

4.8: Time Traveler

visit the future, don't come back.

Laura Long has been thoughtfully following the argument. She comments, "You know, we have been discussing you as a space traveler. But you are a *time* traveler as well. Do you realize that by traveling to Canopus and back at 99/101 of light speed, you journey six generations forward in time: 202 years at 33 years per generation? So you will be able to visit your great-great-great-great-great-grandchildren at a cost of only 40 years of your life.

Travel to Earth's future

"Yes, I did think of that," we reply. "Time and space are not so different in this respect. Just as we can travel to as great an Earth-linked distance as we want in as short a rocket time as we want, so we can also travel as far forward into Earth's future as we wish."¹

"While I was trying various numbers in making up the proposed plan, I realized that if we traveled not at 99/101 light speed but at 9999/10,001 light speed, then a round trip would take not 40 rocket years but only 3.96 rocket years and 198 Earth years. Ten such round trips will age us 39.6 years and bring us back finally at an Earth time about two thousand years in the future, or some year in the fortieth century. That is not six generations ahead, but sixty generations, an additional time equal to one third of recorded history on Earth."

"Why stop there?" pursues Laura Long excitedly. "Why not go even faster, make more round trips, and learn the ultimate fate of Earth and its solar system - or even the still more remote future of the Universe as a whole? Then you could report back to us whether the Universe expands forever or ends in a crunch."

"Sorry, but no report back to our century is possible," smiles Professor Bright. "There are differences between travel in time and travel in space. To begin with, we can stand still on Earth if we choose and go nowhere in space with respect to that frame. Concerning travel through time, however, we have no such choice! Even when we stand stock still on Earth, we nevertheless travel gently but inevitably forward in time. Time proceeds inexorably!

Time travel is one way

"Second, time travel is one way. You may be able to buy a round-trip ticket to Canopus, but you can get only a one-way ticket to the fortieth century. You can't go backward in time. Time won't reverse."²

Turning to us he adds, "As for the fate of the solar system and the end of the Universe, our descendants may meet you there as fellow observers, but we ourselves will have to bid you a firm and final 'good-bye' as you leave us on any of the trips we have been discussing. The French *au revoir* -until we meet again - will not do."

1 Travel to Earth's future

2 Time travel is one way

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