

**This book is dedicated to my wife, Marré Hollingsworth Chamberlain, our children, a long line of Chamberlains, Esplins and many people of other surnames. Without them this voyage would not have been possible.**



## **VOYAGING AMONG STARS**

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Autobiography of Von Del Chamberlain

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## FOREWORD

My life has been a series of voyages among stars. When I speak of voyaging and stars, I am thinking of several things: I am thinking about the places where I was born and grew up and where I have lived and traveled; I am thinking about my parents, teachers and others who have cared enough about me to spend their precious time, talents and other resources to help make me what I am; I am thinking about friends who welcomed me into their lives and contributed so much toward helping me develop into a cultured human being; I am thinking about my kind, good and so generous wife who has always been thoughtful of others and so patient and loving; I am thinking about my family who found their ways to productive and exemplary lives in spite of me. All of these have been stellar lights in the fields of space and time I have traveled in.

I am also thinking of the fact that my life has been one of scientific exploration that wandered into the field of astronomy, more specifically into interpretation of astronomy using settings in planetariums, museums, college and university classrooms and under glorious skies cruising oceans of the world, in national parks and in many other settings where I have been privileged to gather with others and look outward. I have worked for and with some who have voyaged beyond our planet in quest for greater understanding and enriched human experience. Apollo astronaut Michael Collins, first director of the new National Air and Space Museum was one of the finest employers I have had the privilege of working with and because of that association I was able to come into contact with other astronauts and with many others engaged in exploration of space. I have been able to know a few of history's greatest authors, master wordsmiths, who helped make me aware that words are among our most powerful tools and I have known some of the world's renowned scientists. All of these have been guiding stars in my life voyage.

As I write, I am thinking about excursions I have made into the cultures of the world composed of people who have looked out at the same stars I have learned to love. I have a passionate desire to know what I can about how others have observed, understood and thought about the things around them, especially about the sky and its wonderful collection of objects and phenomena, and how they have used their hard-won observational knowledge, coupled with their interpretations of nature, for successful and enjoyable living.

Light is such a precious thing, in all its forms. Without the ability to see, what would we be? Without light to touch our minds, illuminating our cognitive selves, our perceptions of the world would be as if we were only half alive. Getting down to the fundamentals, it is stars that give us life and sight. The Sun is a star. It's wave of light, constantly sweeping round the rotating Earth, nourishes all living things as its radiant energy filters through the atmosphere, and each sunrise awakens the activities which fill our existence. At sunset, the wave of darkness permits us to see other stars. Without darkness we would be limited to knowing only the nearby, not aware of the vast cosmos. Light feeds the brain as surely as food does the body.

Because light is so important to us, we have created countless symbols of light in our language and in our ways of thinking about ourselves and our surroundings. Light is associated with life, with birth and rebirth and with renewals of all sorts. Darkness is associated with death, burial and terminations. The sunrise is associated with all things glorious, but so is the sunset and rightly so, for nothing surpasses the beauty of a star-lit sky.

So, whether we are thinking about nature's jewels of heaven or about the things we symbolize from them, stars are tied most closely to our existence and to our enjoyment of the few days we have upon this planet. With these thoughts, dear reader, perhaps you can see how pervasive both real and symbolic stars have been in my life.

Here, then, is my story and it is, indeed, a story of voyaging among stars.

Von Del Chamberlain  
Kanab, Utah  
August 2006

one of the finest astronomy libraries in the world. For other information one could not find better than the Library of Congress.

The ten and one-third years I spent at the Smithsonian were surely a decade of growth and fulfillment for me, and I am pleased to look back upon them knowing that I provided the service expected of me to the best of my ability. I also know that following my intellectual interests resulted in good things that went beyond what was expected. I know that I did good work which expanded the National Air and Space Museum beyond what it might have been without me. I feel good in having provided enjoyable learning for large numbers of people who went there from all over the world. My family and I left good friends when we moved away to continue our lives elsewhere.

### 1984-96: Hansen Planetarium

In the company of my son Brent I drove to Salt Lake City, pulling a trailer filled with my professional files and books. I moved into my Hansen Planetarium office on Wednesday, and officially began work the next day, 1 March 1984.

Hansen Planetarium was located in the building which had been built as Salt Lake City's first real public library. I had used the library when I was a student at the University of Utah. I recalled, for example, having gone there to find books on Albert Einstein. Thus, coming back to that building had fond memories and good feelings for me. The building was not really well suited as a planetarium, not having all the space needed and with no public parking lot, but it was good being back in that historically important place again.

The reason for the planetarium being there was because the building had been vacated with opening of a new library and, under the administration of Salt Lake City government the library board had been involved in founding and initially running the planetarium. So, with interest in having a planetarium in Salt Lake City, along with a financial gift from Mr. and Mrs. George T. Hansen to make it possible, the library board became the administrators of a new planetarium in an old building. Soon, however, the planetarium went over to Salt Lake County for its administration. I will not recount any more of HP's interesting history here.

Having been informed of details about the dismissal of the previous director and many associated things, I was not surprised when the president of the Hansen Planetarium Foundation, Cliff White, appeared at various times and places attempting to cause problems. Feelings had been so intense and factions so divided that emotions ran high over the matter. So, here was a foundation which had been created for the sole purpose of assisting the planetarium in its mission now doing everything it could to make it fail. In addition, Salt Lake County had severed all relationships between the Foundation and the planetarium the day before I arrived. Such a strange situation would not likely be found in many other places.

I was able to see the situation from both sides. It was apparent to me that Mark Littmann had not been fairly treated. He had become em-

broiled in a fight with Salt Lake County officials, primarily the County Attorney and one of the Commissioners, and he was the loser. The County, on the other hand, had failed to appreciate the outstanding work Mark had done in his years as the first director of Hansen Planetarium. Instead of seeking ways to make the operation run more easily, they had insisted in applying every "letter of the law," and then some to everything. It seemed to me that both parties did things which were ethically wrong. Mark had chosen to use governmental facilities to obtain money which was cared for outside governmental control and the County had refused to help create a mechanism for healthy financial support. That resulted in everyone being unhappy and an awkward organization for me to step into.

I will jump ahead in the story to illustrate the intensity of the situation. During the night of the day of my first anniversary of employment at Salt Lake County, Marré and I were awakened by the sound of something crashing against our bedroom wall. Going out I found that a large piece of concrete had been thrown at our window, missing by a few inches, breaking one of the wood sidings. Although I can not prove that this had anything to do with the situation described above, I have no doubt that it did.

Enough about that side of my new job. I will try not to dwell on it except as seems to be required to put down a true and accurate record of my work at Hansen. For a long time I lived a non-stop schedule of meetings with staff, board of directors (actually advisory board), Diana Felt (my department head), County Commissioners, directors of many other organizations and others. We went right to work on creation of shows, including one with financial support from the National Endowment for the Humanities. Before leaving Washington I had already met with people from NEA concerning that show. A few words are in order to explain.

Mark Littmann and the staff had developed a system for producing planetarium shows so that after their use in Salt Lake they could be adapted for use by other planetariums. Kits of audiovisual materials were prepared along with modified recordings of the soundtracks so that the shows were easily adaptable for use by others.

So, when I arrived at Hansen, the process had already started in production of a show on ancient navigation in the Pacific. I stepped into that process with enthusiasm, because it represented all that I believed in: providing quality enjoyable education for as many people as possible. In addition to producing highest quality shows for our local audiences, our work could be appreciated by an additional much larger audience scattered at many places around the country and even in other countries.

For scripting the navigation show we had a writer in residence, Hugh Harbor. As he was completing his work, he went into Holy Cross Hospital one day and the next evening had triple bypass surgery. A few days later he went home to Pennsylvania. We had to continue writing and production of the show without him.

In addition to being noted for its high quality shows, Hansen Planetarium had also become world renowned for publishing the finest astronomical images in the form of posters, charts and slides. This adjunct to our primary mission of providing planetarium programming for the City, County and State, was always difficult for Salt Lake County government officials to

understand, but we were able to keep it going for as long as I was director. Thus, we provided first rate education in the form of stunning scientific images which could be used by educational and other organizations as well as by individuals.

One more outstanding feature of our educational offerings was our outreach programs provided for Utah schools, even for schools near but outside Utah. Our "Astrovan" with driver-educator went throughout the State visiting schools with space science programs presented in school auditoriums and classrooms. When the van stayed overnight in a community, students were sent home with the message that, weather permitting, a telescope would be set up that evening at some specific location. Everyone was invited and often, in small communities, the whole town would turn out to look into the heavens at selected objects ranging from the Moon, to planets, stars and galaxies. Even in the daytime the telescope would be used to view features of our day-time star, the Sun.

So I did everything I could, not only to preserve the good things Hansen Planetarium was already doing, but to strengthen them as well. Marré and I gave a party at our new home for the HP staff on 11 May. Four staff members brought musical instruments which they played for our enjoyment. Everyone seemed to have a good time.

One of my first jobs was to select a new planetarium projector. I had arrived knowing that the staff had already been convinced that they wanted an Evans & Sutherland (E&S) Digistar projector made right in Salt Lake City. I thought that my work would be to change their minds. I had already seen the first Digistar in Richmond and had been greatly disappointed in the quality of images inherent in projecting so much information from a CRT through a lens onto the dome. However, wanting to have the best we could obtain to accomplish our mission, and wanting to have reasonable staff consensus on the matter, I set up a demonstration of the new Digistar equipment in our theater. I was pleasantly surprised with improvements that had been made. When I became aware, in detail, of the abilities provided by this new-generation device, I was excited at its potential for use in research as well as for education and entertainment. It could do so much more than just project images of stars and planets. I got thoroughly acquainted with the E&S organization, realizing that this group of technical and administrative people would continue to improve their product and that in every way they would stand behind the equipment they provided and those they sold it to. Thus, with careful consideration all the way by our staff, our advisors and our County bosses, we obtained an especially favorable contract with Evans & Sutherland (E&S) which gave us a good price, superior service expectations and made Hansen Planetarium the E & S showplace for their future prospective customers.

The HP advisory board held a gala reception for me on 17 May with Utah politicians, other leaders and influential people, religious leaders, news media, and special friends of HP in attendance. Following a buffet dinner, I presented a talk in the planetarium, *New Stars for Salt Lake City*, then some of our regular shows were presented for those wanting to see them. That was my formal introduction to the city.

My job entailed everything involved in operating a planetarium with

large staff and budget: administration, supervision, program development and presentation, public relations and fund raising. Starting as soon as I arrived in Salt Lake City, and continuing throughout my tenure there, I was asked by all sorts of groups in the immediate region, throughout Utah and beyond to speak on subjects including planetarium items, astronomy in general and my personal interests. I also gave many and frequent radio and television interviews. It was part of my job to do this and I enjoyed it as time permitted. I will not detail most of these here, but will mention some of them as we go along.

Since there had been severe problems among the staff for many years, we began holding team building seminars and retreats, a process which went on throughout the years I was at HP. Although these seemed to help, we never did derive the level of effectiveness I wanted. Over time a negative attitude, filled with pessimism and self-fulfilling prophecy, had developed which wouldn't go away. The staff had a very hard time with the concept of producing shows which could be completed on a pre-decided schedule, one they themselves determined, so that we could establish, promote and hold show opening events, a procedure which is highly desirable for good community response and support. A few staff members could be depended upon to get the job done no matter what it took, while others resorted to Salt Lake County regulations on pay for time and just put in the hours required. Even though the group was successful at producing the finest programs anywhere in the planetarium field, some of them would not attend opening night events. We were fortunate to have and maintain a most talented and capable staff, but an organizational illness persisted.

We hired a public relations specialist, started a membership program and started maintaining a schedule of programming which could be announced in advance. We also started using an occasional program produced elsewhere in addition to our own productions. We always improved these before using them. One example is the show *Cosmos: Voyage to the Stars*, written by Carl Sagan. For all our productions we hired the very best consultants, experts on the topics explored in the programs. This consistently assured accuracy and gave quality and depth to our programs.

The first HP program which I scripted was *Once Upon a Starry Night*, a show about sky mythology which was supported by the Utah Endowment for the Humanities. I arranged for Dennis Simopoulos, director of the planetarium in Athens, Greece, to narrate the Greek myths included in the show. His Greek accent and otherwise fine voice seemed the perfect match. N. Scott Momaday narrated a Kiowa story and the main narrator was Merlin Olsen, professional football player who turned actor, featured in *Little House on the Prairie* and other film productions.

During my first several months at HP we worked hard to fine-tune our contract with Evans & Sutherland for a new and improved Digistar projector, and with another organization for automation of the entire theater system as well. Once the E & S contract was signed, we went to work writing acceptance criteria and scheduling instrument installation along with considerable remodeling in early 1985.

Now and then my job offered invitations to interesting activities. On 2 August I was invited by the Utah Air National Guard to accompany a

refueling mission. Aboard a KC-135 we met a B52 somewhere over the Wendover, Nevada area. Flying just twenty feet away from the B52, snuggled down in the nose of the KC-135, I watched the boom extend, attach and inject fuel into the other airplane. Then we watched from a distance as another KC-135 paired up with the B52 to add additional fuel. In that way military aircraft constantly were kept aloft in defense of our country.

We presented a variety of entertaining education programs at HP. Each year, for example, we held a science fiction film festival which generally included a symposium. The first of those during my tenure was presented by Orson Scott Card, noted science fiction author, and Chris Hicks, a film critic for KSL radio and the Deseret News. Thus, we began working with Scott on the possibility of a science fiction planetarium show which he would script. Sometimes we held shows consisting of music under the stars and constantly had laser light shows which brought in much needed money for other programs. We even showed award-winning commercials, a presentation I questioned at first, but it brought lots of people to see these programs combined with regular star shows.

*Once Upon a Starry Night* opened for an invited audience 19 October 1984 with regular public showings thereafter. We conducted a lecture series in conjunction with the show.

With lots of hard work we were able to somewhat heal relationships with the Hansen Planetarium Foundation which, although with some reluctance, started helping us with some of our financial needs such as automation of the new theater system and placing the old Spitz STP projector, affectionately called "Jake" by school kids in the area, on exhibit when removed from its long-time central position in the star theater.

In early December I learned that I had been elected president of IPS, a six year commitment: 1985-86 as president-elect, serving on the executive council; 1987-88 as president; 1989-90 as past president on the council.

Also in early December we learned that House of Representatives LaMont Richards, son of LDS church Apostle LeGrand Richards, had introduced a bill to remove the mill levy HP received from the State for support of our educational programs. We knew that this would seriously damage the planetarium. Thus, among everything else I had to do, I became a lobbyist. We went to see Representative Richards, carefully explaining what we used the state funds for. We knew that he had been a friend to Mark Littmann and that this was just another of the continuing attempts to hurt the planetarium in response to his dismissal. From that time forth, each year, we had to spend many hours at legislative sessions, talking to particular legislators to maintain relationships, provide information, win and maintain support for HP. Each year we had a special evening at the planetarium for legislators, their staffs and families. This was probably the least enjoyable part of my work at HP.

We had a constant stream of professional visitors from around the country and the world. They came because of our excellent programs, to consult on planetarium matters, to see our facilities (especially after Digistar was installed in 1985) and for other reasons. Unlike the political activity mentioned above, welcoming those visitors and responding to their interests was one of the most enjoyable parts of my job.

Through hard work we re-won the friendship of the Hansen family, at least partially (they could not help but hold feelings over what had happened). On 31 December "Jake" projected his last star shows. The entire Hansen family — George, Jr., his wife, children and grandchildren, were at the last two shows (*Once Upon a Starry Night* and *Stars and Sounds of Christmas*). Jake's first show was about the Christmas star and so was his last. Since George's birthday was 1 January, we projected a special birthday wish at the conclusion of the final show, then invited his family to the second floor for cake and punch.

