Text, Textuality and Digital media
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Lecture 9
Febvre and Martin: The Discovery of Printing & The Chinese Precedent

Welcome to today's lecture after having looked at oral forms of communication oral techniques of representation and then the manuscript, the form in which the communication happens. Today we will look at the coming of print. Now just to reiterate what I have been maintaining and from the words of Marshall McLuhan "The medium is the message" that is no matter what we say- that of course is important- but what is also important is how we say it.

Because there are two aspects to this, one is that the medium itself, the manner in which a story or some idea is communicated has an influence on what is being communicated. As we have seen that within orality you use more verse and rhythmic patterns a lot more which is not really a matter of choice, similarly when you write a diary entry or when you write an essay the form itself limits what you can tell through the particular form.

And the other point is, that the way it is received, the way a certain communication is received for example if a person sends an official letter that will be received with a certain level of seriousness whereas the same person communicating the same idea through a message on WhatsApp will perhaps not be taken in a similar kind of seriousness. Sometimes WhatsApp messages are taken too seriously and that makes it even more dangerous. We will discuss about the social media and the coming of the digital media towards the end of this course.

But the point being reiterated that how we say it how a certain thing is communicated to us is something of great importance and in this course we are paying a lot of importance to that, to understanding that. So the coming of print as we have been discussing marks a very important watershed, a very important revolutionary change that comes about in human history really. We have already seen how the coming of writing, the alphabet and the mechanisms of writing already made a certain degree of change in the way people live their lives and people went about relating to each other and organization of society.

In our previous class we looked at the coming of capitalism and how capitalist processes are very different from the processes of feudalism. And we looked at how there is a total change,

almost in every facet of life. It's an all-encompassing change that takes place with the coming of capitalism really. So with that background we enter into this discussion on the discovery of the coming of printing.

I think the word the coming of printing might be a better idea, better way to talk about, a different way really of talking about this particular historical event. Now when I say discovery it would almost mean that it would stress the fact that it wasn't there and it was something that was created by human beings. Whereas if I say the coming of print it is as if print came about on its own the truth really lies in between the two.

Whenever we associate commonsensically the coming of the print and the discovery of printing and therefore the discovery of the printing machine one name really comes before us and that is that of Johannes Gutenberg who was really someone who was in Western Europe primarily in the area around Germany and the date that is given is around the 1460s. However what today's discussion is going to tell us is that, it is probably not a correct idea that Gutenberg discovered the printing press because the change being however revolutionary was not brought about by one individual.

It was something that came about due to the requirement of the times, I would like to refer you back to our lecture where Raymond Williams discusses technology in the context of television, where we say that the idea that we subscribe to is technology is a product of social innovation and a result of historical means and requirements in historical changes.

This is of course the view of technological determinism, that technology brings about certain changes, that is also true but I think the truth really lies between them and perhaps a little bit more in terms of that certain technology comes about because of certain changes that have already happened within the society and the discovery of that technology becomes imperative and therefore people start looking for it. As one says, necessity is the mother of invention.

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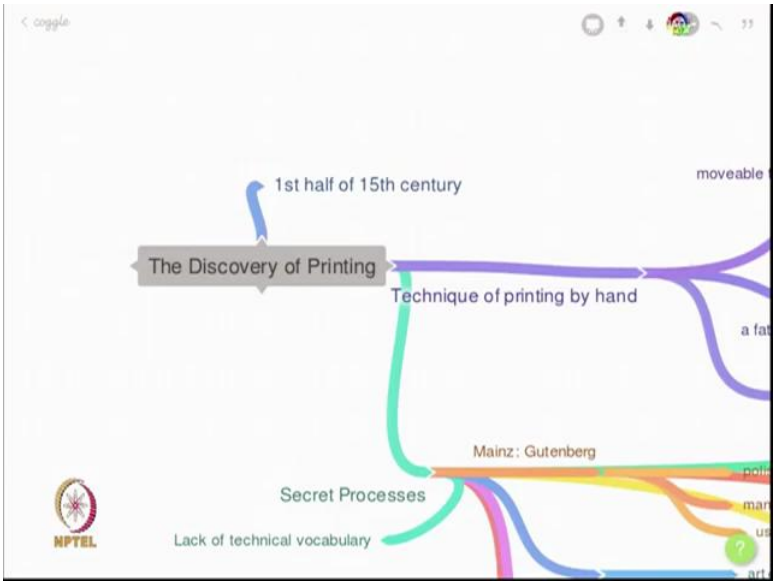

So it is only when human beings feel the need or necessity for something that they would try to innovate and then reach to that particular invention. So what were the conditions that really gave shape to the discovery of printing? Printing was discovered around the first half of the fifteenth century at least that is what is the date that has been given by most historical records.

The need for technology which is similar to printing was something that really comes about in the preceding centuries. Now in our discussion of the various manuscript techniques elimination, inscription, so we discussed how the need for making scribal copies of books increases through history, through a certain period of time as we have discussed that in the first millennia within Western Europe really the printing really.

In the first millennia you had the need for manuscripts really coming through the scribal agents within the ecclesiastical authorities that the need for Christian monks and Roman Catholic Church to spread the idea of Christianity across Europe makes monasteries possible and the need for communicating ideas assumes a greater degree of importance and therefore scribal records writing becomes important. However, just manual writing would have sufficed.

If a certain monastery did not have a particular manuscript someone can travel to a particular monastery where that manuscript record is there and could make a copy of it and take it back. It was a slow process and therefore in history you would find such manuscripts very rare because the production also was rare, you didn't have a situation where there would be

hundreds of copies of a particular text it would only be a handful- if at all in double digits- that there would be copies of these various texts.

However as we move towards the turn of the millennium and in the early part of the second millennium that is around 11th, 12th and early 13th centuries by then you have the growth of education that due to certain changes that were coming about within the society you had the scope of education increasing and including amongst this, the laity or the common people who are outside the purview of the ecclesiastical authorities or the church authorities.

So you had a slow movement towards secularization of education though I would say the education was not yet so much secular but the fact that the Scriptures and the ideas, the philosophical texts would now be studied by laity, by people still within more well-to-do class not really some kind of universal education mechanism that's a much later concept, several 100 years we will have to wait for the formal schooling systems and increase in mass literacy and something that comes about only when the industrial era really takes shape by about the 18th century.

But still in the 12th and 13th centuries, 14th century really, education spreads outside the monasteries and the church and you have the setting up of the first universities. Now what we need to remember is that though these universities were there in Europe at that point of time they were still not studying texts in the vernacular languages. The development of vernacular languages still will take some more time and print will play a very important role in it. We will discuss that in a future lecture.

The principal languages which were the mode of scholarly communication at that point of time- learning and writing- was the classical languages which is Latin and Greek. What is important for us to note is that the nature of classical languages as opposed to the vernacular languages. So classical languages are available, are accessible only to a certain elite but among that elite, across various territories across Europe, there would be therefore communication that is possible.

Whereas these classical languages were differentiated from the language of everyday issues which would be slowly taking the shape of what is present day English or German or French or Italian you would still have very different kinds of languages and dialects for example there will be Scott and Welsh and Gaelic and other languages which are there in various pockets of Europe and this is very similar to the Indian situation if you do understand.

Though English is not a classical language in India in the Indian context really if you look at classical languages you will have to look at Sanskrit and Pali and these kinds of languages which are not living languages, so it's a difficult example for us to give. But if we for a moment we imagine English as a classical language, it is a language that links all of India. Even Hindi as a language does not really connect every part of India, English does.

But English is a language of the elite, it connects the elite of various states of India, various provinces of India. But if you look at the vernacular languages that is Bangla or Oriya or Assamese or Tamil and Telugu then these are languages which are local and these are language which are horizontal which are spoken by people across the board in that particular locality, in that particular province or state, that particular region.

So that's the concept of the horizontal that it is across class. Whereas the vertical is where only people of the elite are connected across regions. So India's situation, India is almost a mini continent, so it's a very apt sort of situation to what was there in early modern Europe really and so for us to understand that what the condition was in early modern Europe we can look at the example of India. We will return to these questions of language and specifically to the question of language within the Indian subcontinent later on in the course and print plays a very very important role through the various eras in that but more about that later.

So returning to the late mediaeval Europe, we see the coming of learning but this learning is primarily in Greek and Latin. So what I'm trying to tell you is that though there are universities it does not mean that there is some kind of a universal education that everybody in the society has an opportunity to study, no it doesn't. The doors of the university are open only to a certain elite section of the population who come in for certain kind of education which they need for various purposes in life.

But it is certainly an exponential growth from the education or the learning or the scholarship that existed only within the Ecclesiastical domain within the first millennia in Europe. The situation within the Indian subcontinent as we looked at in our lecture on Indian manuscripts was slightly different because within India you had these centers of learning, these manuscripts were not only possessed by ecclesiastical authorities there were also these kind of structures through which centers of learning had come into existence. But within these centers of learning whether it be in Nalanda or other similar kind of institutions, the learning itself was open primarily to a very very small section miniscule section of the population.

But certainly the learning did have a certain secular character even outside and existed outside of religious practices that is something that comes to Europe only by about the late mediaeval age that is the 12th, 13th and 14th centuries. But what happens is that, now there are all these people who are coming to the universities to study texts.

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And therefore there is a need for texts, there becomes a greater need for texts. Now there has to be mechanisms of sharing texts. So two things happen, one is the mechanism of sharing the text comes about with the birth of the library these universities now start developing libraries.

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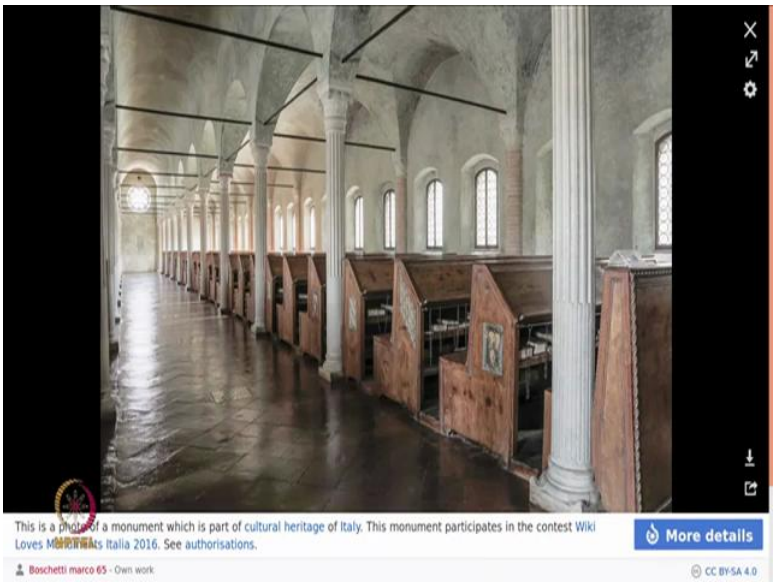

Libraries are of course institutions where more sharing of texts become possible and these manuscripts would often be as we looked at the processes of manuscript production that these manuscripts, would be bulky and they would be prepared customized or be commissioned really and they would mostly be pretty bulky.

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And so there would be situations where these libraries would have to ensure that nobody I mean these texts are not misplaced in any way. So there would also be situations where books would be put on racks and be chained to the library rack and you read it there, you consult it there, you sit there or stand there and consult that particular book, that particular volume. So libraries become a very important way of sharing of texts for the scholarship.

