the valley is. But, it can be an expensive and time-consuming process, and requires a level of sophistication that might be considered unreasonable by some who just want to do a simple residential development on their personal property.

Mader Let's take the case of a city that isn't as affluent. If the city told an applicant, "You can't build on a landslide," hopefully you can convince the person that it's not in their best interest to develop there. In some cities the city might say, "We're not going to second guess the applicant's geologist. He's got a professional doing the job. We're going to accept that and go ahead." But a city can get into a lot of trouble doing that. When people argue this, I say, "Suppose an attorney for an applicant brings you a legal document and wants you to

approve it. What's your approach to that?" Your reply would normally be, "We're not going to just accept it without a review by our attorney." The same should hold true for geologic reports. The city needs its own professional review.

Of course, a community has to find a way to obtain geologic advice. If it can't afford its own geologist, then maybe some advice can be sought on a volunteer basis from professionals in the community or nearby, or from a university. Also, the trend is to require deposits from applicants, which the city can then use to hire geologists to review development proposals.

Johnson Are there vocal critics of the town's geologic review process?

Mader By and large, in Portola Valley applicants accept the process. Even with respect to house design, applicants may object to the design review process, but later may come back and say, "You know, I am really glad you made us make those changes." These people normally don't have the design background to properly judge their proposals.

With respect to geologic issues, developers may come in and complain, "Oh, you won't let us do this and that." And we just say, "That is the way it is done in Portola Valley, but if you have better information, please provide it." More often than not, the town's approach has been to work with, rather than against, people. We have had no major challenges to our geological and design regulations. There have been threats of challenges, yes, but none have been successful.

Bill Cotton and Cotton, Shires & Associates

Johnson You and Bill Cotton—Spangle Associates and Cotton, Shires & Associates—have been involved with Portola Valley for a long time. Has the relationship between you and Bill gotten to be fairly symbiotic over the years in reviewing different development applications?

Mader Bill Cotton is a consummate professional geologist. He is incredibly good at analyzing geology in the field, analyzing reports and maps, and advising on how to address geologic problems. He is willing to cross over between geology and planning and make suggestions on how to deal with problems from a planning point of view, in developing critical regulations, and seeing that geology is accounted for when new developments are evaluated and approved.

We found that, by and large, having Bill Cotton solves a lot of problems with applicants because he and his firm can deal with their consultant geologists. They work together and, when they get common geologic information, they normally resolve issues in a professional manner.

He is also very effective in public meetings and is often called upon as an expert witness. I couldn't think of a better person to work with as a town geologist than Bill Cotton. He is a superb geologist and a great friend. In recent years two highly qualified principals in the firm, Ted Sayre and John Wallace, have taken over most of the work of the firm for Portola Valley.

Chapter 7

State Involvement in Geologic Hazards (1969–1992)

Then, Dick Jahns, bless his heart, said, "The hazard that state legislation can deal with most easily is faulting. You can map faults, and then you can prohibit building on them."

Johnson Looking back, what do you think were the major factors that melded earth science and planning together the way they did in Portola Valley, and what influences did the Portola Valley approach have on other communities in the Bay Area and around California?

Mader Well, I think the success at the local community level in Portola Valley is the result of the confluence of several factors: geologic hazards; an enlightened public; the availability of scientists within the town, at Stanford, and the USGS; and a "champion," in this case Dwight Crowder. Dwight would say, "You've got to take geologic hazards into account in planning; you have to do it." He alerted people. It took one person like him to lead the way and then others followed. Over the years I have

been invited to speak at various meetings about the Portola Valley experience, because the town's approach was new. Beyond Portola Valley, other things were happening in the state during this time, for instance with Senator Alfred Alquist working to get the state involved in earthquake hazards.

Joint Legislative Committee on Seismic Safety (1969–1974)

Johnson Who was Senator Alquist, and why did he care about earth hazards?

Mader Senator Alquist was from the San Jose area and may have become concerned about the San Andreas Fault because it affected his area.[4] Alquist was largely responsible for formation of the Joint Legislative Committee on Seismic Safety, which was in existence from 1969 to 1974. It was called "joint" because it had members from both houses of the legislature, the Senate and the Assembly.

The committee met and considered the earthquake problem in California, what needed to be done about it, and how to approach it. The committee had five advisory bodies: Engineering Considerations and Earthquake Sciences; Disaster Preparedness; Post-Earthquake Recovery and Redevelopment; Land Use Planning; and Governmental Organization and Performance. The Advisory Group on Land Use Planning had 16 members. It had some outstanding persons including Roy Cameron, Planning Director for Santa Clara County; Lloyd Cluff, Vice President of Woodward–Lundgren & Associates; Rolf Eliassen, Professor of Engineering, Stanford University; Michael Heyman, Professor of Law at UC Berkeley; Donald Nichols, geologist with the USGS. I was fortunate to be selected to chair this committee.

Johnson How did it happen that you were selected for the land use advisory group?

Mader Somebody must have recommended me because of what we were doing in Portola Valley. In any event, our group worked with the other groups. Now, when the Joint Legislative Committee was formed and started to look into earthquake problems—talk about the confluence of matters—the San Fernando earthquake occurred in 1971. So the advisory bodies had a major example of the earthquake threat. Our group made a field trip to view the damage and then discussed what kind of recommendations we might make.

I will remember forever when our advisory group was sitting around talking. Dick Jahns, Dean of the School of Earth Sciences at Stanford, was a member at that time. We were speculating, "What are we going to do

4 After this Johnson-Mader interview session, Mader queried Robert (Bob) Olson to get more background on Senator Alquist. Olson served as the first executive director of the California Seismic Safety Commission, which was established in 1975. Olson said that Alquist recruited Steve Larson, who had graduated from San Jose State University, to be his administrative assistant. Larson, on reading the report titled *Earthquake Hazard in the San Francisco Bay Area: A Continuing Problem in Public Policy* (Institute of Governmental Studies, University of California, Berkeley, 1968), written by Karl Steinbrugge (1919-2001) and edited by Stan Scott (1921-2002), brought the subject to the attention of Senator Alquist, a young senator at the time. He then took the earthquake threat as a central focus in his legislative career.

about these geologic hazards?" I remember asking, "Since landslides are a huge issue, how can we deal with them?" And we talked about that. Then, Dick Jahns, bless his heart, said, "The hazard that state legislation can deal with most easily is faulting. You can map faults, and then you can prohibit building on them." That was the simplest thing we could do. And so, a year after the 1971 San Fernando earthquake, the Alquist-Priolo Special Studies Zones Act was adopted, and Senator Alquist carried the proposal through the legislature. Because of what happened in the San Fernando earthquake, no one was going to debate the need for the law. Surface fault rupture was quite prominent through urbanized areas of the San Fernando Valley, shearing apart streets, sidewalks, utilities, and some buildings. Those in the field of hazards often say that there is a "window of opportunity" immediately following a disaster to pass legislation and make substantial regulatory changes, and that you need a champion. We had our disaster in the 1971 San Fernando earthquake, our champion in Senator Alquist, and substantial new state legislation was adopted.

Johnson Were there problems with the implementation of the Alquist-Priolo Act, the act that limited development along major active faults in the state?

Mader Yes there were. The state geologist had the problem of how to map those faults that didn't have surface expression but might cause ground deformations in a future earthquake. The geologists would tell someone, there's a fault under an alluvial area, but since the public could not actually see the fault, implementation was difficult. Finally, the geologists retreated and mapped only the faults that had a surface expression. That was quite a change and underrepresented the actual faulting threat.

One of the other problems was that people began to think that they were safe from all seismic hazards if they adhered to the provisions of the Alquist-Priolo Act. They thought the only hazard was the fault itself. We knew that wasn't right. The major hazards were not faulting as such, but the effects of the rupture of the fault—ground shaking and ground failures like landslides and liquefaction that affect much larger areas and more people than just the faulting. There was the criticism that this emphasis on the fault misplaced public attention on a small part of the seismic problems, leading people to think that by staying off the fault they were going to be safe. In fact, that misperception is still something that concerns people. I would still defend the Alquist-Priolo Act as a logical thing to do, because it dealt with the problems we could address at that time.

Johnson How did the idea of requiring seismic safety elements as part of local government general plans come about?

Mader There was a civil engineer on our Land Use Planning group, Chuck Blair, who suggested that we really needed to require something for the general plan. We sat around and discussed that, and decided there ought to be some element required in the general plan to deal with seismic problems. The idea of a seismic safety element emerged. Then the question was how to define a seismic safety element?

The consensus was that we really didn't know exactly what it should consist of, but that attention should be given to seismic problems. We came up with a very general provision that was eventually put into state legislation. Essentially, one sentence was added to the planning law, requiring that communities identify and appraise seismic problems related to seismic shaking and ground failure as part of the general plan. We didn't tell them how to do it, or what to do with the information, but merely said that they had to investigate these topics and take the results into account in the general plan. In later years, the seismic safety element requirement was folded into a new requirement for a safety element, one that includes all hazards.

Johnson How do you rate the effectiveness of the addition of the seismic safety element requirement to state planning law?

Mader The interesting thing now is how that very simple addition to the state law had such major repercussions in terms of the planning work in the state. It has caused cities and counties to undertake mapping programs and to develop policies. Although the quality of elements varies throughout the state, the amount of work done and the seismic awareness of planning departments, planning commissions, and city councils has been greatly increased through that one legislative change.

Johnson Within a few years of the earthquake, the Seismic Safety Commission was established, which we can talk about in a moment. Didn't the commission undertake a review of the seismic safety element requirement after its initial implementation?

Mader Yes, I chaired a committee that made a report to the commission in 1977. Quite a few cities and counties still hadn't adopted elements, but my recollection is that we felt the law was doing a good job, that the seismic safety elements were being prepared and adopted, but that we really needed to give it a little more time to see whether most cities and counties would adopt them. We noticed that the quality varied among jurisdictions, and reported that there might need to be some standards adopted to help ensure higher uniform quality.

Geologists, however, were critical of the elements because they didn't include a lot of new geology, a lot of new investigations. I wasn't surprised at that, because most cities and counties don't have a lot of budget to do expensive mapping, so they used other sources. Most assembled information from various sources—whatever they could—to put together an element. I also understood that, because the cities and counties had so many other demands, this was just one small part of what they had to do. But it was my feeling that they were far ahead—at least in cities and counties that had done elements—of where they had been before they assembled the information.

Johnson How did the San Fernando earthquake affect the work of the Joint Legislative Committee?

Mader I recall the hearing we held in San Fernando. The 1971 earthquake was an important event for those who were interested in the earthquake field at the time, to educate them, to begin to focus their interests, and of course, it was important legislatively. San Fernando was a

major event for me. I learned a lot. The reports that came out of it have been very useful, and something we could rely on in future years, going back and saying, here are the kinds of problems we need to deal with. We all know the kinds of legislation that came out of that event: regulations covering dams, hospitals, faults, freeway bridges, and building code seismic provisions. We always say it takes an earthquake to convince people. That one certainly made believers out of a lot of people very rapidly.

Johnson Didn't you or the firm have a part in preparation of the Joint Legislative Committee's report on the San Fernando earthquake?

Mader Yes, I was one of the contractors retained to prepare the committee's report, titled *The San Fernando Earthquake of February 9, 1971 and Public Policy*[5] My part identified the lessons we could learn from the earthquake. We addressed the usual kinds of planning techniques, especially general plan limitations and zoning limitations, and how you can use these in areas subject to ground failure and faulting. The use of subdivision regulations and the need for geologic information relative to the design of subdivisions were also addressed.

Johnson You were on the Joint Legislative Committee during what period of time?

Mader From 1969 to 1974.

Seismic Safety Commission (1975–1984)

Johnson How did the California Seismic Safety Commission come about?

Mader The Joint Legislative Committee recommended formation of the Seismic Safety Commission. But, again, it was Senator Alquist who pushed the idea. He was closely advised by Karl Steinbrugge, a highly respected structural engineer, who served as the Commission's first chair. Also, he had a pretty strong key staff person in Rod Diridon. Rod continued in politics, later serving on the Santa Clara County Board of Supervisors.

The Seismic Safety Commission is unusual because it's an independent commission and doesn't have to answer to anybody. However, the governor makes the appointments and therefore has control over who serves on it. The commission had 15 members and reflected the makeup of the advisory bodies of the Joint Legislative Committee to a large extent. So the disciplines had already been pretty much defined and included a wide range: architecture, planning, health, transportation, emergency preparedness, earth science, engineering, emergency services, medical, and so forth. One member was to be an architect or planner. I filled the planner role in the early years. Some of the original members were Henry Degenkolb, Richard Jahns, Stanley Scott, Harry Seed, James Slosson, and Karl Steinbrugge. The commission then started working to develop topics that could lead to good legislation.

Johnson And, did the Joint Legislative Committee dissolve at that point?

5 Special Subcommittee of the Joint Committee on Seismic Safety, California Legislature, *The San Fernando Earthquake of February 9, 1971 and Public Policy*, July 1972.

Mader Yes. The Seismic Safety Commission took over the concerns of the committee. The commission had a very good executive director in Robert Olson and a small capable staff that gradually expanded as the responsibilities increased. Bob Olson is a broad-thinking person, extremely capable, and a good friend. He was essential to the successful establishment of the commission. People of varying backgrounds have entered the field that is broadly called earthquake engineering. Bob had a degree in political science and, before becoming the executive director of the commission, he worked for a predecessor to the Federal Emergency Management Agency (FEMA), and later for the San Francisco region's transportation planning agency, the Metropolitan Transportation Commission.

As I look back on these early years, the string of events was amazing. Here I was in Portola Valley doing normal planning work, then I was teaching at Stanford University in the School of Earth Sciences. Next, I'm at the state level working on an advisory committee. Next, I'm on the Seismic Safety Commission. You don't plan those things, they just happen. I had the opportunity to work with many extremely capable and interesting people. This was a fascinating time and also a lot of fun.

Johnson You were on the commission from 1975 to 1984 and chair from 1979 to 1981. This was a time in which seismic safety became more of a policy matter at the state and federal levels. I'm curious about issues that the commission addressed during that time period, as well as your perspective on its role. Several states now have seismic safety commissions, but it all started here in California.

Mader As I've noted, we had a range of specialists on the commission, each with his or her particular interests. We would select topics to study. Some were of our own choosing and some came from people outside the commission, including legislators.

One of the biggest topics we got into was the issue of unreinforced masonry buildings. As we know, there's so much of this type of construction in California and it has proven disastrous in earthquakes. The San Fernando earthquake brought all of this into focus. That event allowed the commission to make recommendations to strengthen state legislation. This was one of the main early accomplishments.

At the same time, there were major hospital failures in the San Fernando earthquake that led the commission to consider hospital safety, primarily structural safety, but also equipment survivability and the functionality of hospitals. The commission was successful in having new legislation adopted there too.

Of course, the state had the Field Act for schools since the 1933 Long Beach earthquake, so we didn't really get much into public schools. We did, however, get into considering private schools since they did not fall under the Field Act.

We also had the failure of the earth-fill Lower San Fernando Dam in the San Fernando earthquake, so the commission considered the issue of dam safety. We also focused on the question of mapping the flood areas that would result should a dam fail. We were successful in having a requirement for dam inundation mapping adopted that could be used to warn residents of possible dam failure.

From a community planning point of view, this information should have a role in helping guide urban development in order to minimize risk. Also, legislation was adopted to address the design of earth-fill dams.

Johnson In the 1970s and early 1980s, there must have been some big infrastructure projects across California. Was the commission ever asked to comment on those kinds of projects?

Mader One of the major infrastructure issues we got involved with was the siting of liquefied natural gas (LNG) facilities. Proposals we considered were for locations along the coast. We were worried about the hazardous nature of LNG sites and pipelines in areas of faulting, ground failure, or intense shaking. We held hearings on LNG facilities and tried to affect the siting of them. I don't recall now if we affected final decisions that were to be made by others, but our hearings were pretty well publicized.

