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MARY LEA HEGER SHANE

THE LICK OBSERVATORY

An Interview Conducted By
Elizabeth Spedding Calciano

Santa Cruz
1969



Mary Lea Heger Shane

On the terrace of her home

April, 1969

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INTRODUCTION

Shortly after the administration of the Lick Observatory was transferred to the Santa Cruz campus of the University of California in 1965, the Regional History Project decided that interviews on the history of the Observatory should be included as part of our proposed University History series.

The Lick Observatory, of course, has much more "history" behind it than our own very young campus. It was almost a century ago that James Lick, a rather eccentric California bachelor, decided, although he knew almost nothing about astronomy, "To expend the sum of seven hundred thousand dollars (\$700,000) for the purpose of purchasing land, and constructing and putting up on such land ... a powerful telescope, superior to and more powerful than any telescope yet made, with all the machinery appertaining thereto ... and also a suitable observatory connected therewith."

Lick began thinking seriously about building an observatory in 1873 and included it as part of a trust he set up in 1874. Lick changed the trust and his trustees twice before his death in 1876, but all three versions contained provisions for the Observatory. Upon its completion, Lick wanted the Observatory to be given to the Regents of the University of California.

In 1875 Lick selected Mount Hamilton, a 4,213 foot peak to the east of San Jose, as the site for his observatory and soon

thereafter arranged for Santa Clara County to build a road to the top of the mountain. Lick died at the age of 80 on October 1, 1876, and thus never saw his observatory take shape, but he had set the course and construction proceeded steadily for the next twelve years.

In 1888 the Lick Trustees conveyed the completed observatory to the Regents of the University of California; however a great observatory is never truly completed and over the years superb telescopes and ever more sophisticated machinery have been added. Thus the Lick Observatory is still today in the ranks of the world's outstanding observatories.

The Lick Observatory had the status of an independent campus of the University of California until 1958 when it was made a part of the Berkeley campus. On July 1, 1965, the administrative responsibility for the Observatory was shifted to the Santa Cruz campus, and in late 1966 the astronomers moved their homes and offices from Mount Hamilton to Santa Cruz. The observational facilities on Mount Hamilton, of course, continue to be used to full capacity by the Lick astronomers and their counterparts in the astronomy departments on the other University campuses. Visiting astronomers also use the facilities from time to time.

When the Regional History Project began planning its University History series, it was abundantly clear that our

first interviews on the Observatory should be with Dr. and Mrs. C. D. Shane. Dr. Shane, who is a former Director of the Observatory, first visited Mount Hamilton in 1914 when he was an undergraduate in astronomy at the University of California, Berkeley. He took his Ph.D. in astronomy at Berkeley and was twice a Lick Fellow (1916-17 and 1919-20); thus he worked closely with the Lick astronomers during this period. Some of these astronomers were men who had been with the Observatory since its very early years.

From 1920 to 1942 Dr. Shane was a member of the Berkeley faculty; in 1942 he became Assistant Director of the Lawrence Radiation Laboratory and in 1944 went to the Los Alamos Laboratory where he was Assistant Director in charge of personnel. In 1945 he was appointed Director of the Lick Observatory, a position he held until 1958.

During his tenure as Director he was faced with the postwar rebuilding of the staff, with putting into operation the Carnegie 20-inch Astrograph, with instituting a general building program to provide adequate housing and facilities on the mountain, and with the tremendous administrative responsibilities involved in the funding, designing, and building of the great 120-inch reflecting telescope.

Dr. Shane asked to retire as Director in 1958 so that he could devote more time to research; he and Mrs. Shane remained

on Mount Hamilton until 1963 when he became Astronomer Emeritus. They now live on a small acreage in a lovely hilly area near Santa Cruz.

Since his retirement Dr. Shane, who is a member of the National Academy of Sciences, has continued to be most active in national and international astronomy, serving on numerous advisory committees as well as lecturing, writing, and continuing his research. Indeed it seemed that on every visit the interviewer made to the Shane home, Dr. Shane was either packing for a trip or unpacking from one just completed.

Mary Lea Heger Shane's association with the Lick Observatory also goes back to her student days at Berkeley. She graduated in 1919 with a degree in astronomy and moved up on Mount Hamilton in July of that year for a year's postgraduate work, work which eventually resulted in her Ph.D. thesis. She married Dr. Shane in 1920 and completed her Ph.D. in 1924. She did not pursue a career in astronomy, but her training has proved an invaluable asset both in assisting in her husband's work (doing calculations, editing papers, et cetera) and in being able to enjoy and participate in the hours and hours of astronomical conversation that she is exposed to. She also, during both World War I and II, helped out in the manpower shortage by teaching math and navigation at UC Berkeley. For many of the years that her husband was Director of the

Observatory, Mrs. Shane ran a virtual guest house on Mount Hamilton since housing there during the post-war period was so limited. Visiting astronomers (whose visits lasted anywhere from a few days to as long as several weeks) were generally the Shanes' house guests, and while this inevitably must have meant a tremendous amount of work for Mrs. Shane, she emphasizes instead the interesting conversations and lasting friendships that resulted from these visits.

Mary Shane is an extremely modest woman who continually downplays her many talents. Perhaps her administrative skills become most apparent in the way she handled all the non-scientific preparations for the triennial International Astronomical Union meeting that was held in Berkeley in 1961. The 1,140 people attending were thoroughly impressed with how smoothly the ten-day conference ran. Mary Shane's two years of preparation and her "to-the-rescue" talents during the course of the conference were duly, if not solemnly, recognized when the assembled astronomers presented her with the "Great Seal" as drawn by Donald Menzel. (See page 232.)

Mary Shane also has a fine sense of history, and one of her pet projects has been the organization of the Lick Archives, particularly the hodge-podge of papers produced in the pre-1890 period. Despite the many other demands on her time, she has made good progress with this project and for years has been the

Observatory's unofficial historian-in-residence. It is hoped that at some point she will find time to write a definitive history of the Observatory's early years, for certainly no one is more familiar with the source materials than she.

At the time the Regional History Project was planning its University History Series, we knew that Dr. and Mrs. Shane were also high on the list of people that the American Institute of Physics wished to interview as part of their series on the history of astronomy. However, since it was uncertain just when the AIP would be able to do these interviews, and since their focus would be slightly different than ours, the Regional History Project decided to proceed with its own interviews of the Shanes.

Our first interview with Mrs. Shane was held at her home on November 7, 1966, and covered her childhood, her years at Berkeley, life on Mount Hamilton in 1919, and the early years of her marriage. A large portion of that session dealt with the workings of the Observatory in the 1919 period -- the apparatus, the astronomers, the duties of the graduate assistants, and the more mundane subjects such as food, lodging, water supply, and health care.

The interview took place in the Shanes' spacious, beautifully furnished living room; the walls were lined with books; a small stack of correspondence sat on the grand piano

(it was part of her continuing effort to get the widows and descendents of Lick astronomers to donate the astronomers' papers to the Lick Archives); on the sofa were some photo albums of her Mount Hamilton years that Mrs. Shane had thoughtfully unearthed for the interviewer*--in short everything was perfect with the unfortunate exception of the tape recorder (an emergency replacement) which persisted in humming and scratching throughout the interview. Mrs. Shane had already stated that she was a bit "machine-shy" as far as tape recorders were concerned and it is testimony to her wit and self-discipline that we were able to obtain a good interview in spite of the continually distracting machine.

Our second session with Mrs. Shane was held on March 22, 1967, during an all-day trip to Mount Hamilton. Mrs. Shane did the driving while the interviewer turned the recorder on and off as the conversation went from subject to subject. Once on top of the mountain we explored all the main buildings with the recorder catching Mrs. Shane's comments. It was understood from the beginning that the tapes made that day would be edited for continuity and clarity; the resulting 80 pages of manuscript contain a delightful array of comments and anecdotes on the history of the Mount Hamilton road itself (its construction, changes, and landmarks); the history, development, joys and

* pictures from these albums are reproduced on page 52.

pitfalls (sometimes literally) of the various telescopes; mountaintop living in 1919 and the post-1945 period; and on a variety of astronomers and observatories throughout the world. This was Mrs. Shane's first trip to the mountain since the staff had moved to Santa Cruz and she commented several times on how much the mountain seemed like a ghost town to her -- it had always been such a crowded and bustling place before.

Our final session with Mrs. Shane was held on August 1, 1967, at her home and started off with a description of her husband's career prior to 1945 and a discussion of former Directors of the Observatory. We then concentrated quite some time on the years (1945-1958) when Dr. Shane was Director of the Observatory. Here appears a wife's-eye view of the administrative and technical problems her husband coped with, as well as amusing vignettes of everyday life on the mountain. Mrs. Shane has a delightful sense of humor and an adept way of turning a phrase.

The last portion of the interview contained discussions about the various visitors to Mount Hamilton, the methods (and mishaps) involved in doing large-scale entertaining on a mountaintop, Mrs. Shane's work with the Lick Archives, and the 1961 International Astronomical Union meeting in Berkeley.

The manuscript was edited by the interviewer and returned to Mrs. Shane for additions and corrections. The Shanes checked

the manuscript very carefully and Mrs. Shane even made several trips to the Library to proofread the pages of the master copy. At no time did she try to "dress up" the wording or change the conversational tone of the manuscript, but she was concerned that the text at all times say what she meant it to say and made a number of small, but very pertinent, corrections.

The picture of Mrs. Shane used as the frontispiece was taken by Dr. Shane in April, 1969. The picture reproduced on page 112 came from the Lick Archives. The pictures on page 55 and 92 and the "Great Seal" on page 232 were loaned to us by the Shanes for reproduction. The map on page 71 was drawn by Wendell Simons, Assistant University Librarian. The name and subject index was done with two purposes in mind: the needs of the astronomical community and the needs of those who use our cumulative regional history index, hence the index is quite detailed and rather lengthy.

Copies of this manuscript are on deposit in the Bancroft Library, University of California, Berkeley; at the Center for History and Philosophy of Physics of the American Institute of Physics in New York; and in the Special Collections Room of the University Library at the University of California, Santa Cruz. This manuscript is part of a collection of interviews on the history of the University of California, Santa Cruz, which have been conducted by the Regional History Project. The Project

is under the administrative supervision of Donald T. Clark,
University Librarian.

Elizabeth Spedding Calciano

August 5, 1969

Regional History Project

University Library

University of California, Santa Cruz

THE HEGER FAMILY

Calciano: Where were you born?

Mrs. Shane: I was born in Wilmington, Delaware.

Calciano: What was your family doing there?

Mrs. Shane: My mother's home is in Wilmington, Delaware. My father had drifted from one place to another. Because of his mother's death he had gone to Europe and was brought up in Vienna. He went to college in Vienna and then came back to this country as an engineer.

Calciano: Was he American born?

Mrs. Shane: Yes, American born. He was presumably the first white child born in what is now the state of Washington, though that is not documented. He was born at a little army outpost, Fort Simcoe, near the present town of Yakima. His father was an army doctor in the U.S. Army and was stationed there. Father was born in 1857. I'm not sure how father's parents came west, but they went first to Benicia, then to San Francisco by ship, and again by ship to Portland. From there it took them several months to get to Fort Simcoe. Part of this was by small boat, and part by wagon or on foot. On their trip back to

the East Coast a few years later, I'm quite sure they crossed the Isthmus. Due to the hardships my father's mother became ill and soon after died.

Calciano: Oh dear.

Mrs. Shane: So he was a little fellow of seven or eight then. She didn't die immediately; I think she died when he was perhaps eight, and then later he went to Vienna and was brought up by a quite remarkable group of stalwart aunts.

Calciano: Were these his father's sisters or...

Mrs. Shane: His father's. His mother was brought up in Pennsylvania. This is in no way connected with the Observatory, but I have some of the old letters that she wrote home from Fort Simcoe in those days, written in '56 and '57 when she was a bride in what was really all Indian country.

Calciano: How interesting! Now was there just the one child?

Mrs. Shane: Yes. He was the only child.

Calciano: And he was educated in Vienna as an engineer?

Mrs. Shane: Yes, and then was further educated in this country at Stevens Institute.

Calciano: Where is that?

Mrs. Shane: I think it's in Hoboken, New Jersey.

Calciano: And he met your mother...

Mrs. Shane: He went to work for the Edge Moor Iron Company which was owned by my mother's first cousin, and they met in that way. And then they came to San Francisco very early, I think in '89, but it was traditional to be born in the old house so I was born in Wilmington, but came to California as an infant.

Calciano: Why did your father decide to live here?

Mrs. Shane: He was with one or more electrical companies of which one was the Westinghouse Electric Company that sold machinery for the early power developments in California. He is the one whose reminiscences would have been valuable -- idiot I who didn't realize it at the time. He knew and worked with many of the men who planned the early power plants through California that later were merged into the Pacific Gas and Electric Company. I still have vague recollections of traveling with him in the Sierra to remote reservoirs and power plants. I remember camping out and walking on the narrow boards on the flumes that carried the water to the power plants. This must have been before 1905.

Calciano: You say it was the tradition to be born in your family home? Do you mean your parents went back

there, or...

Mrs. Shane: My mother went back prior to my birth.

Calciano: Did you have brothers and sisters?

Mrs. Shane: I had two sisters and a brother.

Calciano: Were they older than you?

Mrs. Shane: Older.

Calciano: Oh. Then she only had to make the trip back once?

Mrs. Shane: I think they hadn't moved out when the others were born. I think they were still living in the East.

Calciano: Where did your brothers and sisters live after they grew up?

Mrs. Shane: One sister died in infancy. The sisters were twins. The surviving twin was here and graduated from the University of California in 1905 in a combined major of physics and engineering which was rather unusual for a girl.

Calciano: Oh my, yes:

Mrs. Shane: And she was the runner-up for University medalist. She was a very bright girl, and she died a few months after her graduation. A family tragedy.

Calciano: Oh no.

Mrs. Shane: My brother graduated in 1912 from Berkeley, so you can see I came by the University naturally.

Calciano: That's quite a record for one family, because not as many people went to a university in the early 1900's.

Mrs. Shane: No, but we all grew up in this area and it was natural to go to the University. My mother was not a university graduate. Girls seldom were then. But she had a very good mathematical and scientific mind. And so did the rest of the family. My father was oriented towards science.

Calciano: When your brother graduated from Berkeley, did he live in...

Mrs. Shane: He lived in Berkeley, and he died just recently.

Calciano: And what was his field?

Mrs. Shane: He was an engineer also. But prior to that all my father's family were medical doctors.

EDUCATION

Calciano: You went to elementary school in California?

Mrs. Shane: I started in San Francisco and then we moved to Milwaukee, and then to Los Angeles, and then back to Berkeley, and then to Belvedere, so I got a little spotty education.

Calciano: Was your father with one company the whole time?

Mrs. Shane: No, he left San Francisco and went to Milwaukee with the Allis-Chalmers Company. He was there for about five years and presumably retired, but he agreed to go to Los Angeles for two years with the Busch Sulzer Diesel Engine Company.

Calciano: Well now, when you say spotty education...

Mrs. Shane: I was at first one school then another.

Calciano: But you weren't out for a year, or playing hooky?

(Laughter)

Mrs. Shane: No, I wasn't playing hooky, but I think I was out a year in some of the transitions, and it didn't pull together very well, so I had some private tutoring to try to make up the gap. But I started high school at Miss Hamlin's in San Francisco and from then on I went through for four years.

Calciano: I see. That's a girls' school?

Mrs. Shane: Yes, an old, old school that gave a very good classical education; it was slanted toward Latin and the fundamentals.

Calciano: Oh, I see. Your scientific bent didn't have too much chance to show itself?

Mrs. Shane: Well, it was not encouraged. We had a small class in science, but it was not emphasized by them. That

didn't contribute.

Calciano: Did you know at that time that you were more interested in science?

Mrs. Shane: Yes, I always knew I was more interested in science, but I didn't know just what type.

University of California Berkeley

Calciano: Well how did you come to choose Berkeley as opposed to, say, Stanford or...

Mrs. Shane: The family tradition, I'm sure.

Calciano: You never even considered anywhere else?

Mrs. Shane: No, it just seemed the traditional thing.

Calciano: Did a great number of the graduates of Miss Hamlin's go on to the University, or were you among the minority?

Mrs. Shane: I think a fair percentage went on. I really can't answer that. It was a very small school. I think there were only fourteen in the graduating class.

Calciano: Oh my.

Mrs. Shane: I really haven't thought of what happened to them. No, I don't think too many went on. It was a good grounding -- general education.

Calciano: How did you arrive at astronomy as your choice of

major? Did you try other sciences too?

Mrs. Shane: I did. We had to put in a major in those days right at the beginning, and I think I put down physics. I also took chemistry, geology, botany, and astronomy. I think I was probably more influenced by the fact that it was a small department; the professors were very friendly. In a sense I felt welcome and at home, and of course I was interested immediately. I was also interested in the others, but they were more impersonal. The classes were big; I was used to smaller classes. Also the astronomy professors were singularly friendly.

Calciano: Did the University have a feeling of bigness back then at that time?

Mrs. Shane: Well it was, of course, nothing like it is now; it seems to me it might have been 5,000 or 6,000 in 1915 when I entered. But it was a big change from a small private school. However, I never felt lost because the majority of the specialized classes, as soon as you got on at all, were small in a small department. That was not true of the big Chem. 1A which was, I suppose, 500 even in those days, maybe more. There was more than one section.

Calciano: The University is condemned so much now for the

extensive use of teaching assistants and the anonymity of the students. Was it true even then that they used T.A.'s in the big courses?

Mrs. Shane: Well, they did use T.A.'s a great deal. I was a T.A. myself my last year.

Calciano: Your senior year of college?

Mrs. Shane: My senior year.

Calciano: Oh!

Mrs. Shane: But I think, of course, that they weren't used as widely as they are now. It was trifling compared to now.

Calciano: Were there any counterparts at that time to our present beatniky types?

Mrs. Shane: Well, they were counterparts in a slightly different way. I think there was a cult of the junior cords. Juniors wore corduroy trousers which people initialed and which were not supposed to be disturbed, I think, for months on end. (Laughter) Certainly that was not very beautiful. The seniors wore a thing called the senior plug, if I remember rightly, which was sort of a soft squashed top hat. But I don't think the students set about outraging the public in quite the same way that they do now.

These were more within the group. I think that people on the outside laughed at them and said, "Aha! University of California students again," but they didn't have the influence in a political way and in general ways. At least that would be my feeling.

Calciano: It didn't create the resentment that...

Mrs. Shane: No. It was just all fun within the University. At least I would think of it more or less in that way.

Calciano: Were there many girls in the University?

Mrs. Shane: Oh yes.

Calciano: What percent would you say?

Mrs. Shane: I think there were fewer than men, but there were still a great many.

Calciano: And in your discipline there would be...

Mrs. Shane: Fewer.

Calciano: Considerably fewer?

Mrs. Shane: Oh yes. There were, however, a few.

Calciano: You weren't really bucking any considerable prejudice then?

Mrs. Shane: No. Astronomy had at that time a number of women teachers and a number of women astronomers and a

certain number of women students, but they were perhaps one to ten, of that order of magnitude. They weren't a rarity; they were a minority.

Calciano: Was astronomy an important department at Berkeley at that time? Had it built up its reputation?

Mrs. Shane: It was a very outstanding department because it was led by Dr. Leuschner who had made a very fine reputation in theoretical astronomy, the computation of orbits, and the perturbations of the minor planets. It's a field that has gone into more or less of a decline, except in the matter of space science and orbit computation in a very, very different way. It's important, but it's from a completely different point of view.

Calciano: Is part of its decline because our equipment is so much more sophisticated?

Mrs. Shane: Yes, it is. We used to work hours and hours to turn out the same amount of computing that the machine does in a second. It's a totally different world.

Calciano: This man Leuschner, had he been there for quite a few years?

Mrs. Shane: Yes.

Calciano: So he had built up the department?

Mrs. Shane: Yes, he had. And it had a very fine reputation in its field; it trained a lot of various people.

Calciano: And was there much connection between Lick and it?

Mrs. Shane: Well, the type of work was quite different because the work of Lick was in observation. The work at Berkeley was in general theoretical. But over the years there was some exchange of personnel. When I was in the University it was in the war years, and a good many of the people went into war work, so some of the people in the Lick Observatory came down and taught in the Berkeley department, and I had some of the Lick astronomers as my teachers in 1918.

Calciano: I see. Was there much of a relationship between the physics and the astronomy departments?

Mrs. Shane: There was between physics and astronomy in the very young matter of astrophysics. That was in the very early days of atomic theory and the Bohr atom and things of that sort that are now so elementary. There was a crossing in that field.

Calciano: Was there rivalry between the two departments, would you say?

Mrs. Shane: I had no consciousness of it.

Calciano: Nowadays many universities seem to have a sort of a pecking order. Theoretical physicists look down on

the regular physicists, and they in turn look down on the...

Mrs. Shane: Well I wouldn't be in a position to know; everything looked lovely to me up at Berkeley. My Ph.D. major was in astrophysics which was a hybrid of the two in that there were courses taught in both departments which touched on the other department. That is the physics department taught optics, which was usable in astronomy, and they taught spectroscopy, which was usable in astronomy.

Calciano: Who were your major teachers? Do you want to talk about any of them in particular?

Mrs. Shane: In astronomy, Mr. Wright, who came down from Lick Observatory and was subsequently the Director, probably gave me more inspiration toward future work than anyone. And it was, if I remember correctly, a term paper of some sort that I wrote in a course of his that gave me a clue for what I would use for the Ph.D. topic. But I can also thank him for one thing which I've never forgotten. I remember his saying, "Never believe anything you read in a book. Prove it for yourself." He said, "Don't accept it as true because it's in a book." And that is, I think, very sound scientific advice.

Calciano: A sound bit of historical advice too.

Mrs. Shane: That might be. Well, then Dr. Curtis came down from the Lick Observatory. I think his is a name that I should mention. He was an astronomer from Lick Observatory who went from there to be Director at Allegheny. He left Lick at the end of 1920. When he came down to teach at Berkeley I was fairly well along, a junior perhaps, and the classes were small, perhaps eight or ten, and several times he invited us all to come up to Mount Hamilton to spend the weekend. I can remember full well going up there at least upon two occasions when Mrs. Curtis wasn't even there and he just said, "Now come in and make yourselves at home." He produced lots of food and we all cooked it, and can you imagine a professor with that courage? (Laughter) But you can see that one is easily won over to a department which can operate and did operate on such a personal level. He was a person who had tremendous enthusiasm for his own work and for your work. He was just bubbling with enthusiasm. And if he found something that couldn't wait, he couldn't even go to bed. He had to tell everybody first thing in the morning what he had observed. He was a person who shared his enthusiasm

and inspiration with his students.

Calciano: How wonderful.

Mrs. Shane: And I would have called him a very good teacher. One that carried you along and made you want to do something yourself. Of course not too many teachers in big classes can do that. I was in one of the early, I think the second, class that Hildebrand ever taught. Chemistry. I took Chemistry 1A when he was a very young and exciting teacher. Do you know him?

Calciano: I know of him, partly because my father has mentioned him.

Mrs. Shane: Yes, of course, your father knows him well. He was an extremely good lecturer and always doing fun things. Before the Big Game we had smoke experiments, fire experiments, that came out into big C's and golden bears and one thing and another. Of course I only had an elementary course with him and never went on, but I certainly enjoyed him.

Calciano: You didn't need a great deal of chemistry for astronomy?

Mrs. Shane: Not very much. Not for the type of astronomy that I was doing. You needed some. I never took organic. I

just took elementary, the one year. And then, of course, there were the various colorful teachers in the University such as Andy Lawson in geology.

Calciano: I don't know anything about him.

Mrs. Shane: He was a very dynamic and unusual person given to not mincing words with students who needed discipline. There are funny stories about him.

Calciano: Any that come to mind?

Mrs. Shane: Oh, there were just so many that it would take all afternoon.

Calciano: Did you have him for...

Mrs. Shane: I had him in an elementary course. I sampled all these various sciences just in the 1A & B courses and loved them all. I always loved every kind of science.

Calciano: Did you have any kind of earth-shaking experience with him, or...

Mrs. Shane: I wouldn't say earth-shaking, but in his class there was never a time you didn't leave with a chuckle. I do remember one amusing incident. The lecture was given in a room at the end of California Hall which sloped down to the ground level outside, and across the open double doors at the foot the blackboard was pulled down so Lawson could write on it. And one of

the students, I remember, was trying to sneak in one day, so he waited until Lawson had written something and then turned his back to the blackboard and was lecturing to the class. The student then bent over and tried to sneak in under the blackboard. Andy could tell by the titters in the audience that something was happening. He didn't really look around, but he somehow or other noted it, and he turned quickly and just removed the gentleman about twenty feet out into the field and went on lecturing and didn't miss a word.

Calciano: Oh no!

Mrs. Shane: He was always full of little byplay that made it so entertaining. (Laughter) And I think he was a very good teacher, too. This is out of the realm of the sciences, but you can see that I have happy memories of the University of California.

Calciano: Did you take many courses in the liberal arts? Was English required?

Mrs. Shane: English was required and I struggled through it with no enthusiasm. And I probably have done more writing since I was out of college than I ever used astronomy. So...

Calciano: You never...

Mrs. Shane: You never can tell, that's right. And I rather enjoy writing now, but I certainly didn't at the time. How the change came over me I don't know.

Calciano: What were your languages?

Mrs. Shane: Well, German primarily, and on the side enough French to pass the...

Calciano: For your Ph.D. requirement?

Mrs. Shane: For my Ph.D. requirement. I don't know how to speak French, but I can read scientific things.

Calciano: Did you live at home while you were going to college?

Mrs. Shane: No, I rented an apartment with a friend for two years, and then she went East and I went to a boardinghouse. I never did belong to a fraternity. Or a sorority rather. (Laughter)

Calciano: That would be quite a record!

Mrs. Shane: That would be quite a record, wouldn't it?

Calciano: Did your family live in Berkeley at the time?

Mrs. Shane: They lived in Belvedere.

Calciano: I see. Did they have dormitories for the girls who didn't want sororities, or was that not done then?

