# Human Communication

Lecture by Charles T. Newton
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Time Transcription

00:00 Charles T. Newton: Well, by now you probably are wondering what in the world you've gotten yourself into tonight. Here is a lecture series called Meet the Scientist and on the platform appears a hoax, an advertising man gone wrong who has come to talk about something called human communication. By fair means or foul, I hope before the period is over to have shown you perhaps that there is a connection between science and the arts and perhaps a little black magic in the job of communicating ideas between human beings. It's hard to say what the business of communication is at this point. A profession has been defined by a fellow I know, he says the profession is a conspiracy against the layman for his own good. And if that is so, I guess science is a more highly organized conspiracy, and one day, perhaps, human communication will become a science. In any event, I think there are some fairly exciting prospects for you folks who are looking forward to one sort of career or another, and perhaps I can bring some of them to your attention here.

01:43 Charles T. Newton: Let's consider then first of all what's going on these days in the world about people and passing ideas back and forth between their heads. It's been estimated by somebody, who had a bigger computer than I've got, that of all the people who've ever been born on this planet, 20 percent of them are alive right now. A figure which shows you perhaps that there are more of us and we are getting crowded closer together on the face of this planet. And the more people you have the more closely they are connected with each other physically, the more need there is for them to communicate between each other. A fellow named J. Lewis Powell spoke on the matter of how things, how fast things are moving these days. I suspect that when you are my age - if you can foresee such a dreadful circumstance at your age - but when you are my age, people will still be saying as they are today boy things are really speeding up now. I know my parents said that, you older folks here in the room who are my age, I'm sure have said that.

03:02 Charles T. Newton: But here is a man who has sort of put it into frame of reference. He said if you took the 50,000 recorded years of mankind's history and you compress them into a fifty-year cycle because a fifty-year cycle is something that you can understand. The chronology would go something like this: ten years ago, out of the fifty, man first left his cave for some other sort of dwelling; five years ago, some genius invented the first writing; two years ago, Christianity appeared; fifteen months ago, Gutenberg developed movable printing type; ten days ago, electricity was discovered; yesterday morning, the airplane was invented; last night, the radio; this morning, television and the jet airplane was invented less than a minute ago. Do you get the feeling how things are speeding up?

04:09 Charles T. Newton: Life on this planet is then getting more complicated because there are more of us and more things are happening. Thus, the need to communicate. Now when I say communication here, let me tell you exactly what I'm

talking about. I'm talking about the movement of ideas from one person's head to another. I'm not talking about the communications media. By media, I mean newspapers, radio, televisions, and so on. If our human communication channels are clogged these days, and I think they are. But if they are clogged, the problem goes deeper than what's wrong with the newspapers or the magazines or who's getting how much payola on TV. It's a matter of how we formulate our ideas and pass them back and forth from one to the other. So let's investigate then for a moment. If you'll kill the house lights please, or here we are. Fine, thank you. I'm sorry, I've come disengaged. Thank you.

05:25 Charles T. Newton: Let's look at the screen for a few minutes and see what we are really talking about, about human communication. Let's say we start with an idea. In this case, a strange and wonderful beast that nobody has ever seen before, something maybe that looks like this. And in our heads, it's perfectly clear. We know exactly what that beast looks like in every detail. But this other gent over here, he's never heard of this beast before. He doesn't want to know anything about it, he could care less. He's got his own ideas, his own problems, and so on. Our job then is to get the image out of our head, over into his. All right, how do we do that? Well, we do that with the same basic tools that man has used ever since he crawled up and became, up on his two hind legs and became a man. We do this, first of all, with our eyes, we do it with our ears, then we do it with our senses. The sense of touch indicated by the hands in the drawing here and the other sensory organs and perceptions that we have. And that's all there is! Down through the 15,000 years that mankind has been batting around on this planet, he still got the same essential tools to communicate with his fellow man as he had at the outset.

07:02 Charles T. Newton: Now, let's think a moment then, about how man has been able to progress, overcome his environment, the initial environment that he faced, invent some strange and wonderful things this beast, and a lot of other things. And move forward and take the natural environment of the planet that he inherited and create for himself things like this building and all the wonderful things that we have today that he didn't have 15,000 years ago. What is then the basic difference, communication-wise, between a man and the higher animals? The basic difference of course is very interesting. If you take an infant human and an infant ape at the age of birth and bring them up together, you will find that in the early months of life, the ape progresses much more rapidly. And can, in time, be trained to have some very highly trained specific responses to some specific stimuli and may for a time forge ahead of the human infant.