The Auburn Dam project was also in the design phase at the time. Dick Jahns was the person on the commission who in particular was concerned about faulting hazards at the site. Given the commission's independence, we held several public hearings. Those were pretty intense with a lot of experts. I chaired the meetings, but not being an expert on dams, had to defer to others.

One enjoyable part of serving on the commission was the opportunity to work with Dick Jahns. On several occasions, we drove together from Palo Alto to Sacramento and had some conversations that I greatly enjoyed.

Johnson Besides the San Fernando earthquake, what other significant earthquakes occurred during your tenure on the advisory body to the Joint Legislative Committee and on the Seismic Safety Commission, and how did those influence the work of these groups?

Mader There were three in particular: Imperial Valley in 1979, Livermore in 1980, and Eureka in 1980. We learned something new from each of the earthquakes. In each one we gained lessons that affected the future work of the commission.

The commission held a meeting in El Centro after the Imperial Valley earthquake. We got to see the County Services Building, which was so badly damaged. It was the first time, since the 1971 San Fernando earthquake, that I had seen a structure with a so-called soft first story damaged so badly. It really got us back into structural engineering. We went into the field and saw the faulting, which was especially evident where it offset neat agricultural rows and nearby roads. We got onto discussions about emergency power supply problems for the county at the time of the earthquake. Mobile homes were knocked off their foundations. So that was a real learning experience.

Chris Arnold's study of evacuations of the County Services Building was illuminating. As you know, Chris is one of the few architects to specialize in the study of earthquakes, and he has brought a slightly different perspective to the field than the engineers. He's the only architect to have served as president of EERI. In the case of the County Services Building, he studied who did what, how they moved out of the building, the evidence of file cabinets falling over, and other things not fastened down.

He even noted that the use of plastic material on windows to cut down on glare also served to prevent the windows from breaking into pieces and shattering. So those experiences served as an education for the commission, and particularly for any commissioners who might not have been involved in the 1971 San Fernando earthquake.

After the Livermore earthquake, we held a meeting there because the locals were concerned about what might have happened at the Lawrence Livermore National Laboratory and problems of getting that information out. The people at the lab seemed to indicate that there was not a great cause for concern, but the commission was concerned. We decided to implement our independent review process and helped the Department of Energy select an independent group to review the plutonium building. Dick Jahns and Bruce Bolt were particularly helpful in this.

The review body made recommendations for retrofitting structures and some support facilities. The commission's involvement continued for a couple of years.

The Commission did not meet in Eureka following the 1980 earthquake, but the staff prepared a report. The major lesson we learned concerned freeway structures. Here one of the ramps to an overpass south of Eureka came off its support and collapsed. After that, Caltrans undertook retrofitting for these types of approaches into structures.

Johnson Were there topics that the commission attempted to raise that didn't get support or legislative action?

Mader There must have been, but I don't recall any at the moment. Other topics we dealt with, some of which resulted in legislation, related to anchoring of mobile homes, safety of state-owned property, emergency preparedness, and safety of fire stations. I believe that Bob Olson is writing the history of the Seismic Safety Commission. When that is published, there will be a very good record of its early history.

Southern California Earthquake Preparedness Project

Johnson While you were chairman, the Seismic Safety Commission launched the Southern California Earthquake Preparedness Project (SCEPP). How did this project come about?

Mader Charles (Chuck) Thiel, who was a key person at the National Science Foundation (NSF), running its earthquake program, was on leave from NSF to help start the earthquake program at FEMA soon after it was established. Chuck thought it was necessary to get a project going to demonstrate the ability to increase safety at the local level, and that it should be addressed at the metropolitan level rather than at the city level. He suggested Los Angeles as the candidate area and called a meeting in Southern California where a group brainstormed the idea. There were probably about a dozen people at the meeting. I attended, as did Bob Rigney, who was from Southern California and on the commission, and Bob Olson. We discussed such items as what cities and counties to include, membership, staffing, program, and relationship to the commission.

As I recall, the commission got involved in the project around 1980.

Johnson How did the relationship between the commission and SCEPP work?

Mader SCEPP was under the jurisdiction of the commission and, thus, the commission had to approve financial matters related to SCEPP, administer contract compliance, and the like. One question was how far the commission should go in approving the products of SCEPP.

As time went on, SCEPP developed a personality and strength of its own, which seemed to call for more local authority at SCEPP and less review by the commission. It took a while to work out the relationship so that it was one the commission could deal with and that the executive director of SCEPP and his board felt comfortable with. Still, SCEPP was under the jurisdiction of the commission.

Unfortunately, the first executive director for SCEPP did not fit well with the desires of the commission and things got very tense between SCEPP and the commission—even to the point where calls from the executive director of the commission were not routinely routed to the executive director of SCEPP, even though he reported to the executive director of the commission. In addition, I remember how the executive director of SCEPP spoke antagonistically to Commissioner Bruce Bolt at a commission meeting in Sacramento. Bruce was the authority on the seismic issue being discussed, and everyone was aghast at the completely embarrassing outburst.

Finally, a change had to be made. Dick Andrews, who had been teaching history at the University of Redlands and was second in command at SCEPP, emerged as the person who seemed more appropriate for the job. When he took the post of executive director, the relationship between the two entities greatly improved. Bob Olson and Dick Andrews were able to work very well together.

Johnson Did this affect you as chairman of the commission during this time?

Mader This was a very trying time for me in having to deal with what developed into a major personnel issue. Fortunately, one of the good things about the commission is that the chairman is not alone, but has good support.

Bay Area Regional Earthquake Preparedness Project (1984–1992)

Johnson After your tenure on the Seismic Safety Commission, you also served on the board of the Bay Area Regional Earthquake Preparedness Project (BAREPP), which, along with SCEPP, was originally formed by the Seismic Safety Commission. Why did the commission launch these regional preparedness projects?

Mader The level of concern is so different at a regional level than at the state level since you can look at matters in much more detail. The same concerns of the Commission could then be brought down to a more proactive organization that could undertake specific education and other actions that would affect cities and counties.

BAREPP looked at all kinds of earthquake-related issues such as emergency preparedness, hospitals, schools and so forth. They had a very good staff with Rich Eisner as Director,

Paula Schulz as Deputy Director, and Marjorie Greene as Project Planner. Rich and Paula subsequently continued their careers with the state's Office of Emergency Services, when SCEPP and BAREPP were transferred there, and Marjorie is about to retire from the Earthquake Engineering Research Institute. BAREPP did not have any regulatory powers. It was advisory only, but it did a lot of outreach and a lot of education. By pulling in people who were active in government and leadership in the Bay Area, the preparedness message got out to a lot of other organizations that they were related to. I saw it very much as an education process. That seemed to be the key thing.

I served on the Policy Advisory Board of BAREPP, which had about 30 members representing local government, emergency services, American Red Cross, community outreach, Seismic Safety Commission, labor, private sector, earth sciences, structural safety, and lifelines. There were also several ex-officio members. Some of the members with science and engineering specializations were Ephraim Hirsch, a structural engineer; Joseph Litehiser, a seismologist; Fred Herman, the Palo Alto Building Official; Bill Iwan, an engineering professor at Caltech; Bob Brown from USGS; and Jim Davis, the California State Geologist.

As a related matter, the Association of Bay Area Governments (ABAG), a regional agency, took over management of a lot of the geologic information for the Bay Area. Jeanne Perkins of ABAG headed that effort and worked closely with the USGS to provide very good mapped information for the Bay Area at a regional scale on earthquake hazards, damage scenarios, and so forth. This was complementary to BAREPP and is still functioning.

Chapter 8

Stanford University (1970–2000)

After I gave my lectures at the Stanford Summer Camp, Professor Remson asked if I'd like to help develop a new course and major where we would combine city and regional planning with earth sciences. He was way ahead of his time.

Johnson At some point during your early work with Portola Valley, you began teaching at Stanford University. How did that opportunity arise?

Mader Things just happened. Professor Irwin Remson, a hydrogeologist in the School of Earth Sciences at Stanford, learned about the work we were doing in Portola Valley. He asked me to come and give some lectures at a summer camp in 1969 put on by the School of Earth Sciences at the university facilities at Fallen Leaf Lake near Lake Tahoe. After I gave my lectures in the Stanford Summer Camp, Professor Remson asked if I'd like to help develop a new course and major where we would combine city

and regional planning with earth sciences. He was way ahead of his time. This was in 1970 before the environmental movement really got underway.

We developed a major we called "Land Resources Planning," with a core three-quarter sequence—five units a quarter for a total of 15 units. Here was a hydrogeologist stepping out of his comfort zone to work in a new area. But he felt strongly about the environment and treating it properly. He was a wonderful person, an excellent scientist, a good friend and a kind, supportive individual. It was a great privilege to be able to teach with him.

Irwin introduced the students to a wide range of earth science topics through field trips, projects, and labs. I introduced the students to a typical planning process that was focused on a different city in the Bay Area each quarter. We wanted the students to investigate earth science topics and then develop policies to deal with these and other topics affecting cities. In the first quarter, they made reconnaissance studies on all aspects of the selected city including economics, sociology, land use regulations, and the earth sciences. In the second quarter, they worked with the results of the first quarter where they prepared land capability maps, among other studies. In the final quarter, they prepared general plans for the city and then presented the plans to city representatives.

It was interesting and fun to develop the major and teach the core course. At that time, the environmental movement was just catching on and we attracted quite a few students to the course. It ran for 30 years. Irwin stepped down at one point and Keith Loague, also a geologist, took over for him and we worked together. Then, after 30 years, students were gravitating toward another program in the School of Earth Sciences that was looking more at global environmental issues.

Our course was really popular during the time that it was needed. I stopped teaching at Stanford in 2000. To me, it's so interesting how things happened, how Portola Valley would lead to teaching at Stanford as well as other involvements such as at regional and state levels. It was a privilege to teach at Stanford with its great students, collaborating with Irwin and Keith. Irwin died in 2013 at the age of 90.

Johnson I'm sorry to hear this. I will always remember Irwin as such a positive person. He approached every person, every conversation, with curiosity and enthusiasm. He is one of those people who just naturally "lit up a room."

Stanford doesn't have a planning program, does it? Were you ever called upon to provide that sort of expertise in different ways for the university over time?

Mader In particular, there was an Urban Studies Program led by Professor Leonard Ortolano, a civil engineer. He was another person who was willing to step out of his normal comfort zone to help teach in a related field. A number of his students took our course. For a time we were sort of the planning part of the Urban Studies program.

Stanford has had a small architecture program. In the early days, architect Vic Thompson headed it. He got architects to come in and lecture, I believe largely on a pro bono basis. With very little support from the university, he turned out some very good architects. The

word I got was that if Stanford couldn't be a leader in a field, it wouldn't pursue it. There are a lot of other architecture and planning schools, and these topics weren't a major interest of Stanford.

I am pleased that some of our students went on to graduate programs in planning, a number went into law, and some stayed in the earth sciences. Since the course covered a broad range of topics, it was a good one for students who were trying to find career paths. That was a wonderful chapter for me.

Chapter 9

Involvement with the National Earthquake Hazards Reduction Program (1977–1978)

It was pretty heady company on the Advisory Group for the newly established NEHRP. It had many noted engineers, but at that time there weren't many planners talking about earthquake problems.

Johnson The National Earthquake Hazards Reduction Act was first passed in 1977. What led or prompted the federal adoption of this act? And how did you get involved in structuring the programs and thinking about earthquake policy at the federal level?

Mader I can't talk authoritatively about why the act was adopted. After it was adopted, however, the President's Office of Science

and Technology Policy formed a Working Group, a Steering Group, and an Advisory Group to decide on next steps. Their report was titled *Earthquake Hazards Reduction: Issues for an Implementation Plan*.[6] I don't know exactly how members of these bodies were appointed. I believe that at that time they were aware that our firm had been working with the application of seismic information in land use planning in California, in particular in Portola Valley. It was an honor to be invited to serve on the Advisory Group that included many notable people, for instance, Clarence Allen, Henry Degenkolb, Carl Kisslinger, Henry Lagorio, Nathan Newmark, and Robert Whitman. Donald Nichols of the USGS was on the parent Working Group and it may be that Don, whom I knew rather well, recommended me for appointment to the Advisory Group. I also knew Bob Wallace of USGS, who was on the Working Group, and he might have made a recommendation. Finally, I knew Karl Steinbrugge, who chaired the Working Group.

It was pretty heady company on the Advisory Group for the newly established National Earthquake Hazards Reduction Program (NEHRP). It had many noted engineers, but at that time there weren't many planners talking about earthquake problems. A lot of the things that I had done included speaking at meetings with non-planner groups and talking about the role of land use planning. I talked rather extensively to earth scientists, engineering geologists, and architects and, of course, the planning community.

6 Working Group on Earthquake Hazards Reduction, Office of Science and Technology Policy, Executive Office of the President, Washington, D.C., 1978.

Johnson You said that the President's Office of Science and Technology Policy was responsible for shaping NEHRP. There have been four NEHRP federal agencies since the beginning: FEMA, the National Science Foundation, USGS, and the National Institute of Standards and Technology. To begin with, and for a number of years, FEMA was the lead NEHRP agency at the federal level. Were you advisors actually figuring out the future roles of different federal agencies? What other sorts of things did your group work on?

Mader The charge of the Advisory Group was to look pretty broadly at earthquake hazards: what they are; the range of them; where information is available; and what rules that federal agencies, even local agencies, have relative to those questions. We also raised questions about things that needed to be done and tried to pinpoint some direction for various programs. We focused on several topical groups: preparedness and response, prediction and warning, construction standards, financial institutions, land use planning, and communications and education. We also talked about the role of government at all levels: federal, state, and local. The report listed many issues for a hazard reduction implementation plan, ranging from contingency response planning, earthquake-resistant design, risk mapping, training planners in the use of hazards information, all the way to international cooperation. It was a very broad review.

Johnson And, very much the basis for what became the National Earthquake Hazards Reduction Program.

Mader Yes, the responsibilities were then assigned to various agencies. Frank Press

was the Director of the Office of Science and Technology Policy in the Executive Office of the President and was instrumental in helping implement the recommendations of the report. The late 1970s was a landmark time where, all of a sudden, the several groups began to talk cohesively about a program with different elements. And it was the President's Office calling for this, and that is pretty good when you have the President weighing in on the need to address earthquake safety.

Johnson I would say that framework, as I understand it, still exists today to some extent with a multi-perspective advisory approach. Today, there is the Advisory Council on the Earthquake Hazards Reduction Program (ACEHR) that has a multidisciplinary membership of engineers, geoscientists, emergency managers, and social scientists.

Chapter 10

Spangle Associates Research and Other Key Projects (1977–2002)

As a planner, I got interested in the question of why cities aren't rebuilt to be safer after earthquakes. It seemed that in most cases cities were rebuilt pretty much as they existed prior to the earthquake.

Johnson Now I want to talk with you about Spangle Associates' involvement in research. How did the firm begin to get involved in research? Also, it is surprising that, not being Ph.D.s, you received a number of National Science Foundation (NSF) awards over the years. Maybe we could talk about how you went from being a general planning firm to becoming more specialized with a research component.

Mader As a member of the NEHRP Advisory Group, I got to know Chuck Thiel, who was on the Steering Group for the project. Fortunately, Chuck is a very broad thinker and, in his role with NSF, where he was before he went to FEMA, he was interested in new approaches to solving earthquake problems. As I recall, we had an idea for a research project concerning land use planning following earthquakes, and it was with his urging that we submitted a proposal to NSF. Chuck continued to be a good friend over the years. Others at NSF were favorable to research related to city planning issues, including Fred Krimgold, Bill Anderson, and Henry Lagorio.

Land Use Planning After Earthquakes (1977–1980)

Johnson It was in the late 1970s that Spangle Associates received a NSF grant and produced what became a landmark study on land use planning after earthquakes. Could you tell me a little bit more about your interest in that topic as a research question?

Mader As a planner, I got interested in the question of why cities aren't rebuilt to be safer after earthquakes. It seemed that in most cases cities were rebuilt pretty much as they existed prior to the earthquake. I was interested in why that was the case.