### Digistar for Hansen Planetarium's 20th Anniversary, 1985

Thus, 1984 closed one era at HP and 1985 opened another with expectation of the latest technology in planetarium equipment and a better looking building. Right after the new year we had a staff party in honor of good old "Jake" who had preformed such great service for the people who came to HP. Then, Jake and all associated equipment were removed from the theater. We started production work for the science fiction show which Scott Card was writing for us.

In late January I had a visit from Joe Goodwin, Smithsonian Exposition Books, wanting to consult with me on pictures for a book I had suggested and they had decided to publish. This was to be a companion to *Fire of Life: The Smithsonian Book of the Sun*.

On 17 February the future started for us when we saw "first light" from the new Digistar on our HP dome. But software development problems, accompanied by staff changes at E&S were causing delays in our scheduled start up of the new facility. All of these rested with E&S. I felt so helpless, but kept working with E&S, being assured that those problems, centering on administration and personnel, would not adversely effect the final product, and that they were handling them. Those were frustrating days!

In spite of those problems we were able to begin school shows on 5 March. For our first general public Digistar show, *Journey with Digistar*, I selected El Dean Bennett as narrator. I had used him at Abrams Planetarium when he was a PhD student in communications at Michigan State University. Now he was chairman of the Walter Cronkite School of Journalism and Communication at Arizona State University. He had a superb voice for narration.

Wanting to have a high degree of recognition for our newly remodeled and improved HP, in spite of staff pressure against it I insisted on setting a public opening date of 29 March which we could announce. We continued to have a very difficult time getting the first Digistar show programmed. With work around the clock, one day flowing into the next, in a blur of toil that seemed would never end, we made it! On 27 March press representatives came to see segments of our new show performed by Digistar; the next day was our official "eye-opening" event with Governor Norman H. Bangerter, others from the City, County, Chamber of Commerce, E&S, etc. present. That was followed by open house showings for the rest of the day. Our first complete showing of *Journey* was for a full house of our HP members. Our first regular public show on 29 March was sold out.

People loved the new capabilities of Digistar and the rest of our improved theater system. We knew we had accomplished something monumental. Now we needed to learn to proficiently use our new instrument.

I really enjoyed my job at HP, some aspects of it more than others. Rather than exempt myself from teaching, as some administrators do, I injected myself into the teaching end of what we did, our mission after all, as much as time would permit. I wrote some of our show scripts and worked with staff and consultants on others. We were constantly working on show production, which I participated in, being careful not to limit the creative efforts of our talented staff. I was involved in our publication business. I worked with our public relations director on fund raising and grant writing. I represented the planetarium to the media and to all sorts of civic and educational organizations, but I also invited staff members to do some of this as their interests, abilities and circumstances warranted. It was the administrative part of my work that I least enjoyed: an unending round of meetings with staff, advisory board, county officials and others; handling staff morale problems; performance evaluations; annual lobby activities when the legislature was in session (and even when it wasn't); budget preparation each year; and situations involving the Hansen Planetarium Foundation.

Working with Salt Lake County government officials was a never ending, time consuming and frustrating, yet necessary part of my job. Each election produced at least some changes and each newly elected or appointed official seemed to want to change things, even things that were operating efficiently and effectively. There was always the threat that county commissioners or others involved in budget would want to seriously cut, or even eliminate, the planetarium budget. They were constantly looking for ways to appear to citizens that they were attempting to cut, or at least restrict, taxes, while at the same time they protected the really big spending parts of government where lots of waste existed. Their focus was always on budgetary matters and they never had much appreciation for the valuable services we rendered. Having a system of recognizing county workers, they would sometimes include HP, but this almost always seemed shallow rather than sincere. Our governmental people seldom had much knowledge or appreciation of science and their educational backgrounds were usually restricted to a narrow range of fields. We, and our board and supporters, did everything we could to help them understand what we did, but even though we were applauded as world renowned leaders in the planetarium field and throughout the astronomy education community, their true understanding of the planetarium was always limited. They seemed to want to get the planetarium out of county government, if we also wanted with careful planning, but at the same time whenever opportunity to do that in ways that would help the planetarium, rather than hurt it, came along they would back off. They never wanted to let go of anything which might bring them good recognition, something the planetarium frequently did.

After having the new Digistar at HP for awhile, becoming familiar with its many capabilities, we started having fun with it. On the last day of May 1985 the crew of the Space Shuttle Flight 51-D visited HP. Utah Senator Jake Garn was one of them. We spent all of the previous night programming a Digistar simulation of a flight from Earth orbit to beyond the Milky

Way Galaxy. We had a full house of invited guests watching a highlight film of Flight 51-D when the astronauts and their spouses arrived. I introduced Commander Bobko and he introduced the crew. Then they fielded questions from the audience. Following that, we presented our special program: to soaring music we orbited Earth, then swooped away to watch Earth recede, passed through planetary orbits and out through stars, pulled out of the Galaxy to watch it majestically rotate, then plunged back through to behold our familiar set of stars seen from planet Earth. At that point we brought up a lunar panorama with Earth in the sky, and I said, "Whoops, we missed, but not by much — never mind, it is just a short shuttle ride to Earth." Up came our school show shuttle, a yellow school bus with space shuttle shape and rockets to propel it. We flew home, landing in front of a projected Hansen Planetarium building. Astronauts and audience applauded in glee. The shuttle crew continued their visits in Salt Lake City, concluding in the evening at the Tabernacle on Temple Square.

Now that Digistar was performing well and we were becoming versatile in its usage, we started production of new types of planetarium shows. We were nearing completion of *Islands in the Sky*, the NEH funded program about Pacific Island navigation. Ben Finney, University of Hawai'i had drafted a script and we had engaged Ward Goodenough, Museum of the University of Pennsylvania as another consultant. I rewrote the script, making it active, rather than reflective, turning part of it into a story of a Micronesian father and son sailing to the place of their origins. We used Digistar to simulate the motions of the canoe they sailed in. We featured the Micronesian star compass discovered by Ward Goodenough, going from color renderings of a navigator and his students using lumps of coral to indicate directions of rising and setting of key stars. Then, we dissolved to Digistar to have the coral stars wrap around the horizon. The navigational stars rose out of those lumps of coral to dramatically trace their trails across the sky, filling the dome with star paths which were so important to those island navigators. Our program featured Mau Piailug, from the island of Satawal, last real navigator of the islands. I fantasized about having Mau visit HP to see the stars he knew so well trace those arcs across heaven. Although I did not know it then, I would meet Mau in Hawai'i some years later.

Our quality work, along with effective grant writing, brought HP needed funds for show development and educational activities. In summer 1985 we were awarded \$75,000 from the Institute for Museum Services and we wrote a request for NSF funds to develop a show on Galaxies to be produced with consultation by well-known science writer Timothy Ferris. Ferris had written a popular book on the topic. We were also successful with the NSF proposal. Rick Gore (photographer for National Geographic), whom I had met while attending the IPS council meeting in Northern Ireland, visited HP in July. I discussed with him the possibility of a National Geographic sponsored planetarium show on the topic of the Hubble Space Telescope.

Through intensive work right up to the last moment, *Islands in the Sky* opened on schedule. In conjunction with the show, we held a film and lecture series: 7 August, consultant for the show, Dr. Ben Finney, professor of anthropology at the University of Hawai'i lectured on *Relearning a Vanishing Art*; 14 August our other consultant, Ward Goodenough, lectured on his

discovery of the Micronesian star compass; (Ward's office was next to an individual whose writings I greatly admired, Lorin Eisley); having lived with mau Pailug on Satawal, Stephen Thomas lectured on 21 August, giving a very personal view of the life of that humble, yet so knowledgeable, old time navigator; events concluded with the Halau Hula O Moana primitive Hawaiian dancers performing at HP.

HP hosted the joint meeting of the Rocky Mountain and Pacific Planetarium associations 10-12 October, attended by 110 delegates. With naked eye visibility of Halley's Comet expected soon, planetariums all over the world were planning and producing programs about the most famous comet of all times. Many times I had given, to various groups, a lecture I had developed earlier for presentation to the Southeastern Planetarium Association, *Through the Eyes of the Comet*. HP had its own comet program ready to go and we added a trailer to it showing what it was like in SLC in 1910 when the comet last graced our sky. It was a lot of fun digging out what it was like in our city at that time and putting it to images which we could project on our dome.

So much was going on at HP during the fall of 1985, the year of our 20th anniversary. Rick Nobis, composer and percussionist for the Utah Symphony, composed a special piece which he titled *Full Moon* in honor of our anniversary. It premiered at Symphony Hall on 18 October with a reception following at which Mr. Novis gave HP an original copy of the score. He would compose the music score for our upcoming show *Star Pioneers* written by Orson Scott Card.

*A Comet Called Halley* started at HP 28 October, along with the trailer about SLC in 1910 which had the title *The Last Time I Saw The Comet*. That was a little drama about a couple who met in 1910 and were awaiting the return of the comet. On 29 October we held a birthday party for Edmund Halley, his 329th. Halley was there as well as his guests: Aristotle, Isaac Newton, Galileo, Kepler and a few others, all actually HP staff members in costume. A house full of people came to meet these celebrities, among them reporters from radio, television and newspapers. At the very time we were doing such worthwhile educational things, Salt Lake County commissioners were threatening to take away our mill levy which provided a large portion of our operating budget. Thus, in addition to everything else, when our full attention should have been on education, we had to try to work with our board and others to persuade the very people who should have been our greatest supporters, the commissioners, to back off from their threat to seriously diminish what we were able to do.

Having had the idea of making people who had seen Halley's Comet at its last apparition, 75 years before, honorary members of HP, through the media we hunted such people out and on 2 November had a party for our 1910 Comet Club. We had a list of about 300 of these old timers and most of them came to see *A Comet Called Halley*, then joined together in the Grand Ballroom of the Hotel Utah to visit and eat. It was a great reunion for people who's contributions to our city had nearly been forgotten. A few of us, including Edmund Halley (Seth Jarvis in disguise) rode to the hotel in horse drawn carriages. Halley spoke to those about to become "two-timers" and so did I, then we took photographs of the 1910 Comet Club members who were there. Dr. Thomas Parmley was among our honored guests. He

was chairman of the Physics Department when I received my physics degree at the U of U. My cousin Johnathan Heaton and Haven Bergeson's father were there. Staff from National Geographic, including Rick Gore who I had met at Birr Castle, were there to cover the event and interview members of the 1910 Club. Those grand people enjoyed the day perhaps even more than we did putting it on.

By mid-November Halley's Comet was visible with binoculars. On 20 November Obert C. Tanner hosted a dinner at the Alta Club for 25 guests where we talked about the comet. Obert had seen it as a six year old boy in 1910. I presented him with a print of the planetarium building and a poster of the comet. Then, his group went next door for a special showing of *A Comet Called Halley*. The group consisted of the "whos who" of SLC, helping to celebrate both the famous comet and the anniversary of HP. Governor Bangerter signed a proclamation declaring the last week in November to be "Hansen Planetarium Week in Utah." On the anniversary day, 26 November, we held a private party for the Hansen family, their invited guests, county commissioners, members of the Hansen Planetarium Foundation board and a few others. They saw the premier of our 1985 version of *Star of Wonder*, which was the same topic for the show which opened the planetarium twenty-five years previously.

We had tried so hard for most of two years to heal feelings which had existed over change of administration at HP. We had done the best we could to produce a show that portrayed the spirit of the holiday season regardless of religious orientation, emphasizing the Star as one example of a symbol of light expressed in beautiful ways in the arts as well as speculated about by science. Most people applauded the show, but Cliff White, president of the Hansen Planetarium Foundation called me to say that he intended to attempt to get the courts to stop the show. He said it stepped over the boundary between Church and State. Actually that show, above others presented at HP, had less attention to the Christian aspects of the story of the Star. It did include Christian art portraying the Star, and surely anyone would agree that this was great art for its own sake. Christmas Star programs under Mark Littmann's administration certainly had more focus on the Christian aspects of the story than this one did. Cliff was Jewish and a close friend to Mark Littmann, also Jewish. I was dismayed to see that in spite of our many attempts at friendship Cliff would continue to do whatever he could to interfere with our work to provide highest quality planetarium programming. His threat was idle, for he did not attempt a law suite.

The greatest shock of all came in mid-December when the county commissioners cut our mill levy and gave us notice that they intended to continue to reduce it each year until we were off from tax support. Two of the commissioners had deceived me for several weeks, saying that they would not reduce our tax support. Politicians! I felt betrayed. They had brought me to Salt Lake with glowing statements of support to make HP the finest planetarium in the world and we had certainly done so. Twenty years before, HP had become administered by Salt Lake County rather than Salt Lake City because it needed greater financial support. No planetarium that I knew of, anywhere in the world, was able to exist without public financial support. Yet those few individuals who were supposed to represent the people thought



we should be able to find some way to raise our own needed revenues. My job had suddenly changed from one of raising the quality of the facility, which they had said all along I was supposed to do, to one of survival. We would need to halt plans for extensive remodeling of the building, which commissioners had encouraged us to do. I was devastated. I was angry. With monumental effort we gathered community support to show how much HP was valued and succeeded in putting a temporary stop to this political interference.

Having had about enough of such political manipulation, we started careful long-range planning with the hope of eventual separation from governmental administration without losing the financial support we needed.

### The Idea of Becoming a Science Center, 1986

I returned from the Oxford II archaeoastronomy conference and Stellar Solaris cruise in the Caribbean to attend a meeting at the State Office of Education when the Space Shuttle Challenger blew up shortly after launch, the whole thing being watched live on television by millions. Aboard was the first civilian, a school teacher. NASA had been working on the message that space had become a safe activity for common people; instantaneously, the world learned that exploration of new frontiers remained dangerous. It was a great public tragedy and the world asked "why?" That question could be asked about so many things: why do we get on airplanes when we do not need to? Why do we drive cars for so many flimsy reasons? Why, indeed, do we go to war, where so many lives are lost, without doing everything possible to prevent it? Such things were discussed everywhere (I was on radio in such discussion). It was a difficult week. Images of debris raining from the sky were replayed over and over and over. The ending of seven lives was on everyone's mind.

Having worked hard to counter the threat of having our tax revenues reduced when the budget was set during December 1985, we were overjoyed when in June 1986 they brought it back to its maximum level. HP also received another grant from IMS for \$75,000. Only a few planetariums received IMS funding of any sort.

Success in receiving an NSF grant to produce a program on galaxies allowed us to start working on the production in June with Timothy Ferris, Jay Gallagher and Alan Sandage as consultants. All were the best qualified people to help us make this program the finest it could be. On 23 July 1986 these consultants visited HP to begin working with us. We made them aware of our capabilities and brain-stormed with them prior to scripting. The sessions went well and we were on our way toward producing a truly fine planetarium show for our own use and which would become available to other planetarium wanting to use it.

I wanted HP to become THE training place for people from the National Park Service and other outdoor education centers. We did make some headway with that concept, putting on training sessions at Bryce Canyon, Yellowstone and other places, occasionally having outdoor educators

come to HP for training, but we never found the way to get the program solidified. In retrospect, I see that the reason is threefold: we had too many other things we were doing amid concerns over our survival and well-being; key staff members never did truly buy into the program; it was outside the service mission Salt Lake County officials thought we should have.

On 23 September 1986 we opened the show we had been working on for a very long time, *Star Pioneers*, scripted by Orson Scott Card. It was a fine show which proved to be enjoyed by many people. On the same evening we hosted the world premier of a new album, *Fresh Aire VI*. We projected Digistar effects to accompany the music. This was another first for HP; I knew of no other planetarium which had premiered two shows in one evening.

At HP we often received planetarium colleagues from around the world. Their coming so frequently to a facility that in so many ways was inferior to other larger ones was a constant reminder of how well we were doing. I will cite one example. Near the end of October 1986 Eric Ubelacker, director of the planetarium in Hamburg, Germany came to see our facility and purchase shows and other items for their use. Eric had worked at the Zeiss company when they engineered one of their improved projectors. As we talked, he told me that HP was the world's best known planetarium. I wished that our government officials and other community leaders could have heard such things which might have helped them really understand what they had in HP. We continued our constant struggle to help them understand the valuable services we rendered to such a vast audience.

