

Program Information:

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Good evening, I am Laura Welcher from The Long Now Foundation. I am the director of the Rosetta Project. Some of you may know, this summer, we finished our first prototype Rosetta disk, after 8 years of work, and so now five copies of that disk are out there in the world, that is to the very long-term archive of the Rosetta Project as you know is a collection of the world's languages. When we made that available over the past several years, we have had many, many request for a version that would not cost \$25,000 and that we could distribute it very widely. So, I am very pleased to announce that we have now made a version that can be distributed very widely, and this is a digital fully browsable version of the disk which is available now on DVD and today we have made it available at the Rosetta Project website for anybody to go and interact with. And so this is what it looks like, so now if you go to rosettaproject.org this is what you see and this gives you the virtual experience of looking at the Rosetta disk through a microscope except you are browsing on your computer. And so what you see here is the human eye readable side, so this is the part that starts with languages at a scale that the human eye can see, and it tells you this is an archive of the world's language and then the text spirals down and gets progressively smaller and smaller, and inside those radiating spokes are list of languages that have information on the other side of the disk. So, I will show you what this looks like, you can browse all the way in, the languages are arranged by geographic region, and so you can see I am zooming in on the Americas, and getting closer, and here you can see we have documentation in the Rosetta Project on the Piraha language that Dan Everett is going to be talking about tonight. So, there is Mura-piraha which is the very small language grouping that Piraha belongs to and you can also look at the other side of the disk, this is the archive side, so this side has about 14,000 pages of documentation and about 1,500 languages, there is about 7,000 languages in the world, this is a good chunk of them. And you can also zoom all the way in this one. So, now we are zooming in to the region that has documentation of languages of the Americas, we are getting closer, and closer, ahah! It turns out we have information on Piraha, by Daniel Everett. So, you are very welcome to go browse site at your leisure, you can also buy DVD versions of this disk. So, it is now my very great pleasure to introduce the speaker for tonight Dan Everett, a linguist who has worked for many, many years with an endangered language. A group of people called the Piraha along the Amazon river, and in the 70s, as he is going to tell you much more about, he equipped as a missionary, went with his entire family to work with the Piraha and he had his missionary tools and beliefs. He had his linguistic tools and beliefs, and he went there and what he learned from this very small group of people shook, actually rocked, both of those sets of beliefs, and changed his world view in a very fundamental way, and also changed the way that he looked at language. Now, his research and his writings on language are changing the way all of us

think about language works, and how it is encoded in the human mind. So, let me introduce and welcome, Dan Everett

Great! Good to be here this evening, have you ever imagined that you were God, that is something that I think about once in while and when I do, I think maybe the tower of Babel could have been different than the story was originally told, maybe God actually liked the results of humans creating some tower, and he decided to take out of this one language and make many, and send many people around the world to solve problems. As it were creating thousands of other Adams, not atom A-T-O-M but Adam A-D-A-M, to create and name other creatures, and learn about the world around them. And language have spread around the world. We do not really know where the first language started, but we have ideas about how long ago it might have been, and we do know that language has thrived and that the general principle that makes languages alike or different is very simple. You talk like who you talk with, so if you talk with somebody all the time, you will talk like them, and if you do not talk to them, eventually you would not talk like them at all. So, language has lived like bread and love, by being shared with others. But languages die also, and languages die in one of two ways. First way is that the speakers actually die, and so if the speakers of a language die out the language is going to die, the Piraha almost died out in the early 60s, they got down to 80 or 90 because of a measles epidemic, and eventually it come back up to 350 people, but that is still a very small number. Another reason language die is because the speaker stop speaking, speakers lived but they shifted to another language. So, the languages that are gone, usually would not come back. So, the language of Squanto, the Indian fellow you all remember from your history books who helped the pilgrims make it through the first winter. The Tupinamba who occupied the coast of Brazil in the 1500s and were eventually wiped out by a combination of factors mainly the activities of Jesuit priests. And another language that might be dying out is Irish, and we do not know how much longer that will last. There are almost 7,000 or more than 7,000 languages spoken in the world and all the red regions that you see are the areas of highest concentration of languages. So, if you look very carefully at the world map, you will see that the highest concentration of languages in the world is Papua New Guinea, in Brazil there are about 188 languages still spoken, probably half the number that was spoken in the 1500s and a population of less than 200,000 people. What is the scale of language loss in the world? What I want to do this evening is talk to you about the general issues of language loss and what that means to us, when languages die. But also very specifically look at a case study, the Piraha people that I spent the last 30 years working with, and the lessons that they have for us, both scientifically and how to live lives as human beings on planet earth. There are 6,912 to 7,000 languages, nobody knows exactly how many, but around that number, 3500 languages are spoken by 0.2% of the worlds population. So, almost half the world's languages, or half the world's languages are spoken by only 0.2% of the

