Great Experiments in Psychology
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Module 1
Lecture No 4
A New Psychology

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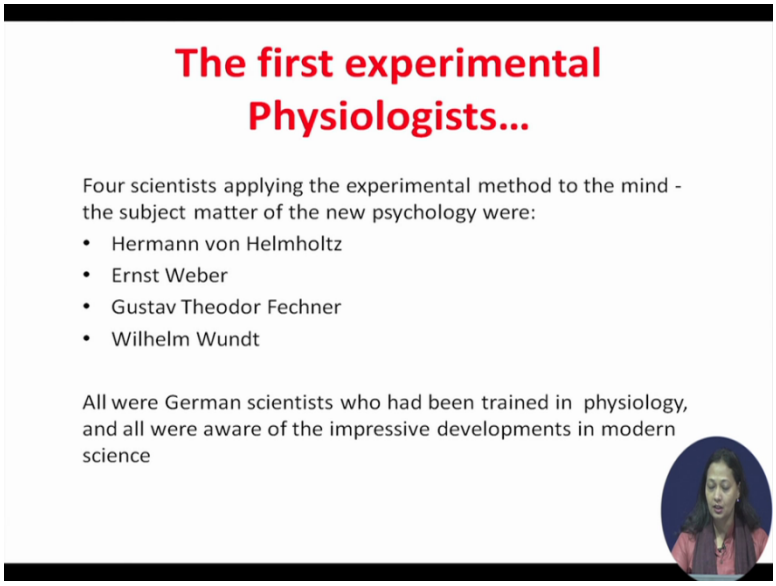

Hello everybody, welcome to this fourth lecture on the Great experiments in psychology. In the previous lectures so far we have discussed about the development of psychology from philosophy, physiology and physics and then we talked about the first experimental psychologists primarily the people who developed psychology without even knowing that they were doing it and we spoke about Helmholtz, Webber and Fechner though they were not really psychologists, they have really contributed to the development of the psychology as a science of its own.

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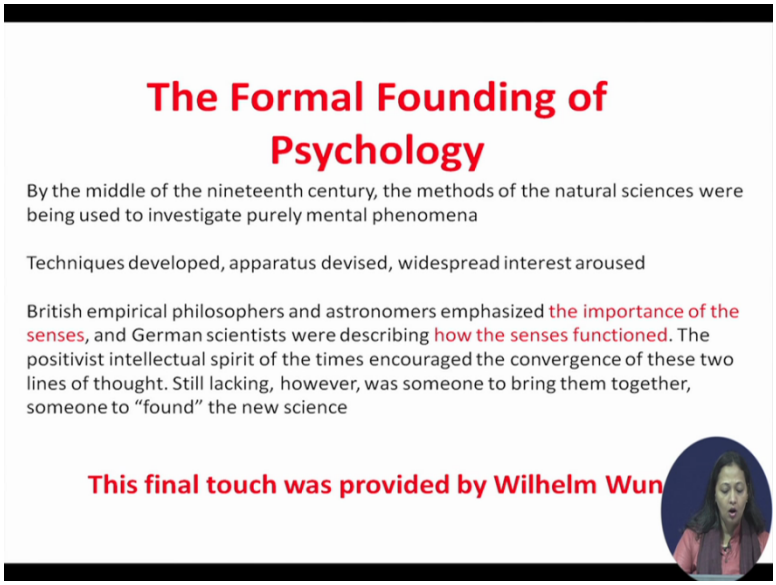

And today we are going to talk about Wilhelm Wundt the founding father who is known for his role in he has major contribution in the development of psychology and he is the first one who had developed psychology as a science in its own origin in its own discipline of its own. So and he is finally known as a former father of modern psychology and in this slide as you can see we discussed the slide in the previous session also where we spoke about development of the natural sciences in the 19th century especially in Germany and there were techniques developed, apparatus devised and widespread scientific interest aroused in psychology and there were two wings of science, one primarily trying to understand the importance of sciences and the other wing was trying to understand how the senses function

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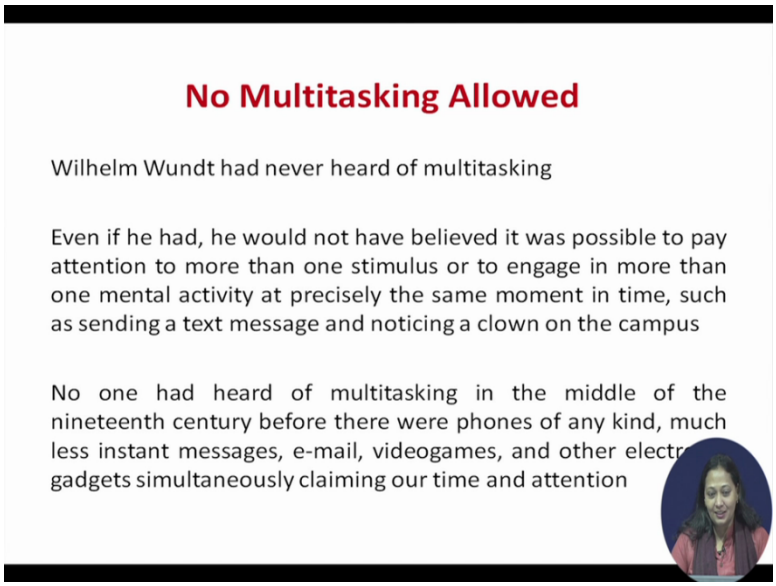

And this had created the platform for the new science of psychology and we actually need one individual to come forth and present it as a science to a modern world. And Wilhelm Wundt took this responsibility, so this brought about new psychology. Now Wilhelm Wundt was one of his major tasks was about multitasking and discussing about or thinking about multitasking. Wundt had never heard about the word multitasking and this is a wonderful anecdote which goes like this that even if he had, he would not have believed it was possible. Say think about Wundt days, we did not have a mobile phone where one could actually (()) (02:52) messages along with doing the task of driving at the same time.

So he did not he would not have believed at even at that time that it was possible to pay attention to more than one stimulus or to engage in more than one mental activity at precisely at the same moment in time. So this is something that we often come across in the universities and college situations and also while travelling on the road where people are trying to multitask talking on the phone or scribbling while travelling.

