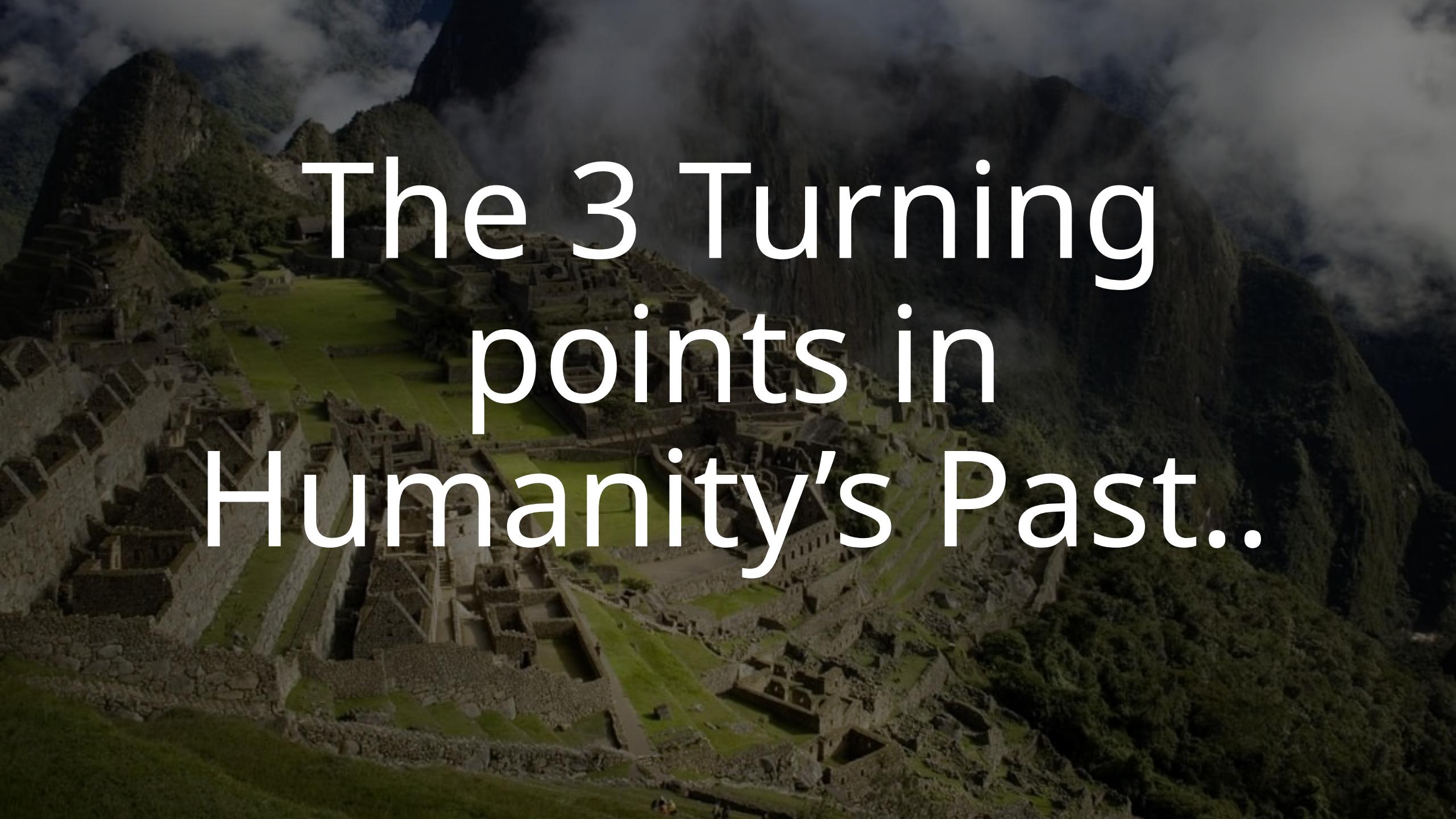




BIOGRAPHY OF DR. HOMI J. BHABHA

Biography Presentation
Indian Tradition, Culture and
Heritage
PA10. Krishnaraj Thadesar

Lets start with why learn about him in the first place, and lets start from the beginning...

A dramatic aerial photograph of the ancient Incan city of Machu Picchu, perched high in the Andes mountains. The city's intricate stone architecture and terraced agricultural fields are visible against a backdrop of dark, misty peaks under a cloudy sky.

The 3 Turning
points in
Humanity's Past..

