PISHAROTH RAMA PISHAROTY

(10 February 1909 - 24 September 2004)

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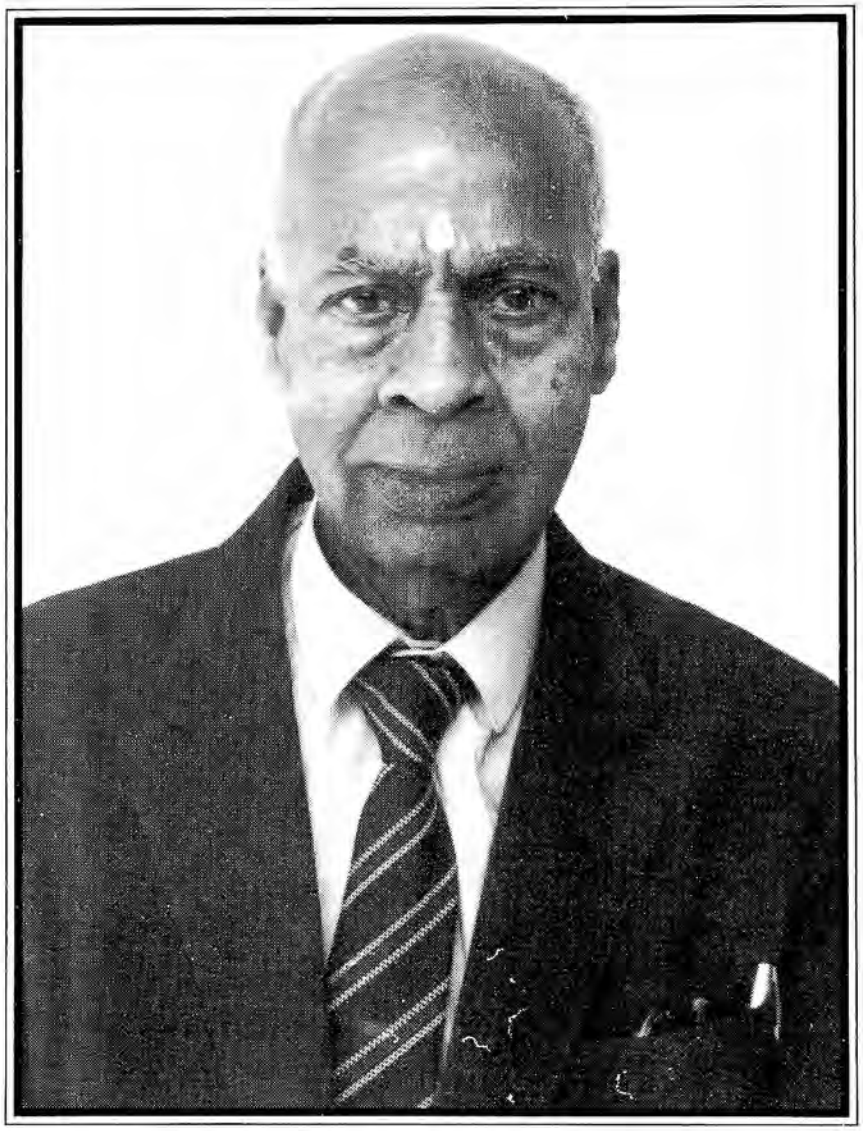

P.R. Pisharoty

PISHAROTH RAMA PISHAROTY

(1909 - 2002)

Elected Fellow 1978

SOME PERSONAL PARTICULARS OF PROF. PISHAROTY'S LIFE

PISHAROTH RAMA PISHAROTY was born on 10th February 1909 at Kollengode (Kerala State). His father's name was Sri V Gopala Vadhyar; his mother's name was Smt. KP Lakshmi Pisharasyar. He had three brothers, the elder brother named Shri KP Chakrapani Pisharoty (born in 1896), and his two younger brothers were Shri KP Balakrishna Pisharoty (born in 1916) and Shri KP Rajagopalan (born in 1920). He had no sisters. Pisharotys' are caretakers of Hindu Temples, also providing the flowers for worship. He had a very religious background, their house being less than 100 yards from a great Temple of Kerala. In the morning, he woke up around 6 AM, with the chanting of Sanskrit and Malayalam prayers which went on inside the Temple. By the age of 15, Prof. Pisharoty had acquired a good grounding in Hindu Philosophy and Hindu way of life. The parents gave the children full freedom of education and occupation.

