

SILBERMAN

Hansen Planetarium
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PREFACE TO "THE LAST QUESTION"

(LECTURER, LIVE)

Thousands of years ago, before men invented writing, they knew the night sky. They watched the motions of the planets and named the brighter stars. Thousands of years have passed since, but if you go outside tonight you can still see the same stars.

(Cue music, fade dome lights, begin instrument rise to color organ. Position instrument and turn on stars.)

On a clear night away from the city lights, you can see more stars than you could possibly count. It looks like you might never be able to become familiar with them, to remember which star is which. People long ago solved this problem by dividing the stars into groups or patterns we call constellations. We still see the same constellations tonight.

(Briefly point our currently visible constellations and planets, using constellation figures to assist. Cue tape--rest of show is on tape.)

NARRATOR

TAPE:

The constellations we see tonight have not changed in the thousands of years since they were named. The stars have not changed either. We might conclude that the stars are permanent fixtures, ageless, that have always existed and will shine forever, but this impression would be false. Our lifetime, and even all the time in recorded history, is far too brief to notice that the stars do change, that they are born, grow, and die, and that our Milky Way Galaxy is a dynamic evolving system.

If we could live for a million years we would begin to see the true nature of the starry universe. We would see immense swirling clouds of

(Use crossfading slides to illustrate)

cool gas slowly contract into hot young stars. With telescopes we can see these softly glowing clouds although to us in our few moments of life we can only imagine the forces at play. In a million years we would see these clouds give birth to stars a cluster at a time; we would see that these clusters are made of a variety of stars some larger than our sun, some smaller, and that the clusters soon break up, each star to wander its lonely way through the vastness of space. Now and then we would see an ancient star expel its outer layers, the gases expanding back into the darkness of space while the dying star slowly shrinks and cools, silently growing dark. We would see some stars suddenly flare up in

(Grain-of-wheat supernova)

dazzling brilliance: the explosive death of a once mighty star. And we would see the cycle repeat itself as new stars are born.

If we could live a million years we would see little change in the Milky Way. Some stars would die and others would replace them, but most would shine on steadily as if no time at all had passed. The Milky Way is too old and vast for it to show the passage of a mere million years. But as neighboring stars drift silently through space we would notice that the Milky Way is an immense spiraling pinwheel of stars, about 200 billion in number,

(Briefly bring up circular telescopic view of the Milky Way over the STP Milky Way, which then dissolves into a nonrotating face-on spiral galaxy.)

and that our sun is just a typical star near an outer edge of that pinwheel. And we would see many other galaxies similar to our own, each a complex dynamic system of stars that are forming, shining awhile, and then dying.

(Face-on Milky Way off; stars begin to rotate in slow daily motion.)

A million years would give us time to see many things. It would give us time to realize the ultimate mortality of the stars, the complexity and diversity of the universe and to attain a truly cosmic perspective of our place within it. What experiences would we have? What would excite our curiosity? What questions would we ask; what thoughts would we ponder if we had that long to think? What would become to us the most important questions that we could ask?

(Music begins to build: short fanfare. Title slide appears briefly, then Assembly Hill panorama comes up as crowd noises begin.)