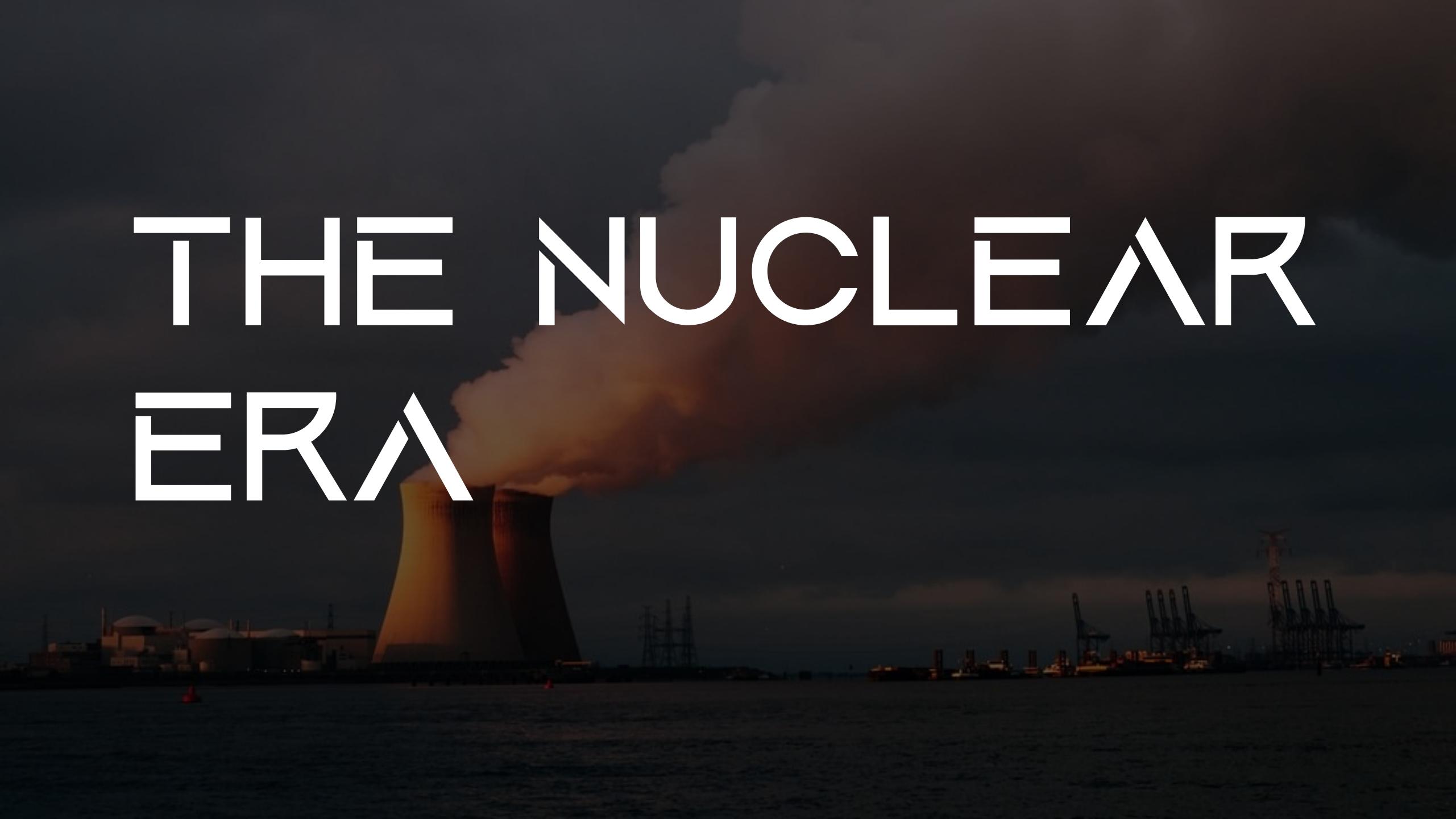


The Beginning of
Civilization



THE INDUSTRIAL ERA

THE NUCLEAR ERA

A photograph of a nuclear power plant at sunset or dusk. The sky is dark, and the setting sun is visible behind the cooling towers, casting a warm glow. Two large cooling towers are prominent in the foreground, with thick plumes of white steam rising into the air. In the background, there are more industrial structures, power lines, and what appears to be a port area with shipping containers and cranes across a body of water.

Dr. Homi j Bhabha is the Father of the Indian Nuclear Programme

Bhabha was also the founding director of the Atomic Energy Establishment, Trombay (AEET) which is now named the Bhabha Atomic Research Centre in his honour. TIFR and AEET were the cornerstone of Indian development of nuclear weapons which Bhabha also supervised as director.