Prof. Pisharoty's younger brother Shri KPB Pisharoty retired as Deputy Director General Health Services, Government of India. Three of his nephews were all Doctors of Medicine (MD).

Prof. Pisharoty was married on 16th May 1939 to Smt. Droupady Pisharasyar, daughter of Smt. Kochukutty Pisharasyar and Brahmasree AKTKM Ashtamoorthy Namboodiripad. His brothers-in-law were in Public Service: District Judge; General Manager, Telephones; Additional Chief Engineer, Fertilizer Corporation of India; Population Specialist, World Bank.

Prof. Pisharoty had three children: Smt. Dr. Rama Nandakumaran (MBBS), Dr. Narayanan Rama Pisharoty (M.Tech, Ph.D), and Smt. Dr. Jaya Bhat (MD). Prof. Pisharoty made tremendous sacrifices to get all his children well-educated and well-placed in life. Certainly, they were all talented children.

FIRST STAGES OF EDUCAT'ONAL ATTAINMENTS OF PROF. PISHAROTY

Shri Pisharoty was a brilliant student from his Primary school stage onwards. During is secondary school education, he won Competitive Government Scholarship from 1922-1925 till he cleared his SSLC Examination. Although his was an ordinary High School, yet some of its teachers were very brilliant and ambitious

to see that some of their students performed very well in the examinations, particularly in Mathematics and Physics. Shri Pisharoty fulfilled their ambitions and efforts. These efforts also created in Shri Pisharoty a life-long love for Physics and Mathematics.

The family did not have a very comfortable financial position. They lived on meager rations which the family received from the Temple Trust, in return for the general duties performed in preparation for the poojas and offerings made to the Temple Deity. After clearing his SSLC, Shri. Pisharoty wanted to go for college studies but there was no money. After great effort by himself and encouragement from his school teachers, Shri Pisharoty managed to go to Palghat for study at the Victoria College. The Physics lecturer there encouraged him to go for his Bachelor's Degree in Physics to St. Joseph College, Trichinopoly (Trichy) after his Intermediate. His early Physics teachers at Palghat and Trichy, especially one Shri PE Subrahmaniam Iyer, who was a childhood friend of Sir CV Raman influenced him tremendously. After his B.A. (Honours), Shri Pisharoty taught briefly at a Women's college which his mother did not quite like. He moved to Madras to teach at Loyola College, Madras. At this place, Shri Pisharoty very much impressed his students as well as his colleagues. He also completed his M.A. in 1936.

While teaching at Loyola College in Madras, Shri Pisharoty started going during the summer vacations, to Tata Institute (later to be The Indian Institute of Science) at Bangalore, to do research work in Physics under Sir CV Raman. Those were the days of severe economic depression, jobs were rare and salaries very low. Still, inspired to devote himself entirely to research work, Shri Pisharoty gave up the post of Lecturership at Loyola College and lived at Bangalore on a smaller research assistantship under Sir CV Raman, to work for Ph.D. He worked on X-Rays and published a mimeograph in Malayalam on X-Rays. He worked on various properties of light waves and published the following three Papers:

- Laminar Diffraction and the Becke Phenomenon. *Proc. Ind. Acad. Sci.*, 1935.
- Visibility of Ultrasonic Waves – *Proc. Ind. Acad. Sci.*, 1936.
- Young's Modulus of Diamond- *Proc. Indian Acad. Sci.*, 1940.

Shri Pisharoty got married on 16th May 1939. Obviously, his decision to give up Lecturership at Loyola College and to take up a lower-paid research assistantship under Sir CV Raman at Bangalore was taken with the concurrence of his Sahadharmini, Ardhangini, who always supported him in such ventures. She always stood by him, as I could also see during my later contact with Prof. Pisharoty and his family.

