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Historical Note on Tata Institute of Fundamental Research

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Summary:

A historical note from Dr. Bhabha to the Prime Minister chronicling the history of the establishment and subsequent operation of the Tata Institute of Fundamental Research. Also includes information about the Institute’s administrative functions and relations with the Atomic Energy Commission.

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HISTORICAL NOTE
ON
TATA INSTITUTE OF FUNDAMENTAL RESEARCH

Prepared by Dr. H.J. Bhabha for the Prime Minister on the occasion of the laying of the Foundation Stone of the Institute's new building on January 1, 1954.

Note: References to subsequent developments are indicated in the footnotes. The appendices have been brought up-to-date.

1. GENESIS OF THE INSTITUTE

While I was working at the Indian Institute of Science, Bangalore, during the war years, the lack of adequate support for, and the consequent shortcomings of, science in India impressed themselves upon me. In a letter dated 19 August 1943 to Mr. J.R.D. Tata I pointed out that "the lack of proper conditions and intelligent financial support hampers the development of science in India at the pace which the talent in the country would warrant."
The lack of support operated adversely in several years. It did not provide men who had chosen a scientific carrier with the necessary equipment, facilities and environment for doing research. By throwing too great an administrative burden and teaching load on their shoulders it did not leave them enough time and energy for advanced study and research. Thirdly, the poor conditions of work and the poor financial prospects of a scientific career induced many of the most able university men to take up an administrative or commercial career. In the letter to Mr. J.R.D. Tata referred to above I pointed out that, if Indian science was to progress, far greater financial support was needed, particularly for "pure" or

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fundamental research which was not likely to give any immediate economic return. I gave him figures about the rate of scientific development in the Soviet Union and pointed out that although great emphasis was laid there on gearing scientific research and development to economic and social problems, nevertheless fundamental research was also strongly supported, for, in the official Soviet view:

> "there is no genuine knowledge of the universe that is not potentially useful for man, not merely in the sense that action may one day be taken on it but also in the fact that every new knowledge necessarily affects the way in which we hold all the rest of our stock".

I also suggested in this letter that a large scale use of distinguished foreign professors, even for short visits, would help to improve the situation in India immediately, and give a very considerable return for the money spent.

> "I hope one day money will be given for financing visiting professorships in a number of subjects, which will enable one pre-eminently distinguished scientist in each to be invited to work in this country for periods of not more than one year at a time, a new man being selected each year ..... The presence of such eminent men here even for a few months at a time would attract eminent Indian scientists in their subject from all over India to work at the Institution which they may be temporarily attached, and would have an electrifying effect on the development of science in India. The

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United States has in the past quarter of a century consistently followed the policy of absorbing not only all the very top scientists from Europe who were prepared to go to the States, but also lesser men whose presence there would be a gain. This policy was paid handsome dividends for America, which was behind Europe barely a quarter of a century ago, has now some of the finest research centres in the world".

In his reply to me of 2 September 1943, Mr. J.R.D. Tata wrote: "From what you say in your letter, it is evident that there is scope for rendering valuable service to the country and to the cause of scientific research in India. If you and/or some of your colleagues in the scientific world will put up concrete proposals backed by a sound case, I think there is a very good chance that the Sir Dorab Tata Trust, and perhaps also the Sir Ratan Tata Trust, will respond. After all, the advancement of science is one of the fundamental objects with which most of the Tata Trusts were founded, and they have already rendered useful service in that field. If they are shown that they can give still more valuable help in a new way, I am quite sure that they will give it their most serious consideration.

As the end of the war came in sight, it became clear that I would soon have to decide between returning to the post which I held in Cambridge, or deciding to work in India, at least for some years. In this connection, a copy of a letter from Prof. M. Pryce, now Wykeham Professor or Physics at Oxford, may be seen (Appendix A). Prof. Pryce pointed out the shortage of outstanding theoretical physicists in England and wanted me to return to

England by applying for the Wykeham Professorship at Oxford. I replied to him that I was already committed. As I wrote later to Professor S. Chandrasekhar, F.R.S., on 20 April 1944.

> "I have recently come to the view that if proper appreciation and financial support are forthcoming, it is the duty of people like us to stay in our own country and build up outstanding schools of research such as some other countries are fortunate enough to possess. It is for this reason that I put forward my scheme, and I am glad to say that it has met with understanding and liberal support. It is our intention to bring together as many outstanding scientists as possible in physics and allied lines so as to build up in time an intellectual atmosphere approaching what we know in places like Cambridge and Paris".