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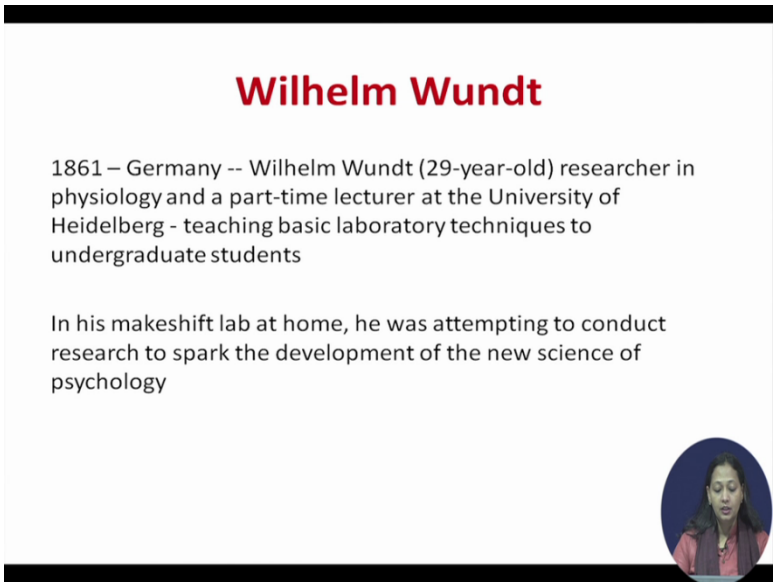

So at that point in time though multitasking was one area of research, it is a little surprising but this is the first thought that came to Wundt when he tried to analyse David Kinnebrook's performance. We will come to that so at that time Wundt started his research in physiology as a part time lecturer in the University of Heidelberg and he was teaching basic laboratory techniques to undergraduate students, but in his makeshift lab at home, he was attempting to conduct research to spark development of the new science of psychology.

Wundt came from a family of a lot of academicians, his father was a minister and he had a very unfortunate ill childhood, I will say that he was not an achiever during his childhood in fact, he had very poor interactions with people, but over time he overcame this and he had developed a considerable amount of interactions with people but his research that is why he was more focused on dealing with the mental processes.

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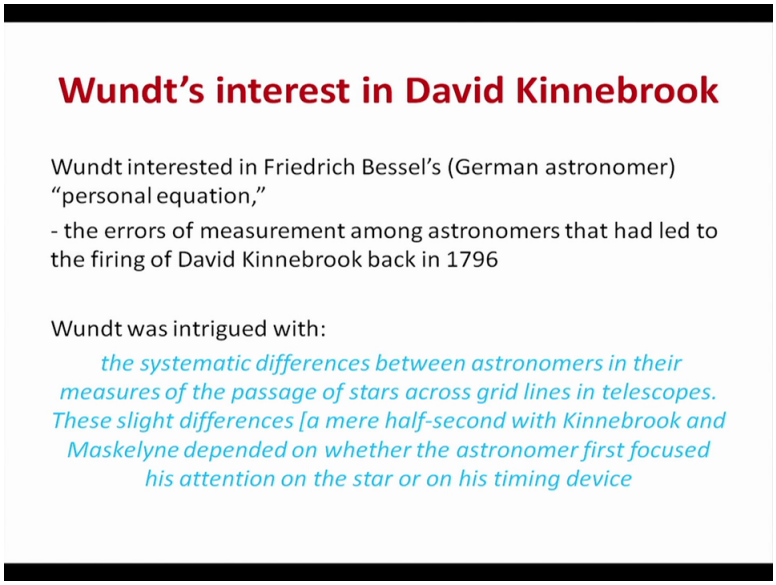

So he had a makeshift lab at home where he conducted most of his experiments and what interested Wundt primarily was a report on David Kinnebrook in way back in 1796. If you remember, we had spoken about David Kinnebrook, David Kinnebrook was a very famous astronomer in Maskelynes assistant in 1796 and he was fired from his job because he was he was reporting errors a tenth of a second on the movement of a star and Maskelyne who was really impressed with his performance a year back. Kinnebrook had served his superior for around a year and maskelyne found it really strange that in spite of being told Kinnebrook could not change these errors, correct these errors. So this performance changed in Kinnebrook and these errors that Maskelyne report about Kinnebrook really made Wundt wonder about the personal equation.

Friedrich Bessel had written about the personal equation and Wundt was intrigued that the systematic differences between astronomers in their measures of the passage of stars across grid lines in telescope, this actually there were differences between the astronomers and theses differences he found were see there was a mere half a second difference between Kinnerbrooks and maskelyne and this depended on whether the astronomer first focused his attention on the star or on his timing device.

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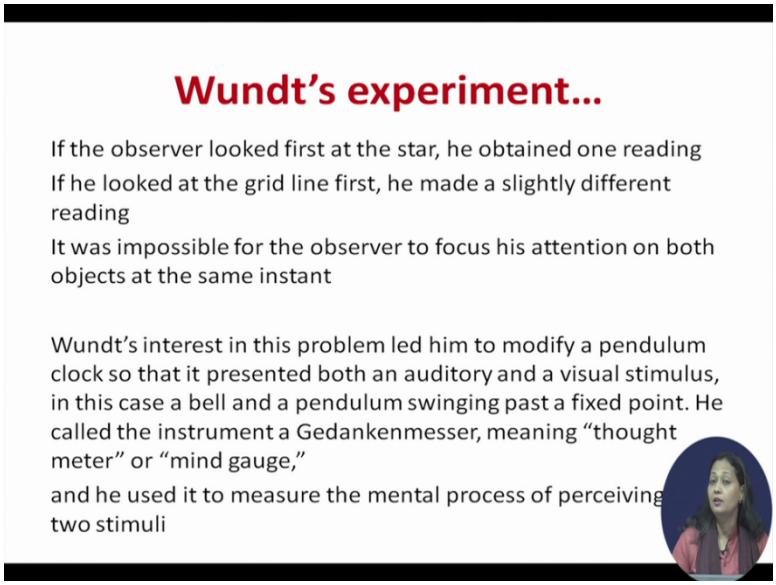

So Wundt felt that one cannot multitask, so if you are looking at the device instead of the star then you are losing a fraction of a second over then, so this so if the observer looked first at the star he obtained one reading, if he looked at the grid line first he made a slightly different reading and it was found out that it was impossible for the observer to focus his attention on both objects at the same instance. Now Wundt interest in this problem led him to modify a pendulum, pendulum clock that it represented both an auditory as well as a visual stimulus and in this case he had a bell and a pendulum swinging past a fixed point together, so it would go like this and he called this Gedankenmesser meaning thought meter or mind gauge and he used to measure the mental process of perceiving two stimuli together.