Prof. Pisharoty published another five papers connected with X-Ray reflection while working with Sir CV Raman at Bangalore upto 1941.

JOINING INDIA METEOROLOGICAL DEPARTMENT AND GETTING PH.D. FROM UCLA

World War II had started in September 1939. There was great necessity for expansion of India Meteorological Department, particularly for aviation purposes, for which a few meteorologists from Great Britain had come to support Royal Air Force in India. For this work, scientific officers of high-grade were required. In 1941, Sir Charles W Normand, the then Director General of India Meteorological Department approached Sir CV Raman to recommend some young scientists working under him, to join India Meteorological Department. Of course, India Meteorological Department offered far better salaries than what the assistantship under Sir CV Raman could give. As a practical person, Sir CV Raman advised some of his young scientists, including Shri Pisharoty to apply for service in India Meteorological Department (IMD). Shri Pisharoty got the appointment order and joined IMD in 1942. While recommending Shri Pisharoty for a job in IMD, Sir CV Raman had written, "I would include Mr. Pisharoty in a short-list of the ablest men I have ever had working with me. His personal and intellectual qualities are such as to enable him successfully to undertake the highest type of scientific and administrative work."

Almost new to the field of meteorology, Mr. Pisharoty worked very hard to understand the science of meteorology and the practice of weather forecasting. He translated into English several chapters of the German Book dealing with Physical and Hydrodynamical meteorology titled "Physikalische Hydrodynamik", by V Bjerknes, J Bjerknes, H Solberg, and T Bergeron (1933). In Prof. Pisharoty's personal collection, donated by him to IITM, Pune, there are three handwritten volumes of this translation, full-scape size (33 cm x 21 cm), each volume of 470 pages of English translation. From his marginal notes, it appears that Prof. Pisharoty had started this work of translation on 10th August 1944. In my personal view, this is a valuable treasure of IITM of which Prof. Pisharoty was the First Director. Through such serious study, hard work, and also alertness in the forecasting offices, Prof. Pisharoty created an excellent impression about his capabilities and also about the status of India Meteorological Department among the pilots and Commanding Officers of Royal Air Force operating from Indian Airports. While in service in IMD, Mr. Pisharoty also continued his research activities "outside office hours" and authored Technical Note No. 13 of India Meteorological Department titled "Thermodynamic Diagrams and some of their uses" (1946). He also authored a few research papers titled "Combined role of fresh monsoon pulses and easterly waves in the formation of monsoon storms" (1946), "Air masses in tropical cyclonic storm 1948", "Thunderstorms", "Unorthodox westerly disturbances (1951)".

The authorities of India Meteorological Department got impressed by him, recognized the interest and ability of Mr. Pisharoty and sent him to USA on

deputation for 15 months to familiarize himself with recent modern methods of weather forecasting. He obtained his Masters Degree in Meteorology in 1953 from the University of California, Los Angeles (UCLA), during this brief period. The Government of India extended his deputation further and in almost record short time, he submitted his Ph.D. thesis and got Ph.D. Degree from the University of California, Los Angeles (UCLA) in 1954, for his investigation on the Meridional Flux of sensible heat and kinetic energy in the General Circulation of the Atmosphere. His work revealed that the main source of the kinetic energy in the northern hemisphere was from the tropical region between the equator and 30^0N. At that time, UCLA was a leading institution in the field of meteorology, with very eminent meteorologists like Prof. J Bjerknes, Prof. Holmboe, Prof. Charney, and others who were bringing almost a revolution in the field of meteorology. Prof. Charney had revolutionized meteorology with weather forecasting through computers. Dr. Pisharoty was highly respected in UCLA which I could feel even in 1962 when I went there on Post-doctoral assignment, having been a Ph.D student of Prof. Pisharoty.

