Thank you for your invitation for me and t is a great pleasure to be able to talk to you. I would like to talk about the future am glad to talk about the future but first I will have a short break to the past, looking to the past. Looking to the past, looking back to look forward and looking with a special eye to see what is mathematics what is mathematics just for the common eye not only for mathematicians, for mathematicians mathematics is like water for a fish so they do not notice many things that others do. Maths is formulas proving theorems, maths is also solving problems, many exercierses, many hard work for all of us. Well this is a too vastscope for me to describe I would only like to look at one aspect of maths, not only on formulas but what they sat, what they convey. In the beginning, in the past we can see great two monumnets in maths, first Euclid's elementa then La geometrue of descartes, why I have chosen these two and many peoople do I will tell later.E has its oiwn style of rigourous prose like definition prtoof theorem very strict with logic and with definitions sticking to it very rigorourly it was so syccessful it squashed everything that was done before and we have really very scant symptons of what was befire elenmenta but there are some some of them we have in Plato? Dialogues when he says about theodorus lecture when Th was provingt tye incommensurability of sq of 3, 5, 7, etc up to 17. Of course he omitted the full squares, 4,9, 16 that was a great riddle for many hostoriansd what stopped him how we can say what he did with our concepts, we say incommensurabilty wbut it was not his way of thinking he proved someothing else this is only our way of looking at it he was the lat or one of the last of the Pythagoreans who emigrated fron the land and then disseminated the craft in maths in the whole of Greece but this is one of the evidences of the actiivity of the Ps they taught maths for some kind of beans or some food for survival and in this way maths spread but what was the proff and what was the threorem before elementa because E we know from schol this is the familaiar stryle of gG how did it look before E we will try to folow it

Take for example this simple act I take it simplified because if you want to take time ther are many othgers athat are much more sophisticated, his is our language of putting this act if you add the odd numbers

1, to 3 it is 4 and so on, 5, ==

Now we are trying to write up a genraal foirmula, this is a small problem for every student, what should we write here, this was 2 squared, this is 3 squared, oh probably n squared, is it right?
It is a small problem with symbolics, this problem with symbolics has little to do with the problem itself, about numbers, this is coding problem, how was it in the past how they approeached that problem how come they even formulated this fact in thepast not having the symbolics of ourselves, it was as simple as bonjour I would fsay they used pebbles small stones, calculi, and they calculated with calculi you seed and they wrote it that way, 1 calculus then 3 then 5 then 7 is it clear that adding any subsequent odd number will get full square, the terminolgy the very words even just come to our tongue, it is so simple, Is it a proof well it is not in our symbolic but it is I would say and it has one feature that even today is very ver yvery essenytial in proving theorems of which we forget very often,iue It has a culmination point a point at whih we suddenly see it is alright that it should eb be that way and it is now only a question of rider to prove it with logic to put it to the test of logic but if we do not **see** beforehand what we want to prove the whole proof is just for nothing we just only meddle with these formulas and there is no point and we can prolong wthis to an arbitrary number but this prolongation in our mind has various logival formulations such as being able to say for all natural numers but in Greek mentality to say all natural numbers was not possible, it was possible to consider each nartural number separately but bot all of them together so this was a great obstacle to thoink about the totality of natural numbers even in E of E when he proved in ourt point of vire that there is infinity of prime nunbers he must say that way for any collection of prime numbers there is a prime number that is not in that collection and of course he thought only of finite collections To say that the set of prime numbers is infinite just could not just get through his tongue there are some other traces of the essential atges of the proof. This is the word T. In G T means to see, T means that which has been see, T is not that has been proved by logic but that which has been seen. Now that E came and was translated into L , all changed the word for the point P was changed the word p
T lost its meaning into somethin ttaht should be demnstrated logiuically and such stiff netwerok of concepts in G M after E received not much consideration in R education, it was slow decline developed lessa nd less important in the R schools, in palce of it came Rhetoproics, the art of teaching others very popular were the

books, but M there was no big M contribution by the R, well after that the centre of excellence moved from Europe to Arab countris and that was another peiriod of excellence to follow it and use it for the school for motivation and realtion of maths to history but this is really a very rice source of M which is right fittiing for the school but the chagnge of paradigm when they solved the quadratic equation, notation, change of stule G use of geometry was as if for caluclation drawing s should be exact not just schemes in A drawing in G was only a scheme he does notr care about exact proportions what aws imporatnt was relationship bewteen variables in the R not to say G which we know we have notatio new have very peculiar notation for numbers and this oersisted in our cultural numbers in consectutive numbers coding but look there was another word that was used for number, nombre it came from nombre from Spanish and that came for the nomen arabica became number nombre en francais and this was real inspiration for the real number line throygh arab countries and next I would say was LaG of cartesius what was the great achievement of C, lets think about it for a moment this was so that there were many competing ways of coding qequations many competing notations biutt he main problem wax how to add length to area and area to volume and the great spavce in every treatise was how to add surface to volume or vcames the word poly nomial surfaces to volumes and it is well C with oine stroke of the pen said it is not important for me I reduce all values to lebngth and I will now calculate with length I only considered homogeniety in them and he code the powers with upper scripts no mattre which and he wrote a treatise in completely in a different style from E, in E it is all very dry and logoic and not human in C at the beginning he said I will show you ways to solve a problem in antiquity which noone could solve, the problem was having two lines or more on the surface just find the place where the distance to any of these lines in a given direction are in a given proportion if it is three lines it is difficult to see what is come out if there is thre eit is nit simple but C gave the way of thinking about all of these cases

So the main style of C was problem solving

His way of saying things was very curious for us well his way of telling the story about poolynomials was very funny every P has so many roots but therre are some P which have false roots in our language negative roots so he devised a way of making

False roots real just be adding some variable rto the indepenedent v to shift theP on the number line thatewas very funny to see and to explain there is much in m history which with our technique we can take directly from the ancient writings of 17th century and try to decifer what it is

In LaG there was also anoither apedt

It was insoiring lecture for many M of that time Pascal Newton leibtn everybofy read C and in a way it became like Bach you know in music there were many ideas on how to produce good scales

So that we can transcribe freely but noone used it

Up to back he not only took one of these states but wrote

In that tonation and so it wa afterwards commonlya accepted

So with LaG with only onre excpetion

His equality sign was not like ours b

The equality sign came from another source Robert R

There was another aspect of 176th

In this time there was happening with Galiliea that oncvinced him a very importan tm idea