08:23 Charles T. Newton: But then the ape slows down and stops progressing. And the human begins to do what? To speak. He can make words and words separate him from the apes and they are our basic communication device. Words are very interesting things. Words, well, I kind of think sometimes of a word as a single little neat package that always contains roughly the same ingredients. I'll tell you what I

mean. If you go down to Oscar's after you leave here tonight and that's where I'm going because I haven't had any dinner. So we'll go down to Oscar's together and if we order a hamburger, we've got an image of a hamburger in our mind, the carhop has, the man on the grill who makes it will have, and so will the bookkeeper when he totals up the bill at the end of the month and equates it against the charges that went into the cost of the thing, to tell whether we made money - and all the other relationships. Now suppose we didn't have words. Or let's say in this case, we didn't have this particular word hamburger denoting this particular little neat package. So you drive down there and the gal would come up you know, she says yeah and you'd say well I want a thing here, I want you to take a bun about three inches in diameter and about an inch and a half thick, with sesame seeds on top.

10:06 Charles T. Newton: And you can't hardly do this without waving your arms, and I want you to slice it horizontally through the broad plane twice so that you have three equal segments, and I want you to put a fried meat patty in each of these two segments and in the upper one some lettuce and some relish and in the lower one some cheese and then put it all together and in a glassine bag and bring it to me. And of course, if you want onion, you really did. Well, you can imagine what the carhop would, you know, the feedback you would get from her. But you can still further imagine what happens when she goes to the fry cook and says hey dad and then she goes through this routine, you know. And about halfway through this, he quits. Fry cooks always quit, I don't know whether you know that or not, but they always quit. So then, here is a word, a tool, a communication tool, a very basic communication tool. Now, as I say, this separates us from the apes and it's the one of the main things that separates us from the apes. This linkage of words and the symbols we make for them, both verbal and visual, and in other ways, and we'll get into that in a moment.

11:40 Charles T. Newton: But the animal still is reduced to groaning, and whistling, and pointing and things that they do. Of course, groaning and whistling and pointing has its merits in human communication, at the right time and place as any good girl-watcher can tell you but that's really another subject. Alright, so words then are little catch-alls, little bags of goodies that we use to hang our ideas out. Then we invented some other things that are called symbols and they are communication devices. And particularly numbers-symbols, are interesting communication devices. Now, one of the old traditional things is the systems that the Romans invented for numbering. It's used these days mostly, as far as I can tell, for putting the copyright notice on old movies on TV so you won't really know how old they are. But it's a pretty cumbersome system. So we've gone to Arabic numerals, some of you maybe didn't know about Arabic numerals. Originally they only went to nine, as you see them here. So the biggest number you can ever write down was nine times nine times nine or some derivation to that.

13:09 Charles T. Newton: And then one day, some unknown genius did a very simple thing. He invented the cipher. Now, look what he did for us with that one little circle. You could only go to nine before, now you can go up as far as you want to go. And you can count miles to the moon or to the outer planets and count all sorts of things. He unlocked there a new key for us to communicate through the use of symbology-symbols. And of course, he made it possible to have the largest national debt in history. If we had to express the national debt in roman numerals, we'd be dead. Now, symbols are kind of tricky. Special shapes have special meanings. But as a communication device, they are tricky and volatile because you've got to be very sure that the image that that symbol evokes in your head is the same as what it evokes in other people's heads. Now the Red Cross is a good symbol because we, all of us, pretty well understand what it means you know. It means medical first aid or something, and these things are all connected. There's a little story connected with the red cross that you might find interesting, and it illustrates my point.

14:47 Charles T. Newton: By federal legislation, the red cross cannot be used except by the American Red Cross organization and on medical first aid supplies. Except for Red Cross shoes because they had adopted it as a trademark prior to the time this legislation was passed. Now if that legislation hadn't been passed and suppose today there were fifty different kinds of items, shoes, hair pins, who knows what with the red cross label on them. It no longer would have this very special meaning. So graphic symbols have to have a very special treatment and they must be isolated if they are going to really be clear communication devices. Now, I seem to have - now to us communicators, there is something especially interesting. I've talked about the Red Cross and the medical things and I'll go into - leads me to think a moment for, about things like psychology. Psychologists have something to tell us about the use of symbols. They tell us, for instance, that if you take a simple thing like a circle. Perhaps in every mind here this evening, this image has some meaning. Psychologists have found it can mean a lot of different things. For instance, if one of you fellows is on the baseball team, the circle may evoke this image in your mind.