population, 40% of the languages in the world are endangered. Some estimates go as high as one language every 2 weeks becoming extinct. That is much higher than mammals only 18% or 5% of fish, or 8% of plants according to a new book that I highly recommend by David Harrison on When Languages Die. So what is lost? The late Ken Hale, linguist at MIT was one of the greatest field workers who ever lived, said that when

a single language is lost, it is worst than a bomb dropped on a Louvre, it is a museum it is a repository of knowledge that cannot be replaced, it is not written, most of these languages are not written at all. Linguists have to go there and develop writing systems, they are not written, there is no way to recover the knowledge once it is gone, once these languages are lost. We lose ways of life, and records of ways of life, we lose solutions to problems, we lose classifications of plants and animals and folk knowledge of the world. We lose myths, folktales, lullabies, songs, poetry, and literature. Talk encodes ways of life. One of the groups that I worked on the Amazon are the Wari, who were until about 1962 cannibals and they practice exo- and endo- cannibalism, exocannibalism eat your enemies, endocannibalism eat your own dead. And the reason that they ate their dead, which is a very elaborate set of rituals was to give the dead immortality, they live on through us, as we eat them and consume our beloved and the first people to have consume the dead were immediate family. To be able to give them eternal life through us. The Wari discourse about death and immortality is fascinating, and teaches us a lot about how to face death and how to live life, unafraid of death in the world, and that is going as the Wari language is more endangered. Almost 50% some people say 55% of the foods consumed in the world today come from the Americas cassava, manioc, chilis, coca, coffee, tobacco, corn, some people have claimed that corn might be the greatest invention in human history, it does seem to have been invented by the Mayas or predecessors to the Mayas from husbandry of different kinds of grasses, and it is certainly one of the most widely consumed foods in the world. But as these languages have died, the question that arises for us is what else have we lost and the answer is we will never know, how many cures for diseases, how many other food, how many other great stories and philosophies that we lost, because these people have gone. We lose information when these languages die about classifications and taxonomies of the world, so the Wayampi Indians of Brazil, speakers of Tupi-Guarani language, classify birds, every bird in their environment is carefully classified, but they do not classify them just like we do. So for example someone noticed, a colleague of mine in Brazil, Allen Jensen, when he did his dissertation on them, that one type of hawk is classified in the toucans. Why would they classify a hawk among the toucans? Surely they can see the difference. The reason is their classification systems follows the food they eat and certain kinds of behavior, and this hawk as we got to know more about it, actually eats what toucans eat, and has a behavior similar to theirs. We lose this kind of knowledge, this folk knowledge that is vital to us understanding the way the world works. Especially in these local environments when I asked the word for dog in Piraha, I got two words neopi and neipi and I asked them why are there two words? That is the way it is, then I saw them bring in two jungle animals that according to my book of mammals in the tropics were both extinct and they were called jungle dogs, and so they haven't been seen in the wild for over 50 years, and here the Piraha have 2 the were keeping as pets in the village, and knew all about their behavior all about the things they eat and the places they stay, things that biologist would love to know, and we lose this as these languages begin to die out. We know for example that Tupi Indians in Brazil have heavily influenced Brazilian literature from the legends that were written down by catholic priest We learn things about calendars and the way time is kept so the Natchez Indians of Louisiana in the United States keep their calendar according to crops that grow at certain