A black and white photograph of a rural landscape. In the foreground, there's a weathered wooden fence post on the right and some utility poles with wires on the left. A dirt road or track runs diagonally across the frame from the bottom left towards the horizon. The background shows a flat, open field with sparse, dry vegetation under a clear sky.

Early Life

Family Background

- Homi Jehangir Bhabha was born in Bombay on October 30, 1909 to Jehangir and Meherbai Bhabha. After marriage, the couple moved to Bombay, the first commercial city of British India where young Bhabha spent his childhood.



Connection to the Tatas

- Homi's paternal aunt, also Meherbai, was married to Dorab Tata, the elder son of the pioneer of Indian industry, Jamsetji Nusserwanji Tata. Here, at the Tatas' ancestral home, the commercial world of his industrialist uncle revealed itself to the young Homi.

But he also observed the deep bonds that the Tatas had forged with institutions of learning notably the Indian Institute of Science, Bangalore, of which, Sir Dorab had taken charge of, following the death of Jamsetji Tata.

Education

- Homi had his schooling at the Cathedral and John Connon School, Bombay, which, he would observe years later, did much to foster his love for science.

14th October, 1955.

My dear Hammond,

Thank you for your letter of September 11, 1955, and your congratulations. The Cathedral High School did much to foster a love for science in me. One's school years are often the most formative ones and I remember enjoying my school days very much.

It was nice to hear from you again after such a long time. I hope you are well and are enjoying your retirement.

With my best wishes,

Yours sincerely,

Homi J.B.
(H.J. Bhabha)



University and Love for Physics

- Bhabha enrolled for Mechanical Tripos in Cambridge since his father and his uncle, Sir Dorab wanted him to become an engineer and join the Tata Industries.

At Cambridge, Homi's interests soon shifted to theoretical physics and mathematics. He described this passion in a letter to his father in 1928:

His letter to his Father

“I seriously say to you that business or a job as an engineer is not the thing for me. It is totally foreign to my nature and radically opposed to my temperament and opinions. Physics is my line. I know I shall do great things here. For, each man can do best and excel in only that thing of which he is passionately fond, in which he believes, as I do, that he has the ability to do it, that he is in fact born and destined to do it... Besides India is not a land where science cannot be carried on.”

"I am burning with a desire to do physics. I will and must do it sometime. It is my only ambition. I have no desire to be a 'successful' man or the head of a big firm. There are intelligent people who like that and let them do it... It is no use saying to Beethoven, 'You must be a scientist, for it is a great thing' when he did not care two hoots for science; or to Socrates, 'Be an engineer: it is the work of an intelligent man.' It is not in the nature of things. I therefore earnestly implore you to let me do physics."