To pursue that, we decided to study some earthquakes about which there was pretty good information. Fortunately, at that time Fred Krimgold, an architect, was at NSF. He was interested in this question and encouraged us to go ahead and form a proposal to undertake the study. Without his support, I think it would have been very difficult because we are not typical social science researchers. Rather, we were practicing planners with an interest in research.

For the study, we selected certain key earthquakes. The Alaska earthquake of 1964 was the key one because there were major land failures in that earthquake and these are problems that land use planning can address. Also, there was a rich record of the earthquake. We also selected the 1971 San Fernando earthquake because that was recent and had good information. We also looked at a few earthquakes in other countries, including Skopje (Yugoslavia, 1963), where there was major urban redesign after the earthquake.

Fortunately, some very good people helped us out, too many people to mention completely. Our advisory panel included Bob Brown, geologist with the USGS in Menlo Park; Dale James with HUD; Ted Levin, formerly Chief Economist for the Federal Insurance Agency; and Frank Manda, Assistant Director of FEMA. We also had Norman Murdock, who had been the Planning Director for Los Angeles, and Jack Schoop, the Anchorage City Planner at the time of the earthquake. These and many other highly accomplished persons served on our panel.

Then we had one major workshop in Anchorage at which we had people from many agencies come and meet with us. We were fortunate that we could get their involvement. I should mention here that Susan Tubbesing, who was then at the Natural Hazards Research and Applications Information Center, University of Colorado, Boulder, was of much help. This was several years before she became executive director of EERI. Some of the people who were

involved in the workshop and reviewing drafts were Frank McClure, Stan Scott, Chuck Thiel, Fred Krimgold, Bob Olson, and Bill Petak.

Johnson It's interesting to think about this being done around 1980. Could you describe how you did the case studies, how much field work was involved, and how you collected the necessary data?

Mader We didn't do a lot of fieldwork because often very good information was available. For instance, relative to the Alaska earthquake, extensive information had been prepared at the national level and was contained in a number of volumes. Also, there had been several good studies made of the San Fernando earthquake. We relied on these types of sources. We supplemented the information on both Alaska and San Fernando by going back to the areas that had been damaged to see what was on the ground at that point. This was a very sobering experience.

The lessons in Anchorage were basically related to massive ground failures such as the Fourth Street landslide. The change there was the installation of a major buttress fill to stabilize Fourth Street, an important commercial street. Out in Turnagain Arm, there was a massive landslide that went out into the bay and left behind an area of very disrupted land. People in Anchorage thought that no one would ever build there again since it was so bad, but we discovered that they were beginning to build at the edge of the slide.

Johnson They did not put in some sort of prohibition?

Mader They did not, and yet there was a perfect opportunity to do so. In other places, such as construction of the large buttress fill in the commercial area where federal money was involved, limits were placed on the buildings, for instance, by limiting the weight and design of the buildings supported by the fill. Where there wasn't federal money, increases in safety from future earthquakes didn't seem to take place.

Another fascinating thing about the Alaska earthquake was what happened to the small community of Valdez that had about 1,000 inhabitants at the time of the earthquake. The city is located at the southern terminus of the Richardson Highway and also at the northernmost ice-free harbor in Alaska. A large submarine landslide took place, and slide-induced waves destroyed the port facilities and ripped the town apart. The federal government said, "You can rebuild here in the same place and we will not put a dime in it, or we will pay to build a new community for you at a nearby safe location." There was a lot of disagreement among the locals, but finally they decided, "Yes, we will go along with the relocation." It's hard to find other cases where there are complete relocations like that. This was a small community, so it wasn't the same problem of a big city, but nonetheless, it is an interesting example.

Johnson I wonder if the Valdez relocation was in some ways, at the federal level, a precursor to what became a more established federal policy of buyouts after the 1993 floods on the Mississippi River and thereafter. The policy of using federal post-disaster mitigation money for buyouts really took shape over the late 1980s and early 1990s.

Mader That's an interesting point. This may have been the federal point of view, but I don't recall it was expressed.

Johnson It wasn't part of the dialogue?

Mader No, at least to my knowledge, not at that time soon after the earthquake. Construction on the Alaska Pipeline, with its southern terminus at Valdez, didn't begin until ten years after the Alaska earthquake, after the 1973 Arab oil embargo, so that didn't have a bearing on the decision.

Our major focus in the study after reviewing the histories of several earthquakes was to define how to make good decisions after an earthquake regarding rebuilding. We developed a timeline indicating when decisions should be made at various stages of rebuilding, what agencies should be involved, and how the decisions at local, state, federal levels should lead toward a better solution for rebuilding after an earthquake.

There was interest at the federal level in our proposals for post-earthquake decision making. I am not certain to what extent our proposals were followed, but there are some indications they may have had an effect. It is likely our study was one of the first attempts to make this kind of analysis. One of the most interesting parts of the study was the analysis of the post-earthquake planning process in order to get a better result. We found some major weak parts related to a lack of interest in developing tough regulations and problems in getting funding to make changes.

Alaska was a great place to do this study because a major earthquake had occurred, there was major damage, and some years had passed, so you could see what had and had not happened.

Johnson And, just to be clear, since so many engineers are part of EERI, when you are talking about cities that don't rebuild safely, you mean primarily in terms of land use decisions and not necessarily about new construction being built to seismic standards, right?

Mader That is true. We were also interested in the engineering geology aspects such as the large buttress fill related to the Fourth Street slide in Anchorage. It's interesting that the new buildings at the head were limited in weight so they would not overload the head of the slide. They were relatively low-rise steel buildings. Well, that got into structural engineering to a degree, but land stability was the real issue. Of course, this set a limit on the types of land uses that would be appropriate.

We included the Santa Rosa earthquake of 1969, in which there was a lot of structural damage to older buildings and a great need for redevelopment projects to clear areas and encourage safer buildings. We also looked at the Bluebird Canyon landslide in the hills of Laguna Beach in 1978. This landslide was largely an engineering geology problem. The bedding planes were parallel with the natural slopes and hence landslides were a major issue. The slide was induced by water intrusion into the ground, not by seismic shaking.

Johnson And the international earthquakes you studied were Skopje (1963) and Managua (1972)?

Mader The Skopje one was impressive because, after the earthquake, the city was largely redesigned and documentation of the

changes was excellent. But that was under a fairly different governmental system with the centralized planning of the Tito government. It's hard to transfer lessons from other countries to direct applications in the U.S. While a lot was done in Managua to improve seismic safety, the efforts fell short of providing a safe and functional environment. From a planning point-of-view, re-planning and development of effective regulations is difficult where planning and regulation have not been a regular function of government.

The "PEPPER" Project (1981–1987)

Johnson Next, Spangle Associates conducted a study of planning before an earthquake for recovery afterwards?

Mader Yes, the product was *Pre-earthquake Planning for Post-earthquake Rebuilding,* published in 1987, also known as the PEPPER project. I posed the question: Can one predetermine potential earthquake-induced damage patterns in a city in sufficient detail to allow one to make detailed plans, in advance, for rebuilding after the earthquake? We raised the question and NSF felt it was worth investigating.

Johnson Please talk more about the PEPPER project.

Mader Henry Degenkolb was a part of our team, which was headed by Bill Spangle. What a pleasure it was to work with Henry. Typically, he would come to our office from San Francisco, huffing and puffing, with his briefcase stuffed full of things. He was very excited about and interested in the project. Henry was an outstanding structural engineer and a very willing collaborator. He provided all of the structural information. Ultimately, we found that damage patterns will vary widely and not support detailed rebuilding plans. We did, however, document the extent of potential damage in areas of the city. Also, we recommended that a city could establish procedures and mechanisms to employ after an earthquake to guide the making of good decisions for rebuilding. I recall that at that time there weren't many people thinking about these types of questions.

Johnson As you said, there were many procedural recommendations, one of which was for the City of Los Angeles to have some ordinances in place pre-disaster.

Mader Yes, and Los Angeles adopted such an ordinance. I remember the Lake Arrowhead meetings put on by the city where they got city employees away from day-to-day activities to discuss implications of the PEPPER report. Those were carried out under Ken Topping, who at that time was the planning director for the city.

Strengthening Unreinforced Masonry Buildings in Los Angeles (1987–1990)

Johnson Then, there was the NSF-funded study of the implementation of the Los Angeles unreinforced masonry building ordinance, Division 88 of the city's building code.

Mader Martha Blair Tyler of our office was the chief investigator. Kathleen Tierney, a sociologist, then at the Disaster Research Center of the University of Delaware, was

a consultant. The purpose of the study was to determine whether the Los Angeles city-mandated program for the strengthening of unreinforced masonry buildings resulted in changes in land uses and building occupancies. Under the program, owners either demolished buildings and built new ones or invested in strengthening their buildings. The study focused on four small areas that had many strengthened unreinforced masonry buildings. In other words, did the regulations result in significant changes to the city? We found that the ordinance by itself did not result in major changes, but when coupled with other factors, such as a rising real estate market, it did.

International Symposium on Rebuilding After Earthquakes (ISORE) (1988–1990)

Johnson When I joined in 1988, Spangle Associates had just submitted a proposal for another study with NSF that was to host an international symposium on rebuilding after earthquakes. I have always been curious why you thought such a meeting was needed and why NSF was willing to fund such an activity.

Mader I got the idea that, because we did not have a long history in this country of rebuilding after damaging earthquakes, we should learn from the experiences of other countries. We put together a proposal to NSF to gather planners from other countries who could directly relate their experiences in reconstruction after earthquakes to U.S. planners.

Unless planners can begin to realize the kinds of problems they will face, they won't be prepared. As you know, we developed a huge timeline that was put on the wall. Participants from other countries made presentations and inserted notations on the timeline about the various types of decisions that were made and when.

Before the project got underway, the 1989 Loma Prieta earthquake occurred, which gave us another example to include in the project. The symposium was held at Stanford University. With the Loma Prieta earthquake, we had great examples to look at right in the Bay Area. For instance, Santa Cruz, which was heavily damaged, became a study area. Fortunately, Charles Eadie, a planner with the city, became a key participant in the study.

We thought it was a good symposium. The proceedings were published by Spangle and Associates in 1991 in the report *Rebuilding after Earthquakes: Lessons from Planners*[7]. You had a key part in organizing and running the symposium.

Johnson Yes, we asked the planners from other countries to tell us about their experiences with several key activities, such as how they conducted and when they completed damage assessments, when they started and completed planning processes, when temporary housing was in place, when permanent housing reconstruction was completed, whether they established temporary businesses, and what the demolition schedules were.

7 *Rebuilding after Earthquakes: Lessons from Planners,* Proceedings of the International Symposium on Rebuilding after Earthquakes, Stanford University, Stanford, California, August 12-15, 1990, William Spangle and Associates, Inc., funded by the National Science Foundation.

Mader We noted that two weeks after their earthquake, most of the international cities were taking up planning issues about how to make changes. After a month, they were looking at business recovery and public facility needs. After two years, major accomplishments included clearance and some housing and business recovery. And after four years, they were bringing closure on infrastructure and facility repairs as well as planning. So overall, they were looking at about a four-year process until things were really significantly changed on the ground.

Johnson What was special about this is that, until then, no one had really been looking at a timeline as a strategy for managing recovery. There had been some talk of that by Haas and Kates in their 1977 landmark study, *Reconstruction Following Disaster*[8], but this was really the first time that a project had actually specified tasks and broken them down in terms of the major functions that cities would be responsible for and how those would play out over time. Isn't that correct?

Mader Yes. It was fascinating to get the different stories of these people from other countries. We looked at rebuilding following six earthquakes: Skopje, Yugoslavia (1963); Managua, Nicaragua (1972); Friuli, in northern Italy (1976); El Asnam, Algeria (1980); Mexico City (1985); and Armenia (1988). On the timeline, we had a record of tasks performed following these events. It was a lot of fun and interesting as these key people put their markers on the chart timeline so we could discuss all the steps in the process.

Johnson But, as you noted, in the process of organizing and getting ready for the workshop, which was held in August 1990, the Loma Prieta earthquake happened. As I recall, we got additional funding from NSF to extend the workshop another day in order to go down to the damaged communities of Santa Cruz and Watsonville in Santa Cruz County. These visits brought the reality more clearly to the U.S. planners.

Mader True. We had to convince people these things do happen. We prepared a summary publication out of the workshop, and it received a fairly wide distribution. It was unusual that NSF was allowing planners to do research work. Planners do research work, but it's of a different nature than the usual studies funded by NSF that are conducted in academia. We were not trying to follow certain theories, we were just trying to find out what happened and why—a very direct approach.

Post-earthquake Rebuilding Exercise for Planners (1991–1994)

Johnson The timeline then became the basis for a follow-on study with NSF funding to develop a training exercise for local government officials on recovery and reconstruction. This really differed from the disaster training that local governments usually undertake, didn't it?

Mader Yes, much of the training focus has been on emergency response activities. Now that we had looked at a number of disasters and had a sense of a recovery and rebuilding

8 J.E. Haas, R. W. Kates, and M. J. Bowden, editors, *Reconstruction Following Disaster*, MIT Press, 1977.

timeline, we suggested a training exercise where key city employees would run the recovery decision-making process. Knowing the limited available time of highly paid city employees, such as a city manager and a planning director, we decided that an eight-hour training day is really all we could aim for.

Also, rather than providing a damage scenario, we decided to assign that task to the players. In essence, we had folks sit down, gave them maps of the city and some geology, and then guided them through a process of predicting damage.

Johnson This also is not typical of exercises—allowing participants to actually develop their own scenario. But the exercise instructions provided some direction, with examples of typical types of building damage and ground failures, and then asked them to identify at least one location of heavier residential and commercial damage as well as ground failure.

Mader One of the reasons for this was that we wanted them to buy into the scenario. If you hand them a scenario, how much do they really know about its basis? If they do it themselves and say this hillside is going to fail or there will be major downtown destruction, this sets them up for the next part where they begin to think about how they are going to solve the problems. What should they have done before the earthquake to ensure greater safety? What should they do after the event to address recovery issues? So I think it was important to have them do the scenario themselves and in the process think about the categories of damage, ground failure, and so forth. The exercise also pointed out to the participants just how little information they had in the city about possible earthquake damage and how much they needed to obtain. We did these in several cities, and I recall that you handled most of the exercises.

Johnson Yes I did. We first conducted them in Los Angeles and Pleasanton, California. Then we started doing them with the Central United States Earthquake Consortium (CUSEC) in Memphis, Tennessee; Evansville, Indiana; Carbondale, Illinois; Cape Girardeau, Missouri; and Paragould, Arkansas.

Mader Were the exercises done elsewhere?

Johnson We did one with the Los Angeles Redevelopment Agency. Then, FEMA actually adopted the exercise and it was offered for several years at their training facility in Emmitsburg, Maryland. Spangle Associates also helped them develop a similar exercise for flooding. In 2008, I conducted a modified version of the exercise with local officials in the Palm Springs area as part of the Great Southern California ShakeOut scenario development project. It proved helpful in engaging local officials in considering the long-term recovery issues associated with the scenario.

Mader We have to mention Martha Blair Tyler here because Martha did much of the research to develop the exercises. She is a very good planner and researcher, and is knowledgeable about the public decision-making process. You and she worked together on a lot of these projects.

Redevelopment after Earthquakes (1998–2002)

Johnson There was yet another NSF study in the lineage of *Land Use Planning after*

Earthquakes, which looked at redevelopment and the role of redevelopment agencies after large disasters. It also considered a number of different communities and different types of disasters. Martha Blair Tyler was a key researcher on this study as well.

Mader Yes, as I noted before, Martha was an incredible researcher and very productive member of the firm. She has since moved on and now lives in Sea Ranch, a well-designed seaside community north of San Francisco, where she has applied her planning and leadership skills to help guide future development and changes there. Once a planner, always a planner.