Throughout the 1986 budget process the Salt Lake County commissioners praised the work we were doing. Two of them told me personally that they were 100% behind us and that they understood our continuing need for tax support. Division directors, such as myself, were prohibited from attending meetings in the commission chambers where they discussed and decided our budgets, but the public, including the press, could attend. So we learned what their posture really was from the news media. Thus, it was a surprise to read a newspaper article which came out on Thanksgiving day that said the commission had passed the planetarium budget after toying with a proposal by one of them to cut our budget. The article said: "in doing so, the commissions were unanimous that they wanted the planetarium put on notice that it must wean away from tax support or else close its doors forever." My job was such a mix of euphoria and stress. I felt disillusioned by people whose religious principles claimed honesty to be paramount, yet who exhibited, even publicly, such deceit. Such was a constant demoralizing influence on all of the HP staff.

At one of our "cost allocation" meetings with county auditors we learned that the average cost for each purchase we made was \$150, not including the cost of the items purchased. Those were charges made to our budget for services of various county offices involved in processing purchase orders. We were charged for time of various county employees, many of which had nothing to do with our business, things we neither wanted nor needed. This was because of the bureaucratic processes involved in being administered through Salt Lake County. All along the way there were charges made to us for supposed assistance by many county offices. It was a mystery

to us as to why or how many of those should be involved in our purchases. Another way of putting this is that they were raiding funds specifically allocated for use by HP. That seemed ludicrous. The county showed concern over our need for tax support while our existence was helping to support jobs of many county employees that we did not need at all. The county structure was bulky and filled with waste. We certainly wanted to become privatized, if only county officials would work with us in consistent and reasonable ways to accomplish that goal while maintaining strong and effective services.

For quite sometime we had been thinking about having a new facility and hoped that we could get out from under governmental administration at the same time. We latched onto the idea of becoming a science center, the hottest type of museum. Science centers were places where people learned about science by lots of hands on, indeed brains-on, activities; people participated in science at such places. We started to work on that concept by getting our advisory board convinced of the idea, then informing all the community leaders we could about it. We were encouraged in seeing how many liked the concept and said they would support it. We developed long-range plans to head us squarely in that direction and carefully modified our programs and exhibits accordingly.

### Long Range Planning, 1987

Having entered into the work of long-range planning with the goal of becoming a privately funded operation, our board resisted becoming the type of board we needed. In order to be a private operation we would need a strong fund-raising board and they simply did not want to do this. The planetarium staff was also divided on the issue of becoming private or remaining a publicly managed facility; they knew that a private operation required constant justification for every element of its budget and some of them felt that their jobs might be threatened. That is the way it is in the world where everyone must survive on the basis of their value to the institution they work for. Fear for security is a powerful force which entered strongly into our deliberations and inhibited our progress.

In the midst of all of that we completed production of *Galaxies*. This, too, had been difficult due to Timothy Ferris' insistence that he narrate the show and to changes he wanted to make right up to the time of opening. All of us on the staff knew that another voice would be better than his, but we wanted him to be pleased with the program. We also had problems loading the huge amount of computer programming needed to run the show. Several successive twenty-four hour work days completed the job and the show opened on schedule. Those who saw it had no idea what had been required to produce that great program. It received immediate accolades by the public. The show had original music by Kevin Braheny. Both Braheny and Ferris joined us for show opening events. Over following years that show was enjoyed at many planetariums throughout the world. Over early weeks of this new show, we conducted a lecture series on the subject of galaxies, bringing to Salt Lake some of the most knowledgeable people on the topic.

We started doing several things designed to eventually make us a privately managed facility and to direct us toward becoming a science center. As terms of office and resignations made it possible, we started restructuring our board in an attempt to make it one which could support us for major fund raising. I also started holding meetings with my colleagues at the Utah Museum of Natural History, the Children's Museum, Hogle Zoo and others in order to combine our efforts to improve services, increase attendance at museums and otherwise strengthen area museums. We also did carefully designed surveys of the community we served so that we could be sure our services were of the type people wanted and to learn more about how our work was perceived. This was quite a change for HP staff; for the first time we were designing programs based on what we knew our service audience wanted, not just on what we thought they should want.

In order to increase revenue earned from admissions, we decided to do a special show on the topic of electricity. That required installation of a two million volt Tesla Coil and we had to remove the planetarium equipment, Digistar and its control system, from the room so that it would not be damaged by stray electricity from the Tesla Coil. The show would be titled "The Zap Show," a drama using the Tesla Coil as the main character, with human characters, Dr. Frankenzap and other actors, joining on stage and doing amazing things with the coil. At times, for example, one of the actors would stand bare foot on a metal plate which was attached to the coil and bolts of lightning would sprout out of that person's head and from finger tips of elevated hands. Members of the audience could hold fluorescent bulbs in their hands and these would light up from the ambient electricity in the room. It was an exciting show which drew large audiences while our planetarium equipment was removed and replaced.

Because of some displeasure at HP, I submitted a statement of interest in the position of director of a new planetarium, the Taylor Planetarium, at the Museum of the Rockies, Montana State University in Bozeman. I doubted that I would accept the position, if offered, but wanted to at least have the option. It offered excellent research possibilities as well as having the chance to direct a fine new facility located at a museum with an exciting mission, to tell the story of the region in which it was located, "One place through all of time." The planetarium would, of course, tell the cosmic part of the history of that place, as well as have strong programs of whatever sorts they wanted to offer. In view of the constant struggle of working with Salt Lake County, I wanted options.

The senseless antics of Salt Lake County commissioners continued to cause problems for HP. While we were working so hard to replace our advisory board with a power board which could help us raise major funds that could allow us to become privatized, they contacted the media with the content of a letter from a disgruntled HP staff member, and they did that without even discussing the matter with me. So the first I knew about the letter was when I heard it on the news. The problem was exacerbated by one of the commissioners doing an interview with one of the TV channels in which he said someone would be named to head all non-governmental enti-

ties of the county, which of course included HP. Such things always got our staff upset; they were experts in reading worst case possibilities in anything negative. The very people who should have been our primary supporters and helpers, the commissioners, were always our worst enemies, causing stress which was neither wanted nor needed. How could we possibly be successful in doing what they said they wanted, to have HP privately managed? Meanwhile, the Zap Show drew large crowds, exceeding revenue projections, while we installed new equipment which would enhance HP's ability to continue to improve its already world-renowned programs.

I continued to explore various possibilities for a long-range future for HP, with my favorite remaining a high quality museum located near This Is The Place Monument. I felt that an IMAX theater, along with planetarium and possibly Natural History museum would be a winning combination. I found that the entertainment park named "Lagoon," located north of Salt Lake, was planning to install an IMAX soon. My discussions with those involved at Lagoon, along with others settled on a location downtown as the best possibility for IMAX, and probably for a new planetarium as well. We continued to want all of this to be in conjunction with a science center. Salt Lake County officials wanted to find a better use for the building occupied by the Art Center and they thought the planetarium should move into that site. Had an IMAX adjacent to that building been possible, everything we had learned indicated that site to be one of guaranteed success; right next to the Salt Palace Convention Center and Symphony Hall. A destination IMAX film about attractions in Utah would add the final needed touch. Film producer Keith Merrill was interested in the project, especially in producing the film.

In October 1987 a representative from the BYU Salt Lake campus asked me to teach a course for them. Having all I could handle already, I reluctantly agreed to consider doing so while they "checked me out" to see if everything was in order to make a final offer to me. In November the representative told me that they very much wanted me to teach, and I agreed to do so with payment going to Hansen Planetarium rather than to me. But, said the representative, there was just one problem; I would have to shave off my beard. That gave me an easy out, wanting to do what I could for the sake of education and for the planetarium, but knowing that I was already overextended.

In November I met with representatives from Utah Valley Community College (now named Utah Valley State College). They sought my guidance in putting a planetarium into the planning of a new science building. I did not realize at the time what a lasting relationship I would have with that institution.

At the end of 1987 we removed the Tesla Coil from the star theater and reinstalled Digistar and the control system. Then, at the beginning of 1988 we opened a new set of planetarium shows.

### Planning for a Science Center Continued, 1988

Throughout 1988 we continued working hard on our hopes of HP becoming a science center. This involved working with the staff as well as with our board, Salt Lake County officials, community leaders and potential funding sources. In March we held a staff retreat specifically for the purpose of getting all our staff in tune with the idea. By that time I had restructured our board so that it had more of a fund raising posture. One of the new members was Arch Madsen, founder of Bonneville Broadcasting, certainly one of the most influential and admired individuals in the Salt Lake community. Our new board and the commissioner we worked under set up a task force with membership from our board and the Salt Palace/Fine Arts board to get things moving. Every moment of the working day, plus many additional hours, were consumed with such activities: cultivation lunch meetings; sometimes breakfasts; meetings, meetings, meetings whenever time and opportunity permitted. I worked very hard doing all I could to map out a productive and exciting future for HP in a science center setting. Through careful planning I was able to get away to follow the interests I was ever more passionate about and attempt to maintain reasonable sanity.

As I have said before, throughout the years I was at HP we offered laser light shows in order to boost earned revenue. In April 1988 we changed laser companies, going with Audio Visual Imagineering and we started a greater variety of laser shows. For example, we introduced laser shows for children. The first of those was *Laser Magic*. I knew it was good when Marré, Diana, Christopher and Bryce liked it.

In April I was invited to the Museum of the Rockies to become familiar with the museum and its Taylor Planetarium. The Bozeman, Montana region is so beautiful. The museum managed natural areas in the mountains, places ideal for sky interpretation activities which are so deeply within my soul. It had a strong winning concept and clear vision of where it wanted to go and the idea of being back with a university was attractive to me; another MSU (Montana State University). Although I was not there to interview for it, in many ways the job of directing that planetarium would have been a dream come true. Before departing, we drove into the mountains, admiring jagged snow capped peaks, crystal streams and lakes. We stopped at a dairy store to buy some cheese and butter. They also had their own ice cream, so we ordered cones. The lady at the counter asked, "regular or baby scoop." I ordered regular and Marré ordered baby scoop. Wow! Mine was the largest pile of ice cream I had ever seen on a cone and Marré's was the second largest I had seen. My comment was answered, "That's what Montana is all about." Those were the last words we heard on our visit to scope out possible work in Montana, words which only added to the fine feeling we had about the opportunity which might become available to me.

I had an appointment in Bozeman for an official interview, but I had much to think about in order to decide whether or not to even keep the appointment for 11-13 June. I was deeply frustrated at the never ending series of inhibiting problems encountered at HP, yet it was exciting to be part of an attempt to do something of lasting value through creation of a first

class science learning center. I knew that administration was not what I did best and that fact kept me thinking that my best qualities might lie somewhere else. The Museum of the Rockies seemed to offer a reasonable chance to create a place which excelled in research and teaching. I wanted to be in a place where I knew I could make my best contributions. Still, I did not want to leave a project where I was the key player. The easier way would be to relocate to Montana State University, but the easier way was not usually the best way. I decided that I would go to the interview and continue to sort through those problems.

When I went to Bozeman, I was treated royally with meals, hot tubs, a drive through mountains to meet with the MSU vice president for research at a cozy cabin, then on to Boles Meadow, a wonderful place which the Museum of the Rockies hoped to use for environmental research and education — a place I could use for sky interpretation activities. Everyone seemed very supportive of a sky interpretation training program and of the research I wanted to do on Native American sky traditions. They had done their homework well on learning about me and my interests. On the second day I met Bea Taylor, benefactor for the planetarium and recent chairman of the museum board. We drove past one of three Taylor ranches up to the "Bowl". The official interview was at the museum where Mick Hager (director of the museum who I felt had become my friend), the assistant director of the Museum, Bea Taylor and a member of the physics department asked me questions about my background, philosophy and ideas. Then, a country club lunch with Mick, the museum's curator of photography and the director of education. The director of marketing escorted me on a campus tour with stops at departments of physics, film and television, computer science, music and the library. As Mick drove me to the airport, he said he could not make an official offer but that "he wanted me to come to the museum at MSU, and that he had a plan to get my salary up to where it would be somewhat competitive with what I earned at HP. I felt very much wanted and had lots to think about.

The offer came by telephone the following day and Mick wanted an answer within ten days. I decided to confide with my board chairman, my boss and one other county employee to seek their perspective on the possibility of my leaving HP. Then Marré accompanied me on a trip to present a course for Canyonlands Field Institute in Moab with an all-night activity at Professor Valley Ranch. From there we drove to Cortez, Colorado to meet Ray Williamson and discuss joint purchase of 55 acres outside of Cortez. From Cortez we went to Dulce, New Mexico to continue study of the Sun shield and star ceiling site.

All along the way Marré and I discussed pros and cons about accepting the offer at MSU and moving to Bozeman. In the end, I knew that that would be an enjoyable job and that I could make a fine contribution at a quality museum, but Marré and I decided to remain in Salt Lake. The next day, 23 June, I called Mick to thank him for his confidence in me and the invitation to work with him, wishing him well with a great museum I had come to cherish. I was committed to continue working hard on our science center concept and presenting highest quality planetarium programs for the community we served, both locally and throughout the world. We had crossed a bridge to peer into new territory and decided to remain on the other side.

While on a trip to attend an IPS conference in Richmond, Virginia, I met with people at the Institute of Museum Services, National Science Foundation and NASA to cultivate possibilities for funding at HP and for the proposed science center.

By early August we had a specific, well worked proposal for the science center which could create it along with expansion of the Salt Palace Convention Center so that the HP/science center would have an IMAX theater. We presented the plan as a very well written document along with an oral presentation. We had been sure the necessary people were well informed, having shown excitement for the project and we had clear vision of how the facility would be managed. As we did this, we were instructed to develop a budget in case proposed tax limitations might pass and these limitations would close us down. Here we go again: disguised encouragement and sudden-impact disappointment. My sanity was saved by departing for a trip to meet John Carlson and a National Geographic photographer to work on photography at Chaco Canyon and Canyon de Chelly for a National Geographic article John was writing.

The tax limitation initiative absorbed a tremendous amount of effort, taking most of our time for the next few months. We had to prepare two budgets, one in case the initiative passed and another, which we hoped to be the real one, if it failed. Of course we continued to do the best we could in keeping strong, high quality, educational programs going as we fiddled with such things. We ran an on stage performance titled "Moon Rush" in order to increase income and provide more variety in our offerings. Through all of that we continued work on the science center, winning more and more verbal support from throughout the community and state.

I worked hard to get Marlon Berrett to be chairman of the new science center board which was designed to bring the science center into being. He was a smart strategic planner. He and I planned things so that commissioner Barker would ask him to accept the position of chairman and he would agree to do so only if the commissioner would agree to give his full support to the project and also have the planetarium board be immediately changed to the science center board and that the commissioner do whatever he could to be sure that all parties in the Salt Lake area interested in putting in IMAX systems be required to deal with us. We hoped that would put HP clearly in control of the science center movement, including IMAX.

It was a great relief when the tax limitation initiative was defeated. Now we could get back to the usual budget preparation, which was bad enough to deal with. We started again to move forward with new enthusiasm.

At the end of 1988 we accomplished remodeling which we had been planning for about three years, finding contributions for most of the work and discount prices on materials. All carpeting was replaced and there were major changes in the lobby and exhibit areas. HP had a fresh new look on the inside and we made repairs and improvements on the outside as well.

In December, through our HP board member, Hugh Rossi, who was Dean of science and mathematics at the U of U, I met Heinz-Otto Peitgen, pioneer in Fractal Geometry, a most exciting development in mathematics. We started work with him on an exhibit on fractals and on generat-

ing fractal structures with Digistar. The exhibit would be at HP during summer 1989, but we hoped our relationship with Peitgen would continue into the science center.