Scientific Discoveries

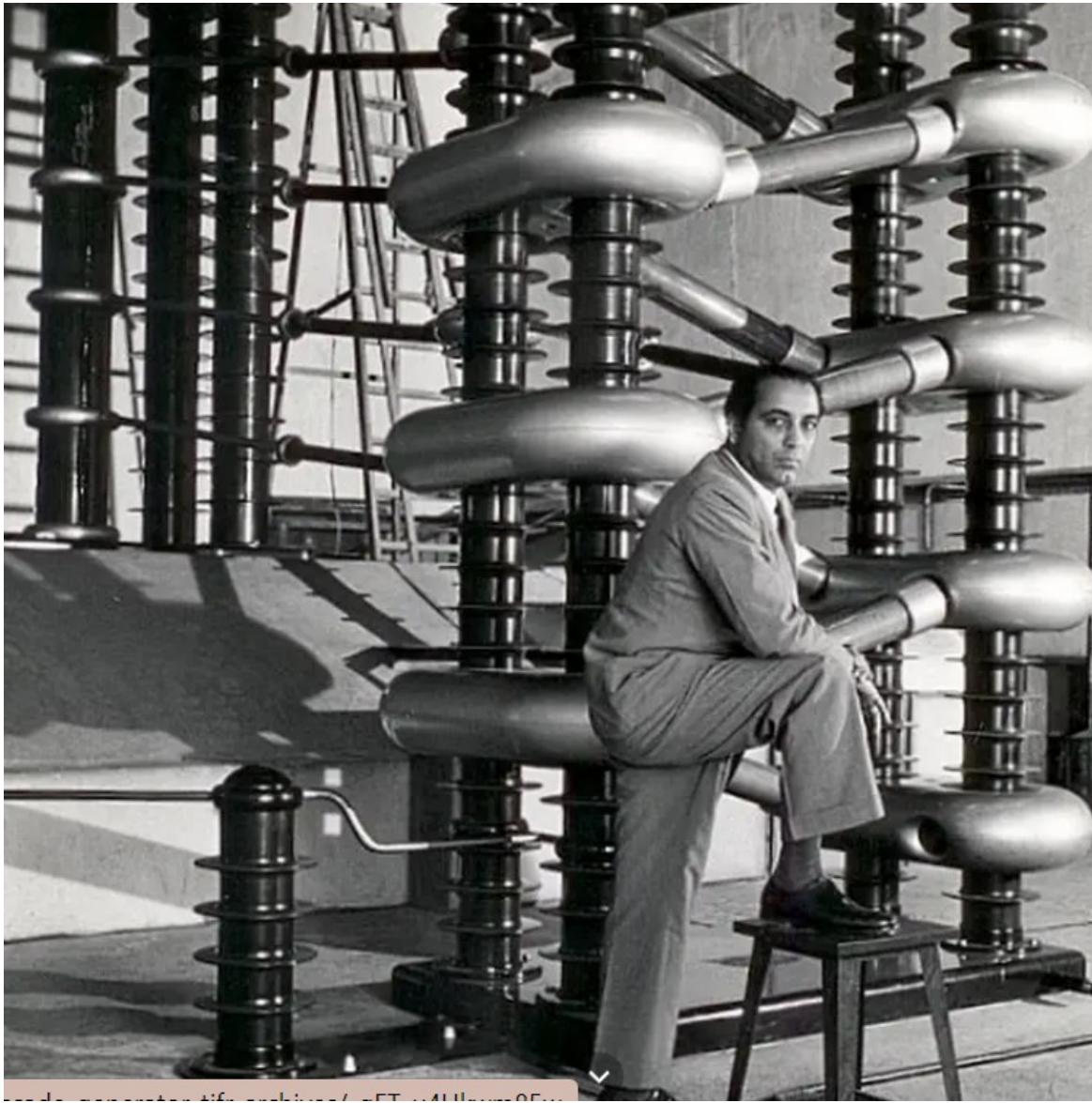
- Bhabha was the first to do a proper quantum theoretic calculation of the process of electron-positron annihilation and creation – one of the basic processes in quantum electro dynamics using Dirac's theory. This process, known as the Bhabha Scattering, is even today used as a luminosity monitor in electron-positron collider physics experiments.
- Jointly with the German scientist W. Heitler, then at Cambridge, Bhabha explained the cosmic-ray shower formation in a paper published in 1937.
- It had been discovered by 1918 that there is a strong level of radiation in the upper atmosphere. Robert Millikan, who was the first to identify that the origin of the radiation was from outside the Earth, called it cosmic radiation.

Predicting a new *Particle*

To explain the penetrating component, Bhabha made the far-reaching hypothesis that there must exist a new particle with the same characteristics as the electron but approximately 100 times heavier.

This was an original deduction and Bhabha's prediction was soon corroborated by the discovery of Neddermeyer and Anderson. These particles were then given the name "meson".