Martha was the project leader and did a lot of the work on it. We looked at redevelopment experiences in 11 cities including six in California, two in Alaska, and one each in Florida, North Dakota, and North Carolina. In California, we considered Los Angeles, Santa Cruz, Coalinga, Los Gatos, Whittier, and Fillmore. The study concluded that redevelopment can be a powerful tool in clearing heavily damaged areas in order to develop a new and improved part of a community. The final report, *Redevelopment after Earthquakes*[9], was published by Spangle Associates in 2002, and included many recommendations on how to use redevelopment as an effective tool in the aftermath of earthquakes.

Johnson What led you to want to focus on redevelopment? It seems that your research had moved beyond planning and more into local government management and recovery management models. Are there are some unique qualities that redevelopment agencies possess that are well suited for disaster recovery?

Mader We realized that land use planning works best in raw land situations before development decisions have been made. But a big problem is in areas of cities that are partially destroyed. What do you do in that case? Most people want to build things back pretty much as they were, but how do you do it safely? Redevelopment is a major tool whereby you can gather funds to redevelop areas, rebuild safer, and hopefully use the increase in property taxes to offset a good deal of that cost. Redevelopment is a powerful tool because it can include eminent domain powers to acquire damaged properties. It's the only way we have to make major changes unless there is a large investor who can come in and buy up land, but that requires willing sellers. The fact that you can use redevelopment powers to take over land is very important, but normally controversial. So we thought let's look at it. Let's see how it works; how can it be used? What are the advantages and disadvantages of this major tool?

Johnson Having worked in New Orleans after Hurricane Katrina in 2005, I realize the importance of local leadership, a topic discussed in that study. Claire Rubin, in her early work, also documented the need to have a vision, and noted that redevelopment agencies are often much more versed in this than planning departments. The redevelopment process involves collaborative work with the

9 Spangle Associates, *Redevelopment after Earthquakes*, Spangle Associates, Portola Valley, 2002, funded by the National Science Foundation.

local community and stakeholders, as well as a visioning process to consider how the redeveloped area could look. These are some of the things that you called out in the study. If you have local staff experienced with that kind of community re-visioning on an ongoing basis, these valuable skill sets can readily be leveraged to help with recovery when a disaster happens. Redevelopment staff are also used in packaging all kinds of funds that come together in a redevelopment project, and then similarly for recovery.

Mader Did you find people of that type in New Orleans?

Johnson New Orleans' planners struggled with their recovery visioning and implementation. In all fairness, they were terribly understaffed and the city had also been dealing with a declining local tax base, suburban flight, and the loss of major industries before Katrina hit. Planners had already been struggling with the issue of re-imagining and re-visioning what their future city would be economically, socially, and culturally. After Katrina, it was a real challenge to identify new economic opportunities that would help stimulate reinvestment and restore a "sense of place" in different neighborhoods. The city had some limited experience working with redevelopment along the riverfront and in a few other places. But, in a place like Los Angeles, they had a fairly large and evolved redevelopment agency, and they moved quite effectively into several major redevelopment efforts after the 1994 Northridge earthquake.

Mader I remember visiting blocks where apartment buildings in the San Fernando Valley were seriously damaged and fenced off. The city faced the question of what was going to happen to those properties, and it looked like it would be a big problem for LA.

Johnson The city created several new post-earthquake redevelopment districts to deal with the housing and commercial damage across the San Fernando Valley. Because the economy had been slumping and there was a recession at the time, these districts weren't able to generate a lot of funds initially from tax increment financing. It took a long time, but 10-15 years later, after the economy improved and property values increased, you saw a major recovery in those districts. Hollywood was the one neighborhood where they had established a redevelopment area before the earthquake. So, by having the system in place, and by having already identified their problem buildings, many of which then had major earthquake damage, they were able to focus a lot of targeted funding into the area and the whole area just took off. The Kodak Center was constructed and a sort of rebirth of Hollywood took place. This all happened as a result of the Northridge earthquake and the redevelopment district being there.

Mader Well, that's part of the planning process: you pick up the pieces and rebuild. But in rebuilding, a key is to rebuild so as to increase safety from future earthquakes. I think we participated in an interesting succession of projects from 1977 to 2002: from land use planning after earthquakes to redevelopment after earthquakes.

San Francisco Bay Region Environment and Resources Planning Study (1977–1979)

Johnson In addition to the many research studies and your work in Portola Valley, I want to talk a bit about some of the important regional-level work Spangle Associates was involved with, the first being the San Francisco Bay Region Environment and Resources Planning Study of the USGS in the 1970s, and the work that followed on from that.

Mader The USGS focused on the geologic mapping of the Bay Area in the late 1960s. In the 1970s, the geologists got the idea to bring this mapping together to form the Bay Region study. They packaged the maps as Basic Data Contributions to the study. Bob Brown, a geologist with the USGS in the Menlo Park office, headed the study.

They also got the idea that this information should be used in guiding future development of the Bay Area. We were asked by the USGS to come down to their offices in Menlo Park and describe the planning applications of geology in Portola Valley. They wanted to demonstrate that there was a need to translate geologic information for application to land use planning. With USGS money, and funds from the Department of Housing and Urban Development, they developed a program of translating this information for use in the Bay Area. I believe what we presented was a source of encouragement to them as they were trying to get support for the program.

Then, we were retained by USGS to develop some interpretive materials for use by land planners and decision makers. Here, I really have to mention Martha Blair Tyler again as she was a key player in our office in this work. Bill Spangle also contributed much of this work, as did Tom Vlasic of our office. We co-authored with USGS geologists interpretive reports on several topics including flooding, flatland deposits and slope stability. We also authored a report, *Seismic Safety and Land Use Planning, Selected Examples from the San Francisco Bay Region, California,* published by USGS as a Professional Paper.

I would also like to mention in particular two persons at USGS—William Kockelman, a planner, and Don Nichols, a geologist—as I believe they were extremely important in USGS's reaching out to user communities.

Johnson Although much more briefly, I also knew Bill Kockelman. He took an interest in my career as a technically oriented planner, and offered some very useful advice in those early years. I loved looking through his book collection. We had some nice visits.

Mader Bill was a planner from the Midwest and had worked for the Southeast Wisconsin Regional Planning Commission prior to coming to USGS. He was hired by USGS to help develop an outreach program whereby USGS products would be developed for application by planners and others. His outreach included consistently talking to many groups around the country about USGS products and how to use them. He kept meticulous records of everything he did at USGS. He was the only planner on the USGS staff based in Menlo Park. He was a perfectly wonderful guy with an infectious enthusiasm for what he was doing. We also became very good friends. He was an important person with

the USGS relative to planning applications of geologic information.

Don Nichols, to my knowledge, was the first person at USGS who really reached out of the geologic community into the area of application of geologic information in a meaningful way. He wrote the Geological Survey Circular #690, *Seismic Hazards and Land Use Planning*, in 1974. That was pretty early on. He continued to champion this kind of cross-disciplinary work throughout his career with the USGS. Don and his wife became close friends of my wife and me.

Johnson In documenting the use of earth science information, I think Bill Kockelman created a lot of the basic policy and process for the USGS. I was part of the later project that Spangle Associates had, in the mid-1990s, to evaluate how the Bay Region study products had actually been used by cities and counties in the region over time.

Mader It's a hard thing to always figure out how products are used. Often they are used in subtle ways. What's your recollection of the evaluation?

Johnson We looked at how the products were used in various types of planning. We first looked at the use in preparing general plans and safety elements of general plans. Then we looked at their use in reviewing actual development applications, in mapping projects, and in actual regulations. The survey looked at whether these maps and other products had been used in general planning applications down to the detailed applications in actual development projects.

It seemed there was a very consistent application of those products across the Bay Area for a period of time. In particular, they had been consistently used in the preparation of safety elements of general plans as required in California.

Now, the products have been superseded by much of what the California Geological Survey, formerly the California Division of Mines and Geology, has done with the state's seismic hazards mapping program. Bill's job was to help USGS develop products that would be useful to other planners and decision makers. He spread the word across the country and was a vital part of USGS.

Portland Metro (1994 – 1996)

Johnson I recall that Portland, Oregon attempted to do something that was along the lines of microzonation and Spangle Associates was involved. Was it a big project?

Mader Yes, it was. Portland has a metropolitan regional government, Metro, that serves the three-county area. The Oregon Department of Geology and Mineral Industries (DOGAMI), with funding from USGS, had prepared maps of relative earthquake hazard zones based on maps of slope instability, liquefaction, and ground shaking. The next question was: what should Metro do with the information?

We were fortunate to be selected as a consultant to Metro, and we put together a team that included Frank McClure, structural engineer, and John Martin, who was with Dames and Moore at the time. I have to add

that, as many know, Frank was a wonderful person to work with.

Metro had a good staff. We worked with Gerry Uba, a planner, our key contact, as well as a land use committee. Yumei Wang of DOGAMI was also actively involved. Our job was to look at the hazard maps and correlate permitted land uses with the different hazard categories. The maps were pretty detailed, and we addressed a number of things: how you implement the maps, the kind of studies you make, how you make decisions, and so forth.

A key part of the study was a matrix we developed with Frank, relating different classes of land uses with hazard zones. The hazard zones were in four categories: greatest, high, moderate, and least. These largely reflected ground-shaking problems. Working with Frank, we listed about 60 land uses, each of which assumed typical building types that were built to code. We also included the amount of damage that could be accepted for each type of land use (building), ranging from uses the loss of which would be catastrophic, such as dams, all the way down to low-intensity residential uses. We also listed the types of site investigations that should be required for each land use category.

Johnson Was the study adopted by Portland Metro?

Mader Yes, it is my understanding that the work we did was used by Metro. At that time Metro had rather strong planning and regulatory powers. It would be informative to revisit Metro to evaluate the results of our work.

Johnson What is the resulting publication?

Mader The final report, published by our firm in May of 1996, was *Using Earthquake Hazard Maps for Land Use Planning and Building Permit Administration.*

Johnson What the project did was make the translations from hazard maps to land use applications?

Mader Yes, that was the whole point. It was great doing this project with Frank. He pushed a lot towards the structural engineering end, which we wouldn't have been able to do without him.

Chapter 11

International Experiences (1981–2006)

This was an exciting trip for me for many reasons: meeting with Chinese educators and professionals, and the most memorable visit to Tangshan.

Johnson We talked about your trip to Europe as a Fulbright Grantee, but when did you really get involved with studies after international disasters in order gain lessons that could be brought back to the U.S.?

Microzonation Conference in China, 1981

Mader One of the early experiences I had was as an invitee to a microzonation conference held in Harbin, China in 1981. The conference was sponsored by NSF and the State Seismological Bureau of the People's Republic of China. Mehmet Sherif, of the University of Washington, was the leader. Both the U.S. and Chinese contingents made presentations. Some of the U.S. members included John Wiggins, Burt Slemmons, Walt Hays, Henry Lagorio, Marcy Wang, John Lysmer, and Anne Kiremidjian.

This was an exciting trip for me for many reasons: meeting with Chinese educators and professionals, and the most memorable visit to Tangshan. Here we saw the incredible evidence of destruction where poorly built buildings just crumbled and were then often repaired in a makeshift fashion so that they were no safer. It was one of the largest earthquakes in terms of death, with estimates of 240,000 or more fatalities.

The trip afforded many other opportunities, such as meeting with structural engineering professors, at one end of the spectrum, and engaging with elementary school children in Beijing at the other end. We visited temples and walked on the Great Wall. Major impressions at that time were wall-to-wall people, manual labor on projects, and poverty. We heard sad tales from professors who were not allowed to teach during the Cultural Revolution, had been sent to the countryside to work on farms, and were only recently returning to the universities. I also recall talking to a young Chinese man who was learning about the outside world and English by secretly listening to the Voice of America.

Tangshan was very sobering and I really began to think about its relevance to other developing countries. The economic ability to rebuild in developing countries is so limited. People rebuild with what they have and what they can do, and that's it. Their main concern is to have a roof over their heads, food, and water. Thinking about earthquake safety is probably the last thing many could or would worry about. The 1981 conference in China was an important event for me.

Campania–Basilicata Earthquake (1980–1981)

Mader Another interesting project was my work with Henry Lagorio, Professor of Architecture at UC Berkeley, in 1981. Under an NSF grant, he and I investigated the aftermath of the large 1980 Campania-Basilicata earthquake. The magnitude 6.9 earthquake caused an estimated 2,700 deaths, 7,700 injuries, and destroyed over 250,000 dwellings. Normally, teams of seismologists, geologists, and engineers visited areas after earthquakes, but we suggested that architects and planners should be included. Fred Krimgold of NSF supported our approach and subsequently we visited the area in March of 1981. The results of our study were published by EERI in 1981 as *Earthquake in Campania-Basilicata, Italy, November 23, 1980, Architectural and Planning Aspects.*

The Campania-Basilicata hill areas are east of Naples and have very rough terrain where houses just crumbled on the hillsides. We also visited heavily damaged areas in Naples. We looked not only at damage, but also at emergency aspects after the earthquakes. Finding locations for temporary housing in the hill areas was a big problem because there were few level areas upon which to locate it. They also had to quickly develop places where they could bring in prefabricated units for displaced persons.

Italy had to buy a lot of prefabricated buildings from different countries and there was lots of competition among suppliers. There also were questions of who could even bring prefabs into port. We heard stories of people who wanted to provide housing having a very difficult time even getting it into the country. We heard tales

of what appeared to be illegal tactics against suppliers. These are things you don't normally think about.

One of the key lessons I learned was that in mountainous terrain, you don't have enough useable land for all of the needed emergency and temporary construction. There were many other lessons that we described in the report. We met with government officials in local communities where not much English was spoken. Luckily for me, Hank spoke fluent Italian. Otherwise, I would have been lost.

Algeria (1982–1984)

Mader El Asnam had a devastating earthquake in 1980. I was asked by Geomatrix to be involved in their seismic zonation study of nine urban areas in the aftermath. Key persons involved were Maury Power, Chuck Thiel, Fred Swan, and Nick Forell. The assignment was to make seismic zonation studies as a basis for reconstruction and future development. The zonation maps differentiated areas based on liquefaction potential, landslide potential, surface fault rupture, and compaction.

We, largely Chuck and I, then developed 11 land use categories based on density of residential development, occupancy of commercial development, hazardous nature of industrial uses, essential services, and open space. Each of these categories was then assigned a value and weight in a matrix for each of the microzones. In urban planning, we call this a land capability study. The result was that a user could look at the microzonation map and determine the appropriateness, or capability, of each zone for alternate land uses. This was intended to be a major tool in planning for the future development of the nine urban areas.

Johnson How consistent were the actual rebuilding patterns with the microzonation maps?

Mader I had one additional assignment that can help answer this question. I was assigned to meet with urban planners and describe how the land capability study might be used as a tool in the urban planning process. I really enjoyed this since I was working with fellow urban planners in an entirely different setting than I was used to. The location was in one of the new city extensions outside of the old city. Here the response to the earthquake seemed typical.

The government had quickly brought in prefabricated housing that wasn't built for the climate. They were essentially pre-fabricated boxes that I am sure overheated. They faced the major question of whether they wanted that kind of prefabricated housing or something more temporary. They knew that the prefab housing would be better than most people had prior to the earthquake and would likely become permanent housing, but not of a good quality. There was a big debate, but temporary housing came in and was scattered around at the margins of the city, but not really designed as a part of the city and with inadequate services.

Planning in El Asnam was very difficult due to diverse ownership, diverse interests, and a difficult governmental structure. While redevelopment of damaged areas, largely in the center of the city, would have been desirable, that would have required strong governmental

redevelopment empowers, money, and political willingness. That just didn't seem to be possible. Unfortunately, we did not have the opportunity to follow up our work to find out to what extent our recommendations were followed.

Johnson In your opinion, is microzonation useful?

Mader Microzonation includes specifying permitted land use types, including structural types, with respect to different hazard areas. I believe these maps can be of significant assistance to land use planners in recommending changes to a city, but the critical question is whether the decision makers have the power and authority to implement such plans.