PROF. PISHAROTY BECOMES FIRST DIRECTOR OF INSTITUTE OF TROPICAL METEOROLOGY (ITM)

The appreciation which Prof. Pisharoty received from very eminent meteorologists of prime institution UCLA, largely influenced Government of India's decision to select Prof. Pisharoty as the First Director of Institute of Tropical Meteorology. This selection also caused some problems for Prof. Pisharoty in India Meteorological Department (IMD), which became too severe for him after the retirement of Shri PR Krishna Rao as DGO in 1965. As the first Director of ITM, Prof. Pisharoty also became well-known at the international level including World Meteorological Organization (WMO). On the International scene, Prof Pisharoty became Member of the Scientific Advisory Board, World Meteorological Organization (1963-1968) and later it's Chairman, a Member of Joint Organizing Committee for Global Atmospheric Research Programme (GARP) from 1969 to 1977, and Vice President of the International Association for Meteorology and Atmospheric Physics (1972-79). He was also awarded the prestigious International Meteorological (IMO) Prize 1989 by the WMO. He held some of these international positions after he had retired from ITM/IMD.

Inside India also, soon after return from UCLA in 1954, Prof. Pisharoty was elected as a Fellow of the Indian Academy of Sciences in 1956. He was conferred Padmashri by the Government of India in 1970. Prof. Pisharoty was also a recipient of Raman Centenary Medal (1988) and Prof. KR Ramanathan Medal (1990) of Indian National Science Academy. His achievements as Director of ITM in India Meteorological Department and later as a part of Physical Research Laboratory (PRL) and ISRO made him a world celebrity in the field of Meteorology and Space Science.

PROF. PISHAROTY RETIRES FROM IMD AND JOINS PHYSICAL RESEARCH LABORATORY (PRL), AHMEDABAD

Prof. Pisharoty retired from the post of Director, ITM, Pune, around December 1966, about two months earlier than his due date of retirement (February 1967) and joined Physical Research Laboratory (PRL), Ahmedabad. His initial post at PRL was Professor of Aeronomy. He was very active in PRL. He shared the office room with Prof. KR Ramanathan. Dr. Vikram Sarabhai had been a student of Prof. KR Ramanathan and had invited Prof. Ramanathan to join PRL immediately after retirement from India Meteorological Department. As such, Prof. Pisharoty also became quite close to Dr. Vikram Sarabhai. Both Prof. KR Ramanathan and Prof. PR Pisharoty jointly helped Dr. Vikram Sarabhai. Prof. Pisharoty was a member of the first team sent by Dr. Vikram Sarabhai in 1969 to Goddard Space Flight Center of NASA in USA to formulate Indian Programme of Remote Sensing by ISRO. In 1972-73, Prof. Pisharoty convinced the ISRO authorities about the importance of inclusion of a Meteorological Payload on the INSAT series of satellites, for the benefit of agricultural output and hence benefit the economy of the country.

SOME OF THE REMARKABLE QUALITIES IN PROF. PISHAROTY

In addition to my own personal experience, I have had the advantage of getting feedback from a number of friends whom I approached to give me some material for this Biographical Memoir on Late Prof. PR Pisharoty; I have used part of that material for this write-up on Prof. Pisharoty. I am very grateful to all of them (Prof. RR Kelkar, Prof. DR Sikka, Dr. ON Dhar, Prof. RN Keshavamurty, Dr (Mrs.) Girija Rajaram, Prof. PP Kale, Prof. GB Pant, Dr. SK Mishra and others). Due to limitation of space allotted to me for this write-up, I am keeping that original material with myself, perhaps to be published later, possibly by myself, in the form of an enlarged Biography of Prof. Pisharoty. Prof. Pisharoty himself practiced and gave advice on the following lines, to those who worked with him:

(i) Sir CV Raman got his Nobel Prize by using not very expensive equipment, but relatively very simple and cheap equipment. He used his brain and bold thinking.

(ii) Prof. Pisharoty had confidence in Indian capacity for doing great things; elders and seniors have to appreciate the capabilities of their juniors, encourage and help them to come up, rise and achieve great things.

(iii) Scientific achievement is far more valuable than getting more money or higher administrative positions.

(iv) Sky is the limit for achievement in meteorology and associated fields like Space Science, Solar Physics, Geomagnetism, and Remote Sensing.