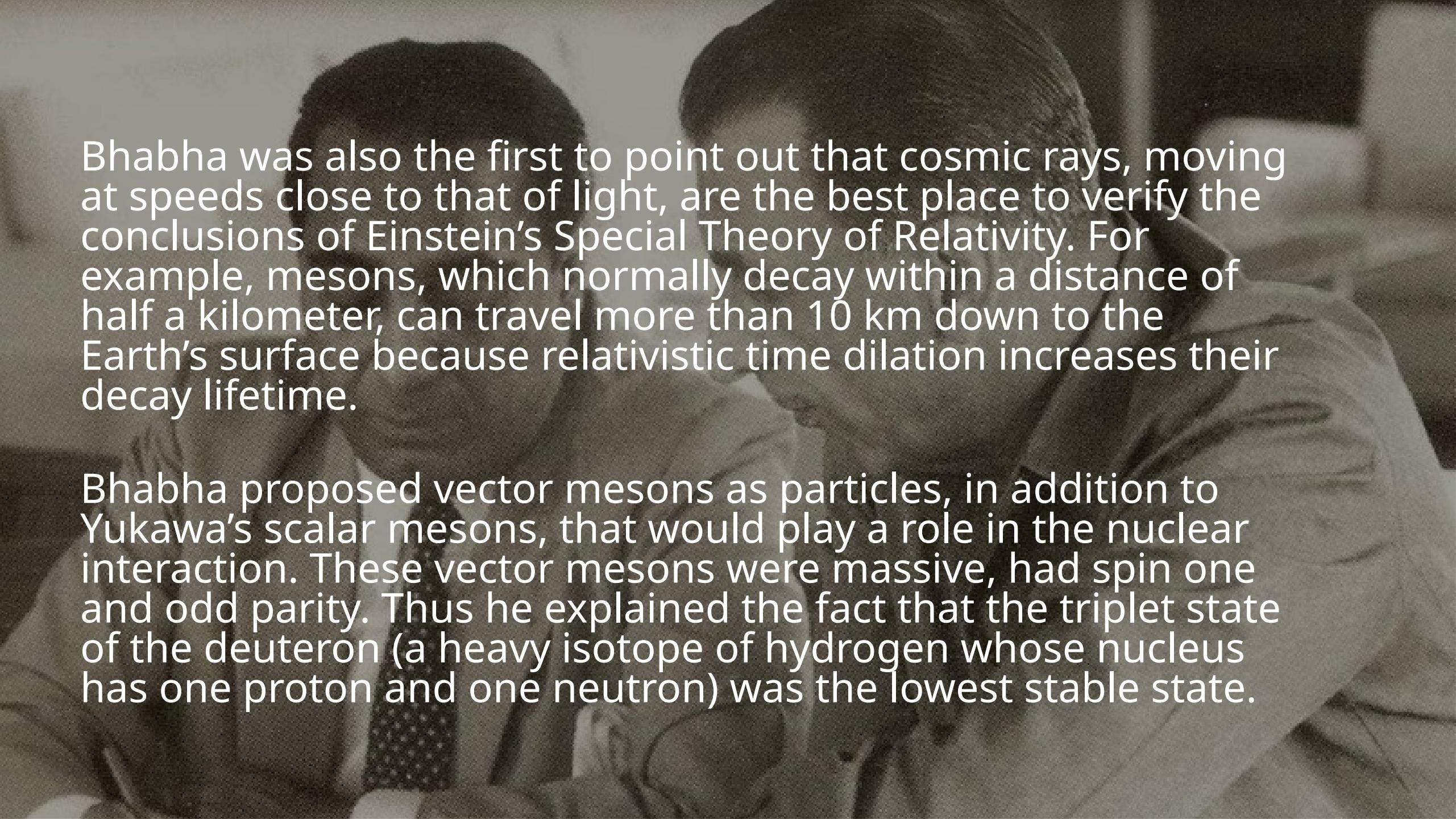
Today this particle is called the 'muon'. It is approximately 200 times heavier than the electron.



16' 0" x 40' 0" x 41' 0" 05"

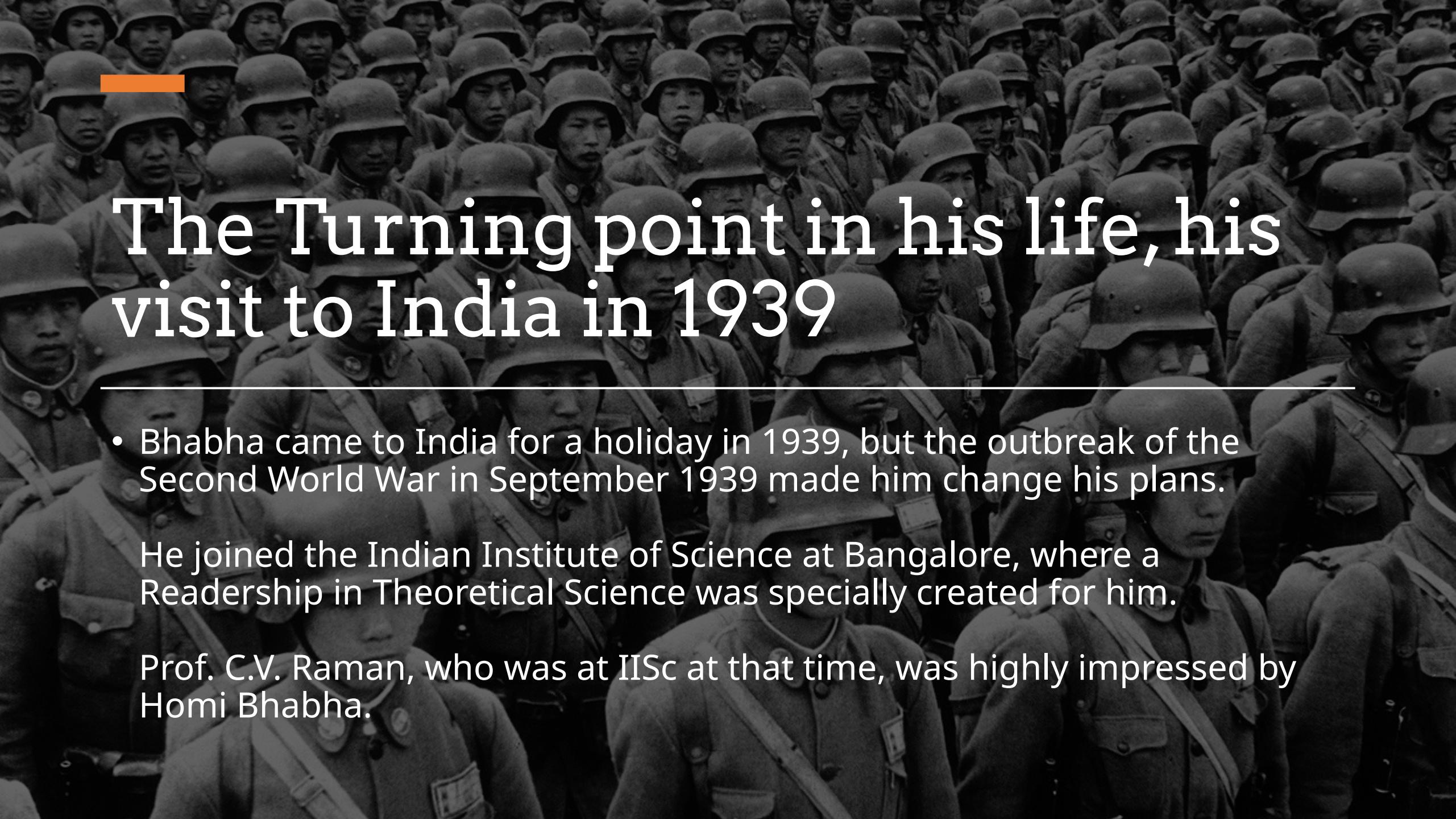
This is how creating something new would actually look like