times. And by knowing how their language works and how they keep time, we learn something about crops, and how different kinds of crops that have entered the area historically. When languages die, it is like to me, a great disturbance in the force, there is something about humanity, and the unity of all humans and the things that we all depend on, the knowledge that we have been spread around the world to share with one another is lost. So, I want to talk to you first about a small group that I worked with called the Banawa, and then I will spend most of my time talking with you about the Piraha. The Banawa are now only 79 people, they are members of a family called the Arawan family and there are only 7 languages left in this family and the biggest one is about 1500 people spoken in Peru and recently was accused of being cannibals and this is a very highly charged accusation in South America, because if you can find that a group is cannibals, the idea is that they do not deserve any land or anything. It is completely false that they are cannibals, there is no evidence whatsoever for this, that any group anymore practices cannibalism, not that I would care. But the population of the Banawa is 79 as of 2005, the last time I was there. And one type of special knowledge that the Banawa have is how to make poison, so they hunt with long blow guns and poison darts and this is really fascinating technology, to know how to make poison according to ethnobotanist Mark Plotkin in his book the Shaman's Apprentice is really to sit at the top of knowledge about the uses of the plants around you and the knowledge of how different poison affect, what kinds of ingredients do you put in the poison, I remember going with a Banawa man to collect poison one time, and filmed the entire process, and here he is getting poison. It does not look like poison, does it? This looks like a tree, but actually it is a vine that grows up high in the trees in the jungle, you have to climb up cut the vine, the vine falls, it is full of strychnine in the bark, and so I did not know that, so I walked over, this guy is cutting, I just picked it up and say, what is this, and he looked at my hands to make sure there were no cuts and everything, he said, you should not have done that, wash your hands as soon as we get back to the village, and do not put them in your eyes or your mouth, on the way back, they take strychnine from the bark, and they use to make a very potent poison that goes on darts, and the first sample of this poison was taken in the 1800s and taken in to the Smithsonian Institution, and a hundred years later, they tested the poison, and it was still just as lethal as when they have originally collected it. So they know to make very good poisons, and the make blow guns to hunt with, I remember bringing quite a few of their darts and blow guns to the States for the Carnegie Museum in Pittsburg, had them in a long PVC pipe, it did not occur to me that that pipe could break and those darts could get so do not tell anybody that I brought this up here, but we were going through customs and the guys said, ... Open the pipe, ... and I tried to open it, it would not open, it was hard, he said, ... Well, just go on through ... and my son, who was about 8 then, said, ... We could have brought cocaine. ... Endangered languages, endanger science ... and the reason for that is, there are many different areas of science, many different sciences that want to know where language came from, how does it relate to the evolution of our species, is there anything like it in other species, what is language like, what is the essence of language, how does it relate to the mind, how does it relate to

culture, what is the connection between the things that we believe and the values that we share and the way we talk, is there any connection, we cannot know this until we get a wide variety of languages to study. So, I am going to talk to you about a people that are called in the literature the Pirahas, but they do not even know what that word means themselves. They call themselves the Hi'aiti'ihi and the talk something this, [phrase in Piraha] which means, do not speak with a crooked head to me, speak with a straight head, and their language is called a straight head, and you guess what our language is called a crooked head. They call themselves the straight ones, they are found in Brazil, if you took out all of the country boundaries of South America the Piraha would be right in the heart of the Amazon jungle, right in the heart of South America as a continent. [jungle sounds] These are the kinds of sounds you go to sleep with at night, the Piraha have a great expression when you go to bed at night. And that is, [phrase in Piraha] do not sleep there are snakes. If they know you are afraid of something else though, they might say [phrase in Piraha] do not sleep there are tarantulas. Whatever makes you the most afraid, but they say this to themselves, and they do not sleep solidly, all night long. Field research and figuring out these languages takes a certain amount of time, the reason this photo is in there, is the little boy standing by me is now in his second year as an assistant professor of anthropology at the University of Miami, and when I first went to the Piraha, he was 9 months old, so its been a long time now. [audio playing] Now if you noticed, when one starts singing the others are about a syllable behind him, and the reason for that is, they haven't sung the song before, he is telling them about an experience that he had that day, and they are just following along about a syllable behind singing with him, and when you analyze the singing, it turns out that it is nothing more than their language, it is not an invented melody, the tones of their words and the stress patterns of their words and the link of their syllables produce the singing effect. And they accent those things to produce music, but it is just part of their normal speech [audio playing] that is a spirit speaking, the Piraha only believe and we will talk about this in more detail, the Piraha believe in what they can see, or what someone has seen tells them about. So how do they believe in spirits? Well they believe they have seen them, they think I am one, still just last year when I thought, we were great friends and there was no mysteries between us, one of them said, "Hey Dan, what? Do Americans die?" And I said, "Yeah, but I didn't want any research conducted. I said, "Yes we do die," and they said, "Well, you know you are really old and you are not dead yet." So, I told them about wars and that sort of thing which is a fascinating conversation, I told them that groups of people would go out and kill other groups of people, and I think there was a German researcher with me at the time, and I talked to them about, World War II as best as I could explain that in Piraha, and they just found it fascinating that we killed each other, but at least it let them know that we did die, my name when I first went to the Piraha, they do not use foreign names, so my first name was "Oldiyay" I was just named after someone else in the village. My next name was "Aibigay" which just means strong, but I do not think that was really a compliment. And I do not know exactly what they meant by that, but it was

not a compliment from the way they used it. And then finally I was in the village camping out, it was late at night and I have been traveling at night, I was sort of lost on the river and I found this village, and I got my tent up, put my tent up in the middle of the village, the fires were going, and I was really tired, and one of the Piraha came said, 'I want to talk to you,' and I said, 'I really rather sleep, I am tired,' he said, 'Just let me talk to you.' I came out and he said, 'Your name is Aibigay, but you really, that is not a good name for you anymore.' I said, 'Why?' He said, 'Because now you are really old, and so I am going to name you after my father who died,' so my name now is Pawaise.