16:28 Charles T. Newton: On the other hand, to your girlfriend, it may evoke this symbol and if it does, watch out! So graphic symbols are indeed volatile and they must be used with great caution if you are going to establish a uniform communication system through their use. The psychologists, of course, have gone a good deal further in motivation research talking to us about what subtle influences or emotions can have on our reactions to certain situations. They've investigated the shapes of automobiles and what kind of a symbol that evokes in the minds of certain kinds of buyers. They can tell you, for instance, that a 4-door Sedan to the average American married male buyer represents a family image, a wifely situation but the convertible represents something a little racier in the female line. Now that may sound preposterous to you but this is actually so. So these images and these symbols have a tremendous effect on human behavior and any time you affect human behavior you are preconditioning responses and you are affecting human communication. I hope you are beginning to

see now why I came here tonight to try to show you how science and art have a meeting point in this human communication system. Well then, let's come now to an examination of our present condition with respect to human communication. We've talked a little bit here about the history of symbology and man's use of symbols.

18:40 Charles T. Newton: We talked about how things are speeding up these days and everything is moving faster. And we talked about the fact there are lots more people around these days and all of them are yakking and they are filling the air with messages. Now all the length of time that we humans have been occupying this planet, nobody ever really paid very much attention to what some of the basic ingredients are of human communication messages until a scientist stumbled across this problem as a sort of a byproduct of something else that he was doing. His name was Dr. Claude Shannon and in the 1940s he was working at the Bell Telephone Laboratories in New York on computer theory, digital computer theory. As I expect you folks know very well, a digital computer is essentially an electrical, electro-mechanical device for making decisions at a very high rate of speed, X and Y decisions. Shannon, in developing basic digital computer theory, was trying to figure out how he could inform the computer, how he could give problems to the computer, how he could speak to the computer if you'd like to use that term. And he discovered that in order to do this he was going to have to define information. And he was going to have to go further than that and find out what is the lowest common denominator of information. Well, you say everybody knows what information is! But do you? What is information? If I do that [kicking sound], is that information? If you read your own name, is that information?

20:55 Charles T. Newton: These were some of the things that - here - in all the history of mankind, nobody had ever really asked that question before. And Shannon did. And the interesting thing is that he did it in pursuit of a scientific objective in digital computer theory that had nothing to do with human beings at all. But his theory that he evolved is very important to us in moving human communication progress forward. Now, Shannon's theory is essentially quite simple. And I would commend to some of you folks of scientific bent that, here is a possible area to go look into sometime because computer theory is a fabulous, fabulous thing. But any rate, Shannon said that information is only transmitted when something new takes place. To put it another way, information occurs only when the direction of thought occurs. Or to put it still a third way, if you are traveling, as my family and I were a couple of summers ago in some backroads in the High Sierras. And you come, you are traveling a road that's just barely been open since the snow melted, and it's an old rutted road and you come to a Y in the road and there's no sign, no nothing.

22:41 Charles T. Newton: So this is called a X and Y decision; you can either take road X or you can take road Y. And Shannon says when you come to the Y in the road and take one or the other, that is one bit of information, a binary digit of information, an X and Y decision, an information bit. Here is the lowest common denominator of human

information or computer information, either one. Here is another way to illustrate it. That's one bit. Here is another, another bit, one bit of information, a change of direction of thought. Well, Dr. Shannon really opened up some things. He went born ahead on worrying about computer theory but people like Norbert Wiener and others said holy smoke here is something that applies to the human. A lot of other people began to probe into this thing. They found out some very interesting things about us humans in connection with information and information bits. For instance, the human eye can pick up and transmit to the brain about 43 billion bits per second, 43 billion bits per second. The ear, the other primary communication device, can pick up and transmit to the brain about 80,000 bits per second. And then your whole body, as I guess you know, is covered with sensory organs, the little, the little synapses connected to senses here on your fingertips and your tongue and all over your body, and certain areas are more sensitive than others.