The Dorab Tata Trust had already given the money for establishing the Cosmic Ray Research Unit at the Indian Institute of Science, Bangalore, of which I was the Professor-in-Charge, and to Professor M.N. Saha for a cyclotron at the University of Calcutta. But it became clear that fundamental research in physics and mathematics, which included nuclear physics and cosmic rays, was too big a subject to be dealt with in a small department in a University or a general purpose research institute, and that it required for its proper and effective prosecution an institution devoted solely to this end. After the matter had matured in careful discussion with Professor R.D. Choksi, Director of the Dorab Tata Trust and Member of

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the Council of the Bangalore Institute, I placed a formal proposal before Sir. S.D. Saklatvala, Chairman of the Dorab Tata Trust, in a letter dated 12 March 1944. This letter is given in extenso in Appendix B. In it I stressed the need in India for a first-class school of research in the most advanced branches of physics.

> "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 since the two are closely connected theoretically ..... 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."

Among the reasons given for locating the Institute in Bombay was the circumstance that the Director of Public Instruction of Bombay Province had already approached me with the aim of creating a Chair for me and a Department at the Royal Institute of Science. It was anticipated that if the institution was located in Bombay, financial support of the Government of Bombay would be forthcoming. The letter closed thus:

> "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".

My proposal was considered by the Trustees of the Dorab Tata Trust in the light of two covering notes on Trust Policy written by the Director, Professor R.D. Choksi. The first note entitled "Note on Trust Policy" which I only saw for the first time a few days ago, gives such an admirable and clear statement of the objectives of a big Trust, that I have appended it in to in Appendix C.

"What distinguishes a Trust is not its ability to give or the extent and range of its giving but the character of its giving. It is important for a Trust to maintain its "pioneering" character and this can only be done adequately where from time to time a Trust initiates and fosters new institutions and new types of service to society. For a great Trust the large project, carefully designed and executed, must always be a major objective. Even in the routine giving of grants and donations the Trust must constantly bear in mind the "pioneering" factor. Frequently, its grants should help to initiate a new project...."

Professor Choksi's second note to the Trustees (dated March 1944) deals specifically with my proposal. To quote from the Note.

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"That a project for research in advanced branches of physics is worthy of Trust support is, I believe, not in question. If that is so, the Trustees have, I think, for consideration two main points:

(1) How far is it proper for the Trust to give support to a scientific project which may be called at this stage a one-man affair?

(2) How far the Trust should commit itself financially.

Relevant to the first point is the considered opinion of Prof. A.V. Hill that much of the scientific work in England has been built up round an individual

... ...

There is general agreement in the country that more money be forthcoming for scientific work, that Government should even earmark a certain percentage of revenue. I think the Trust will do well to earmark at least 12% for this purposes as suggested above. If this is approved I am confident that the Trustees can undertake the complete responsibility for this new project for the next five years at least. After which period the responsibility may be shared in the light of experience.

... ...

A further reason for advocating full support to Dr. Bhabha's Scheme lies in the pioneer character of the undertaking. The Trust has always stood for pioneer work. It undertook a project in the field of Social Sciences in 1936, it completed

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and established a much larger project in the medical sphere in 1940, and in 1944 it may well enter upon a modest project in the field of pure Science. It is important that the Trust should maintain its character for pioneer work.

At a meeting on the 14th April 1944, the Trustees of the Dorab Tata Trust decided to accept responsibility for launching an institution along the lines I had proposed. The relevant minute reads:

"After discussion of the financial implications of Dr. Bhabha's proposals as embodied in his letter, the Trustees decided to undertake the responsibility. They were of opinion that this responsibility should be shared from the outset with the Bombay University and the Bombay Government - both in respect of finance and administration. It was remitted to Prof. Choksi under the general direction of the Chairman to explore the possibilities of such co-operation with the University and the Government. Dr. Bhabha was present at this stage of the meeting and entered into the discussion. He readily accepted the Trustees' views regarding the sharing of the responsibility."

It is worthy of note that the decision to find an institute for fundamental research with particular reference to nuclear physics and cosmic rays was taken by the Trust early in 1944, more than a year before the subject became notorious through the explosion of the atomic bomb on Hiroshima and the subsequent manner in which it captured popular imagination.

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As mentioned earlier, Mr. S.N. Moos, Director of Public Instruction, Bombay, had been in touch with me as he was desirous of activating the physics department of the Royal Institute of Science, Bombay. While he sympathized with my proposal to start a separate institute, he felt that this larger project would have to wait till the end of the war, and that a beginning could be made by creating a special chair at the Institute in which the Tata Trusts might also be invited to assist. His official offer of a chair was made to me on 2 June 1944, and I replied on 19 June to the effect that I was already committed, as the Tata Trust had accepted a proposal which I had made for the establishment of a new institute. I suggested that the money, which the Bombay Government proposed to spend on the creation of a chair for me and on equipment, could be more effectively used if Government co-operated with the trust in a joint venture.