Our plans for the science center became more and more exciting. We had, for example, planned for a way to be able to be in every Utah school by real-time electronic means. We could talk, two-way, with students, either one class at a time or even every school at once when special scientific events were taking place. We intended to have the finest abilities possible for improving science learning in the area we would serve.

The year 1988 had been a particularly good one for HP. We exceeded our revenue projections, got the building in the best shape it had ever been in and made major strides in planning for our future. I also made good progress with my research interests. I would always wonder what our lives might have been like had I accepted the job in Bozeman and would carry warm feelings about the Museum of the Rockies.

### Plans for a Science Center Announced, 1989

Marlon Berrett was the kind of board chairman we had needed for a long time. Not only did we seem to have the Salt Lake County commissioners in support of the science center idea, but early in 1989 we obtained the same from Governor Bangerter. Marlon, Commissioner Barker and others went to the Governor's office to brief him on the project and left with his statement of full support.

In preparation for a public announcement of the science center plan, on 7 July we installed interactive-science exhibits at HP: a set of Gyro Rings, inside which a person rode, twirling around in any direction, thereby studying, in a very personal way, the laws of motion and gravity; a one-sixth gravity simulator consisting of halter, ropes and counter weight so that a person could move around in simulation of what it would be like to be on the Moon; a lunar crater box into which one could drop marbles into flour to make simulated lunar craters. The main event for the announcement would be at Symphony Hall where the Utah Symphony would perform *A Concert for Apollo*. In addition to announcement of the science center plan, that would begin Salt Lake's celebration of the twentieth anniversary of the Apollo 11 landing on the Moon. Our summer planetarium show, *Footsteps*, was a revision of a program offered earlier based on the spaceflight which resulted in the first footprints on the Moon. I made sure all arrangements were made even though I would be away during those events on long-planned and important travel.

Back from a pair of trips, one to Canyon de Chelly and the other to Greece (see chapter on Intellectual Excursions), I found that the 7 July *Concert for Apollo*, had been a great success. Our HP staff had projected images above the orchestra, adding picture to sound to commemorate the singular event of humans visiting another world. I received a note from James Irwin (Apollo 15), who I had arranged to be there and speak, telling me that he had greatly enjoyed the event and offering to help us again if we wished.

The next two weeks were immersed in preparation for celebration of the actual 25th anniversary of the Apollo 11 landing. At the ZCMI mall, we participated in installation of an exhibit with components from Boeing, Hercules, Thiokol, Utah State University, University of Utah, Salt Lake Astronomical Society, Utah Space Club and, of course, HP. On 20 July HP had a special showing of *Footsteps* for an invited audience. Astronaut Dr. Mary Cleave spoke following the show, mostly about her STS-30 flight. She presented prizes to winners of our inaugural annual space art contest.

As July ended I traveled to the University of North Carolina at Charlotte to attend an intensive week long institute for new science centers. Organized by Sheila Grinell and instructed by other leaders in the science center field, that was an illuminating and rewarding week. We studied exhibit planning, desirable procedures in starting a science center, administration and budgeting, marketing and fund raising, program and exhibit evaluation and visited several science centers with various qualities and in different stages of development. Our commencement speaker was Mike Templeton from the National Science Foundation. He highlighted the significance of the year 1969 when a new type of museum emerged, the first science center. In short order, I had become friends with many in the science center field and left the institute with numerous ideas which should expedite what we wanted to do.

I rented a car and drove to Chapel Hill to spend a couple of days at the Morehead Planetarium to see their facility, shows and consult on items of mutual interest. Throughout most of those days in North Carolina I suffered from leg pain caused by back problems. That was becoming a more frequent problem which I did not want to interfere with either employment or my other interests.

HP remained open all night long, 24-25 August, for visitors to watch data and images come in from the Voyager II Neptune encounter. That phenomenal spacecraft had greatly out-performed all of the abilities built and programmed into it, showing us close-up images of a vast array of worlds: Jupiter and its satellites, the Saturn system, Uranus and now Neptune. What a moment in human discovery of the Solar System! What a vast amount of information/knowledge had been obtained! We had discovered new worlds and seen known ones so much more clearly! Still, we had so much to learn! The little Voyager was headed out of the Solar System at twenty-two times the speed of the fastest bullets with a message attached from humans on planet Earth for any intelligent being that might come across it.

One of the supporters of HP and its science center effort was Marilyn Nielson, wife of Rulon Nielson. She had played the part of Bat Woman in film and had been a student in one of my U of U honors courses. From time to time she invited Marré and me to her lovely home overlooking Memory Grove. She introduced us to her influential friends and helped plan and execute fund raising activities. She became a good personal friend.

As our success with outstanding programs both at HP and outreach to schools continued to reach more people with ever better results, the annual budget problem through Salt Lake County became even more difficult. Our continued increase in earned revenue and all our good work should have

been receiving more financial assistance from the community, but that seemed impossible in Salt Lake. There was a mentality there which was hard to penetrate, one which looked at any increase in public financial support as something which should not be tolerated. In spite of that, we kept on trekking, remaining as optimistic as we could, seeking and finding new ways to bring in revenue in order to remain in business and continue our exciting planning for the future.

On 9 October I was at Michigan State University to attend the twenty-fifth anniversary of Abrams Planetarium. The past was celebrated in good style: Patty Hogg and her son represented her deceased husband, Vic; Thomas Osgood, then nearly 90 years old looked great; so many of us owed so much to the existence of that place and its simulated stars. After we sat in those seats and saw a show together, Dave Batch noted that more than a million people had occupied those seats, asking us to imagine layers of spirits, with us as the most recent to be inspired from each chair. We remembered Talbert Abrams, still living, but unable to hear or speak much, honoring him for what he had done in sponsoring that planetarium.

While in Lansing I visited "Impressions 5," a science center that was in planning when I directed Hansen Planetarium. Now, I was seeking to learn from them what I could about how to make a science center successful.

From Lansing, I traveled on to Maryland for a visit with Blake and his family. I walked Brittany to the school bus, joking with her as I had her dad about the big yellow monster which came along, opening up its mouth and all the children marching in; later in the day it returned and the kids marched out. Brittany was, from childhood on, such an enthusiastic and happy person; such a wonderful attitude about everything. I went for a hike with Griz, looking at caterpillars and leaves, also seeing deer. I took the entire family to Chesapeake Bay Seafood house for a feast from the ocean.

Next day I went with Blake to visit his medical school, then took the metro to the National Mall, visiting some of the Smithsonian museums, including NASM. Then, Ponce Madden, HP's development director, joined me to meet with people at the National Endowment for the Arts, seeking sponsorship for a program on the textures of the universe, a show concept I had thought about for many years. We also met with Mike Templeton at the National Science Foundation to discuss possible NSF support for several things. In the afternoon I was at National Geographic with John Carlson to review artistic renderings for his archaeoastronomy article which was nearing completion, slated for the March 1990 issue. The following day Ponce and I attended meetings at the National Endowment for the Humanities and also with Audio Visual Imaginering. At the Institute for Museum Services we were able to meet with, Dathne Wood-Murray, the new IMS director. We wondered how we were able to get an appointment with her on such short notice and learned that she had been to HP to see Digistar and some of our programs which had impressed her greatly.

I kept on traveling the short distance to Baltimore to attend the Association of Science and Technology Centers held 14-16 October at the Maryland Science Center. While at the opening social, I was surprised to encounter our Salt Lake County commissioner Bart Barker who was attend-

ing a meeting in northern Maryland and had come to see the science center, not knowing about the ASTC conference. It was encouraging to see that he had grown that interested in science centers. The ASTC conference was filled with good information that could help us in our efforts.

Now, in November, we had a plan in place to install a 70mm motion picture projector in the HP star theater, along with Digistar, in order to get a visible start on the science center and add considerably to our earned revenue. We had a feasibility study completed, done by an individual who was very familiar with Utah demographics, which indicated likely great success. This, however, became impossible as we prepared our 1990 budget. We simply could not get county officials to help us actually accomplish what they always said they wanted to see happen.

I arrived back at the office after being away for a few days in early December to find that one of my staff members had been instructed to write an impact statement for a \$100,000 budget cut. Upon digging into this I found that the commissioners had already made that cut to our budget. There was no sane reason for it; we had submitted a balanced budget which did not request any additional tax revenue. They were requiring this simply because they were cutting other budgets and they thought every unit must share the pain. This for our upcoming silver anniversary year, the pivotal year in the science center plan. It was becoming more and more impossible to succeed! We had put in place a powerful board composed of people wanting to help us. We had cultivated influential friends and made sure citizens were informed. Nearly everyone seemed to want the science center, but those over us kept getting in the way. Frustration!

I went to work and arranged for a host of people to be at the public budget hearing to speak on our behalf. In that way, we helped our public officials to be "wise" and help us remain healthy. Public budget hearings were for the purpose of learning what the community wanted. Everyone knew, however, that the majority view was never heard at those meetings; the majority was unaware that the hearings were taking place and didn't even know the issues. So those supporting whatever causes were involved gathered and gave the politicians their mind to make final decisions. That was the game we had to play. At times like that I wanted to get out of Utah.

Many at that 1989 budget hearing were there to support the county Equestrian Park. They had on their boots and 10-gallon hats. One group sat near where I was. They applauded when their cause was defended. When people spoke about science education and its critical significance in our highly technological age, they profaned and made cutting comments about the speakers whom they didn't even know. They demonstrated the very issues addressed, the ignorance of our people. It had been a long time since I had observed such lack of respect. We had so many such dunces in Utah. If I had not known the others also were there, I would have quickly gone elsewhere.

We did get the \$100,000 reinstated, but the commissioners added a condition; we must find a way to include within our balanced budget their mandated personnel costs. That was a departure from the past, such a minute thing for them, yet so important for us; another unspoken comment on how much they valued hard working county employees. Oh my!

### Hansen Planetarium's Silver Anniversary, 1990

Once our 1990 budget was finalized and set, the Utah Legislature went into session. Since we received modest funding from the state to make our programs, both inhouse and outreach, free to Utah students (we received much less than what it cost to provide those services), I had to go up there and lobby for preservations of our funding. Looking back on all this as I write (2005), I wonder how I ever stayed at HP. Actually I know the reason; there was such great satisfaction and joy in providing our valuable services to so many in spite of the ever present challenge to do so.

Marlon Berrett proved to be the finest board chair during my administration. He went with me to individually meet with many state representatives as well as attend budget hearings at the state. He knew what needed to be done and was an active participant in making it so.

Through long and diligent work, we demonstrated to the legislature that we needed substantially more funding to support the free services we provided for Utah schools. They all said they understood the need and supported it. However, in the end they really did not. We did get what we had been getting and they put into place future "building blocks" which might bring increases, but those seldom actually got funded. In a time when the U.S. was falling behind other countries in science education, our leaders simply did not understand the great need for higher quality science and technology education. It was saddening and regrettable. Our Utah people had lost the pioneer spirit they had when they came into the area, now willing to remain near the bottom in progression. Again, I was dejected, disappointed and depressed.

In April 1990, during "Earth Week," we opened our "Computer Visions" exhibit, the one that started out to be on the topic of fractals. It did have 20 original color prints of fractals by Heinz-Otto Peitgen, but also included a Digistar show with mathematical structures in 3-D and other things. Then, in hopes of gaining revenues to improve our financial health, we installed another show with the Tesla Coil, *ZAP 90*.

Having calculated the cost of producing and presenting programs for schools, knowing the costs far exceeded what we received for them from the State, we realized that we must do something. So we started informing the schools of the situation. I wrote letters to each of the forty district superintendent, then held follow-up meetings. We hoped they would want our programs badly enough to go to bat for us when the legislature met again to formulate budget. That was risky; we knew that legislators might try to "punish" us rather than recognize our plight and help maintain quality science education for the schools. We had to do something. When asked to speak to civic groups, I talked about science literacy, HP programs for schools and the need for a science center.

Near the end of August we received word of approval for an NSF grant in the amount of \$225,000. We had worked hard for this and it would help us a great deal, more in 1991 than in 1990. We would produce a planetarium show based on the game I had invented, attempting to look at Earth through alien eyes. We intended to have audiences enter the Solar System from beyond, surveying its planets to finally arrive at the most amazing planet

imaginable, Earth. We obtained the services of a fine set of consultants to help create the show which would be titled *Cosmic Catastrophes*.

I arranged for HP to become part of the Rocky Mountain Space Consortium, finding some solid HP supporters among its members which included Utah State University, University of Utah, Denver University and others.

Even though Salt Lake County officials had promised to phase HP out of being assessed "cost allocations," changing to direct billing, instead they increased our cost allocation. We paid such unreasonable amounts that helped support so many county employees, for such little service. Tax money which was supposed to help provide the educational services we gave to citizens was being siphoned away from its intended use. That made me angry; feelings that continued to grow the longer I remained director of HP.

In November 1990 Salt Lake County commissioner Bart Barker was defeated. Since he had become our champion for the science center, we had to start over trying to win support from new players who must support a development of the type we worked toward. This was always very difficult because a newly elected official always wanted to support things which came out of their administration rather than things carrying over from past ones. Here, then, was still another stumbling block causing us to lose ground and waste time and energy in our struggle to do something really good for our citizens. Now, we were in final preparation for celebrating the 25th anniversary of HP.

Our big event took place 26 November. We greeted a special group of invited friends and supporters of HP. George Hansen, Jr., son of HP's founding contributors spoke about his parents; Mrs. Gail Plummer, whose husband had been the individual first conceiving of a planetarium for Salt Lake, was acknowledged; a wall plaque listing primary donors was unveiled. After a nice dinner we went into the theater where I spoke about the many who had made HP what it had become, then our board chairman Marlon Berrett honored past donors. I made comments on HP's history. We presented a short Digistar show, *Silver Glories*, which introduced the shows people could expect to see during our silver anniversary celebration year. Dr. Ellis Miner lectured; a beautiful review of what had been learned during twenty-five years of space exploration while HP had been interpreting the same for its millions of visitors. The event ended with presentation of *Star of Bethlehem*, the same topic HP presented for its very first show. Throughout the week KALL Radio did telephone interviews I had arranged for them so that noted people would be part of our celebration: Isaac Asimov, Carl Sagan, Ray Bradbury, Orson Scott Card, Michael Collins, Ed Krupp, Tony Aveni and Timothy Ferris all commented on the significance of HP as they discussed various science topics. I did a final interview for KALL.

### A Roller Coaster Year, 1991

As with every year, 1991 started with work at the Utah legislature to win needed funding for HP's school programs. Actually, we had begun months earlier and met with legislators, their fiscal analysts and very many others so

that when the legislators were in session we already had them very much aware of our programs and needs. When the appropriation committee met to consider our budget request, Public Education Appropriation Committee chairman Haven Barlow, a long-time advocate of the arts said glowing things as he introduced the arts groups that proceeded us in making presentations. He made it easy for the committee to quickly approve the arts requests. Then, when our turn came, Barlow said that time was short and we would need to hurry. He referred to the "problem Hansen Planetarium had a couple of years ago." He was inaccurately indicating the Mark Littmann affair more than seven years before. He had set a very negative tone for the rest of the meeting. However, we had done the job of preparing all the other committee members for our request. We had met with every one of the them to be sure they understand what we did and what was needed to sustain our services. I introduced our presentation by pointing out the national failure in science education at a time when science was critical to our well being and future. Then, we gave them a short, high impact science lesson on Newton's laws. Board member Bill Smart made it very clear that we can not carry on our programs by funding only 23% of their cost. Davis school district superintendent Rich Kendell made them aware of the importance of our programs for Utah schools. Fred Brown, president of Utah Science Teachers Association spoke up for all Utah science teachers as well as for HP. John Baranca, Utah's Teacher in Space candidate spoke for us. Finally, a student gave testimony about how our programs motivated youth to science. She concluded: "We are your future. We will be here when you are gone."

