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https://www.100test.com/kao_ti2020/290/2021_2022__E4_B8_8A_E5_A4_96_E7_89_88_E5_c83_290090.htm Unit Three Text Are we humans alone in the universe ? Or is there intelligent life on other planets ? These questions are not new. What is new , however , is the scientific attempt to discover whether or not other planets beyond our own have given birth to advanced civilizations. In the following article , the author describes the scientific means now available for investigating this possibility and discusses how probable it is that we are not alone in the universe. THE QUEST FOR EXTRATERRESTRIAL INTELLIGENCE Carl Sagan Through all of our history we have pondered the stars and mused whether humanity is unique or if , somewhere else in the dark of the night sky , there are other beings who contemplate and wonder as we do , fellow thinkers in the cosmos. Such beings might view themselves and the universe differently. Somewhere else there might be very exotic biologies and technologies and societies. In a cosmic setting vast and old beyond ordinary human understanding , we are a little lonely ; and we ponder the ultimate significance , if any , of our tiny but exquisite blue planet. The search for extraterrestrial intelligence is the search for a generally acceptable cosmic context for the human species. In the deepest sense , the search for extraterrestrial intelligence is a search for ourselves. In the last few years in one-millionth the lifetime of our species on this planet we have achieved an extraordinary technological capability which

enables us to seek out unimaginably distant civilizations even if they are no more advanced than we. That capability is called radio astronomy and involves single radio telescopes , collections or arrays of radio telescopes , sensitive radio detectors , advanced computers for processing received data , and the imagination and skill of dedicated scientists. Radio astronomy has in the last decade opened a new window on the physical universe. It may also , if we are wise enough to make the effort , cast a profound light on the biological universe. Some scientists working on the question of extraterrestrial intelligence , myself among them , have attempted to estimate the number of advanced technical civilizations defined operationally as societies capable of radio astronomy in the Milky Way Galaxy. Such estimates are little better than guesses. They require assigning numerical values to quantities such as the numbers and ages of stars ; the abundance of planetary systems and the likelihood of the origin of life , which we know less well ; and the probability of the evolution of intelligent life and the lifetime of technical civilizations , about which we know very little indeed. When we do the arithmetic , the sorts of numbers we come up with are , characteristically , around a million technical civilizations. A million civilizations is a breathtakingly large number , and it is exhilarating to imagine the diversity , lifestyles and commerce of those million worlds. But the Milky Way Galaxy contains some 250 billion stars , and even with a million civilizations , less than one star in 200 , 000 would have a planet inhabited by an advanced civilization. Since we have little idea which stars are likely candidates

, we will have to examine a very large number of them. Such considerations suggest that the quest for extraterrestrial intelligence may require a significant effort. Despite claims about ancient astronauts and unidentified flying objects , there is no firm evidence for past visitation of the Earth by other civilizations. We are restricted to remote signaling and , of the long-distance techniques available to our technology , radio is by far the best. Radio telescopes are relatively inexpensive ; radio signals travel at the speed of light , faster than which nothing can go ; and the use of radio for communication is not a short-sighted or anthropocentric activity. Radio represents a large part of the electromagnetic spectrum and any technical civilization anywhere in the Galaxy will have discovered radio early just as in the last few centuries we have explored the entire electromagnetic spectrum from short gamma rays to very long radio waves. Advanced civilizations might very well use some other means of communication with their peers. But if they wish to communicate with backward or emerging civilizations , there are only a few obvious methods , the chief of which is radio.

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