It is because I am old. This fellow is old, his name is Toitoi but you can see he is very fit, his skin is tough as a leather, he is a very good hunter, and fisher, and you can see how long their arrows are, and how big their bows are, they are fascinating people, they are also interesting, because the canoe is such a vital part of their lives, and they do not make them, they prefer to steal them. I taught them how to make canoes once, I brought a Brazilian in who make canoes and we worked on it together for days and after we got a great canoe going, the Brazilian left and they came, we like another canoe like that, well I got the tools, you know how to make it. Oh Piraha do not make canoes. Why not? That is hard work. So what do the Pirahas have to teach us, what does this small group of 350 people scattered along the Maici River in the center of the Amazon rainforest have to teach us, if anything. In fact, I think they have a lot to teach us, from the perspective of science they have things to teach us about the relationship between language and culture. About the origin of language, about the role and nature of language, whether language is an instinct or a tool, I think they have things to say about all of these important scientific topics. But as human beings, they have perhaps even more to teach us about their happiness and their way of life. Recently, a team of 3 MIT psycholinguists went with me to check out some of the claims that I have made that have been controversial to people, and when we got there, after we have been there for a few days, the team said, these seemed like the happiest people we have ever seen. Well, how would you evaluate happiness? As good psychologists they said, we just measured the time they spent smiling, and laughing, and compare that to the time that Americans for example spends smiling and laughing, and I bet you they come out ahead. The Piraha have a very interesting concept, among all Amazonian tribes as far as I can tell, one important value that is shared, is called immediacy of experience, Amazonian tribes are very interested on what is going on now. And they tend not to value so much, the deep past or the distant future, but to focus on now, and many anthropologist have commented on that, but I do not know of any other group that has a concept, which the Piraha called xibipio and xibipio is a fascinating concept, when you are out there, they do not speak Portuguese by the way, so when I first went there in December of 1977 and got off the plane airsick and looking for the first place to throw up, they started talking to me, and I

didn't understand anything they said. So, concept like xibipio, these kinds of concept are really difficult to figure out when there is no language in common. So, I remember once a fellow walked in to the jungle, and they said, he xibipio left, and then somebody else came out of the jungle and they said he xibipio arrived. Well maybe it means he just left, he just arrived, and then I saw someone go around the bend in a canoe, and they said he xibipio left they came back, he xibipio left, planes, they would say xibipio. And then one night, I could not find my candles and I just had a match and my flashlight batteries were dead and I have this match lit and it was flickering, and they said the match is xibipioing they used it as a verb, and I could not figure out, what on earth would this mean. Well it means to go in and out of the boundaries of experience. If you want to use a technical terms, you can say, that refers to experiential liminality, but it simply means to go in and out of experience. This is so important to them, not we do this when we are children, peek-a-boo that sort of the equivalent to xibipio in our vocabulary. It is the excitement of seeing something go in and out of experience, the Piraha have codified it and made it a very important part of their language and an important part of their culture. And one thing I noticed was that, their verb structure so English has how many verb forms, well it has about 5, sing, sang, sung, singing, sings Spanish or Portuguese might have 40 different verb forms, well Piraha like many American Indian languages has a very complex verbal system. So Piraha has 16 different suffix that can go with the end of a verb, that gives 2 to the 16th power possible verb forms and that is a lot. That is more than 40. And of those things, 3 suffixes are very important and those tell you how you got your evidence. So every verb has to have on it the source of the evidence, did you hear about it, did you see it with your own eyes, or did you deduce it from the local evidence. So if I say did John go fishing? They can say John went fishing "heai" which means I heard that he did, or they can say John went fishing sibiga and that means I deduced that he did, or they can say John went fishing ha and that means I saw he went. In some respects they are the ultimate empiricist, or like people from Missouri, the show me state. Part of this cultural value of the Piraha, the immediacy of experience reflected in this word xibipio produces a value to keep information slow and to keep it verifiable, and it must be witnessed, so a Christian missionary, which I no longer am, if you read the book, you will find out what they did to me. They actually demanded evidence for what I believe and I realized, I could not give it as well as they wanted me to give it. So, this changed my profoundly, but I remember telling them about Jesus one time and they said So Dan, is Jesus is he brown like us or is he white like you? I do not know I haven't seen him. What did your dad say? Because your dad must have seen him. No, he never saw him. Oh what did your friends say who saw him? No I do not know anybody who saw him. Why are you telling us about him then? Why would you talk about something you do not have evidence for? But of course we do that all the