United Nations Disaster Relief Organization (1989–1990)

Mader After these experiences, I got involved in work with the United Nations Disaster Relief Organization (UNDRO). Ludovic van Essche of UNDRO, who was heading the SEISMED project (the Cooperative Project for Seismic Risk Reduction in the Mediterranean Region), asked me to be a consultant to the project. This was a stroke of luck since it allowed me the opportunity to visit a number of countries, see new situations and meet with many people in the region. Walt Hays of the USGS was a key player in the project. The goal of SEISMED was to foster actions that would reduce risks associated with earthquake ground shaking and ground failure in each country of the Mediterranean. The project was a pilot for the International Decade for Natural Disaster Reduction, which extended from 1990 to 2000. Participants included Albania, Algeria, Cyprus, Egypt, France, Greece, Israel, Namibia, Morocco, Sicily, Spain, Syria, Tunisia, Turkey, and Yugoslavia.

The project stated that the destructiveness of earthquakes was related primarily to the magnitude of the earthquake, proximity to the earthquake source, and the wise use of land. My role was to show how good land use planning, both prior to and following earthquakes, could provide dividends in the long run. This involvement led to other things. In particular, UNDRO became interested in earthquake problems in Yugoslavia, especially in Montenegro, where we met with people in the government about planning and safety. This was a fascinating experience. We met some absolutely splendid people in Yugoslavia. Jakim Petrovski, an earthquake engineering professor, was one of the main participants. He was a wonderful man whom I greatly enjoyed getting to know and working with.

We had an interesting experience in Montenegro when we met at the hillside home of the mayor of a small city. He climbed his cherry trees and tossed down freshly picked cherries for us to eat. He also provided some strong liquor accompanied by his homemade goat cheese. I have a vivid memory of this delightful time outside on a bright, clear, warm day, stretched out on the grass. Language was not a barrier in this setting. We were just people from different countries having a good time together.

Johnson What were the products of the UNDRO project? Was it basically knowledge sharing or was it more product-related efforts, such as mapping?

Mader It was basically knowledge sharing, trying to provide examples of effective approaches to dealing with earthquake problems. We were not doing mapping.

Turkey (2004–2006)

Mader From 2004 to 2006, Spangle Associates worked with ABS Consulting in Turkey on a project titled "Microzonation and Hazard Vulnerability Studies for Disaster Mitigation." We met with several cities to discuss their planning and regulation processes and how they dealt with earthquake hazards. That was interesting because the laws are so different in Turkey.

We also conducted a pre-earthquake planning exercise, like we had done in the U.S., where we involved representatives from each of six cities. Again, it was a one-day exercise. I tried to take them through the process. It was only partially successful, I am afraid, for a number of reasons. Although they all spoke English reasonably well, communication was difficult. Also, differences in government and regulations made it hard to use U.S. examples. In hindsight, it was too much to try, particularly with so many players and in one day.

As a planner, I was interested in the 1999 earthquake that hit the Izmit region just outside Istanbul. In the town of Gemlik, the earthquake caused major damage to petroleum storage tanks with resulting fires. The city decided to encourage development in the hills behind the city since this area was thought to be safer from the earthquake threat. This is one of the few examples I know of where land use planning was used as a major tool to significantly change a city for purposes of protection from earthquakes.

When we visited the city, there was one minor road leading to the new development in the hills. We saw only the beginnings of the city extension, but it's a dramatic thing because you are taking people out of a familiar situation, putting them up in a very barren area with no community infrastructure. How they are going to develop the area into a viable community is a good question. It would be interesting to go back in a few years to see how successful that's been. Another major post-earthquake relocation that I mentioned earlier was with respect to the City of Valdez in Alaska

Johnson There have also been some more recent examples of relocations in Japan following the 2004 earthquake in the Niigata region, more recently in the Tohoku region after the 2011 earthquake and tsunami, and also in China after the 2008 Sichuan earthquake.

Chapter 12

GeoHazards International (2007–Present)

I've known Brian Tucker for quite a long time. His observation that there are developing parts of the world where there will be damaging earthquakes and there isn't adequate safety led him to establish GeoHazards International.

Johnson You have also been involved for many years now with Brian Tucker and GeoHazards International. How did he get interested in starting GHI and how did your connection take place?

Mader After Brian got his Ph.D., he lived in the Republic of Tajikistan for several years. This country had been hit by a devastating earthquake in 1949 that killed more than 25,000 people. Brian, a seismologist, realized that simple changes in building design could have reduced the deaths and injuries, but that these actions had not been taken. Subsequently, he came back to the U.S. and took the job of Acting State Geologist in California for a period of time, but the vision of what he saw in Tajikistan remained

with him. I recall that when he was developing his ideas for GeoHazards International, he came down and talked with me about his thoughts and how to go about starting the organization. Now, he has honed his skills as an earthquake risk management specialist.

I've known Brian Tucker for quite a long time. His observation that there are developing parts of the world where there will be damaging earthquakes and there isn't adequate safety led him to establish GeoHazards International. He asked: How do we protect these cities against damage, death and destruction?

Fortunately, Brian became friends with a Japanese man, Mr. Satoru Oyo, who headed the Oyo Corporation. Through Mr. Oyo, GHI was given a start-up grant in 1991. Brian assembled a small staff and started projects. The funding allowed GHI to develop projects and then get grants to carry them out. Brian wanted to do the things that he thought were needed and no one else was doing.

His first project was in Ecuador. It looked broadly at risk reduction actions that could be taken across many sectors. I was involved on his initial risk advisory group, and Spangle Associates was involved in helping him design and facilitate multi-sector workshops and discussions. The project eventually focused on school safety. Schools are a very good topic because people are willing to support safe schools and politically that's a good place to start. Brian was successful in having changes made in Ecuador to increase the safety of schools. He then started doing work in other countries such as India, Nepal and Pakistan, all with a focus on schools and hospitals.

Recently, GHI has become involved in tsunami problems in Indonesia as well as earthquake problems in Peru and Haiti. For Padung, a city in Indonesia that was heavily hit by the tsunami in 2009, GHI developed an idea of a raised-earth park, a place for people to assemble when a tsunami is coming that could be used for recreation at other times. In Padung, there isn't sufficient time for people to escape to the hills, so you need safe places close in to where they live. That project is still in the formative stage.

Johnson For how long have you been on the GHI board?

Mader I have been on the board since 2007 and currently serve as chairman. GHI celebrated its 20th anniversary in 2011 with a very nice event held at a supporter's home in Atherton overlooking the San Andreas Fault valley.

One of the problems with an organization like GHI, which is a non-profit organization, is being able to get funds to cover the development of project proposals and overhead. GHI does not respond to RFPs, but rather develops projects it believes are needed and then tries to find funding. The funding comes largely from a variety of governmental sources, most of which do not provide enough overhead to support the large task of writing proposals and running the organization. But Brian, a very unassuming person, through logic and enthusiasm and by developing worthwhile projects, is able to get grants and some donations. Nonetheless, funding for GHI is a constant pressure on the organization. People like to work with Brian because he's so smart and innovating. He was honored by being named a MacArthur Fellow a few years ago. GHI is still a small

organization and uses consultants to help on a lot of their projects. Some consultants donate their time or charge a very low rate.

Chapter 13

Looking Back

I consider myself very fortunate, as I look back on about 45 years, to have been involved in the application of the earth sciences, particularly with regard to earthquakes, in city planning.

Johnson In preparing for these interviews, you've shared your vita that has a pretty hefty section on presentations, conference involvement, and other professional recognition. When you look back on those many activities, how do you see them, in sum?

Mader I consider myself very fortunate, as I look back on about 45 years, to have been involved in the application of the earth sciences, particularly with regard to earthquakes, in city planning. One of the major pleasures has been the opportunity to get to know so many outstanding persons involved in this field—earth scientists, engineers, teachers, as well as politicians.

I have made many presentations at meetings of planners, earth scientists, and engineers where I hope I've been able to point out the importance of these disciplines to urban planning. Also, I have had many papers published in proceedings and in various other ways. In addition, I have served on many committees dealing with earthquake issues at regional, national, and international levels.

It's very gratifying to have had the opportunities I have had, all in the interest of improving the safety of the public relative to geologic hazards. In the international work I have done, I have primarily tried to demonstrate how the planning-regulation-development process we use in this country might be adapted to other countries.

Johnson In the American Planning Association (APA), we have the American Institute of Certified Planners, and we can nominate and elect fellows to the institute as an honor for service. When were you inducted as a Fellow of the American Institute of Certified Planners (FAICP)?

Mader I was inducted in 2003.

Johnson The nominations are made from various places, such as the state chapters of the association. And they have different categories like public service and teaching. In what category was your nomination?

Mader Mine is for "Professional Practice." Sanjay Jeer, who worked at the national APA office, nominated me because we'd worked together and he knew what I had done relative to planning and geology. He made the nomination and then, of course, APA had to get reports from a number of people about me. I was honored to be nominated and then elected to the College of Fellows.

More recently, in 2010, I was pleased to receive a Distinguished Leadership Award from the Northern Section of the California Chapter of the APA and then, in the same year, I received the leadership award from the whole California state chapter. I think a lot of it related to my work in Portola Valley as town planner for so many years.

Earlier, in 1992, I also received the Award for Excellence in Teaching in the School of Earth Sciences at Stanford. That was a very nice compliment.

Johnson You have just been awarded the Alfred E. Alquist Special Recognition Medal by EERI for 2013. This must be especially gratifying given your relationship with Senator Alquist?

Mader Yes, Tom Tobin, then President of EERI, called me and told me of this award. I was completely blown away, surprised, and very honored. At one time, I chaired the committee that nominated people for this award, but I never expected to receive it. California owes a huge debt of gratitude to Senator Alquist for leading the way in establishing seismic safety policies and regulations for the state.

I greatly appreciate this recognition as a member of EERI, as well as the opportunity to have worked with so many EERI members in the field of seismic safety.

The Role of Planners in Seismic Safety

Johnson Let's talk about your perspective on some key issues. First of all, what do you think about the role of planners in the areas of seismic safety and earthquake engineering? You, Bill Spangle, and the firm had a very unique place in history, being among the first, if not *the* first, urban planners to work in this technical area and on multidisciplinary teams that were trying to address these issues.

Mader Fundamentally, much of the earthquake problem is solved through structural design; you just have to recognize that. Planners, however, are particularly effective in correlating alternate land uses with potential geologic hazards that can be triggered by earthquakes. In considering alternate land uses, decisions will be affected by the feasibility of solving problems with money. When land values are high, you can solve a lot of problems by putting money into engineering solutions to withstand the degree of hazard. When land values are low, such solutions are less feasible, and hazardous areas may need to be avoided.

The planner's role also relates to how one views the role of the natural environment. Where the natural environment is highly valued and geologic hazards are an issue, good arguments can be made for preserving hazardous land as open space or for very low-intensity purposes. That's a happy marriage, where it fits into the overall design and you can do it. I think planners need to understand earthquake hazards and take them into account. They have to decide to what extent hazards should shape a community either by avoidance, on one hand, or helping facilitate solutions on the other.

Many problems can be solved through design. If you are sympathetic with respect to landforms, then you probably will try to give expression to those natural landforms rather than modify them by grading. On the other hand, in places with difficult terrain, like San Francisco, land values are so high that it may be warranted to spend more money on engineering solutions on the very steep slopes.

Johnson Do you think that planning is sometimes dismissed as a risk management option and we look to engineering solutions too quickly?

Mader Sure, but, it's a continuum. Some engineering solutions to problems are not expensive and don't really make major changes to the environment. But I would hope that, in appropriate situations, we would say that it would be better to not undertake a development project if solutions to reduce risk would be inconsistent with community values.

Take the case of an engineer telling a client, "Well, you could do this massive project, but I think it would be better for society if you didn't and leave the land undeveloped," which is nothing a landowner wants to hear. Maybe the professional should present that option to a different party, probably a public agency or a public interest group that could intercede. But I would think most engineers don't want to get into that kind of value discussion because their job normally is to design a solution to a problem for a site and a project that have already been determined.

Johnson I think that's where planning is interesting because planning still resides to some extent in the value realm. There are probably some local staff planners who feel a lot like engineers where they really have no choice; their job is just to make sure they meet the permitting requirements. So, where does the value discussion reside anymore?

Mader Well, it's usually at the political level, and the politicians need to have good information and options to choose from.

Johnson But who is the public defender for the other side?

Mader That's a good question. Environmental quality acts like CEQA and NEPA are to an extent representing the public side, because the review process brings out options if the studies are done right. It should be unbiased on the pluses and minuses of actions and what the repercussions may be. But any planner worth his or her salt should have essentially considered these things in preparing a plan in the first place. On the other hand, many budgets for public planning projects don't support all of the basic studies that are needed in preparing a plan.

Johnson What do you feel is the role of planners in disaster recovery and reconstruction? Are there differences in planning pre-disaster versus post-disaster?

Mader A lot of things need to be considered in pre-disaster planning. Are the critical systems of the city likely to be disrupted to the point that they do not function? The planner needs to think about lifelines, utilities and roads in particular, their viability after an event and needed redundancy in systems. The planner also needs to consider the safety of emergency facilities so they can function after a disaster. These include schools, hospitals, and emergency facilities for police, fire, and so forth.

The planner also needs to think about the immediate post-earthquake recovery period including handling temporary facilities, whether it be housing or commercial development. For instance, take the City of Santa Cruz after the Loma Prieta earthquake, where they put up temporary buildings and tents in the downtown area so businesses could continue. Next, you need to plan for the longer term including final rebuilding. In this process, the planner needs to work with engineers, geologists, and others.

Johnson How do you think your opinion compares with what is the modern or typical urban planning curriculum, or the practitioner planner's viewpoint?

Mader I don't know to what extent the whole topic of land instability and seismicity is currently being taught in planning schools. It certainly wasn't taught when I went through graduate planning school at UC Berkeley. Earlier we talked about the first master plan for San Mateo County. We didn't have a word about earthquake problems in the plan prepared in the mid-1950s. My impression is that more attention is paid to seismic issues in planning schools now. With the seismic safety element requirement for general plans in California, and the Alquist-Priolo Special Studies Zones Act, California schools should be paying more attention to earthquake issues.

City planning has become more specialized in recent years. A lot of planners specialize in topics such as housing, transportation, economic development, redevelopment and environmental protection. There is room for some planners to specialize in the earth sciences, particularly in seismic and non-seismic hazards.

Johnson With so many competing demands, do you think that hazards and risk might become part of the general planning curriculum? A few universities or colleges have

electives that are focused on these topics, but few, if any, have a full program with multiple courses on hazards and disasters.

Mader Natural disasters of all types seem to be happening with more frequency throughout the world, and news about them spreads rapidly. Certainly, with increased worldwide communications and reporting, we are at least more aware of disasters. Also, we are now faced with uncertainties due to climate change. And urban development continues to spread into areas subject to earthquakes, tsunamis, and other earth science hazards. With all of this happening, it seems that planning schools will have to give more attention to natural hazards. Certainly more courses should be added, and I wouldn't be surprised to see a planning program emerge with its primary focus on natural hazards.

Professors of planning who teach about earthquakes and other geologic hazards include Rob Olshansky at the University of Illinois; Philip Berke, David Brower, and Ray Burby at the University of North Carolina; Tim Beatley at the University of Virginia.

Multidisciplinary Collaboration among Planners, Engineers and Geologists

Johnson By the time structural engineers raise the issue of risks and hazards in the design and construction process, the planning function in many ways is already over. What would you say about when structural engineers should think about involving an urban planner?

Mader Structural engineers normally are working on a project on a single parcel of land. Planners, on the other hand, have probably already prepared a general plan or area plan as well as zoning for a much larger area that includes the specific parcel. The decision will already have been made on what range of land uses will be permitted. The structural engineer will then be faced with the types of land use already identified. In that case, the structural engineer will have to come up with designs to deal with whatever seismic problems exist at the site. The structural engineer would be much more helpful to the planner, and vice versa, at an earlier stage so that the initial designation of future land uses would have the benefit of the engineer's advice. This was the suggestion made as a part of the Metro project in Portland that we discussed earlier. Few cities, however, have structural engineers on their staffs and, if they do, it is likely that the engineering or building department with the structural engineers operates quite separately from the planning department.