Mrs. Shane: I don't think they had any. I don't believe so. I think the University didn't administer them. There

were a good many boardinghouses, and of course sororities.

Calciano: You know to this day there are certain foods my father absolutely will not eat because he was served them so many times in boardinghouses. (Laughter) Do you have any such memories?

Mrs. Shane: No, I haven't, because I lived with an old family friend who had a big home in Berkeley and had about four or five girls living there. They were all family friends so it was more like a home. It wasn't a boardinghouse in the sense of mass production.

Calciano: Did you belong to any organizations or have any activities?

Mrs. Shane: I was solely athletically slanted, I grieve to state. I had no social interest whatsoever. I don't think I went to a single dance the whole time I was in college.

Calciano: But you did participate in...

Mrs. Shane: I participated in sports in the girls area, and I was an avid spectator of sports -- rallies, and all that sort of thing, but not social activities. I seem to have had a blind spot there.

Calciano: I guess much of your life since has been spent in the social sphere.

Mrs. Shane: It's funny how you start one way and go another. But that seems to have been it.

Calciano: What type of athletics did they have?

Mrs. Shane: Swimming, basketball, and baseball that I participated in. Three. And I think there was also soccer.

Calciano: Were these intramural competition, or what?

Mrs. Shane: Intercollegiate. We played Stanford and Mills; I think no further away than that.

Entering a Ph.D. Program

Calciano: Do you remember how you started to work for your Ph.D.?

Mrs. Shane: It was one of these things that I grew into. I had been fortunate in going up to the Lick Observatory with Dr. Curtis on these trips, and I saw all these people going along to higher degrees, and it just seemed, again, the natural thing to do. I don't think I meant to take a Ph.D. when I first went up. I just wanted a little observatory experience. And very fortunately this idea I had had in undergraduate work just panned out too well. It became a ready-made thesis so it was all done within

the year. And then I went back and took the courses.

Calciano: I was wondering!

Mrs. Shane: Yes, you see I did it backwards. Most people take their courses, then go up and do their thesis work, but I fell into the thesis. And so then after I was married I went back and took the courses. Of course it took me a very long time. I think I was five or six years finishing, but I did it on a very part-time basis.

Calciano: What did your family think when you said that you were going to study astronomy?

Mrs. Shane: I don't think I recollect.

Calciano: Did they support you, or you supported yourself, or...

Mrs. Shane: Well, it was not a very expensive affair in those days. Living cost something like fifty dollars a month. And, of course, there was essentially no tuition. I earned a little as a T.A. in Berkeley and my family filled in.

Calciano: You mentioned last May that you refused to be subsidized in any way at the Lick Observatory.

Mrs. Shane: Well I didn't want to apply for a fellowship or be a paid assistant because I just was not sure I wanted to stay with astronomy. Being paid created something

of an obligation to go on, and if I didn't, I would have felt they wasted money on me that might have gone to a more worthy student. So I went to Lick as a volunteer assistant, though I worked on just the same basis as everyone else in the group.

Calciano: What was the topic that you did your thesis work on?

Mrs. Shane: It had to do with the stationary sodium lines in certain binary stars. That is, as these stars go back and forth in the line of sight, the wavelengths are normally shifted, but lines of certain wavelengths due to sodium didn't shift. This showed the presence of interstellar absorbing material. This was just such a neat, clean-cut, easy problem that it was simply irresistible. You know what I mean? It was as though the thesis came and said, "Take me."

Calciano: Well, did you get at this mainly by observation, or was there a good deal of theoretical...

Mrs. Shane: Oh, it was observational. Theoretically it was extremely simple.

Calciano: Did you turn the thesis into a paper that was published?

Mrs. Shane: It was published as one of the University's Lick Observatory Bulletins.

Calciano: Did you work with your husband at all on this?

Mrs. Shane: No, he had his own research problem. We met up there; I think he was there when I went up. He was still working for a degree.

Calciano: But you weren't assisting him?

Mrs. Shane: No. We were part of the small group of young people who were working for degrees or assisting the astronomers in their work. That was a happy, hard-working year.

THE LICK OBSERVATORY 1919

The Role of An Assistant

Calciano: Let's start out with the first time you went up to Lick, while you were still an undergraduate. What were some of your impressions of the Lick Observatory, the area, the buildings...

Mrs. Shane: I loved it right from the very beginning. To me it seemed a very exciting place to be and to work, and I was excited by all the things that were done. Of course when we came up there to live we had a great deal of fun, many good times, and it was a very friendly community; at least it seemed so to me as far as I touched it. The men up there, the

professors and their wives, were always awfully nice to the students. I loved working with the different men, working at night on the telescope, which I wouldn't feel like at the present moment I'm sure, but I was a young person.

Calciano: How exactly would you help them? What would you do?

Mrs. Shane: Well, at first you learned how to do the observing, and then as you became more expert you observed alone. And if you had a problem of your own, you were given a certain, amount of time to work on it. Otherwise you worked on Observatory programs. But I think we were passed around from person to person to broaden our experience. We learned about the use of the different instruments and the different sort of work that was being done.

Calciano: I'm a little confused. If an astronomer was working on a particular problem, did he have to have his eye glued to the eyepiece, or would he...

Mrs. Shane: Well, he would have to take long photographic exposures. He provided the brains as it were, but once an object was picked up and identified, it was occasionally a matter of taking its photograph for as long as four or five nights when all you did was to keep a star in position, and it was extremely

monotonous and dull. And that was what the assistants were used for in the early stages of their training -- they'd do that nightly, just keep a star trained on the cross wires or the slit of a spectrograph. Of course you have to know how to operate the telescope, and it's intricate in many ways, and you have to be especially careful because a telescope is a very valuable piece of equipment and a little inattention could ruin it. And then you learned how to develop the plates. In those days you couldn't buy the plates sensitized outside of the photographic wavelengths, and we used to sensitize our own plates and experiment with the various dyes, dipping the plates to make them sensitive in the long wavelengths. There was a lot of technical work of that sort.

Calciano: Well now, while you were sitting watching to make sure the star was in position, would the astronomer be in another room working? Or was he in bed sleeping?

Mrs. Shane: It depended. If he didn't have much confidence in you he would be standing by, but as you became more competent maybe he would work with you for an hour to make sure everything was going well and then go

off. And, finally, we would be assigned to take plates for other people with no help at all when we were trained to do it.

Calciano: Would there often be times when you would plan on working from dark to dawn, or was it just occasionally that you'd work that long and usually you'd work regular daytime hours?

Mrs. Shane: Well, it depended on the type of program you were working on. Sometimes you observed long stretches at a time; other times you would be working up results and hardly doing any observing. So there was no regularity about it. But the major telescopes that were used to observe, and still are, were scheduled very closely because it is valuable equipment.

Calciano: What are the productive hours of viewing? Did you usually stop about half an hour before dawn?

Mrs. Shane: It depends on the type of work you're doing. If you're doing visual work you can start as soon as you can see an object. If you're working on faint objects photographically you have to wait until all the light has gone.

Calciano: You liked the long winter nights, didn't you?

Mrs. Shane: Well winter nights were mighty cold, and you couldn't heat the dome because it would spoil the

seeing. When I was a student there was no way of keeping yourself warm except by additional clothing, and of course your hands have to be kept uncovered most of the time in order to work on the telescope.

Calciano: Oh dear.

Mrs. Shane: Yes. But now they use these electric suits that were war surplus. You keep yourself as warm as you want in these suits. You plug yourself in and wander around like the men from Mars.

Calciano: Oh how funny. Electric suits.

Mrs. Shane: Well, they are very useful. My husband wears one now when he is working in Flagstaff. The nights are cold in a dome even in the summer, and in winter they are incredibly cold.

Calciano: I presume there weren't too many cases of pneumonia, were there?

Mrs. Shane: Oh no. You get used to it. But it isn't ... observing is hard work. At least most parts of observing are, because it takes a long, long amount of time and gets monotonous. Of course if it's interesting observing where you take short exposures and change objects often, then you're doing something and it's more exciting, but a great deal of it is monotonous, and what we used to do was to

memorize poetry. You'd have a book on the observing stand and look in the telescope, and you wouldn't have to look for another minute or two so you'd go over and pick up another few lines and come back and see how far you could go. My husband used to memorize a lot of poetry that way, and so did I, to pass the time.

Calciano: Oh, how intriguing. Why didn't you read a mystery story, or...

Mrs. Shane: Well the continuity. You've got to break too often and poetry just seemed to fit. Now maybe somebody else could do a mystery story, but it all depends entirely upon the type of observing that you're doing. But most observing takes fairly close attention.

Calciano: Well then I gather you could have some lights on in the dome?

Mrs. Shane: A very low light over the observing table. That's where the books sat and the clocks and charts that had to be consulted. The light was not suitable for long reading, just an occasional glance.

Calciano: I can see why the astronomers valued their assistants.

Mrs. Shane: Well the assistants were mostly in the learning

stage. Most of us, I think, regarded it as quite a privilege to work with the people and learn as an apprentice. The old type of apprentice -- learning. from watching and talking. You see we could talk, discuss problems. It was just like a private lesson in astronomy if you wanted to talk about astronomy. I certainly wouldn't say it was the sole topic of conversation. There were many lighter moments.

(Laughter) We were all human.

Working the Apparatus

Calciano: You mentioned that there was quite a bit of physical work in this business of being an assistant. Closing the dome and...

Mrs. Shane: Yes. Much of it now is motorized that was not motorized in those days. Now there's a motor for closing the shutters. You just punch a button and the heavy shutters slide together. Back then you pulled an endless rope over a pulley. It was a matter of five minutes or so to close the shutters and to pull up the windscreen. For the 12-inch telescope the clocks were wound by the good old method of winding them up by hand. They were weight-driven clocks, and some of the weights were fairly

heavy. Those drove the 12-inch telescope in right ascension so the telescope would follow the stars. Now the majority of those controls are electric.

Calciano: Well now, as the telescope would go around to keep up with the earth turning, would you have to keep opening up different sections of the dome, or did the dome go around?

Mrs. Shane: The dome went around. There were shutters that ran out to the side leaving a slit open and then the whole dome turned. The dome always turned in some mechanical way, but the shutters you had to close by pulling on ropes.

Calciano: That was what protected the telescope?

Mrs. Shane: Yes. And then there is another protection in the other axis, up and down, known as the windscreen, and that had to be pulled up and down. So there was a fair amount of manual...

Calciano: Well, how did the whole dome turn? Somebody must have done something.

Mrs. Shane: It turned mechanically.

Calciano: With a motor?

Mrs. Shane: Yes. I think originally probably it was a water motor. Electricity came in later years. When I was there, it was done with an electric motor. There was no electricity brought into the mountain in 1919. There was some generated with an engine and stored

in a big storage battery. So the use of electricity was very limited.

Calciano: When did electricity come up there?

Mrs. Shane: I don't remember. That occurred in the span of years when I wasn't there.

Calciano: You also mentioned that you had to lug around eyepieces?

Mrs. Shane: You had to change the equipment depending upon what the observer was doing at the telescope. You could observe either visually through an eyepiece, or you could observe photographically with a spectrograph, and to change over from one type of equipment to the other is a rather heavy job. And that has to be done still, to some extent, manually.

Calciano: Were there very many girls doing this work?

Mrs. Shane: Not many.

Calciano: You said something about how you did it by yourself without help.

Mrs. Shane: I was quite strong and I could do it, but I'm not sure that all of the girls were able to. It took a fair amount of physical strength to do it and the person for whom I made the changeover was Dr. Aitken who was fairly along in years and really wasn't physically able at that time to make the change,

though I'm sure he had earlier in his career. But mostly that was no job for a girl.

Calciano: These things that you were lugging around, I imagine they were worth thousands of dollars, weren't they?

Mrs. Shane: Well, you could get into trouble and destroy thousands of dollars worth of property. Maybe the particular piece wasn't so valuable -- in one case it was simply an iron core to counterbalance the telescope when the lighter eyepiece was on. We were given a good deal of serious talk about precaution. It was an invariable rule that heavy hooks secured to the floor should be hooked to the telescope before anything was touched to put it out of balance. And upon two occasions that I know of, it did get away from the observer.

Calciano: Oh. What happened?

Mrs. Shane: Well, in one case when Dr. Trumpler was reversing the telescope from the floor, which is a tricky business, it got away from him. He tried to stop it by bracing himself under it, and he received a very bad injury to his leg, which I think he probably never quite regained full use of. It smashed his heel. And then not too awfully long ago some young assistant up there, I believe, did not put on the

safety devices and the telescope, the eye end, started to go up. He held on to it trying to hold it down, but his weight wasn't adequate, and after it had gone up in the air quite a long distance he finally let go, and he was very badly injured. He came out of it all right, but there was some damage done to the telescope. It didn't break the lens, but it was just awfully good luck that it didn't. I think they had some extra equipment on it and that came down and took the blow and saved the lens, but the young fellow was badly hurt. They brought a helicopter up from San Jose and landed it right at the Observatory and took him to the hospital. So it's nothing to toy with. You have to be careful. And of course the other telescope, the Crossley, has a high gallery from which you have to observe, a little sort of floating platform, so you pirouette on the edge of it and lean over to observe. It's a long way down, and three people that I know of have gone off of that, and they were badly hurt. This Mr. Wright that I spoke of, he was the Director in the 1930's, said the only way to observe in comfort with the Crossley was to flood the dome with water and observe from a boat. (Laughter) We thought it was a

nice idea for observing.

Calciano: Why did they have such a careless system?

Mrs. Shane: Well, it was an old, old mounting. The telescope was given in 1895 by someone in England whose name was Crossley. And it was a mounting that was just not well designed for the comfort of the observer. It was a very tricky telescope to use.

Calciano: And they never could change the layout?

Mrs. Shane: They made certain improvements. It used to be that they observed from a narrow plank. They laid this plank between two flights of stairs and walked out on this plank in the pitch darkness. It was about twelve inches wide, I think, and it was a drop of a good many feet. I should think about twenty feet at least down to the floor. It was a good long way.

Calciano: Oh my goodness.

Mrs. Shane: Then they built a platform that followed the stairs and you worked on the platform. It presumably had a rail around it, but the rail interfered with the telescope in some positions so the astronomers were a little careless about putting up the rail and there were several accidents. That was not an easy one to observe with.

Calciano: Is that still used?

Mrs. Shane: It is. It's a very good telescope, but it's a hard one to use.

The Lick Astronomers

Calciano: I asked you to think of some of the major astronomers. You've already mentioned a couple of them. Are there any ones that you feel you want to talk about?

Mrs. Shane: The ones I wrote down I think we've already mentioned. There's of course Dr. Campbell, the Director in 1919 when I came, and Mr. Wright, who had personally quite an influence on my thinking.

Calciano: Now were these both men of international reputation?

Mrs. Shane: Dr. Campbell had very decidedly an international reputation. And he got around to meetings a great deal. Mr. Wright didn't travel too much. He had a very good reputation. Mr. Tucker was another astronomer who had been up there almost from the beginning, and he worked in the narrow field of meridian circle positional astronomy and did work which was fundamental and good. He was rather a lone worker. I really never thought I knew him very well.

Calciano: Was he an older man?

Mrs. Shane: He was older, yes.

Calciano: Married?

Mrs. Shane: He was married and had two children. But he was older than the other men. He'd probably been there longer than anyone except Campbell. And there was Dr. Moore, whom I knew very well indeed, and he preceded Donald as Director. He was a very likable, human, amusing person, full of pleasant stories, and always a big smile. Dr. Aitken was, oh, somewhat older, and there was Dr. Curtis who left. I think those were the astronomers who were on the mountain when I was there. Dr. Trumpler, who was afterwards an astronomer, was there, but I think he was an assistant at that time. Those were the ones that I knew.

Calciano: Did the Lick Observatory have one of the best staffs of astronomers?

Mrs. Shane: It was rated very high, yes. I think it had the best equipment and observing conditions in the early days. Of course the Palomar telescope is more powerful now.

Calciano: I was wondering whether you have any comments on the great debate in astronomy around 1920 between Shapley and Curtis?

Mrs. Shane: Mr. Shane would be the person to talk to. It was of course a very spirited debate, but I wouldn't be able to make any intelligent comments on that. I remember the situation very well and how stirred up and excited everyone was about it at the time.

Calciano: Were the Lick people all rooting for Curtis, or were the ranks split?

Mrs. Shane: Well I suppose in general yes, the Lick Observatory supported its local contender. (Laughter) Then of course it was a difference of point of view to some extent. Well that is nothing I can offer anything about. I'm sure Donald can talk about that.

Calciano: I guess there were no rallies or sign carrying.
(Laughter)

Mrs. Shane: I think there were no rumblings or sign carrying, but a lot of talk, and I believe that when they went East, Curtis and Shapley went together on the same train, but the debate was never mentioned. I think someone told me that years ago -- it just stays vaguely in my mind.

Food and Lodging

Calciano: The first time you went up the mountain when you were an undergraduate, how did you get there?

Mrs. Shane: We were taken by Dr. Curtis in his car. His car was an old Mitchell, which I guess is long since out of production, and he called it Elizabeth Mitchell -- I don't know exactly why. It was of very advanced age and condition of decrepitude, and I can so well remember that the radiator heated and he would get out and pour flax seed into the radiator to keep it from leaking.

Calciano: Pour what?

Mrs. Shane: Flax seed.

Calciano: What's that?

Mrs. Shane: Well, it's sort of a little seed that swelled up and went into the cracks of the radiator and kept the water from leaking out.

Calciano: Oh!

Mrs. Shane: So we would go chugging up the mountain heavily loaded, just loaded to the gills, in Elizabeth Mitchell*, puffing and panting, and there were several water troughs for horses along the way, and Elizabeth Mitchell would have to have frequent drinks, but it got us there.

* Note: Mr. Shane remembers the car as "Maria Mitchell," but

Calciano: Oh, how funny!

Mrs. Shane: There weren't a great many cars going to Mount Hamilton at that time, but there were some; I think the horse-drawn stage had been succeeded by an automobile stage somewhere around 1911.

Calciano: What about the food supply up there?

Mrs. Shane: Well, I lived in what was known then as the boardinghouse, so I had no food problems in the matter of providing, but I think it was done just as it is now. You telephoned down and the stage brought up the food. Ever since I can remember the stage has come up every day bringing the food and the mail. That is every day but Sunday. The freight rates on the stage are fairly high, so the Observatory truck did go down once a week (or once in two weeks I think it was in the early days) for heavy supplies like potatoes and onions and flour because the costs were very much less, so they always laughed and said, "If the people on Mount Hamilton were butchered, they would look just like bacon. They'd have strips of fat and strips of lean depending on the truck trips," because after the truck went down we had fine food for two or three days, and then we

gradually went over to sparser and sparser foods until the truck went down again.

Calciano: Oh how funny. You mentioned the freight rates on the stage. Who ran the stage? A private company, or...

Mrs. Shane: The stage driver was paid partly by the Observatory, who subsidized a certain amount, and it was reimbursed through freight and passenger charges and the mail contract. The Observatory ran the truck, and I think the same plan has carried on to the present time. Now with the Observatory moving down I don't know what's going to happen. There will still be a number of people left up on the mountain, and they will undoubtedly have some plan, but what it is I don't know.

Calciano: Was there a cook? One person who cooked for everybody?

Mrs. Shane: For the boardinghouse, yes. It went through different cycles. Sometimes they would hire the cooks and the diners would buy the food and then other times you paid a certain amount and the people who cooked bought the food. Often it was a couple in those days. When I was there the eating was pretty marginal because the people who ran the diner were trying to make money. They cut down on food very

badly, but I can't remember doing anything more than objecting as one always does.

Calciano: You had your own private store of candy bars?

Mrs. Shane: We had a little private stock for emergencies, yes. We could always order up anything that we wanted, but you see there was no refrigeration in those days. There was no electricity, and I certainly take my hat off to the people who managed in those days. It was nothing when I was there because we had a deep freeze, refrigeration, and electric stove. But at that time all the stoves were stuffed with wood, and it was hot up there in the summer. So from that point of view living became much, much easier. But as a student I had no concern. I couldn't have cared less -- I was thinking of other things, not of what makes hot meals appear on the table.

Calciano: Was the boardinghouse where all the young...

Mrs. Shane: The unattached people.

Calciano: I see, and could couples buy their own food?

Mrs. Shane: The couples who had housing bought their own food, although there were a few couples who ate there because they didn't have independent housing. Did you know the Trampers who lived in Aptos?

Calciano: No.

Mrs. Shane: He was an astronomer there. He's dead now, but she still lives in Aptos, and they were at the boardinghouse when I was there because they just had rooms without a kitchen. The housing was inadequate for everyone. Then, of course, there were always a great many visitors who ate there.

Calciano: About how many people composed the community on top the mountain?

Mrs. Shane: I think in those days there probably were fifty or sixty. But this counts children -- not sixty astronomers.

Calciano: No.

Mrs. Shane: The staff of senior astronomers was very close to what it is now, but there are very many more technicians now because electronics takes a much larger part in astronomical work.

Calciano: How does the staff of astronomers fluctuate?

Mrs. Shane: Around eight or nine. It varies slightly. And then there are types of assistants -- some permanent, some student assistants, and secretaries, and janitors, painters, plumbers, the whole gamut of living. I think there have been something like 120 people in the community in more recent years. Now,

of course, you're going to have another big change in the move to Santa Cruz.

Calciano: Now about the housing on top of the mountain, do the people rent it from the University, or...

Mrs. Shane: No, it was supplied rent-free. It was really a mandatory perquisite.

Calciano: Was the housing supplied by Lick originally?

Mrs. Shane: No. Lick supplied the money that purchased the telescope, the original building, and the original dormitory which was destroyed or rendered unsafe in an earthquake about 1911, I think. And since then all of the buildings have been done by the University. There was no further endowment.

Calciano: What happened to the mountain in the 1906 earthquake?

Mrs. Shane: I don't think anything particularly disastrous then. The major damage was in this' other one. Why, I can't say. But this original building which had been built for the living quarters was so badly cracked and shattered it was rendered unsafe and they replaced it.

Calciano: But the main telescope and it's housing was all right?

Mrs. Shane: I think so. There may have been minor repairs. I

can't tell you. But nothing major. Two or three times people have been observing when there has been an earthquake and they say it's some experience. The telescope gives ominous shakes and vibrations. It's a little frightening because of course you can't tell how far it's going to go. You never can with an earthquake.

William Wallace Campbell

Calciano: You said once that you had to have permission to leave the mountain.

Mrs. Shane: Well, Dr. Campbell was a very remarkable person. He had a benevolent autocracy. He was awfully kind and awfully thoughtful, but he felt that things should be handled with a pretty tight rein. There was the fire hazard; the transportation was bad. He wanted to know where the people were and what they were doing. He didn't want to suddenly discover, if there was a fire, that everyone was off the mountain. So we did have to ask permission, even if we went down on weekends. But it was not from any sense of restriction; it was simply an intelligent regulation, and I think everyone received it that way.

Calciano: You asked him, or...

Mrs. Shane: You went through channels. I can't remember. I guess you asked his secretary who kept a list, you see.

Calciano: Were you ever denied permission to leave?

Mrs. Shane: Well, if things were unsuitable, yes, you were. But I can't remember feeling any restraint or resentment about this. Also he had a very strong conscience; he had very high standards for himself and everyone else. And we held him in great respect and great affection. Although he had a very stern appearance, he was most kind and tireless in seeing that we got what we should out of our time there. A remarkable person, but he ran an observatory in a way that one could hardly do now. You see people didn't have cars. It was a very different situation. When my husband was a student in Berkeley, if he had to get back and forth from the mountain to San Jose, he walked. That's twenty miles by road. Of course shortcuts shortened it.

Calciano: He walked down from the mountain to San Jose? Mrs.

Shane: And then he took the train to Berkeley.

Calciano: That would take a good part of the day, wouldn't it?

Mrs. Shane: Oh, about three or four hours.

Calciano: I see.

Mrs. Shane: The first seven miles to get to Smith Creek you can shorten to two by trails. But at the same time it's a major thing. In fact on one occasion Donald even made a round trip to San Jose one day.

Calciano: Walking?

Mrs. Shane: Walking. And for no more lofty purpose than to buy a pair of shoes and go to the movies, and then he made the long trek back.

Calciano: I guess there wasn't much chance for hitchhiking, was there?

Mrs. Shane: Oh no. In those days not many cars went up to the mountain. In fact there weren't too many automobiles around.

Calciano: With the Director being such a particular and stern man, did this carry over with people's personal lives like in the dormitory? Were there strict regulations as far as when women had to be in?

Mrs. Shane: No, not at all because we all worked in a very irregular atmosphere. I mean some of us were out half the night. (Laughter)

Calciano: I forgot about that: So he wasn't an interfering man?

Mrs. Shane: Oh no. In no way at all, but the mountain was... Astronomy was the important thing. That came first.

For example, I recall that Christmas Eve was the only night the 36-inch wasn't used. Dr. Campbell took things very seriously, and he had it all laid out. It took \$80.00 a night to run the 36-inch telescope and we must not waste a minute; we were indoctrinated.

Water Supply, Health Care, etc.

Calciano: Well now, you mentioned the hazard of fire. What...

Mrs. Shane: Well, fire ... suppose the building caught fire? Suppose a forest fire came in, which was always a hazard up there, the possibility of fires coming over the mountain.

Calciano: Was the brush too close to the buildings?

Mrs. Shane: The brush was cleared off to a certain extent, but you know in tinder-dry California, fire is always a hazard. And in case of an emergency, any kind of an emergency, it was well to have a certain distribution of people on the mountain.

Calciano: Did you have a bucket brigade system lined up?

Mrs. Shane: We had some water protection from fire hazards, a kind of primitive fire department you might say.

Calciano: Where did your water protection come from?