(v) When you were a student, you were taught to believe all that was written in a text-book. In a research institute, you should question everything that you read in a text-book.

(vi) Work on new ideas; test your new ideas through the NWP models.

(vii) During his lectures, Prof. Pisharoty made his points very clear, thought-provoking, and also kept the audience in a happy and jovial mood. Starting with a Sanskrit sloka and also quoting a few Sanskrit slokas in the course of his lecture, he not only excited his audience, but also created respect for ancient Indian culture and knowledge.

(viii) About satellite pictures, he once remarked, "Each satellite image contains millions of bits of information. These images contain solutions. You have to find out and enunciate the problems to which these are the solutions."

(ix) He had beautiful handwriting. He used to say, "the more you write, the better will be your handwriting; and the more you think, the sharper will be your intellect."

(x) To increase the membership of India Meteorological Society, he advised, "Every Indian breathes air and so is qualified to be a member of Indian Meteorological Society. We should work towards enrolling millions of members"

(xi) Once he said, "It is a good idea to draft one's own obituary while one is alive, and try to live upto it. Then, when the time comes, someone else will actually write it and it would ring true".

(xii) His greatness was characterized by simplicity, dignity, and integrity.

(xiii) In office, he was generally very well-dressed.

(xiv) To his juniors, his attitude was affectionate, helpful, and friendly. As such, many regarded him as their Friend, Philosopher and Guide.

(xv) With his simple and apt statements, Prof. Pisharoty could lighten a serious situation and make everyone laugh. He could do this not only in India but also abroad, in international Meetings.

(xvi) Prof. Pisharoty believed that putting a person to do a new job gave that person a quick and good training, than a prolonged routine type of training, like a person learns swimming fast when pushed into a swimming pool during the training for swimming.

(xvii) He expressed appreciation of the good work of his junior colleagues without reservations. This appreciation enlivened the spirit and interest of the junior workers for doing more and better work.

(xviii) To encourage his juniors, Prof. Pisharoty did not hesitate to visit their houses along with Mrs. Pisharoty. This created a feeling of togetherness and family friendship between Prof. Pisharoty and his juniors.

(xix) Prof. Pisharoty was a man of deep and broad vision. With this quality, he became either a builder or an active participant in building a number of Scientific Institutions in India.

(xx) Prof. Pisharoty was always prompt and sincere in helping his juniors when they related their difficulties to him.

(xxi) In respect of his own interest and arousing similar interest in others in meteorology, Prof. Pisharoty quoted the great Sage Varahamihra: "Food is the elixir of life, and food comes from the Rains; so let us investigate the Rains in right earnest."

(xxii) Prof. Pisharoty often said, "Science is our profession as well as our life's hobby. Government is paying us for our hobby. Amount of money which we get from the Government, should not worry us very much; we are being paid for our hobby."

(xxiii) From his experience in UCLA, Prof. Pisharoty had realized the importance of Numerical Weather Prediction (NWP). As the Director of ITM and even subsequently, he wanted to see India coming up fast with NWP models for Short-Range (1-3 days), Medium-Range (3-10 days) and Long-Range (Monsoon Season) forecasting. He enthused persons inside ITM and later at PRL, to take interest in this field of NWP. He also invited very eminent scientists in the field of NWP in USA to visit ITM for periods ranging from a couple of weeks to a couple of years to train ITM Staff in this field. He also arranged the visit of some young persons from ITM to go to USA on training visits for this purpose. He believed that interaction between Indians and top scientists of USA in the field of NWP will raise the standard of young Indian scientists to develop or intelligently adopt others' models and take India forward in the right direction.