Bhabha was also the first to point out that cosmic rays, moving at speeds close to that of light, are the best place to verify the conclusions of Einstein's Special Theory of Relativity. For example, mesons, which normally decay within a distance of half a kilometer, can travel more than 10 km down to the Earth's surface because relativistic time dilation increases their decay lifetime.

Bhabha proposed vector mesons as particles, in addition to Yukawa's scalar mesons, that would play a role in the nuclear interaction. These vector mesons were massive, had spin one and odd parity. Thus he explained the fact that the triplet state of the deuteron (a heavy isotope of hydrogen whose nucleus has one proton and one neutron) was the lowest stable state.



The Turning point in his life, his visit to India in 1939

- Bhabha came to India for a holiday in 1939, but the outbreak of the Second World War in September 1939 made him change his plans.

He joined the Indian Institute of Science at Bangalore, where a Readership in Theoretical Science was specially created for him.

Prof. C.V. Raman, who was at IISc at that time, was highly impressed by Homi Bhabha.

Formation of the TIFR

During his five-year period in Bangalore, Bhabha realized the difficulty of carrying out research activities in India. He understood that none of the existing research institutions in the country had facilities for original work in nuclear physics, cosmic ray physics, high energy physics and other frontiers of physics.

In a letter to his friend, J.R.D Tata, Bhabha wrote “The lack of proper conditions and intelligent financial support hampers the development of science in India at the pace the talent in the country would warrant”

The Letter

“ I have for some time past nurtured the idea of founding a first class school of research in the most advanced branches of physics in Bombay..”

“ ...There is at the moment in India no big school of research in the fundamental problems of physics, both theoretical and experimental.... It is absolutely in the interest of India to have a vigorous school of research in fundamental physics, for such a school forms the spearhead of research not only in less advanced branches of physics but also in problems of immediate practical application in industry.”

" When nuclear energy has been successfully applied for power production in, say, a couple of decades from now , India will not have to look abroad for its experts but will find them ready at hand."

" The scheme I am now submitting to you is but an embryo from which I hope to build up in the course of time a school of physics comparable with the best anywhere."

His advocation for Peace of Nuclear Weapons



Bhabha at the First International Conference on the Peaceful Uses of Atomic Energy, Geneva 1955., TIFR Archives, 1955,
From the collection of: Tata Institute of Fundamental Research