So you what are the two stimuli? One is the auditory stimulus the other is a visual stimulus and again it is a two stimulus moving together, so here he found out that it was impossible to perceive two things at the same moment. So, there is a bell that too is a visual stimulus, though it is also giving an auditory stimulation along with that the movement of the pendulum. It was impossible to look at the two stimuli together, one could either attempt to the sound of the bell or to the sight of the pendulum passing a specific point.

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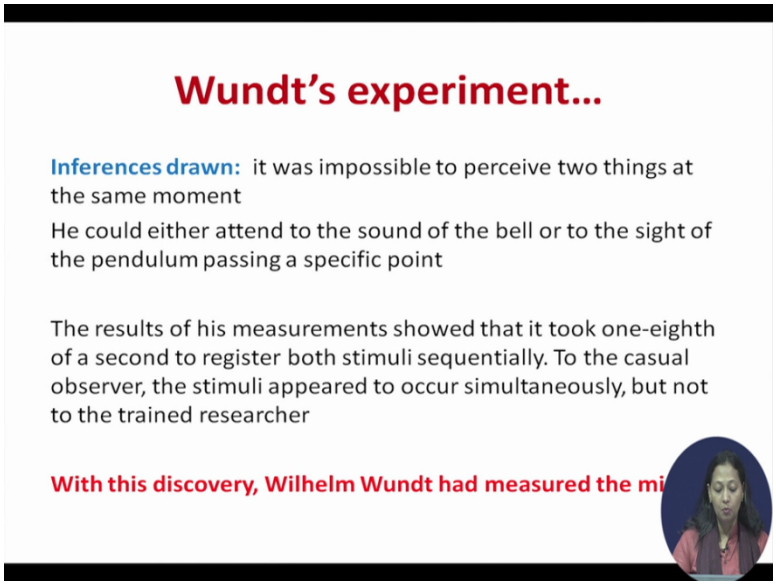

The results of his measurements showed that it that it took one eight of a second to register both the stimuli sequentially. To the casual observer the stimuli appear to occur simultaneously but not to the trained researcher. So Wundt in his own way found out a way to measure the mind as you can see that it was seen that there was a subsequence or for the stimuli for the responses to happen, so they did not happen together. So when you are either you respond to the auditory stimulus first and then the visual stimulus or to the visual stimulus first and then to the auditory stimulus, but one cannot do the two tasks together but and he also found the quantitative difference between the two responses, so what was the being even that being simultaneous he found out the difference in time.

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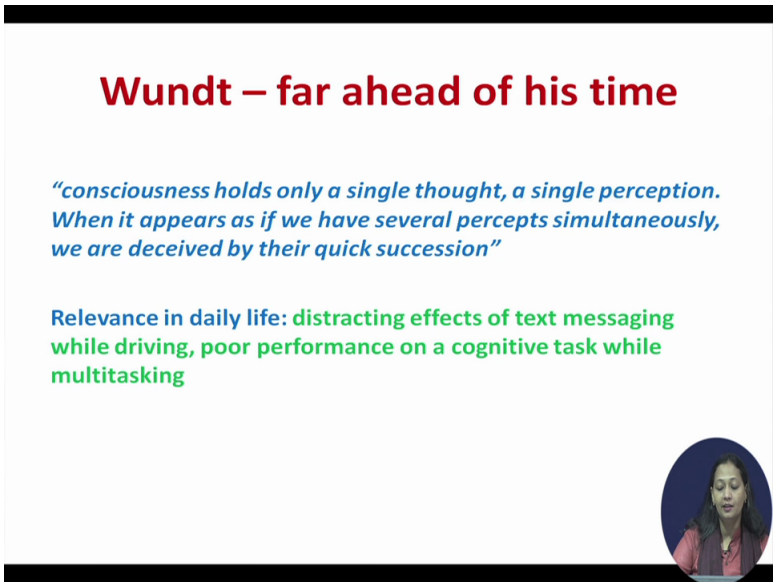

So this was the first measurement of the mind. Wundt was far ahead of his time, he said that consciousness holds only a single thought and a single perception. When it appears as if we have several percepts simultaneously, we are deceived by their quick succession. In fact, this is very true, imagine you yourself listening to the sound of singing a song while biking down the road, it seems that you can easily do the task together, but say if you had an obstruction on the road and you had to stop your vehicle, then you will see that the song that you were singing had stopped

Or say if you are counting while walking, so there are two tasks and we can always argue that I am doing both of them together, but one is primarily automated, so you are actually following the other and most of the times one is subsequently followed by the other, they are not done simultaneously, you cannot focus on two things simultaneously. So if it is especially if the stimulus is tapping the same sense organ, so it is not possible to follow two things simultaneously on the same sense organ also.

So what happens is we actually follow one the other becomes an automated response, but nevertheless if this as I mentioned that if there is a say on the other hand, ifthere is an obstruction on the road the road, the song stops. On the other hand if there is a complicated note if I ask you suddenly what is a meaning of the song, then the driving or the biking will stop to focus on the meaning, may be you can topple down from your bicycle.

So these are so Wundt thoughts or Wundt ideas are yet still very relevant in our daily life and we see that there is generally a poor performance on a cognitive task while we are multitasking. So with we will discuss about Wundt's thoughts on psychology, but primarily first we come to this point where Wundt was considered the father of modern psychology and why was he done, so primarily because he was the first one to declare psychology as a formal academic discipline.