(xxiv) As a Member of Joint Scientific Committee of World Meteorological Organization (WMO), Global Atmospheric Research Programme (GARP), and International Council of Scientific Unions (ICSU), Prof. Pisharoty ensured to include Indian Summer Monsoon Studies as part of the First GARP Global Experiment (FGGE). The success of FGGE opened a new era for Global Weather Prediction on Medium-Range Scale to be a reality in Europe, USA, and Japan. This paved the way for National Center for Medium-Range Weather Forecasting (NCMRWF) in India. Professor Pisharoty, supported by Prof. Yashpal, Prof. Gowarikar, and others managed to have a Meeting with the Prime Minister of India, convinced the Prime Minister with well-prepared

slides, that for improving agricultural production in India, we must manage to get a fast Super-Computer from USA, for Medium-Range Weather Forecasting. USA was unwilling to give India such a Super-Computer, but Professor Pisharoty managed to have talks between the Prime Minister of India and President of USA in 1987, India assuring USA that the Super-Computer shall not be used for making a nuclear bomb, shall be used only for Weather Forecasting. The USA Government agreed to sell the Super-Computer under specific conditions of some sort of continual supervision of US Government to ensure that the Super-Computer was being used for meteorological forecasts.

(xxv) In the initial stages, ITM was housed in Ramdurg house next to India Meteorological Department office at Shivaji Nagar, Poona. Prof. Pisharoty had a vision of ITM becoming a large research organization with adequate facilities for field experiments, computer facilities, office accommodation, residential accommodation, student's hostel, and Guest House facilities for visiting scientists. In his own inimitable way, Prof. Pisharoty approached the Collector of Poona expressing his vision of an Institution which would be a place of Pride for Pune. By mutual consultation, the Collector of Pune and Prof. Pisharoty managed to get about 80 acres of land located between National Chemical Laboratory and ARDE. Even with very limited staff which Prof. Pisharoty had at that time to help him in the process of locating and going through acquisition process by the Government, Prof. Pisharoty succeeded in getting about 80 acres of land, of which IMD took about half the land (on the western side of the Pashan Road) and gave the rest to ITM (on the eastern side of the Pashan Road).

(xxvi) When TIFR got a very fast computer CDC- 3600, there was a very positive suggestion that some scientists from TIFR and IMD could jointly work to develop an NWP model for Weather Forecasting in India. For this purpose, even a seminar by a scientist from ITM was arranged in TIFR Auditorium, in which Prof. Bhabha, Prof. MGK Menon, Prof. Pisharoty and Director General of India Met Department (DGO, Dr. C Ramaswamy), from Delhi were present. However, DGO gave cold shoulder to this proposal of joint project with TIFR and said that India Met Dept would do it by itself. Prof. Pisharoty felt very sorry, believing that the country was losing an opportunity for quick progress in NWP and for keeping pace with the rest of the developed world. This was one of the events which caused a feeling of depression in him.

(xxvii) After the retirement of Shri PR Krishna Rao as DGO, Prof. Pisharoty felt very uncomfortable in his position as Director of ITM. He would not unload the burden of his mind to people working in ITM; finally, he became depressed, went on leave for medical treatment in Kerala, returned recovered and soon

retired in December 1966, about two months before his due date of retirement; he joined Physical Research Laboratory (PRL), Ahmedabad as Professor of Aeronomy.

(xxviii) As already stated, Prof. Pisharoty had retired from the post of Director ITM in December 1966. After a few years of experience with ITM as a component of IMD, the Government of India reviewed the situation and came to the conclusion that ITM should be an independent autonomous organization. On April 1, 1971, the Government of India gave ITM an autonomous status with a new name as the Indian Institute of Tropical Meteorology (IITM). The IITM functions under the Department of Science and Technology, Government of India. DGO is the Chairman of the Governing Council of IITM. Prof. V Narasimhan Committee later appointed by Government of India, recommended that DGO need not necessarily be the Chairman of the Governing Council of IITM.