time. Piraha talk about a fish, now I should not make them sound like saints, because one of the great functions of this suffix is say I saw it with my own eyes is to lie. So it works, they do lie, and I remember once taking the story of how they killed their babies, infanticide, and they took this, I was really getting in to this, I was taking the whole story down, infanticide, and they all started laughing, I said "What are you laughing for?"

"Who would kill their babies? Difficulties of being an anthropologist"

One of the interesting things about Piraha, in fact it is extremely interesting is that, they do not have any numbers, they do not even have the word for one, and they do not have even the concept of counting. Now it took me a long time to work up the courage to make this claim, they have a couple of words that might be like numbers, one of them is "hoi" which I originally translated as one, and another

one is "hoe" which I translated as two, and there is another one "bahagisu" which I

translated as many. So one, two, many, there are Australian languages that have one, two, many systems, there are other languages like this. But then I realize that if I have 3 fish at the same size and two of them are in one pile and one was in another, then they would in fact use the word I felt meant one for the one fish and the word I felt meant two for the two fish. But if the fish were different sizes so that there is one large fish and two very small fish, then they use the word that I felt meant one for the two very small fish.

And the word that felt meant two for the very large fish, and then I realize that was the same word that was appearing as a suffix on the noun for man to refer to a little boy, a little boy baby, so it means a little amount, but it does not mean a number.

When I

made this claim, a lot of people did not believe me. And so, psychologist from MIT came down, and we published a paper in Cognition eventually, which last year, won the award, was named by Discovery Magazine, it is one of the most 100 top science

stories of the year, but why would Discovery Magazine find that particularly interesting. Because it has been claimed that number is innate to human beings, there are many people who believed that number is part of the innate endowment of human beings, we all have numbers of some sort, you show a group that does not have any numbers or any concept of counting, what does that mean, well one thing it does not mean is that they are retarded. It does not mean that they stoop, I have seen Piraha been kidnapped and raised outside the village as Brazilians who handle all the numbers just fine, I have met a young girl once, about 13 years old behind a counter in a store in a village of Brazilians not far from the Piraha reservation. She look very familiar and I was staring at her and the guy said, "Oh you think, she looks like the Piraha?" And

I said,

"Actually I do, Well, that is because she was Piraha, we took her when she was a little girl, and she kept store and made all the change, the Piraha children when we tried to teach them number in Portuguese learn this fairly quickly, but they do not have in their

language a word for any number. Now, one of the ways that we showed that was to get them first to *hohoi* we would put objects in front of them, one at a time, and I asked them to name the quantities as we went up *hohoi* what is the size of this? So when we put one spool of thread, they would say *hohoi*... *hohoi* one, if we put two spools of thread they would say *hohoi*...

two, and then once we got up to higher numbers, sometimes by 3 but certainly by ten, we got *hohoi*... *hohoi*, but I had already figured out that *hohoi* meant to pause, to touch, to

pile things up. It really wasn't a number. But when we started with say 10 items on the page, or 10 items on the board in front of us, and started taking them away, what you find is that they start with the same *hohoi* so the right end of both charts looks pretty much the same, but once you start getting down to *hohoi* even six, some of the Piraha are using the word I felt meant one, *hohoi* so how on earth did they call six one? And when you get to three if you are counting down they all say one what I thought was one, and the reason is, the relative smallness of that quantity is what in focus for them, and so they use the word which means relatively small, in the appropriate context, but it is not a number, and if that is not a number, what does that mean, what does that mean for the ability to count. So we have a research proposal and I have to go down and look at the Piraha from the perspective of education, when would be the best time to introduce math, what happens if people haven't had math for a long time. There were lot of proposals that have been based on the idea that all humans have math, that it is innate and it matures at certain ages, but here is a tribe that doesn't have it all. Another thing about the Piraha, I won't have time to mention all the great things about them, especially their sense of humor I alluded to, is they have no creation stories, they do not believe, they do not just demand evidence for my God, the God that I used to have, they demand evidence for any God, so they do not have one, they do not believe in God, they do not believe the world was ever created, you just ask them and when you can finally get the idea across, it is hard enough to get the idea of something they do not even believe in across, they say, it is just the way it always was, this is the way the world is, what do you mean. What was the world like before there was water? Before there was water that is a stupid question, there always has been water, there have always been trees, they have no creation stories, they do not believe in heaven, they do not believe in hell, they take life very much as it comes. They do not want to die, but when they see death is coming they do not fear it, they certainly have sorrow when a dearth of a love one dies, or a dog, they love dogs tremendously, and so I have seen women cry all night long and I thought somebody died. And I went over and I said, what is she crying about, they get embarrassed, "Oh I do not know what she is crying for." But what is she crying for?