For instance, on liquefiable soils you might be able to build houses, but the cost of necessary foundations might make the projects infeasible. On the other hand, for an expensive project such as an office building, the cost of putting pilings down for a safe project might be financially feasible. So the structural engineer and geologist should have been included in the preparation of the general or area plan. Consequently, the work might rule out some uses as financially infeasible, while others might be feasible. Of course, there might also be some areas where all involved agree would be better left undisturbed.

Johnson So you would say that there is an opportunity for engineers to be a little more

proactive in trying to engage earlier in the land use planning process if they feel that there are areas that really are too vulnerable for certain kinds of land use and structure types? Knowing what types of land uses are appropriate in certain areas is something that the structural engineering community might be able to help more with, in combination with the planning and engineering geology communities?

Mader Yes, there is a need for multidisciplinary perspectives, especially in highly vulnerable areas, such as liquefaction- and landslide-prone areas. Some of our major collaborative efforts were for projects like the Portland Metro that took more of a macro perspective since they involved large areas such as entire cities or large parts of cities. Our work for the Town of Portola Valley, on the other hand, has been much more at the micro scale. In Portola Valley, we have detailed geologic maps. Mapping is down to the parcel level and has been used as a key input to the town's plans. This kind of information is very important. I hope, but I don't know, that many jurisdictions in the state have such detailed geologic maps.

Johnson On several occasions, you have expressed concerns about the lack of triggers for more detailed geologic studies as part of local subdivisions and land use development activities.

Mader We need a simple amendment to the Subdivision Map Act in California that would require geologic mapping as a part of the subdivision approval process. That is, each city and county, before it approves a subdivision or major development project, should have to require a geologic report and take it into account in approving the subdivision, or else waive the requirements for a geologic report because they have evidence that there are no problems with the site.

California's Subdivision Map Act requires only a soils report, not a geologic report. There have been several attempts at the state level to get such legislation passed, but each time the real estate lobby has successfully fought the measure. This is still needed.

Johnson In a way, this would be a logical extension of the seismic safety element requirements in the General Plan.

Mader Yes, it would be an implementation device for the seismic safety element, just as the Alquist-Priolo Special Studies Zones Act is an implementation device.

Johnson You have also been an advocate for the increased use of geologists in local government. Can you elaborate on these concerns?

Mader I feel strongly that every city and county in California, and in geologically hazardous areas in other states, should be required to have a geologist on the staff, or available to advise on the need for geologic reports and to review reports submitted with applications. Problems that a geologist could discover might be overlooked. Or say a project is brought in with a report prepared by a geologist hired by the developer, and a non-geologist staff person of the jurisdiction reviews the report. The project may be allowed without a technically qualified review of the report.

Johnson Looking back, have there ever been any "Ah-ha" moments from the collaboration you have had with the geologic and engineering communities that you might not

have ever appreciated if you had stayed more focused on the planning discipline alone?

Mader Well, I think that, unless you have some background in these other fields, you don't know how you can deal with different geologic issues. You need to know something about what the issues are and how you solve problems. Otherwise, you have one hand tied behind your back. I have come to appreciate the many seismic problems that can be solved through good land use planning, geotechnical engineering, and structural engineering, but these are areas that a lot of planners don't know much about. I think this knowledge sort of tempers some of your biases about what's good land use planning. To me that has been very beneficial and I think can make others better planners. This has been my "A-ha" experience.

Johnson Any thoughts about what other disciplines could learn from planning?

Mader Well, to the extent that disciplines work with blinders on and don't see out to the sides, I think most of them could stand some better understanding of related issues. I think some engineers may not have the broad perspective they need. Hopefully that's changing.

Decision makers need to have some idea about the whole earth science topic, because they might say, "We can't do this or that" if they don't understand or have the background. I think certainly elected bodies need to have some understanding of seismic issues.

Seismic Safety in Developed versus Developing Economies

Johnson Looking back more than 40 years, you have worked in many different localities and in many different countries. What impressions stick with you? What insights have you gained?

Mader One thing that I have learned over time, and that is so surprising to me as an urban planner, is that in many developing countries you can find areas where development has taken place in hazardous areas. When asking officials how this could happen, they often say, "Well, that's illegal development." "What do you mean by illegal development?" "We haven't controlled it." So, it's accepted that there will be a significant amount of development that won't be controlled by the government. This may be a realistic attitude given the socio-economic and political situation, but I find it very hard to accept. I truly wonder to what extent this fundamental problem can be solved.

Johnson Do these places just not have the planning and development controls and governance structures that are needed?

Mader Yes and the financial ability to do a good job.

Johnson I believe this is often called informal development.

Mader Informal development, and yet it's an accepted thing—not desired, but accepted in many developing countries. So how do you deal with that problem? You begin to think of low-cost remedies for people building in areas with high seismicity. Techniques are being developed for low-cost construction, along with programs to help put them into practice, but only a little has been done. GeoHazards International has helped several less-developed countries in this way.

Johnson And how about your post-disaster impressions?

Mader A lot of impressions stick with me. Major lessons came from the 1964 Alaska earthquake, the 1971 San Fernando earthquake, and the 1989 Loma Prieta earthquake. The Alaska earthquake was relatively recent when I first became involved in the earthquake community and provided me with a great introduction to earthquake issues. When we became involved in studying the earthquake, the event was fresh enough that we were able to see many of its impacts.

But each of these earthquakes provided a wealth of knowledge. In Tangshan, China, where the 1976 earthquake leveled most of the city, most buildings had no built-in protection from seismic shaking. There are of course many other similar cities in the world. How do we begin to address the magnitude of this problem?

This gets down to the question of resources to deal with hazards in advance of an earthquake. How do you protect people in areas without the wherewithal and the knowledge to provide reasonable safety? I keep hoping that more low-cost techniques are created, particularly for developing countries, and put into place to minimize risk. With my work as a board member of GHI, I have seen some of this work, including GHI's work in helping to protect schools. We need to be concerned about people with minimal means to provide safety. In some ways, I get more excited about that than dealing with more sophisticated areas of the world.

Organizations in Natural Hazards Research and Seismic Safety

Johnson Looking back, what has been the role and importance of organizations and professional affiliations that you have had in seismic safety and natural hazards research?

Mader The Natural Hazards Center at Boulder has been the center for research on natural hazards in this country and has served as a meeting place for many people from different disciplines, largely from social science, but it crosses into other areas including planning, architecture, and engineering. I have been fortunate to go to a number of their annual conferences and hear and meet many outstanding people. The Center has been a tremendously important resource and serves a major function.

Johnson What about your involvement with the Earthquake Engineering Research Institute? There is a very short list of urban planners who are members of EERI.

Mader It's been a pleasure to be associated with members of EERI. I have to say that the people I've met in USGS and EERI are some of the finest people I have ever known and that's very gratifying. Also, I've enjoyed going to EERI conferences and learning more about the earth sciences and structural engineering. I've spoken at several conferences about the role of planning relative to seismic safety. It's a very important organization and provides a real function nationally and internationally.

I am of the opinion that very few planners even know of EERI. More should be done to interest planners, and this might well stem from educators at planning schools.

Chapter 14

Family

We are very fortunate to have three great children. They ended up in fields somewhat related to mine. One is a builder; one is in public works as a civil engineer; and one used his master's degree in city planning to go into real estate development.

Johnson How did you meet your wife, Marjorie?

Mader We had a very proper introduction. Her uncle and aunt were good friends of my folks and also members of the large Presbyterian Church in Los Angeles where my dad was organist. Marjorie was down from the Bay Area, where she was a reporter at the *San Rafael Independent Journal,* visiting her aunt and uncle. We met at their home in what must have been a planned event.

Johnson You were married in 1956. Where did you live after you were married?

Mader We lived in San Carlos, when I worked for the San Mateo County-Wide Master Plan project and she worked at the *Redwood City Tribune.* We did that for two years to save enough money to take our trip to Europe.

Johnson When you were on the Fulbright grant and a young couple, you did not have any children yet?

Mader That's correct.

Johnson You came back and took a job in the San Mateo County planning department. When were your children born and what do they do?

Mader We are very fortunate to have three great children. They ended up in fields somewhat related to mine. One is a builder; one is in public works as a civil engineer; and one used his master's degree in city planning and an advanced degree in real estate to go into the development field.

Steve was born in 1960, Ann in 1963, and Philip in 1966. These are easy-to-remember dates, each being three years apart.

Our oldest, Steve, became interested at an early age in how things are built. He liked going to construction sites and sitting on bulldozers after working hours, for instance, building things on his own, and helping me on a lot of home projects. He got his building contractor's license and is a very fine contractor and builder. People for whom he has worked sing praises for the quality of his work. Steve and his wife Helen live in Sea Ranch on the northern California coast where they can look out over the ocean and meadows, as well as in a house inland in Santa Rosa. They keep up-to-date on national and world affairs, so we have good discussions when we get together. Intellectually, that's very satisfying and we look forward to those times.

Johnson Your daughter, Ann?

Mader Ann is a Deputy Director of Public Works for San Mateo County. She is a civil engineer, incredibly quick, intuitive, and with an un-ending sense of responsibility, which means she works long hours to get many things done for the county.

I like doing projects with Ann because if I am going to do something and I think I need a tool, she already has it and is handing it to me. That intuitiveness goes beyond just physical projects. She and her husband, John Stillman, a geologist, live in Menlo Park with their children, Cayla and Bradley. Cayla is a senior in high school and Bradley is now an eighth grader. Both of the children are very active in sports. Bradley plays soccer, basketball, and baseball. Cayla is largely into soccer and on the varsity team for Menlo-Atherton High School. Their home is only about ten minutes from our home.

Johnson And your youngest is Philip, who has also had an interest in urban planning.

Mader Yes, Phil got his undergraduate degree in geography from UC Davis and then worked in the planning department for San Mateo County for a couple of years. Following that, he got a Master of City and Regional Planning from the University of North Carolina. Then, after working at Spangle Associates for a short period, he went to USC and received a degree in real estate development—a very demanding one-year program. After that he worked for three very good residential development companies in the Bay Area. Then he developed a real estate fund for a global investment management company. He manages this fund that has projects in various parts of the country.

He is married to Alison, who has a degree in planning from USC. They have three children. Caroline is in fifth grade, Max is in third grade, and Jillian is in first grade. Jillian is a dynamo and bright, Max is all boy, and Caroline is a delightful young girl. Fortunately, we get to see them frequently. Their home was in Pleasanton, just across San Francisco Bay, but now they are in the process of moving to this side of the Bay.

Johnson When did you move to Ladera and, if you were the town planner in Portola Valley, how come you stayed right on the unincorporated edge of Portola Valley?

Mader Property in Portola Valley was out of our price range in 1963. Also, we wanted to build our own home. We bought a lot in Ladera, a well-planned community adjoining Portola Valley. It was a lot that we could barely afford, and lucky for us, my brother designed our contemporary style home, which was finished in 1965.

Johnson And you still live there today.

Mader Yes, we still live there and see no reason to move. We recently converted Steve's workshop to a guesthouse. The mid-peninsula is an area that has many advantages, a beautiful area with mountains in our backyard, the San Mateo County coast to the west, San Francisco to the north, San Francisco Bay to the east, and the Sierra further to the east. Our home is about ten minutes from Stanford and at the edge of Silicon Valley, where we have access to educational, cultural, and sporting events, as well as excellent medical facilities. We feel very fortunate to live in this area.

Johnson You also have ties to Wisconsin and travel there each year.

Mader Yes, Marjorie grew up in Wisconsin, and each summer we go to the family cottage in northern Wisconsin on Silver Lake. The cottage was built for her grandfather in the late 1920s. Silver Lake is a very nice small lake, not overcrowded, and very peaceful. One highlight of being there is going into the town of Tomahawk, pretty exciting!

Our grandkids are the fifth generation to use that cottage. The ownership has now been transferred to Ann and Philip. It's pretty unusual to have a place that five generations have had something to do with. It continues to have the same sense of quietude, blue water, birch trees, fish, and animals that it always has had.

Johnson You also have a place up in Tahoe?

Mader We own a cabin on Highway 88 near Caples Lake, which is about 20 miles south of Lake Tahoe. It's at 7,900 feet on Forest Service land and is snow-bound in the winter. In fact, we went up in spring to replace a pipe that burst last winter. You always have projects on older cabins at such elevations largely as the result of freezing and very heavy snowfalls. Nonetheless, our family really enjoys the cabin during wonderful summers. We also have a condo at the nearby Kirkwood ski resort.

Johnson You are still working part-time?

Mader Yes.

Johnson You've worked a long time. What drives George Mader, especially at this point in his life?

Mader Getting things done. I think that's it. I like to be able to get things done—accomplish things that I feel good about.

Johnson Do you still have some things you need to accomplish?

Mader Yes.

Johnson In planning?

Mader I look forward to more volunteer activities such as my role as chair of the Board of Trustees of GHI and my role as a board member of the Ruth and Clarence Mader Memorial Scholarship Fund. Recently, I have been appointed to a committee that will advise Stanford University on the future of Searsville Dam. This aging dam supplies some water for Stanford. This will be a complicated endeavor as we address questions of fish passage, siltation behind the dam, possible dam removal, downstream siltation and flooding, and impacts on the adjoining Stanford Jasper Ridge Biological Preserve.

Also, I want to keep up on my reading of planning literature more than I had been able to do when working full time. I don't know if I'll do other things in the planning field, but I may. Also, I look forward to having more time with my family, including five grandchildren, and attending to items such as the many boxes of family photos and family history.

Photographs



George Mader, about two years old.



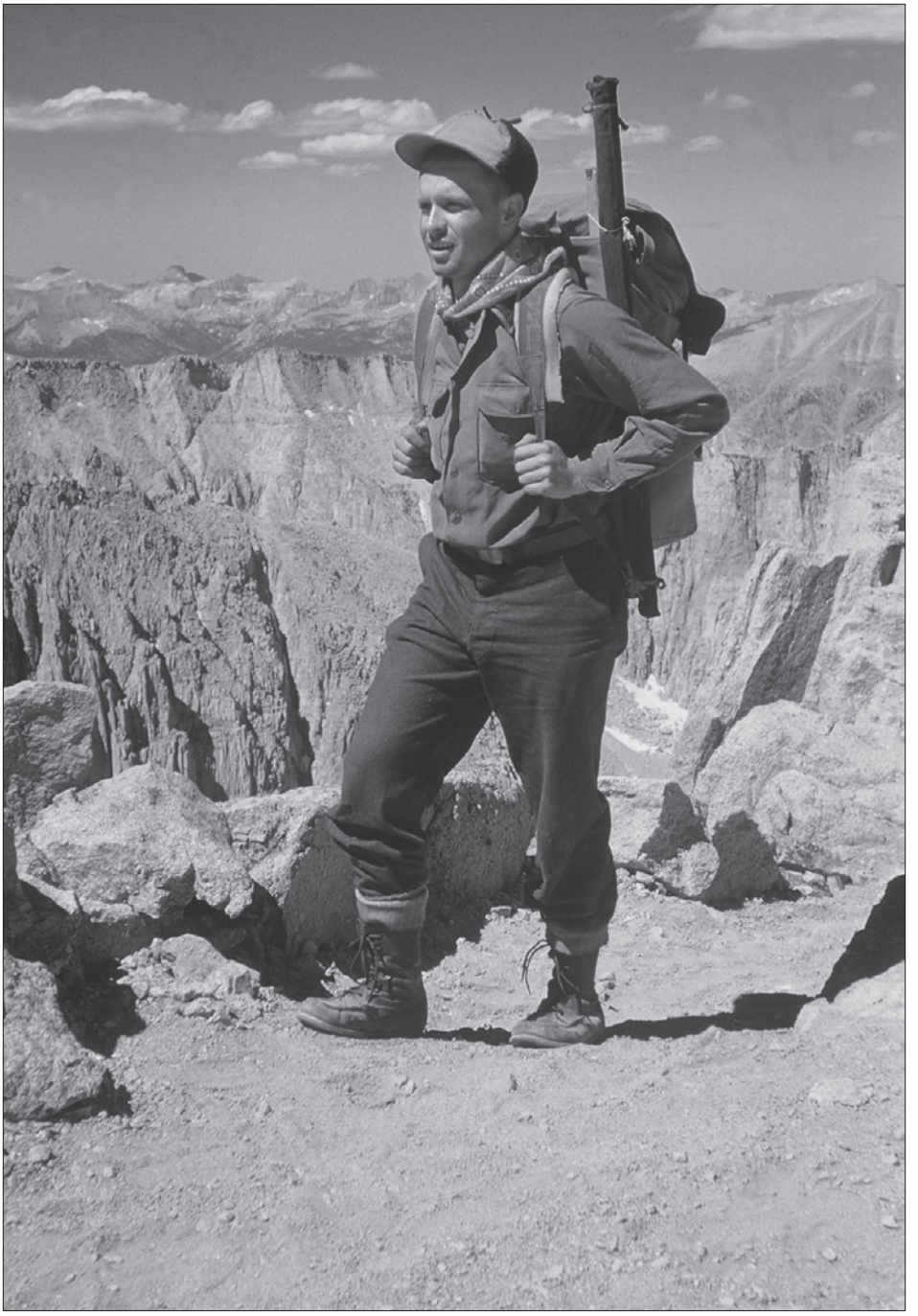
George Mader, about four years old, with his older brother Bill at their home in Glendale, California.