However scholars would often like to have personal copies of specific treatises and texts for their own record and for their own concentration because they need it. So sometimes a certain book let's say your specific textbooks you would like to have a copy of whereas there are a certain book which you just need to consult fleetingly or for a certain period of time you would perhaps rely on a library to refer to it.

What becomes important is that process of copying. Now for a scholar to sit down and copy an entire volume together would be time-consuming this is what would have been a very important mark of scholarship in the early mediaeval period where one of the scholarly tasks would be to make copies of manuscripts and only scholars could make copies of manuscripts because they will have to be able to decipher what is written there, understand what is written there and sometimes make intelligent, important interventions and changes into those

manuscripts in order to be able to really make sense of it because remember these manuscripts would be travelling across time.

So every several hundred years or so or even for a lesser period of time a certain text might need to with some philosophical ideas may be challenged and they may need to be rewritten within that current context and therefore there would be topical or other interventions that would take place and the scholar is well equipped to bring about that particular change.

So in the early mediaeval period one aspect of scholarship was the copying of a manuscript and this was really a continuation of the oral domain where the aspect of scholarship was to actually memorize and repeat and keep the knowledge going by that repetition, keep the memory going by the repetitive utterance of a certain tract and that is something that really carries on into the manuscript domain where the scholarship exercise is that of repetition.

The reputation or the rewriting of manuscripts itself is a scholarly exercise but with the growth of learning and really with the holding of manuscript culture, that task of repetition has become superfluous, has become vestigial this is no longer really necessary because the knowledge can be for a moment manuscript is the mnemonic for that knowledge and you do not need to spend the time keeping it going.

So scholarship would now try to engage with more texts, more ideas instead of trying to spend the time in copying. So therefore now there would be professional copiers. So as I told you while we discussed the production of manuscripts there would be the booksellers or the stationers who would actually do this task of copying books. So typically what would happen is that sometimes the bookseller would have a particular master copy of a particular book and when a scholar comes and orders a certain copy, they would pull out that specimen and ask the scribes to make a copy of it.

And it would of course be customized, the kind of illustrations that they might want, the size of the paper or the parchment and the cover and gilding and everything would be decided. But that process too where the scholar is not engaged in the copying but a certain scribe is doing it of course there would be certain minimum qualification for the scribe. The scribe would need to know Latin and Greek, know the language well enough to understand the words and make the copy but they are not the most learned people within the society, really.

Just to give you a comparison it is as much learning that a typist needs to have to be able to type without much of a-- or the job of a stenographer or there might be someone who is very

important functionary- an officer- who does not have time to type out their own letters or their own documents, they dictate and the scribe notes it down or some notes have to be made, it is the job of the stenographer to do it.

Similarly the scribe in the late mediaeval era would be someone who would have some minimum knowledge, working knowledge of the language and the texts and they would write out or copy out the manuscripts that are required and would supply it to the scholars and the scholar meanwhile can therefore use their time to engage with many more texts. Now we see how this kind of professionalization of scribal copying sort of enables the scholar to consult more texts or engage their time more productively which was would not have been possible before this particular era.

And moment you are looking at several texts and consulting more and more texts you are making space for the interplay of ideas because do understand that previous to this you did not have within the oral domain you did not have the possibility of someone comparing couple of several ideas together.

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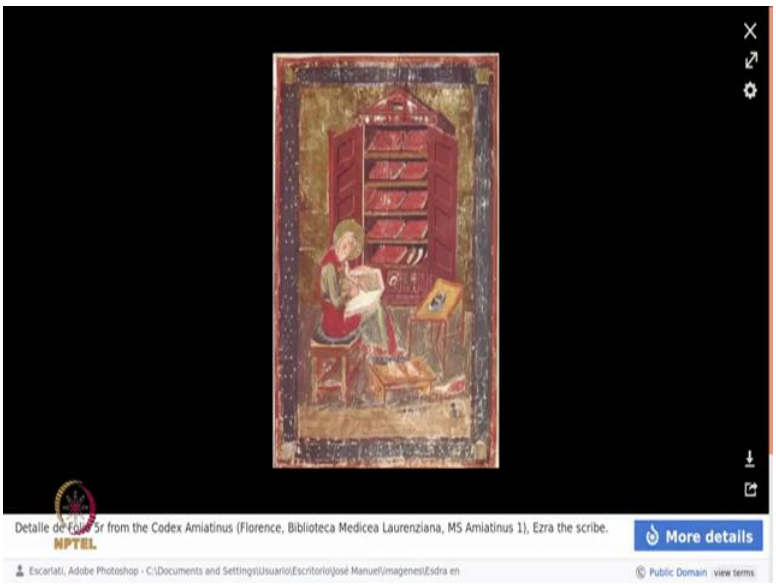

The movement of knowledge was tied to the person, it was embodied form of knowledge, it was not some form of knowledge that could travel without the body. It is only when knowledge can travel without the body of the knower that it is possible for the scholars to engage with ideas that are coming across from various ideas and that leads to the development of scientific ideas.

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Because one of the techniques of science is to ensure that you test out a certain hypothesis in several contexts and only when it is proved in several contexts that you take that to be a maxim. You take that hypothesis to be a kind of a law. So these kind of techniques actually lead to the growth of rationality and reason.

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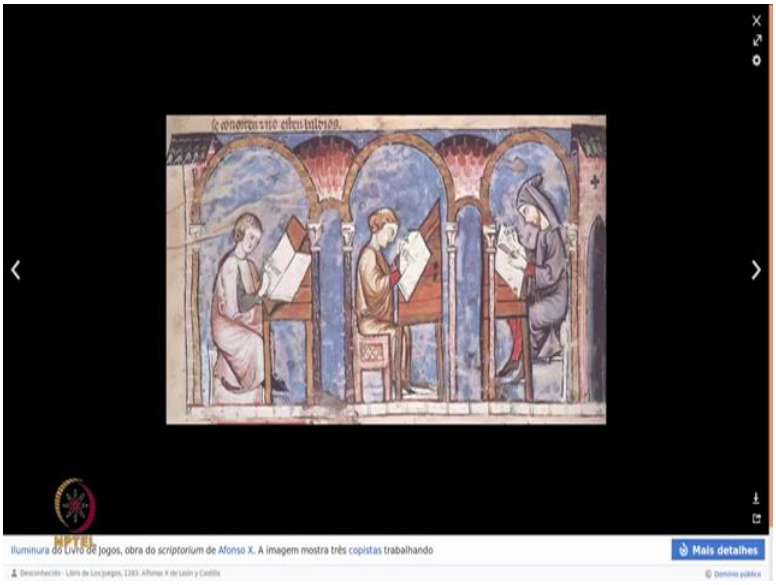

However returning to the act of scribal copying even this process where a copy of a particular book is being copied down by a particular scribe is through the centuries seems to be slow and does not satisfy the need.

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The speed at which the book has to be prepared or the copy has to be prepared becomes a greater imperative. So therefore now you have situations where certain booksellers, some enterprising booksellers, what they would do is, when the scholar comes in with a certain manuscript to be copied, they would first UN-seam it, they would first remove the binding, the stitching of the binding and take out the gatherings and distribute the gathering among various scribes who would then copy out those gatherings and then both the original and the copy would be put together and you have a copy at a much faster rate. At a much quicker rate.

It is almost like these, if you speak to somebody who would use the photocopy machine some 30 years ago or even 25 years ago they would print at a much slower rate. You would get maybe 5 or 6 or 10 copies per minute. Now you get up to there are machines which would be able to make photocopies up to 70-80 pages per minute which is at a much faster rate. You now have very very efficient photocopy machines which are able to sort the pages out themselves even photocopy books by turning the pages by itself this speeds up, mechanizes and automates and speeds up the entire process.

So the more the demand for the texts the greater the demand for the speed at which printing happens and the more number of copies. And the importance of having more number of copies is, also let's say a certain scholar comes in with a certain very important rare manuscript, the bookseller would like to make more copies of that book because there could be a certain clientele for it.

He would like to make some more money out of copying that book or selling that book. Also if a certain idea suddenly becomes currency, there is a greater demand for a particular book and you have to meet that demand. In order to meet that demand you have to speed up the process of the production of that particular book. Now what we are moving towards is really what we saw within our discussion on capitalism of this process of mechanization.

We are moving from kind of a slow manual form of manufacture to a mechanized form of manufacture which will produce mass goods, which will create more and more products. The book now becomes a certain product and the book now caters to a certain market. It is no longer an object of individual use.

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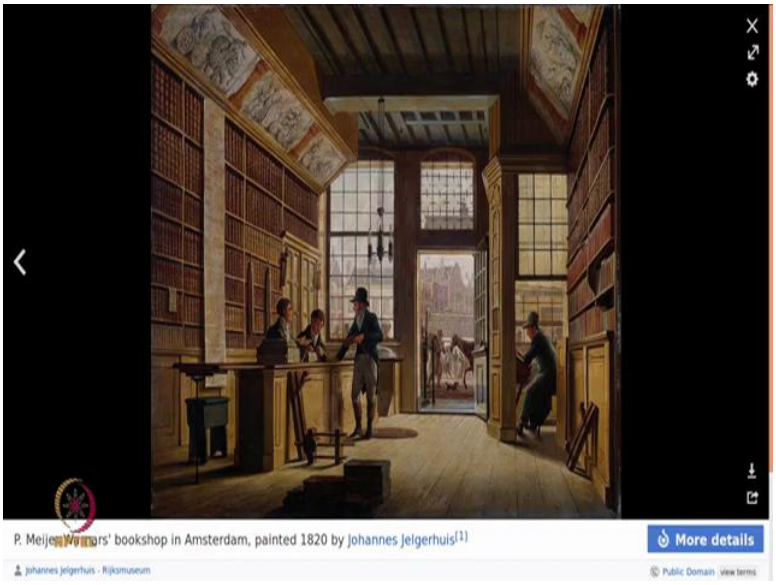

It becomes an object which is to be sold in the market and a profit can be generated. You already see certain pro to-capitalist models of functioning that come into being and the bookseller by trade is trying to engage with these chain circumstances within which human life and human trade in commerce is developing and therefore now very clearly this process of speeding up of creation of copies, one tries to create a situation, look for ways in which one can speed it up further because manual copying is something that is a slower process.

Now what is important to note when we say it is the discovery of printing, what we're looking at is really the discovery of or the invention of text, printing of texts because printing of images is something that is older it did exist in history where printing of images on cloth, on textiles is something that had been in existence for many centuries previous to the printing press were the textual printing takes place.

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Printing of alphabet takes place in fact the Chinese have been printing for a very very long period of time.