Oh her dog died. And they definitely have sorrow about these things but they get over very quickly but they realized that death is part of life and they do not create any legends to make themselves feel better, about any myths to make themselves feel better in the absence of life. They have the simplest kinship system known, so there is a word for me, there is a word for anybody of my generation regardless of gender. There is a word for the generation above me, there is a word for the generation below me, and then there is a word for my biological son, and for my biological daughter. And that is it, that exhausted the kinship system,

and if you know much about kinship systems and marriage rules, like we have here, you cannot marry your first cousin, the more elaborate of kinship system, usually the more elaborate the marriage rules. So the less elaborate kinship system, so I have seen half sisters, and half brothers married. I never seen full siblings married, but there is no difference between brother and any one else of your generation, it just is "ahagi". One of the things that frustrated me when I was... one of the many things when I was starting to work with the Piraha, trying to find the words for left and right. So I would say, this is my left hand, and this side I would say in Portuguese which means nothing to them because they do not speak Portuguese but I have to say something...
 ...mao esquerda...
 and they would say ...Ok, hand... that is my right hand, "Hand" its your other hand.

...Oh, so after a while I could not get this, and I thought, I must be a terrible linguist, I

cannot even get left hand and right hand, and then one of them said, that hand is up river, and this hand is down river, and I said, why are they introducing irrelevant stuff, I am trying to get left hand or right hand here. And so we went out to the jungle, and I said, now I will find it, they will tell this guy to turn left or turn right, so he said, hey turn up river, we are in the middle of the jungle and he turns up river, and they said turn down river, turn towards the center of the jungle, turn towards the water. I realized that, and this turns out not to be unique to the Piraha, many other groups have this, they used systems of absolute direction, it is just though we only use north, south, east and west, rather than left and right. And we know that left or right are really not the best way to give direction, because if stand up here and tell you to turn left and use my left that is your right, but if I tell you to turn up river, where is the closest river, well if you are Piraha you would know that. If you were Piraha you would have a map of your local environment in your head. When I walk with the Piraha in the jungles, and I asked them, what is this tree? They would give me a name, and I write it down, what is this tree, they are always different, they know the name of every species, so they asked me, what do you call these in your language? What is that? Tree. What... that? Tree. You just have one word? That is all I know, but there are some people that know more, but I do not... the Piraha do not even have a words for yesterday or tomorrow, and I found this very strange, there a word for other day, there is a word for now, there is a word for big time, a word for little time, but they do not have a word... and there is a word for sun is big, meaning noon or the moon is big meaning full moon, but they do not have yesterday or tomorrow for example. Why wouldn't they have that? One of the interesting discoveries about the Piraha is that their time, their view of time is that it is concentric, you take the moment of speech and if things are certain distance from them, if they are close by, they use one word, which means literally other day. If they are a little bit further away, they use another word, big time which could be future or past, so they conceive of time differently than we do, I least in the superficial way, I mean I have not done detailed studies to get Piraha philosophy of time and the would probably tell me to go find something else to do, but it is something to think about. In any case the concentric circle view of time as opposed to the linear view of time is a new way to conceive of time and comparing how different cultures talk about even something as much a part of our daily