Mrs. Shane: Water was pumped up to a high tank about 175 feet above the Observatory. I think Copernicus is 160 feet higher. The water was needed to move the Observatory floor in the 36-inch dome. You observe from a floor that is raised and lowered depending upon where the telescope is pointing. You see if you're pointing high, the eye end is low and the floor has to go down, and vice versa. If you're pointing low, the telescope levels off and the floor has to come up, and that was done with hydraulic rams and still is done with hydraulic rams, and in 1919 the water for this was pumped up into 'the tanks. I presume that in the early days that was done with windmills because I've seen pictures of windmills, but that was earlier than I was.

Calciano: Did you say Copernicus?

Mrs. Shane: Copernicus is the name of the high peak. The Observatory itself is not on the highest peak.

Calciano: Oh!

Mrs. Shane: Copernicus is a little bit back of the Observatory. The pressure tanks are on that, and they have the fire line from there for fire prevention.

Calciano: The fire line is a...

Mrs. Shane: A pipeline with a hydrant. But it wasn't drinking

water because it was contaminated with the various oils that went through the hydraulic rams.

Calciano: Where was the drinking water?

Mrs. Shane: That was pumped into another tank and distributed.

Calciano: Spring water?

Mrs. Shane: Yes. Still is.

Calciano: I gather there was quite a camaraderie, quite a bit of feeling among the people up there.

Mrs. Shane: Well, maybe I viewed everything through rose-colored glasses, but it was to me a wonderful year, and I think that all of the young people had an awfully good time. Our connection with the staff was very pleasant indeed. Now I believe that there was perhaps some lack of friendliness between one or two members of staff, but I wasn't aware of it, you see. I wasn't in a position to be aware of it.

Calciano: I would think that with the available time on the telescopes being limited, that there would be some friction and jockeying...

Mrs. Shane: I don't think there was too much. No, I don't think there was too much of that. I think that people were awfully isolated up there in those days. Almost none of the families had cars. Dr. Curtis had this

Elizabeth Mitchell vehicle, and Dr. Campbell had a car. And I had a car, strangely enough, but I seldom used it.

Calciano: How did you happen...

Mrs. Shane: I had had a car at the University and I took it on up, but I didn't come down more than about once in four months because, well, we had too much to do. We worked awfully hard, and we played very happily. There were all sorts of things we did. We played tennis a lot. We went swimming. We did lots of hiking. All sorts of make-your-own-fun type of entertainment. There was no radio, no television, no mechanical entertainment.

Calciano: What happened if somebody got sick on the mountain?

Mrs. Shane: Upon one occasion I remember a doctor came up when someone was hurt up there, but mostly people went down to San Jose. I remember just that one emergency, but there might very well have been others. This one particular occasion there was a very ill-advised race that two of the young people ran down a very steep slope. One of them, a girl, got going too fast and couldn't stop, and she went over a high bank and hit the road. She was very badly damaged in a superficial way; she didn't break

anything, so it was not serious in the end, but she was pretty badly messed up and they had a doctor come up, but that was the only time I can remember a doctor on the mountain.

Calciano: Well now, some of the women up there would be pregnant. Would they go down a month before?

Mrs. Shane: They'd go down a little before, especially if the weather was threatening snow, to be sure that they were near San Jose at the critical moment.

Calciano: I see. Now in those years people down in "civilization" would not infrequently have some household help. Was there anything like this up there for the Director?

Mrs. Shane: The Campbells always had at least one live-in maid. If I remember rightly, there was one who was with them for quite a long time, and she subsequently went down with them to the big house on the campus when Dr. Campbell went down as President of the University. She was sort of a housekeeper.

Calciano: She'd been hired by him personally?



Above: C.D. Shane, Mary Lea Heger, Priscilla Fairfield and Frederick C. Leonard resting at Paddock's Pool on Isabel Creek.



Above: Mary Lea Heger pauses on a hike to Mount Isabel.

Below: H.M. Jeffers, Amy G. Marshall, J.E. Hoover, Mary Lea Heger, T.S. Vanasek on the Mount Hamilton tennis courts.



Below: C.D. Shane, Mary Lea Heger, and S.D. Townley with a rattlesnake killed on a hike.



Mrs. Shane: Yes. Help was vastly easier to come by in those days, although Mount Hamilton was not an easy place to get help.

Calciano: Yes. That's what I was thinking. (Laughter)

Mrs. Shane: Still, it was a whole lot easier to get help in those days than it is now. Even on Mount Hamilton.

The Mount Hamilton School

Calciano: Was there a school on top of the mountain for the children of the astronomers and staff members?

Mrs. Shane: There was a school in the early days. It was started, I think, quite early. Just a little one-room school. And the amusing part is that from that little school of eight or nine or ten children, there came two University medalists which was a big proportion for any school. A very big proportion. One was the son of the janitor, and he went into chemistry. Waldo Westwater. And the other was the granddaughter of Dr. Aitken.

Calciano: The University medal is for the top student in the University?

Mrs. Shane: The top student in the University, and it is a considerable academic honor.

Calciano: Do they still do that?

Mrs. Shane: Yes. They still do that. Whether one approves of a medal or whether one doesn't at the same time it's interesting that that small school produced two. There was never a high school. The children, they varied. Some families went to San Jose for a short period, the mother and the children, and then came up weekends, and the children went to high school in San Jose. Some were self-taught at home. The various people on the mountain for a time taught different things and carried the children into high school. Some of them were sent away to boarding school. Then the elementary school was dropped because there weren't enough children, and when we came back to the mountain in 1945 there was no school. The war years had taken the younger astronomers and their children away and it was largely a community of older people, you see, who were carrying on during the war. So the school had been discontinued, but not long after we came back the number of children built up sufficiently that the school was resumed, and it was having two teachers for the last few years. Now I don't know what's going to happen with the move to Santa Cruz. It'll probably drop down and may have to drop out again.

Calciano: When they do that, what school will they go to?

Mrs. Shane: Well, they'd have to go into San Jose. The school bus will come halfway, and the parents would have to go the rest of the way, and that is a long trip for a small child. In recent years the high school students have been commuting from Mount Hamilton with parents supplying transportation in shifts so it didn't weigh too heavily on individual parents.

Calciano: How did the bus decide to go halfway?

Mrs. Shane: It goes to Hall's Valley or to Smith Creek. I've forgotten. It goes partway up because there are children along the line to that point that are bused to San Jose. Then there's the last jump of half an hour with no children on the way at all until you get up to the Observatory. It was too far for the bus to go, so it has been a real problem, and that is one of the problems that is being solved by the move down here to Santa Cruz. It's expensive to send children away to boarding school at the beginning of high school.

Calciano: Yes. Especially if they're going to have four years of college and then postgraduate school.

Mrs. Shane: It's a long pull.

EARLY MARRIED LIFEMeeting Donald Shane

Calciano: You met your husband up on Mount Hamilton?

Mrs. Shane: Yes. He was a student.

Calciano: You said that he had been married. Was he married at the time, or had his wife already died?

Mrs. Shane: She died when the baby was born in January, 1919. They were married about a year. He went north and taught during the war and they were married up in Washington. They lived there and she died there. She had been a secretary at the Lick Observatory, but that was before I came to the Lick Observatory. Or perhaps she was there one of those weekends that I went up, but I wouldn't have seen her. At all events, I never met her.

Calciano: What year were you up there?

Mrs. Shane: I went up in July of 1919.

Calciano: And he came that year?

Mrs. Shane: Yes, he came in March. Charles was two when we were married in the end of '20. Charles was born the beginning of '19.

Calciano: I see. So your husband was up there with his little boy?

Mrs. Shane: No. The little boy was with Donald's mother in Oakland. There was no way of taking care of a baby up there. His mother took the baby and he was with her until we were married.

Calciano: And after you were married were you still up on the mountain, or did you come down then?

Mrs. Shane: We came down before we were married. Both of us came down about July of 1920, and we were married in December of 1920. He was teaching in the University by that time. He had gotten his Ph.D.

Calciano: And he was in the astronomy department?

Mrs. Shane: No, he started in the math department. Later he went into the astronomy department. I think there was an opening in the math department in Berkeley so he started teaching math.

Calciano: Did you find it hard to be a bride and all of a sudden be taking care of a two-year-old? Because two-year-olds get into everything!

Mrs. Shane: He was a singularly lovely two-year-old. He was the sweetest little boy you can ever imagine, and so good. And all the time I was taking classes at the University I can remember very well putting him in the back of our car, driving down, parking the car right in front of North Hall where I had classes,

and then I would sit by the window where I could watch the car, and he would play in there quietly while I attended a class for an hour.

Calciano: Oh, my goodness. What a delightful child.

Mrs. Shane: He was a very good child. And I would look with horror now upon a mother who would do that, but in those days the University campus was a very quiet place and you could bring your car practically right into the building with you. And I always sat where I could watch the car to make sure all went well. And now I think it's pretty awful. As I look back, I'm ashamed of myself. But I did it and he survived. I went on more or less slowly toward a degree from that point because I had a lot of graduate work to take, you see.

Calciano: You had the equivalent of two full years to do?

Mrs. Shane: Yes. I didn't take it all at once. I took it slowly. It was spread over about six years because other obligations developed. This was sort of my play-fun to go ahead and get through and get a degree. I couldn't resist it after my thesis evolved. It would have been the waste of a good thesis. So I decided to go on with it, and I've been glad. It's enriched my life because I've had an understanding not only

of my husband's work, but of endless hours of astronomical conversation that would have bored me flat if I hadn't known what it was about.

Calciano: Right. And then you had another child?

Mrs. Shane: Yes. He was born in '28.

Calciano: So he's nine years...

Mrs. Shane: ... younger, yes.

University Activities

Calciano: What did you do prior to 1932?

Mrs. Shane: I wonder why you selected 1932?

Calciano: Because you told me that in 1932 you started working with real estate.

Mrs. Shane: Oh yes. Well, I was getting my degree. I was bringing up two children part of the time and one of them all of the time, and running a house and feeding a husband and general activities, and strangely enough, after having been completely anti-social all my college years, I took quite an active part in the social life of the University, in the sense of college teas. I took part in organizing functions of that sort and the calling committee --

calling on all the young people that came. I found the contact with people very pleasant, which is something I had never really taken part in much as a young person. I don't know why.

Calciano: Those were the years, I guess, when your husband was going through the ranks?

Mrs. Shane: Yes. He was always carrying on some kind of research. He was very quickly in various administrative positions around the University. He was on the budget committee, I know, a long time, which was a very time-consuming job. He was chairman of it for a couple of years. He was Vice Chairman of the Senate for a year.

Calciano: Did these things of his entail work on your part also?

Mrs. Shane: No.

Calciano: University life is always full of politics, I know, but I would imagine that a man's career was not made or broken on his wife's sociability, or her ability to entertain, et cetera, the way a businessman's sometimes is...

Mrs. Shane: Well I certainly would have no idea, and I didn't entertain in any way that would have played politics if there had been any. And I don't think there ever

were any. Oh, I think the answer to that is a flat no. His work was with a totally different group of people. Mine was very lively because I thought the University was too big and that the new people coming in needed some kind of help to get started.

Calciano: I see. Did you used to do much astronomical work with your husband?

Mrs. Shane: No, I didn't do original scientific work. I mean I didn't share problems with him. I did a lot of computing and what you call slave-labor type of work.

Calciano: Typing up papers and things?

Mrs. Shane: Yes, nothing that took original research.

Designing and Remodeling Houses

Calciano: You told me that in 1932 you started in the field of designing, buying, and selling houses. Can you tell me about that? How did you get into it?

Mrs. Shane: I had a friend who had designed for herself a little backyard cottage, and it was quite cute, and she had gotten permission to build it, and she was very interested in building. She used to talk to me about it, and she said there was a tremendous lack of

attractive small homes for people. Plenty of big homes for people with lots of money, but no small homes for lone people, or couples, or people without too much money. They were pretty sordid. I thought that was probably true so I started to design and build houses and remodel little places. I think that was about the time of the Depression when it didn't cost very much to either build or to buy. I started very modestly and just got interested. When one was paid for, I'd go on to another.

Calciano: With the Depression years, didn't you have a problem selling them?

Mrs. Shane: I didn't sell them for a long time. I rented them.

Calciano: And you didn't have any trouble renting?

Mrs. Shane: Never.

Calciano: Oh my. How many did you remodel?

Mrs. Shane: Well, I actually can't tell you. I suppose I dabbled with maybe thirty over the years. But it was all very small. The thing that I really enjoyed most was to take a very unattractive place and fix it up.

Calciano: Really a challenge.

Mrs. Shane: Yes, I really got a thrill out of that. Taking out some ugly feature and putting in a fireplace or windows...

Calciano: Did you take walls out at all?

Mrs. Shane: No. Structurally it was difficult.

Calciano: Well, putting a fireplace in...

Mrs. Shane: Well, you can take a window out and put a fireplace in.

Calciano: I see.

Mrs. Shane: I moved things to different places and I added picket fences and such. And then I picked tenants very carefully because I only chose people that had a feel for something that was a little out of the ordinary and attractive, and that part was satisfying to the soul and it was financially sensible because they stayed there.

Calciano: Was this in the Berkeley area?

Mrs. Shane: They were mostly in the north Berkeley area which was where we lived. North of the campus, some distance north.

Calciano: You rented to University couples?

Mrs. Shane: To some extent, but not exclusively. I usually rented to young couples, but now I seem to have older people as tenants.

Calciano: I didn't realize you were still involved.

Mrs. Shane: Yes, I still have a few rental houses. But I haven't

done anything with it for years and years. I haven't added any since about 1951. I didn't start in with any idea of developing this, but then one thing led to another.

Calciano: Did it take a considerable amount of your time?

Mrs. Shane: In fits and starts. If I got something new and started working on it, it would take a lot of time.

Teaching

Calciano: Are there any other avocations that you have had along the way?

Mrs. Shane: Pretty soon we were into the war years, and disruption occurred in everybody's domestic life with World War II. And my husband's work changed; he went out of teaching and into the Radiation Laboratory.

Calciano: At Los Alamos?

Mrs. Shane: First he was at the Lawrence Radiation Lab in Berkeley and then at Los Alamos.

Calciano: Well now, why did he...

Mrs. Shane: He felt that he wanted to get into the war effort. And that was the more logical thing for him. He couldn't carry a gun at his age so he went into the Radiation Lab. And from there he went to Los Alamos.

During the time that he was away, I worked in the Statistical Laboratory part of the time and taught mathematics in the University.

Calciano: Do I recall correctly that you also taught navigation?

Mrs. Shane: I didn't teach navigation in the forties. I taught math in the forties. I taught navigation in the First World War, 1919.

Calciano: But you were on the mountain in 1919.

Mrs. Shane: No, I wasn't on the mountain until July, and during my last year in college (I graduated in June) I taught navigation. I taught five nights a week if I remember rightly.

Calciano: Oh my goodness. And you were still in school learning?

Mrs. Shane: Oh yes.

Calciano: That must have been quite a load.

Mrs. Shane: I think it probably was. I don't know.

Calciano: Who were you teaching navigation to?

Mrs. Shane: Well this was when the Navy had a Navy school on campus in connection with the war effort. I taught the Navy students.

Calciano: Was this celestial navigation?

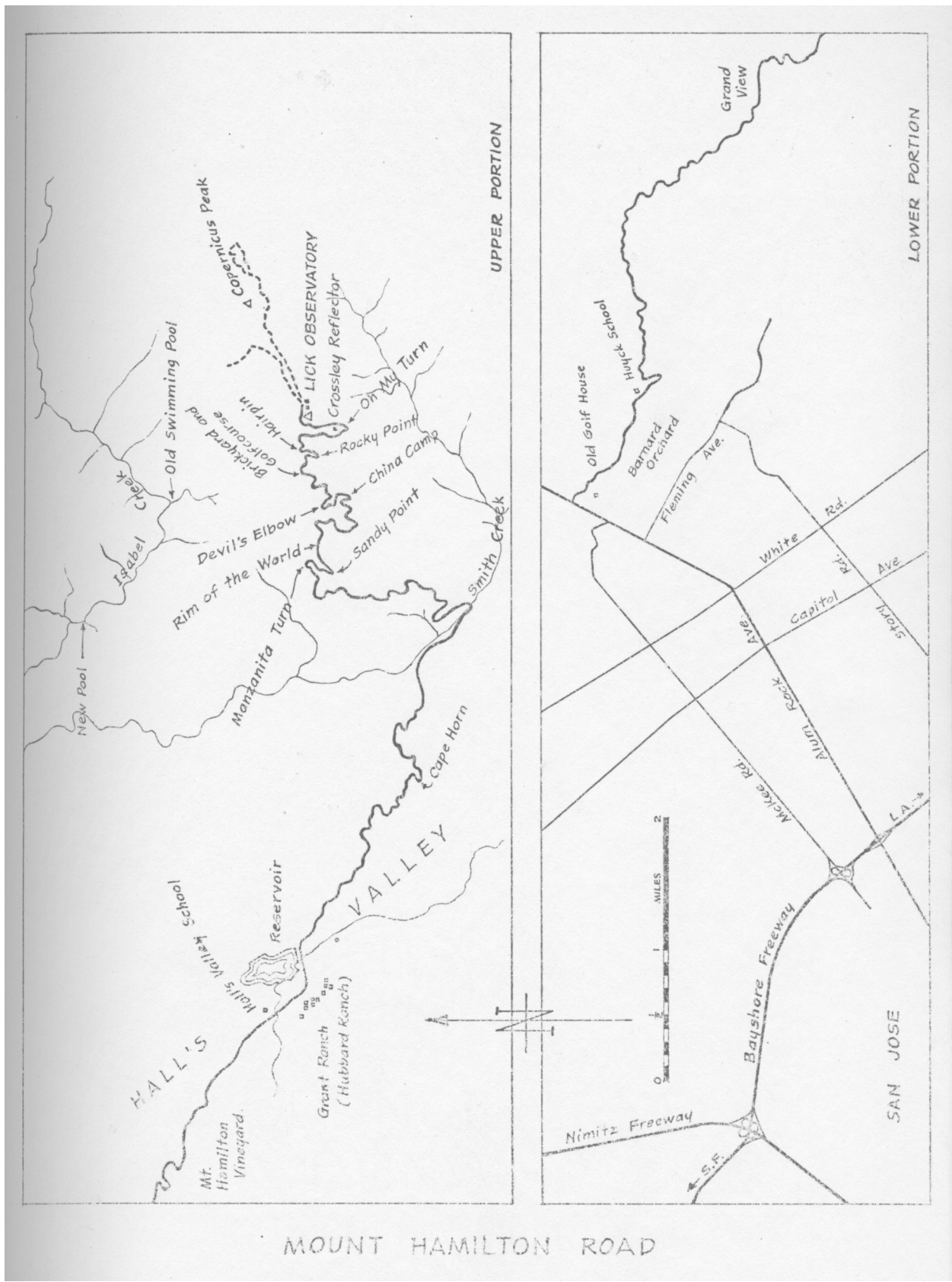
Mrs. Shane: Celestial navigation. They still use it to some extent, but of course navigation's very different now with modern methods.

Calciano: And then in the forties you taught straight math?

Mrs. Shane: I taught straight math. They lost a lot of their people and were scraping the bottom of the barrel, so I taught at the University in Berkeley and I enjoyed that very much. Then at the same time or afterwards, I can't remember just the sequence, I worked in the Statistical Laboratory. And then when I went to Los Alamos I worked in the theoretical physics division as a computer.

Calciano: You had your hand in a number of things.

Mrs. Shane: Yes. I seem to have kept out of mischief.



MOUNT HAMILTON ROAD

A TRIP TO THE LICK OBSERVATORY

[During the eight hours spent traveling to and from Mount Hamilton and exploring the buildings at the top, the tape recorder was switched on and off several times depending on the nature of the conversation and the activities involved. Furthermore, not all of the recorded material was transcribed -- e.g. purely personal, random conversation was omitted.]

THE ROAD UP THE MOUNTAIN -- HISTORICAL HIGHLIGHTS

Mrs. Shane: Now here is where you start up the mountain road. This was the road that was put in to serve the Observatory. When we first came up here there was a little golf house that stood there that has now been moved up here. You can see...

Calciano: A little what?

Mrs. Shane: A house for golf-course keepers. The golf course was right across the road and still is there. As we also, in those days, had a golf course on Mount Hamilton, we used to stop here and buy golf balls, 25c a bucket. (Laughter) Of course we lost them with great speed.

Calciano: You had a regular course up on the mountain?

Mrs. Shane: You shall see it. I wouldn't say a regular course, but we had a course.

Calciano: How wonderful: Who planned that?

Mrs. Shane: Mr. Tucker, who was one of the very early astronomers, was a great golf player, and he organized this golf club we had -- he even printed programs. Everything was very elegant. And we used to play a lot of golf in 1919 when we lived there. One of the early astronomers, Mr. Barnard, owned this ridge down in here, and he had an orchard that he planted and tended right along in that area somewhere. I know that because Mr. Holden, who was the first Director, had fallings-out with everyone, and they communicated entirely by writing notes to each other. (Laughter) There were even cliques within cliques as it were. They wrote notes, directions, and some of those are in the early files. Mr. Barnard was always writing to Mr. Holden. He'd come down and spend a half day looking after his trees, which were down here at the foot of the mountain, and he, of course, came down on foot, because there just wasn't any other way. This is the first switchback, and there was a cute little school in here known as the Huyck School which, when I was

last up here, had been converted into a home. Now the little school is standing right on your left. It's just a little country school. It was modified into a residence, but you can still see the old shape of the early school days.

Calciano: Yes, definitely. Oh it's pretty up here!

Mrs. Shane: Well, it's pretty when it's clear, and I hope we'll be above this fog soon. I think we probably will. This was originally a very lovely apricot area. In the fall when they picked the apricots they put them out in big trays to surf-dry. They were banners of gold over these hills.

The Construction of the Road

Mrs. Shane: Now this road has scarcely been rerouted. There are one or two small changes that I'll show you, but I think it's quite remarkable that a road built for horse and buggies in 1876 should have a grade that a modern car can travel. The grading is very even despite the fact that it was graded with the crudest of instruments.

Calciano: This is the original road that they used?

Mrs. Shane: The original road that was put in.

Calciano: Did they bring their supplies and building materials

up here?

Mrs. Shane: Everything. And of course I hardly need tell you it was not paved. It has undoubtedly been widened. In fact I'm sure it has. It has been widened slightly, but in my memory it has not been materially realigned. This is the original grading of the road. When we used to first run automobiles up here which was ... well I had a car in 1919, and somewhere along in here there was a watering trough where we had to stop and water our automobiles. They always heated up. Right in this stretch we made our first stop. (Laughter)

Calciano: Oh how funny.

Mrs. Shane: I think we'll get above this fog. The fog usually doesn't go up more than 1500 feet. But you can see that this is an old-time road. And the only places that they've had fatal accidents are the few places where the road has been made a high speed road. There are one or two short stretches where it's been improved, and that's where the accidents, for the most part, have taken place. Because you see nobody can go fast enough around here to get into much serious trouble. A few people have gone off the road in the fog. And at night in the fog this is quite a

road to drive. We have been up here at night when we have had to let someone out with a flashlight to walk ahead because this white line does not go all the way. The white line only goes as long as it's a two-way road.

Calciano: Oh for heaven's sake. You'd think they could paint a white line along the edge.

Mrs. Shane: Well, they have put paddles on the outside over some of it, but that wasn't done until after Donald was Director and his secretary drove off one night and broke her neck.

Calciano: Oh no!

Mrs. Shane: So by that time the highway department had come to the conclusion that they should have paddles.

Calciano: If you went off here, you wouldn't survive.

Mrs. Shane: It's surprising the number of people who have gone off up here and were not seriously hurt.

Calciano: Did his secretary...

Mrs. Shane: She survived. She crawled back to the road and spent all night lying there. Somebody found her the next morning, thought she was dead, drove her to San Jose, and she was in the hospital a long time, but she finally recovered completely.

Calciano: How wonderful. I'm enjoying the flowers here.

Mrs. Shane: Oh, the flowers in the back valleys are so beautiful. The Isabel Valley is a paradise of flowers, and so is the San Antonio on beyond the Isabel. We made many picnics there. You can see that this road might be terrifying to a person who came from the flatlands somewhere. As I was usually the chauffeur up and down this mountain, I drove it rather carefully to keep people from being frightened,

Calciano: From panicking!

Mrs. Shane: Panicking and also from getting sick on the turns, because some people don't take to motion very well. This road was completed, you know, in fairly jig time. I think something like eight months.

Calciano: Oh really?

Mrs. Shane: With no machinery. Just pick and shovel and that good Chinese labor that was so useful in all of early California road construction.

Calciano: They worked on this?

Mrs. Shane: They had Chinese crews on this road too, and this road was built by the county because part of James Lick's agreement was to give the money if the county would build the road, which they did. Now the first

stage station, where they changed horses coming up from San Jose, was here. This is called Grand View. And there used to be a roadhouse right here which is still standing. You can see the old barn right here. This was the place where you could have a snack while they changed the horses. This is the top of the first ridge. You see you go over two ridges before you make the last climb to the top.

Calciano: I see. Until what years did the horse stages run?

Mrs. Shane: I think it was about 1911; they had fairly recently changed to automobile stages when Donald came up, and I think that was 1914. And they had definitely changed when I came up in 1919. As we go around this curve you get your first look at the Observatory. We're now approaching Hall's Valley. This was a very early vineyard known as the Mount Hamilton Vineyard, and there's a very beautiful stone winery with some of the walls still standing, although I don't think you can see it from the way they've got the road now. This was all a great vineyard, and it was discontinued at the time of prohibition. Well, what are you [an oncoming car on the wrong side of the road] doing over here? This may be the day that it'll happen, but in all the trips that we made up

and down this mountain, and both my husband and I've made many, many, many, neither one of us was ever touched on the road by another vehicle. This is a very hazardous road in the sense that people come down on the wrong side, as you see. Especially if there's a precipice.

Calciano: It's certainly a winding road!

Mrs. Shane: Well, it's 19 miles to the top, and our standard time is 55 minutes, so you can see it's a slow road. Now you can see the big 120-inch to the left. That was the one started when my husband was Director. It was finished just about the time he retired. Now we're in Hall's Valley. And this, by the way, was another one of those little schools. They've all been converted long since into houses of sorts, but...

Calciano: They are all rectangular.