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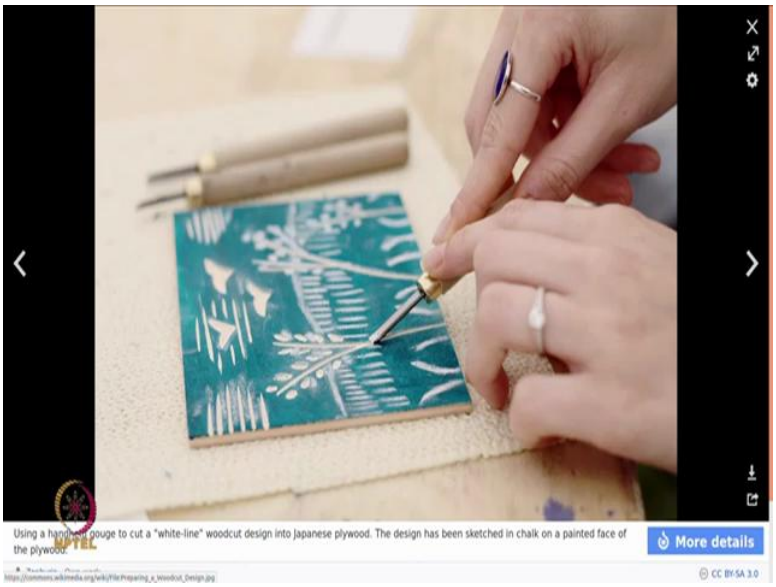

And therefore within the creation of texts this kind of printing is something that it did exist for printing of illustrations. The illustrations would be, this process of illustrating manuscripts was mechanized to a certain extent.

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Though it was printing by hand- a certain xylo graph or a woodcut would be used to sort of make an impression of the drawing on the page and then maybe it would be colored or illustrated in a certain way by hand.

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But that process was speed ed up. In fact it would so happen that scribes would be writing out manuscripts and we saw how in the manuscript tradition it's actually the writing of the text that happens first and detailed instructions are left for the illustrator as to what, even the illuminator for the kind of illustrations and (()) (33:18) that they're going to fill up within the blank spaces that are there.

So the text actually gets framed pretty densely even before the manuscript reaches the illustrator. So the illustrator's task is pretty much restricted to what has been envisaged already.

However this tradition of leaving a blank space for the illustration now gets taken up by leaving-- that blank space is then used to actually take a woodcut and actually make an impression with an ink and the drawing is ready in very very quickly. And so therefore you would have situations where manuscripts in the words the written text would differ from volume to volume but the illustrations would be very much similar.

Because each volume is getting customized, so in a certain volume the illustration may occur on page number 33 but in another volume it might appear on page number 36 depending on what kind of font has been used, how many illustrations have been put but the illustration actually would look almost identical. So we need to remember that there was a process of mechanizing illustrations much earlier than the process of mechanizing the printing of the written text and really the innovation that was involved was to actually bring about that process of printing in the written text. I will briefly talk about the difficulties that are there in that is that

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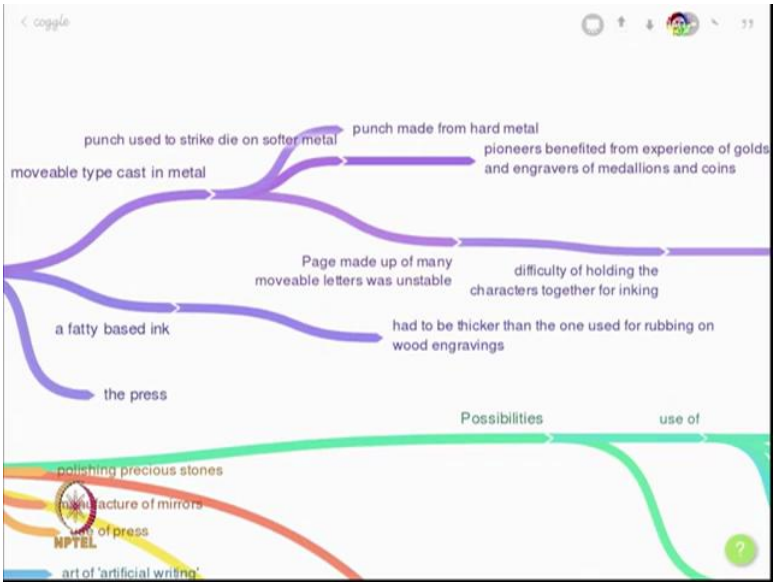

When the printing happened by hand, so they would create these dyes to punch a dye onto-- sometimes these blocks would be metallic and the punch would be made on a softer metal with a harder metal and there would be many more copies of that particular punch which would be there and one of the very important professions which made heyday at these point

of times were goldsmiths and those who were engravers, who would engrave coins and other such medallions and other things which was an ancient profession.

But they come into a new kind of use now because this creation of illustration on metal or even on woodcut is something that requires a certain intricate task of carving, certain dexterity of the hand, certain expertise which goldsmiths would have had, those who would make jewelry and they become very very important because that is the kind of professional expertise that also leads Johannesburg Gutenberg to create the printing press that really is there.

Now it's one thing to actually use blocks for printing illustrations, it's another thing to use blocks to print entire pages because you know it's not that it was not used, people did experiment with it that the entire page, to compose it, it's a lot of carving. Carving each letter out on a block of wood or a piece of metal is not an easy task. Whereas making one illustration, a single illustration in a certain text there would be a certain number of illustrations.

In illustrations you're looking at lines, straight lines and the colour would be really filled in by hand whereas creating an entire page full of text would be extremely time-consuming and after that, that block cannot be used any further. And so the amount of time that goes into--

Whereas illustrations can be reused across volumes. Let us say if you have to look at illustrations of a dragon then the dragon could be there in multiple narratives. So the printer has lots of blocks around, they can use that block to put the picture of a dragon in. A quick titbit here, a kind of an aside here, so you know of this term called the stereotype. Just think about for moment what is the meaning of stereotype in your mind?

I will give you 10 seconds. Stereotype really is an idea that we sort of think of as some straitjacketing a definition that if you have to think about a jealous person or a greedy person, you are stereotyping a certain social definition. You are sort of fixing a certain social definition on a certain community of people. So you are stereotyping the way a certain community behaves.

I'm desperately trying not to give illustrations because sometimes it might be pejorative. So we say "okay he is from this region, so therefore all people from this region are like this, they are money minded or they are stupid or they eat this or they wear this". This is the kind of

stereotype that we have, that's the cultural definition but this word stereotype actually emerges from this tradition of printing.

Where, as I said, if you had to get the picture of a dragon, all dragons would look the same. That is why the idea, the type its a stereotype. A certain typeset which is used for a certain particular object. You need the picture of an elephant, there is one elephant that gets printed everywhere, that is the origin, historically, of the term, stereotype, do go and check a little bit more about the history of this term stereotype, it is very-very interesting I must assure you. Returning to our discussion of print. The point was that the page, a written text was made up of many many movable letters and it was very unstable.

And if you did not actually make an entire block of the print, people did try to create individual alphabets or individual words and then put it together and they did not master the technique. They did not figure out how to hold the words, so many blocks but they have to be all printed together, how do you put it all together? It was a very-very difficult task and people were not able to do it.

They were trying, there were limited successes and sometimes they would try to use a single mould for the whole page and it was something that was difficult, they would not be able to do it.

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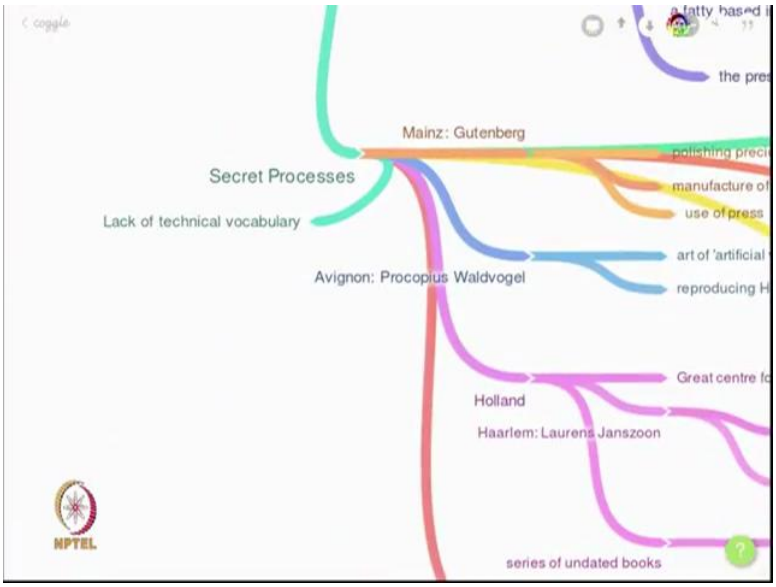

So this kind of experimentation went on throughout Europe and through various enterprising individuals across the continent and therefore there was a certain secrecy involved in this process because the person who is able to do it best would then be able to capture the entire

market, will have a certain monopoly. So these were kind of trade secrets that would be there but even within the trade secrets, words they would keep getting

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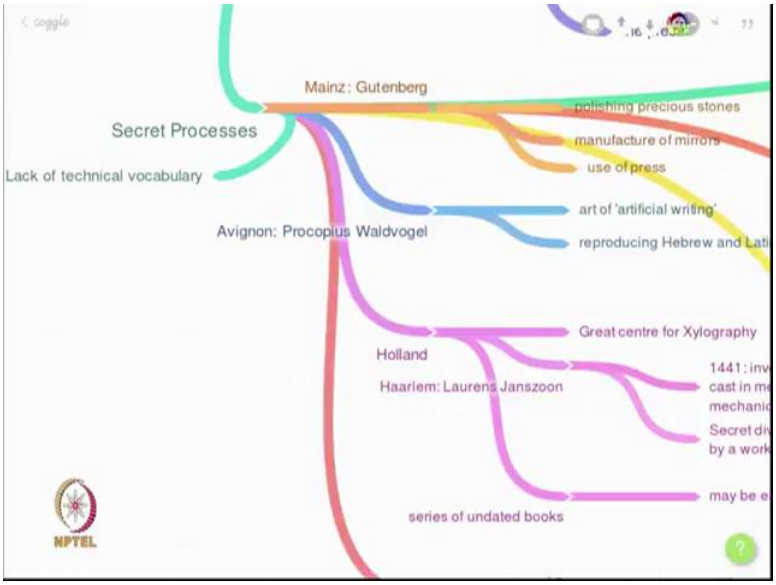

It would keep getting passed on, knowledge would keep getting passed on. It wasn't an easy era because you still didn't have the development of science, people did not know exactly how to communicate these ideas but what would happen is, as I said in an earlier class, that this was a period of time when various kinds of artisan-AL activity would have grown because you're moving more towards mass production and therefore within a certain workshop, within a certain artisan-AL space there would be a master artisan, a master painter or someone and within them they would have certain apprentices.

These apprentices would learn the trade but then they would go away after having learned that trade and therefore the trade would pass on. So over generations a certain practice would spread. So within Western Europe there were various specific locales within which, which were important domains for the development of printing and each of these places there were few booksellers and innovators who would be working on specific ideas in order to sort of prefer their trade little bit more.