24:37 Charles T. Newton: And every one of those little things can send 6,000 bits of information per second to your brain. So here is your whole human system, which is almost like one of these big antennas you see down here, at the Navy Electronics Lab, always tuned always out rating, picking up things, and pumping them in your brain. But the brain can at very best, not at the very best but at the average best, can only take action on about 100 bits per second. Well, gee, this explains a lot of things. It explains, for instance, to you fellas at the lunch hour at school when those gals are all standing around going yackety, yackety, yackety, yack, this confirms what you suspected all the time: none of them are hearing or understanding what anybody else is saying but they sure are talking a lot. Communication, you see, is something other than launching the message. Going back, remember the two heads we had up there, if nothing comes life in the other guys had over there, you haven't communicated.

25:58 Charles T. Newton: Here's why. Now, to some of you youngsters who are interested in physiology, and anthropology, and psychology, and in particular, neuropsychiatry and things like that. Do you begin to see some things where there might be some interesting careers in this racket? All right, now let me illustrate to you how the theory works, about this business of the conflict of things being pumped into your brain all the time and so on. May I have the footage, please? [rumbling noise] About the first two minutes, first two minutes of flight, this missile burns as much fuel as a 707 crossing the country nonstop. What'd I say?

27:02 Speaker 1: [crosstalk] In the first two minutes, it burns as much fuel as a 707 that's crossing the country.

27:10 Charles T. Newton: Is that right? Anybody else got any theories? A very accurate statement. Did you feel any pull as you were trying to hear what I said and trying to understand what you saw on the screen? Did you experience that at all? Could you feel the conflict there of the eye and the ear fighting for attention up here? Trying to

say, what is this clown talking about? I want to watch. Do you have that feeling at all? Now, are you beginning to see where science and art can mix? Here is something as volatile and as exciting as a motion picture. And yet the scientist can tell us how to use that mechanical tool. There is another way to say this incidentally, and let me go through this a little further. If instead of showing the film, I had put this slide on the screen and I had said, well there's any number of things I can say. But I can say you know the Atlas missile means power.

28:23 Charles T. Newton: And then I'd wait, and you'd see all right this must be an Atlas missile he sees here. And, so then your visual satisfaction would have been relatively complete and your mind would have been released to hear what I would next say. And I could go on and say a number of things. I could say what I did about the Atlas burns as much fuel in two minutes as a 707 does flying nonstop across the country and as a taxpayer you would say oh my god. But it does. Or I could say, have you ever seen a greater, more dramatic, wonderful demonstration of power, sheer brute strength than that big 280,000-pound creature lifting itself off the pad? And perhaps I could stir you a little bit. Or I could say tonight at Vandenberg Air Force Base, sit Atlas missiles on the pad, which represent the kind of power that the Russian understands. Three entirely different messages evoked here by one visual image, where you've let the visual be saturated and then let the oral take over.

29:51 Charles T. Newton: Well, as I say, I hope that you're beginning to sense that there is a place for science and art to mix and it's you kids here tonight, believe me, this is not con, this is not this stuff that guys my age always are trying to pump into you. But in the next 20 to 25 years, things are gonna happen in this business of human communication. And it's going to fall right dead center in your creative period as you grow into adults. And they are going to be some mighty exciting things I think and they are things which will be tremendously rewarding in terms of satisfaction and probably money as well. Let me just review then some of the career things or some of the things that I feel are the ingredients of human communication so that you can sort of look them over as I dangle them on the line here, and see if perhaps there's something for you here. I think any list of fields of endeavor concerned with human communication has to begin with words. The people who know how to use the words, in writing and speaking, will probably always be the primary communicators, the primary artiste of a new science shall we say because they are the rootstalk of our human capability.

31:28 Charles T. Newton: And if I may digress on a tangent for just a moment, let me just say one thing and you can take it or leave it alone, but there stretches out behind you and me 15,000 years of mankind's progress. And we've, all these people have chugged along here along a rocky road and they've given us a heritage of human capability and words are the rootstalk of it. And the only way we got of talking back and forth to each other really and certainly, the only advantage we've got over the apes outside of a little IQ differential maybe, are words. And doggone it, I've got no

patience with somebody, be he in high school or an adult, who cannot speak and write a simple declarative sentence in his native tongue. That's preposterous! If you don't know the English language, I don't care whether you are a math major or what in the world you are, you are denying your human heritage. You are fuzzing up the business, you are gumming up the works, you are inviting the apes to take over. Spread the word, will you? Because things are getting kinda fuzzy out there, people don't know the English language as good as they used to, as the man says. And I would hope you folks here who may be faculty people would join me in my small campaign, and it's one that- we have some colleagues in too. All right, let's go on.