Mrs. Shane: Yes. The little box-like school of the old days. And there were several settlements in here. This is a very beautiful little valley, and in the 1919 era, when we both spent a year on Mount Hamilton, the old road used to go straight ahead at this point, you see. It went across the valley farther on and past the little ranch house that you can see through the

trees, and that was the old Hubbard Ranch.

The Hubbard Family

Mrs. Shane: In 1919 Mr. and Mrs. Frank. Hubbard lived here.

Frank Hubbard's father had died by then. He was reputed to have had several notches on his gun. The Hubbards had five sons -- two of them lived on a ranch back of Mount Hamilton and used to ride up to the top for mail. They rode magnificent horses with fancy trappings and were as handsome and photogenic a pair as you can imagine. They looked as though they had just come out of a western movie and were quite a treat for picture-taking visitors. Strangely enough, in our lifetime four of the boys have died. Only one, Lou, in San Jose, was living a short time ago. Two died natural deaths, another was killed when his car overturned, and one who had a very mean horse said that he would either kill the horse or the horse would kill him, and the horse killed him. He was dragged.

Calciano: How terrible!

Mrs. Shane: You can look down on the house now. It's been very much changed and is practically hidden by new buildings. It was acquired by the Grants many years

ago; it's called the Grant Ranch now, and the daughter, Josephine McCreery, still lives there.

Calciano: Why did they change the road?

Mrs. Shane: Well that went quite far up, you see, and then came back. They cut out, oh, half a mile, or maybe a little bit more. And it also took the road away from the houses where they were running cattle.

Calciano: When was it changed?

Mrs. Shane: That was cut out sometime between 1920 and when we came back in '45, but I can't tell you when. But that was the only major realignment of the road in my memory. There have been some short, small changes made. But of course in 1919 it was dirt. The paving came in during that intermediate era. We were not on Mount Hamilton very much during that time, which, after all, is twenty-five years. I think we spent six months here once, and then we came for occasional visits. There are quite a few rather frightening drop-offs, you see, coming around here. This is known as Cape Horn. (Laughter) These places, many of them, were named. We had a great many times when we'd be expecting someone for lunch or for dinner, with the table all set and everything cooking, and have them telephone from San Jose, "We

got part way up; we just couldn't take it. We drove back to San Jose." (Laughter) Oh, that happened over and over again. And then sometimes the frailest little old ladies would come up without a quiver, and some stalwart man would arrive simply scared to death. Our son, who is a Navy flier and accustomed to living dangerously, never could let anyone drive him on this road. He would have to drive himself. He was simply scared to death to be a passenger. Now we have crossed over the crest going into Smith Creek and you can get a little better view.

Calciano: Is that the 12-inch I see or...

Mrs. Shane: The 36-inch is the right-hand one and the 12-inch is the left-hand one, and they 'are connected by the main building. The little one off to the right is the Crossley, and that came into being about 1895 as a gift from an Englishman, Mr. Crossley, who for some reason thought he could observe in England where the climate was not suitable. So he was prevailed upon to give the telescope to the Lick Observatory and it, was brought over and mounted at the expense of several Californians -- leading citizens whose names are perpetuated on a marble slab down in the Crossley building, and that was the

world's worst-designed mounting. It has been improved over the years, but it's still hardly a real delight to work with.

Smith Creek and Isabel Creek

Mrs. Shane: Now Smith Creek was the luncheon stop for the old stages, and very decidedly in my memory, 1919, there was an old hotel, and it was a big hotel, sitting right on this elevation. It was torn down some years ago. Oh, goodness, the main house is gone! There was a big house right in here. I think I heard it burned. Now this is Smith Creek that winds almost around the mountain, and on the other side of the road, to the left of the bridge, was a store where you could buy little grocery things. I can't think who patronized it; I suppose the people going up and down the mountain and the people camping. This is a government campground down here.

Calciano: Is anybody allowed to camp?

Mrs. Shane: Yes. This is quite a place to camp. Boy Scouts and whatnot. Then they come up to the mountain. Now from here on up it's plug all the way, but you can short-cut this section of the road.

Calciano: It's what all the way?

Mrs. Shane: Plugging. Just plugging up a straight hill if you're walking. Even in the car it's a climb all the way up to the top. Someplace not very far from this spot there was a holdup. The stage was held up; it was the only time the stage was ever held up on the mountain run.

Calciano: What did they expect to get out of it?

Mrs. Shane: Oh, I think they robbed the passengers.

Calciano: I wouldn't think you'd have much gold bullion!

Mrs. Shane: No, there was no gold bullion at all. They suspected a local character, and although I think no one was ever brought to trial for it, they had a pretty good idea who did it.

Calciano: When was this?

Mrs. Shane: Oh, it was when the horse stages were still running. The Observatory has a lot of scrapbooks that go back over all this. During Donald's time as Director we were able to get boxes of clippings and things from the relatives of people who were deceased, the old Mount Hamilton staff. Those are still just packed up in boxes in the archives. I'm glad they're now down in Santa Cruz because I never had time to do anything with them up here on the mountain. And in

some degree that is something that probably I have more familiarity with than most people because I've been through them, and that's the sort of thing I would love to work on and put in order so something could be gotten out of them, and I could perhaps get things out of them myself. Now this is a little road that runs down to Isabel Creek which circles around the back of the mountain. You can't drive the road because of locked gates. It's down there that we had a pretty fair swimming pool. In recent years we drove down to it from the top. It took about half an hour. There were very nice picnic grounds down there. It was sort of a private club, and we knew people belonging to it so we were given the privilege of using it, and the whole mountain used to go down every couple of weeks in the summer. Everybody would have supper and swim down there.

Calciano: This pool was there back-in the earlier years?

Mrs. Shane: Yes, but it was not improved. We used to walk down to another pool on the Isabel, right down the 12 inch ridge from the Observatory. We'd have our supper down there and walk up the ridge after supper and a swim and then work all night. I can't tell you how we did it; I couldn't do it now. But that was

about 50 years ago and I did it very nimbly. The young people were much more mobile in those days because they hadn't been brought up in automobiles. They were accustomed to walking. It was quite a walk -- about twenty-five hundred feet in elevation. A good husky walk. But in 1945 I don't think either of us walked down; we used to ride down to the lower pool.

Calciano: On those oak trees over there, those bunches of green...

Mrs. Shane: Mistletoe. Toward Christmas you'll see commercial florists up here hauling mistletoe out of the trees. We were always entertained when we found they were selling little sprigs of it for 25 and we were taking our truck or the Observatory truck and just loading it and decorating our houses. This place lends itself so beautifully to things of nature that you can use for decorations. For many years we had Christmas dinners for the whole mountain at our house up here, and we used to use greens, and cones, and candles, and it was very gay and pretty.

Calciano: I didn't realize mistletoe grew here.

Mrs. Shane: Yes. There are two kinds of mistletoe. There's one kind that grows on the oak; it's green, and that's

the standard kind that you stand under to get kissed. And then there's a stringy yellow one that grows on the pines, pine mistletoe, which is not glamorous at all. It's not as obvious. It doesn't hang in great big bunches; it's in closer to the trunk, and it's a kind of a sulfurous yellow -- not pretty at all.

Calciano: I see something on those trees over there.

Mrs. Shane: That's mistletoe on that digger pine over there.

Calciano: That rusty colored stuff?

Mrs. Shane: Yes.

Calciano: That's mistletoe?

Mrs. Shane: Yes. That's the pine mistletoe; it's quite different looking. Rather repulsive looking.

Calciano: Yes, it looks like rust. I thought it was just bunches of dead needles.

Mrs. Shane: This is known as the manzanita turn. Right in here there is a very fine stand of manzanita. One of the early workmen up here was a Hawaiian person who had gathered up some scrap lumber and made himself a house, and among the scrap lumber were a bunch of doors that he had picked up from the old dormitory. And right along in here somewhere he had built this cabin where he lived. We always called it his out-

of-doors home. (Laughter) It was mostly made of doors. Now we're going around what is known as Sandy Point, and it took just ten minutes from the time people came around Sandy Point until they appeared on our front porch. The Director's house commanded a beautiful view of this spot, so if I knew a car and had an idea when a person was coming, I could spot them here with binoculars and know how to time the cooking.

Calciano: Very good.

Mrs. Shane: This little spot in here is known as the tunnel, the reason being that they say it is the only spot on the road with a bank on both sides. (Laughter) But I don't think it's quite true. Now this was called the Rim of the World, and they widened this and made the road much faster, and immediately a car went off and killed two people. The car used to be lying there at the bottom. I think it's probably disintegrated or been hauled away. It was there for a long time.

Calciano: When was this?

Mrs. Shane: Oh, a few years ago; not very long ago. But you can see on this part of the road you can drive pretty fast so people did, and immediately there was a fatality.

Calciano: Were they Lick people?

Mrs. Shane: No.

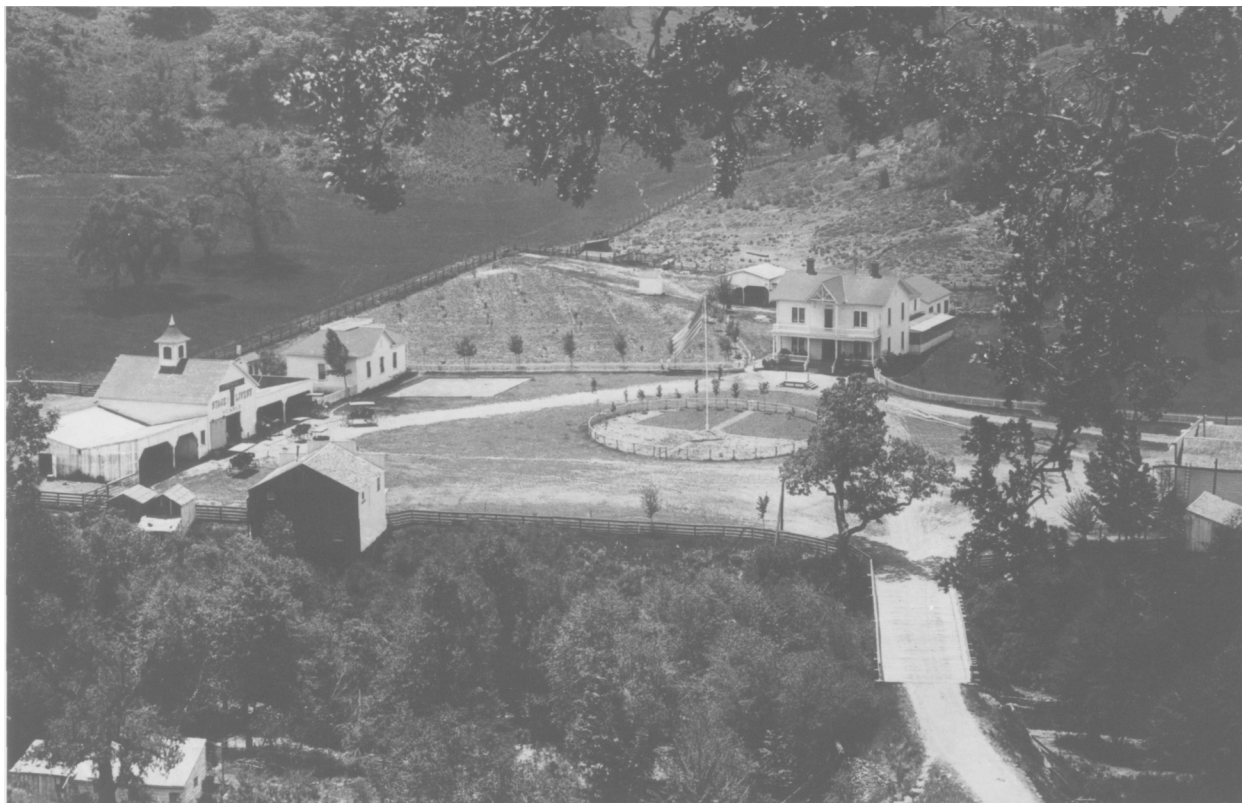
Calciano: You had a lot of invited visitors, but did you have much in the way of tourists? Just people coming up? Not that you'd have anything particularly to do with them.

Mrs. Shane: No. No, we had nothing especially to do with the tourists. Yes, I could quote you figures, but visitors' night we had to arrange for tickets because there simply wasn't enough parking space on the mountain. Sometime along during Donald's administration it was changed from just catch-as-catch-can to a ticket arrangement. I think they put out about 300 tickets a night, but before that they were...

Calciano: Three hundred a night?

Mrs. Shane: Something like that. Oh yes' and on Sundays there were hundreds of people up here. And when it snowed the place was just too awful because people piled up here, and the roads were slick and they threw snowballs at your cars... This is where Donald's secretary went tumbling off on that foggy night. You can see it's a pretty rough trip down there.

Calciano: Yes.



Smith Creek Hotel, circa 1900-1907
The road in the lower right hand corner leads to
Mount Hamilton

China Camp

Mrs. Shane: Now we're going out toward what is known as China Camp. Some of the original laborers camped down here. I think they had a little rather poor water and they had a little material for making bricks. I don't know whether you can see the pits down there; there are a few little places where they have excavated. And that is known as China Camp.

Calciano: Did the Chinese live there while they were working on the road?

Mrs. Shane: They lived there while they were working on the road and very probably while the bricks for the buildings were being burned too.

Calciano: Oh this is beautiful.

Mrs. Shane: This is known as the Devil's Elbow because it is a double turn, as you'll see in a minute. Now on our left we're coming to the old golf links, and the old brickyard.

Calciano: I thought you said the brickyard was down below.

Mrs. Shane: Well they dug some material there, but the majority of it was done right up here, and I think you can still see the old brick piles. You can see one right ahead. This was the major place where they burned the brick.

Calciano: Where exactly do you...

Mrs. Shane: Well, you can see the irregularities under the trees where they have dug excavations and burned the bricks. You can hardly see it from here; you can see little outcroppings of bricks up there, and they're rather like brick mines in a sense. When we used to be making paths and patios for our homes up here, we would come down with our cars and dig for bricks. And this area was the golf course. The eighth hole was down in the bottom. The ninth hole was up here. We had to drive up over the road. So you see it was quite a sporting golf course.

Calciano: Yes. When did it stop being used?

Mrs. Shane: It was used in 1919, but by 1945 it was no longer being kept in usable condition. Occasionally we'd bat the ball around for a few holes, but very infrequently.

Calciano: Well now, why did they make the bricks? For the buildings?

Mrs. Shane: Yes, all the bricks were made here, and they're very fine bricks they say. When Mr. Steilberg, the architect, was up for some changes in the main building a few years ago, he highly praised the quality of the bricks. This is one of the most

difficult turns on the road -- it's called Rocky Point. When they were bringing up the arch girders for the 120-inch dome, they had a terrible time getting around there. By the way, that little summer house over there is the garbage incinerator for the mountain. This next turn is the Hairpin. I remember an experience here. I was bringing up Dr. and Mrs. Oort from the Leiden Observatory for a big do on the mountain, along with a car full of food supplies. When we got to this point the snow was so deep the car got completely stuck, and the poor guests had to walk the rest of the way to the top through the snow. So when you ask if entertaining was easy, that's one of the times when it wasn't.

Calciano: How often do you get snow up here?

Mrs. Shane: Oh, you get snow every winter, but sometimes you get more snow than other times.

Calciano: How far down did the snow come?

Mrs. Shane: Oh very variably. There was snow usually only the last thousand feet; sometimes it went clear down to Smith Creek and on down to Hall's Valley. But it was usually pretty close to the top.

Calciano: And you did have it every year several times at least?

Mrs. Shane: Usually three or four times a year. But the years varied greatly. Just to make you feel thoroughly uneasy, a bus loaded with students from San Jose went off here, and it was lucky it didn't kill anybody.

Calciano: You haven't made me nervous yet! (Laughter)

Mrs. Shane: Good.

AT THE TOP

Mrs. Shane: This little home in here was built and occupied by the Vasilevskis. That was during the building program which we had close touch with. This was one of the old homes. This was built for the Trumplers way back when, and it was subsequently lived in by the Mayall family for many years and then was turned into a sort of apartment. But that was after we left the mountain. This is called the Oh, My: turn because it used to be very narrow here and when people came around this corner they said, "Oh, My!" It was very narrow. (Laughter) This has been tremendously improved. Now you can see the white crest of the snow-covered Sierra.

Calciano: Oh yes.

Mrs. Shane: This was a rather terrifying little turn a thousand

years ago, but it's nothing now. Now the two original old houses were these two built in the 1890's on what we dubbed Rattlesnake Ridge. This one is the Director's house where we lived for thirteen years, and it has been much changed, but that one was hardly changed at all. They were both built with our local brick. This was built for Campbell and that other one was built for Barnard, and this was the old brick landing where the stage used to pull up and take out the packages and leave them, and then all the inhabitants would run over and pick up the packages.

Calciano: How was the house for living in?

Mrs. Shane: It was very nice except the dining room was somewhat larger than the living room, but... And there's the pine tree we used to climb.

Calciano: In your student days, I trust!

Mrs. Shane: Yes.

[Break for lunch]

[Editor's note: Mr. Donald Miller, Telescope Installation Supervisor, showed us through several of the Observatory buildings. The tape starts as we are about to enter the Crossley building.]

The Crossley

Mrs. Shane: Now there are more ways of getting killed in here than with any other telescope. Although this is not a model of convenience now, it is so vastly better. It was quite different earlier. There was no traveling platform, and what observers did was to throw a plank over between the stairways, and then one stood on this plank in the abysmal darkness and observed through the eyepiece of that telescope. I think you may be able to appreciate the dangers more if you walk up that flight of steps. There is a rail that goes here, but I have never yet known anyone to use it. And here's where your eye goes and you lean forward, and it's a long way down.

Calciano: Heavens yes!

Mrs. Shane: And you may know that when they had to stand on a narrow plank instead of this relatively sturdy platform, observing was difficult. And this was the dome about which Mr. Wright made the classic remark that the only way in which to observe comfortably was to flood the dome with water and observe from a boat. (Laughter) You can see what a whimsical sense of humor he had. When one was doing two or three things at once in here, it was really difficult. You

can't have any light on, and in a winter night it is extraordinarily cold here. I can remember when I was a student I was assigned to take a plate for someone five nights in a row. It was the heart of the cold winter, and I think I was never so glad as when I closed this dome shut the last night and walked wearily up the hill.

Mr. Miller: You walked?

Mrs. Shane: Yes. We didn't ride automobiles in those days. And believe me, when we were going from here to the top, and there was no one in the Campbell House, it was a lonely spot around here I might say. Well, that is the Crossley which has done very, very remarkable work on nebular photography. And Keeler was the first one who used it efficiently. He got the first fine pictures of these galaxies. Then the work was continued over the years by a variety of people and most recently Nick Mayall who observed with this instrument more than any other.

Calciano: Now what advantage does this telescope have over the other ones?

Mrs. Shane: They do different things. One is efficient for one sort of work; one is efficient for another. This one takes very fine pictures of very dim objects. It can

also be used with various spectrographs that have been designed by the astronomers for their special research problems.

Calciano: How many inches is it?

Mrs. Shane: It's a 36-inch reflector. It's a different type from the 36-inch refractor. It uses a mirror.

Calciano: I see.

Mrs. Shane: The 36-inch refractor is like a spyglass. The light comes in through the lens and focuses at the eye end of the telescope. With the Crossley here, the light falls on the mirror which reflects it back to the eyepiece or the plate holder. That's the way the 120-inch is constructed.

[En route to the astrograph.]

Mrs. Shane: ... you see where the Observatory now stands was a pointed cone of rock that they had to blast off and dig out for the Observatory. The little old school used to be over there, and I'm told that at one time the snow was so deep that they tunneled through where this road goes. Now this is the old Aitken house, which was one of the original houses, and it stood right where the 120-inch stands now. They put it up on big skids and skidded it over, and subsequently it was broken up into apartments. Then

next to it was the very nice tennis court where we used to have tennis tournaments.

The 20-Inch Astrograph

Mrs. Shane: This is the astrograph, which is simply an enlarged camera. And that takes plates 17 inches square. This is the one that my husband did a large survey program with, and the plates will be repeated after a lapse of time. My husband's work was purely the photographic -- location of nebulae, not analyzing them; simply giving their distribution over the sky. You take the distant nebulae as a guide frame in order to show the motions of the stars by repeating the survey after a period of years.

Calciano: At a ten-year interval, or what?

Mrs. Shane: Well, as long an interval as they can get. The last plate of the first series was taken in '54. Mr. Wright, who always had a very cryptic way of speaking, said that you could observe with this telescope in a dress suit. (Laughter) You see everything is so clean, and there's nothing to fall off of. To observe from above the floor all you have to do is slide a few feet up in that chair.

Calciano: When was this built?

Mrs. Shane: The money was appropriated by the Carnegie Corporation just prior to the war. Then everything was at a standstill.

Calciano: World War...

Mrs. Shane: Two. When we came up here subsequent to the war, that was in 1945, it was all put together but hadn't yet been tested and the bugs worked out, and that's a long process. So work was begun with it in about 1947. Then my husband and C. A. Wirtanen took the first series of program plates extending over about seven years. Presently this series will be repeated.

Calciano: Was Wright his immediate predecessor?

Mrs. Shane: No, Dr. Moore.

Calciano: Oh. But Wright was connected with it?

Mrs. Shane: Mr. Wright initiated the plans for this telescope. He drew up the general specifications and planned the program. He was very proud of this telescope. There are two lenses -- one corrected for yellow light and one corrected for blue light -- so that you can take the same field on two different plates simultaneously. From this you learn a certain amount about the colors of the stars. Now they're not always used in this double way. For the first survey

only one lens had been installed, the one corrected for the blue. They are big husky plates; they used to cost about four or five dollars apiece. If there was a chance of clouds coming over, my husband wouldn't start because it meant throwing away a plate, and I am told they cost vastly more now -- about \$16 each. They're all refrigerated you see.

Calciano: They're not frozen! That's a deep freeze, isn't it?

Mrs. Shane: It is a deep freeze. Yes. They spoil in heat, so they are stored in a freezer, then moved to a refrigerator just before they are used. That was another new thing. Well, of course they didn't do photographic work very much in the old days. It was all visual. But you can see what a tidy neat little number this is.

Calciano: Yes.

The 120-Inch

[Much of the discussion about the construction of the 120-inch could not be transcribed because of excessive background noise. For an excellent pictorial account of the building of the 120-inch see the article by J. F. Chappell and W. W. Baustian

that appeared in three installments in Sky and Telescope magazine, Vol. 14, numbers 5, 6, and 7 (March, April, and May, 1955) entitled "Lick Observatory 120-Inch Album."]

Mrs. Shane: I want you to look through this visitor's gallery. This little contraption here is the observer's cell that goes on clear at the top when certain equipment is being used.

Calciano: How do they get it up there?

Mrs. Shane: There's a crane up in the top of the dome. You wouldn't believe it would go in there.

Calciano: It fits up there?

Mrs. Shane: It fits. They take off that upper circle, then they hook it on with some big hooks up there in top that you can't see. They just raise this up, slide it over, and drop it on top of the telescope. Then the observers in general ride up on an elevator that follows the dome track. You should have seen my husband scrambling up the ladder to do things at the top. (Laughter) But you see how shiny clean everything is, and dustless. And it is kept that way to protect the instruments from dust. Over here they have a schematic diagram that is quite good, because here is the observer and the cell.

Calciano: Well where is the mirror?

Mrs. Shane: In the tube. And when the mirror is washed or aluminized, a piece comes out of the floor (sort of like the hatch of a ship) and the mirror drops down into the optical shop down below. And that is a hair-raising experience.

Calciano: To touch the mirror?

Mrs. Shane: To take that mirror out on a little flimsy thread, which is in truth a heavy cable, but it doesn't look so, and drop it right down through this hatch without touching anything. I see they've kept the same colors that we chose. The traditional telescope was black, but we couldn't see why it had to be black, so it was decided that we'd have terra-cotta for the moving parts, and the beige and the yellow for the telescope, and then just a little soft green around the walls.

Calciano: It's a very attractive combination.

Mrs. Shane: This [the mirror] was to have been used as a test blank for the 200-inch Palomar telescope, but it never was. You see they cast progressively bigger blanks and the Observatory was able to get this test blank from Palomar. The mirror at Palomar is 200 inches and this is 120 inches. And perhaps Kitt peak

will have a 150-inch. They're still working on it; I don't know that the money is in hand, but...

[On the lower floor of the 120-inch building]

Mrs. Shane: This is where they polished and tested the mirror. You can look down the light tunnel. I'm thinking of two amusing incidents. This place was very sanitized. You had to wear white coats and they were very particular. And right next to this big grinding machine was a sign saying, "Do not walk on the mirror with your shoes on." (Laughter) You had to be so terribly clean, you know. You had to change clothes and take off your shoes and all. Donald was at the same time running a little tree-planting project outside, and as with all of these things, you had to drill to put in a tree because it was so rocky. So while they were working down here all clean as a pin, Mr. Noren was up above drilling holes for the trees, and the drill went right through the light tunnel with a great cascade of dirt. (Laughter)

Calciano: Oh, how funny! Was there any damage?

Mrs. Shane: No, just a mess.

[Outside, again]

Mrs. Shane: I can't get used to the empty look everything has.

Calciano: I can see how it must seem like a ghost town up here now.

Mrs. Shane: Well it was so bursting with activity and so overcrowded; it was always the question: How are we going to get another person in? The children up here had a very gay and happy life. They were always outdoors.

The Dormitory

Mrs. Shane: Now this red building down below here was our dormitory. It has four single rooms on the top floor and two apartments down below. It's really very attractive. It's all furnished, and very attractively. And during the last years of our stay up here we were able to lodge guests there, I think quite comfortably, so we didn't have as many house guests as we had had earlier. And in many ways it was much nicer, too, for the guests, because they often felt embarrassed. They hadn't realized that they were to be the personal guests of someone and this arrangement made them happier -- especially people staying a month or so -- to have their own cooking facilities. They had little kitchens.

Calciano: Would you have guests for that long?