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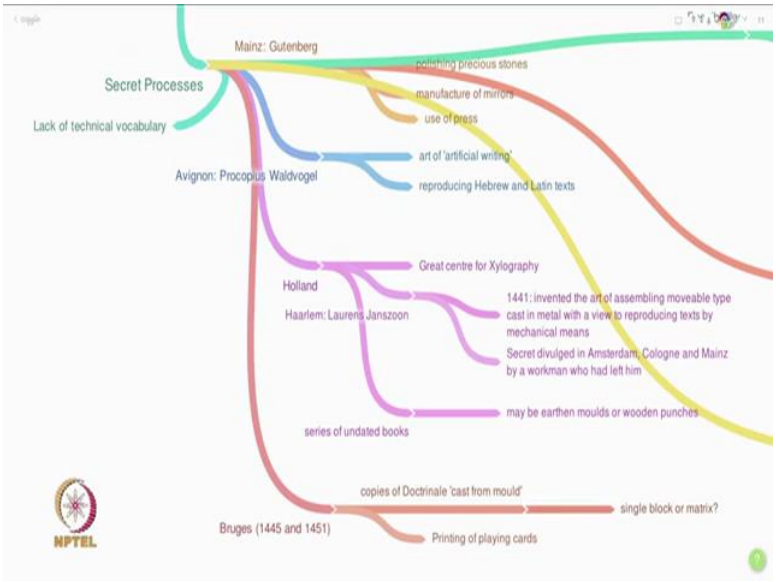

Now when you look at an invention, any kind of invention it's one thing to say, okay this is the date on which this particular thing was invented. It would seem like one fine day someone invented something but it is important for us to remember that it is not that one fine day that things got invented. People were working at it for a lot of period of time.

It is not like for example the World Cup cricket or the World Cup football where everybody knows okay after 4 years there is going to be a tournament and we are all working towards it or there is going to be national elections, we are going to have a new government after 5 years and so everybody is preparing for that.

So that end is not there, we do not see that light at the end of the tunnel. When India got independence in 1947, people did not know that they would get independence. Let say say when various moments of national liberation were happening in the 1930s, nobody had a clue that India would actually get independence in 1947, so we have to think of it from the minds of the people who were operating at that point of time.

They were working towards a certain goal which they do not know when it will fructify and this is true of all inventions, all kinds of social movements primarily and also certainly of the invention of the printing press. People were innovating, they did not know what is that invention that is going to really be cutting-edge, really be a breakthrough in the process. And everybody contributed in their own way and they were living a life as if this is the current state of affairs.

I have made this invention, this innovation and it works for me, I would like something better but at the moment this is the best and we live life with it. No one says this is the printing press I do not know how to make it, I am trying to make the printing press, nobody had a clue as to what-- that there would be a printing press in future.

For them at any point of time they would be like, we would think that technology is extremely advanced today, today we can do various kinds of things which was unthinkable 30 years ago but today we are doing various things which may be obsolete in 5 years or 10 years. Really speaking, so we need to have that kind of a idea of history also in our mind that when these innovators are innovating, let's say in 1445 or the 1430s they are at the cutting edge of society.

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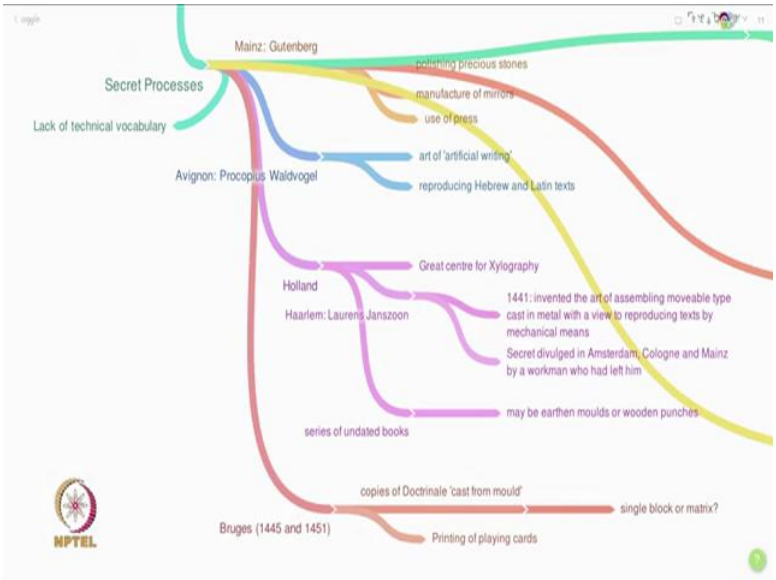

They are the most advanced, they are doing tremendous amount of innovation in their own right and each of these innovations really builds up into that one ultimate sort of, so when an avalanche happens, it does not happen at once. The soil, the earth, the snow really gains traction over long period of time and then the avalanche happens. Without that slow process of gathering, that revolutionary movement of the avalanche would not have been possible.

All I am trying to tell you is that Gutenberg did invent the printing press we can say, but he did not do it alone. It was the ideas that came about through the other innovators who were in the process of answering this crucial question as to how to mass produce a book to actually increase the number of the speed of copying of books. And all these innovators actually contributed to Gutenberg's ultimate breakthrough that happened.

So Bruges was an important space where there was a printing of playing cards as they tried to use a single block or a certain metrics where several blocks would be placed together and held together into one block tightly and the printing would happen. Holland was a great center of Xylography and in Harlem Laurens Janszoon- I am not sure if I am actually pronouncing the names correctly- in 1441 he invented the art of assembling movable type cast in metal to reproduce text by mechanical means.

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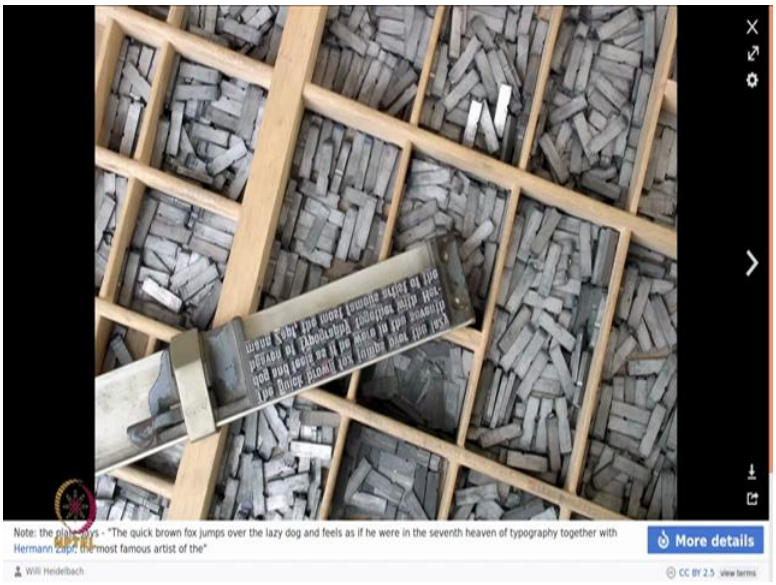

So what is a movable type? Type which can be moved from one lattice to another. So it can be taken-- otherwise if you have one full block parts of that block cannot be removed, It is just one block. Whereas if individual type blocks are there and they are combined together into a certain lattice and put together then taken apart and put into another lattice and printed, that is movability.

But of course the secrets do not stay secrets because apprentices, the workmen may have fallen out and some workmen left him and went and divulged these secrets to other places. So we really do not know exactly whether the text produced, the copies produced from these early innovations would be very rare we have very few copies of it. Sometimes maybe earthen molds were used, sometimes wooden punches would have been used, various kinds of techniques would have been used.

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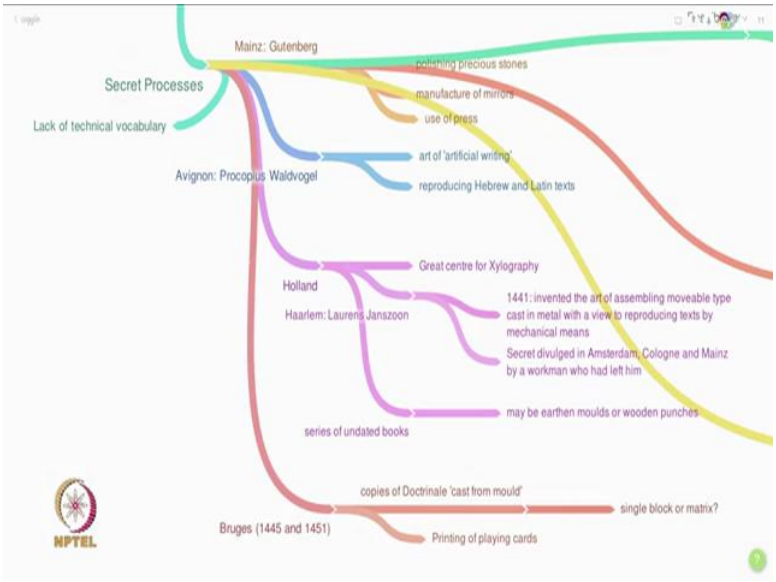

Another very important center was Avignon, where they were trying to work on the art of artificial writing. So it's not the manual writing but the artificial- the use of machines- to write in order to-- So they were trying to innovate with the reproduction of Hebrew and Latin texts but a very important center was really Meinz in Germany. Another very important center of course was Leipzig and later on after the coming of the printing press, Leipzig becomes very important, we learn more about Leipzig later on within the course.

But it was in Meinz where Gutenberg was based. One of the reasons why Gutenberg really succeeded was because Johannes Gutenberg was a man of many parts. He was not a specialized sort of printer, so to say, or a bookseller. He tried many things in life and he was not altogether too wealthy or very successful. We all know, connect the printing press with Gutenberg, his name is associated with it.

But Gutenberg would have wished that he knew all that because he himself had a very peculiar existence. So, he was engaged in the polishing of precious stones, he was engaged in the manufacture of mirrors and also the use of the press and the creation of the press that he did is actually an amalgamation of the expertise he got from each of these activities.

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So he tried experimenting with using clay and fine sand to make molds or wooden punches or molds of lead, mattresses and everything, when there was very slow progress and various people across Europe actually were struggling with the same problem for around these 20 years- 1430 to 1450. A lot of people were struggling with a similar problem but really what happens is there are the 3 names which are very important.

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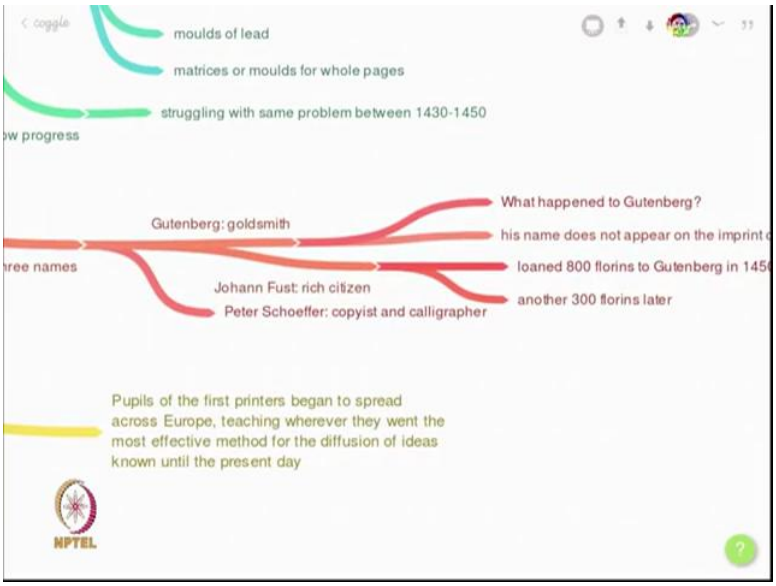

And when we discuss the invention of Gutenberg, we have to discuss these 3 names which occurred together because I think the innovation happened together. Gutenberg is a goldsmith, he had a very important role but along that, you had Fust who was a rich citizen, who funded

Gutenberg, who gave a loan, a very strong loan to Gutenberg and he was given more loans later on.