George's father, Clarence Mader, at the organ of the Immanuel Presbyterian Church in Los Angeles, 1930.



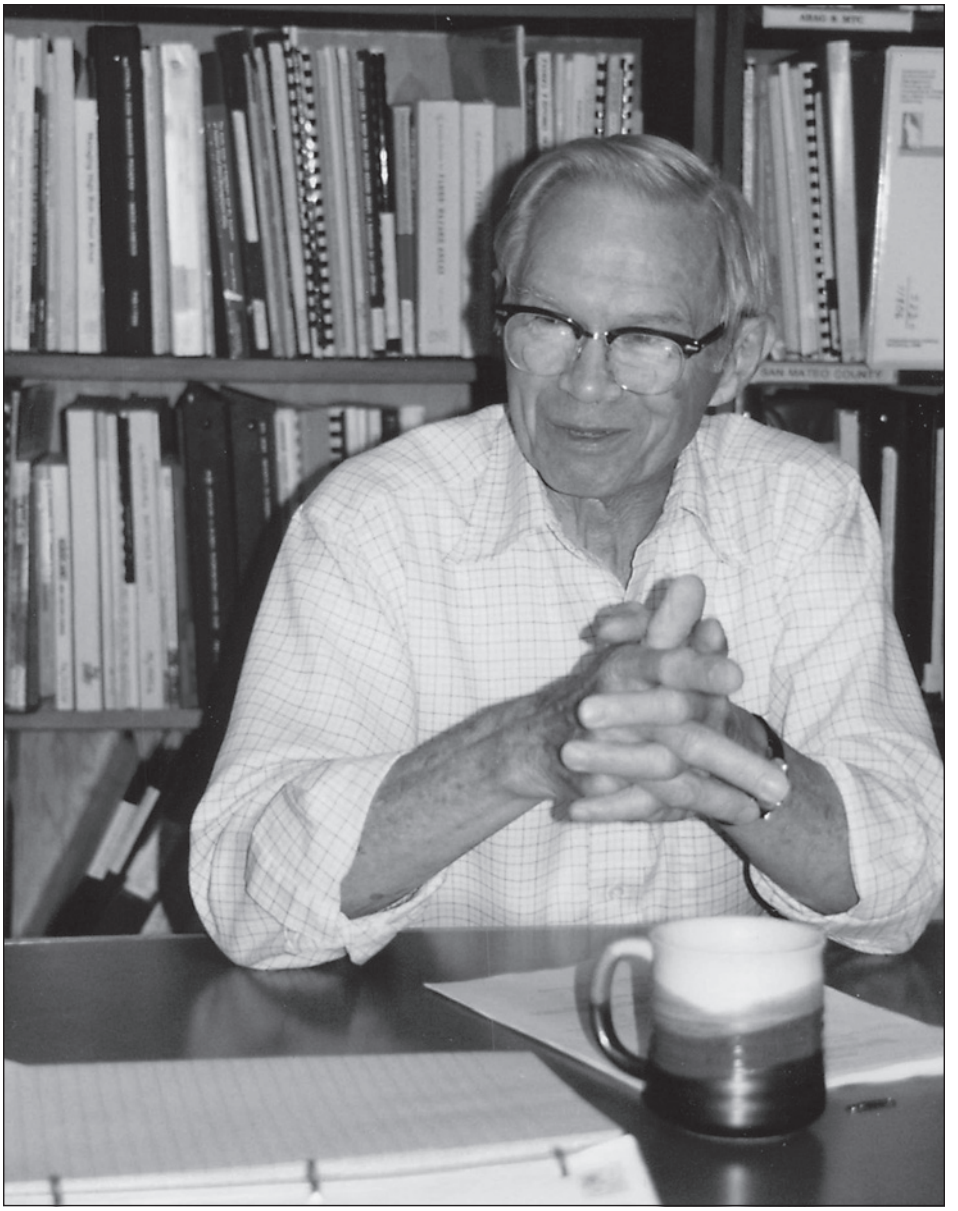
George's parents, Ruth and Clarence Mader (circa 1970).



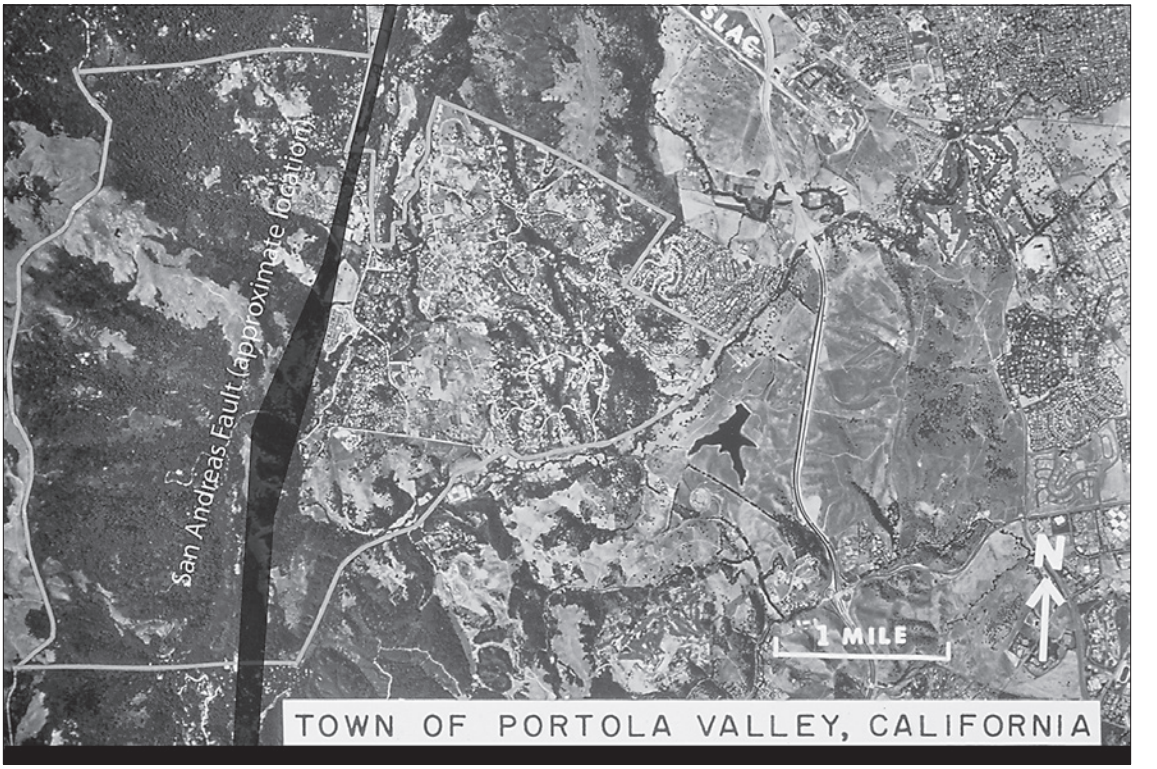
George backpacking on the Mt. Whitney trail, circa 1949.



George Mader while on the California Seismic Safety Commission



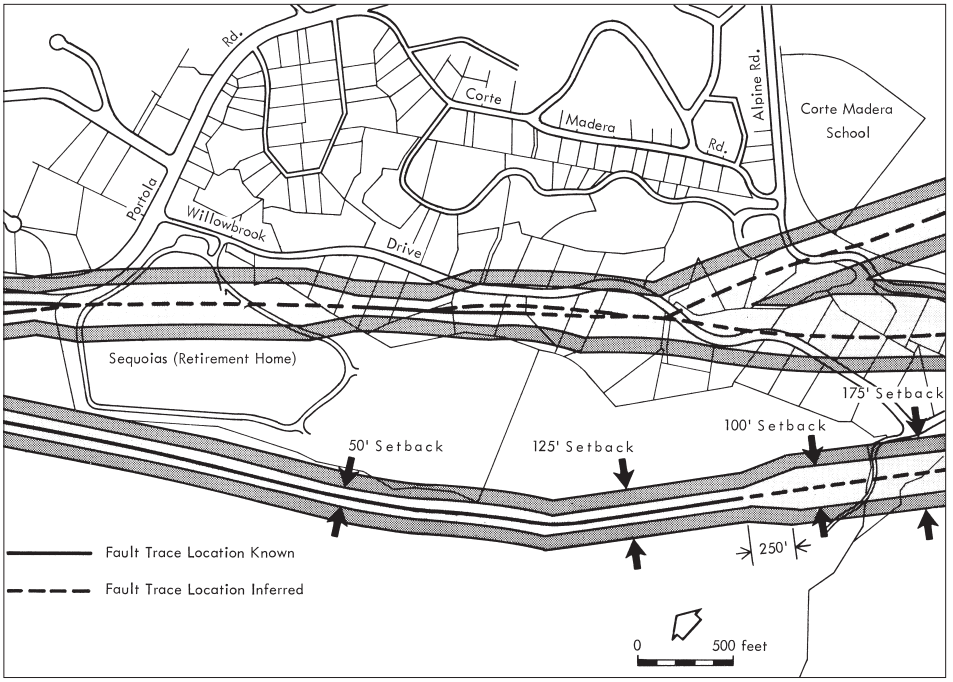
William Spangle, founder of the planning firm William Spangle and Associates



Air photo of the Town of Portola Valley, bisected by the San Andreas Fault.



An early (1974) planning application of earth science knowledge: a map prepared for Portola Valley under the supervision of Professor Arvid Johnson showing variation in ground movement potential. The San Andreas Fault runs diagonally through the town, with steeper areas southwest of the San Andreas being more hazardous than the portion of the town to the northeast.



Portola Valley was the first place earthquake fault setback requirements were adopted.

CRITERIA FOR PERMISSIBLE LAND USE IN PORTOLA VALLEY

	Land Stability Symbol	Roads		Houses (*parcel acreage*)			Utilities	Water Tanks
		Public	*Private*	*¼-Ac*	*1-Ac*	*3-Ac*		
MOST STABLE	Sbr	Y	Y	Y	Y	Y	Y	Y
	Sun	Y	Y	Y	Y	Y	Y	Y
	Sex	[Y]	Y	[Y]	Y	Y	Y	[Y]
	Sls	[Y]	[Y]	[N]	[Y]	[Y]	[Y]	[N]
	Ps	[Y]	[Y]	[N]	[Y]	[Y]	[Y]	[N]
	Pmw	[N]	[N]	[N]	[N]	[N]	[N]	[N]
	Ms	[N]	[N]	N	N	N	N	N
	Pd	N	[N]	N	N	N	N	N
	Psc	N	N	N	N	N	N	N
	Md	N	N	N	N	N	N	N
LEAST STABLE	Pf	[Y]	[Y]	(*Covered by zoning ordinance*)			[N]	[N]

LEGEND

- Y Yes (construction permitted)
- [Y] Normally permitted, given favorable geologic data and/or engineering solutions
- N No (construction *not* permitted)
- [N] Normally *not* permitted, unless geologic data and/or engineering solutions favorable

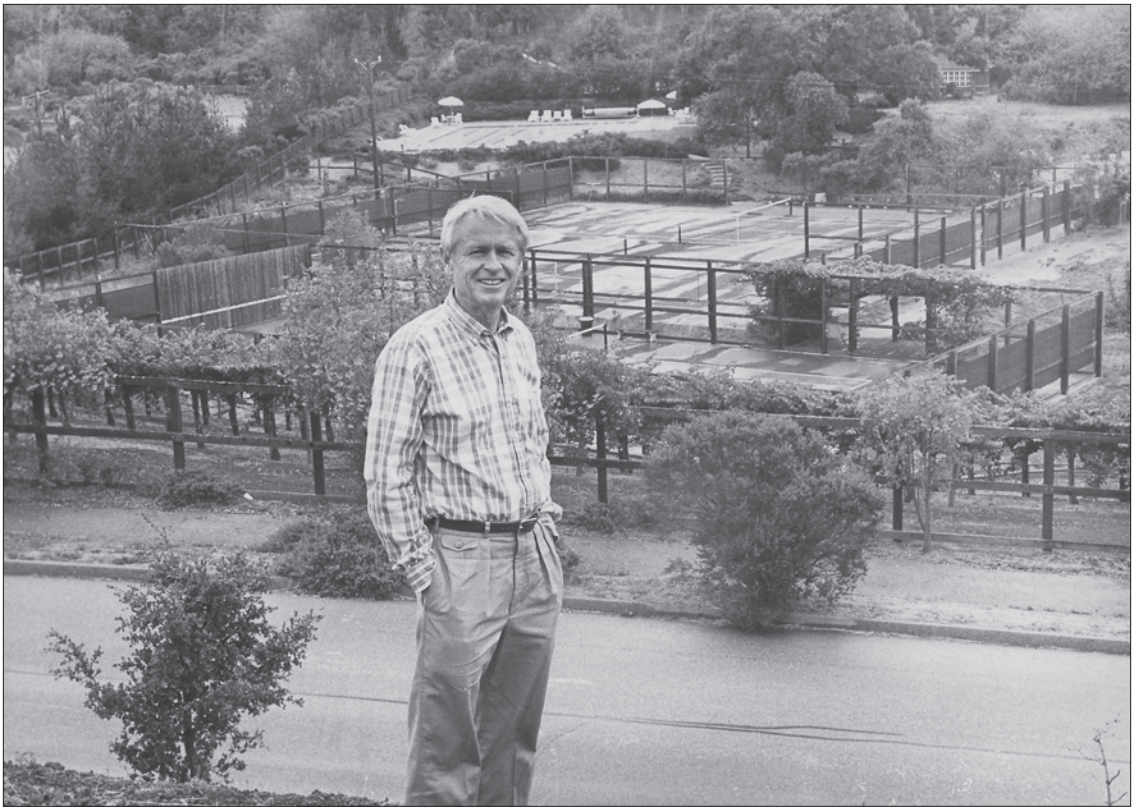
LAND STABILITY SYMBOLS (*as used on geologic hazards map*)

- S Stable
- P Potential movement
- M Moving
- br bedrock within three feet of surface
- d deep landsliding
- ex expansive shale interbedded with sandstone
- f permanent ground displacement within 100 feet of active fault zone
- ls ancient landslide debris
- mw mass wasting on steep slopes, rockfalls and slumping
- s shallow landsliding or slumping
- sc movement along scarps of bedrock landslides
- un unconsolidated material on gentle slope

