OUR DISTANT FATE 1 2 Part of Worship Assistants Nature Service UUBelmont, April 27, 2014 3 4 Edwin F. Taylor 5 6 Parish Dobson left us on the night desert. No better place exists to view the heavens; far from city 7 lights and air pollution each star stands out like a jewel. Until the time of Galileo, our ancestors 8 thought that the heavens are everlasting. Even Albert Einstein initially believed that the Universe does 9 not change. 10 11 Two years before I was born, astronomers concluded that the Universe is expanding. My lifetime spans 12 a golden age of cosmology, for which I can take no personal credit. The golden age will extend through your lifetimes as well. 13 14 15 Recent data comes from a tenth of a trillionth of a trillionth of a trillionth of a second after what I will call Creation; at that early instant the Universe was a speck one hundred billionth the size of our 16 17 present proton. After that came sudden inflation to the size of a marble, followed by the fiery Big 18 Bang, whose remnants we now detect as a quiet residual glow in all directions. 19 20 So here we are, almost 14 billion years after Creation. 21 22 And the future? Strangely, we now believe that the expansion of the Universe is speeding up, so during 23 the next tens of billion of years the surrounding galaxies will drift away from our telescopes. Long 24 before that—in about 4 billion years—our galaxy will collide with the Andromeda galaxy. Galaxies are mostly empty space, so our descendants should enjoy a billion-year-long, slow-motion spectacular 25 display, with almost no chance of catastrophic collision. 26 27 28 But by then humanity may not be viewing the heavens from Mother Earth any more. The Sun's surface 29 temperature is gradually rising; if this continues, then in about one billion years Earth's water will 30 evaporate and escape into space. In about six billion years the Sun will expand and swallow the Earth. 31 Long before these local catastrophes, humans will surely have spread to planets around other stars in our galaxy. Thereafter they may move from star to star as each home star reaches the end of its life 32 33 cvcle. 34 35 Will we grow lonely in this immense, expanding Universe? Why should we? Are we lonely now? When you look into the desert sky, your naked eye sees, at most, one galaxy-Andromeda-outside our 36 37 own. Our descendants will hardly miss that detail in their nightly view. 38 39 I spend every working day writing (and re-writing, and re-re-writing!) a textbook on black holes, 40 general relativity, and cosmology. Does my growing knowledge reduce appreciation for our nightly view of the heavens? Not at all! Every new detail increases my wonder. 41 42 43 For me, advancing age makes every day more precious, and I anticipate that our super-distant 44 descendants will treasure more and more the amazing Universe into which they – and we – were born.

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