Mrs. Shane: Well, we'd have them sometimes for two or three weeks at a time. It was right at this point that Mr. Fraser built his brick water tanks that he was so proud of. But they've been taken down and have given way to steel tanks. You see the water is pumped up here from springs and then distributed over the mountain.

Calciano: What's that little telescope?

Mrs. Shane: It's a 24-inch reflector. It has just recently been built and I never have seen it, but it's in that little dome.

Calciano: That's kind of a small place, isn't it?

Mrs. Shane: Well, it's a small telescope. It has certain purposes.

Calciano: Is the building that you lived in as a student still around?

Mrs. Shane: Yes, it's the dormitory you saw near the top. It is known as "the old dormitory." The original dormitory was shaken down by an earthquake in 1911, or badly damaged, and a new dormitory was built in its place right at the top of what we always called the chicken walk because it consisted of two boards with slats across them. But I remember very clearly when

my husband was director the boards and slats were getting badly worn, so he felt something must replace it. So he sent to the University a request for a new chicken walk. The answer came back, "Well, why in the world does the Lick Observatory need a chicken walk?" (Laughter) A chicken observatory? A poultry farm? But we had called it the chicken walk for so long that he hadn't even thought about it. Naturally the business office in Berkeley didn't know quite what a chicken walk had to do with astronomy. Now the building that you see over there with the star on it (and I'll never know why the Star of David is sitting on that dormitory, but it was put on there and is still there) is the dormitory that was occupied by the students at the time of my student days. And it is still occupied, I presume, in part. I don't know who's in it now. And these cement steps replaced the so-called chicken walk. There are three floors to that dormitory and the middle floor has two or three apartments. The upper floor has eight bedrooms, and the lower floor has four bedroom-living room suites.



Aerial view of the Lick Observatory in the late 1920's

- | | |
|--|---------------------|
| 1. Dining Hall | 4. Director's house |
| 2. Dormitory | 5. Crossley Dome |
| 3. Main building showing
The 36" dome with 12"
Dome behind it. | |

The 12-Inch

Mrs. Shane: Now this is the original building, and it is very little changed. It has had stucco put on the outside. You can see in old pictures that it was brick, and it is brick still, underneath, but it's had a coat of stucco.

Calciano: Why did they do that?

Mrs. Shane: I don't know. It has been stucco all my memory. It was changed, I think, a very long time ago. This 12 inch telescope was bought in 1881. It was the first one mounted. The first viewing was done in the spring of '82, but it really wasn't working awfully well until later. This dome was built first, and in fact it originally had a canvas cover. And it was this telescope that the King of the Sandwich Islands, Kalakaua, looked through on that famous visit which is recorded in the diaries so entertainingly, "Arrived today. Two loads of sand, one king." (Laughter) This was built by Clark for the Portuguese government, but they failed to come through with the money so it was sold to the Lick Observatory. It's one of the original instruments, and it has a very superior lens. It was said to be the finest lens Clark ever made. It has been used

very largely for early photometric work and double star work, but now I'm told it's used just for stargazing. It has been outmoded, but it was a good telescope for certain purposes, and it had photometric equipment on it for a good many years. It was used part of the time during our stay here. More recently it was used for showing during visitors' night. There were two telescopes open for visitors, and they showed one object with one and one with the other. But visitors' nights have been discontinued.

Calciano: When was that?

Mrs. Shane: They were discontinued when the staff moved to Santa Cruz. But they were part of the original plan of the Observatory and were kept up until this past November.

The 36-Inch

[Entering the dome of the 36-inch. The huge room was dimly lit, and at the base of the telescope mounting one could see a plaque with a single light burning over it, and on the plaque was the inscription: Here Lies The Body Of James Lick.]

Calciano: Oh, how creepy!

Mrs. Shane: He's there to keep you company when you're observing here at night. When you observe here alone at night and the building is creaking and the wind is blowing and you have as your sole companion the body of James Lick... (Laughter)

Calciano: Well, it's so spooky anyway! Even in the daytime.

Mrs. Shane: There's a lovely tale, whether it's true or not I'm not sure, that James Lick was a very tall man, and when they had the ceremony up here, transferring his remains from Laurel Hill Cemetery in San Francisco, they had all the great and the near great, you know, with speeches and so on, and they found that his casket was six inches too long for the place they had prepared, so they cut it off. So we always felt that he had a quick way out. (Laughter) Well, here we have it. This elevating floor was designed by Fraser, but it had been suggested by Sir Howard Grubb, the English telescope maker. Fraser and Floyd were very enthusiastic about the plan and they adopted Grubb's general idea. You see the floor follows the eye end of the telescope up and down. This floor, the whole thing, is on hydraulic rams, and it drops to the lower level at which we came in. It's like a giant elevator.

Calciano: It doesn't have a bridge like the Crossley does.

Mrs. Shane: No, it doesn't have a bridge like the Crossley does, but if you're looking at something close to the horizon, even with the floor up you have to climb. High. And that's what these ladders of various sizes are for. Sometimes you have to observe from the very top of these ladders if your telescope is pointing close down to the horizon. Now this telescope, as with others, has been altered over the years to make everything much more convenient. It used to be that to raise and lower the floor you turned a great wheel to let the water in and to shut it off. And you operated the windscreen and opened the slit in the dome manually. The turning of the dome was always on a motor or on some power, but I think it used to take five minutes or so of just constant pulling to close the dome. It got pretty tiresome at the end of the night. Now it's all done by pushing a button which makes observing vastly easier.

Calciano: Now was this the one where you said you had to put the heavy eyepiece on, and if you goofed the telescope would go flying off?

Mrs. Shane: This is the one. That's all installed on a carriage.

Now here is what they call a tailpiece. As you can see, the tailpiece now sits on a little carriage, but in my day it just sat in a box out there and you picked this thing up and got in under it and gave it a tremendous push; I think it weighed about 90 pounds. And these are different spectrographs that can be attached to the telescope.

Calciano: Now is this still used for astronomy?

Mrs. Shane: Oh my yes. This is used for astronomy. When you change the equipment on the telescope (you see here are the heavy ropes) you get these out and hook them over the end of the telescope before you touch anything, because as you move equipment on and off here you change the weight and the telescope is liable to come down one way or the other. So you have it held at all times, and of course heavily clamped. Then when you're through changing your apparatus you gingerly release one of these clamps and see whether you need more weight or less weight. And these are the heavy counterweights. They are put on over there, and you balance the telescope so that when it's unclamped it's not going to get away. And as I've told you, there have been two bad accidents in my memory on this telescope. You may know that

with just the manpower of the old days, this building was a remarkable accomplishment. And notice every detail, how they spared no...

Calciano: Yes, I was looking at the woodwork and the floors.

Mrs. Shane: The woodwork on the floors, and the woodwork on the walls, everything was done in a very elaborate way. Now fairly recently they have replaced all these trucks that carry the dome so that it turns much more easily. I still remember the thrill of the first night I ever observed here alone. I was feeling so small and incompetent, and I was overwhelmed by the fact that I was being trusted with this instrument. It was really something that impresses the young. At least it impressed me.

Calciano: Yes, I should think it would.

Mrs. Shane: When the Observatory was open for visitors' nights, this entire gallery around the dome would be filled with people. They would line up on the stairs and down the hall. They would allow sixteen at a time on the floor, only. And then there would be an astronomer to give them a talk and show them through.

Calciano: Wouldn't this interfere with the regular astronomical work?

Mrs. Shane: Oh yes, it interfered completely.

Calciano: So you couldn't do this every night?

Mrs. Shane: Once a week, every Friday night. Those are some of the old files of the Observatory that I worked with so long.

[Going down the main hall which is lined with large photos.]

Mrs. Shane: The visitors look at these transparencies quite a bit, especially when they're waiting in line. The original ones were all dated -- pictures of the eclipse of 1895 and so on, and as you walked along the hall you had the impression that the Observatory had done nothing since 1900 because they were still using the old pictures. So somewhere along the line they got an appropriation to make up these cases, which I think are quite attractive. It tells the people something about astronomy without being too scientific.

Calciano: Did you ever do much spectrographic work?

Mrs. Shane: I did quite a bit as a student up here. They were doing a big program then of radial velocities. We all were assigned about two nights a week of observing, or two half-nights. And then in addition

we did our own thesis work. I did that partly with the 36-inch and partly with the Crossley.

THE RETURN TRIP

Mrs. Shane: Now I was telling you that we used to go swimming down in a swimming hole at the foot of the 12-inch ridge.

Calciano: Yes.

Mrs. Shane: And this is where we took off, right over the edge here.

Calciano: Did you call it the 12-inch ridge because of the...

Mrs. Shane: The 12-inch is at the top of the ridge. And we went just straight down here to the bottom of that canyon and then we would swim. We had a set of cooking utensils down there and we would have our supper there and then we would hustle back up the ridge. Stalwart stuff we were made of in those days:

Calciano: It's a very steep ridge.

Mrs. Shane: Yes, it's a pretty steep ridge; even in those days it was steep, but we didn't seem to be very much disturbed by it. Now you can see the truncated top which shows how they cut the top off the mountain.

Calciano: Oh, yes.

Mrs. Shane: You see it was a point of rock and they cut it off.

Comments on the Lick Telescopes

Calciano: This has been such fun!

Mrs. Shane: Well, I hope you feel it was worth your time to come up, because I think that since you will have a touch with Observatory things that it is nice to have seen the Observatory.

Calciano: Yes. I have much more comprehension now. You described the Crossley to me last time, and. I knew it was a very awkward thing, but it didn't really come through until I saw it. It's incredible; it's like suicide.

Mrs. Shane: And it must have been just a corker in the early days.

Calciano: With a plank!

Mrs. Shane: With a plank. It had been somewhat improved when I observed there and it was plenty bad then, because you know you get awfully sleepy and tired at night, and it's dark. You have absolutely no light. Just a little muted light over the desk to note times or things of that sort, but nothing that you can see your way around with so that it's all done more or less by feel. That's the chief telescope that they

have had accidents with in the past, as you can readily understand.

Calciano: Yes. One thing I was wondering about the astrograph is why doesn't there have to be some facility for climbing when the end of it goes up in the air?

Mrs. Shane: Because it's not very long and it doesn't go up very far.

Calciano: I guess there was a ladder in the astrograph building?

Mrs. Shane: There is a ladder, or more accurately that elevating observing chair I showed you. It goes up six or eight feet and that takes care of it.

Calciano: That was a 20-inch though.

Mrs. Shane: Yes, but it's a different type of optics. It doesn't have the long focus so you don't have to worry about the end of the telescope going far above the floor.

Calciano: The 36-inch certainly would be wicked to ride up to the top of...

Mrs. Shane: The 36-inch is taken with respect. All those instruments are taken with respect. You don't just fool around making mistakes.

Calciano: What if the lens on the 36-inch had been smashed in that accident. How long would it have taken to manufacture another?

Mrs. Shane: Oh, mercy, I wouldn't know.

Calciano: Are they as bad to make as mirrors?

Mrs. Shane: Well different problems are involved. You see the only lens bigger than this is the one at Yerkes which is a 40-inch.

Calciano: Oh, really?

Mrs. Shane: Yes. This was the largest in its day, but very shortly afterwards Yerkes got its 40-inch refractor. Now actually its optics are slightly less good, and the seeing conditions are so much poorer there than they are here that it has done no better work despite the fact that it has a 4-inch greater aperture. But these big lenses are extremely expensive. They take a very skillful lens maker. The reflecting telescopes have to a considerable extent displaced the refractors because they can make them much larger and they have perfected methods of mirror support.

Calciano: The refractor still has a place in astronomy?

Mrs. Shane: It still has a place for certain visual work, but the reflectors were almost dead at one time. That is the early reflectors were so awkward, and the mechanics of mounting the mirror were so complicated, that they just were never very

successful. And in fact some place I read that in the hands of Keeler the reflecting telescope was born again, because he made it take magnificent observations and people recognized that reflecting telescopes did have promise.

Calciano: When did the reflecting telescopes come in?

Mrs. Shane: Newton was the inventor of this type of telescope, and Herschel used a reflector in the late 18th century. Lord Rosse had a monstrosity in England. I just can't put a date to it; about 1850 I think. It was hung on chains between high walls out-of-doors, and of course had no accuracy whatsoever.

Calciano: It was very nice of Mr. Miller to take us through the telescope buildings.

Mrs. Shane: Yes. Now Don Miller came in '48, he said, which of course seems only yesterday now, but he's been there nearly twenty years.

Calciano: That's right.

Mrs. Shane: And he grew up with that 120-inch telescope. You see it was started when he was an electrician. He came in the electrical department and he was trained up with the telescope, saw it go together, saw the wires and all the parts go in, and he would be a very difficult person to replace.

Calciano: Oh I can imagine. It's tremendously intricate.

Mrs. Shane: You can see how very intricate it is.

Calciano: Are the astronomers well versed in all the intricacies of the 120-inch, or do they just use it as a tool?

Mrs. Shane: Well, they differ. I think my husband would be completely lost because he's not of the electronic age. But some of the younger astronomers, I think, are versed in electronics and understand those controls and all these fancy electronic computers that are on those panels.

Calciano: What about aluminizing the mirror? If Mr. Miller weren't here, could somebody...

Mrs. Shane: They would have to be very carefully indoctrinated. I don't know who except Miller and Cowan understands aluminizing the mirror now, and washing the mirror - - that is a job that you have to be awfully careful about. Even the people who are well trained in it go through considerable anguish when they have to remove that mirror.

Calciano: How often do they wash the mirror?

Mrs. Shane: Well I think it's something like once a year. It gets realuminized, I think, once in several years.

Calciano: You said it had been done twice after the original

time.

Mrs. Shane: Yes, about three-year intervals, something of that order of magnitude. And it's very easy to make one little slip or to have one little thing break, then that's it. In that first aluminizing job, they did, of course, put in little pieces of inconsequential glass and ran tests, but they never had had the big mirror in until that critical night when they put it in and ran it for the first time. It came out absolutely perfect.

Calciano: Is that manzanita or something?

Mrs. Shane: That's a manzanita. There was a perfectly beautiful one right in this turn. One day a telephone truck came up with a load of telephone poles and they swung wide on that turn and knocked it over and we were all very grieved about it.

Calciano: Oh.

Mrs. Shane: These have a very strange phosphorescent appearance on a wet night when one is coming up in the dark. They simply glow as though they were covered with a phosphorescent paint; they're quite startling. This was known as Criterion Creek (laughter), because when the ground is soaked up it starts to run, and it was considered a criterion. Nothing happened

during the first few rains; it didn't start running until the ground was soaked.

Calciano: Oh. I see.

Mrs. Shane: I think as a matter of fact our son named it that. But everybody had a little pet name for things, and when I rode with other people, they were always springing some new name on me that I hadn't heard.
(Laughter)

The Move to Santa Cruz

Calciano: I've been wondering, what do you think the reaction of the Lick People has been on the move to Santa Cruz?

Mrs. Shane: Well, I know one who's very enthusiastic about it; I talked with him. I suspect there are some who aren't so enthusiastic. And then there are some who are going to be kind of lost in between. And I don't know. I just can't visualize it.

Calciano: How is it going to work when the men need to view at night?

Mrs. Shane: They will come up from Santa Cruz. You see that is done at Mount Wilson and always was. And the same way at Palomar. The staff lived below and then they went up for an observing run. Five days, four days

maybe five days a month, or on an irregular schedule. And then, of course, there will be certain people coming to the Observatory from other parts of the University. Maybe certain students will be up there more. I really don't know.

Calciano: Why wasn't this part of Berkeley. Didn't anybody...

Mrs. Shane: Well, that seemed so much further. To begin with, Berkeley is further. There was no reason to live in San Jose, because that was neither here nor there. It was either Berkeley or Mount Hamilton, and in those days when it was discussed (it was discussed to some extent, I know, when we went up there) the majority sentiment was to stay on the mountain because it was in those days about a four-hour trip to Berkeley. You see with inferior cars and inferior roads it made a vast difference. We used to consider it a long half-day trip, and frequently take a lunch in the early days and stop somewhere along the line. Now you can do it from Berkeley to Mount Hamilton in about two hours, but it was a much longer trip before the roads and the cars were so improved. So the whole picture has changed.

Calciano: How long is it to Santa Cruz?

Mrs. Shane: It's about an hour and forty minutes.

Calciano: It's still considerable.

Mrs. Shane: Yes.

Calciano: I may have my geography wrong, but doesn't the road go down the wrong side of the mountain as far as Santa Cruz is concerned? Isn't it sort of a roundabout way?

Mrs. Shane: You come down this side of the mountain from Mount Hamilton. The tricky part is to get across in a straight line from the bottom of the mountain to Los Gatos. You have to go south or north. You have to make a swing in there. I think they're building a cross-valley freeway, but it's not built yet. And if and when it goes in that will shorten it. Well, they've been around and around on where to live for many years.

Calciano: It just doesn't fit into our society, this working in the middle of the night on the top of the mountain. (Laughter)

Mrs. Shane: No, and people have changed. We were accustomed to more or less making our own entertainment in the old days. They read. Life was geared, I think, a little more slowly. People didn't dash out quite as much as they do now. Now maybe it's better, maybe it's

worse. I wouldn't venture to say. But it's hard to take a person accustomed to a modern city life and put them now on the top an isolated mountain. They would miss the roar and clatter, whereas it wasn't quite such a change from what you did anyway in the old days. You stayed home. You didn't have cars to go out in.

Calciano: You didn't worry about how close the shopping center was.

Mrs. Shane: No. Actually the shopping was easy enough up there because it was all done by telephone. I probably spent less time shopping than I do now when I go down and run from place to place wasting time.

Calciano: You said as we came up that you approve of the move.

Mrs. Shane: Yes, I think probably in the spirit of the times it will be good in the end, yes. And when things shake down these facilities will probably be used again. But there's this pause between things that makes this a difficult period.

Life on the Mountain, 1919

Mrs. Shane: I can't remember now where I got this little scrap of information, but Mrs. Hubbard, the teacher of all those handsome Hubbard boys that I was telling you about who came to such sad ends, used to drive daily

to Mount Hamilton to deliver milk. She had a five-gallon milk can and she would drive up from Hall's Valley here to the...

Calciano: That's a long way:

Mrs. Shane: It was. She'd come with a five-gallon can of milk which she sold to the astronomers for 10c a quart. In due course she felt she'd have to charge, I think it was 11¢ or 12C a quart, and the astronomers felt that that was too much, so she discontinued her milk route to the mountain. I believe it was Kenneth Campbell we were talking with who was here at the 75th reunion. He's the youngest son of Dr. W. W. Campbell, and he grew up, of course, on the mountain. And he said he could remember her driving up with the milk, and when she passed that brick landing where I told you they unloaded supplies, he and his brothers would run out and scramble on the wagon and ride up to the top, up, I think, to school. So I believe there must have been a school on the mountain in those days. I'm quite sure there was. Did you know that people who have lived on Mount Hamilton say that marriages are made in heaven, but the Lord has a branch office at the Lick Observatory? Because it has been that over the years

the secretaries and the schoolteachers almost without exception married astronomers, or someone in the Observatory community. And as my husband cheerfully pointed out, it's the cheapest place in the world for a courtship. You can't even buy an ice-cream cone. So perhaps it's thrift. (Laughter)

Calciano: Speaking of weddings reminds me of churches. What did you do when people wanted to go to church?

Mrs. Shane: They'd go down to San Jose.

Calciano: But back in the days when it was a two-hour drive?

Mrs. Shane: Well then, I guess, they didn't; they just didn't. Once in a while when we were on the mountain someone would have some type of clergyman visiting and they would have services in a private home. I think there's some University regulation about University buildings being used for religious services.

Calciano: You mentioned you had dancing every weekend.

Mrs. Shane: Not on the weekend. It was a weekday night.

Calciano: Was this a custom that had been started years before, or...

Mrs. Shane: Oh, it was on-again, off-again. It wasn't all the time we were there. There'd be a group who'd be interested in folk dancing, and Bobbe Jeffers was a very good dancer and a very fine leader, and it was

just an awfully good way of getting the whole group together. It went on for many years and then people began to lose interest. It was dropped and then people revived their interest. It came and went. The dances were held in the old library, which had been abandoned when the new library was built. The old library was used as a conference room, but it had this additional use.

Calciano: Well I was wondering, in your student days what were the main things that courting couples did with their evenings?

Mrs. Shane: We went on hikes together and walks, played tennis. Where two astronomical people were concerned, we were all studying and working together. We did a great deal of walking. When I was a student living in the dormitory, back in 1919 now, virtually every evening we assembled in the secretary's room because the secretary had a bigger living room with a fireplace, and this sounds terribly old-fashioned to you, but somebody usually read aloud. And the girls did mending and darning, and we charitably did the boys' socks and all that sort of thing, you know.
(Laughter)

Calciano: Oh, that's how you caught your husbands!

Mrs. Shane: That might have been the way we caught our husbands; I wouldn't be too sure. Then as I say, we played tennis; we had that fine golf course; we had theatricals

Calciano: You had enough people to do that? Theatricals?

Mrs. Shane: Yes. Mr. Tucker, the astronomer who was so fond of golf, was also fond of theatricals, and he used to lead a great many theatricals. He was a pretty good actor himself. He took the leading part and coached the rest of us, and we had them in what is now the conference room.

Life on the Mountain, 1945-1958

Calciano: You told me once how many people were on the mountain then...

Mrs. Shane: Well it didn't vary too much until the explosion of the 120-inch days. It remained fairly static, and I would have said a total of perhaps 60. It was a fair-sized community. But when we first came back here after the war in 1945, the staff was very small. We always had everyone for Christmas dinner, and we had 28 the first year; the last year we had three dinners of about 35 each. We had dinners on Tuesday, Thursday, and Saturday, and those did not

include the children.

Calciano: Why did you only have 28 when you came back after the war?

Mrs. Shane: Because the population of the mountain had dropped very low during the war years. We came back in November of '45, and gradually many of the people returned, and there were some additions to the staff. Then the 120-inch went through, and that meant engineers and designers and architects and optical people, and all that caused a considerable bulge in the population.

Calciano: The fact that the mountain was so isolated, did this cause any hesitation on your part about moving up...

Mrs. Shane: No, none at all. No. We both liked the life. We loved the location; we loved the ability to be close to people. And although it was in a very small and minor way, it gave us great satisfaction to feel that in a small way we could set standards which we felt enriched the lives of some people. I think the thing that pleased me almost more than anything up there, and it may seem very unimportant I suppose, was the fact that in these Christmas dinners we had everyone, and some of those people had never seen an elaborate dinner before. They were some of these new

workmen who had just come, and it was all just opening something to them.

Calciano: Oh, how wonderful.

Mrs. Shane: It was just very interesting to see, and we often spoke of it, how people would come up and they'd be a little careless in their housekeeping and so on, and very soon they were falling into the pattern of care and higher standards. Well, it's a drop in the bucket, but it was fun to feel that perhaps you gave somebody a little something that they might not have gotten otherwise.

Calciano: Yes, that's very true.

Mrs. Shane: And of course as a student up there I was the one on the learning side.

Calciano: And it didn't bother you at all, the fact that you were going to be stuck up on the mountaintop for a year?

Mrs. Shane: Oh no. We went back very, very happily.

Calciano: No, but I meant as a student.

Mrs. Shane: Oh, as a student, no. It was a good life; we were terribly interested in what we were doing.

Comments on Astronomers and Observatories

Mrs. Shane: The mountain, of course, brought very, very many

interesting contacts in the Many fine visitors who came. University officials who were up there on various kinds of...

Calciano: Now are you speaking of when you were the Director's wife?

Mrs. Shane: Of the number two period, yes. Of course I saw none of that when I was a student. I daresay the same interesting people came, but I wasn't exposed to them. But in the second period I was, because in a sense we had a captive audience, poor souls.

(Laughter) They could do nothing else.

Calciano: Did Shapley ever come up 'to the mountain?

Mrs. Shane: Oh yes. He's been our guest a number of times.

Calciano: He is one of the top astronomers in the nation, isn't he?

Mrs. Shane: Oh, yes. He's a person who has done a great deal of writing and talking. I think he talks very easily, and he's done a lot of very good work, too. He's done a lot of popular work, not that there's anything wrong with that. It would be far better if more astronomers were more articulate probably, but he was one of the articulate ones. He's no one that we know awfully well.

Calciano: The Harvard Observatory is placed right in the middle of Cambridge, isn't it?

Mrs. Shane: Well, the observing station is at Oak Ridge, the new observing station. And of course all these people observe at observatories away from home now. They come as guest observers to Palomar, to Kitt peak, to Lick Observatory. Much of their serious observing is done away from that area.

Calciano: I don't see how you could observe anything in the Cambridge sky!

Mrs. Shane: Well, a great deal of astronomy is done at your desk thinking. Or with a pen in hand. A great many people do a lot of theoretical work with a very small proportion of observing mixed in; some astronomers never look through a telescope. They take the results that other people have gotten at the telescope and they interpret them. Then, of course, Harvard has a radio astronomy station at Oak Ridge.

Calciano: Where's Oak Ridge?

Mrs. Shane: It's outside of Boston, I think northwest. I suppose it's maybe 30 miles or something of that sort. I've been there and spent the night, but I've only been there twice.

Calciano: People come from all over the world to the Lick

Observatory, do they not?

Mrs. Shane: Yes, that is very true. We had a great many visitors from Europe. And by visitors I don't mean just in and out, but people who came on various sorts of scholarships and grants and one thing and another, fellowships. There was a Martin Kellogg fellowship that I think gave people as much as a year at Lick. Many people came on that and other fellowships who now have very high positions in European observatories.

Calciano: Is the United States the leading country, or one of the leading countries, in astronomy? How does it stack up with the rest of the world?

Mrs. Shane: It certainly has the biggest telescopes. Now other parts of the world have very fine astronomers. Leiden has an extremely active group under the leadership of Jan Oort, who twice during our time on the mountain was there for extended visits of several months. I had a letter from Mrs. Oort just yesterday, and she said he was going to spend two months in either Caltech or Mount Wilson in December and January. They're very inclined to come for long periods and take observations.