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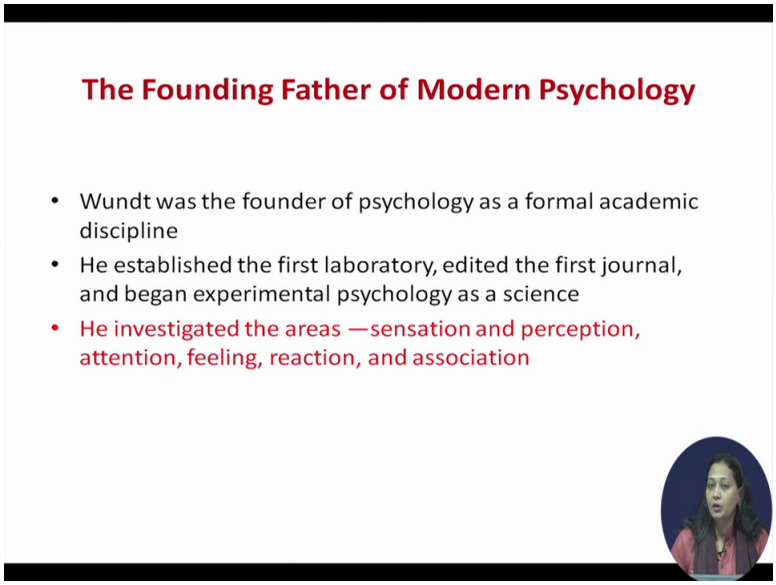

Mind you before this Helmholtz, Webber, Fechner they had their own areas of research and these researches had actually contributed to psychology on the whole but they were not psychologists, they did not declare themselves as psychologists nor did they wish to establish psychology as a discipline of its own, and not only that they did not have laboratories dedicated to the science of psychology.

Wundt was a first one to establish the laboratory in the University of Leipzig and he edited the first journal and he began experimental psychology as a science. So the areas that he investigated are sensation and perception, attention, feeling, reaction and association. We will see how he went about that, so that brings us to the question that why have the honours for finding the new psychology fallen to Wundt and not Fechner.

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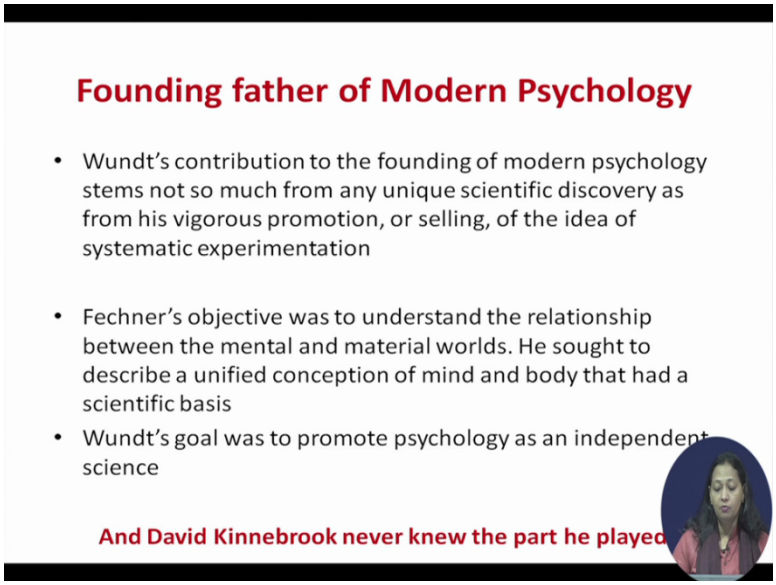

We did discuss about Fechner's role in psychology and he founded the science of psychophysics, the discipline of psychophysics, where we understand that mental phenomenon can be studied and mental phenomenon actually is it is not the direct, it does not have a direct one to one relationship with the physiological with a physical phenomenon, but definitely there is a relationship between the two and that can be quantitatively measured. Now Wundt's contribution but yet Fechner is not called the father of modern psychology and Wundt is. Wundt's contribution to the founding of the modern psychology stems not from the unique scientific discovery as from his vigorous promotion or selling of the idea of systematic experimentation in psychology.

Fechner's objective was to understand the relationship between the mental and the material worlds; we have studied the mind-body relationship as discussed by Fechner. He sought to describe a unified conception of mind and body that had a scientific basis, but Wundt's goal was to promote psychology as an independent science as we have discussed earlier. Hence strangely David Kinnebrook who started it all way back in 1796 had no clue whatsoever that Wundt was going to use his error in astronomical findings as the root cause for the development of a new science of psychology.

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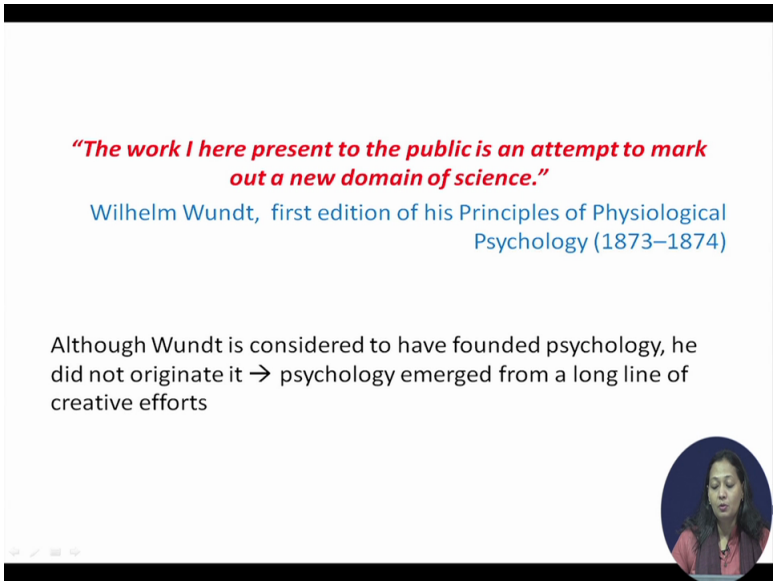

According to Wundt, the work I here present to the public is an attempt to mark out a new domain of science, and this is where what he wrote in the first edition principles of physiological psychology. We must of course remember that though we been calling Wundt the father of modern psychology, he is not the founding father of psychology as a whole.