The committee doubled our annual base as well as putting a \$150,000 supplemental in the budget. We did not know that those amounts would remain in the final budget because the house and senate usually made cuts before the legislature ended. We knew, however, that we had used effective strategy and that hard work had won needed friends. A few days later, at the end of the legislative session, we were awarded \$300,000 for our annual base, still not what the programs cost to create and present, but much better than the \$141,000 before. We also received a \$100,000 supplemental for the rest of our current fiscal year. Hard work with good supporters had paid off.

Lowell Observatory at Flagstaff was planning a new visitor center where they intended to do extensive educational programs involving schools as well as visitors. In order to look into this, I was invited to give a colloquium and meet with them to consider ideas on educational programs and methodology they might want to consider.

People in Utah who knew me well were constantly amazed to learn that it had been much easier working at the Smithsonian, under the federal government system, than under Salt Lake County government. The newly elected democratic county commissioners were a case in point. Jim Bradley was the one the HP portfolio came under. Without any hesitation he started putting his friends into county positions. It was amazing to observe how frequently such officials abused rules which they, themselves, had put in place. Everyone else had to apply rigorous procedures for hiring people with the

best qualifications, while also taking into account such things as providing opportunities for minorities, but county commissioners seldom paid much attention to such regulations. When HP had an opening to hire someone with strong education credentials, Jim Bradley called to inform me that one of his friends was applying for the position. I assured him that we would give that person careful and proper consideration. The candidate turned out to be one of the least well qualified of the list we had to choose from. When we selected someone else I had another call which let me know how disappointed the commissioner was in the fact that we had not selected the individual he had recommended. Jim was quite upset and had his new Administrative Services director, Brent Cameron, do a complete review of all the candidates, our selection criteria and the selection we had made. I vowed that if they thought they were better qualified than we were to select people to do our work, if they overturned our choice, I would leave.

When Brent did his review he pointed out that I had not responded properly to Jim Bradley's interest in having his friend hired and that I should not expect any favors from the commissioner. He said, "remember that he has a long memory." He concluded that I would need to decide how all this went along with my morality and decide what to do. That came from one whose specialty was law and who had come to work for Salt Lake County from the State Attorney General's office. I could not believe what I had heard! Even though it was not much fun working through such things, it wasn't dull either.

Later in the week Brent said they would go along with our choice, but that they would review our future personnel actions in detail. If that continued, I knew I could not stay. But I had to stay. I had invited my colleagues from all over the world to come to Salt Lake for their 1992 conference. Each morning I would ring the little bell on the Russian bird given to me by the director of the Moscow Planetarium, and blow its whistle to remind me that we were one day closer to the conference.

Right at that time I was invited back to the Lowell Observatory to interview for position of Education Director and to give another colloquium, that one on Navajo cosmology. The position did not look like the kind of thing I should abandon the science center effort and the IPS 92 conference for, but I could not help but be interested due to frustrations of working for Salt Lake County. Lowell could have been a very nice place to work. They were building a visitor center for the Lowell centennial and they were interested in establishing a relationship with the Navajo reservation in order to encourage Indian youth to go into science. The Hopi mesas were close by. Indeed, there were many things which could attract me to Lowell Observatory.

Bob Millis, director of Lowell, took me to see all the Lowell facilities as well as to get acquainted with those at the Naval Observatory facility near Flagstaff. As we toured, we discussed various possibilities for a quality education program. Bob talked like he wanted me at Lowell. He loaned me an observatory car so that I could look the region over. I ended up on the top of a mesa, at Buffalo Park, an ideal place for sky interpretation activities. Indeed, the education position offered by Lowell Observatory would be a fine opportunity.



The flight back to Salt Lake was spectacular. Passing over the Grand Canyon, we flew a route that allowed me to view Kanab Creek from the Grand Canyon right up to the town where I was born and grew up. In one magnificent view I saw Kanab, the highway over the sand dunes, Zion Canyon and much more. The whole region seemed to have shrunk. We flew over Bryce and on to the gleaming Rocky Mountains and home. Beauty all around!

A couple of weeks later I had a call from Bob Millis in which he thanked me for being interested in the position they offered. He said that he had many favorable comments from his staff about me, that they were flattered at my interest, but that the position would not be even close to the level of my interests and abilities and that the salary available was only about half what I would require. I was flattered by his glowing comments and told him I would always be interested in what took place on Mars Hill and the other places operated by Lowell Observatory. Had Lowell been able to make a reasonable offer, I would have had a difficult time passing it up, but I would have regretted leaving HP at that particular time. I was too involved in things that mattered a great deal to me as well as to the rest of the HP staff.

Things picked up again for the science center. The reports from the various task force committees made strong recommendations that were receiving more and more positive support from leaders throughout Utah. We had stronger commitments for working for needed funds. Still, there was much work to be done and everything would rest on the political support we actually received from the state, county and city. What made that tenuous was the constantly changing set of politicians entering the scene, each with their own agendas and each needing to be brought up to speed on our project. Sadly, most of them were quite ignorant of science and placed little importance on it. The process seemed to be never ending.

On 19 May we received a \$20,000 check from the Dumke Foundation as well as encouragement on another \$250,000 grant request we had made to NSF to do a show on scientific exploration for the Columbian Quincentennial and International Space year, the year when we would host the IPS 92 conference. We also received agreement from several new people we had invited to join our board. We were at a high point in expressed interest in our HP programs and the possibility of the new science center.

I had often heard it said that HP was the best known planetarium in the world. Our clear mission and focus on quality science education was well known locally, nationally and throughout the world. Our credibility with most local and powerful people was good, especially with state educators. Still, a very few people we were forced to work with were so ignorant of all this that they questioned our credibility. They were the ones who should have been our champions, but they had such low opinions of science — were so ignorant of it — that they did little except interfere with our work.

A little incident illustrates the kind of man Commissioner Bradley was. I must preface this with noting the few parking places we had for our staff, with no public parking lot at all. One day Bradley had a function at the Alta Club next door to HP, so he put his car in our tiny lot. Since there was no parking space available, he just left it in the driveway with the keys inside. One

of the staff moved his own car and put the Commissioners car in that slot, then took the keys to the front desk so that Bradley's car would be secure. When Bradley returned to his car he was angry because he could not locate his keys immediately. At that moment the planetarium was closed and everyone at HP was involved in pulling out equipment, even seats for remodeling we had planned for many months. When Bradley arrived at the Government Center he threw a tantrum shouting, "doesn't anyone work over there?" He added words I will not repeat. He was such a profane man, quick tempered, impatient, uninformed. It was a mystery as to how one like him could get into public office. Our citizens surely deserved better. His actions had demoralized our staff.

We installed new seats and carpeting in the star theater and an audience response system which would permit us to do a higher level of presentation. We could constantly monitor how information was getting across to audiences as well as allow them to control how the show proceeded. We wrote programs that had several pathways and multiple endings, according to audience choice. We could also perform enjoyable "tests" so that audiences could see how much they had learned and we could see how well we were doing in imparting the information we intended. We reopened with those new capabilities in July.

Great news on 2 August. We got the \$250,000 NSF grant! Two NSF successes in a row, and both of them the largest we had ever received. We knew that we would be able to produce a fine show for our audiences, and for our special audience attending IPS 92.

Our science center task force prepared a "straw man" proposal for the science center. Then, in August we had Jim Backstrom, a highly experienced person in the science center field, to coach us on the project. He met with our board, our staff and the entire science center task force. He also accompanied us to meet with LDS Presiding Bishop Henry Eyring to discuss the possibility of the science center being located on LDS Church owned property. In the course of that discussion, Bishop Eyring complimented us on what we were doing, telling us how much HP meant to his son. With tears in his eyes and choked voice he said that his son would not be where he was at that time without Hansen Planetarium. As we parted that evening, Jim's last words to me were, "You are on the way to a fine science center — trust me, nothing is apt to stop it now." But Jim did not fully understand the attitudes and orientations of our Salt Lake County and Utah politicians.

Near the end of August we opened our NSF funded *Cosmic Catastrophes* with special showings for HP members, County officials and other invited guests. It was a hit.

Early in October board chairman Marlon Berrett had a heart-to-heart talk with our county commissioners to let them know that they must get fully on board with us on the science center project if it was to have any chance of success. They were non-committal.

Meeting after meeting after meeting took place as we continued to work on the science center project. Change after change occurred within the political players of importance. The board and task force changed also, sometimes very encouraging; Utah Senator Jake Garn, who had flown in space, agreed to head the capital campaign. Still, progress seemed unreason-

ably slow. I was quite discouraged. As I had done before, I started thinking seriously about early retirement — a change from regular employment to making our way through some combination of lecturing, story-telling, conducting educational excursions and writing. The frustrations of working within the Salt Lake County government system, along with what we had to do with the Utah Legislature, was getting to me.

### HP Hosts IPS 92 in the Columbian Quincentennial Year

In spite of discouragements, the year 1992 dawned with much to look forward to. Financially, HP had done very well. The science center project had bogged down some, yet those involved were optimistic. We especially looked forward to hosting IPS 92 in the fall and had an NSF grant to produce a fine show for the Columbian Quincentennial year.

On 12 January another milestone in the science center project was reached. We selected a firm to review the written proposal that had been produced by the science center task force. Economic Research Associates (ERA) would study the proposal and give critical comments on the feasibility of success of the science center as proposed. In addition, we were in another round of meetings with advisors to the Governor, legislators and many others. I received a letter from the governor appointing me to serve on the Governor's Science and Technology Council.

Now, the intensity of planning for IPS 92 increased. Our conference planning committee consisted of many HP staff members joined by some from Weber State University and Brigham Young University. We arranged with my cousin Bryce Chamberlain, a well-known actor in the area, to do a special one-man dramatization of Christopher Columbus, specifically written for planetariums. We had completed negotiation with Snowbird resort located in one of our beautiful canyons to be the site for the conference. We were working on having a group of Indian dancers perform at an outdoor dinner on the mountain side, weather permitting. Everything was arranged for receiving and reviewing proposals for papers and we had started arrangements for special lectures. Plans were well underway for a post-conference excursion to Hovenweep, Chaco Canyon and Canyon de Chelly and I had written a guide book for the trip. We already had many people signed up for the excursion.

At our annual Legislator's Family night, the time when we invited legislators and their families to attend an evening at HP, we entertained them with punch and cookies, science demonstrations, our newest show *Cosmic Catastrophes* and some of our school programs. We also briefed them on the status of the science center project and asked for their continuing support.

The science consultants for *Cosmic Catastrophes* came to town one more time to review changes to be made to the version of the program that would become available to other planetariums. Consultants for the next NSF funded show on exploration were reviewing drafts of the script.

In early March we had completed the final script for the exploration show and had narration for it recorded by Patrick Stewart. We presented special performances under the stars by Indian flute player Douglas Spotted

Eagle. He told stories and played flute to pre-recorded electronic accompaniment. Most shows were full and everyone seemed to love them. At the end of these, Douglas gave me a beaded eagle feather. His wife, Linda, had beaded the stem of the feather with blue beads to represent the sky and white ones for stars. This was something I had to take good care of. I considered it to have been loaned to me by the great messenger bird of the sky. For me, it represented many things including music, stars, friendships, memories of the ages. It was a piece of life, Earth and Sky.

For a full month, 12 March until 12 April, I was able to escape work and go on the *Stella Solaris* around South America, on a cruise which allowed me in-depth study of the southern sky (see "Intellectual Excursions"). That particular trip, which had considerable focus on history, also helped me better comprehend things related to the Columbian Quincentennial Year and the HP program on exploration we were producing, with NSF funding. I think it was such excursions which made it possible for me to tolerate the stresses at HP and remain as long as I did.

In early June, the ERA submitted its preliminary feasibility study for the science center. Now our major focus was on final details for IPS 92: final meetings with Snowbird Resort; answering lots of telephone calls from delegates, exhibitors, press and others; final arrangements for the post-conference excursion; dealing with problems we had done everything we could to avoid; signing certificates of honor for all 400 delegates who would attend; final arrangements for entertainment; installation of our new NSF funded show, *The Endless Horizon*; so many other things. Delegates would come from eighteen countries. We had been able to get a lot of financial support which reduced the conference registration fee from what it otherwise would have been.

Four hundred twenty people attended the eleventh conference of the International Planetarium Society held in Salt Lake City 23-28 June 1992, and seventy four of them went on the post conference excursion 28 June through 2 July. All of the HP staff, representatives from the planetariums at BYU and Weber State and a number of other volunteers did a commendable job of hosting the conference, attending to its unnumbered details in fine form. I feel obligated to note that Sheri Trbovich played a key part in planning and executing the conference, going way beyond what was expected to help make it successful. Others worked hard as well.

Most of the conference sessions were held at Snowbird where delegates were also lodged. It was a marvelous setting for such a meeting. The high mountains offered pleasant surroundings with cool fresh air and quiet not found at meetings held in busy cities. The following gives a brief run down on what took place.

Prior to the beginning of IPS 92, the Digistar Users Group held their reception on 21 June at HP followed by a full day meeting at the Salt Lake Marriott on the 22nd. The IPS council met on 23 June, the day when most delegates arrived and registered. The buffet reception held at the Snowbird Amphitheater offered good food and music provided by the Musica Reservata, a group of musicians playing ancient instruments and featuring pieces from the time of Columbus to the present; just the right touch for beginning the conference held during the Columbian Quincentennial Year; towering mountains, clear fresh air, flowing stream, music, food and friend-

The first day of papers, including my own with the title *Star Tracks: Star Patterns in American Southwest Rock Art*, started the morning of 24 June. At lunch Lt. Governor Val Overson and Commissioner Bradley welcomed the group on behalf of the State of Utah and Salt Lake County. When I welcomed them on behalf of the conference hosts and planners, I took out the little Russian bird, blew into it one last time, then gave it to Mike Hutton, host for the 1994 conference, so that he could "enjoy" it for the next pair of years. I should briefly explain this. At the previous conference in Borlenga, Sweden, the director of the Moscow planetarium had given me a little ceramic bird which chirped when you blew into it. He said I should hear it once each day until the IPS 92 conference. So I told those assembled that I had faithfully done as requested; I had heard it more than 700 times and it had grown louder and more intense as the time grew neigh. I offered the tradition to Mike and he took it. I wasn't sorry to have that adorable, yet obnoxious, twittering thing in someone else's bedroom to chirp off the days until the next meeting.

Bill Gutsch, president of IPS, officially opened the conference. The head table represented the conference theme, "Role of the Planetarium, Past, Present and Future." It consisted of IPS past presidents, current officers (including president elect) and our keynote speaker. Bryce Chamberlain was masterful in his portrayal of Christopher Columbus. As he began talking, he put on makeup and costume, suddenly becoming Columbus. His drama focused on the parts of Columbus' life most relevant to planetarians. He ended with the warning that our most important discoveries might be unexpected, even not recognized during our lives, "Remember," he concluded, "it was I, Christopher Columbus, who told you so."

During the IPS business meeting, I was called out with the message that we had five minutes to decide whether or not to go on with the planned mountain barbecue or move it indoors. Although the weather looked threatening, in the spirit of adventure we decided to go up to the meadow on the mountainside as planned. Everyone rode the chair-lifts to the place where they found an unbeatable vista in the cool mountain air and excellent food. In the light of alpine-glow, a Native American elder offered a prayer to the four directions, to Earth and Sky, then voices and drums rang out and Indians danced in colorful costumes portraying textures of the universe expressed in motions played out amid rocks and grasses; everyone could feel the forces of nature all around. Beauty was everywhere; before, behind, above, below and within. Most people walked down the trail in twilight.

The first star party did not go as we wanted. On Hidden Peak, at 11,000 feet, there were some clear spots, but mostly cloudy. People seemed to enjoy being there in spite of the overcast and cold.