Calciano: Isn't that a problem, scheduling people on the

telescopes?

Mrs. Shane: Yes, it is.

Calciano: How do you decide who is going to come when and how much time to give away to...

Mrs. Shane: That's part of the job of the Director. And you can hardly fail to make somebody mad, but then you have to try and decide a fair schedule. And that is the reason the Lick Observatory is very anxious and very, very badly needs another telescope not too far away, and they are now exploring sites down toward King City.

Calciano: With all the big telescopes on the West Coast, and a lot of the fine astronomy schools on the East Coast, is there much East-West rivalry in the academic world?

Mrs. Shane: I don't think so. I think the Eastern people would like to have some big telescopes, but they realize that it's impractical. A big telescope is just thrown away in the Eastern weather and most of them have arrangements with other observatories. The Kitt peak National Observatory was set up for that purpose. To give extra observing time to the...

Calciano: Who runs that?

Mrs. Shane: Well it's run by AURA which is the Association of

Universities for Research in Astronomy, and it was started initially by, I believe, seven universities, but it's supported by government money. It's the National Science Foundation Observatory.

Calciano: Where is it located?

Mrs. Shane: It's near Tuscon.

Calciano: How big is it?

Mrs. Shane: Well it has designs in the book now for a 150-inch telescope, but the present biggest one is, I believe, 84 inches. It's only been in operation for a fairly short time. And that's the one where our good friend, Nick Mayall, is the director. Then the Kitt peak Observatory has built a big station on Cerro Tololo in Chile, a very high station with remarkably fine observing conditions, and they are getting a big telescope started there.

Calciano: Why is it so good in Chile? The weather?

Mrs. Shane: Partly. There it is possible to observe in the southern sky. Also, the weather is very fine; the seeing is superb. It's up quite high in the foothills of the Andes with a situation of air currents that is very ideal for seeing. And when you get into the big telescopes, it's not only a matter

of gathering light; it's equally important to have good definition, and you don't get that if you have a turbulent atmosphere.

Calciano: Oh. The "Twinkle Twinkle Little Star" business.

Mrs. Shane: That's right. "Twinkle Twinkle Little Star" is not looked upon with favor by astronomers. And they have this very big settlement down there, and the European Southern Observatory, known as ESO, is locating about 60 miles away. Mat is a combination of all the European observatories that are participating. It doesn't include England.

Calciano: Now suppose Shapley wanted three weeks on Lick's 36-inch or 120-inch or something and it is arranged, what does Harvard do for Lick? Is there reciprocity?

Mrs. Shane: No, there's no formal reciprocity.

Calciano: No payment?

Mrs. Shane: No, I don't think so, but of course he wouldn't get three weeks on the 120-inch because it's too much in demand by too many people; it serves all the various astronomy departments in the multi-university, or whatever you please to call it now, which are Berkeley, San Diego, UCLA, and Santa Cruz at the present time. So that much time, I'm sure, is very hard to come by.

Calciano: And what does Joe No-name from some other university, who is a bright guy but who hasn't yet built up much of a reputation, do? He really wouldn't have very much of a chance at all, would he?

Mrs. Shane: Well, he would only have a chance if he could present a program that seemed to those making the decision to be better than Mr. Big-name's program.

Calciano: So a good director has to have a good command of all the aspects of astronomy.

Mrs. Shane: Yes, or he has advisers. Of course no astronomer knows all branches of astronomy any more than a doctor knows all branches of medicine. They're almost always a specialist in a certain branch. But a good director will go to someone concerned in this field and say, "How good a program is this? Do you think he should have the time?" Now with such instruments as the Crossley, the 36-inch, and the Carnegie Astrograph that my husband worked with, those are not in nearly such demand, and the person who presented a good program could probably get pretty adequate time.

Calciano: But there's no . . . like when you use some university's computer you pay so many dollars an

hour, but...

Mrs. Shane: Well, I've never known of anybody paying for any time at Lick. They pay their own expenses at the dining hall, and they may have a scholarship, but they don't pay the Observatory for the use of their facilities. I don't think it's customarily done in astronomy.

Calciano: When you mentioned that Lick was looking for a site for another telescope, I wondered why they don't want to put another one on the mountain?

Mrs. Shane: Well, the lights of San Jose are beginning to get bad for certain types of astronomy. They illuminate the atmosphere and are quite troublesome if you're observing very faint objects. It doesn't spoil some kinds of observing; it doesn't affect it at all, but other kinds...

Calciano: Are the refracting or the reflecting telescopes more vulnerable, or does it just depend on the kind of thing you are doing?

Mrs. Shane: On what you are doing.

Calciano: Is the San Jose smog posing a threat?

Mrs. Shane: Well the smog has a pleasant way of subsiding at night and seldom gets as high as the mountain anyway; it's the lights that are becoming more and

more a threat. No doubt the smog could become a problem if it continues. But as you know, it dies down at night. It flattens out, and I don't think there's any problem over the top of the mountain.

Calciano: Is the mountain high enough to miss a lot of these overcast nights

Mrs. Shane: Oh yes. It misses virtually all of them in summer.

Calciano: So the greatest percentage of the nights would be observing nights?

Mrs. Shane: Well, certainly far, far more of them than down in the valley, but the storm clouds of course go over the mountain. The summer fog almost always stays below it. The top of the fog varies from maybe 1,000 to 3,000 feet high, and once in a long, long time it will come over the top in the summer, but very seldom. But in winter it is in the clouds a lot of the time instead of being under as you are in the valley.

Calciano: How high is the mountain?

Mrs. Shane: Forty-two hundred feet.

Calciano: Just out of curiosity, why didn't Lick choose a higher mountain? Why not Mount Whitney or one of its sisters in the Sierras?

Mrs. Shane: Well it's a combination of being above the

atmosphere and having good seeing conditions. The steadiness of the atmosphere. In general, the higher up you are, the better position you're in. But when you get up too high, you have difficult winter conditions to cope with, and the Sierra is so far from the coast that you don't get the stable air conditions that result from the coastal temperature inversions. It is unstable air conditions which make the irregularity in ... well, what they call poor seeing, so that the images are all blown up and fuzzy instead of sharp. So as far as the seeing goes, I think Mount Whitney wouldn't do. It depends on how the air currents come against the mountain. The best seeing is where you're above an inversion layer and thus in a region of stable air. At night the air drains down the mountainside and floods the area with air from above which is at a fairly uniform temperature. And that is what makes the seeing on Mount Hamilton so good. But of course the thing now is the astronomical instruments being mounted on the vehicles that get completely outside the earth's atmosphere.

Calciano: That's true.

Mrs. Shane: That's something else entirely again.

Calciano: When Mount Hamilton was chosen for the Observatory site, were they aware of this stable layer of air there?

Mrs. Shane: Yes. I think they were. They had an astronomer come and study the seeing conditions. When it was first thought of I don't think it was in Mr. Lick's mind at all, the scientific part of it, but the seeing was studied by an astronomer named Burnham from Chicago, from the Yerkes Observatory. He was a specialist in observing double stars, and he brought a small 6-inch telescope to Mount Hamilton and observed for one summer to report to the trustees on whether it was a good site.

Calciano: Why was it picked instead of Loma Prieta or some other mountain?

Mrs. Shane: Well, it's a little bit higher than Loma Prieta. Lick wanted a mountain over 4,000 feet, and that was the only one in the coast range that was. He considered Mount St. Helena, but that fizzled for some reason. They didn't get any studies of Mount St. Helena. I don't know whether it would have been any good or not.

[END OF TRIP.]

C. D. SHANE'S CAREER 1920-1945

Calciano: Could you give me a synopsis of your husband's career between 1920 when he left Lick, and 1945 when he came back as Director?

Mrs. Shane: He went to Berkeley as an Instructor, first in the mathematics department, and then later in astronomy.

Calciano: Why didn't they put him in the astronomy department? Why math?

Mrs. Shane: Well, I couldn't answer that. I think there was an opening in math at the time. Very shortly afterward he was part time in astronomy, and then full time in astronomy, and he taught on the Berkeley campus until the fall of 1942. Then he left teaching and went into the Radiation Laboratory as assistant to Lawrence and had an extremely happy and interesting year because Lawrence was a wonderful man, personally, an inspiring person to work with, and the Laboratory was really a dynamic venture. Then from there he went to Los Alamos and left there at the end of the war and came to the Lick Observatory.

Calciano: What was he doing at Los Alamos?

Mrs. Shane: He was Assistant Director in charge of personnel,

working under Robert Oppenheimer. And that, too, was an exciting period, Very exciting, and I shared just a very short part of that.

Calciano: Oh, you didn't go down with him?

Mrs. Shane: I didn't go down with Donald because the security was very tight then, and people were not permitted to go in and out. I had a child in prep school who would not have been able to come and go on his school vacations. During that time I was teaching at the University in Berkeley and working in the Statistical Laboratory. When the security became a little easier I did go, about the last three months, from something like March to June. And then Donald left at the end of the -- well when was it they dropped the bomb?

Calciano: I think it was August.

Mrs. Shane: August something or other, and I had expected to go back to Los Alamos, but things ended.

Calciano: Had your husband been able to commute up to Berkeley from time to time, or...

Mrs. Shane: He made occasⁱonal trips up. In general people were not permitted to go more than 80 miles from Los Alamos, but he had to travel on Laboratory business sometimes.

Calciano: How long was he there?

Mrs. Shane: It was a little over a year, He was at the Radiation Lab in Berkeley for the first part of the war period, and then he was at Los Alamos for the later part.

Calciano: Well now, when he was teaching at Berkeley, I think you said you went up to Lick Observatory twice for short stints.

Mrs. Shane: We were up, I think in 1924, for a semester -- perhaps it was a little bit longer.

Calciano: On research strictly, or...

Mrs. Shane: It was on research. It was at a time when there was an exchange of personnel between the Berkeley department and the Lick Observatory. They felt that it was a good idea for some of the Lick staff to have a turn at teaching and an opportunity for the Berkeley people to have a turn at research. That exchange was made for a number of years.

Calciano: What was the relationship between the Observatory and the astronomy and the physics departments down at Berkeley?

Mrs. Shane: It was in the days when they were just becoming closer together on the scientific side. Astronomy had been entirely observational with the stars;

physics had been theoretical and laboratory; and then when astrophysics became more common -- that is the physical study of astronomical things, then they were pulled closer together, and of course they have continued through all the recent developments to be much closer together. All of this current space exploration, the moon coming down to earth as it were (laughter) has meant that astronomers and physicists scientifically are far closer together than they were in my youth.

Research Programs

Calciano: All these years that your husband was teaching astronomy at Berkeley, I noticed he was producing papers regularly. They must have been theoretical rather than observation-based.

Mrs. Shane: He was doing some work in Berkeley on the side, some work with a young man by the name of Spedding, at that time.

Calciano: Right. It's quite a coincidence.

Mrs. Shane: Yes, isn't it. Well they had a spectrograph set up in the basement of the astronomy department. Now what part each took in it you would have to ask them, but they worked together. In fact I think they

even have a couple of papers published together.

Calciano: Yes, I noticed that in your husband's bibliography.

Mrs. Shane: And I can recall seeing this boiling container of liquid air that your father took from the physics department to where they were experimenting, but I couldn't tell you just what it was all about. But Donald always had some research under way. He got into his present research on galaxies more or less by accident, you may or may not know, when he went up to the Lick Observatory, because Mr. Wright had set up the 20-inch astrographic camera which we saw when we were up there...

Calciano: Yes.

Mrs. Shane: And this had to do with using the distant nebulae as a reference point for the motion of the stars. But this was a very long-range program. The thing was not fully set up when the war came along and stopped everything, of course. There simply was not enough personnel left on the mountain to enable a new program like this to be started. So when we went up in 1945, the telescope had been put together, but the program had not begun. And by that time, you see, Mr. Wright had retired and was a fairly old man. The plan was to take these places and then

another set perhaps twenty, twenty-five years later, and then the comparison would show up this motion. Well, my husband thought it was a shame to have all these fine plates with no current use. It was a long program with apparently no immediate reward because he wouldn't be around to cash in on it, and young people just starting don't want to sit around forty years before they have a single result, all of which is quite reasonable, but it seemed to be a very valuable thing to do, so he undertook this program. Then he had these plates with all these nebulae on them, and the spiral galaxies, and he got interested in counting those and studying their distribution over the sky, and that has been his research of late; but it was not the research that he started with.

Calciano: This wasn't his goal when he started?

Mrs. Shane: It developed shortly after he started this program, but he started the program for an entirely different purpose.

Calciano: A sort of public-service purpose.

Mrs. Shane: He was then Director and had administrative duties, and this seemed a good way to use his observing

time. But it turned out to be much more interesting than he imagined it would. Now you see they are just about to start the second series, so time flies. The first series was started very soon after we went up and I think completed, essentially completed, in about seven years. And then the thought was that great phalanxes of observers and measurers would turn to and work on these plates for years and years and years. Meanwhile the electronics development has been such that this magnificent measuring machine under the direction of Stan Vasilevskis has been developed, so that the plates will now be put in that.

Calciano: Computerized?

Mrs. Shane: Yes. Push a button and it's automatically set; it's automatically measured and recorded, and what would have taken days and days of time is done in a minute fraction of the time.

Calciano: How wonderful:

Mrs. Shane: So you see everything comes to those who wait. The second series of plates will be started as soon as the engine is perfected. It's working, but it's...

Calciano: Now which engine? The machine?

Mrs. Shane: This one, this measuring machine that Stan Vasilevskis provided the astronomical know-how for, and the Gaertner Company in Chicago built. And it's a very remarkable piece of equipment. Now just as soon as they're ready to go on that, they'll start the second series of plates. In other words, the longer the interval, the more valuable the plates, but meanwhile these plates have formed the basis of an atlas, and the basis of my husband's more recent research in the distribution of galaxies.

Calciano: They can check them fifty and one hundred years from now, too.

Mrs. Shane: They can keep on doing this as long as anyone can get anything out of it. So you never know when you start. Of course that is the value of research...

Calciano: Yes, basic research.

Mrs. Shane: Basic research, you don't know what it's going to lead to, but you have a certain confidence in it. So he really switched his field completely.

Calciano: Before he had been, what would you say...

Mrs. Shane: Well in his early years he'd been interested in stellar spectroscopy, but he dealt with a variety of things. And as I said, in Berkeley for some reason

or other, they were working on the sun. He was not a solar observer by nature, but I think he was driven to it because that's the only sort of research you could do then in Berkeley. So perhaps his research career has been molded by circumstances; he picked whatever he could out of a situation.

AURA

Calciano: Did he do much in the way of going on expeditions to Godforsaken parts of the world?

Mrs. Shane: No, I think he went on two. Godforsaken parts of the world usually means an eclipse expedition. That's the only thing I think astronomers go to far places about, and he went on one in Maine and one as far away as Camptonville, California, so...

Calciano: (Laughter) Godforsaken parts of the country: Mrs. Shane: I don't think very Godforsaken.

Calciano: In more recent years he has gone off to...

Mrs. Shane: Well not on eclipse expeditions.

Calciano: South America or...

Mrs. Shane: He was in South America through his connection with the Kitt peak Observatory, and the Kitt peak Observatory is a part of AURA. The original object

was to provide some research facility in a good climate for a wide variety of universities, and I am not certain, I think there were seven originally -- Chicago was one, Harvard was one, Michigan, Wisconsin, and in the West the University of California, because they wanted to have a facility somewhere in an area of good winter climate. And my husband was an early representative of that -- each university had one businessman and one astronomer, and I think he was perhaps the first astronomer from the University of California. When AURA was established there was some considerable period of searching about the mountains near Kingman and those near Tucson, and so on, to try and find a mountain with good seeing. They finally selected this Kitt peak which is about an hour-and-a-half drive from Tucson. And the early trips up there were quite rugged. I think it's over six thousand feet; I'm sure it is, and it was quite a rugged mountain with no trails. Anyway, while he was still at the Lick Observatory, toward the end of his stay there, and I think after he had retired as Director, he spent quite a good deal of time at Kitt peak, and in fact for six months was Director -- just filling in while

they found a permanent director. The Kitt peak Observatory was built there with federal funds, National Science Foundation, and it's a very fine observatory with a fine solar telescope and other stellar telescopes. Then they wanted to extend their observing facilities to the southern hemisphere to get the southern sky, and he went down to Chile on two survey trips. So when you questioned about far places, that was what he was doing in Chile.

Calciano: What I was leading up to is did you ever go with him on these?

Mrs. Shane: Well I didn't climb the peaks in the rugged days, but while he was Director at Kitt Peak he was there two weeks and at Lick two weeks, he was alternating, and I went several times on these trips. And when they had their dedication I got back my old job of writing a brochure, (laughter) a little booklet, you know, like the Lick Observatory booklet, which was quite fun. I did things like looking up the history of the Indian reservation. Kitt Peak and the surrounding area was purchased from the Indians.

Calciano: Oh?

Mrs. Shane: It was an Indian sacred mountain, and there were quite interesting negotiations to get the mountain

without offending the spirits and so on, and so that was rather fun. I think that's my only far place, and that's not very far; I've never been to Chile because it was very rugged in the early trips that he made. They were riding mules along the crest of the mountains up ten thousand feet, just sleeping on the ground and eating what they could come by. They wouldn't have welcomed my company.

DIRECTORS OF THE LICK OBSERVATORY

1920-1945

Calciano: During these years that you were away from the Lick Observatory, what was happening at Lick? Was it growing, or was it stagnant, or...

Mrs. Shane: Oh no, it was growing. It was a slow and even pace until, of course, the beginning of the war when they couldn't expand their facilities because of reduced personnel. The astronomers were practically all -- except for a few of the older men -- away at war work. I don't think the budget was actually cut, but they couldn't get mechanical and optical work done on account of war demands, so during the period 1940-45, activities naturally had to contract. And the number of people there when we returned was very small.

Calciano: So your husband really had quite a building up job to do when he came back.

Mrs. Shane: Well that is true, and of course the big addition in equipment was the 120-inch telescope. Then as I mentioned, that 20-inch. Carnegie telescope had been secured and built, but not finally tested, when the war came. And I thought it was rather nice that after all of these years of preparation and thought, when the last program plate was taken, Mr. Wright came up and stayed with us, and he started the exposure on the last plate,

Calciano: Oh, that's nice.

Mrs. Shane: So it was rather nice that he could. By that time, of course, he was not able to do any regular observing.

Calciano: Had Mr. Wright been a good Director?

Mrs. Shane: Yes, I think he had; he was not there many years you see.

Calciano: What were his years?

Mrs. Shane: Well the late thirties, about 1935 to '42.

Calciano: Which of the Directors that you're familiar with do you think were the best ones?

Mrs. Shane: Of course the one that I knew best and who was my

model, the one I always think of as a perfect Director, was Dr. Campbell, but I came as a very young person, and he represented to me the last word in dignity and ability. He would stand comparison, I know, with anyone who has ever been a Director. Dr. Aitken became Director as quite an old man, and he was filling in as Associate Director first. Then Mr. Wright became Director, but again this was toward the end of his active career, and he served almost to his retirement. I don't think it was too many years -- maybe eight, and then Dr. Moore was there a very short time. This was during the war years when there was practically no one there.

Calciano: Was he older too?

Mrs. Shane: He was older, and he left in 1945. He had heart trouble and couldn't take the altitude. He went down to Berkeley, and he died very soon afterward. His widow is still living, and I see her once in a while. And Mrs. Wright is still living, and I see her every once in a while too. But the women are more durable, or something or other. Well I've known all the Directors but Holden and Keeler; Keeler died in 1900.

Edward Singleton Holden

Calciano: And Holden was the first Director?

Mrs. Shane: Holden was the first Director, and he had a very stormy career.

Calciano: Oh?

Mrs. Shane: There was a great deal of animosity among the members of the staff, and very poor public relations between the press and the people and Holden, and I think there was a good deal to be said on both sides. He was army-trained, and it just didn't go over with these erratic genius types -- the astronomers, who weren't accustomed to rules and punching the button and so on. It was just that oil and water didn't mix.

Calciano: How was he chosen?

Mrs. Shane: He was chosen prior to the completion of the Observatory. Various people were consulted and he was selected. He quarreled with my friends, Floyd and Fraser, who were building the Observatory, because they were not trained in astronomy and he was, and I'm sure they had some strange ideas, but most of them seemed to work, and, well, there was a great deal of animosity with his first staff who were

temperamental without question. Finally I think it came down to practically no oral communication. It was a matter of writing notes, and his notes were always with studied politeness, and the notes of the staff were sometimes quite fiery (laughter), but as I say, I think it was just a question of misunderstanding all around. And finally in 1897, after he'd been Director nine stormy years, he resigned. He went to West Point. He was a fine librarian and was librarian at West Point the rest of his life. He kept wonderful records, and I think the reason we have many of these records of the Lick Observatory was due to his care in keeping them and keeping journals and that sort of thing, preserving them. He built that very fine library which was the pride of the Observatory before the newer library was built which was the pride of the later years; it was around 1950 that the new library was built; now it is empty -- the books are all down here in another new library. (Laughter) So time marches on.

James E. Keeler

Calciano: Keeler, you said, was very good.

Mrs. Shane: Keeler, I think, must have been a very remarkable

man. He was a very brilliant man; he had been at the Allegheny Observatory and he came out to Lick Observatory while Mr. Fraser was there. I don't know that you -- yes, didn't you read a paper that introduced you somewhat to Mr. Fraser?

Calciano: Yes.

Mrs. Shane: Fraser was a person of very unusual qualities, and he felt himself a very fine judge of men, and his comments on Keeler's visit are very amusing. Keeler was a very fine young astronomer, very well trained, and he came to the Lick Observatory, and I can't quote the words, of course, but the gist of it was that, "He seems like a smart young man; he may amount to something someday."

Calciano: (Laughter)

Mrs. Shane: But they said that Keeler, if he had a paper to write or a speech to write, the first draft would be perfect without one word of modification. People who have seen the scratch copy said that there was never a word changed; that it flowed out absolutely fantastically. And in the very short while that he was at the Lick Observatory, he started this nebular work and took a fine set of nebular pictures. Oh not comparable to what the 200-inch is doing today, but

for what he had to work with, which was the Crossley in its early stages, and very inferior photographic plates, of course, in those days compared to what we now have, he did a remarkable job, and he died a very young man. I think he was about forty, and had he lived he undoubtedly would have been a very great astronomer, and a very great man.

Calciano: What did he die from?

Mrs. Shane: I think of pneumonia. He had gone up to Clear Lake to visit Captain Floyd, and had apparently taken a cold and died within a very few days. I believe he died after he got back to the city. He was apparently not only a very brilliant astronomer, but a very kind administrator. A person everyone liked. And his death was a great tragedy to astronomy.

Calciano: Let's see, he was Director from...

Mrs. Shane: He was Director of the Observatory from '97 to 1900 or thereabouts. He was only Director for a few years and then he died. His wife was the niece of Mrs. Floyd, and in a sense he married into the Lick Observatory family. This Mr. Hoskin who will be here from England is doing something about a life of Keeler which I think would be a very nice thing to have done.

Calciano: Yes.

C. D. SHANE DIRECTOR, 1945-1958

Rebuilding the Staff

Calciano: When your husband went up to Lick Observatory as Director, I guess, as you said, because of this hiatus he had quite a bit of resurrection to do. What were his immediate problems?

Mrs. Shane: His immediate problem was to gather the staff back. Most unfortunately one of the most promising young Lick astronomers lost his life in an accident connected with war; not in combat, but in an explosion of a dirigible. He was studying sonic echoes having to do with anti-submarine warfare, or something of that sort. That was Art Wyse. And he and Nick Mayall were the two young people at that time who went off in their early thirties to war work, and of course Nick Mayall returned very shortly after we came, and he is presently the Director at the Kitt Peak National Observatory.

Calciano: Oh!

Mrs. Shane: So that name would be familiar, but he was at the Lick Observatory all those intervening years until

1960 when he went to the Kitt Peak Observatory as Director.

Calciano: Now you only have eight or nine astronomers up there at one time...

Mrs. Shane: Yes, about that, and I think that perhaps there were two others away, and the other two or three were there, but then as people came back it meant building up personnel all across the board -- more mechanics, more electrical people, more carpenters, more assistants, and of course the students had practically fallen off to nothing during the war years. There had been no building; the people were very badly under housed because the building had stood still. And then as the people returned there was activity in all directions. I think the first thing that was done was to put this 20-inch in operating order, and of course telescopes, as you well know, are never done; they're always building new equipment, making improvements and changes, and many changes were made in the Crossley; and then of course the major project was the 120-inch telescope.

Calciano: Yes. I want to get to that in a minute. On getting the staff up there, was it hard to get people to come live up on the mountain?

Mrs. Shane: Well people are very sharply divided. The people who love it love it dearly, and they stayed on end on and on with tremendous loyalty. There are some people who are just not cut out for that type of living, and they very quickly found it out and left, so that by a slow process of selection, at least it seemed in a way slow, there were gathered there a very cooperative and happy group of people -- people who liked that sort of life and were content there. In general the astronomers were well adjusted because they had their work, but for the people whose work ended, you might say, at five o'clock, and who didn't have a consuming interest that went far into the night, you can see it would have been dull. You have to like that type of life. It turned out in due course that a staff was built up that did like that kind of life, and for them and us it was a very happy existence.

Calciano: How long did it take to get the place in working shape? Was it a matter of a year or two, or...

Mrs. Shane: It just doesn't happen suddenly. Little by little one person after another was added, and instruments were slowly fixed up -- it was nothing spectacular. Some office buildings were added, and a new

dormitory was built; houses were remodeled, fixed up; new houses were built.

Calciano: Did the University finance most of this, or the federal government?

Mrs. Shane: The University financed all of it.

Relations with President Sproul

Calciano: Did your husband have many battles to get these things?