But along with Gutenberg there was a copyist and a calligrapher, Schoeffer, why is this important? He is important because creation of the press really takes a lot of time and takes a lot of money because metal would have been expensive and if you do not have the kind of money to be able to invest, you will not be able to reap that benefit. So therefore investment becomes important.

The importance of the role of the capitalist machine is something which is what we say capital intensive. Any machine is capital intensive and it requires a lot of machines, so this is a capital intensive technique. So therefore everybody cannot, workers do not have the kind of money to be able to create a machine, they need money and therefore that's where the rich citizen comes in, the capitalist, the creation, the conversion of the rich citizen into the capitalist.

This is very very much different from the feudal setup where someone can be much richer than even the ruler, through trade and commerce. Though rulers were kings and queens, they were really rich but they may not have been the richest people. It would be traders who would be able to gather a whole lot more riches but the social respectability, the social respectability was that of the king.

The power, the political power was that of the king and not of the richest person in the society. Whereas with the capitalist system it undergoes a change suddenly this rich person becomes extremely powerful because they are the ones who are able to invest in the capital intensive technologies that are coming about.

Like here, even though Gutenberg has all the ideas, he does not have the money to invest, so at the end of the day, Gutenberg actually had a lot of loan, a lot of debt that he had to live with and he did suffer because of it. The crucial innovation of Gutenberg was to actually create the movable type in a metal face which had a certain shape and would fix into this lattice. So if we look at the early printing press really,

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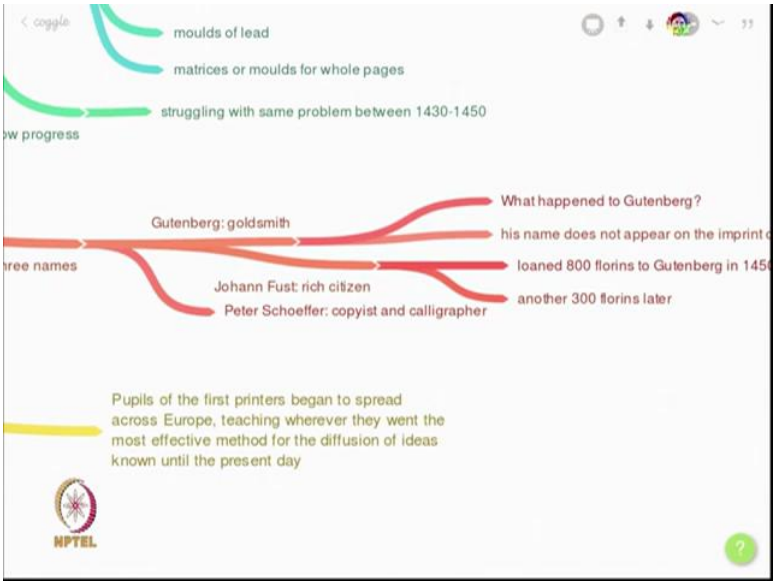

What exactly happens there is that, if you look at the picture of a very early printer, or a printing workshop, you would find that there would be these typefaces which would be boxed together in front of the printer who would then compose the page- which is to pick up specific letters from various boxes and then put them together in a lattice, fix it in the page and then sort of put it into the printing press and it is sort of the printing actually happens.

As I may have mentioned earlier, that there is a series of videos which are linked to the page of this particular course, I would encourage you to actually look through these videos to understand the process of printing a little bit better, so that you are able to understand this transformation of the ways communication is taking place. Over the years, over centuries, what happens there is a certain kind of mechanization of the human body involved in this. Where people could know exactly, if you see it's very similar to the way the type machine,

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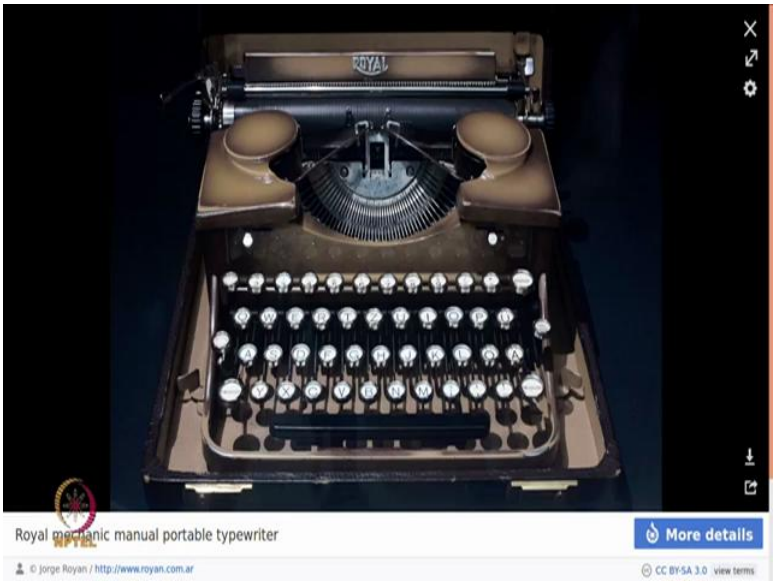

The typewriter actually operates. So if you have let us say a computer and you know that the layout of the keyboard, the QWERTY keyboard as it is called is organized. So many of us who actually do not know touch typing we actually hunt for the letters and we type but those who type really fast, they don't need to look at the keyboard because the finger knows exactly where the particular letter is. So, as time progresses, even in typesetting there is a particular layout in which the particular letters are put.

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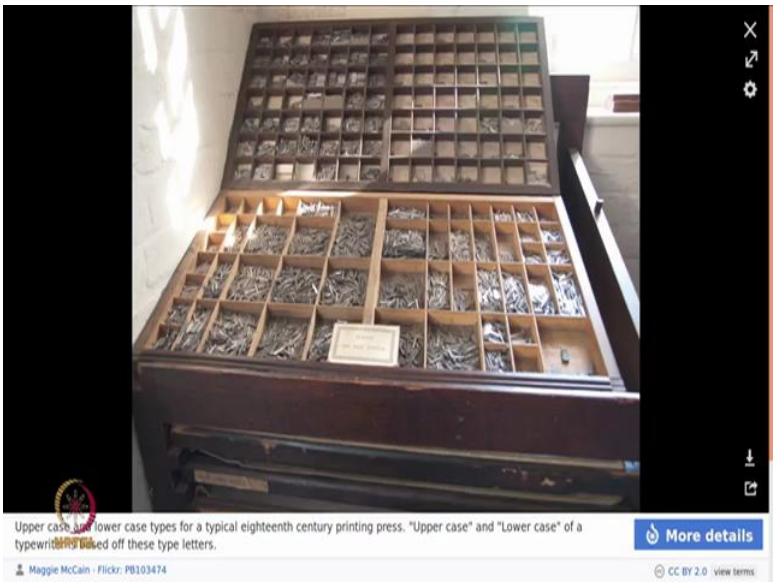

The typesetter now looks at the original manuscript and immediately his hands fly around the various boxes of the type sets and puts the lattice together at a much faster rate.

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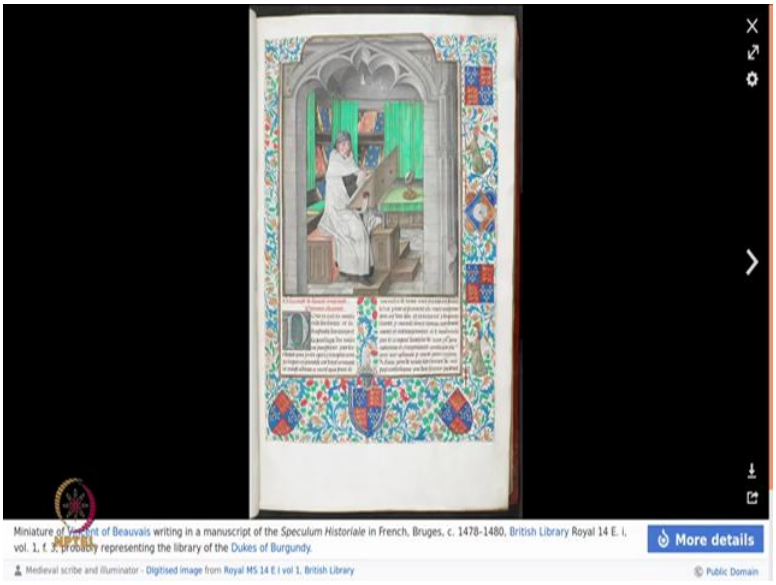

So we see how the transformation actually takes place that instead of the scribe who holds the specimen in front and copies, you now have the printer-- the typesetter who is looking at the specimen and putting the lattice together. And when he puts the lattice together that lattice which holds the entire movable type together becomes one piece which can then mass produce many more pieces, many more books, many more pages.

And then these movable types can be put back into their individual boxes again once the printing process is over. So therefore now you do not have to create a mould for a specific page. You can actually utilize the certain energy that is required, effort that is required in creating a typeset and the typeset can be replicated through the processes of the way the goldsmiths and the engravers or the coin makers work through molds and the process is mechanized and moves much faster and these types are reusable because they can fix into a lattice and put into the printing press and the page is actually printed.

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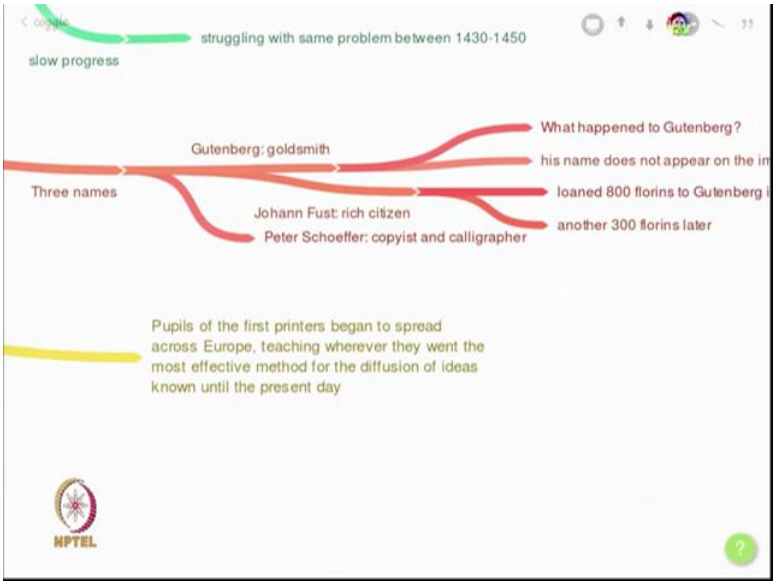

And as pupils of the first printers they start spending throughout Europe, they continue to teach whatever ideas that they have and this diffusion of ideas continues till the present day and actually further innovations happen. As we go about our lectures we will also look at how the various kinds of printing that develop and how the printing press really revolutionizes the way we encounter texts, encounter knowledge, we encounter ideas across time and the printing process really becomes faster and more sophisticated over time till such time that in today's present-day and age, in the digital age, it almost disappears.