Negotiations between the Tata Trust and the Government of Bombay were taken up, and proceeded favourably from the beginning. The Bombay Government and Trustees took up the problem of finding a temporary home for the new institute during war-time, until a new building could be built, and the possibility of building temporary structures on the top floor of one wing of the Royal Institute of Science was considered. By good fortune half of a house on Pedder Road became available early in 1945, and the Trustees with the approval of the Government of Bombay decided to rent it in April of that year.

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Pending the passing of final orders by Government, the creation of a provisional Council of Management, consisting of one representative of the Government of Bombay, two representatives of the Trust and the Director of the Institute, to take all necessary steps for the establishment and maintenance of the Institute, was agreed to between the Government of Bombay and the Trust. The provisional Council consisting of

Shri S.D. Saklatvala	Chairman
Mr. S.N. Moos	
Dr. John Mathai	
Dr. Homi J. Bhabha	Director

held its first meeting on 18 May 1945.

2. HISTORY SINCE ITS FOUNDATION

At the first meeting, tentative proposals for the budget of Rs.80,000/- for the year 1945-46 were passed, the income available being Rs.45,000/- from the Dorab Tata Trust, Rs.25,000/- from the Government of Bombay and Rs.10,000/- from the Council of Scientific and Industrial Research for "Measurements on cosmic rays and ground experiments on mesons"; the Director and one Professor were appointed and sanction was accorded for one post of a Reader in Experimental Physics, one Research Assistant and two Studentships; a Registrar Librarian and the necessary clerical staff were also sanctioned. The equipment of the Cosmic Ray Research Unit at the Indian Institute of Science, Bangalore, was bought over with a special grant of Rs.50,000/- given for the purpose by the Dorab Tata Trust.

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The Institute may be considered to have commenced its work on 1 June 1945 at the Indian Institute of Science, Bangalore, in the accommodation formerly belonging to the Cosmic Ray Research Unit. Its work continued there till it was gradually shifted to its temporary premises at 53 Pedder Road, Bombay, in the course of the following year. The temporary premises of the Institute at Pedder Road, Bombay were formally declared open at an inaugural function on 19 December 1945 by Sir John Colville, Governer of Bombay.

The formal approval of the Government of Bombay to the establishment of the Institute and the agreement* relating thereto was incorporated in Resolution No.7793, Government of Bombay, Education Department, dated 3 January 1947 (Appendix D). The following are the most important provisions of the

"RESOLUTION:- The scheme of the Sir Dorabji Tata Trust for the establishment of an institute in Bombay for the promotion of fundamental research in physics is sanctioned subject to the following terms and conditions:-

(1) The Institute will be known as "The Tata Institute of Fundamental Research"

... ...

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* It is now proposed to replace this bipartite agreement by a tripartite agreement between the Government of India, the the Government of Bombay and the Sir Dorabji Tata Trust: Appendix D.1.

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(7)(a) The Institute will be under the control and direction of a Council consisting of two representatives of Sir Dorabji Tata Trust, one representative of the Government of Bombay and the Director of the Institute. The representative of Government on the Council will report to Government from time to time on the activities of the Institute.

(b) So long as the Central Government and/or the Council of Scientific and Industrial Research makes annual or other periodical grants to the Institute the Central Government shall be entitled to appoint a representative** on the Council."

The Resolution provided for the payment of Annual block grants of Rs.45,000/- and Rs.25,000/- for a period of three years in the first instance by the Dorab Tata Trust and the Government of Bombay respectively. In addition the Trust was to pay a sum of Rs.50,000/- for the cost of equipment, including that taken over from the Cosmic Ray Research Unit at Bangalore.

As regards the capital cost for site and new buildings, it was agreed that the Trust and the Government of Bombay would undertake commitments upto a maximum of Rs.4 lakhs and Rs.2 lakhs respectively.

** It is now proposed that the Government of India should have permanent representatives on the Council. The matter is under correspondence : Appendix D.1.