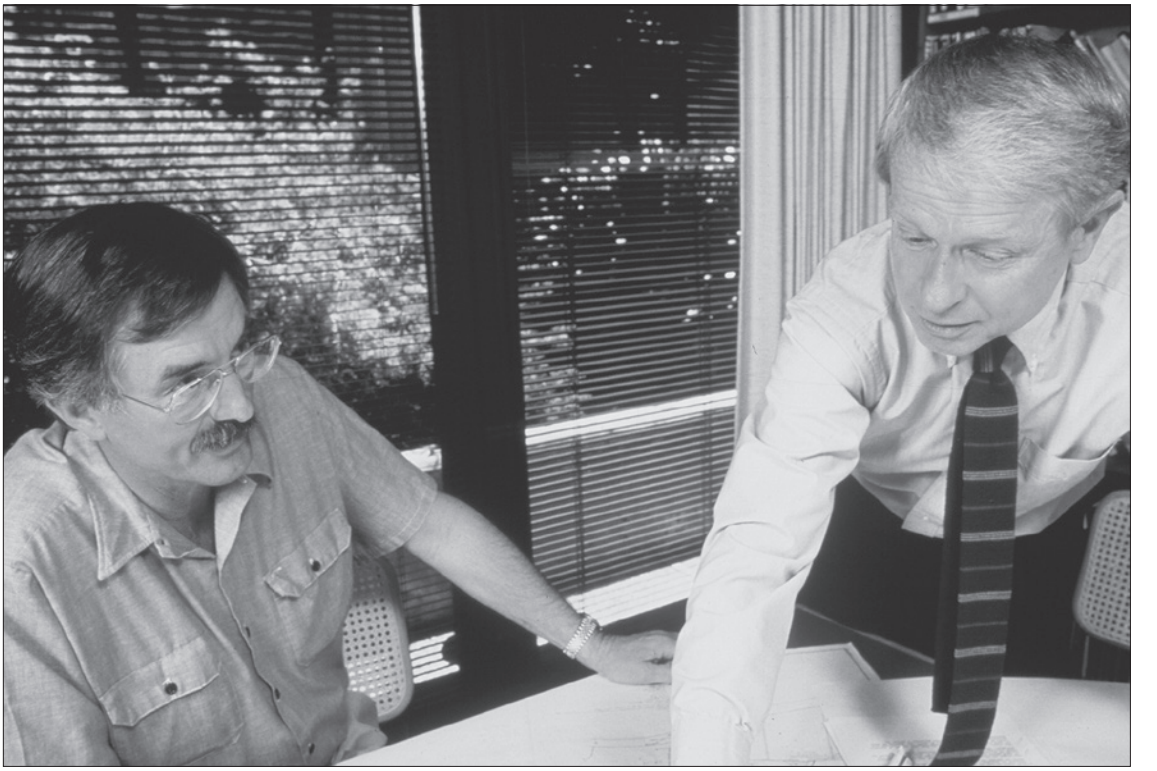
The land uses permitted with respect to land stability categories shown on the movement potential map as adopted by the Town of Portola Valley.



Portola Valley Ranch was planned to cluster higher-density development on the more stable land at lower right. The ridge in the upper left with the water tank was highly landslide-prone and was left as permanent open space except for the stable site for the tank.



George Mader at the community center of Portola Valley Ranch, with its "double fault" tennis courts (which straddle the San Andreas Fault).



George Mader, at right, with Portola Valley's Consulting Town Geologist, William Cotton.



At the Spangle Associates office in 1992. From left to right:
Tom Vlasic, Martha Blair Tyler, Laurie Johnson, and George Mader.



George Mader meeting with Chinese educators on his trip to China in 1981.



In Cetinje, Yugoslavia (now Montenegro), during the 1980-1990 UN SEISMED project in the Mediterranean region. George Mader second from right in front row.



In Geneva, Switzerland, 1989, with members of the International Panel on Seismic Risk Reduction in the Mediterranean. George Mader, far left.



The Mader family in 1983 at Sun Valley, Idaho.
Left to right: Ann, Marjorie, Philip, Steve, and George.



Marjorie and George Mader, Silver Lake, Wisconsin, at Marjorie's grandfather's cottage, built in 1927.

Index

A

Advisory Council on the Earthquake Hazards Reduction Program (ACEHR) 47
Alaska earthquake (1964) 50, 80
  Fourth Street landslide 51
  Turnagain Arm 51
Alquist, Alfred 32, 33, 74
  earthquake safety champion 33
Alquist-Priolo Special Studies Zones Act 24, 33, 76
  implementation 33
American Institute of Certified Planners (AICP) 74
American Planning Association (APA) 74
American Red Cross 40
Anderson, William (Bill) 50
Andrews, Richard (Dick)
  SCEPP 39
Applied Technology Council (ATC)
  ATC 3-06.
Armenia earthquake (1988) 55
Arnold, Chris 37
Association of Bay Area Governments (ABAG) 19, 40

B

Bay Area Regional Earthquake Preparedness Project (BAREPP) 6, 39
Bay Area Regional Transit Plan 10
Bay Conservation and Development Commission 11
Blair Tyler, Martha 53, 56, 59
Boat, Marty 12
Bolt, Bruce 38, 39
Brown, Bob 59
Brown, Edmund (Pat) 10
Building codes. See also Los Angeles, California, Building and Safety Department

C

California Department of Transportation (Caltrans) 38
California Environmental Quality Act (CEQA) 18, 76
California Geological Survey 60
California Office of Emergency Services 6, 40
California Seismic Safety Commission. See Seismic Safety Commission, California

California Subdivision Map Act
needed amendment 78
Campania-Basilicata, Italy earthquake (1980) 64
City of Los Angeles
building code 53
post-earthquake rebuilding ordinances 53
unreinforced masonry building ordinance 53
Cooperative Project for Seismic Risk Reduction in the Mediterranean Region (SEISMED) 66
Cotton, Shires & Associates 24, 30
Cotton, William (Bill) 24, 30
County of San Mateo 10
population projection 11
Crowder, Dwight 22, 31
Portola Valley 23
San Andreas fault 23
Cummings, Jon 24

D

Davis, Jim 40
Degenkolb, Henry 35, 53
Dickinson, William (Bill) 23, 24
San Andreas Fault map 23
Diridon, Ron
staffer to Senator Alquist 35
Disaster research. See also Disaster Research Center (DRC)
field work. See also Disaster Research Center (DRC)
Natural Hazards Center. See University of Colorado, Boulder
Division of the State Architect (DSA). See Office of the State Architect (OSA)
Doneghy, Norma Jeanne. See Anderson, Norma (wife)

E

Eadie, Charles 54
Earthquake Engineering Research Institute (EERI) 9, 50, 80
Earthquake hazards
early planning approach 11
Earthquake hazards reduction. See Risk reduction and Disaster research
Earthquakes
hazards reduction. See Disaster research and Risk reduction
Eckbo, Dean, Austin & Williams 19
Eisner, Richard 6, 39
Eisner, Simon 6
El Asnam, Algeria earthquake (1980) 55, 65
Environmental Impact Reports
pre- and post-CEQA 28
Eureka, California earthquake (1980) 37

F

Federal Emergency Management Agency (FEMA) 36, 46
Emmitsburg training facility 56
NEHRP. See National Earthquake Hazards Reduction Program
Field Act 36
Friuli, Italy earthquake (1976) 55
Fulbright Grant
Netherlands 13

G

GeoHazards International (GHI) 69, 79
Great Southern California ShakeOut 56
Greene, Marjorie 40
Guzzardo, Tony
  Portola Valley Ranch lot size 27

H

Harbin, China
  microzonation conference 63
Hays, Walt 66
Hazards reduction. See Risk reduction and Disaster research
High-rise buildings. See also Steel and Concrete
Hudson, Harlow 12
Hurricane Katrina (2005) 15, 57
  New Orleans planning after 58

I

Immanuel Presbyterian Church 2, 87
Imperial Valley, California earthquake (1979) 37
International Decade for Natural Disaster Reduction 66
International Symposium on Rebuilding after Earthquakes 54
Izmit, Turkey earthquake (1999) 67

J

Jahns, Richard (Dick) 32, 35, 38
  Auburn Dam project 37
Johnson, Arvid 23
Johnson, Laurie
  New Orleans planning work 57
  Spangle Associates 54
Joint Legislative Committee on Seismic Safety 32, 35

K

Kent, T.J. (Jack) 7
Kockelman, William (Bill) 59
  use of earth science information 60
Krimgold, Fred 50

L

Ladera
  planned community 20, 83
Lagorio, Henry 50, 64
Laguna Beach, California landslide (1978)
  Bluebird Canyon 52
Land use planning after earthquakes 50
Landslides 23, 25, 27
Lettis & Associates. See William Lettis & Associates
Liquefied Natural Gas
  facilities siting 37
Livermore, California earthquake (1980) 37
Loague, Keith 42
Loma Prieta, California earthquake (1989) 54, 55, 80
Long Beach, California earthquake (1933) 36

Los Angeles Redevelopment Agency 56

M

Mader, Ann (daughter) 4, 82
San Mateo County Public Works 82
Mader, Bill (brother) 2
education, Ripon College 5
education, USC 6
Irvine Corporation 8
Mader, Clarence (father) 1
death 4
Immanuel Presbyterian Church 2
Mader, George
Alfred E. Alquist Special Recognition Medal 74
Army service, Korean War 6
Award for Excellence in Teaching, School of Earth Sciences, Stanford 74
BAREPP Advisory Board 40
Distinguished Leadership Award, APA 74
early life in Glendale 1
education
early 3
Ripon College 5
Technical University of Delft 14
UC Berkeley graduate school 7
UCLA 6
EERI membership 80
Fellow of the American Institute of Certified Planners (FAICP) 74
first work with Spangle Associates 10
Fulbright study in Netherlands 13
GHI trustee 69, 80, 84
international projects 64
Joint Legislative Committee on Seismic Safety 32
NEHRP Advisory Group 46
Portola Valley Town Planner 22
San Mateo Master Plan Project 10
Seismic Safety Commission 36
Spangle Associates 19
teaching at Stanford 41
USGS collaboration 80
Mader, Marjorie (wife) 7, 13, 14, 81
Wisconsin childhood 83
Mader, Philip (son) 4, 82
real estate fund manager 82
Mader, Ruth (mother) 1
death 4
Mader, Steve (son) 4, 82
building contractor 82
Managua, Nicaragua earthquake (1972) 52, 55
Martin, John 60
McClure, Frank 60
Metropolitan Transportation Commission (MTC) 19, 36
Mexico City earthquake (1985) 55
Microzonation
usefulness of 66
Microzonation and Hazard Vulnerability Studies for Disaster Mitigation
project in Turkey 67
Mississippi River floods (1993) 51
Multidisciplinary collaboration
value of 79

N

National Academies. See U.S. National Academies
National Bureau of Standards. See National Institute of Science and Technology (NIST)
National Earthquake Hazards Reduction Act (1977) 45

National Earthquake Hazards Reduction Program (NEHRP) 46
Working Group 50
National Environmental Policy Act (NEPA) 18, 76
National Institute of Standards and Technology (NIST) 46
National Science Foundation (NSF) 38, 46, 49, 54
Natural Hazards Center, University of Colorado, Boulder. See University of Colorado, Boulder
Netherlands
city planning practice 14
planning practice, national 13
Zuiderzee project 15
New towns
in Denmark 13
in England 16
in Great Britain 15
in Sweden 15
Nichols, Don 59
Geological Circular #690 60
Northridge, California earthquake (1994) 58
San Fernando Valley damage 58

O

Ohio State University (OSU). See also Disaster Research Center (DRC)
Olson, Robert (Bob)
first director of Seismic Safety Commission 36
history of Seismic Safety Commission 38
Oregon Department of Geology and Mineral Industries (DOGAMI) 60

P

Perkins, Jeanne 40
Portland Metro 60
Portola Valley 21, 78
advice from Stanford faculty 25
advice from USGS professionals 25
Architecture and Site Control Commission 28
Blue Oaks subdivision 28
density of development 25
fault setbacks 24
geological advisory committee 23
incorporation 22
land movement potential map 25
Portola Valley Ranch 27, 28
Post-earthquake Rebuilding Exercise for Planners 55
Post-earthquake relocation
Izmit, Turkey 67
Niigata region, Japan 67
Sichuan region, china 67
Tohoku region, Japan 67
Valdez, Alaska 67
Pre-earthquake Planning for Post-earthquake Rebuilding (PEPPER) project 53
President's Office of Science and Technology Policy (OSTP) 46
Press, Frank
director, OSTP 46

R

Rebuilding after earthquakes
decision guidance 52
Reconstruction following disaster
Haas & Kates study 55

Redevelopment agencies
role of after disaster 57
Remson, Irwin 41
Risk reduction. See also Disaster research
NEHRP. See also National Earthquake Hazards Reduction Program
Ruth and Clarence Mader Memorial Scholarship Fund 4, 84

S

San Andreas Fault
in Blue Oaks 28
in Portola Valley 23
San Fernando, California earthquake (1971) 32, 34, 50, 80
hospitals 36
Lower San Fernando Dam 36
official report on 35
San Francisco Bay Region Environment and Resources Planning Study 59
San Mateo County
Board of Supervisors 12
San Mateo County Master Plan 7, 10, 18
San Mateo County Planning Department 17
Santa Cruz, California
recovery planning 76
Santa Rosa, California earthquake (1969) 52
Sayre, Ted 30
Schulz, Paula 40
Scott, Stanley 35
Section 701 grant 18
Seed, Harry 35
Seismic Safety Commission, California 34, 35
Seismic safety element
origin 33
Sherif, Mehmet 63
Skillman, Frank 18
Skopje, Yugoslavia earthquake (1963) 50, 52, 55
Slope density regulations
in California cities 26
in Portola Valley 26
Slosson, James 35
Southern California Earthquake Preparedness Project (SCEPP) 38
relationship with Seismic Safety Commission 39
Spangle Associates 10, 30
NSF research 22, 49
PEPPER Project 53
Town of Portola Valley 21
Town of Woodside 21
Spangle, William (Bill) 7, 10, 19, 25, 59, 74
City and Regional Planning degree 10
Planning Pioneer 10
Stanford University 23, 41
School of Earth Sciences 41
Steel
welding. See Welded steel moment frames
Steinbrugge, Karl 35, 46
Surface fault rupture 23–24

T

Tall buildings. See High-rise buildings
Tangshan, China earthquake (1976) 64, 80
Thiel, Charles (Chuck) 38, 50
Tierney, Kathleen 53
Topping, Ken 53
Transfer of development rights 26
in geologically sensitive areas 27
Tubbesing, Susan 50
Tucker, Brian
GeoHazards International 69
Tajikistan 69

U

United Nations Disaster Relief Organization (UNDRO) 66
University of California, Berkeley
City and Regional Planning 7
University of Colorado
Natural Hazards Center 50, 80
University of Delaware
Disaster Research Center 53
University of Southern California (USC)
School of Architecture 2
Unreinforced masonry buildings 36
US Department of Housing and Urban Development (HUD) 59
Section 701 grant 21
US Geological Survey (USGS) 22, 46, 59
Geological Survey Circular #690 60

V

Valdez, Alaska
post-earthquake relocation 51, 67
Vlasic, Tom 22, 28, 59

W

Wallace, John 30
William Lettis & Associates 24



In this oral history with interviewer Laurie Johnson, George Mader describes the early involvement of land use planners in managing earthquake hazards. He took part in the earliest first surface fault hazard zoning in the world, the invention of development density measures for hazards such as landslides, and seminal studies to document how regions re-build and recover from earthquakes. In his long career he worked as a planner with San Mateo County and with Spangle Associates, served as a member and chair of the California Seismic Safety Commission, and taught at Stanford University. In telling the story about his life and career, George recounts how planners got involved in the earthquake field several decades ago and why their discipline assumed a key role in the movement to confront and reduce earthquake risks.

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