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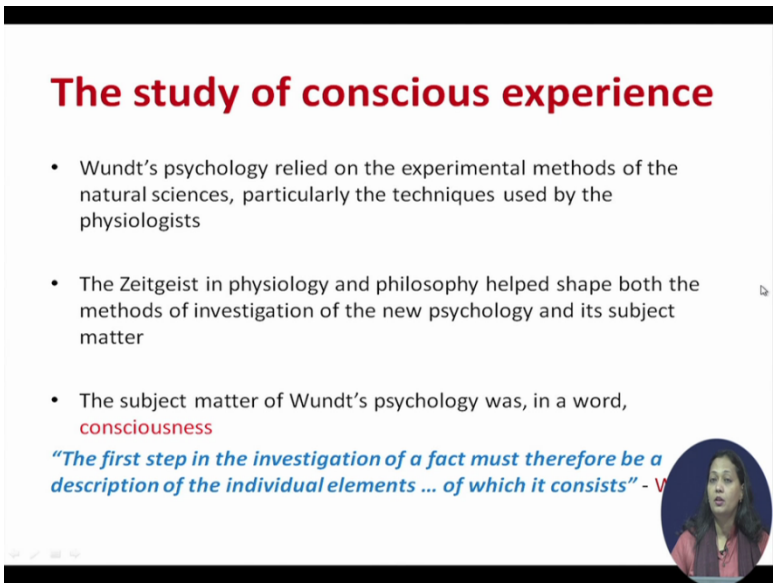

Psychology emerged from a long line of creative efforts and as we have studied in the first class that psychology had its beginning centuries ago, but here we are talking about modern psychology and that is where we must acknowledge Wundt's contributions. So Wundt's primary area of study was conscience experience what does Wundt's have to say for that, it relied Wundt's psychology relied on experimental methods of the natural sciences and

especially at that time in Germany as you can well understand Wundt himself was also a physiologists, so he was trying to understand the techniques used particularly by the physiologists.

And there was a movement in the science of physiology and philosophy and both these investigations helped structured the science and its subject matters, so that is psychology. And so you will see that most of the areas or the domains studied by Wundt were areas that were also studied by physiology as a subject, so subject and the Wundt study of consciousness emerged from the study of consciousness or the study of the processes of the mind in physiology. So he believed that we must understand the individual elements so the first step in the investigation of a fact was therefore be a description of the individual elements of which it consists, so Wilhelm Wundt believed that when you want to study a mental process you have to break it down to its minimal core elements unless you understand the elements you will not be able to understand the mental process.

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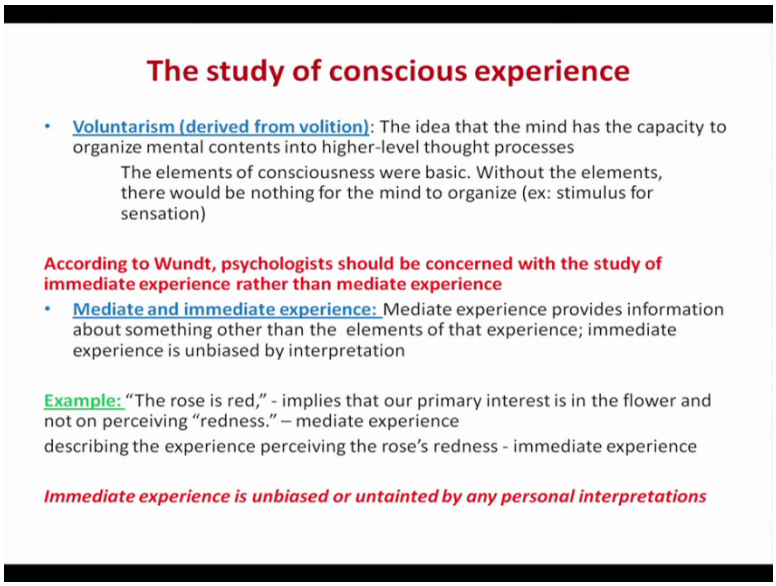

Now if you can see the influence of physiology so we were talking of time where people were trying to understand how the sense organs work and now they function. Soh he developed an idea call voluntarism, so voluntarism came from the thought came from the idea of volition or action. So it is the idea that the mind has a capacity to organise mental contents into higher level thought processes. The elements of consciousness were basic, so without the elements there would be nothing for the mind to organise, so that is safer sensation we would require a stimulus. So without understanding the stimulus and its

properties and the process of sensation we would not be able to understand the sensation itself.

So according to Wundt, psychologists should be concerned with the study of the immediate experience rather than the mediate experience. Now what does it mean by mediate and immediate experience? Mediate experience provides information about something other than the elements of that experience, so while immediate experience is unbiased by the interpretation. So say if I show you a rose and you say that the rose is red, it implies an interest in the flower and not of perceiving the redness, so that is a mediate experience, so the rose is red is an idea that is already persisting in your mind and that is what he said that a mediate experience.

Immediate experience would be, you are talking about the redness or you are experiencing what you are experiencing currently. So that he said that it describing the experience perceiving the rose is redness would be the immediate experience. An immediate experience is unbiased or untainted by any personal interpretation. So what exactly does he mean by this that if when we are talking of mediate experiences and not immediate experience, immediate experience mind you is what you are going through right now?

Mediate experience as Wundt pointed out was something that has shaped your ideas about something so that has shaped your perception about something, so it would definitely be tainted by individual differences or I should not use the word individual differences, it would be definitely tainted by your one's own previous experiences or own perceptions. So he said that psychologists should be more concerned about the immediate experience, so what an individual is going through currently rather than you know what he has experienced earlier. And h he speaks of so Wundt outline the goal of psychology specially his goals as follows.