In the meanwhile, the Governing Body of the Council of Scientific and Industrial Research, which had already sanctioned a grant of Rs.10,000/- for the year 1945-46, met in September 1945 at New Delhi under the Presidentship of Sir Ardeshir Dalal, and thanks to his interest and that of Dr. S.S. Bhatnagar, agreed to provide a block grant of Rs.75,000/- for the year 1946-47, subject to the condition that adequate representation on the Council of the Institute was given to the Council of Scientific and Industrial Research. This decision was communicated in letter No.133 Bd/(3)/45 dated 6 March 1946 (Appendix E). The concurrence of the Trustees of the Dorab Tata Trust and of the Government of Bombay was obtained for the condition stipulated by the Council of Scientific and Industrial Research, and in April 1947 Dr. S.S. Bhatnagar, F.R.S. took his seat on the Council of the Institute as their representative. This block grant has been continued by the Council of Scientific and Industrial Research, and has undergone a gradual increase with the normal increase of salaries.

In 1946 the Council of Scientific and Industrial Research appointed an Atomic Research Committee for promoting research in atomic energy. As the Institute was the place in India at which the largest amount of theoretical and experimental work in nuclear physics was being done at the time, the Council of Scientific and Industrial Research the recommendation of the Atomic Research Committee gave a grant of Rs.26,000/- to the Institute in 1947-48 for training a team of Scientists in the general techniques of nuclear physics with special reference to a high energy accelerator. It is interesting to note that, even before the

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Atomic Energy Commission came into existence, the Council of Scientific and Industrial Research had already taken the initiative to provide a grant for training personnel in this field and for setting up a high energy accelerator, and that this work had been entrusted to the Institute. The grants given by the Council of Scientific and Industrial Research are shown in the Statements of Grants in Appendix F.

The Annual block grants from the Dorab Tata Trust and the Government of Bombay to the Institute were raised Rs.80,000/- and Rs.40,000/- respectively in 1948. The annual block grant from the Trust was further raised to Rs.1 lakh in 1951, and continues at this figure.

In 1948 the Government of India in the Ministry of Natural Resources and Scientific Research entered the picture and sanctioned a block grant of Rs.1 lakh for 1948-49. This grant was increased to Rs.1,35,000/- in 1949-50 and to Rs.1,70,000/- in 1950-51, and continues at this figure.

The Scientific Manpower Committee of the Government of India under the chairmanship of Dr. S.S. Bhatnagar had also made certain recommendations to Government with the object of promoting the training of scientific personnel. In accordance with its recommendations the Ministry of Natural Resources and Scientific Research gave the Institute a grant of Rs.30,000/- in 1949-50 for providing additional laboratory facilities for training of research students, and has given 10 scholarships for research students since 1950-51.

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The Atomic Energy Commission of the Government of India was established in 1948. One of its immediate problems was the shortage of trained scientific personnel in its field. During the three years preceding the establishment of the Commission the Institute had already collected and built up a small group of scientists trained in some of the special techniques of nuclear physics with the assistance of the Council of Scientific and Industrial Research. It was therefore natural that the Commission should turn to the Institute for carrying out its own projects and for training further personnel for it. The Institute has thus carried out a number of projects for the Atomic Energy Commission with joint teams of personnel belonging to the Institute and the Physics Division of the Atomic Energy Commission. The senior members of most of these teams belong to the Institute and were drawn from the original group built up by the Institute. This co-operation has steadily grown, and the Commission today has a large group of able young physicists trained in the different branches of nuclear physics, most of whom work at the Institute.

In addition to financing its own projects at the Institute, the Commission has also provided funds for projects initiated by the Institute, these grants being made, as to other scientific institutions in India, on the recommendation of the Board of Research on Atomic Energy. Such projects are shown separately in Appendix F.

To close link thus established between the activities if the Institute and the Atomic Energy Commission, and the satisfactory manner in

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which these services have been rendered by the Institute, moved the Atomic Energy Commission, on the initiative of Dr. S.S. Bhatnagar, at its 27th meeting on the 22nd and 23rd April 1953 to record the following:-

> "The Commission noted that it had recognized the Tata Institute of Fundamental Research as the only laboratory of the Commission for fundamental research in atomic science. In view of this decision the Commission would not set up another laboratory of its own for fundamental research in atomic physics"

The temporary premises of the Institute at Pedder Road, having a useable floor space of some 6000 square feet were entirely inadequate for these expanded activities. Consequently, a floor space of some 35,000 square feet was leased in the premises vacated by the Royal Bombay Yatch Club at Apollo Pier Road, and in September 1949 the Institute's activities were moved to these new temporary premises. The Commission also leased space for its work in the same building. Work has however expanded to such an extent that even this space, representing a sixfold increase in four years, has become completely inadequate. Shortage of space is the main restricting factor in further expansion.