On 25 June there were workshops in the morning then busses took the group to Salt Lake for the afternoon and evening where delegates could do whatever they chose. HP had continuous shows to full houses: *The Endless Horizon*, *The Planets Show* and *Tale of a Comet*. We also premiered our new 3-D laser show. Busses returned the group to Snowbird where people could, if they wished, go up to Hidden Peak for another try at a star party; even though it was cloudy, I gave a slide talk up there in the frigid air and it seemed to have been appreciated.

Paper sessions took place in the morning and afternoon of 26 June with Ellis Miner giving a remarkable review of planetary exploration at lunch. That evening, Dr. Harry van der Laan, Director General of the European Space Observatory, was the banquet speaker. About 100 door prizes were given out and IPS presented a few awards. I felt honored to receive the IPS Service Award, the highest award the society bestowed. The final star party at Hidden Peak had decent sky at times and clouds at others.

On the last full day, 27 June, we split delegates into two groups with one going to Evans and Sutherland (manufacturers of Digistar) in the morning and the other going to HP; both groups were together for lunch at the Marriott where Ray Villard spoke about the Hubble Space Telescope; his title, prompted by the many problems encountered in the Space Telescope project, was, *The Good, the Bad and the Unbelievable*. The groups switched afternoon locations so that each visited both E&S and HP. Back at Snowbird that evening the weather was good so I arranged for a final star party to take place at the Snowbird pool and spa with lights off. Friends and colleagues lay in very warm water, looking out at stars they knew so well, sharing stories and cordial conversation.

On 28 June Christopher Columbus appeared again at the closing session, reminding planetarians that they should look to the future. Jim Manning conducted a panel consisting of delegates from around the world on the topic of making IPS a more world-effective organization. In it, he included a wonderful slide show that captured the IPS 92 conference with images he had worked on throughout the meeting. Mike Hutton talked about plans for IPS 94 in Cocoa Beach, Florida.

For the final activity, I called the conference planning committee to the front so that I could thank them for their outstanding work which had been enjoyed by so many. Again, I note here that our committee had included people from the planetariums at BYU, Weber State and others. I gave each of them a special gift; sand-cast silver stars with topaz crystals at their centers. I had personally gathered and selected the topaz gems and Teddy Henry, silversmith at Canyon de Chelly, had made the stars. Marré had wrapped each little box in recycled star-studded paper. I so much hoped those individuals knew how much their work was appreciated. IPS 92 was history!

But it was not over yet. The seventy-four delegates going on the post conference archaeoastronomy excursion boarded buses and departed for Moab with a stop at the John Wesley Powell Museum in Green River and a drive through Arches National Park. They got out at the Windows area and hiked, then we drove on to Moab for the night.

On 29 June we went to Hovenweep. We split into manageable groups and made sure everyone visited Hovenweep Castle, Unit Type House and Holly House. I stationed myself at the Holly House rock art chamber where I had an interesting experience between arrival of groups. Alone, I played my tiny ceramic flute. A small bird alighted on the cliff just above my head and sang its song. I played, then it sang. We tried to mimic each other. Over and over, we sang to each other. It was simply amazing!

We stopped at Four Corners Monument where people enjoyed shopping at the Indian craft shops, then stayed the night in Farmington, New Mexico.

June 30 was an especially full day. Up early, we traveled to Chaco Canyon and arrived at the trail-head to Penasco Blanco about 7:30 a.m. The six-mile hike to and from the Crescent and Star pictograph site went well. That is one of the most interesting astronomical rock art places in the world. We had a nice discussion sitting under those symbols that so simply, yet beautifully, depicted the Moon and a brilliant star. Following the hike, everyone got to visit the great kiva known as Casa Rinconada, inside which I played my flute to the eleven cosmic directions. They also explored Pueblo Bonito. After lunch at the camp ground, we drove through Window Rock to Tsaile, Arizona where we had lodging at the Navajo Community College (NCC) dormitories.

We visited the NCC museum where Harry Walters talked as he escorted the group around the exhibits. A traditional Navajo dinner was prepared and served at Tsaile Lake. Harry built a fire and the magic began. The "Pinion Nuts" — drums, flutes, guitar and singers — got the entire group singing under blazing stars. It was a night to behold, one to remember, a fine ending to a difficult, but wonderful, day.

At breakfast in the NCC cafeteria, I realized that starlight recharges planetarians. Those who had remained late the night before were buzzing about the experience. We drove to Thunderbird Lodge and boarded several "shake and bake" open-bedded trucks and went into beautiful Canyon de Chelly, branching left into Canyon del Muerto. We stopped at various star ceilings, ruin sites and Ceremonial Cave where we negotiated fee with Mrs. Anagel to go up and see one of the two finest pictograph sites in those canyons.

At lunch we made a significant discovery. This was at a site I had been to before, but as I stepped off the truck, I said, "It wouldn't surprise me if . . ." I noticed the faded stars in mid sentence. Thus, our IPS group discovered a star ceiling which I had not been aware of. I suppose it should be named the International Planetarium Society Star Ceiling, IPSSC for short.

After lunch we continued to Mummy Cave, then back down del Muerto and rounded the corner into Canyon de Chelly. One major stop was to see the star ceiling at "Dead Man Cave," CdC92. That seemed like an appropriate site for our IPS 92 group to visit. Inside the large rock chamber I said I was sure this was the largest group ever to gather in a Navajo planetarium (the star ceilings had been called "planetariums" in the earliest literature) and that it certainly was the most international one that would ever be there. We talked about star ceilings, speculating on how and why they had been made. I asked everyone to be completely quiet for a few minutes, listening to the pulse of the canyon. To end this wonderful moment of contemplation, I played my flute and recited *Song of the Stars*. The flute sounded so good in that chamber. Later, many said that had been the highlight of their trip.

After an extended stop at Whitehouse Ruin and a few shorter stops, we drove out of the canyon. We gave the group an hour to eat and shop at Thunderbird Lodge, then drove on to Monument Valley where we had a barbecue dinner and spent the night at Gouldings Lodge.

We took a short tour of Monument Valley on the morning of 2 July, then on to the Needles Overlook for lunch. A film crew was there shooting part of a movie. Everyone was overwhelmed by the spectacular vistas, un-

forgettable images displayed on the mineralized pages of the ancient book of Mother Earth's history. On the drive back to Salt Lake, Mike Hutton brought the "IPS Bird" to me and asked me to sign it. I scratched my pictographic signature into the bird and he said he would put his on it as well and at IPS 94 he intended to give it to the next conference host with the hope that the tradition would continue. (My pictographic signature consists of symbols of clouds, lightning, rain, Sun, Moon and star.)

Back in Salt Lake, as we took people to their lodging for the night, we felt good at having completed all we had so carefully planned to do to give our colleagues an enjoyable and valuable experience. Comments received also made us feel good. All of us were probably as tired as we had ever been before. My herniated disk was giving me major pain, yet I was so filled with gratitude for the HP staff and many volunteers, for Harry and Anna Walters and others at NCC; indeed, for too many others to list here. It was a monumental moment in my life!

On 16 July we held a public announcement of the ERA findings regarding a science center for Utah. The event was well attended and the announcement met enthusiastic response.

The problems with my herniated disk became worse and worse until I decided to have it corrected with surgery which was done 15 November, taking me away from work for most of the rest of the year.

### Stephen Hawking at Hansen Planetarium, 1993

When the 1993 Utah legislature convened we worked to attempt to have legislation passed to enable governance of the science center. Senator Ron Ockay had strong interest in seeing something useful done with the old Union Pacific Depot and he was also interested in IMAX. Thus, he was persuaded to sponsor a bill to establish a science center authority composed of fifteen citizens empowered with authority to establish revenue bonds and to study the possibility that the UP Depot become an arts and science center. Our work, then, was to meet with individual legislators and members of the committee considering the bill to be sure they were familiar with what we wanted to do. We were successful in getting the bill passed which awarded \$150,000 for study of the UP Depot as site for the arts and science center. Senator Jake Garn agreed to head the capitol campaign to raise money for the center.

The concept of an arts and science center was an engaging one. We felt that we had captured an idea which would make the center unique in all the world. We would explore many relationships between art and science and attempt to bridge the gap that all too frequently exists between art and science. For example, we would explore sound and music in great depth, from its inception in the sounds of nature to its grandest expressions in concert halls. If the center ended up in the UP Depot, the great hall of which had what many would label "horrible" live acoustics, we would have special music composed for performance there which would take positive advantage of the particular acoustics of that great hall. We discussed many similar ideas.

On 21 March 1993 cosmonaut Georgy Grechko lectured at HP, part of a lecture tour to the United States. He was the cosmonaut I had met in 1990 at the IPS conference in Borlenga, Sweden. Knowing that Grechko liked skiing, we took him to Alta where he enjoyed some time in the snow. He said it was the best day he had spent in the United States. We also took him to tour Temple Square where we had arranged a tour for him with a Russian speaking guide. On the same tour there was a Russian family; they immediately recognized the famous cosmonaut, showing great excitement at having met him. They said they had to come clear to the U.S. in order to get to talk with him. The HP lecture had been cosponsored by HP, the American Institute of Aeronautics and Astronautics, the Association of Old Crows and the Rocky Mountain Space Grant Consortium and attendance was by invitation from all the sponsoring organizations. Utah's astronaut Don Lind and his family were at the lecture and reception which followed. It had been an interesting day.

After having worked so hard to get the arts/science center authority legislation passed, just as the deadline was approaching for the Governor to sign bills, we learned that a small group of our museum colleagues had written to the governor to urge him to veto the arts/science center bill, that they had attempted to do this without our finding out about it until it was too late, and that the Utah Arts Council had also lobbied the Governor for that purpose. We could not understand why we would have such sneaky and unethical opposition from those who should have been our friends and partners. We had worked closely with the Arts Council, hand in hand all the way, since the idea had become to create an arts and science center. A member of the Arts Council was on the committee that created the legislation. The museums involved were those administrated by the University of Utah (Museum of Natural History, Arboretum, Fine Arts Museum).

As we studied that incredible situation and quickly combated it, we concluded that the reason they had taken the action they did was that they were envious of the fact that we had positioned ourselves for success and they coveted the funds we might get from individuals, organizations and groups who would want to support the center. The U of U museums also had plans for expansion and they feared that funds they might obtain would go to us instead. The arts groups in Utah were always that way. They wanted it all. In legislative matters, we were in the same pigeonhole with arts groups; the legislative committee that considered HP funding also handled arts funding. Whereas in the past we thought we had good relations with the arts groups, whereas we had supported their requests in all the ways we could, now we found that the support they had appeared to have given to us was not genuine. What a startling and sad situation that was. Where else, I wondered, would such a thing have happened except in Utah. We were able to defuse the matter and the Governor signed the bill.

Much of my time was being spent in arranging and holding meetings with Utah educators to be sure they understood the science center movement and would support it. I went throughout the state and met with all the district superintendents and others. In May, when we met with the Utah Centennial Commission, we learned that they had earmarked \$1,000,000 for the science center.

The next major star show for HP was one about the origin and destiny of the universe. We asked Stephen Hawking to be co-author on the script, working with Diane Beam, a member of our staff. Hawking was the world's best known living scientist. He occupied the same academic chair at Cambridge University that Isaac Newton had held. We had also asked him to come and lecture at HP. In May we learned that he would be coming and when the press found out they were astonished that such a famous person would agree to work with HP in that way. Local people, especially those in government and the media seemed to not really believe the things we had told them for so many years about how highly HP was regarded throughout the world. That lack of understanding happened over and over for many years.

Mrs. Philo Farnsworth whose husband invented the television tube invited me to her home to look at some of her husband's tubes that she wanted to give to HP. It was inspiring to hear her talk about her husband's work. I knew that the things she showed us must be preserved for their science history value, but HP did not seem like the proper place for such items. I told Max Evans, director of the Utah State Historical Society and Museum about my meeting and suggested that he attempt to obtain the items for his museum.

There was great excitement throughout the community when Stephen Hawking arrived on 2 July. Friends I didn't know I had come to see me wanting to get tickets to his lecture. We knew that, due to having ALS (Amyotrophic Lateral Sclerosis), commonly known as Lou Gehrig's Disease, he was in a wheelchair, that he had little bodily movement and that he could not speak. His "voice" came out of a computer which he operated by movement of his fingers. When we picked him up at the airport, accompanied by his two nurses and a graduate student, we were surprised. We had to run to keep up with him and he nearly ran down several people along his path.

Hawking was an amazing person. His body was gone, yet his mind was keen. Somehow he did not seem to be human, but at the same time he seemed so ultra-human. He could move eyes, fingers and, to some extent, his mouth. Later, I found myself describing him as a brain in a briefcase. From first meeting until parting, he continued to amaze all of us.

Stephen said he had always wanted to see the Great Salt Lake, so we drove to a place on the shore where he could get a good look at it. Then we asked if he might like to see the Bingham Copper Mine. He said yes, so we drove up to look into the world's largest open pit mine. From that point we had to go directly to the restaurant where we had reservations. We knew he wanted to see the recently released motion picture *Jurassic Park*, so as we were finishing dinner I said it was either desert or the movie. Stephen said "movie," so off we went. Very late that night we finally took our guest and his group to their hotel. We knew we were tired, and we could tell that his nurses and graduate student were also, but it seemed that Dr. Hawking would never run down.

Next day at a "whos who in Utah" reception, there was electricity in the air as the invited group awaited the arrival of the famous scientist. When

he did arrive I witnessed excitement at a level I had not seen before. It continued to build as people watched and waited for Stephen to collect his thoughts and enter them into his computer. Suddenly the tension broke as his computer voice said, "There are a lot of you out there. I doubt that I can meet you all, but I will try." Then, he rolled out into the audience and did so.

The Hawking lecture was at Symphony Hall. As the time approached, a line grew which was several blocks long. We learned that about 10,000 people wanted to get in; all but 3,000 were disappointed. We broadcast the lecture into the lobby on loudspeakers. When we went to the stage, there was standing applause which went on and on. Finally, I was able to make opening remarks of welcome and to introduce Joe Cannon, CEO of Geneva Steel, who had sponsored Hawking's visit. Joe turned to his company president, Robert Grow, who introduced Dr. Hawking. Stephen put the audience at ease with his good humor, saying that his synthesized voice got described as having an accent that was a combination of American, Scandinavian and Irish. Then he led the audience through black holes and baby universes. The 7,000 or so people who were turned away sent a strong message to community and state leaders that interest in science was high in Utah. We felt that the event had helped assure success of the science center. Throughout the evening we heard superlative comments such as, "The greatest scientific event in Utah history" and "The event of the century in Utah."

The following day we took Stephen and his group on a mountain tour. At 11,000 feet on Hidden Peak, snowflakes flew and the cold temperature made Hawking's computer screen go dark. We drove through Provo Canyon, past Bridal Veil Falls and on to the Homestead near Heber City for brunch.

Stephen had come to see the opening of the show he had helped produce as well as to lecture. At HP we had invited other scientists and science educators from Utah's colleges and universities. The show went well, then Stephen answered questions. Again we heard praise beyond anything we had experienced before. News coverage was phenomenal. Fireworks that thundered over the city on that Fourth of July evening almost matched those that still rumbled in our minds from the experience of that day.

Meeting with Stephen the next day, before he departed, I asked him for three favors: a statement from him which might help our science center effort; to allow us educational use of the video of his lecture; for him to return to Utah to help us realize our science center dream. He agreed to all of those requests.

Toward the end of August we selected an organization to provide a feasibility study for the old UP depot to be turned into an arts/science center. Having interviewed many candidates, final membership was established for the Science Center Authority, the board assigned to bring the center into existence. The first meeting of the Authority was held 18 November. In our 1994 budget sessions, the Salt Lake County commission awarded our request for \$150,000 to assist the science center project to get the capital campaign underway. Now, architects and others in the community became interested with the hope that they might be engaged for some of the work.