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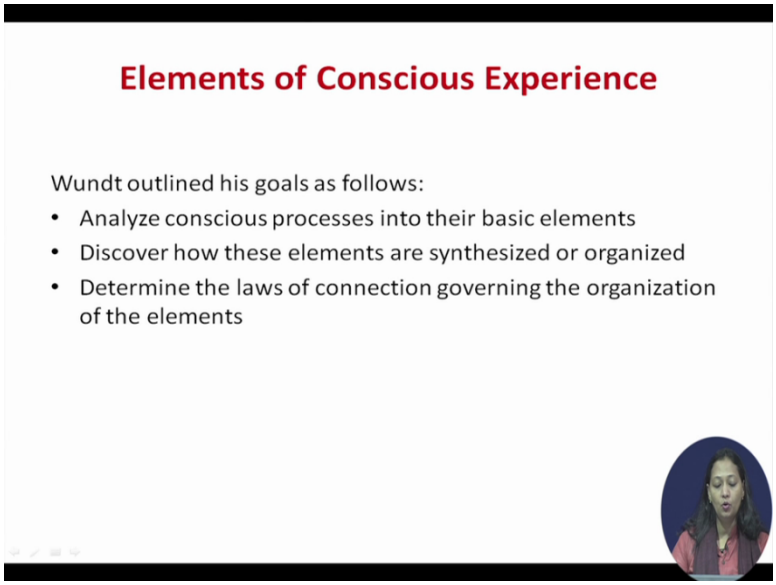

So he said, we must analyse conscience processes into their basic elements, discover how these elements are synthesised or organised, so how they work with each other. So first you separate the elements and then you see how they work with each other and determine the laws of connection governing the organisation of elements. So how do they add on with each-other and contribute to the development of this sensation, so first we identify the elements that are responsible for say a visual sensation, so here the primary elements of seen red rose would be its coloured would be so that would be the redness of the rose, the texture, the light properties, so all these individual elements he said how do they relate to each-other and how were they associated also and how does that give us the perception of a red rose.

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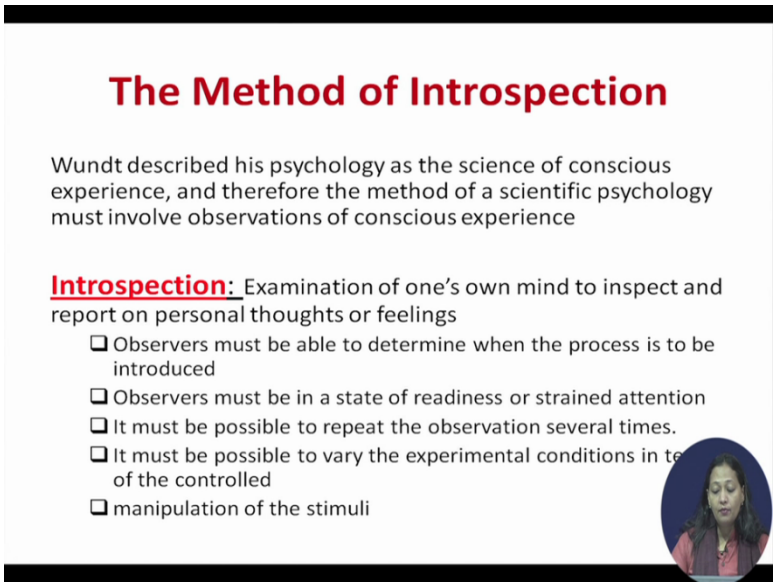

So here to understand conscience experience or the immediate experience, Wundt said we need to require the use of introspection or the method of introspection and Wundt therefore used he had a few laws to understand principles to study introspection and introspection what does it mean? It is examination of one's own mind to inspect and report on personal thoughts and feelings.

So how an individual do that? so he followed very stringent rules in his labs and his students had to undergo huge number of introspection to on various to explore the conscience processes so and he was very strict about those laws that one needs to follow during introspection, so here he says that observers must be able to determine when the processes to be introduced, so when the stimulus is given to you and observers must be in a state of readiness or strained attention, so you should be attentive. It must be possible to repeat the observation several times, so that the introspection can be followed again with the presentation of stimulus and it must be possible to vary the experiment conditions in terms of the controlled manipulation sorry about that controlled manipulation of the stimuli.

So you can actually you see that you can actually verify the vary the experimental condition, change the redness of the flower or change the size of the flower in this case, so or say if you are touching rough surface or you are touching a hot surface, so make it a little warmer than before making at a little older than before and writing about the experience. So here when again when Wundt is speaking about introspection or the report subjective experience, where the experience which the individual undergoes and writing about the immediate experience, he would he followed stringent experimental conditions. So you see when Wundt was calling psychology an experimental science, he was very serious about it. So it is not that h you call it a science and you follow without following any laboratory conditions.

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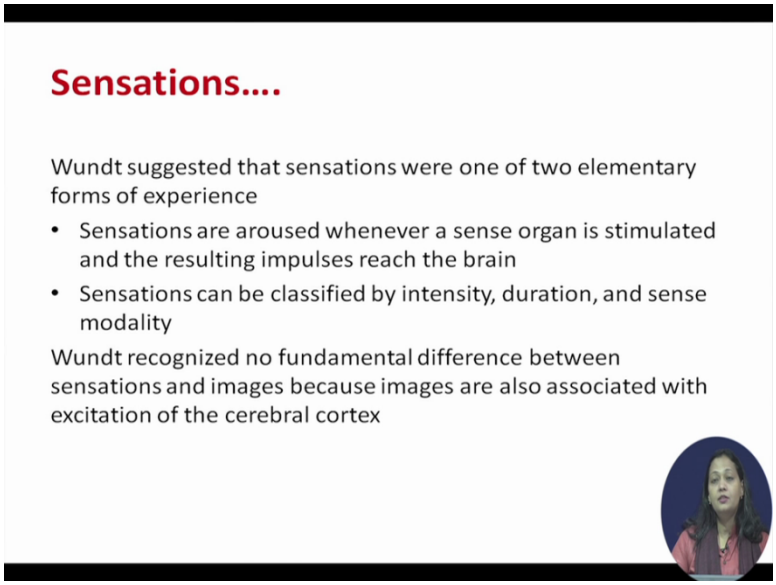

So he was trying to make his experiments more controlled and he was also trying to introduce an independent variable whose value could be manipulated. So changing the type and the quantity of the stimuli or the intensity of the stimuli, so when Wundt spoke of sensation, he suggested that sensations were one of two of elementary forms of experience. Sensations are aroused whenever a sense organ is stimulated and the resultant impulses reach the brain. So mind you he is a physiologist, he is talking about sensations and so obviously he will talk about sensations from a physiological angle and he is talking about breaking it into elements.

So see he is talking about the sense organ and how the sensation how is a sensation created, so whenever the stimulus is sending impulses to the brain. Stimulus arouses sense organ and that sends an impulse to the brain and these sensations can be classified so the resultant being the sensation so that is the understanding of the stimulus by the individual after it crosses a certain threshold and he says that these sensations can differ from each-other in intensity, duration and sense modality. So obviously when we are talking about different sensations so it could be because of the radiation of the modality also. So different sensations could mean that it is in the same modality, so it is a visual sensation, it is an auditory sensation say with different intensity, different frequencies so if one is a shriek note, one is a more base note.