Awards

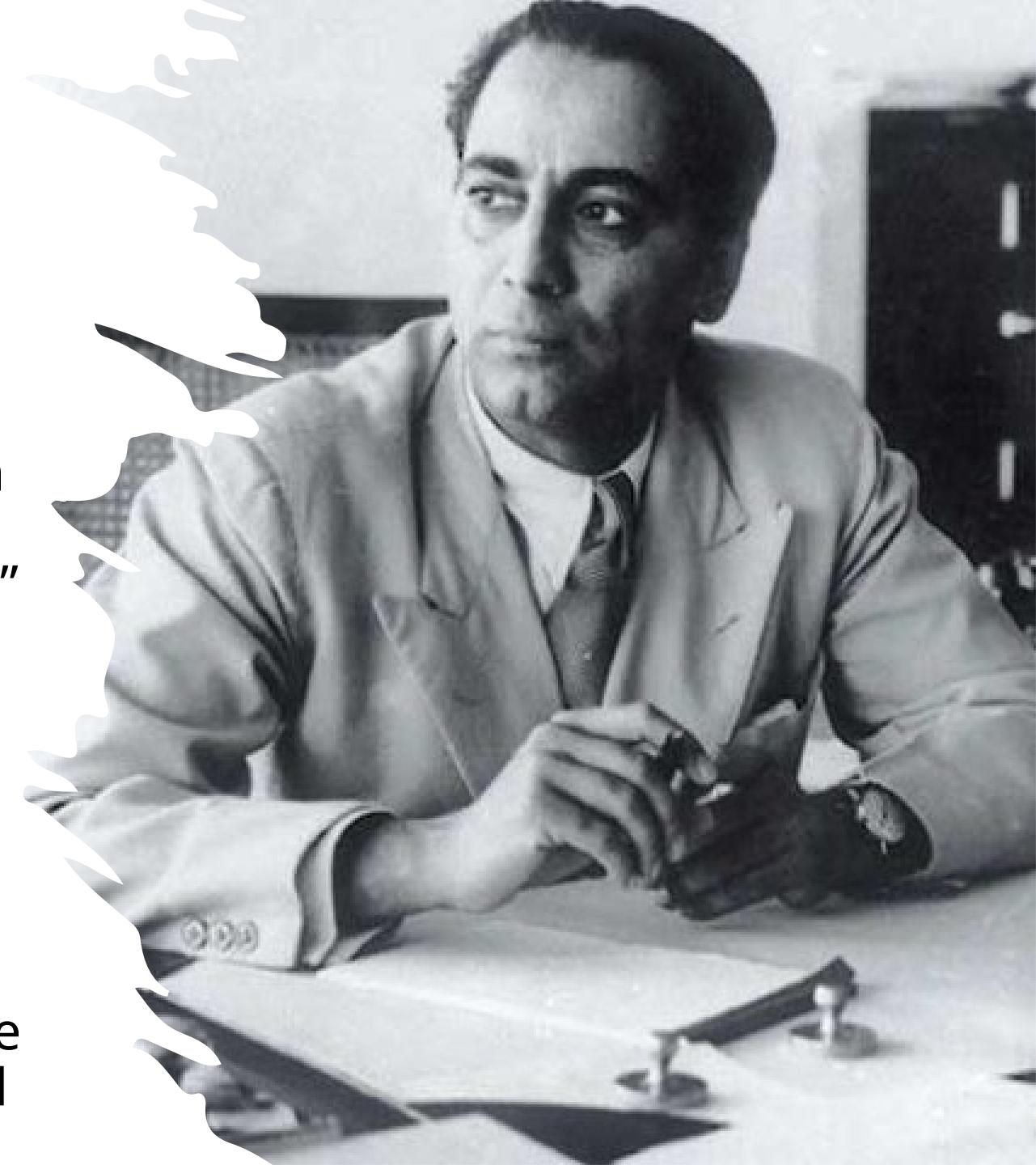
Fellow of the Royal Society, 1941

Adams Prize, Cambridge, for a thesis on
“The theory of the elementary
physical particles and their interactions,”
1942

Hopkins Prize of the Cambridge
Philosophical Society, 1948

Padma Bhushan, 1954

President, First International Conference
on Peaceful Uses of Atomic Energy, held
under the auspices of the UN, 1955