Now though we say that Gutenberg was the inventor of the printing press and I have problematized it a little bit more by suggesting that actually the process of invention of the printing press did take some degree of time and effort of a lot of people in Western Europe in the 15th century, in the early part of the 15th century.

It is crucial to understand that the printing itself was not something that was invented in Western Europe. There were other efforts made to actually print in other parts of the world and more specifically in China. One would say that the first real experience of printing texts did happen in China many many years ago before the coming of printing in Europe.

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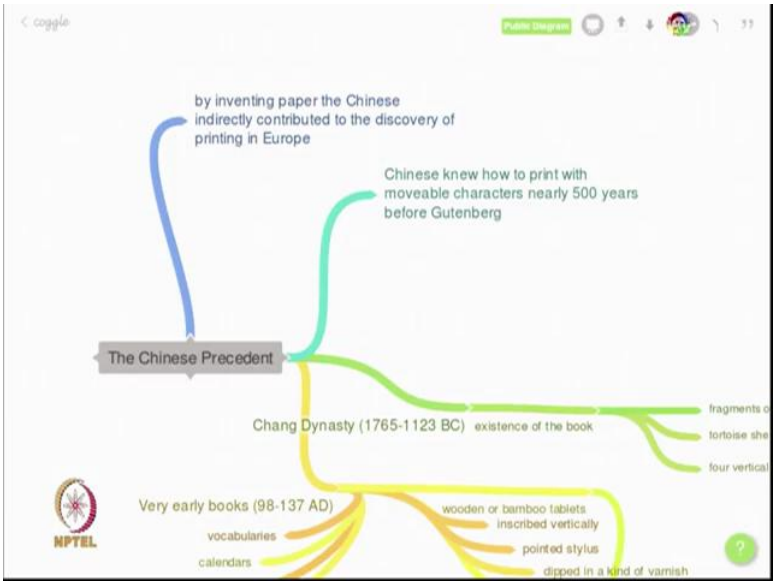

The Chinese did have a great role to play actually in the process of printing also because they also developed paper, that is another important invention but while we were discussing the printing of the images within the manuscripts we also spoke about how images would be printed within China on cloth using blocks. But the Chinese actually knew how to print with movable characters nearly 500 years before Gutenberg but this was a knowledge that did not move to Western Europe when Western Europe was really struggling with it.

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And this was something that we did see that various dynasties which were there in China they were using-- the Chang dynasty as much as the millennia Before the Common Era, there was the existence of the book, the fragments of the bones or tortoise shells.

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So we need not have the kind of an idea that, everything that we know of learning and of innovation comes from Western Europe. We did look at, a very close look at way manuscript culture developed within the Indian subcontinent and here you are, we are looking at China which was also very very important and very old civilization and they did have a lot of innovations within that particular context, within that particular geography.

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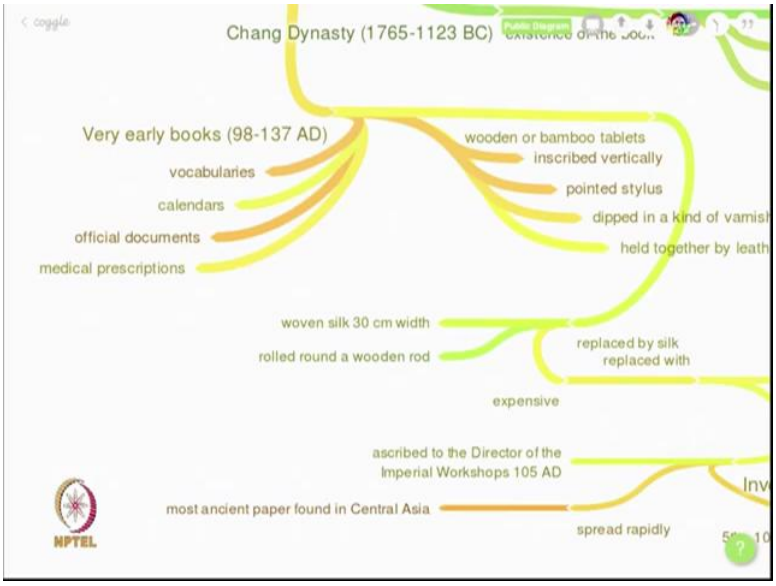

But the very early books that were there, they would in the first second century in the common era there are various kinds of books which were vocabularies or calendars or official documents and medical prescriptions, a lot of secular kind of knowledge not the kind of ecclesiastical based knowledge that we saw in Western Europe, much like India in the Indian

subcontinent, knowledge of both ecclesiastical and secular kinds we do understand even within the Indian subcontinent, knowledge of medicine and various kinds of music, theatre and various arts were also passed on through manuscript and similar was the case within the Chinese context.

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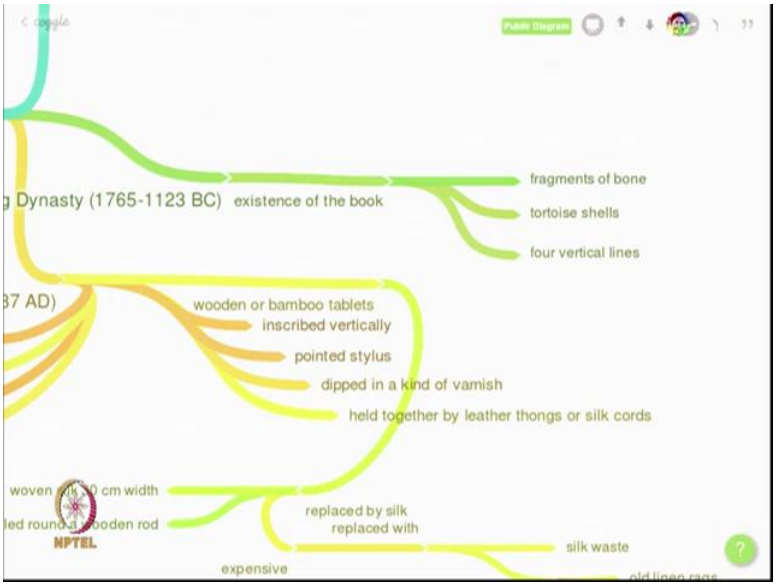

And they used various kinds of techniques to actually inscribe these and write and communicate these ideas.

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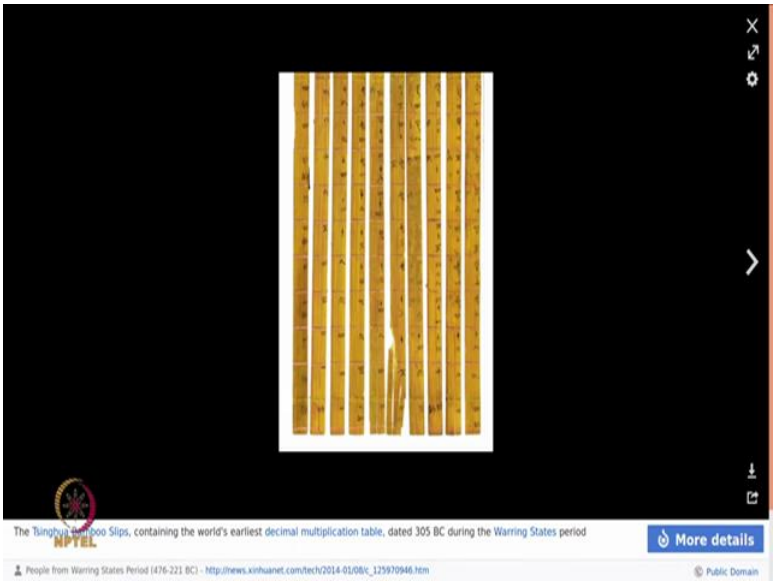

And they would use wooden or bamboo tablets which would be inscribed vertically, they would write from top to bottom in the form of columns, various cultures of the world as I said

follow various kinds of processes of writing and this was written with the stylus which was dipped in a certain kind of varnish.

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And then these bamboo tablets would be made into Codex by tying them up with leather thongs or silk cords depending on what the preference is or the particular convention really is.

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And then slowly they would use more flexible material more lighter material and would use silk cloth which would be rolled around a wooden rod and would be made into a kind of scroll but silk was expensive. So they try to create a much cheaper media, so slowly they

replaced silk which was expensive, they used silk waste and in this process what they did was they discovered paper.

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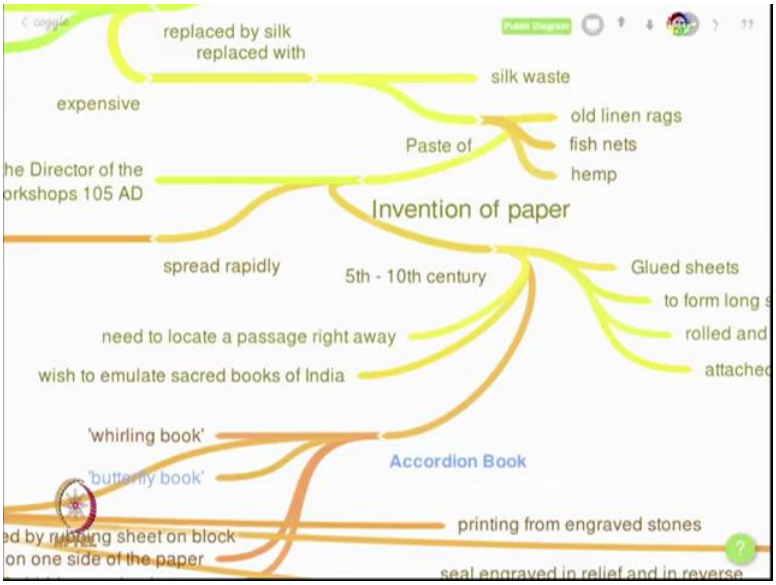

So old paper was made out of a paste of or a pulp of various kinds of cloth, linen rags, fishnets, hemp various kinds of things and these were innovations which were really ascribed to the kind of patronage that existed within the Chinese, the various royal families, the rulers of China and then kind of paper that would be produced, sometimes they would be very thin they would be glued together to make them slightly thicker. They could also be various shapes, they could be in the form of long strips or they could be rolled, they could be attached to a rod and they were organized in different kinds of way.

So certainly there was a certain cross-cultural communication, they tried to emulate the kind of sacred books of India which was the palm leaf manuscripts as we had discussed during our lecture on the manuscripts within Indian subcontinent though in India the Palmyra palm was the one that was used, palm leaf documents were used in China.

They began with bamboo as a writing material and then the coming of paper, so therefore there was clearly a certain cross-culture. We know that various Chinese scholars did travel to India across centuries and they did carry a lot of learned records with them. So those were the kind of cross-cultural learning that also aided the ideas that were there within China.