So on the other hand, it could differ in duration so a note being presented for a long time and for a lesser time it could be one which is louder and which is more soft, so it could vary in intensity and of course it could vary in modality. So you have an auditory sensation as well as or a visual sensation or a tactile sensation. So there the codes stimulus the stimulus is actually

arousing a different sense organ. So now Wundt see just think about this, Wundt was taking about this in the 1870s and here even in the 21st century we that is how we try and experience sensations and various studies several other researchers have culminated from it and we have seen there are changes in that have come about with the progress of science, with progress of Neuroscience and Neuroscience emerging as a discipline of its own right

But we these things were fundamentally started way back by the psychologists of that day and these psychologists have actually brought in the science of psychology, so when so it has an experimental science they have tried to verify it express it as an experimental science. So Wundt recognised that there was no fundamental differences between sensations and images because images are also seen associated with the excitation of the cerebral cortex.

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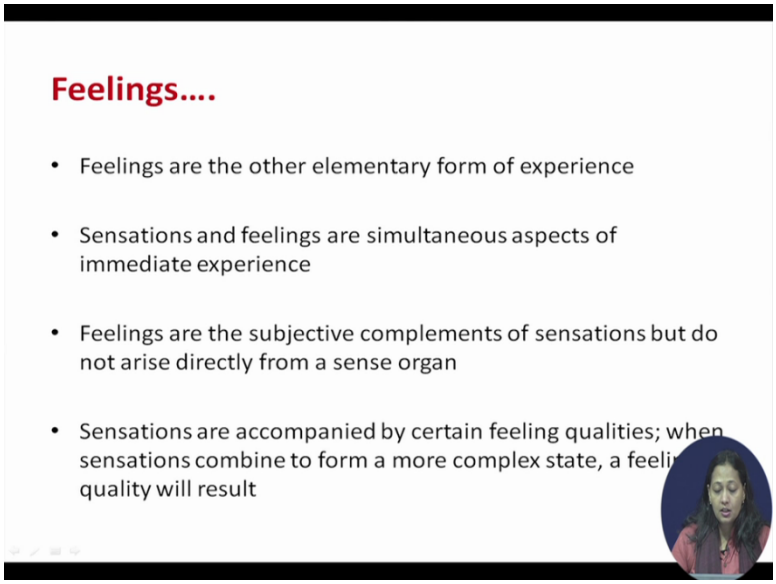

We will see later that this theory is refuted and we there are people who are also studying images and especially when we talk of Galton later, who had theories developed through for the study of mental imagery. So Wundt also spoke about feelings and he says that feelings are another elementary form of experience sensations and feelings are simultaneous aspects of immediate experience, so when we are reporting an immediate experience, we are actually trying to express our feelings about it so it could be pleasant or unpleasant or also and also about the different elements in the sensory process.

So feelings are subjective compliments of sensations but do not arise from a sense organ so this is what Wundt thought ad sensation are accompanied by certain feeling qualities, so as when sensations combine to form a more complex state, a feeling quality will result. So he

said that if it is a very shriek note say, if it is a very shriek high pitch high pitch note which carries on for a long duration, so this is an auditory sensation there it could also arouse a feeling component in the individual who is going through that immediate experience. So that is what he says when he talks about sensations being accompanied by a certain feeling qualities

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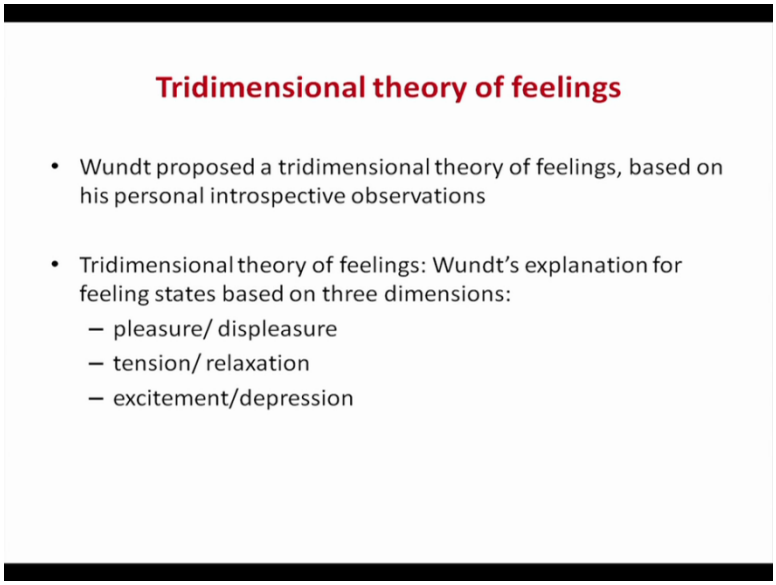

And he spoke about a tri-dimensional theory of feeling where he spoke about pleasure and displeasure, tension and relaxation and excitement and depression.

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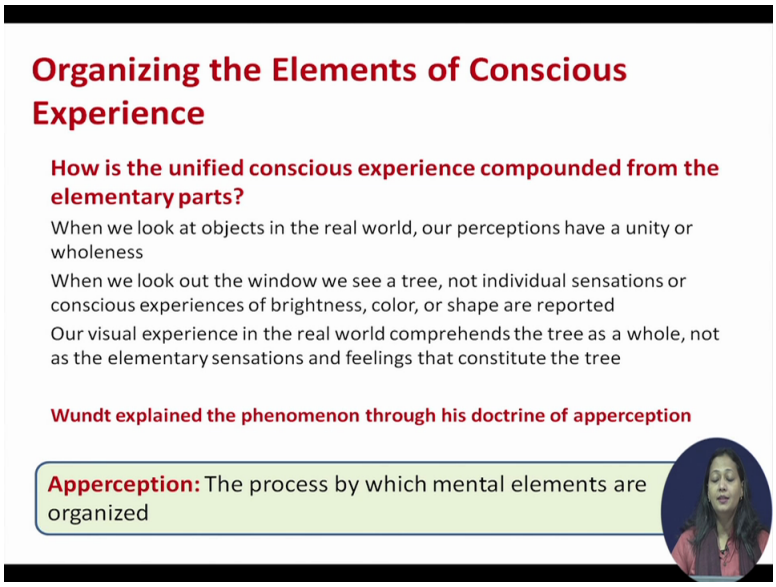

Andh here he again Wundt spoke about organising the elements of conscience experience and this is where a very important topic that was later taken up by personologist came up out and he spoke about apperception. Apperception is the process by which mental elements are organised, so Wundt said that it is a unified conscious experience that we talk about. We do not talk about an experience an immediate experience in elementary parts. For example, when we look at an objects in the real world our perceptions have a wholeness so we do not say we do not speak about individual sensations about say if you are looking at a tree, we do not talk about the greenness of the leaves, the brownness of the wood or the trunk and lightness of the breeze, but we generally report our visual experience as a whole.

