

PROFESSOR H. J. SHARMA, F.R.S.  
BANGALORE

13/3/44  
Plan  
Prof. Choksi  
14/3/44  
COSMIC RAY RESEARCH UNIT  
INDIAN INSTITUTE OF SCIENCE  
BANGALORE

18th March, 1944.

My dear Sir Sorab,

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. I had intended putting my scheme before you in person on my next visit to Bombay, but as a result of a letter from Prof. Choksi I am now sending it in writing for your consideration, and I would be glad to have your views on it. If you so desire I am prepared to come to Bombay to explain the scheme to the Trustees in person.

The scheme I am submitting now is not one which has been hastily conceived. It has been germinating in my mind for nearly two years, and I recently discussed it at length with Prof. A.V.Hill both at Delhi and Bombay. Prof. A.V.Hill, Senior Secretary of the Royal Society, apart from being an eminent scientist himself, is one who has a great and intimate knowledge of the organisation of science and scientific institutions in England, and the many valuable suggestions he made have been incorporated in the scheme as it stands now. The scheme has been set forth on the accompanying schedule and is a simple one, but I should like to make a few remarks to explain its background.

There is at the moment in India no big school of research in the fundamental problems of physics, both

theoretical and experimental. There are however scattered all over India competent workers who are not doing as good work as they would do if brought together in one place under proper direction. 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. If much of the applied research done in India today is disappointing or of very inferior quality it is entirely due to the absence of a sufficient number of outstanding pure research workers who would set the standard of good research and act on the directing boards in an advisory capacity. (For example, while the Department of Scientific and Industrial Research was founded in Great Britain in 1914, it was soon felt that it could not function properly without the appointment of an adequate advisory council for the organisation. The Scientific Advisory Council was founded in Great Britain in 1915 and has consisted mainly of eminent scientists like Lord Rutherford, Sir W.L. Bragg, Sir R.h. Fowler, Lord Rayleigh, Sir James Jeans, Prof. A.V. Hill and others. Without the availability of a sufficient number of pure research workers of this standing to serve on the Advisory Council, the work of the Department would have suffered, as it suffers in India). Moreover, 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. I do not think that any one acquainted with scientific development in other countries would deny the need in India for such a school as I propose.

The subjects on which research and advanced teaching would be done would be theoretical physics, especially on fundamental problems and with special reference to cosmic rays and nuclear physics, and experimental research on cosmic rays. It is neither possible nor desirable to separate nuclear physics from cosmic rays theoretically since the two are closely connected.

For the location of the school I think Bombay would be the most suitable place in India for the following reasons. Firstly, it is an advantage for a cosmic ray laboratory to be situated near the sea, for it is often necessary to make measurements at considerable depths under water. Secondly, Bombay as one of the first and most progressive cities in India has not yet got the scientific research institutions necessary for its population and worthy of its position. People in educational circles in Bombay have long felt and expressed the urgent need for a good school of physical research. Thirdly, I feel that once a laboratory like the one proposed is established in Bombay, it will be easier to collect further money for it in

addition to what the Tata Trusts may give. I am confident that both the Government and the University would be prepared to give regular financial support.

In connection with the third reason I may mention confidentially that the Director of Public Instruction has on several occasions asked me if I would accept a chair at the Royal Institute of Science if one were created there for me with specially favourable conditions for research. He, I am sure, would get the Government to help a scheme of the type I propose. The Institute would be affiliated to the Bombay University. The Bombay University could also send its advanced research students to the laboratory for work on their doctorate theses, and for attending the few advanced courses of lectures that we would give.

I also hope that in time we shall receive liberal support from the Board of Scientific and Industrial Research whose avowed policy includes support of pure research, as publicly stated by Sir Ramaswamy Mudaliar when he presided at a lecture given by me to the Delhi University this January. It would neither be feasible nor advisable to try to do research such as I plan under the same roof as applied physical research and routine testing, and it would be in the interest of efficiency if the Board of Scientific and Industrial Research decided to subsidise us to carry on the pure research which it is

its intention to foster by paying us, say ten percent of the annual expenditure it contemplates on the projected National Physical Laboratory. Prof. Hill, when he was in Bombay, repeatedly expressed the fact that all research has in the beginning to be built round a suitable man, and at the present moment there is no one else in India able to do the type of research proposed. The same principle has guided the financing of research in Germany. To quote the words of the Director of the Kaiser Wilhelm Society which runs many of the biggest research institutions all over Germany

"In order that its ideals may be fulfilled, it is necessary that the Society should keep an intelligent watch on the newer currents in scientific investigation and try to further its ideals by creating facilities for new lines of investigation and by getting the right man for them. The object has thus been expressed by the President, Adolf V. Harnack, 'The K.W. Society shall not first build an institute for research and then seek out the suitable man but shall first pick up an outstanding man, and then build an institute for him.'

Experience has often shown that it is rather useful not only to call an outstanding man to the headship of an institution, but also to a group of associated institutions at one place and under a loose federation." Prof. A.V. Hill expressed the same views and added that that was exactly the way in which

outstanding schools of research had been built up in the United Kingdom, as for example the celebrated schools of physics and physiology at Cambridge. He saw no reason why the same thing could not be done here.

Financial support from Government need not, however, entail Government control, for to quote Prof. Hill in his lecture to the Science Congress at Delhi "Many of these (independent scientific institutions in Great Britain) now-a-days are receiving substantial state support: but nearly always when this is done a buffer of some kind is interposed to prevent Government support from becoming Government control." (Hill's underlining).

It might at first sight be supposed that the absence of a good school of physical research in Bombay at the moment would make it an unsuitable place for the object I have in mind. This is not so. The best and the most promising students desirous of studying theoretical physics or cosmic rays who for the last three years have been sent to me in Bangalore from all parts of India, would come to Bombay instead. I am convinced that within five years we could make Bombay the centre of fundamental physical research in India.

Lastly, I would like to add a few personal remarks. It was while I was on holiday in 1939 that the war broke out and

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stopped my return to my job in Cambridge. For some time after that, I had the idea that after the war I would accept a job in a good university in Europe or America, because universities like Cambridge or Princeton provide an atmosphere which no place in India provides at the moment. But in the last two years I have come more and more to the view that provided proper appreciation and financial support are forthcoming, it is one's duty to stay in one's own country and build up schools comparable with those that other countries are fortunate in possessing. In 1941, I was offered the Physics Chair at the University of Allahabad with specially favourable conditions, and in 1942 the Professorship at the Indian Association for the Cultivation of Science in Calcutta, but I refused both these because I was not convinced that they afforded me sufficient scope for ultimately building up an outstanding school of physics. 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. If Tatas would decide to sponsor an institute such as I propose through their Trusts I am sure that they would be taking the initiative in a move which will be supported soon from many directions and be of lasting benefit to India.

With kind regards,  
Yours sincerely,

H. J. Bhabha

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