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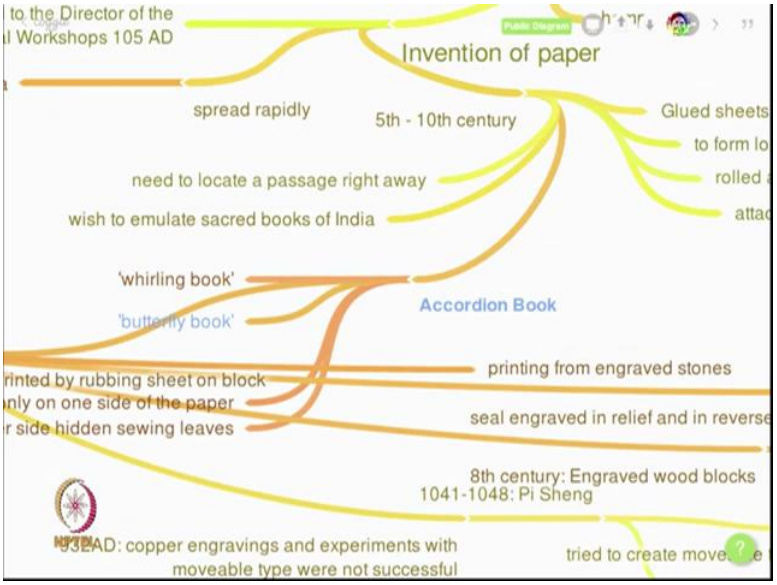

And there were the form of the Accordion book or the Butterfly book or the whirling book, various ways of putting the Codex together where the accordion book is something which is very interesting.

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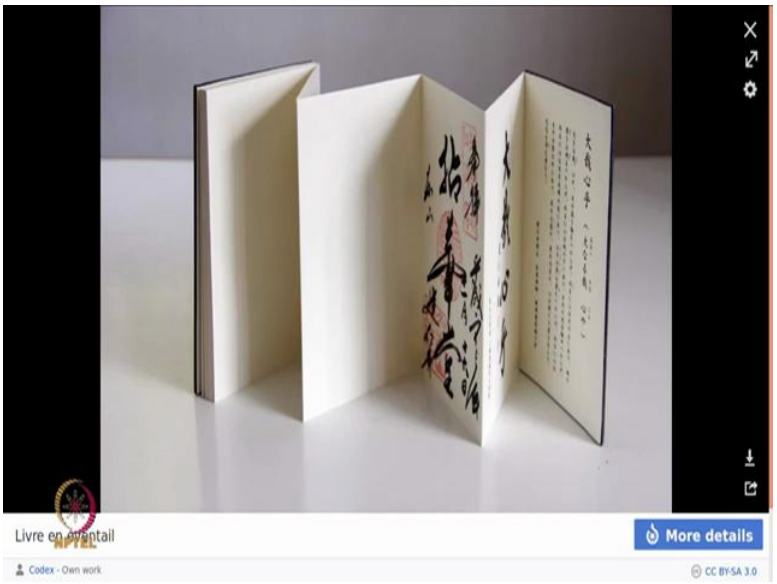

You can shape a book put the text in the form of certain pages without use of any kind of stitching, so the same sheet of paper can be sort of folded up and given the shape of an accordion book and it can be read on both sides.

So only the limited amount of text which requires the viewing of the human eye can be opened at any point of time and that is very crucial because even with scrolls or anything no

matter how long or how large the body of text is, the human eye can always focus only on a certain limited amount of text. It cannot look at the entire piece at once. Whereas we can possibly look at an entire painting at once, we cannot look at the entire text at once. We can only look at a smaller portion of the text which needs to be present before our eyes for us to be able to read that's how the human eye actually works.

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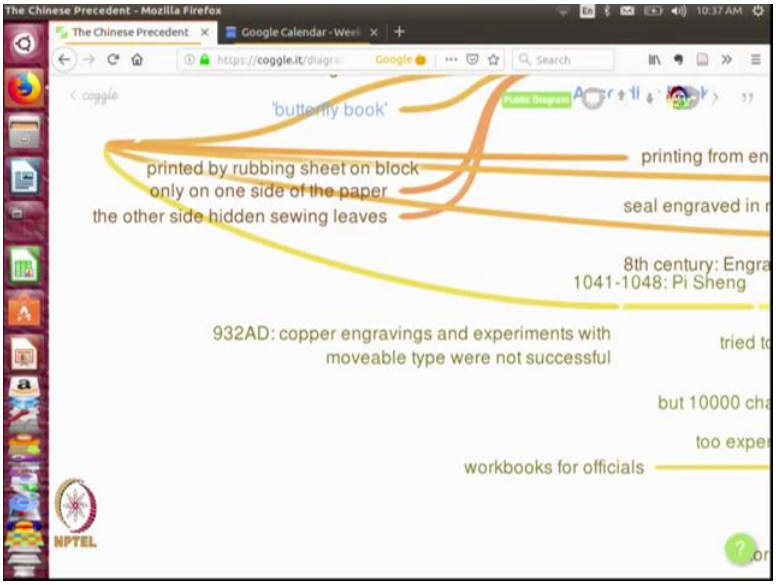

Now in each of these books which were created they would try to experiment with printing by rubbing sheet on a block only on one side of the paper. So they put it on a block and put the impression of the sheet and then try to sort of print on it.

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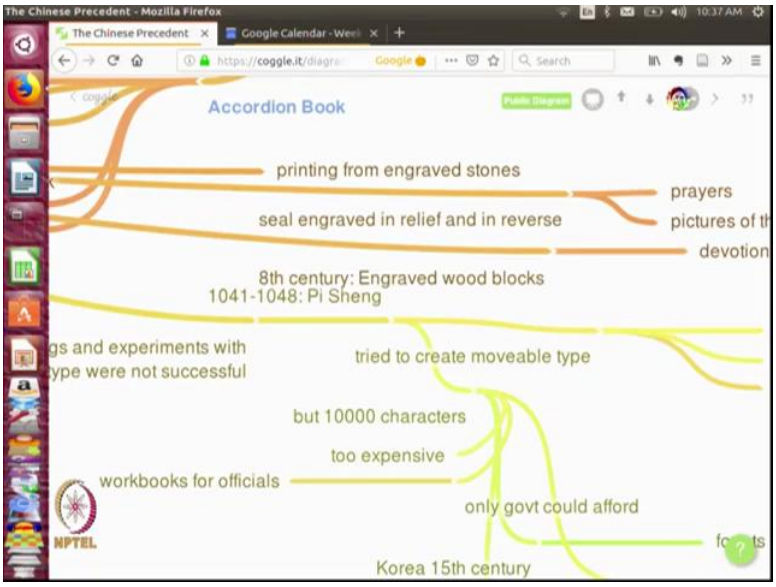

Various kinds of techniques which use printing was also made from engrave stones. There would be book of prayers, pictures of the Buddha, these were engraved in relief and in reverse. So the process was that you have an engraving on which a certain relief would be taken and then it would be sort of printed over. Various kinds of engraved wood blocks were also used, very early 8th century.

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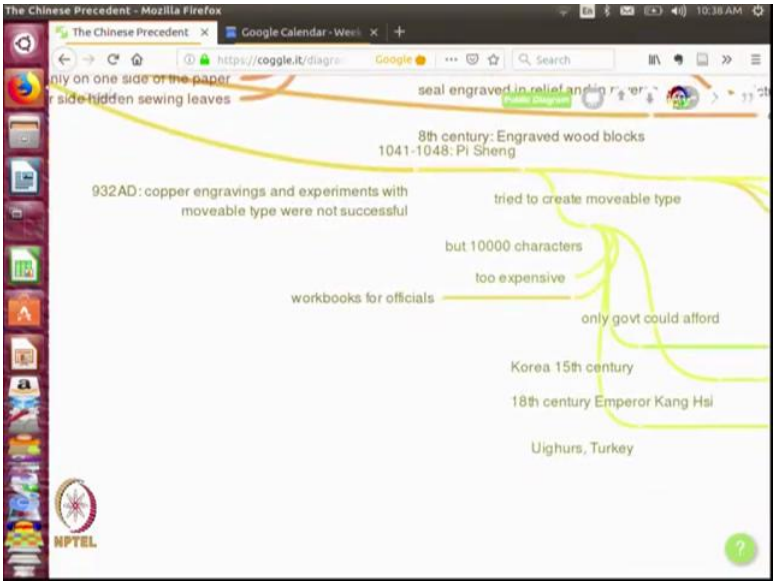

But after all this they tried to used copper engravings with experiments in the 10th century.

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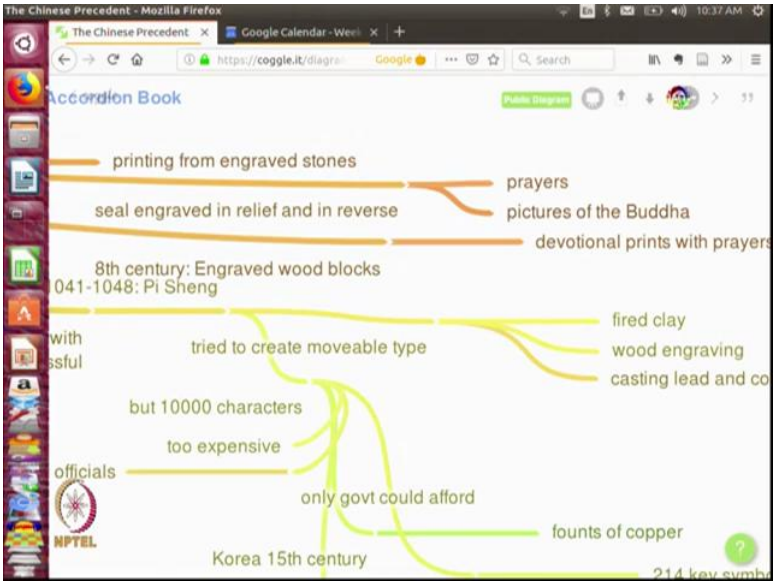

That kind of experiment happened, it was an attempt to create the movable type through the use of fired clay or through wood engraving or use of lead and copper, various kinds of

experiments were used. The crucial point is that all these experiments that were taking place were taking place within a kind of a dynastic domain, the ruler, the government or the monarchy was the one which was responsible for these innovations and that was for making possible administrative contact to pass orders because China was a very vast territory.

So if the king had to pass orders they would need multiple copies of a certain thing to go across, that instruction to go across the various parts of the kingdom and they wanted to hasten the process. This process of printing did not really take off though the makings of it was all there the ideas were all there, that similar kind of ideas led to the printing press in early 15th century Western Europe but it did not really fructify within China and primarily because of two reasons one can identify.

We know from our earlier discussions that Chinese language of course has evolved over the centuries I'm not saying that the Chinese language has remained stagnant for hundreds of years but even then the kind of writing that is there within China is more pictographic and therefore there are a lot of more characters whereas the alphabets that we see in most of the modern languages there are limited number of alphabets, limited number of letters that are there.

We all know that within the English language there are 26 letters in the English alphabet and many of the Indian languages they have just above 50 letters in the alphabet. So it's a kind of finite number which is used to be able to articulate various sounds and the words and ideas that could possibly be articulated through that language. Whereas within the Chinese language there are almost about 10,000 characters which are there.

So to produce an entire set of movable type for the language would be very expensive and we do understand that while for the printing press to work you would need multiple sets of that entire typeset and certainly certain letters would be more used for example A or S or T might be of greater use, required in greater numbers than Z. So usually a box of type would contain more of certain alphabets, certain letters and less of certain other letters.