33:26 Charles T. Newton: The artist, the graphic artist, has a real contribution to make to human communication. The slides you've seen here this evening, for instance, are an effective communication device I think because they pinpoint a thought which can be more dramatically and tellingly told in the graphic medium than in any other. And the artist, the artist is just not a guy who sits in a garret and with a beret and a beard and talks jive talk and paints these nudes all day. He's an analyst and he can help us communicate ideas. The guy who first chiseled those Roman letters into the Trajan Columns, the classic letter, was an artist and he gave us the bedrock of our communication system today. Composers and musicians have a role to play. Now, I'm the last one in the world to try to defend the use of music in Hollywood films. But if you don't believe music has a powerful means of communicating mood, do this: go home and turn on a western on TV, any western. Tune it in at the start of the program and leave the picture on until the principal characters have been established, probably about the first two or three minutes of the story; and then turn the picture thing down and out and so you can't see the picture and just listen, leave the audio on. And don't pay any particular attention to the dialogue, just listen to the music. You try it. You can tell when the good guys are riding on the horse, you can tell when the bad guys are sneaking through the corral, and you can even tell when the heroine kisses the hero's horse at the end from the music. [Audience laughs]

35:26 Charles T. Newton: You can do it. Now, isn't that a wonderful communication medium, when music can do that? Now, part of it sure is a conditioned reflex. We've all seen this thing go so many times, it's the same old jazz and it's the same music and all that stuff. But, music can do this. And remember that mood can either calm or excite the human being to the point where he is either more receptive to communication messages or he is less receptive. And now you folks that are interested in human psychology, here is your chance to get involved in this business. The motion picture, of course, is a tremendously important communication medium. We think of it usually as an entertainment medium but it's a communication medium because it can tell us things quickly and clearly. We made a film at Convair Astronautics that some of you might have seen. Have you seen our picture called *Atlas on Target* that, by any of you, shows the launching of the missiles and the tracking on the downrange islands?

36:29 Charles T. Newton: Well, here is a film which shows you simultaneous activity taking place across a geographical span of about a thousand miles and you are seeing from your seat in the auditorium on this screen at one point in time and in one place, something that's happening in a diverse geographical situation simultaneously. How else could you do it, without the motion picture? When we first finished that film, the people who work at Cape Canaveral and worked there for years, piled in to see it because they say we never knew what in the world was going on down here before! Because all they have seen was a little honko. So this is the type of thing I mean when I say the motion picture is a great tool for communicating ideas. Still photography, you think still photography perhaps as a hobby, as a picture in the newspaper, a picture of the family on a Sunday outing. But the chief of our still photo lab at Convair Astronautics has estimated that a single square inch of a photographic negative can capture as many as a million bits of information, one square inch.

38:01 Charles T. Newton: Now, this means that with the camera, be it still or motion picture in this case still, you can impale for all time henceforth something that happens as fast as one ten thousandths of a second and up to a million bits of that information in each square inch of the negative. At Palomar [Observatory], they do this. An astronomer spends an evening up there at night, exposing plates on the heavens, or a particular part of the heavens that he's studying, and those negatives constitute raw material for him to study for many months, just that one set of negatives. Now, let me go a little more directly into some of the scientific fields that I think are involved in this human communication thing. I talked earlier about Shannon's theory of the computer and how it's linked. We are learning more every day about the very close relationship there is between computers and human beings. I hope sometime that you will invite to this rostrum Dr. Walter Schwidetzky, who is our chief of computers and simulation at Astronautics. He is a tremendous scientist and he is also a wonderful philosopher. I'm not sure whether you get to be a philosopher after you started working with computers or whether you have to be one first and the computers draw you, but most of these guys are philosophers.