Salt Lake City held its first ever "First Night" celebration on the evening of 31 December. It was a New Years Eve event for families held downtown with lots of entertainment spread throughout the city core. HP had continuous free shows until almost midnight and nearly all of them were full. It was a great success, ending with a wonderful fireworks display at midnight. What a nice way to begin 1994!

### Celebrating 25 Years of Man's Journey to Another World, 1994

We brought cosmonaut Georgy Grechko back to Salt Lake on 22 February. Following a news conference he appeared at a banquet followed by his public lecture which we used to introduce our community to the 25th anniversary of the lunar landing that we would celebrate throughout the next six months. The following day we had Grechko speak to about 1,000 Utah middle and high school students, then we took him to the Provo headquarters of Novell where he spoke to employees. At Novell, Grechko learned about the Utah-Russia Institute being formed by Novell's Marlowe Ashton. He was excited about this attempt to develop Russian technology for economic use in America and wanted to be involved in it. Back in Salt Lake we presented the famous cosmonaut on the floors of the Utah Senate and House. Finally, Marré and I accompanied him to the Geneva Steel suite at the Delta Center for the Utah Jazz vs San Antonio Spurs basketball game. Others invited to the suite were members of the Utah Science Center Authority. Grechko had never seen anything quite like an NBA game; the Jazz won in double overtime. Before Grechko departed we took him to the Northwest Middle School where students lined a hall to greet him and where he signed one of his posters and presented it to the school to be added to their "Space Hall," a wall along the hallway filled with items commemorating exploration of space.

Our work with the 1994 Utah legislature proved to be high drama right to the end. In addition to working our HP funding in the usual way, we worked with Senator Ron Okey to sponsor Senate Bill 277 to fund "Leonardo on Wheels," a science center outreach program for Utah schools. We talked to as many legislators as possible to be sure they were well informed about the bill and to answer any questions they might have. Senator Okey used his good experience and put in \$150,000 in fiscal notes as well as in the bill, just in case the bill did not go through.

As the legislative session neared conclusion, we became more and more concerned even though we had been assured that the bill would make it through the session. On the next to final day, however, we found that SB 277 was not on the priority list and probably would not make it to the House floor. We wrote careful notes to all members of the Executive Appropriations Committee and asked key members of the Science Center Authority board to contact them as well.

On the final day we were nearly sure the bill was dead and also learned that the fiscal note had been whittled down to just \$35,000. Still, we decided to sit through the session to the end. About 10:00 p.m. Representative Kim Burningham informed us that the bill might get out after all and about 11:30 they listed a group of Senate bills onto the House floor, reading

the list which did not include SB 277. As we looked at each other in disappointment, we heard the reader say, "Oh yes, I forgot one, also Senate Bill 277." Our bill was number four on the list which they said they would work on until time ran out at midnight. SB 277 was passed about 11:40 p.m.; 54 yes, 5 no, 11 abstaining.

Next day Rep. Burningham came to HP to say that since SB 277 passed so late he had not had time to divert the \$35,000 note to another project he had in mind. Thus, we received \$185,000 instead of the intended \$150,000. That was one of the good things that happened in our efforts to establish a science center for Utah. It started the science center with an outreach program.

On 7 May we held a long-planned and carefully organized retreat for the Utah Science Center Authority. All but two members were present to develop mission statement and long-range plan which, we hoped, would put the science center on course.

The shadow of the Moon touched Earth on 10 May, producing a good partial solar eclipse in Utah. About 3,000 people showed up outside HP to observe the eclipse with telescopes properly equipped for safe viewing. My journal entry for that date included:

I had great sport giving people "free solar telescopes:" cards they put pinholes in to project the Sun image onto a card-stock screen. I believe they enjoyed this as much as anything. I would punch pinhole initials for them to see themselves in little partly eclipsed suns: I made a "2" for TV 2 cameras. School children punched their whole names out. We also showed people how to let a little light through fingers in clenched fists to see the eclipse on the shadow of their hands. Kids picked that up with great speed.

After so many years of working on the science center I began to get impatient with the slow pace it seemed to be going. We did all we could to kindle flames among those we needed to work with and to keep fires burning brightly. All the time, we kept hearing of others who wanted to construct IMAX theaters in the area and had to combat those as they came, because such a theater was a key component of our plan. I was sure that Salt Lake could not have more than one successful large screen theater and soon such theaters would be too common to be sensed as exceptional and thrilling. I knew that we must get our project through the planning stage, through funding and into construction, or we might lose it. As time passed, I got the feeling that before long science centers might pass their peak of newness and freshness in the public mind and there was the possibility that we could lose the heightened interest our project had captured. The slowness was primarily due to political sluggishness which was hindered as well by the opposition we had from some of our own museum colleagues who continued to exhibit jealousy over the popularity of our project and fear that a science center would detract from attendance they might otherwise enjoy. What I had learned from all my years, especially at the Smithsonian, was that any successful museum will enhance success at all other museums in the vicinity.

July 1994 was an exciting time at HP, with major focus on 20 July, the 25th anniversary of first human steps on another world.

The most frequent question of recent days was, "Where were you 25 years ago?" All of us of age to remember that day can answer specifically, and most of us were among those who stopped whatever it was we were involved in to listen and watch: more than any time in history, the world paused to become part of that historic event. Lots of media interviews and attention at HP.

HP had attention for another unusual event: the collision of pieces of Comet Shoemaker Levy 9 with Jupiter. One by one they hit and the results were greater than anyone imagined: even though the impacts were on the far side of the planet, the fireball plumes rose above the limb and the impact sites were clearly visible as they rotated into view, even in small telescopes. Never before have we predicted and observed collisions on planets.

Another event of note was the Deseret String Band in Cowboy Concert under HP stars, held three nights running. Several musicians, including historian of cowboy poetry and music Hal Cannon, played, sang and harmonised to the delight of audiences. That was in conjunction with our primary show, *The Cowboy Astronomer*.

At HP we also started experimenting with a new show concept. Instead of just one show, we introduced several shorter ones. In addition to *The Cowboy Astronomer*, for example, we had *Silver Moon*, *Comet Watch*, *A Cosmic String of Pearls* (about Comet Shoemaker Levy 9 impact with Jupiter) and *Splendid Summer Stars* — all showing together. This allowed people greater variety of selection and encouraged them to see more than one show as they visited. It also encouraged greater creativity from our staff who learned to produce shorter shows more rapidly and the shows utilized our audience interaction capabilities. Visitor response was very good.

In October I started planning for a really proper planetarium show on Native American traditions of the sky. The concept was to use Native American consultants to produce a show that would be interesting to anyone, but most important which would be deemed appropriate and proper by Native American people. I began lining up consultants and hoped to have N. Scott Momaday as co-author of the show.

In November, another critical point arrived with the art/science center project. In a meeting of the USCA executive committee with the Utah Arts Council, we learned that the arts representatives to the USCA had not been keeping the Arts Council properly informed. The Arts Council proposed a joint executive committee to make decisions and set policy and that was against the USCA legislation. The problem had to be resolved; either we would go with their participation or without it. We knew the project could not survive with a house divided.

In order to maintain accreditation with the American Association of Museums it was necessary for HP to do a year-long self study. We began that process in November. I knew how it should be done and was, myself, scheduled to be the chairman of a visiting committee for re-accreditation consideration of the Miami Museum of Science. At the same time we started planning for the thirtieth anniversary of HP which we hoped would include:

another visit by Stephen Hawking to initiate the Stephen Hawking Lecture; establishment of an annual HP event; and the finest set of shows IIP had ever presented.

Scott Momaday agreed to work with me on the Native American show. Indeed, he was very interested in the project. No other name would be more appropriate nor more important for that show.

### Hawking Helps Celebrate 30 Years of Hansen Planetarium Service, 1995

In January 1995, we started work on an HP production titled *SOL: Star of Life*. It turned out to be one of the shows I am most pleased to have been involved with because it did a nice job of helping people "celebrate" the Sun, becoming aware of their dependence on a star. For inclusion in the show, I wrote:

*A star shines near us  
Always rising somewhere on planet Earth.  
It's wave of light sweeps round the world;  
A pulse of power to change our lives.*

*Sunlight!  
A celebration  
Of transformation  
Of starlight into life.*

Our celebration of HP's 30th anniversary started when, on 27 January, both the Utah House and Senate presented to us a proclamation of honor for our sustained quality science education service.

In March I received an answer to my request that Stephen Hawking return to Salt Lake and present the first "Stephen Hawking Lecture." We told him we would take him to some wonderful places during his visit. He agreed to be with us following his participation in the Aspen Institute (an annual gathering of theoretical physicists at Aspen, Colorado) which ended 15 July. We scheduled his second Salt Lake City lecture at the U of U Huntsman Center (sports arena) on 17 July. Marilyn Nielson, my former U of U honors student and good friend of HP agreed to help us organize a VIP event related to Hawking's visit and our hope to develop a film project with him.

In mid-March HP installed the first Digistar II projector with brighter and sharper stars and faster data handling with much smaller computer (a whole room was vacated).

We were able to get lots of help for Stephen Hawking's second visit. A friend, Sue Bellagama, introduced us to Will Pettie in Moab who, along with Ellie Inskip, also of Moab, helped us arrange contributed meals and lodging while in the Canyonlands region. Hawking would stay at the house owned by author Robert Fulghum at Pack Creek Ranch and I was able to arrange additional lodging for Stephen's group and our own HP staff through Jane and Ken Slight, owners of Pack Creek Ranch. We obtained contributed flights to Moab and return to Salt Lake on a company jet. As with Stephen's

first visit, the entire HP staff helped with the many details, but two deserve special mention; as always, Sheri Trbovich, along with her husband John Sohl, made sure every detail was in order and Jayceen Craven and Richard Cox did more than their share of the work. We all worked long and hard to be sure every detail had been arranged.

Stephen's second visit was just as intense and interesting as his first had been. He was traveling with his nurse, Elaine Mason, who he would marry in September, two additional nurses, Mooi and Jermain and his graduate assistant Jon Rogers. On the day of his arrival, 15 July, Stephen's group, Ron and Mrs. Ockey (Utah State Senator), Marilyn Neilson and members of her family, several HP staff and a few others had dinner at the Roof Restaurant atop the Joseph Smith Memorial Building (old Hotel Utah).

On 16 July we held a dinner designed to win support for an IMAX film project we hoped to do with Stephen. HP staff member Diane Beam had initiated this project. The dinner was hosted by Marilyn Nielsen at La Caille, the nicest place to eat in Utah and one of the best anywhere in the world. At the base of the Wasatch mountains, the mouth of Little Cottonwood Canyon, a replica of a piece of French landscape had been created. Peacocks paraded freely around; grape orchards, ponds and waterways flowed along the grounds. The restaurant consisted of quaint rooms and shady gardens. Although it was a nice event, it did not produce significant funds for the project.

On 17 July we held a reception for Stephen at the Fine Arts Museum. A few people had come from across the continent; an archbishop of the Greek Orthodox Church had driven down from Vancouver, B.C..

At the Jon Huntsman Center on the University of Utah campus, we were concerned when we arrived 30 minutes prior to the lecture to find the place nearly empty. Then we learned that there were traffic jams approaching the area. Soon, the part of the Center we planned to use for the lecture began to fill. Following a video that combined Hawking's *Star Trek* piece and scenes of his 1993 visit to Utah, I welcomed people, making them aware that we were celebrating HP's thirty years of service. Having received Hawking's approval, I announced that this would be the first Stephen W. Hawking Lecture with annual lectures to follow (this never happened because of inaction of later HP staff and board after my retirement).

Some 10,000 or so people applauded Dr. Hawking out onto the stage. He said that was by far the largest audience he had ever addressed (more than twice the number he had faced before). It was probably the largest I had addressed as well in my introduction for the event. The lecture was titled *Does God Throw Dice where they can't be Seen?* In it he said that God does throw dice at every opportunity, and He does so where they can not be seen, in black holes, and that He has a few more tricks up His sleeve. People were thrilled with his lecture. Stephen also worked with us in planning for an IMAX film we hoped to produce with him (this never worked out in spite of much effort). We had a special fund raising dinner at La Caille, where Stephen spoke.

The trip we took Stephen and his group on was simply marvelous. On 19 July, we boarded a corporate jet and flew them to Moab.



We flew out over the mountains, circling Snowbird where Stephen had visited Hidden Peak two years ago. Mountain peaks, snowy basins, grassy meadows and forested slopes were replaced in our windows by plains and deserts, then the brilliant colors typical of the Colorado Plateau. Up-thrusted rocks revealed some of the deep set forces: San Rafael Swell; Comb Ridge.

The Green River came into view, cutting the layers underlying the Plateau. Tops of petrified sand dunes, Navajo sandstones, stood like candy drops on the layer cakes of the land. We followed the Green on down to the confluence, then circled back over the rainbow canyons and onto land at the Moab Airport.

At the Center Cafe in Moab, we enjoyed a delicious meal, contributed by owners Tim and Gretchen Buckingham, while Don Burge (College of Eastern Utah) told Stephen about Dinosaur digging in the area. They gave Stephen a plaque with a Utah Raptor claw and a full claw model along with a piece of dinosaur bone and publications.

After getting settled at beautiful Pack Creek Ranch, where Stephen and Elaine stayed in the very nice home of Robert Fulghum (author of *Everything I Needed to Know I Learned in Kindergarten* and other books), we drove up onto Island in the Sky where we shot motion picture film we hoped might be used in the intended IMAX film. With a storm approaching, we rushed Stephen into position on a rock against the edge of everywhere. Hard gusts of air brought what Navajos called "Male" rain. They rolled a bit of film before the winds threatened to turn Stephen's chair into a hang glider. We watched transfixed a spectral array which grew in size and brilliance, then duplicated itself in reverse color order — a once in a lifetime quality rainbow.

At the Jailhouse Cafe, owners Will Petty and Dave Lyle and staff treated us to an enjoyable and relaxing dinner. I played my wood flute and everyone sang songs. It was a happy way to end a beautiful and exciting day.

On 20 July with a guide from the Nature Conservancy, also Dan Murphy from NPS, we toured Arches National Park with stops at Park Avenue, the Windows, the view point of Delicate Arch. Then we went up onto the LaSal mountains where we had lunch beside Millcreek below Uhwah Lake amid mountain grass and flowers. Views from up there were outstanding. Stephen seemed to be inspired at every turn in the road. Back at the ranch, people gathered for an outdoor barbecue with invited guests. One of the guests was a nine year old boy afflicted with cerebral palsy so that he had to use the same kind of technology Stephen used in order to communicate. The moment Stephen saw this lad, he wheeled over to him, said hello through his computer and the two of them engaged in conversation for the rest of the evening. Stephen was so very sensitive to helping others in that way.

At the barbecue, we had several telescopes set up, one with CCD attached (charged-couple-device which greatly amplified the light sensitivity of the telescope), yielding outstanding views of whatever we wanted to look at under excellent sky conditions. I had invited my Navajo friend Kenneth Maryboy, who was preparing to be a medicine man, to the barbecue and asked him to speak, then perform a blessing. He used charcoal, crystals, sweetgrass and other items in a small part of the Blessingway that deals with

Earth, Sky and stars. When he finished the blessing, having burned sweetgrass in an abalone shell, Kenneth invited anyone who wanted to receive a personal blessing to go forth and be "smoked." Stephen immediately responded, followed by nearly everyone else.

On 21 July, before arriving at the airport, we had asked Stephen's group if he might like to fly over the Grand Canyon in route back to Salt Lake; they said we should not do that because they were concerned about all the things they had to do that morning relating to making connections at the Salt Lake airport. Feeling that they had not actually asked Stephen about this, thinking that he might see it differently and wanting to make the experience as interesting as possible for him, when we arrived at the Moab airport, ready to depart, we asked him if he would like to fly over the canyons. His immediate response was, "yes." Thus, in the jet provided by Barkan International we took off.