Mrs. Shane: No, he was awfully lucky. President Sproul was President the entire time that he was Director, and we had known him for years. Donald had known him since college days, even. They were not quite the same class, but were in the University together, and Donald had known him all this time. And I think that my husband said that he could never remember one single request that he ever made to President Sproul being turned down. Donald was modest in his requests; that is he asked for what he needed without padding, and Sproul recognized this. President Sproul was very interested in the Observatory, but I don't think he ever interfered in the administration of it. He showed a great interest, but it was always a friendly and a helpful

interest, and I recall his saying once that the Lick Observatory was one of the brightest jewels in the crown of the University, which I thought was such a nice way of putting it -- I think we both remember that. He came up to the Observatory to attend the Regents' meetings. During those years it had a different status administratively. It was an independent campus and reported to the President. Now it is a department reporting to the Chancellor of the campus to, which it is attached, which was at one time Berkeley, and now it's Santa Cruz. But in those days it was different, and we had the Regents' meetings on a regular schedule...

Calciano: Oh!

Mrs. Shane: ... so that it had a more independent administrative setup.

Calciano: It wasn't considered a part of Berkeley?

Mrs. Shane: It was a separate campus of the University of California until, I think, about 1959. It was a queer arrangement -- I mean it was quite unreasonable in a sense, but it was very pleasant, and to some degree it was just a matter of bookkeeping, you might say. It had had the status of a separate campus since sometime in the 1930's, I

believe. In 1959 it became a part of the University under a different category, comparable to one of the scientific laboratories that are connected with the University.

Calciano: This administrative shift occurred right after your husband left?

Mrs. Shane: Well it was in the wind before he left.

Calciano: Is this part of the reason he retired early?

Mrs. Shane: No, he retired early because he wanted the last five years to complete his research, and with the administrative burdens, and the additional confusion of AURA coming in and taking quite a bit of time toward the end, he didn't get his research finished. In fact the paper that sums up all this was published only a few months ago. Now it's finally seen the light of day. (Laughter) But these things go on, as you well know, forever. The chief nerve-racking battle I recall is the matter of the 120-inch.

Calciano: Yes. What was the story there?

Getting the Appropriation for the 120-Inch

Mrs. Shane: Well I can just remember this one particular incident. The 120-inch telescope came up before the

legislature. You see it was a big expenditure -- maybe not so big in these days, but very big in those days, and it was necessary to put this before the legislature at Sacramento and argue in favor of it. They wanted somebody to go from the Lick Observatory and state their case. I don't know the ins and outs of it all, but I do remember very clearly that my husband and Nick Mayall went up to Sacramento to state the case of the Lick Observatory, and they were to have a hearing at some time in the early evening and expected to be home about midnight. So I was waiting at the Observatory for them to come home, and it got to be midnight end two in the morning and nobody was there yet, and I was getting simply terrified. So just because I had to do something and there was nothing really sensible for me to do, I started to walk down the road at two o'clock in the morning just because I was nearly going crazy. I had gone about a mile, I guess, when I met them coming up. Well, of course, the hearing had been delayed and had carried over late into the evening.

Calciano: And they never thought of phoning?

Mrs. Shane: I don't suppose they had a chance. They were busy

and concerned, and I think that when I met them that night I've never seen two more dejected people, because the legislature had smacked them down and told them that that was the last of their hopes gone. They had argued their case and they had been turned down, and they were both crushed because they felt this was the end -- they would never have a big telescope for the Lick Observatory. Well the next morning, I believe it was Mr. Corley, it was someone from the University at Berkeley who had been up at the sessions, called up very concerned. He said, "We worried about you all night and we thought perhaps you had committed suicide. Don't worry -- this was a political maneuver. They are playing off the cities and counties bill against the Observatory." You know how they bargain and trade.

Calciano: Yes.

Mrs. Shane: "And so everything will be all right in the end."

And of course it was just that way. But Donald was naive in the ways of politicians, and that is one of those nights that is indelibly printed in my memory. My sheer terror that something had happened to the two boys and then their absolute gloom. And oh, how blue and depressed they were!

Calciano: Was it entirely state funds that paid for...

Mrs. Shane: Yes, I think it was all state funds; I think this was before the federal funding of things of this sort was quite so usual, but again that is something out of my knowledge.

Designing the 120-Inch

Calciano: Well may I ask, why did they decide on 120 inches instead of 110 inches, or 133 inches, or...

Mrs. Shane: One very good reason was that there was a 120-inch blank that had been cast as a test blank in making the 200-inch, and it was sitting down in the Caltech shops. Somewhere along the line it was supposed to be used as an auxiliary in testing the 200-inch, but of the details I'm not certain. Anyway, Dr. Bowen, who was Director there at that time, let the Lick Observatory have it for a very favorable price, which saved a lot of time and countless thousands of dollars in having a new one cast, because you see these are custom-made. So when you say why 120 inches, that is the reason. As you get bigger mirrors, the mechanical matter of mounting becomes more and more difficult, and almost everything can be done with a telescope that size that can be done

with a considerably larger one, barring occasional nights of super seeing when the big one can get through. But for the most part when you get upwards of a hundred inches, you're beginning to run into limitations from unsteadiness in the atmosphere and things of that sort, that no sized telescope can overcome. But there are a few nights of superlative seeing when a big telescope pays off.

Calciano: This doesn't pertain to Lick, particularly, but on the 200-inch when they hit one of those super nights, does the man who's regularly scheduled to go on just consider himself lucky, or do they shunt in some particular project?

Mrs. Shane: I can speak only in a small way of what happened at Lick. They were at one time getting a series of moon photographs -- this was with the 36-inch refractor-- and that program had high priority. If there was a super night and someone had it to do something that could be done just any night, they gave it up to this program. Now I don't know how it was worked at Mount Palomar, but it would only be reasonable to expect that if they had some special thing that had to be done with fine seeing, that perhaps they would give it to a person working on that project. But

there's always auxiliary equipment that goes with a telescope, and you can't just shift from one project to another easily. Sometimes you can change observers if suitable equipment is on. With the 120-inch it takes a good-many hours to change from the equipment you use when the moon is around to that used in the dark of the moon. You have to make these changes between the runs, and it's the same with almost any telescope. You have to make certain preparations unless you're doing exactly the same sort of work.

Calciano: Who designed the 120-inch?

Mrs. Shane: Bill Baustian was the chief engineer on the 120-inch. You know there just are not optical designers sitting around for a telescope the like of which has never been built before, but he was very well recommended, and he came to the Lick Observatory. He was, I believe, a graduate of Caltech in engineering, but he had practically never seen a telescope when he set about to design one, but he is now a leading expert on telescopes. He's now designing a big telescope for Kitt Peak. I think their 150-inch has been funded and he is now working on it. But when he came to Lick he was selected

virtually without experience, because there just weren't experienced people. The person in charge of the optics was Don Hendrix, who had had the experience of the 200-inch and was very competent. He has since died. He was a very fine fellow; he died much too young, too. But he had a well-made reputation, and he didn't have to learn on the job as some of the others did because they were feeling their way.

Calciano: Was your husband's role in this mainly assembling the best people available, or was he really involved in each little segment?

Mrs. Shane: He is not a trained engineer, and he knew nothing about the technical details. He knew the ends to be achieved, and he was, of course, very close to it all the way. But perhaps you summed it up right: he tried to find the best people and give them good working conditions to complete it. But he himself would not have been competent to do any part of it because he's not either an optical designer or an engineer, and the electrical side, the electronics and all the things that go with this are special fields.

Calciano: How long did it take? And when was this horrible

legislature session? What year was that?

Mrs. Shane: Oh dear, I would think it was 1946 perhaps. It wasn't too long after we-went up in '45.

Calciano: Well had this idea been kicking around before the war?

Mrs. Shane: Yes, it was being considered before the war, but they had to recover from the effects of the war before it could be pushed actively. I believe Donald went to a discussion meeting in Southern California at Mount Wilson about 1944 discussing the possibility of a large telescope. But of course no work of that nature was done during the war years, which seemed interminable at that time, but all time is telescoped now.

Calciano: When did it go into operation?

Mrs. Shane: It went into operation very close to 1959.

Calciano: It was a bit over ten years...

Mrs. Shane: It was a bit over ten years from the beginning to the end. Perhaps I have gotten off a year or so on these dates.

Calciano: Well you can correct them later...

Mrs. Shane: Donald can correct them later. I know that he timed his retirement to coincide with the completion of the telescope, because he felt a new Director should

do the planning of the programs. He felt his part had been pulling it together, and that it was better that the person who was going to be Director should be there at the beginning of its operation.

Calciano: Why?

Mrs. Shane: Just for continuity. Suppose that Donald had started a program he was interested in. Well then a new Director would have felt, perhaps, that he had to carry that on when it wasn't really his interest. It just seemed a rather normal kind of time, and furthermore he wanted these last few years at Lick for his own research.

Calciano: Has he done any work on the 120-inch?

Mrs. Shane: He's done some observing on it, yes, but for the most part his big observing program was with the 20-inch. Yes, he did observe some with the 120-inch; I've forgotten, something like two nights a month or so after his retirement, but it wasn't an instrument that was specially adapted for the sort of work he was doing. His could be done with a smaller telescope, and there was other work that couldn't be done with a smaller telescope.

[While the tapes were being changed, Dr. Shane

walked by the living room and Mrs. Shane asked him about the building of the 120-inch. The new tape started recording in the middle of the conversation.]

Dr. Shane: ...tax revenues had been accumulating during the war, and so the state had a great big surplus.

Calciano: Oh, that's right.

Dr. Shane: And they were going to spend their money for certain public improvements, and before I was on the staff, Mayall and Kron and maybe Wyse, I'm not sure, had gone to Sproul and urged him to build a big reflector. Now Wright, who was the Director, wasn't in favor of that.

Calciano: Why?

Dr. Shane: He was a very conservative fellow. He had had experience with the 100-inch telescope at Mount Wilson, and he didn't like it, so he thought that large reflectors were no good, and he didn't want it. He wanted to devote all the attention at the Observatory to the 20-inch astrograph. Anyhow, Mayall and Kron and Wyse went to Sproul and convinced him that they ought to have a big reflector, so when the state was going to spend all this money, Sproul asked for the telescope. When

Sproul set aside \$900,000 that was only on the basis of current building costs. Now as building costs went up he could increase the amount proportionately. So it went up first to \$1,200,000, and then to \$1,800,000, so that was the basic amount we had to spend on it. But we had to have a lot of auxiliary equipment, and I think ultimately the cost went up to about \$2,700,000.

Calciano: When did it start? When was the ground broken, so to speak?

Dr. Shane: Oh, I can't tell you when they first started. They had people there making surveys, but probably they first put a pick into the ground in 1950.

Calciano: It was a case of it being planned for a number of years before any...

Dr. Shane: Oh yes. Well you see shortly after I went there we hired Bill Baustian, and Bill got some help in the matter. He not only brought in an assistant by the name of Erwin White, but also he employed one Joe Nunn to do the detailed design. John Case, who was actually an engineer, was hired to serve as architect for the building, and all of this planning went on for years. I think probably they started erecting the telescope around 1954, but I couldn't be sure of

that.

Mrs. Shane: Your trip to Sacramento was...

Dr. Shane: '46.

Mrs. Shane: '46. I knew it was very shortly after we got there.
Bill Baustian came to you unknown, didn't he?

Dr. Shane: He was recommended by Mark Serrurier, then
mechanical engineer on the 200-inch telescope, and
whom we wanted to get, but who was in business with
his father in a very profitable commercial
enterprise and wanted to stay with it, but he
recommended Bill Baustian.

Calciano: But he was really a novice as far as working on big
telescopes?

Dr. Shane: Who, Bill? I don't think he'd ever seen a telescope.

Calciano: (Laughter)

Mrs. Shane: That seems a strange way to select a chief engineer
of a telescope.

Dr. Shane: Well it's the same way with the company that built
it, you know. They probably had never seen a tele-
scope either. But they had all the specifications
and plans; Bill Baustian, of course, had the advice
of the astronomers to tell him what to put into the
telescope. They gave him the benefit of their ideas

and experience, and then he had Mark Serrurier as a consultant, and Bruce Rule from Caltech as a consultant. And before he was through Bill probably knew as much about big telescopes as anybody.

Mrs. Shane: Was there any federal money in that telescope?

Dr. Shane: No.

Calciano: They should have used some federal money and saved some of the state surplus for now! (Laughter)

Dr. & Mrs. Shane: The surplus would never have lasted that long. (Laughter)

[Dr. Shane leaves.]

Other Building Programs

Calciano: Were there any other major building programs while you were there?

Mrs. Shane: Well there were very, very extensive programs in both office and home building. A good-sized dormitory was built, and oh, perhaps six or seven residences. The new library wing with many additional offices was built; a whole wing of offices, all attached to the 36-inch building.

Calciano: Now about the residences, would the University design and build them, or would the people who were

going to live in them design them?

Mrs. Shane: The Observatory architects and engineers designed them, but I know in the case of one of the new staff houses, the one that we went into (and those were the first ones that were built), the architect came up and talked it over with us, knowing that we knew conditions up there, and they listened to us on the proper wind exposure, the proper sun exposure, and things of that sort. And they listened to the superintendent of grounds and buildings about excavating and the condition of the land -- what slid and what didn't, where the snow was heavy and where the roads could be kept cleaned -- things that an architect, not having been through a winter up there, couldn't be expected to know. So I would say it was a cooperative affair, and they got awfully nice houses out of it.

Calciano: When your husband was Director, well I know physicists have a reputation of all being prima donnas, and the head of a physics department always has plenty of headaches. Are astronomers this way or not?

Mrs. Shane: We were just awfully fortunate in having a group of people who were easy to live with.

Calciano: Nobody threw a tantrum if he couldn't get on the 120-inch when he wanted it?

Mrs. Shane: Well, there was no 120-inch then so that was not a problem. I don't recall anyone during our time throwing a tantrum for such a reason. We heard it had happened earlier. The people who were there with us were younger than we were, but people we'd known for a long time, good friends of ours, and they all seemed to manage to live together in peace. I can tell you that on both sides it was a pleasant, pleasant number of years.

Calciano: And you said that you didn't really have budget crises either.

Mrs. Shane: No, you see these were years of prosperity. The budget, I think... (I did write a figure or two down here because I can never remember all the details.) I think my husband said that when he went to the Observatory in 1945, the annual operating budget was \$60,000. When he left in 1958, or maybe it was in '63, I can't tell you which, it was \$300,000--that's five times. It's now \$600,000.

Calciano: Whooo.

Mrs. Shane: Of course there's been inflation, too. But all the years that we were there were years of reasonable

stability and prosperity. You see it was a fairly easy time financially, not that everybody had everything they wanted, nobody ever does. But the place was not impoverished or a depressed area by any manner of means. I think the community lived reasonably, I mean the academic community. Expenses were watched. Money was never thrown about, but there was always a reasonable amount, and I think people were interested in making things go and saving money for the Observatory so that there'd be extra money for scientific purposes. I'm thinking in a very small area now, the new dormitory. In order to save money the ladies of the mountain made all the curtains and bedspreads, and it became a very pleasant project because we would meet, I've forgotten, maybe two evenings a week, down at our house. All the ladies came.

Calciano: It was almost like a quilting bee.

Mrs. Shane: It was sort of a quilting bee, and it was a mixture of social occasion and work -- it gave everybody the feeling, I think, that they were part of the effort.

Calciano: Was this your idea?

Mrs. Shane: I couldn't tell you. Those things just come, you know.

Calciano: That's marvelous.

Mrs. Shane: But it gave a reason for getting together, and it made a community effort that probably was good for everybody; it saved the Observatory money and was fun.

Calciano: You mentioned in our first interview about the wonderful feeling there was in 1919 when you were there. This esprit de corps among the young people, was it still there in the fifties, or had cars and television...

Mrs. Shane: Yes, that made a big difference. In 1919 we had to make our own fun and it was done very simply, and in many ways I think it was very effective. When we were back there after the war, the young people would, most of them, go off weekends. They all had cars and they'd go take a little trip; nothing about that that is unreasonable, but it didn't give quite as much mountain life as there had been by necessity when we were there earlier, just because we didn't have cars and we didn't have electricity and more or less artificial entertainment. We had theatricals, and tennis tournaments, and picnics and hikes, and things like that on weekends, and that was, of course, all done together, whereas these trips were

two or three in one car, and two or three off in another direction in another car. Well life has changed everywhere.

Calciano: Yes, although in a way that mountain had hung on to this make-your-own-entertainment business longer than the rest of civilization.

Mrs. Shane: Probably. Yes, that's right. We didn't have the modern improvements.

Unexpected Duties

Calciano: I have a little category here, a sidelight called "unexpected duties." One of the things I was thinking of was your husband's experience as a judge. Now I know the story, but the machine doesn't. Would you tell that?

Mrs. Shane: This is just one of the amusing little things. Someone sponsored an essay contest in a San Jose school for I believe the seventh and eighth graders. It was the James Lick School so the appropriate thing seemed to be to write an essay on James Lick, and the appropriate next step seemed to be for the Director of the Lick Observatory to judge the essays. So no one could have been more surprised than my husband when a very large bundle of essays

appeared in the mail. (Laughter)

Calciano: There was no request ahead of time?

Mrs. Shane: Well possibly, but it all happened with great suddenness. (Laughter)

Calciano: How many were there?

Mrs. Shane: Oh my, they numbered in the hundreds, if I remember rightly. It was just a terrific number. (Laughter)
Now tell me, did he read them or did you?

Mrs. Shane: Well I perhaps scanned some of them first, but I think he made the great and final decision. I don't remember all the details; that's just not what you would expect a Director would be involved in. However, it was one of the sidelights. Well, there were many things. Another one was the post-visitor morning tour of what we always called the parapet, which was the flat area out in front of the Observatory, the parking area, which was bordered by the parapet where you sit and look at the great world. Well these picnickers would come up for visitors' night, and on the next morning we would go up and the place would be full of orange peels and all the little leftovers of the night before. So the first thing we always did was to pick this all up. (Laughter)

Calciano: You and your husband?

Mrs. Shane: Yes. You see the janitor often had weekends off, and we could not bear to have the visitors come up and see that mess. And I remember very clearly one night when we were walking up to the top preparatory to visitors' night. It was a cold night, and some people had been having a picnic supper in the car. Just as we got up to the top, the car door flew open and out came a cascade of papers and cups. Well we were in the company of a very large and impressive astronomer who's now the Director of the Commonwealth Observatory in Australia, Olin Eggen. He was a very big and a very powerful man with a rather grim and deadpan expression, and he walked over to the car, picked these things up, opened the car door, put them all in the car on top of the people, shut it again, and they stayed in this time: (Laughter) I wish more people were like that. We'd never have had the courage to do it, but he was so furious; he didn't show it at all, but back went all the papers into the car.

Calciano: That's wonderful!

Mrs. Shane: The visitors, most of them, were very well behaved people, but in a group of several hundred, as you

well know, there are always a few people who deface the landscape.

Calciano: Did you have anybody write initials on the....

Mrs. Shane: No, I don't think I ever saw any initials, and the new 120-inch had panels, very handsome panels, in the lobby, and my hideous thought was that that's going to be a perfect place -- people will certainly carve initials or scratch initials in this, and there was some talk of arranging it so that those panels could be unscrewed and new ones replaced, but it wasn't done. I think that place was always respected, and so were the main buildings. I don't know of any real damage except during the snow when people of quite a different type came up -- interested not the least wit in astronomy, but in making merry in the snow, and they would come into the main building and snowball down the corridor, smashing their snowballs into all the books and the chronometer cases. One day we were sitting in our home down just below the top and heard a strange noise and went to find someone taking the light fixture off the porch beside the door! They just were pulling it off with main strength and we said, "Why?" "Oh, we want a souvenir."

Calciano: Oh! Good heavens!

Mrs. Shane: And another time, not in our garage, but in the garage of a friend near us, some of these young people in the snow came in and gathered up a bunch of spare tires that were lying along the edge of the garage and rolled them down into the canyon. And when taxed with that they said, "Well isn't this state property? We own it." So as I say, all sorts of queer people came, but in general, I think, the visitors were a very worthwhile activity of the Observatory, and were usually very patient, despite long, long waits for a chance to look through the telescope for a very short time.

Deer Hunters

Mrs. Shane: You asked a while back about extra-curricular activities. One of the things that we made quite a game of, but certainly wasn't astronomical, were the poachers on the reservation during the deer season.

Calciano: Oh!

Mrs. Shane: Because some of the deer hunters were road hunters, you see, and shot practically on our front lawns. It was really hazardous to be out in the dusk during the deer season.

Calciano: Heavens!

Mrs. Shane: So the men, and I might say the women as well, would patrol the road by just driving back and forth--you can spot these deer hunters in cars.

Calciano: They were driving...

Mrs. Shane: They would drive with their guns assembled, waiting to see a deer. Then they'd shoot from the road which is, of course, illegal. We were not empowered to do anything, but we would pick up one of these cars and just follow along behind. They'd pull off, and we'd pull off. In time I think the word got about that this was not a good place to hunt, and we did this chiefly to eliminate this hazard of random shots. We rather enjoyed these expeditions, especially the early morning trips. There were three of us who particularly delighted in getting up early and following these early-morning deer hunters up and down the road. They would sometimes get out and menace a man if he did that, but they wouldn't, of course, a woman.

Calciano: Very smart:

Mrs. Shane: So we used that as one of our methods of entertainment.

Calciano: (Laughter) Oh, they must have been frustrated.

Mrs. Shane: They were, but that...

Calciano: That was the whole point:

Mrs. Shane: It was a strange type of entertainment, but it was rather fun.

Calciano: You called the area around the Observatory the reservation?

Mrs. Shane: Yes.

Calciano: Is that a real title or a nickname?

Mrs. Shane: I rather think it does appear in some of the grants. I'm not certain. At one time it was a game preserve; no hunting was allowed. Then they opened it up because the deer were becoming too numerous and just starving to death. Of course they were a menace as far as gardens went, but you didn't have much in the way of gardens on the mountain. The Observatory couldn't afford the water, and the climate was not suitable or the soil -- nothing about it was suitable.

Calciano: How large an area is the reservation?

Mrs. Shane: Well a good many hundred acres. Originally it was something like 1600, but now it's more like 3,000 or 4,000 acres. It was granted by the federal government to the Observatory, and then it was added

to by the state by buying parcels lying around it in different directions. Lick never owned any of this land. The original grant was made by the government to the Lick Trustees, and of course it was later transferred to the Regents.

Fires

Calciano: You mentioned that back in your student days Campbell liked to know who was where in case of fire or something. I realize that there's a lot of brush around there and not a great deal of water, and I was wondering if there have been any major fire threats anytime, either recently or long ago.

Mrs. Shane: There was one during our stay there that came not onto the reservation, but perilously close from the back and was a very major threat. And it was fought by everyone from the Observatory plus a much more efficient lot of people from the forest service.

Calciano: Everyone meaning the men, not the women?

Mrs. Shane: Well the women made sandwiches and took them down and ran around pretending they were useful when they really weren't. That was the closest threat. There was another one in front of the Observatory, just down along the road, that apparently was started in

the grass by a cigarette maybe tossed from a car. That was a flash fire, but was really not threatening anything because it was just in the open grass. I remember that that occurred when we were having a farewell party for a German astronomer and his wife and family. As I believe I once told you, we had weekly dances in the old library or in the schoolhouse during most of the time that we were up there during that last period, and we often combined them with a farewell party for someone if they were going, or a birthday party or whatever, and we were having this farewell party for the Hungers when someone rushed in and said, "Fire." Well of course everyone immediately went down, that is the men did, and we had a fire truck on the mountain...

Calciano: Oh, you did?

Mrs. Shane: It was quite fast and efficient, and the fire was put out fairly quickly, and then everyone came back and resumed the dance with new spirit. I can't remember but one house fire, and that was very, very minor, a television set caught fire, something within the set, and that wasn't too long ago and was put out by the householder.

Calciano: Well now, if one of these big grass fires came

along, could the Observatory or some of the housing be swept right along?

Mrs. Shane: Probably not because there's not enough power in back of a grass fire.

Calciano: Well like the ones in the Los Angeles area that sweep down the canyons...

Mrs. Shane: Aren't they combined with brush? Now the Observatory had a very big program of clearing the brush from the north canyon. I don't know whether it's still being done or not, but a band, an open band, was cut some distance below the houses as a fire break, and then the brush up towards the houses was materially thinned so that no very hot fire could come into the foundations of the house. Except for a barn, no structure has ever been burned on the mountain, which I think is quite remarkable, and even more so in all those days of candles, lanterns, lamps, the pre-electricity days, which I too can remember, when we heated with little airtight stoves and open fireplaces. We all had fire extinguishers furnished by the Observatory and serviced by the Observatory, and during the more recent years there was a very good fire truck, very well equipped.

Calciano: The fire extinguishers, I imagine, were relatively

recent in making their appearance?

Mrs. Shane: I remember them in the Director's house when we were up this time, but I can't remember any of them from the earlier days. I don't recall. Water for fire protection was very limited. It was kept in a high tank with a high head of pressure so that they could throw fairly good streams. No, I think that it is very unusual that so many years have gone by with no major fire. Some years ago an airplane went through the center of the main building and took out a very large part, but very fortunately it occurred during the dinner hour and no one was in the building.

Calciano: It missed the domes?

Mrs. Shane: It missed the domes and it missed the library, which was in the other wing and which would have been an irreparable loss. They lost some of the plates and some files which were in the office that was hit, but that was a great potential fire hazard, which fortunately did not develop. They said quantities of gasoline were running down the corridor of the main building.

Calciano: How did they keep it from igniting?

Mrs. Shane: Some very cool-minded person, I think it was one of the women assistants, pulled the main switch when

the plane went in, so that there was no chance of a spark of any kind igniting it. But of course it could have ignited from just the friction of the crash. And apparently the pilot of the plane turned off the ignition, thinking the plane would crash. So it was a very unusual thing.

Calciano: Were you there when it happened?

Mrs. Shane: No, no, we weren't at the Observatory even. It happened in 1939; it was a military plane. Of course the two men in the plane were killed, but no one in the Observatory was hurt, and no very major damage was done. If it had hit a hundred feet over either way, it would have gone through the library or through one of the telescopes. If it had to hit somewhere, the place couldn't have been more fortunately chosen.