So you either talking about imaginary scene where you talk about the tree and where there is a bright tree with the different constituents of the tree and how you feel about it. So it could be a many times we say it is a bright tree which and I feel pleasant looking at it. So you actually you talk about the sensations and feelings as a whole, but we do not put it in elements though see Wundt realised that even though he is trying to break it into elements, the report that an individual the reporting of an individual generally is an apperception of the mask.

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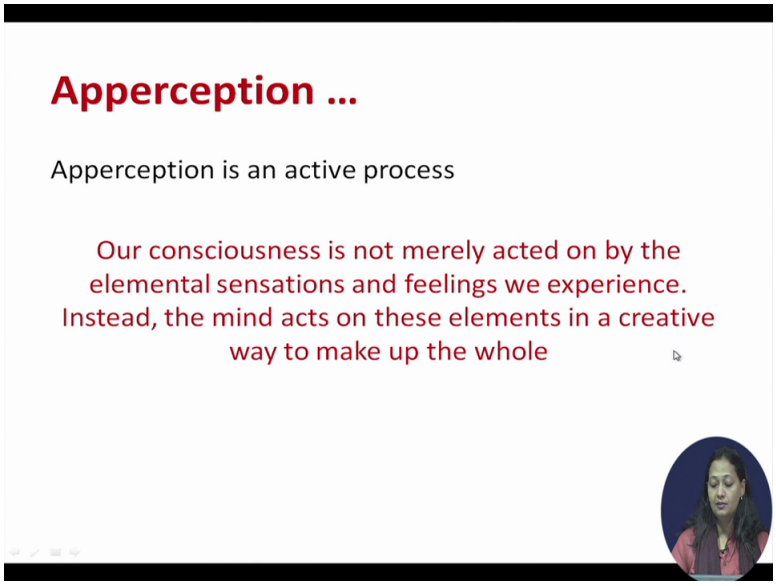

Now this apperception this idea of apperception was laid to taken up by personologists when they develop new theories and we of course know about the thematic apperception test which came up later by Madeline, h so it is apperception is an active process and our consciousness is not merely acted on by the elemental sensations and feelings we experience instead the mind acts on these elements in a creative way to make it up as a whole, so this concept of

whole was also taken up by another group of psychologists later and they were primarily the (())(31:44) again.

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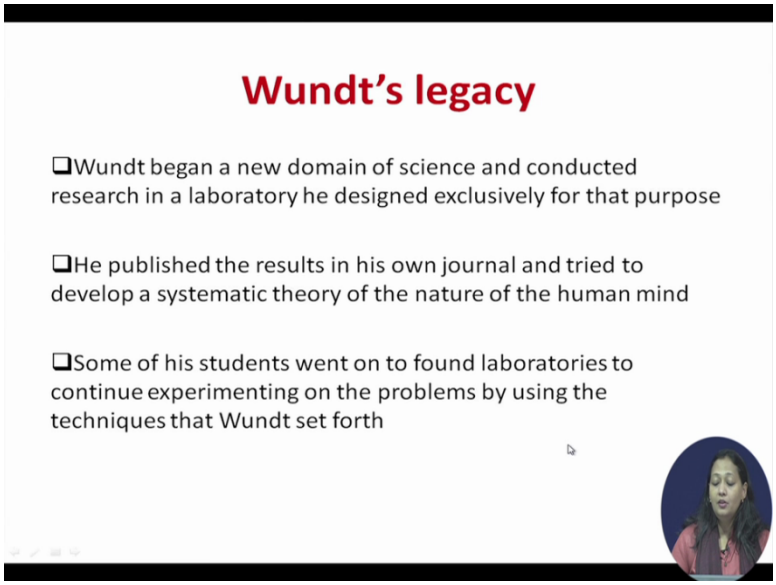

They spoke about seeing things perceiving things as a whole, so Wundt's theories were very interestingly the beginnings of a different areas or different paths of psychology and now talking about Wundt's legacy we see that he began a new domain of science and conducted research in laboratory, designed exclusively to understand psychology. This is very important and he had been repeating this time and again but this is very important to explain or to setup a science had in its own right.

He published the results in his own journal and tried to develop a systematic theory of the nature of the human mind and some of his students went on to found laboratories and continue experimenting on the problems by using techniques that Wundt set forth and one of his most famous students we know wash Titchener we will talk about Titchener in our next class, so we see that around this time there were other developments in England and in America, so at this time in England Darwin had proposed the theory of evolution, Galton began work on psychology of individual differences and these ideas influenced the another direction of psychology.

And in United States, some of Wundt's students especially Titchener who travelled back , he was an Englishmen who went back to England and since England was not at a state to accept his views so he travelled to America where he settled in Cornell university and he was trying

to explore his new science of psychology. He believed that it was all of Wundt's principles that he was trying to propagate and he developed some of his theories on his own.

So h this was how Wundt had created in the science of psychology and he had helped it to be propagated as a systematic establishes experimental science in different parts of the worlds. Though Wundt's ideas were not h taken up by most and later on there were new developments in psychology, but as we know for any science a new research comes up refuting the previous one or even developing something through it, but it in no way delineate or what should I say degrades or degenerates the contributions of the previous explorers in that area. And in this case I will say Wilhelm Wundt's contribution to development of psychology is immense and we will never forget his contribution and so in the next class we will talk about his students Titchener and of course the development by Galton as well as Darwin, Thank you.