A suitable site for the permanent buildings of the Institute has been sought by the Council for several years. A valuable plot in the new reclamation area of Bombay was offered by the Bombay Government, but this offer could not be accepted as the rapid expansion of the Institute showed that it would be inadequate. After much searching a suitable plot of land was located in Block 8 of the Colaba Reclamation,

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and a request for an area of 25 acres was made to the Government of India as this land was in the possession of the Defence Ministry. While the Government of India was unable to spare the area asked for, it has generously given the Institute 15 acres of a most suitable site adjoining the sea in Block 8 of the Colaba Reclamation. At a Special Meeting held on 7 September 1951 the Council of the Institute recorded the following minute:-

"The Council placed on record its appreciation of the great personal interest which the Hon'ble Jawaharlal Nehru, Prime Minister, had taken in the matter of obtaining the site in Block VIII of the Colaba area for the Tata Institute of Fundamental Research. The Council requested the Chairman to convey the warm thanks of the Institute to the Hon'Ble Jawaharlal Nehru.

The Council also desired the Chairman to convey its gratitude to the Hon'ble Sardar Baldev Singh for the sympathetic consideration he had shown in making the site available from land belonging to the Defence Ministry.

The Council placed a record its deep appreciation of the tireless efforts of Sir S.S. Bhatnagar in obtaining the site for the Institute".

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In planning the buildings of the Institute the Council took the view that the latest and best ideas should be incorporated. Accordingly, a noted American firm of architects, Messrs Holabird and Root and Burgee of Chicago were appointed as the Designing Architects, as this firm had considered experience of tropical building in South America and had built several laboratories, including one for the U.S. Atomic Energy Commission at Oakridge. In order, however, to minimize the dollar payment which would have to be made to this firm, and in order to utilize the services of Indian architects to the maximum extent possible consistently with the above objective, it was decided to appoint Messrs Master, Sathe and Bhuta, who had designed and built the National Physical and National Chemical Laboratories, as the Executing Architects. Mr. Kanvinde, Architect of the Council of Scientific and Industrial Research, has also been employed to co-operate with Messrs Master, Sathe and Bhuta in working out the details and producing the half-inch drawings. The foundation stone of the new building will be laid by the Prime Minister on 1 January 1954.

3. RELATIONSHIP WITH THE ATOMIC ENERGY COMMISSION

A word should be said about the relationship of the Institute with the Atomic Energy Commission. There is no doubt that the Institute would not have grown to its present size and importance but for the substantial help given by the Government of India in several of its departments including the Atomic Energy Commission. There is also no doubt that the plans of the Atomic Energy Commission for the development of atomic energy in India would not have matured so rapidly but for the assistance rendered by the Institute.

The work done at the Institute is but a small part of the total activities of the Commission, since in addition to fundamental research the Commission has to do geological survey, exploration, and mining, to set up plants for processing raw materials, and to set up atomic reactors with the ultimate object of generating useful power. The grant given by the Commission to the Institute this year constitutes barely 10% of the total budget of the Commission. While the Institute's budget may grow in future as it undertakes special projects, it is unlikely that it will ever exceed Rs.25 lakhs a year, since any institute of fundamental research of a larger size tends to become unwieldy. The Institute, which has over a hundred scientists at present, including the members of the Physics Division of the Atomic Energy Commission seconded to it, is already a large research institution by any standard. On the other hand the Commission may be considered to have just come of age, and its activities will expand several fold over the coming years. The grants given by the Commission to the Institute will therefore become but a small part of the Commission's budget.

In the field of research an Atomic Energy Commission must promote two kinds of activity: (1) research of a semi-technical or technical nature aimed at solving the problems which arise in the construction and design of atomic reactors and in the processing of materials connected therewith, and (2) fundamental research in all aspects of atomic science without any reference to its immediate utility.

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(1) should be carried out mainly in establishments owned solely by the Commissio, though individual problems may be farmed out to various laboratories, as for example the National Laboratories and the Indian Institute of Science at Bangalore. An atomic reactor should only be set up, at least under present circumstances, in establishments owned solely by the Commission, and not in a University or at the Tata Institute of Fundamental Research.