We flew out over Island in the Sky, noting Upheaval Dome, along the Colorado, circled Lake Powell at the dam, then watched the greatest canyon on Earth grow wider and deeper. We saw the water change with mixing color from the Little Colorado and marveled at the rainbows of the pages of Earth surface history opened to our minds. We circled over the South Rim, then headed out over the Kiabab forest. Nostalgia started to overcome me: the roads I had traveled with my boyhood family; the country that had nourished my mind and body.

I told the pilot I had grown up in Kanab. "There it is," she said, and so it was. Out over the monoliths of Zion, circling around once, then upstate and on into SLC. We arrived earlier than we had expected, with enough time to not need to worry.

Stephen said that was one of the finest experiences of his life.

Getting the group to their departing flight, we passed many people with some recognizing Dr. Hawking: "That's Stephen Hawking — what a thrill." At the other end of the comment spectrum, as I told the security guard who he was so that he could be admitted around the detector gates, another who overheard said, "That's not Stephen Hawking." We began to relax after saying good bye.

Once again, the media and so many others in Utah were amazed that the most famous living scientist, the one occupying the chair once held by none other than Isaac Newton, would come to Utah at the request of Hansen Planetarium. They simply could not realize how well known and highly regarded HP was throughout the scientific world. Above all the others who suffered from that lack of understanding were the Salt Lake County commissioners who's administration we had to operate under. They continued in their less than adequate political support given to our ambitious efforts to establish an outstanding science education facility for Utah students and residents.

## Winds of Change, 1996

With the election of a new commissioner, Republican Brent Overson, who's portfolio HP came under, science center things continued to lag. It was apparent that this commissioner would not be the political champion we so badly needed. We were so very close, having lined up nearly everything needed for success. The only missing ingredient was to have a high ranking politician decide that he wanted the science center to be his hallmark of accomplishment. I knew that we did not have that at least for another four or so years.

Even worse, Julie Peck, director of Administrative Services, the unit of County government I reported directly to, became my adversary. That young and pretty lady had been quickly appointed when the new commissioner took office; it was clear that something behind the scenes was going on. Whatever it was that established Ms. Peck in her position and put her on my case I did not fully understand, but I knew that she was close to some of those who opposed the science center project within the museum community, especially to the director of the Utah Museum of Natural History, our primary opponent.

Ms. Peck gave me my first ever negative performance evaluation. In it she cited reduced attendance and revenues at HP. She also indicated that we had not been as successful as we should have been with the Stephen Hawking events. When I responded, showing her the records, she quickly retracted the citations, pulling her evaluation from the personnel file and replacing it with an altered one.

After having struggled so long under the frustrating and difficult matters of having to operate under Salt Lake County government, I decided that I had had enough. So, I considered my desire to get out of regular employment and do the things which interested me most. I announced my retirement and walked away. My retirement reception was 17 May 1996, the same day I received the Governor's medal for accomplishments in science and technology.

In many ways I hated to leave without having accomplished some of the things we had worked so hard on. We were right at the end of our self study which would bring us continued accreditation with AAM, the hallmark of excellence within the national museum community. We had so much wanted to become one of the leading hands-on science learning places in the country. Under the existing circumstances, however, it was clear to me that some things were not to be within the political environment of that time and place.

When I left, Ms. Peck put out an RFP for management of HP and, not surprisingly, the Utah Museum of Natural History was selected to administer the planetarium. That really killed the science center movement. Since the UMNH was the other Utah institution with AAM accreditation, HP's self study also came to an abrupt halt and with that HP no longer had AAM accreditation.

The science center movement did not completely stop; a group of individuals who had become active with us continued to work on it without HP's involvement. At the time I am writing this (August 2005) the old Salt Lake Public Library (a new one was built a few years ago) is slated to become

"Leonardo at Library Square," a science/art center. It seems clear to me, however, that they have neither funds nor the degree of support needed to make it outstanding among science centers of the world.

Now a word about what has happened to the planetarium. After I had retired, some of the staff made an appointment with me and brought along Mike Clark, a young man who had done some work with us. Mike's father founded Silicon Graphics in California; a pioneer in the computer graphics field. Thus, Mike had inherited a fortune and he wanted to help HP which was now being administered by the UMNH. As we considered how that might be done, Mike said he was willing to give at least 2-million dollars for planetarium improvements and that he felt sure he could get similar amounts from his sister and other members of the family, resulting in around 7-million dollars, perhaps more. What a god-send had been dumped into the laps of those in control — how we would have worked for such a generous and kind gift! We decided that it would be good to have former Senator Jake Garn, highly respected republican leader who had flown in space, approach other political leaders and introduce them to Mike Clark for further discussions. He agreed, but when they met with Salt Lake County commissioners (also republicans) they would hardly listen. They were so embroiled in some hot battles within their own administrations, particularly with the County Attorney, and Mike was not a known person of importance within the community.

That was a mind-boggling situation! So very hard to comprehend! Over months of time Garn and others also met with state officials. Mike got tired of being so much ignored, but he maintained his interest in the planetarium. After the contract for management of HP by the Utah Museum of Natural History was not renewed following the trial period, there followed a divisive period when the planetarium had no real leadership. Eventually, however, Mike Clark did give enough money for the planetarium to be relocated at the new Gateway Center part of town with the condition that it be renamed for his mother.

Thus, the Clark Planetarium came into existence and former staff member, Seth Jarvis, Mike's brother-in-law, became the director. They maintained the name "Hansen" by naming the star theater the "Hansen Star Theater." That, at least, preserved, to a small degree, what the Hansen family had done for Salt Lake City and the state of Utah. The facility features an Evans and Sutherland "Star Rider" instrument — a video projection system which can generate and project color images that fill the projection dome, including stars. In addition, they have a 3-D IMAX theater. Even though the Clark Planetarium is among the best as far as equipment is concerned, Salt Lake's planetarium has become a very different kind of facility, one that more or less blends into the field without further recognition (as far as I know) as a world leader among the many. Being away from it, however, I might be wrong in that assessment. The shows I have seen certainly do not have the quality HP was so noted for.

I need to write a few words about IMAX finally coming to Salt Lake. Two of HP's former board members, neither of them helping HP significantly, but both of them learning a lot from their positions on the board, went out and built their own large screen motion picture theaters; one

at Larry Miller's entertainment center in Murray; the other at Thanksgiving Point located between Salt Lake and Provo. Now, the problem with large screen theaters is that all of them must use the same limited number of films, so it is difficult, if not impossible, for more than one to be successful in a city without huge population. In addition, IMAX and its clone large screen systems have been around for a long time, so they have lost most of their luster in the public mind.

Thus, both the science centers and large screen theaters have passed their extended moment of great success by the time IMAX finally came to northern Utah. I have attended all three of the theaters and every time attendance has been dismally small. (I have not, however, actually studied their attendance records.) Of all of them, fortunately, the one at the Clark Planetarium is the most successful because of its 3-D capability and its location. I surely wish them well. My heart remains with that facility.

### Retired?

Thus, starting in May 1996, I was free to "follow my bliss," as mythologist Joseph Campbell would have said. I let my friends at Utah Valley State College know that I might be available to do a bit of teaching for them, if they were interested. So it was not long before I was teaching a course similar to the one I had developed at the U of U for the honors program. In the physical science department I was appointed associate professor and given the position of scholar in residence. I continued to teach for UVSC until fall 2002 and maintained a working relationship with them beyond that year.

I improved the course and developed a complete textbook for it. Over half a dozen years, I taught one course each semester, taking a cultural approach to teaching basic astronomy. I called the course and textbook *Astronomy In Our Lives*. Near the end of each course I took students on a field trip to some combination of Hovenweep, Chaco Canyon, Dinétah, Canyon de Chelly, Edge of the Cedars and occasionally a few other places. I really enjoyed teaching, but the quality of students at UVSC was not anything like what I had known at the U of U. We certainly did have a few outstanding students, but most of them were neither prepared for nor motivated to succeed with higher education.

I feel fortunate to have enjoyed such wonderful opportunities for employment. Starting with washing dishes at a cafe in my home town, I was able to work as a scientist and educator in ways which gave me extreme satisfaction. My work brought me into frequent contact with the elite people — indeed stars — of astronomy, other sciences and additional fields of knowledge. I would not trade my experiences in the planetarium and museum fields for any other profession. I was able to recognize and respond to opportunities to become a leader in educational methodologies, such as sky interpretation in outdoor settings, resulting in traveling to and spending time in interesting places doing work that I would do even if I had not received pay for it. I worked at fine institutions: the Flint Community College (Longway Planetarium); University of Michigan; Michigan State University (Abrams Planetarium); Smithsonian Institution (NASM, the museum which achieved the

greatest attendance in world history); Salt Lake County (Hansen Planetarium); the University of Utah; and Utah Valley State College. Even though it was filled with frustration and stress, directing Hansen Planetarium with its wonderfully skilled and talented staff and volunteers, creating and sustaining the finest of planetarium, astronomy image publication and outreach programs, was, at least in retrospect, fully worth the struggle. I received additional fulfillment from the opportunity of working with young students, helping them move toward their dreams.

So, my cruise on the sometimes smooth, other times turbulent, both wonderful and wacky waters of the world of work was a voyage to remember and cherish. I feel a great debt to so many I have worked with, most of whom have not even been named here. It is they, more than I, who deserve credit for what the institutions where I worked accomplished. In my employment, I certainly did voyage among stars and they still shine brightly in my memory.

Even though I did continue to do some work for pay, mostly through unsolicited consulting opportunities, I let this bring to an end my record of employment.

20. Another treasure from the Great Lakes country is a piece of specular hematite from the northwest shore of Lake Superior. I tumbled the piece I put in my Medicine Basket. It must be viewed in direct sunlight to properly appreciate its gleaming beauty. When I look at it, I see Father Sky's stars gleaming from this bit of Mother Earth.

21. When my brother in law, Fen Covington, one of the brightest stars I have traveled among, was a boy herding sheep, he sat on a knoll where he found tiny five-pointed star-shaped fossils, now known as crinoids. These lend proof that the land I grew up in was once covered by ocean. At various times I have kept some of these on my desk to find the eyes of visitors who always ask what they are. "Meteorites," I told them. "Really?" they always asked. "Of course they are," I said, "can't you tell from the shape that they came down from the sky?" Many times I have gone back to that little hill to collect these stellar-shaped fossilized creatures from planet Earth. The ones in my Basket, inside a little vial with black top, symbolize so many things; among them is the love I have for my brother in law.

22. I am not aware of any type of stone that shows so many blatant questions revealed in its structure than does Picasso marble which is found in southern Utah northwest of the town of Beaver. I enjoy having a piece of this with me often and I have tumbled lots of it. I selected a piece for my Basket which has hidden within its features a tiny portrait of myself. Can you find it?

23. An envelope in my Medicine Basket contains copies of my high school graduation and my missionary farewell announcements. There are many other documents I could put in my Basket, but these two will represent them all.

24. I suppose any treasure trove should contain diamonds. The ones I put in are not composed of carbon, rather of quartz. There is a vial containing Herkimer Diamonds, the world's most perfect quartz crystals. For me, they are every bit as precious as diamonds made of highly compressed carbon and they are composed of a much more representative mineral from Mother Earth. The vial also contains some topaz crystals I gathered from Topaz Mountain, some of the most brilliant ones I ever found during my many trips to collect from those slopes. Readers curious enough to want to be able to discern the topaz from the quartz crystals should note that the Herkimer Diamonds are doubly terminated (pointed on both ends), while the topaz crystals have flat bottoms.

I certainly could put many more treasures in my Medicine Basket, but these are sufficient to help address the question, "Who am I?"

## SO, WHO AM I?

The only part of history a person really knows is that which he owns. Each of our stories is a tiny part of a great whole and it is important that each part be remembered so that we might know who we are, where we came from

and how we are connected to those who went before us. I have recorded my story so that others may know the tiny part I played in the enormous human saga on planet Earth. I give this story to you. Like any gift bestowed with love, I hope you will care for it, deriving what you can from it. Now this story belongs to you, my children, grandchildren, friends and any others who might read it.

How can anyone possibly adequately answer the question, who am I? This long essay is my attempt to do so. Even though a good story doesn't have an end, this book must. I have tried to look back along my trail; now I attempt to look ahead with hope that the future might hold things as exciting as those I left behind.

I am the product of my ancestors, my experiences and my thoughts. I am a complex of many influences wrought by others along the trails I have walked and the excursions I have undertaken as I voyaged among stars. Ending my dialogue concerning my voyage, I salute, now, those whose light fell upon me, energizing me to become more than I would have without those stellar influences. All hail to them for what they have given me, and hail as well to those I will yet encounter in my journey. Hail to those who will assist my children and grandchildren along their paths.

When I depart this wondrous planet, when my brief stay here is over, someone will be asked to write an obituary for me. As I end my story, I thought I would save them some time and effort by being so bold as to write my own. I guess it will serve as a summary of who I am for those who will gather to remember me at that time.

## OBITUARY

Von Del Chamberlain was born on 24 February 1934 in the home built by his parents in Kanab, Utah, one of the beauty-spots of planet Earth. He was the youngest of five children born to Cora Esplin Chamberlain and Edward Leo Chamberlain. He attended school in Kanab until his senior year which he spent at Granite High School in Salt Lake County, where he later was inducted into the Granite High Hall of Fame. He earned a B.A. degree with honors from the University of Utah with major in Physics, then received a master of science degree with major in Astronomy from the University of Michigan.

Von Del married Marre' Hollingsworth on 9 August 1957 and they became parents of five boys: Marsh Edward, Blake Von, Drew Fen, Ven Cameron and Brent Avery. They are survived by all except Ven Cameron who died in an automobile accident in 1965.

Mr. Chamberlain was active in the Church of Jesus Christ of Latter-day Saints all his life, serving a mission in Northern California, working in Sunday School leadership in several wards and stakes and in various other assignments.

Von Del's professional career was in planetariums and museums. During the initial lunar exploration years he was director of Abrams Planetarium at Michigan State University and he experienced the commencement of planetary exploration by spacecraft at the Smithsonian Institution's Na-

tional Air and Space Museum. As the Hubble Space Telescope began revealing stunning images of the grand cosmos he was director of Hansen Planetarium in Salt Lake City, a post he held until he retired from regular employment in 1996. During his career he taught classes for the University of Michigan, Michigan State University, University of Utah and Utah Valley State College where he was appointed Scholar in Residence with the Pope Southwest Desert Institute. He encouraged the National Park Service and other outdoor education agencies to include the sky in their interpretative programs and he lectured in hundreds of outdoor settings that ranged from parks to cruise ships. He was frequently engaged by sponsors of outdoor education and recreation field excursions to instruct thousands of people about phenomena of the sky and human interpretations of what we see there. He was especially interested in Native American astronomical interpretations.

Von Del was known for his research on Native American ethnoastronomy, was the author of many papers and articles on this and other scientific and education topics, and a book titled, "When Stars Came Down to Earth: Cosmology of the Skidi Pawnee Indians of North America." He was the founding member of the Great Lakes Planetarium Association and the International Planetarium Society, serving as president of both. He hosted regional and international conferences and received recognition for leadership in his work, research, teaching and writing. Among his honors was the Utah Governor's Medal for Science and Technology in 1996.

Von Del Chamberlain was trained as a scientist, his experience was that of an educator and administrator, he thought of himself as an interpreter of the sky, and his heart was that of a naturalist. The more he learned about the vast universe, the more deeply he loved the tiny Earth, this vanishingly small speck we ride upon as we explore the cosmos while each day unfolds the wonders of our lives.

### EPITAPH

OK, since I have written my obituary, I might as well write the epitaph for my gravestone as well. Here is what I would like to have carved on a polished hard black stone, nicely shaped by Nature. Along side a four-pointed star, please engrave the words: *The better he knew the cosmos, the more he loved the Earth.*



## POSTLOGUE

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