experience as time can open up new vistas. Now, you have to be probably a linguist to appreciate this, but I will try to give you some of the excitement about it. One of the greatest sources of hate mail that I have ever had is the claim that the Piraha language lacks recursion, that their grammar lacks recursion, now what is recursion and who cares anyway. So, let me tell you what it is and why it is important and why the Piraha are important for the study of it. Recursion is any rule or any operation that applies to itself, that sounds simple right? So take the act of looking at yourself in the mirror, or looking at a reflection, now if you just look at yourself in the mirror, that is one exemplar of reflection. But if you hold a mirror up to another mirror, what do you get? You get one mirror inside another mirror, inside another mirror, that it is recursive whatever it is, it is the recursion of visual images reappearing. Now, I used to play in bands, in fact, my first experience with San Francisco when I was growing up in Imperial Valley, California. I got arrested trying to come up here in the 60s trying to get to Haight-Ashbury. I was only 15 and my dad didn't like the idea that I was coming up there to live. Because I played in bands, and one of the things of course like everybody in the 60s admire the innovation of Jimi Hendrix and one of the most amazing things that he did was to really take advantage of auditory recursion called feedback, holding up a guitar and letting the amplifier picks up its own output and do it, apply it to its own output over and over again, now that makes the definition of recursion, and it produces feedback, which to some people could sound like noise, but in the hands of Jimmy Hendrix it was beautiful music. Now, in a recent paper, in 2002, Noam Chomsky and Mark Hauser, biologist at Harvard University, Noam Chomsky is a linguist at MIT also known for other writings, and Tecumseh Fitch who is a biologist at the St Andrews University in Scotland proposed that the fundamental property of human language in the sense that it is the only unique characteristic that language is built on, that distinguishes us from other species is recursion. So how does this work in language and when do they think it is important, well think of a sentence like "The boy was fishing. That is one sentence, but what if I take whatever rule made that sentence and apply it to itself, and then I can say "The boy who was fishing owns the dog. So I have a sentence inside a sentence. Or "The dog the boy who was fishing owns bit the farmer. Or "The farmer the dog the boy who was fishing owns bit got the gun. At some point you lose track. One of my favorite examples is "Oysters eat oysters. That is actually a grammatical sentence, but it is really hard to understand, I will let you think about it. Recursion is supposed to be very important, so you get it in words, truck driver, it is a trucking side drive, and you get this other word truck driver, it was a kick the bucket moment. Whatever that means, but kick the bucket is a series of words used inside another word, and this is recursion, human language is what is the longest sentence in English? Who knows? The idea is that it might be infinite and the only way we can do that with brains the size of grapefruit is to have some device that allows us to produce sentences that get that big, without actually having to memorize the sentences. So, that is supposed to be the rule of recursion, so they claim this is unique to humans, this is the way they do not like it when I characterize it this way, but I think it is

right, so I will just say it anyway, that the essence of human language recursion. Now, it turns out that Piraha does not have that, and I do not think it is the only language like that, but how would you say, "I want the hammock that Bill sold." Okay, that is

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recursion that is a sentence inside another sentence. How would you say that in Piraha, you would say, "I want the sentence 'I want the sentence?'" You could say that too perhaps. "I want the hammock. Bill sold the hammock." And then I interpret

that

together in various ways and one of the ways is "I want the hammock Bill sold." The reason this is important is, because if the Piraha do not have recursion, my explanation is "first of all it is important if they do not have recursion whatever the explanation is, because if you claim that it is the essence of human language, and you do not find it in the human language, that is a problem. Now some people have said 'well this is just like finding' in fact, Chomsky said this about me recently in a newspaper interview. Well, let us say that Piraha is just the way Dan did not say Dan actually, he said something else, but he said this person, describes it, and that this is more or

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equivalent to the idea of finding a group of people that just crawls when they could walk, what does it have to tell us about human biology, nothing. Okay, that is a difficult position to hold, because if the language could be as I said it was, and he admits that it could be, then it is possible for that language not to be like what was predicted to be, and it is also possible for a third of the languages in the world not to be that way, ultimately it is possible that no language has it. And if no language has it, then no language can support or refute the idea. So, some philosophers have an idea that cannot be supported or refuted it is not a particularly useful idea. So, maybe it is wrong, and if that idea is wrong then it means that language is different than it was proposed by these 3 imminent researchers. And if it is different, what might be? It might simply be the result of a number of kinds of constraints on how it is we talk to each other, controlled by cultural values. And if cultural values can affect language then this means that language probably is not the innate instinct that say Steven Pinker and others say that it is. This leads to fascinating research, so a lot of people are testing what I am saying, there is a lot of discussion of this, and I do get a lot of hate mail, as a result of saying that Piraha do not have recursion. But that is alright, I can take it. Culture is very important by learning the ways that language combine with culture, we learn lessons about the environment. So, I remember going with the Piraha up river one time and I saw some bubbles in the water, and I said "what is that?" And I wanted to get the word for bubbles, but they did not tell me the word for bubbles, they told me the word for a species of fish that is not a fish that is a bubble, so I tried to get it across them, and they said, no it is that species of fish, they eat this kind of thing down below the water and it produces the release of bubbles. Who would have known that? Very few people would have known that if they did not grow up around those fish and know those fish, walking in the jungle, see a branch sway, to me I do not know if the branch is swaying because of wind, that is usually what I figure what it is, although a Piraha would point out to me that no other branch is swaying, if it were wind maybe the other branches would be swinging, and it turns out to be a certain species of monkey, and they know that inhabits that kind of tree, and that it has this kind of

