

SETI

1. Both Hilary and Mike comment that not everybody SETI is.
2. Hilary says that SETI researchers all believe in planets.
3. She uses the snail example to illustrate involved.
4. NASA sent messages on spacecraft during the .
5. Current SETI techniques involve rather than sending signals.
6. In an ideal world, NASA would like to find and not just simple plant life.
7. It's possible to get depressed by the continued but Hilary remains optimistic.
8. One reason an advanced form of life cannot be detected is that they may have themselves.
9. Hilary mentions nuclear proliferation, overpopulation and as examples of how our civilization puts itself in danger.
10. If Hilary met any aliens, she would ask them how it was possible for them .

to survive
understands exactly what
1960s and 1970s
listening for signals
last few years
environmental damage
destroyed
gazing up at
valuable mineral resources
intelligent life
arguments over money
silence from space
the distances
life on other

1. Why doesn't Hilary believe in UFOs

- she's never seen one herself
- it wouldn't help her organization's reputation
- she never says
- they belong in the movies

2. What does the story of the snail illustrate?

- the size of Alaska
- the expense of space travel
- that humans move as slow as snails
- the enormous distances involved

3. Why were some scientists worried in the 1960s?

we were trying to contact potentially dangerous species

we were wasting money on failed policies

we sent inaccurate maps

nobody knew where to send the probes

4. What changed in SETI policy more recently?

the scientists who were worried won the argument

we ran out of money

we decided to let the aliens come to us

politician criticized the cost of SETI

5. Why would neighboring alien civilizations be aware of us?

because we are looking for them

because we are noisy

because our planet is very bright

because they want to find us

6. What reason does Hilary NOT give for why we haven't encountered any aliens yet?

because this part of space might be empty

because close-by civilizations might be dead

because we may be technically incapable of hearing them

because the government may be hiding this information

7. What issue seems to most concern Hilary about our own planet?

its potential for destruction

its widespread poverty

its isolation

its pollution

Mike: Tonight on *Science Tonight*, we are joined by Professor Hilary Twaine who works at Yale University and also participates in research on various SETI related programs for NASA and private organizations. First Professor, you have to tell us exactly what SETI is as I feel there's a lot of confusion out there.

Hilary: Thanks Mike. It's a pleasure to be here and above all, to be given this chance to explain to your listeners what my work is about and more importantly what it is NOT about. Many of you will know that SETI stands for the Search for Extra Terrestrial Intelligence but it doesn't mean we are standing out in our back yards looking for **flying saucers** in the sky.

Mike: Do you not believe in UFO's?

Hilary: Me personally? Err,...no...I think.

Mike: Oh? That surprises me greatly. It's your job, isn't it?

Hilary: Ah...this is where the confusion lies. SETI scientists do not necessarily believe that there are aliens running around on Earth...or, for that matter, that they are flying about your neighborhood in silver discs. Whether I or my colleagues believe in the classic notion of UFO's is immaterial. What we do all believe in is that there is intelligent life out there somewhere in our solar system or in another galaxy - and it is that which we seek. Not E.T in our garden shed!

Mike: OK, that makes things a bit clearer. So a belief in UFO's is not a pre-requisite to be able to do your job.

Hilary: Exactly. We all believe these intelligent civilizations exist. But not all of us believe they have placed a foot on our planet.

Mike: Or a paw indeed.

Hilary: Oh, of course.

Mike: Now, what does this "search for intelligence" consist of. I understand the distances involved are quite **staggering** and it's not just a case of picking up the phone.

Hilary: It is one of the hardest parts of my job as SETI researcher to **get across** to people what a difficult task it is trying to find this needle in a haystack. Another of my colleagues, a Professor John Turgan who works for NASA, explained it like this to some kids in a school last year. Imagine you have a single solitary snail sat **slap bang** in the center of Alaska. He knows there are two or three other snails sitting on the coast of Alaska hundreds and hundreds of miles away and he can't go any faster than...well, we know how slow a snail is!

Mike: Yeah, pretty slow. Is that what we face?

Hilary: Yeah, the snail can set off in one direction, travel for years and years towards a point on the coast before trying another direction.

Mike: So we would never find anything like that.

Hilary: No, precisely! Searching for life on other planets involved an active stance in the 1960s and 1970s. We were actively putting signals out there trying to find the other guys. We sent probes into space with messages on, with photos and music from Earth on **rudimentary** picture discs. We even sent out a map of how to find us.

Mike: That could be dangerous....these fellows might not be that friendly!

Hilary: There were many who thought that! But then in the last twenty or so years, we have taken up a more passive policy, I mean we wait and listen out for their signals.

Mike: What's the thinking behind that?

Hilary: Well there are many reasons why this makes far more sense. First of all, it's a question of **logistics**. Think of our snail in Alaska again. Instead of trying to guess where his buddy snails are, he can sit back and wait for them to come to him. Also, we are looking for advanced civilizations. It would be nice to find some fungus on Mars or some other planet but we would ultimately like to find an intelligent civilization - one that was capable of long distance inter-stellar communication and possibly travel

Mike: So that is why we listen.

Hilary: Pretty much yes. We have been **emanating** radio and TV waves into space for about 70 years. Any civilization within 70 light years of Earth - and that's quite a few stars, believe me - would have been made aware of our presence by now. We are simply looking for the same **tell tale** signs coming from other planets and star systems.

Mike: OK, that makes sense. But so far it seems we have found nothing.

Hilary: well, in a word, yes, that's true. A famous SETI scientist once said many years ago something **to the effect of**, if these guys are out there in such great numbers as many of us believe, where are they? It's quite worrying, the total silence and it's quite easy to begin to think that we might actually be alone here.

Mike: Do you personally believe that?

Hilary: Hmmmm, no, not really.

Mike: So how would you explain the silence?

Hilary: It could be any of a whole list of things. We may be looking in the wrong place? We may not have the technology to **pick up** whatever is being **broadcast** by civilizations more advanced than us. Would we have been able to pick up radio waves in the days of Jefferson and Washington? I don't think so....

Mike: Is it also true that any advanced civilization in our corner of the universe may not be around anymore?

Hilary: That is another interesting theory. What, in the end, is the **life span** of an advanced civilization? Maybe these extra-terrestrial intelligences got so smart that they destroyed themselves. You only need to look at ourselves to see that possibility. We have only been what one might call advanced for a matter of a century or two - and look at environmental damage, nuclear proliferation and overpopulation. Yeah, it's a distinct possibility that any life form may only be at our level of advancement for a relatively short time.

Mike: Pretty depressing when you think about it.

Hilary: I'm optimistic. The universe is a staggeringly large place and we have only scanned our galaxy really. When you think that there are as many galaxies in the observable universe as there are grains of sand on Earth - it makes you realize we have a lot of **real estate** to get through yet.

Mike: What's the first question you would ask the **little green men**?

Hilary: Oh, good question. Hmmm....well, I think, err, I would ask how they survived!

Mike: In what sense, do...

Hilary: I mean, I mean referring back to what we were talking about before. How did you get past the stage of being capable, technologically speaking, of destroying yourselves, something we are struggling with today. And how did you feed an ever expanding population. And how did you ultimately control that population without destroying the environment of your home planet. Just that!

Mike: Well, you **cheated** as I only gave you one question to ask!

Hilary: Oh, that's right I'm sorry...

Mike: Professor Hilary Twaine, it's been an entertaining and educational talk this evening. Be sure to come back and tell us if ET does phone you.

Hilary: You'll be the first to know! Thanks for having me here tonight.