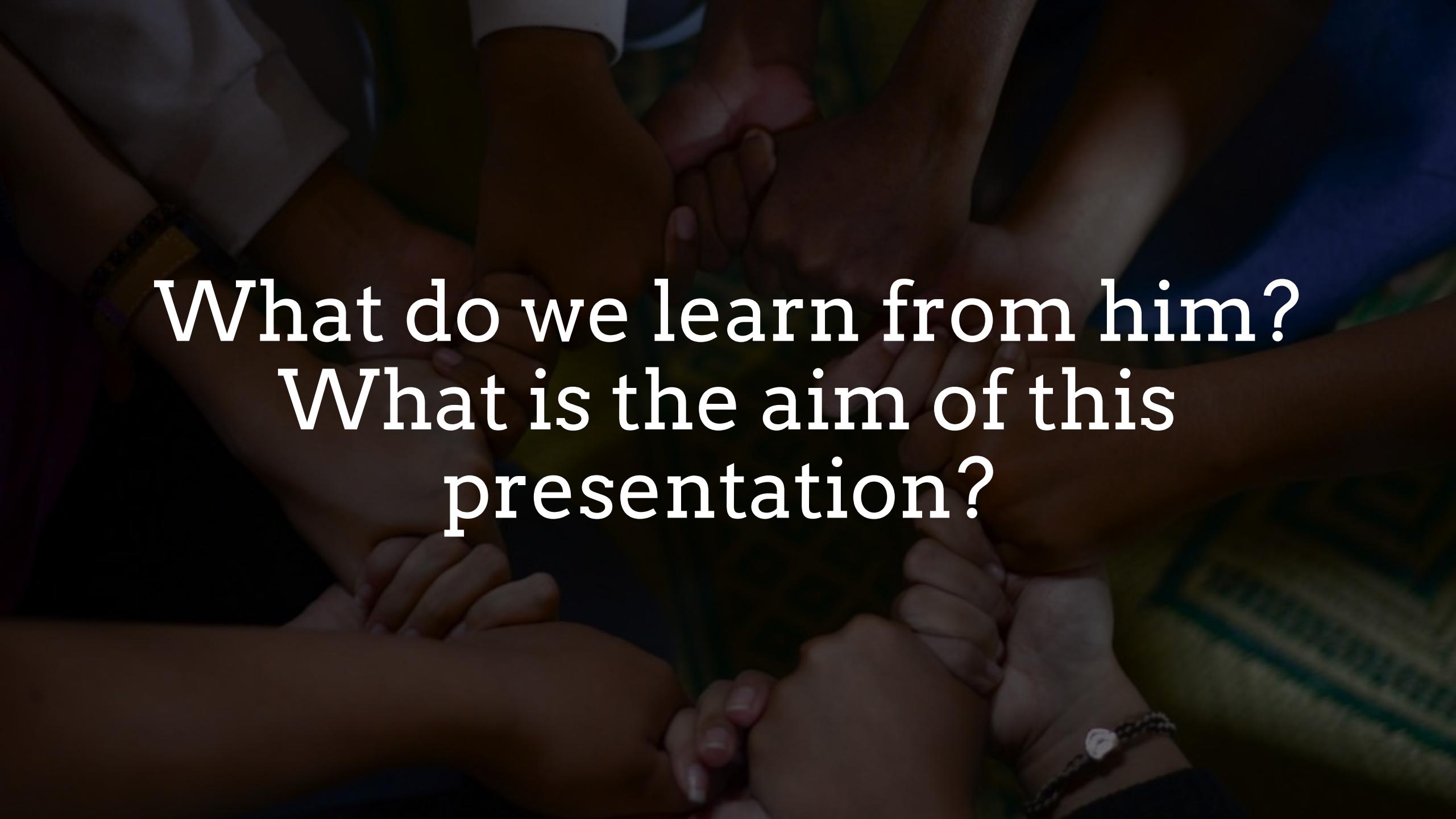


- Honorary fellowship of the Gonville and Caius College (1957), Royal Society of Edinburgh (1957), American Academy of Arts and Sciences (1959), National Academy of Sciences of the United States (1963)
- Honorary Doctoral degrees in science: Patna (1944), Lucknow (1949), Banaras (1950), Agra (1952), Perth (1954), Allahabad (1958), Cambridge (1959), London (1960), Padova (1961)
- President, International Union of Pure and Applied Physics, 1960-63
- Melchett Medal of the Fuel Institute, 1964



The Plane Crash

- “On Monday, 24th January 1966, I was in my office at the Tata Institute of Fundamental Research in Bombay. There was a phone call from Air India to say that their flight that was to land in Geneva had not done so. It was on the aircraft, Kanchenjunga that Homi Bhabha was travelling to Geneva on his way to Vienna. Geneva airport had apparently lost contact with the aircraft. I was told that Air India would keep us in touch with further developments.” – recalls Prof. M.G.K. Menon who took over as Director of TIFR after Homi Bhabha.
- Air India’s Boeing 707 crashed on the Mont Blanc in the Alps, killing everyone on board. Homi Bhabha was on his way to Vienna to attend a meeting of the Scientific Advisory Committee of the International Atomic Energy Agency.

A close-up photograph of several hands of different skin tones joined together in a circle, symbolizing unity, support, or a community coming together. The hands are positioned in the center of the frame against a dark background.

What do we learn from him?
What is the aim of this
presentation?

Thank You