behavior, and it operates at this time of day, not at night. I have been walking with them many times and they tell me to stop because I am about to step on a snake, or you see that I remember going hunting with them one time, and we had gone out a couple of miles from the village, and they said, "Hey, Dan, you are making a lot of noise." Well I am just trying to have my canteen, my machete, and they just were barefoot, and they said, "You just stay here and we will come back and get you when we are done." So I stood there by the tree for probably 4 hours. Hoping that there were no jaguars in the area, assuming that they would not have left me if there were. Not knowing that they would have expected me to be able to take care of myself, because no idiot would go out to the jungle without knowing how to take care of themselves.

Learning about their relationship to the environment and their knowledge of those animals, animals that many people, I do not know I think I have eaten 3 species of extinct mammals in the Piraha, and I didn't make them go extinct, they were just claimed to be extinct and the Piraha not only know that they are not extinct, they know all about them. These are the kinds of things that we lose, and since the language are not written, you cannot find this knowledge on the internet. What is lost when we lose a language? We lose everything that one society has ever thought enough of to encode in their language. There is no chance to recover from it, except a bit of the form. So, one of the few examples of a language that has been revived is Hebrew. But we know that the Hebrew that have spoken in Israel today is not the Hebrew that was spoken 2000 years ago, there is a lot of information now that has been encoded now since it has native speakers again, but is not the same information that was encoded before it was lost. Fortunately Hebrew was written, so one of the legacies is religion and we certainly know what that was because it was written. We lose all the work of 10,000 Adams of 10,000 naming societies that have gone out and learned and mastered their environment, and have all these things to teach us. This is not knowledge that will ever be available on the internet. This is knowledge that will be lost forever unless we do something about it. What can we do? Well one other thing I want to say, before I get to some suggestions is what is so important... there's a fancy sociological term called alterity which just means otherness, getting to know people who are different. Recently, the BBC asked me to come up with a 60-second idea to change the world. So, in 60 seconds I came up with my 60-second idea, I didn't take it very seriously, but people really like the idea, because it was something that did affect me, which is that everyone should live a week with strangers. Everyone should live a week with people that are very unlike them in many ways. This concept of otherness has been profound in my life, coming from a small farming community in Hopeville, California. And winding up in the middle of the Amazon. There is something that is unappealing about everything being homogenous around us. About never experiencing different foods, different ways of life, different points of view, this can be threatening, but the more that we lose in terms of diversity of world languages and cultures, the more opportunities to solve problems, the more different perspectives we lose that we can never recover. The full range of the etic and the comfort of the emic. Let me just tell you those two words, these are really nice words, the etic means to have a perspective of a culture from someone who is outside the

culture, just looking at what they do, just random behaviors, it looks like to us. But if you are inside the culture, you interpret these things very differently, that is the emic perspective. The perspective of the insider, and the more we get to know cultures through individual friends or through travels, through experiences of living abroad the more we adapt other people's emic perspective, other people's insider perspective on

cultures, and as these cultures and languages disappear, people like the Piraha, we lose this perspective, my entire view of God and religion was altered forever. My entire view of language was altered forever by the Piraha, and it is not because I have gone native, because frankly, I prefer to be in San Francisco than the Amazon many times. I mean, I do enjoy the Amazon but I take a lot of reading material for the nights, and I am a terrible hunter, I am not a great outdoorsman, no I can take all this stuff, but I am not good at it and I do not particularly enjoy a lot. But it is the experience that has changed me dramatically, not because I have gone native, but because I have seen profound example of people who lived differently, think differently and have achieved more success in many respects than I have in their lives. So, what do we do, we cannot just watch indifferently, as languages disappear, there is a partial solution one, we need to help these people get land rights, we need to help their state of health, try to get the governments of the world to provide better healthcare for these people, so that they do not lose their language because they all die. Second partial solution is to document and describe these languages. We need more field researchers, the problem is you cannot be what some Australian linguist called FIFO linguist, fly in, fly out. You cannot figure out these languages in a weekend worth of study. It takes a long time, it takes a long time to figure out one of these languages, even reasonably well. Another possible solution is to give one of the organizations is called the Foundation for Endangered Languages and here is its website, but there are lots of other organizations that are interested in this, but documenting endangered language is not just butterfly collecting, it is teaching us things and preserving knowledge that we would never ever have a chance to preserve again, and then in the meantime those of us who are not going to be involved directly on this, read and learn about other cultures and about these other peoples. Thank you.