On the other hand fundamental research should be sponsored by the Commission mainly in institutions other than its own, as for example in the universities and research institutes where a free intellectual and academic atmosphere prevails. Certain projects of this type, however, are too big to be conveniently carried out in the normal laboratory of a university, and consequently the U.S. Atomic Energy Commission has set up several laboratories of its own, mainly for fundamental research, which are nevertheless operated by academic institutions. The Radiation Laboratory at Berkeley, one of the biggest in the world, is financed almost entirely by the U.S. Atomic Energy Commission but operated by the University of California, of which it forms a part. Similarly, the Brookhaven National Laboratory near New York is also financed solely by the U.S. Atomic Energy Commission, but operated by a Committee of Eastern Universities. The Tata Institute of Fundamental Research fulfils precisely this role of being an Institute at which the Commission can carry out its large scale projects of fundamental research. Fundamental research thrives best in an atmosphere that is free, permitting an unrestricted exchange of ideas. An institution for fundamental research should be open to all scientists of

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eminence, whatever the country to which they belong, and should be unfettered by the secrecy regulations required in commercial or strategic establishments. Had the Institute not existed, the Indian Atomic Energy Commission would have been compelled in time to create such an institution where fundamental research in atomic science could be carried out in a free academic atmosphere on a scale larger than is convenient in a university laboratory. The resolution of the Atomic Energy Commission referred to above is a recognition of this situation.

4. SCOPE OF THE INSTITUTE

As has already been stated in the first section, the Tata Institute of Fundamental Research was conceived as a high level academic institution for carrying out fundamental research and advanced study initially in the fields of physics, with special emphasis on nuclear physics and mathematics. The Institute is the biggest centre for cosmic ray and nuclear research in India. From its very inception it has made notable contributions to the theory of elementary particles. Its nuclear emulsion group for the study of the new elementary particles is probably the second largest in the world, and has made outstanding contributions. A Cascade Generator has been set up, and a Van der Graaf Accelerator is under construction.

The Institute has a school of mathematics which is perhaps the largest and most active in India today. It has attracted, by its energy and vitality, several eminent mathematicians from the U.S.A. and Europe. Judged by the quality and extent of research work that is carried out, it is second to none in this country. It is the only centre in India,

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at present, where systematic training is being given to students, in all the major branches of modern mathematics. This provides them with a knowledge of the advanced techniques of pure mathematics which are indispensable for the tackling of research problems in pure and applied science.

In June 1944 I wrote a letter to Professor A.V. Hill, F.R.S. Nobel Laureate, then Senior Secretary of the Royal Society, informing him that the Tata Trust had decided to sponsor a project I put forward for the setting up of an institute for fundamental research in Bombay, and that the support of the Bombay Government and co-operation with the Bombay University was expected. In the course of a reply dated 22 June 1944 Professor A.V. Hill wrote:

> "I am very glad, indeed, to hear also that the Tata Trust have decided to sponsor your scheme for an institute for advanced research in theoretical and experimental physics in Bombay. I think you had better take biophysics under its wing, too. Apart from the Bose Institute at Calcutta, that subject practically does not exist in India. I am sure that many of the most important future applications of physics will be in biology. It sounds a grand scheme which you have on hand..."

While the Institute has not yet embarked on research in biophysics, it would not be inappropriate if it were to take up such research. For it is well known that the new radioactive isotopes made possible by the development of atomic energy have been the most important factor in accelerating the advanced of biological science in recent times.

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I have also had the idea that some day the Institute might render useful service to this country by carrying out research in the history of Indian Science. If the contributions of India and the East to the progress of science in past ages and their relation to world science are to be systematically investigated and appreciated in their proper historical perspective, it is necessary that a great deal of work on the history of Indian science should be done with the proper modern scientific and critical outlook. This is a subject which the Institute might possibly take up at some later stage, if the proper people to do the work can be found. There would be nothing unusual in such an activity since the Institute for Advanced Study at Princeton, of which Dr. J.R. Oppenheimer is the Director, has a Faculty of Humanistic Studies in addition to its Faculties of Mathematics and Theoretical Physics.

5. PROPERTIES AND FUNDS OF THE INSTITUTE - HOLDING TRUSTEES

According to Rule 17 of the Rules*, for the Administration of the Institute agreed upon by the Government of Bombay and the Dorab Tata Trust the fixed properties and funds of the Institute shall be vested in a set of four holding trustees of which two are nominated by the Government of Bombay and two by the Dorab Tata Trust.

When the Government of India decided to give a site of 15 acres to the Institute at Colaba and substantial grants for the construction of new buildings, it was felt by the Council that the Government of India should also be represented on the Board of Holding Trustees. Consequently letters were addressed on 5 May 52 to the Government of Bombay and the Dorab Tata Trust suggesting that the rule regarding the Holding Trustees

* Appendix F.1

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be revised, and that the Board of Holding Trustees should consist in future of one representative of the Government of India, one representative of the Government of Bombay and one representative of the Dorab Tata Trust. This suggestion was approved by the Dorab Tata Trust on 12 May 52 and by the Government of Bombay on 18 June 52. The Government of India had also been addressed on 2 May 52, and their approval was received on 21 July 52. The legal formalities have been virtually completed, and the Trust Deed,* signed by the Government of Bombay and the Trustees, only awaits the signature of the representatives of the Government of India. The site and immovable properties of the Institute will in future be held by a new Board of Trustees constituted as under:

Dr. S.S. Bhatnagar, Secretary to the Government of India, Ministry of Natural Resources and Scientific Research	Nominated by the Government of India
Shri V.T. Dehejia Secretary to the Government of Bombay	Nominated by the Government of Bombay
Mr. N.H. Tata	Nominated by the Dorab Tata Trust

6. COUNCIL OF THE INSTITUTE

The Administration and Management of the Institute vests in the Council, which consists at present of

(1) one representative of the Government of Bombay

(2) two representatives of the Dorab Tata Trust

(3) one representative of the Government of India (so long as the Central Government and/or the Council of Scientific and Industrial Research makes annual or periodic grants to the Institute)

(4) the Director of the Institute.

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* The Trust Deed has since been signed by all the parties. A copy is given at Appendix F.2

In view of the position of the Institute in Indian science, it is unthinkable that the support of the Government of India should cease in future. It has therefore been felt by the Trustees of the Dorab Tata Trust that the Government of India should be given greater and permanent representation on the Council. Accordingly the Trustees of the Dorab Tata Trust addressed a letter to the Government of Bombay dated 12 October 1953 (copy attached - Appendix G) proposing that the constitution of the Council be revised so as to give the Government of India two representatives on the Council*. The approval of the Government of Bombay to this proposal has just been received. In making this proposal it was felt that the Government of India would consider that two representatives would suffice since the Council consists of only six members, of whom three would be Government representatives (two from the Government of India and one from the Government of Bombay), in view of the fact that the Government of India has only three representatives on the Council of the Indian Institute of Science out of a total of seventeen. (Dr. S.S. Bhatnagar has clearly indicated to Dr. Bhabha that in his opinion two should suffice). Incidentally, the present Director of the Institute is the Chairman of the Atomic Energy Commission and is therefore also a representative of Government's point of view. The number of representatives is, however, of little consequence in a Council of this sort, since no single issue has been settled by voting in the last nine years, all matters being discussed and passed unanimously.

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* Subsequent correspondence is given in Appendix D.1

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At a time when the new arrangement and changes in the constitution of the Institute are made, it is desirable that the financial relations between the Institute and the Government of India should be reviewed and simplified. The present grants consisting of block grants and ad hoc grants for specific work should be consolidated into one block grant. Procedures should also be laid down whereby the Institute may undertake new projects initiated either by itself or by the Atomic Energy Commission. In drawing up these financial arrangement importance should be attached to the necessity of providing procedures which are consistent with those followed in the universities and high level academic institutions abroad, and which do not have the ridigity of Government procedure. This is absolutely essential for research at the highest level. To quote from the lecture by Professor A.V. Hill, Senior Secretary of Royal Society to the Science Congress at Delhi.

> "Many of these independent scientific institutions in Great Britain nowadays are receiving substantial state support: but nearly always when this is done a <u>buffer of some kind is interposed to prevent Government support from becoming Government control</u>.
> (Hill's underlining)

For example, the universities in England, including the richest of them like Oxford and Cambridge, depend on substantial Government grants today. Nevertheless, in order to avoid the introduction of Government procedures into university management, the

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grants are not given directly by Government but through the University Grants Commission, which is an autonomous body consisting of men of standing, many of whom are connected with the universities. The Government of India has just appointed a University Grants Commission under the chairmanship of Dr S.S. Bhatnagar for precisely the same purpose, and the Education Minister has given the welcome assurance that this Commission will likewise be completely autonomous.

7. NAME OF THE INSTITUTE

There are two points for consideration

(1) whether the present name should be modified

(2) whether something should be added to the present name

The name of an established institute may be one of its greatest assets. This is certainly so in the case of the Tata Institute of Fundamental Research which has an international reputation in scientific and academic circles second to none in the country. The Institute has established itself during the last 8½ years, and a complete list of papers published by members of the Institute is given in Appendix H. The papers on the theory of the elementary particles and allied nuclear phenomena are studied in other centres of advanced research in the world, and the scientific opinions and advice of members of the Institute have been sought by eminent scientists elsewhere. The experimental work in certain branches, such as in that using the nuclear emulsion technique, has also attracted great attention. This work was reported at the international physics conference in July this year at Bagneres-de-Bigorre in France, and according to Professor Vallarta "was the sensation of the Bagneres conference."