39:30 Charles T. Newton: And they are philosophers about an electronic machine, you've seen them, they are, you know, they are a bunch of things in great cabinets, and once in while a wheel goes around the light blinks. But really, nothing, no, nothing going on in these things except the inside. But these jokers who work with them all the time can almost tell them, you know I was in there one day and a guy says the computer is nervous today. Through the communication theory and through other links, computer theory and the use of computers to coagulate information into meaningful form for human beings. I think the computer, perhaps, makes mundane decisions of repetitive nature and free the human mind of these so that he can free his communication devices only to the more important decision-making things, a tremendous field. And one of the things, perhaps, that will help us make a breakthrough in this communication jungle that we live in. I've mentioned earlier that behavioral sciences I wanna just be sure you understand that I feel are very

important: psychology, anthropology, sociology. By telling us more about the mechanics of a human being in his mind, can help us participate in a progress in communication information and communication action. Of course, there's a lot of secondary fields that have a bearing on this: zoology, biology, physiology, psychiatry, all of these things have a contribution to make.

41:08 Charles T. Newton: We hear a lot about breakthroughs these days in science. I think the time is coming when our communication channels, our human communication channels, are going to be so doggone clogged, that we are going to be forced to find breakthroughs in human communication. Maybe somebody here, somebody of this generation will be a seeker of a cipher and a finder of something. Remember what I told you about the cipher, the Arabic cipher unlocked so much for us as a communication device. There's some more of those keys looking around somewhere and human knowledge will find them and when it does, all tarnation is going to break loose. We're going to have some really exciting things. Now in conclusion, let me just say this, I don't want you to think from what I have said that I think we are ever going to be able to reduce the business of human communication to pure theory, to pure science, in the same sense that you'd think of as a computer or chemistry, some of those sciences. Because we are dealing with human beings and a human being is a funny kind of a goat.

42:36 Charles T. Newton: Just, just when you think you really got a human being figured out and you've made some specific observation about the way he'll behave and you are just about ready to make some general conclusions, the rascal jumps out of the corral and he's gone. He does something completely different. So I would hope that we would see coming along, out of your crowd, your generation, people who are interested in the sciences who also had the feel for the human business. And if you are one of those people, I highly recommend that you think about this area of human communication because people are gonna be looking for you kinda cats in about ten years. They are starting to look now, real hard. I'll just say this, if you get involved with anything involving human beings, I want to quote you here something from a Greek poet Aeschylus, lived a long time ago. And he said this, he who smites the lyre with a chunk of his soul will never lack an audience. In other words, if you are playing some music, you've got to get part of your heart, part of your soul, in the thing if you are really going to communicate with other people - on an emotional level - I'm talking about.

44:02 Charles T. Newton: If you are not willing to be, to get wholly engaged - I'm not sure whether I can make this point clear or not, but it's very important. If you haven't already encountered this, you are going to, very soon. There are some things that you can do for a living and for an occupation that you can take or leave alone, and there are some kinds of people who are the happiest doing that. There are other types of things which you get involved with which take all of you, which draw you in, and I think the teaching profession is one of the greatest examples of that. The really

good teachers that you kids all know, are drawn into teaching and they are wholly involved in the thing. I don't mean by this they never think about anything else but I mean they are, they have committed themselves to the thing. And if you don't like that, if you don't want to get entangled with these sticky things called human beings, stay out of the human communication racket. But if you are willing to take a chunk of your soul and strike that lyre, oh man, this thing has really got some exciting prospects for you.

45:32 Charles T. Newton: And if you have by any chance some latent creative ability in some of the arts and also an interest in science, you have really got it made if this field appeals to you at all. Well, it sounds like vocational day and I didn't intend to go into that at that length. What I've said here tonight is essentially this, there are more humans on the earth today than there have ever been before. We are going at an accelerated pace. We are talking more to each other, that is, we are trying to transmit, there's more attempts at transmitting information back and forth between our heads. And just like an electrical circuit, if you try to pump too much electricity through a 110-volt line, you will blow a fuse if you try to put 220 in there. And we are blowing our fuses these days and we are, communication is breaking down, just like an electrical circuit breaks down. We humans are beginning to find out how we are going to fix this and we, maybe, are going to find some solutions as imaginative as the ways we found in electronics, to whip the problem of transmitting circuitry.

47:08 Charles T. Newton: It, If we don't, we probably - this may sound a little peculiar conclusion for you but one of the reasons why we are always mad at somebody on this planet is because we can't communicate in my opinion. So we are probably gonna blow up the whole fool thing one of these days if we don't learn how to tell each other what's really going on. I submit that this is a real possibility and I further submit that that's an idiotic thing for us to do because there are so many other things we can do that'd be more fun. Thank you very much.

47:54 [Audience Clapping]