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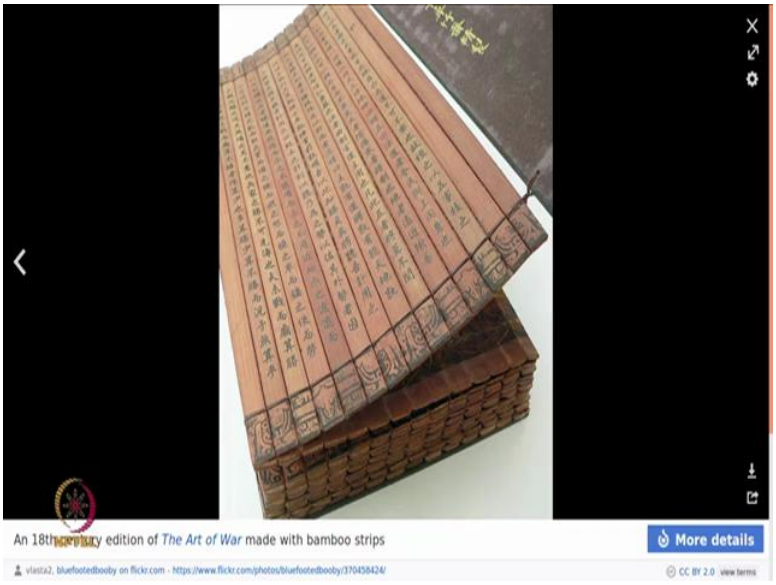

But still you would need even to compose a single page, you would need multiple of each character or each letter and within the Chinese domain that is very very difficult because there are 10,000 unique characters which have to be created, it is a too expensive a process and it is very very difficult.

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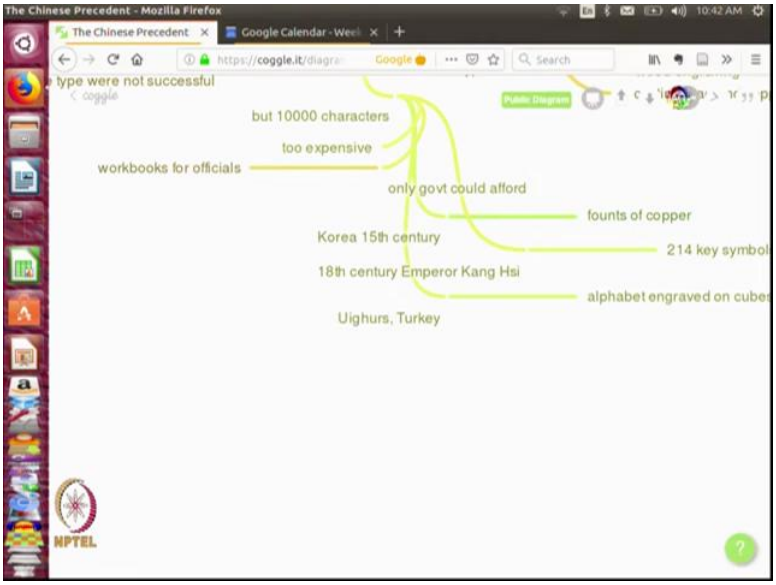

So it is something that only the government could afford. Similar kinds of techniques were also used in travel to Korea, in Turkey and other places but did not really take off because of this kind of, one was the reason was that because there were so many characters within the Chinese language. The second reason of course is historical. The point is that first millennia

China had a very different social context than 15th century Western Europe and the crucial difference is that of the changing of the mode of production.

That the coming of a new mode of production that is already coming into being even in the 15th century Western Europe and that is of capitalism, that the impetus given by the Chinese precedent is that which was through the government or through the Royal family. So it wasn't driven by mass demand. It was driven by a need of the communicator rather than the recipient.

We see in Western Europe that need for printing is really driven by the demand for books, not for the desire of communication but because of the demand for books. That people need more and more books, more and more manuscripts, need it at a faster rate, the market is growing and therefore manufacturers or the producers are trying to match up to that demand and therefore innovating and that results in the machine which is the printing press, that results in the kind of innovation that produces the printing press. But that market, that demand was not present within the Chinese domain, that social system was totally not available.

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And in my book that was the second reason and a very important reason why the Chinese did not innovate further in order to-- Today in 20th-century of course the Chinese press did function because even though the number of characters remain humongously high even within China but the demand had taken off. With greater demand the expense of producing the basic prototype, the movable types gets reduced.

So you have a certain economy of scale that is possible. That economy of scale was not possible with the first experience of Chinese printing even though the expertise may have been there. So this is very classic case of showing how technology really becomes a resultant of the kind of social relationship, the production process the economic processes that exist at a certain point of time.

So many a times we think that technology can be the answer to many of the world's ills or the problems of the nation we need to take that with a pinch of salt. We need to understand that what we really need sometimes may actually be a social innovation rather than a technological innovation. Technological innovation has to work hand-in-hand with social innovation.

Now before I complete today's lecture I want to discuss one more issue and that is the issue of patronage. We have already seen when the Chinese typesetting is happening that the patronage was really squarely coming from a certain feudal authority which is that of the royalty or the monarchy. Whereas in the case of Gutenberg we have seen that the patronage structure has undergone a certain change and even though Gutenberg did have the ideas and the desire to produce something that will speed up a machine that would speed up the printing process he did not have the necessary resources.

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And it is only the investment from one of the capitalist or a proto-capitalist that gives him the kind of funds that he needs to actually produce that innovation. So these are two different kinds of structures of patronage. One is that of endowment which is given primarily through

feudal processes and the second one is kind of a distribution of wealth which is in the form of a market.

Now with the change of historical processes and as well as technological processes, the way in which the creative artist actually survives and produces his or her art undergoes a sea change.

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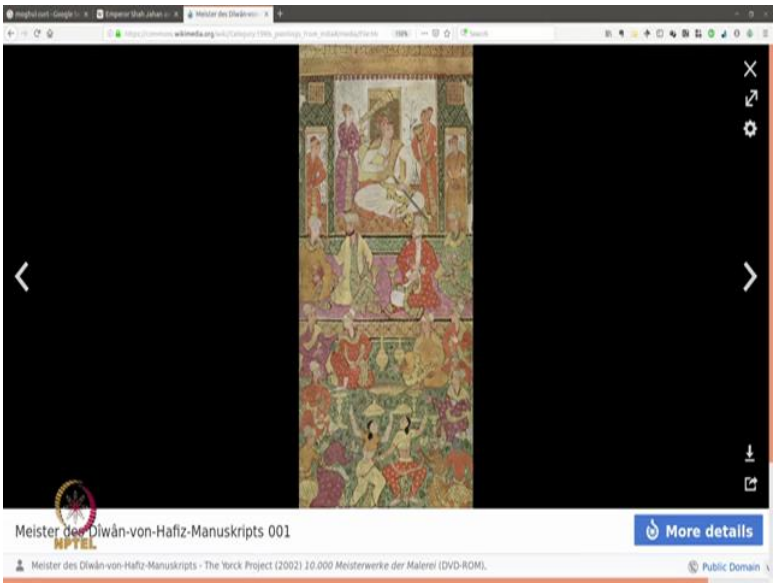

We do know that in feudal times there would be artists and writers who would be part of the courts of great kings of royalty. But other than those there would be other members of the aristocracy who would also have within their retinue, artists and singers, songwriters, bards and poets who would be part of their retinue who would also produce writing or texts, ideas which would be recording the times and certainly with the idea that it would add to the glory of that particular aristocrat or that particular king and what the king in turn does is guarantee a certain livelihood, a certain social status to the artist or the writer.

And this is usually done through a grant of land, that the king actually writes a Farmaan which grants a certain piece of land or maybe he is made an important, he is enabled to basically collect the taxes from that particular area. He may not actually be the direct owner of the land but he is someone who will get all the revenue that is earned generated. But the processes of the manufacturer, what is the revenue coming from? The revenue is really coming from agricultural processes and through the collection of rent.

So therefore the collection of the rent that happens within that land goes to this particular poet or the artist or the bard, the singer whom the Badshah or the Duke or the king has certified or

given a Farmaan to and they are able to then survive and within this kind of a structure therefore the poet is really tied to that authority and therefore they would be writing things which would actually praise their patron, they would be writing other things but certainly they would not be criticizing the patron in any specific way.

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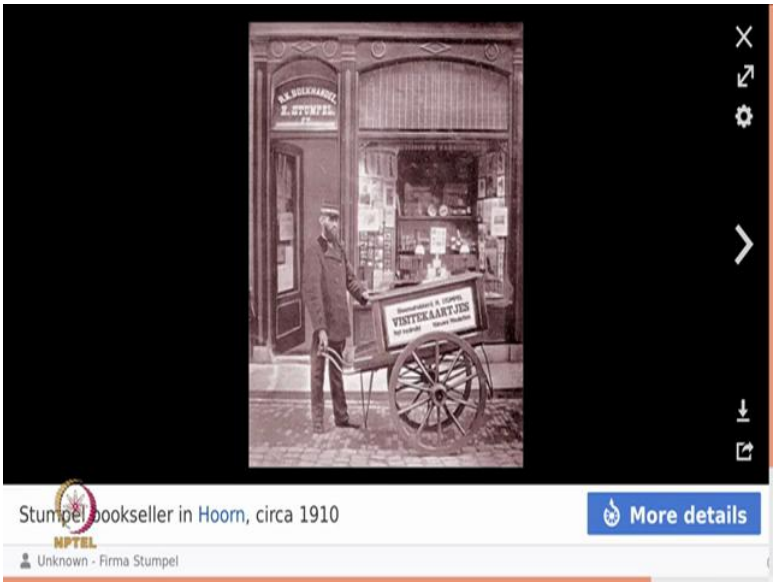

Whereas with the coming of the printing press, with the coming of the capitalist mode this undergoes a certain change where you have writers who were writing, they would write and then those texts would get to the printers. The printers would take that on and print it with the idea that once it gets printed, it goes into the market and people would buy it. Buy the book and a certain profit would be generated and the writer would be paid from that profit.

Sometimes the actual working may be very different. Sometimes the writer could actually be prepaid at the point of time when the printer is taking the manuscript from the writer. He pays off the writer straightaway and then after that whatever profit is generated may go to the printer. Except the arrangement is very different but it is only when there is an expectation of a certain profit of a certain amount of sales that the writer actually earns a certain amount of money. So therefore you have the idea of the bestsellers or someone who are popular writers and they really can make a great amount of money out of this kind of an exercise.

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Charles Dickens for example was someone who was very popular in his days and he would write novels. He wrote lots and lots of stories and novels and he was very popular and certainly the printers made a lot of money and he himself also earned a certain handsome amount. But it was not through the guarantee of a political authority, the money that was made, was made of the market. So therefore then writers will have to make sure that the way they write should cater to certain public tastes.

What people want to hear, what are the kind of popular troops, what are the kind of characters that work, certain kind of formula is something that they fall back upon in order to ensure that the book sells. So the two different patronage patterns, one that of the feudal royal patronage. The other that is the market itself, these two produce very different kinds of stories. These two produce different kinds of art and that is something that we need to understand that the market really comes about one is the printing press becomes important for the market to develop.

Two, the market is really something that we associate with the coming of capitalism and the printing press really is that machine which differentiates between these two worlds of organization when we are talking about the movement from feudalism to capitalism in the world of production and the world of social ideas we are also talking about this movement from a certain patronage structure, the way art is organized and funded undergoes a certain change through history and that has tremendous implications in the way art is created and received, thank you.