Calciano: Aren't there any little blinker lights running around the telescopes such as you see on the tops of radio towers?

Mrs. Shane: No.

Calciano: You're just supposed to miss the mountain and...

Mrs. Shane: Well you see the time that it's hazardous would be in a fog and the blinker lights wouldn't show. When it's not foggy the domes are perfectly obvious; it

isn't as though it were a concealed tower. They're shiny, bright white, and very plain, and of course it's lower than most flight patterns would be. It's only 4200 feet. But apparently something was wrong with his altitude gauge or something on the plane.

Calciano: It's incredible that he just missed the mountain and hit the building. You'd think if you were off you'd hit the mountain.

Mrs. Shane: Yes he hit the building just a few feet above the ground level. He didn't go into the ground; he went into the building, and I would say the engine of the plane went through about halfway between the floor and the ceiling so that he only missed clearing by a very few feet, but he did miss clearing. Very sad.

VISITORS TO MOUNT HAMILTON

Calciano: Was there a fair amount of traveling involved in your husband's position when he was Director?

Mrs. Shane: Not very much, no. No, he was at home far more than he's been since he retired as Director because he's been on more committees lately.

Calciano: Yes, it seems that every time I talk to you he's gone, going, or been!

Mrs. Shane: Yes, he's gone a great deal, but I think there were

perhaps none of these government agencies - NASA and all this sort of thing -- that are so very active now since the space age has come upon us. That takes a great deal of traveling. He never has attended meetings very happily. A lot of the staff would go and he would stay home because he felt someone should be home, and a good many of the men do like to travel. He doesn't really care to. We did go to a meeting of the IAU in Rome in '52, I think, but he's made more trips lately in connection with, well these surveys, site surveys in South America and his work in New Zealand, which is advisory and which, of course, he wouldn't have taken the time to do had he been Director. He was concerned with putting together the big telescope and keeping things running at home. Oh, he did go to some meetings, but he spent most of his time on the mountain. He carried a fairly heavy observing program, and the 120-inch was building, and there were a great many people coming to the mountain, a great many meetings in that area in which he was involved.

Astronomers

Calciano: Now I gather from what you've said at various times

that you really ran a permanent guest house, didn't you?

Mrs. Shane: There were a great many guests and in the early days there was no suitable dormitory accommodation -- that is no longer true and was no longer during the latter part of our stay. When the new dormitory was built there were eight very nice guest rooms, and guests could be lodged there very comfortably, and probably more comfortably than in a private home where sometimes they felt that they were imposing when they really weren't. But having them in our house gave us an opportunity to know more intimately a great number of people, which has since been a great pleasure; it was a pleasure then.

Calciano: Did a lot of them bring their wives, or usually just the men?

Mrs. Shane: Both. Couples came and then there were many meetings where only men were involved.

Calciano: You kept an autograph book of everybody who came, didn't you?

Mrs. Shane: I kept an autograph book of everyone I remembered to ask to write. (Laughter) But there were many people who came and we talked of other things or they left in a great hurry or something happened, and I

wouldn't say it was in any way complete.

Calciano: Will this go into the collection at Santa Cruz?

Mrs. Shane: I think probably the things of that sort should be chucked into the Lick collection for what it's worth. Sometimes after many years pass, things like that are of some interest. They don't seem very vital right at the moment. As a semi-archivist I know records of that sort increase in interest through the years.

Calciano: Yes, they do.

Mrs. Shane: I might mention here the visit of the Russian astronomers in 1947, almost the first to come to this country after the war. There was quite a group of them, I think seven or eight, and they stayed with us some little time.

Calciano: In your house?

Mrs. Shane: Yes, and it was very interesting to exchange ideas. They all speak English, of course; educated people from other countries do, whereas we do not speak the language of all these other countries. The Russians were great travelers, and are great travelers, and have always been very active in science and very able in astronomy. I can recall a visit much later, I think it was '57 or '58 -- it must have been '57

because we were still in the big house -- when we had another group of Russian astronomers, and we had a square dance. We were constructing a building and it had not yet acquired walls and a roof, so there was a big concrete slab out in the open. This was in the summer, and we had rough benches put up around the slab. I remember this so clearly because it was such fun. They just knocked up some rough benches out of boards and strung colored lights around, and after dinner we went down to square dance with the Russian group. One of the Russians was this Mrs. Alla Massevitch, who is a very beautiful and dynamic woman, a very high-power astronomer in Russia, and a magnificent dancer. And we had on the staff, and he still is on the staff, Stan Vasilevskis, who is Latvian, and among his hidden talents is dancing. He knew all of these Russian dances where you leap up in the air and kick your heels and then go down on your knees all in one motion, and so did Alla Massevitch. And I shall never forget that beautiful, warm, moonlit night with this folk dance going on in which we all participated until it came to some of these really fancy numbers that they put on. It was really quite fine, and I remember Dr. Ambartsumian

(he was President of the International Astronomical Union last year) and we tried to interest him in dancing, and he said, "I flunked out of dancing school when I was a boy." (Laughter) So he refused to take part. But these Russian groups, on two occasions we had groups on the mountain that were quite sizeable groups. And at the IAU in Berkeley in 1961 I think there were 45 people in the Russian delegation which gives you an idea how active they are.

Calciano: Why did they choose to come to Lick? Especially these very early groups. What particular reasons were there why they went to Lick instead of to Mount Wilson or...

Mrs. Shane: Well they probably went to Mount Wilson too. I don't know. They may have been on a tour; I think they very likely were, but I only know the part at Lick.

Calciano: They were mostly visiting, or were they also observing?

Mrs. Shane: No, they were just visiting and seeing equipment and talking to the people. One or two of them, a Dr. and Mrs. Shajn -- "Shane" they called it, just like our name, but it was spelled in a different way -- did stay about two weeks with us once and observed. He

was nearly blind at that time (I think they both have died since), and she did the measuring of the plates and observing under his direction. They were delightful people, and they stayed with us quite extensively. Well that is just an example. There were so many interesting and pleasant people who came from far away.

University Guests

Calciano: Are there any others you'd like to mention?

Mrs. Shane: There was Sir Arthur Dixon, who was an amateur astronomer in Britain and had been in the Home Office during the war and had been in charge of, I think of civilian defense or fire fighting activities, and he had come to this country to give lectures at the University of California in criminology. And not infrequently when the University of California had distinguished guests things would be dull during the weekends, so President Sproul would call up and say, "Would you like to have a visit from so and so?" and it was always someone awfully nice. Sir Arthur came up I think about three different times during the semester, and he had great tales to tell and all

sorts of things. He had been with the British police in some way for a very long time. We told him that our first day in London we were riding a bus and we had seen a man with a little black satchel dashing down the street in front of the bus, followed by a policeman who finally caught up with him, and he had just stolen a payroll, put his money in the little satchel, and was making a getaway, and here the policeman caught him. Sir Arthur Dixon said in all his years he had never seen a thief run on the streets of London. So we really had a...

Calciano: You were one up on him.

Mrs. Shane: We were one up on him. Well he was a very pleasant guest, and we still have erratic correspondence from time to time with him. And I can recall another time when Berkeley called and said Sir Charles Darwin is here, and I pinched myself because I was thinking of Sir Charles Darwin of the Voyage of the Beagle -- his tour, you know, gathering specimens and things - - and I thought I was about a hundred years off, but this, of course, was his grandson.

Calciano: My goodness.

Mrs. Shane: So he and Lady Darwin came up and also were very interesting and pleasant.

Calciano: And they would spend the night with you?

Mrs. Shane: We would have them for dinner and then take them up to the domes.

Calciano: Oh yes, your show starts at night.

Mrs. Shane: Our show starts at night, and they usually spent the night with us and went down sometime the next day. It all depended. But in that way there were many visitors to the Lick Observatory who were not, perhaps, directly astronomers, but of course a great many, far, far in the majority, were astronomers. Then there were many organizations in very large numbers -- the Astronomical Society of the Pacific, and the American Astronomical Society, and in a very simple way we usually did a little something for them.

Entertaining Large Groups

Mrs. Shane: Did I tell you about the time the American Association for the Advancement of Science came to supper?

Calciano: No.

Mrs. Shane: It was one of these rather big organizations; one in which we didn't know many people. They were coming up for a tour of the Lick Observatory and to look

through the telescopes, so we asked them all for supper; I think there were to be about 75. We had it arranged that they should be taken around the mountain in groups and then delivered to our home in groups of 25, and we had a sort of buffet...

Calciano: Assembly line? (Laughter).

Mrs. Shane: Yes, assembly line, and then they would eat at card tables around the porch and so on. And these groups kept coming, and kept coming, and there were far more than 75, I was sure. Food was running out; people were scurrying to their homes to get extra bread, bringing in extra cans, and I couldn't believe I'd planned so badly. So finally when it was beginning to quiet down I came out and joined the group. I had been presiding at the buffet table all this while. They were all sitting around outside eating and a very nice looking couple said to me, "My I think this is such a nice idea. We had no idea that the Lick Observatory served supper to all the visitors." And then a great light suddenly dawned and I said, "Are you members of the American Association for the Advancement of Science?" "Why, what is that? No, we've never heard of it. We just came up to look through the telescope, and we saw

all these people walking down here, so we walked down with them." And I finally realized I had 75 guests and 25 or more quite innocent gate-crashers. So after that -- this was early on -- we had all groups provided with tags, and nobody came without a tag. Because it's so easy to mix them all up, and these people didn't mean to go do any gate-crashing; they thought it was just a nice custom. So queer things like that were always happening. And after all we learned in time to regulate things a little bit better.

Calciano: Oh, that's marvelous. One story that you did tell me once, but I want you to tell the tape recorder, is the one about when the Regents came to dinner and your electricity supply failed.

Mrs. Shane: Oh, yes. The electricity had a remarkable way of going off in times of crisis. And of course in my early days at Lick it couldn't go off because it never went on, but I belong to the pampered generation of deep freezes and that sort of thing. But almost invariably when there was a break in the line somewhere, it occurred when there was a big gathering on the mountain. And if it was hot, there was food to keep, or if it was cold, food to heat --

either way you lost; you were stuck. And I seem to have a vague memory of massive numbers of lemon meringue pies that were wilting disconsolately in the heat while all the Frigidaires were off. I remember upon one occasion, I don't know whether it's the one you refer to...

Calciano: Well you mentioned that you had all the Regents to dinner. And I can't remember whether you had parfaits, or lemon meringue pies, or whatnot, but...

Mrs. Shane: Well we had the Regents more than once, and on one occasion we had no current and it was a bit of a shambles, but we got by somehow or other. I've forgotten how we did it.

Calciano: K-rations?

Mrs. Shane: (Laughter) You can make do somehow. Maybe it was cold things, I just don't recall the details, but there was quite liable to be a crisis of that sort.

Calciano: How often would you be hosting the Regents?

Mrs. Shane: Oh, it was very infrequently. It was once in several years. The campuses took turns with some weight given to the bigger ones. I think we had them maybe three times in the time we were there. It was not frequent at all. Of course when we did have them

there was much running about planning.

Calciano: Yes. If there is any group you want to keep happy, it's the Regents!

Mrs. Shane: Of course many of them were friends of ours from other areas, not as being Regents, but people we had known before. But an official group of people is always slightly terrifying. Individually it's all very easy, but put the Regents together as a board and it becomes hard on the nerves for some reason, I don't know why.

Calciano: Did you have a housekeeper or a maid?

Mrs. Shane: I had a very loyal and wonderful woman who had never done domestic work in her life, but who was older than I and needing a home. We worked together on these big projects, and she put her whole heart into it -- a very wonderful help. But we had to keep things on a simple plane because we had no real service at dinners. Things were done buffet style.

Calciano: And what about getting all the windows scrubbed and so forth.

Mrs. Shane: Well, we did that on off days.

Calciano: You really didn't have cleaning ladies or anything?

Mrs. Shane: No. No one on the mountain did in our time, but when I was a student up there in 1919, 1920, help on the

mountain was quite common. But I think that the whole way of life, not only on the mountain, but everywhere, is changed, and of course help on the mountain became increasingly difficult to get. It was not a place where people could ever come for the day. They'd have to be there all the time, and most people didn't care to do that. But I was exceptionally fortunate, and she was with me in the Director's house. Then when we moved to the smaller house we had no room, but she used to come for two or three weeks at a time just as a guest, and she also visited when we moved down here. She died this last year, very sad, because she'd been just part of the family. She was one who loved the mountain. As I said, people either did or didn't, and she was one who did.

Calciano: Did most of the Directors' wives and the astronomers' wives like the mountain?

Mrs. Shane: Yes, I think most of them have -- some more than others, probably. But I think they were all content. As I say, those who weren't moved on when the opportunity came along.

Calciano: I was thinking that an astronomer who needed to be there because of his work might like it fine, while

his wife could be awfully unhappy.

Mrs. Shane: That could be true, but I don't think that that often happened. I know one case where I think you could say that was the case. Although the wife tolerated it very pleasantly, I don't think she was cut out for that type of life. I wouldn't have said she was unhappy, but she would have been more happy in a city, and they were there only a few years and then they did go -- this was many years ago -- to an Eastern observatory where city life, I think, was more to her liking. It was more in the bracket of the people in the shop and in the offices that didn't have after-hours recreation or business that might crave the movies, bright lights, stores, window shopping. It was a long way to go for that, and of course the people with growing children, teenage children, had a problem -- the little children had a school.

Calciano: I should think even with the little tiny ones you would be afraid to, well I guess they had fenced yards, but didn't they have problems of lost kids once in a while?

Mrs. Shane: I can't recall any lost children. The fences were less to keep the children in than to keep the deer

out of the small gardens that people had. Once we did lose a group of 40 boys. A bus from a school had brought them up from where they were camped at Smith Creek, and they were to walk back to camp, but it was foggy and in the dusk they walked east instead of west and turned up missing. The sheriff came to help and they were finally found toward morning at an abandoned cabin back of the mountain.

Calciano: Oh, my.

Mrs. Shane: Now as far as small children were concerned, the chief hazard, you might say, would have been rattlesnakes, but no child was ever bitten by a rattlesnake. Someone was bitten over here in Scotts Valley the other day, so...

Calciano: You can't tell, can you.

Mrs. Shane: In general it was a safe place, a very safe place to live, with the exception of those deer hunters I mentioned.

1958 TO THE PRESENT

Organizing the Lick Archives

Calciano: Well I have two more categories to cover -- for one thing, I don't think we've mentioned much about the work you've done organizing the Lick papers, this

chapter of your life.

Mrs. Shane: Well that was something I guess I have a built-in interest in -- archives and papers and making order out of things -- and the people who had been in the Observatory ahead of me had been too close to recognize this as history. It takes a little while to turn the corner from current junk papers to papers of historical interest, so that during the last years of our stay at Mount Hamilton I'd hoped to go on and get them in better order. It's a job that has no end, but more could have been done with it. In fact I had hoped to devote the last five years to it, but this was badly interrupted by the International Astronomical Union meeting which I probably haven't mentioned to you, but which took a good two or three years of solid work.

Calciano: That's something I'll want to hear about! But while we're discussing the papers, I want to ask you where did you find them? Were they housed in the library, or...

Mrs. Shane: The papers? Well they were very largely in boxes up in the attic, and the people had apparently, in those early days, they had just put them all in a carton and closed the top and put them up in the

attic as one would, and then this Mr. Holden, during his era, instituted files beginning in 1890, and from then on the University correspondence is filed. With that I've had no dealings. And they had these old albums, paste-up albums, for correspondence, and they had copybooks. Everything was handwritten in those days, and they impressed them on these copybook pages on that very thin miserable paper. It's just terribly hard to read, as you know; you have to put something under it to show the writing. And some of the letters duplicated the copybooks; some were missing; some have shown up in various places since; some are up here; and a lot of them came from this Floyd estate up in Clear Lake. Some came to Santa Cruz; some came to the Bancroft Library; they've never all been pulled together, and I didn't have the late material when I made the current index, card file, which is down in the archives room. Well then the Lick Observatory, perhaps thirteen or fourteen years ago, employed this awfully nice Connie Watson. Did you know her?

Calciano: No, I never got a chance to meet her.

Mrs. Shane: She was killed the very day those things were moved down. When she had spare time she was very

interested in archives, and she was pretty conversant with the material and with the people. When requests came for archival material, she prowled through and found it and had a good grasp of it. But with her death no one else knew much about it, and of course so far the library here has been too occupied with getting settled and doing things of major importance to worry about the little project of the Lick files. I would hope to be able to pick that up and complete the job I started. New material that's come in should be incorporated, and then there are all those copybooks which cannot be taken apart. For completeness these should really be copied and put in the files too.

Calciano: They are down in our library now?

Mrs. Shane: A certain number of them. I don't believe those from 1890 on have been brought down, but I had a small office in the library building where all of these things were kept, and I think that office was emptied and everything in that was brought down. And then since then there have been some small additions to the collection, and gradually one picks up things just such as this [pointing to several boxes of the correspondence of W. H. Wright] which I've been

alert to gathering. These were just given to me personally, but of course I have no intention of keeping-them; I'm going to go through them and give them a rough indexing and then see if they want to store them in the archives down here, those of any interest. A lot of them are really not of pertinent interest. Someday I'd like to use the old letters in the archives as the basis of a connected story of the Observatory, up to about 1890. When I'm gone, there will no longer be anyone who's taken much interest in this early era and maybe nobody will ever care, but I hate to see history lost.

Calciano: It's the kind of thing that once it's gathered and typed up, then a lot of people who are interested will read it and become familiar with it. But if it's sitting around in pieces, it's simply too hard to get at. You said you meant to spend the last five years at Lick on the archives. Is this the '58 to '63 period?

Mrs. Shane: Yes, till '63 when Donald retired on age.

The IAU Meeting at Berkeley

Calciano: Now what was this big thing that occupied three of these five years?

Mrs. Shane: Well the International Astronomical Union is an international astronomical association which meets once in three years. It's meeting this year in Prague -- that's where my husband's going. It met last year in Hamburg.

Calciano: Last year or...

Mrs. Shane: Three years ago, I'm sorry, '64; it met in '61 in Berkeley; it met before that in Russia, and before that in Ireland, and in 1952 in Rome. That was the only IAU I'd attended before Berkeley. I believe it's planned to meet probably in Australia next time. It's never been in that area and the invitation has not yet been issued, but I understand that they will issue an invitation, and if it's accepted then it will be in Australia.* Well there were 1,140 people in attendance at the Berkeley meeting. My husband was chairman of the organizing committee -- that meant planning. The meeting extended over two weeks with organized trips before and after. Then there was some social event daily, and every night there was a dinner, or a reception, a dance; there were three musical nights, and trips every day in all directions around the Bay Area, up

* Note: It was subsequently decided that the '70 meeting

to Mount Hamilton in four sections, and then a very big dinner over the weekend up at the Charles Krug winery served by George Mardikian. This was planned for 900, but people kept arriving at Berkeley who had not registered ahead, so at the last minute we set up another trip to Carmel for the same day to take care of 200 or so additional guests. The Jeffers, who had retired then to Carmel, hosted this, and I'm told it went very well. You can see there was a lot of planning for this -- everyone had to be housed, met at trains, planes, interpreters arranged, guides on the bus tours, shopping tours for the ladies; there was a daily newspaper; there was a nursery school thing for the children so they could be left during the day to be taken care of; doctors had to be set up. It was a tremendously complex and intricate job, in addition to which there was all the scientific planning. Now that, of course, I had nothing whatsoever to do with, but I did do the organizing of all the trips and writing the brochures and kept all the books. If we hadn't lived on Mount Hamilton we could have gotten extra help, secretarial help, with all these application

forms and in arranging housing and the paying for it, but we couldn't get the help up there, and it was much too hard to come down to Berkeley and do that. I did go down the last six weeks, but prior to that we operated from the mountain with the help of the ladies up there; we had a regular office set up and the ladies typed all these letters and kept the records until we moved down for the final go. Well it was quite a long job. As I say, it was full time for almost two years to make all these plans -- arrange buses, we had to get them from as far away as Sacramento to get all these people taken places. It was quite a do. That cut into those five years of leisure, so I'm just set back a couple of years.

Calciano: How did your husband fall heir to all this?

Mrs. Shane: Our friend, Jan Oort, who was President of the IAU, asked him to be Chairman of the Organizing Committee. Presumably since he had recently retired as Director at Lick he had nothing to do. This took care of that, but it was terribly interesting; it was wonderful. I just couldn't tell you how exciting it all was. The thing seemed to have gone off very, very well. People were happy; there were no serious accidents. You know with such a big group of people

you're so liable to have an accident or a serious illness. We had a secret fund to take care of an emergency, but luckily it was never needed. Oh, there were thousands of little items to think of.

Calciano: No snafus?

Mrs. Shane: Oh mercy, yes, millions of snafus, but I think very few showed, and they were very simply things that one couldn't help. One of the buses broke an axle going up Mount Hamilton, and the people had to all be taken up in cars. Well they seemed to make light of it. And another bus caught fire when it was taking a trip over to Muir Woods, and it stopped in west Berkeley somewhere, (that's where the fire broke out). The people all piled out of the bus; the neighbors came out of their houses and said, "Oh what a terrible experience, come in and have a cup of coffee." And they were taken in by these perfectly strange people, which made a tremendous



August 24, 1961

Donald Mangel '61

The U.S. National Committee of the International Astronomical Union resolves to create the post of Permanent Hostess, Honorable Member, and Maid of All Work for all future meetings of the Union scheduled to be held in the United States of America. The Committee, in recognition of past services faithfully performed beyond the call of duty, hereby appoints Mary Lee Hager Shane to this important post, with an increase of salary (\$), and with full permission to enjoy all the rights, emoluments, and perquisites of said post. In recognition whereof the U.S. National Committee affixes hereto its Great Seal, together with an official portrait of said individual in active performance of the services rendered.

Leo Goldberg, chairman
 Lewis J. Deutch
 Eugene S. Jaffe, Jr.
 Dudley Allen
 Frank W. Cummings
 Donald Mangel

Olin C. Winter
 Herbert J. Smith
 Otto Struve
 Donald Shane
 Nicholas M. Papayeff
 Fred Blum
 William Morgan



Great Seal

USAC - IAU

impression on these people from all over the world. It was little things like that that counted a lot. They finally got to Sausalito where they found some little bells in a shop, so somebody bought a little bell for each person and the group called themselves the Fire Bells because they had been in this fire. They all wore these bells around the rest of the time. There were just a thousand interesting little things of that sort that happened, and the people were so appreciative, and I've had just wonderful letters from all over the world expressing appreciation to the people at Berkeley for their cooperation; and the University was wonderful to work with. We had hoped to have President Kennedy to open the meeting, but it was just at the time of a crisis. He had to dash off to South America, and Adlai Stevenson came out at a moment's notice and gave the opening address. But all of that sort of thing, that was not in my province at all. That was my husband's responsibility. But all that took a lot of doing and to get all the programs printed at the last minute, and get the final arrangements at the University set up. Those last two days were a nightmare, I might tell you. Well this is not

exactly astronomy or anything, but in some strange way it seems like just when we're all through and about to sit down and be old, something like this comes along and we don't have time to think about being old.

Calciano: Good!

1963-1967

Calciano: Well now, I do have a "Years of Retirement" category. It's been a whirlwind in a way, hasn't it?

Mrs. Shane: Well my husband is not ready to sit down and do nothing, as you can plainly see, and I suppose as long as I'm married to him I follow ten paces behind. (Laughter) And of course the climax of all happiness for us is the fact that the University is now down here and the Lick Observatory is here, which brings the archives to my door. It was a different story when I had to go all the way up to Lick, but if ever I can do it, it will be now since it's so easy geographically to do it, and until they find someone to take over, I can be a little helpful in finding things. And there are frequent requests for information, things to look up there that come to Dr. Whitford, from Dr. Whitford to Donald, from

Donald to me, and from me to the archives, and the answers come trickling out. And it's pleasant to have it, something of that sort to do.

Calciano: Now you said that since his retirement your husband has done much more in the way of astronomical expeditions.

Mrs. Shane: He goes to Flagstaff for a week's observing regularly, except when he's away on these long trips. Well I wouldn't say regularly, but once in two months, because sometimes it's two months on end, and then it skips two, but approximately he's making about six week-long trips to Flagstaff a year for observing. And then this trip to Prague is for the IAU, and he is chairman of the U.S. National Committee which necessitates his being there. The trip to Iceland is incidental.

Calciano: Why does he want to go to Iceland?

Mrs. Shane: He has had an interest for a long time in the Norse settlements in Iceland and in the Vinland voyages. Then he began reading the old sagas and got quite excited about them. During a trip to Washington he was very fortunate in meeting Professor John G. Allee, who specializes in Icelandic at George Washington University. Dr. Allee has been very

helpful in a number of ways, not the least of which has been in introducing Donald to several people who are knowledgeable about Iceland. Donald is interested in the geology of the country too, but primarily he wants to see the places mentioned in the sagas. He has a great feeling to do this, so this is a pleasure trip for him the first two weeks. Then the last two weeks are business at the IAU.

Calciano: Do you people find much time for just plain old recreation, or are you so busy doing all these jobs that you enjoy?

Mrs. Shane: Well we have a very nice cabin up in the Sierras, and our summer vacation up there took place last weekend. We were there for two nights, so that seems to be about it for this year. But it's pretty hard to feel sorry for yourself when you live in a place like this, and have so many interests. If we lived in a city apartment we would need a vacation. We don't need a vacation in this environment, and we just have so many things we like to do, and are interested in, that we almost hate to miss the time. When you pass seventy you begin to count those years as very valuable; you have to put a lot into them.

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Elizabeth Spedding Calciano was born in Iowa in 1939 and lived in Ames, Iowa, until her college years. She received an A.B. cum laude in history from Radcliffe College in 1961 and an M.A. from Stanford University in 1962. She is married to a physician and is the mother of two children. The Calcianos moved to the Santa Cruz area in 1962 and on July 1, 1963, Mrs. Calciano became the Editor of the Regional History Project in a half-time capacity. In 1967 and '68 she also taught a course on the history of Santa Cruz County for University Extension.