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The School of Mathematics at the Institute has also an international reputation and eminent mathematicians from the United States and other countries come regularly to the Institute for several months at a time. It is probably for this reason that the Secretary of the Indian Mathematical Society referred to the Institute as the "Princeton of India" in his Annual Report to the Conference at Delhi in December this year. The report also acknowledges the part played by the Institute in raising the standard of the journals of the Society. About a year and a half ago the Institute, with a special donation from the Dorab Tata Trust, started a series of International Monographs on Mathematics and Physics which bears the name of the Institute. The first monograph of the series has attracted wide attention, and received very laudatory notices from eminent mathematicians who have reviewed it in mathematical journals. Some of the notices are given in Appendix I. The Institute has now come to the stage where, like the Institute for Advanced Study at Princeton or some of the well known laboratories in England, workers from other parts of the world apply for permission to work at it. Requests have been received from scientists in the U.S.A., England, Israel and Japan. All these achievements are associated in the minds of foreign workers with the present name of the Institute, and it would cause needless confusion to alter the name. Unless there are very strong reasons for a change, it is in the interest of the country and the Government that the present name should be retained.

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There are plenty of precedents for this both in India and abroad. For example, the Gouldas Tejpal Hospital or the Jamsetjee Jeejeebhoy Hospital in Bombay are two of the biggest State hospitals which nevertheless carry their original names. Similarly, the Cavendish Laboratory at Cambridge or the Clarendon Laboratory at Oxford are two of the most famous laboratories in the world, which are supported now almost entirely from public funds. Indeed, in all such cases, especially of famous institutions, the name of the laboratory acquires a significance of its own independent of any association with the name of the founder. I am of view that this is already the position with regard to the Tata Institute of Fundamental Research.

After my first talk with the Prime Minister on this subject in early November, I have discussed the name of the Institute at great length with the senior members of the staff of the Institute, and find that they are unanimously of the view that for the scientific reasons given above the present name of the Institute should not be changed, whatever additions may be made to it. I feel that the view of those, whose ability, enthusiasm and unstinted labour have made the Institute what it is, deserves to be given earnest consideration.

As regards the second point, it may be felt desirable for the benefit of non-scientists to indicate in the title the status of the laboratory in the scientific life of the country and the major support it gets from Government. This objective can be achieved by giving the Institute a second title or adding something to the existing title. It could be laid down by regulation that this double title would be

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used on all papers and documents connected with the Institute including letter-heads etc. and be given as the name of the institution in the publication of scientific papers. Some possibilities have been set forth on the attached sheet (Appendix J).

It has been pointed out in section 4 that the scope of the Institute is not restricted to nuclear studies. Consequently, if the phrase NATIONAL CENTRE FOR NUCLEAR STUDIES or NATIONAL INSTITUTE FOR NUCLEAR STUDIES is to be added, the word AND must necessarily be included to join the two phrases. My objection to this suggestion is only that the work of the Institute in the field of nuclear studies is so to speak taken under the wing of Government, while its other activities in the field of theoretical physics and pure mathematics, which in my opinion are equally important, appear to be left out in the cold.

I, therefore, prefer suggestion 2 to suggestion 1. Moreover, the caption NATIONAL CENTRE FOR ADVANCED STUDI has the advantage of evoking an echo of the Institute for Advanced Study at Princeton, one of the most famous institutes in the world for fundamental research of which Dr J.R. Oppenheimer is now the Director. 2 therefore appears to be an acceptable formula. The word CENTRE has been used in order to avoid repetition of the word INSTITUTE, and seems to be a suitable word in this connection. For example, the research establishment at Saclay of the Commissariat a l'Energie Atomique in France is called the Centre for Nuclear Research. But INSTITUTE may be substituted, if preferred.

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The third suggestion is, in my view, the best solution, since it retains the present name of the Institute as a historical fact rather like the Cavandish Laboratory or the Clarendon Laboratory, but makes clear, by the addition of the phrase NATIONAL RESEARCH CENTRE or NATIONAL RESEARCH INSTITUTE, the position of the Institute in the scientific life of the country and Government's part in it. The phrase NATIONAL RESEARCH CENTRE could be put in the first line and TATA INSTITUTE OF FUNDAMENTAL RESEARCH in the second if it is considered better, though I myself prefer the alternative already given.

In my opinion, the same objection applies to 4 or 5 as to 1, namely that it singles out the nuclear science part, which is only a part of the activities of the Institute. 5 is not subject to this objection as NATIONAL qualifies Fundamental Research. My objection to it is purely aesthetic, in that it does not make an elegant title.

To summarize, in my opinion the acceptable solutions are in order of preference 3, 2, 1 and 4.

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