(xxix) A fateful journey to Delhi and back (11th - 13th July 1996)

In our capacity as retired meteorologists, Prof. Pisharoty and myself were invited to participate in a discussion at Delhi, in Defence Ministry in the office of Dr. Abdul Kalam who was then the Scientific Adviser to the Ministry of Defence. The Meeting was to be held on 12th July 1996. At that time, Prof. Pisharoty was about 87 years old and not too strong in physical health. Yet, he accepted the invitation and both of us (Prof. Pisharoty and myself) left Pune together and reached Delhi Airport late in the evening of 11th July 1996. The main subject of discussion was to suggest arrangements by which the Defence personnel, particularly the Army, could effectively handle the problems arising out of severe weather and corresponding hazards in the mountain region, particularly in the western Himalayas. Under the Chairmanship of Dr. Abdul Kalam, participants other than Prof. Pisharoty and myself were Major General Agarwal in charge of SASE at Manali, Dr. SK Mishra (Director, NCMRWF), Dr. RR Kelkar (Director General of Meteorology) and a few other senior officers of India Meteorological Department and Defence Ministry. Dr. Abdul Kalam who had previously worked with Prof. Pisharoty in ISRO, had great respect for Prof. Pisharoty and almost treated him as his Guru. In this vein, Dr. Abdul Kalam called me his Guru-Bhai, since I had done my Ph.D. under Prof. Pisharoty. In the Meeting which lasted for about two hours, it was decided that a separate unit be started to deal with "Severe Weather Hazards in Western Himalayas". In this unit, there should be participants from SASE, Army Personnel in active defence operations who should be given some training in meteorological observations and Weather Forecasting to work in collaboration with NCMRWF and Forecasting section of India Meteorological

Department. We were all happy with the decisions taken. Prof. Pisharoty and myself were staying at DRDO Guesthouse. After the Meeting and the Lunch, Prof. Pisharoty and myself decided that before leaving Delhi, next day (13th July 1996) by afternoon flight, we should write a Report giving specific shape to the proposals which had been broadly agreed to, in the Meeting on 12th July 1996. On the morning of 13th July, immediately after our breakfast, in the Guesthouse, Prof. Pisharoty and myself sat down to write down the Report. We discussed every point which was then hand-written by Prof. Pisharoty. In his beautiful handwriting; a 12-page Report was prepared, containing the decisions and also some suggestions for implementation of the decisions. Continuously at work for about 6 hours, the Report was jointly signed by Prof. Pisharoty and myself; it was ready to be passed on to Dr. Abdul Kalam the next day. Persons in the Guest House expressed their wonder and appreciation of how Prof. Pisharoty at his advanced age of 87 could sit for 5-6 hours continuously and write 12-page Report in his own hand-writing. That 12-page Report handwritten by Prof. Pisharoty has now become an important Basic Document for "Weather Research & Development Centre (SASE)" established at Chandigarh as a result of the discussions and decisions taken on 12th July 1996 under the Chairmanship of Dr. Abdul Kalam. We just reached the Delhi Airport in time and got into the plane for Pune, reaching Pune Airport around 6 PM. At Pune Airport, I was pushing the trolley and Prof. Pisharoty was close to me at my back near the trolley. One young passenger was pushing his own trolley just behind us and seemed to be in a great hurry; his trolley hit Prof. Pisharoty and peeled off the back part of Prof. Pisharoty's skin near the heel. Prof. Pisharoty expressed his annoyance to the young hurrying passenger and told him that the injury could cause him difficulty, as he was a diabetic patient. First-Aid treatment was given by the Airport authorities. By that time, my son had arrived with his car, to take Prof. Pisharoty and myself back to our homes in Aundh. We first went to Prof. Pisharoty's house, took Prof. Pisharoty to his flat on the first floor and informed Prof. Pisharoty's family that he had received an injury near his foot and only First Aid treatment could be given at the Airport. Later, in the evening, I called Dr. Narayan, son of Prof. Pisharoty who had then returned from his office work and I informed him that the bandage was only the First Aid treatment. Dr. Narayan Pisharoty told me that he would take care of it.

After a few days, I learnt that Prof. Pisharoty's injury had not healed up and was taking a complicated turn. I started visiting him more frequently than before and felt sorry that the wound was getting more and more complicated. Under these circumstances, Doctor Mrs. Jaya, the daughter of Prof. Pisharoty came from Bangalore, took her father and mother to her place at Bangalore, where Jaya's

husband was also a doctor; they were treating Prof. Pisharoty in consultation with some other specialists. After a very long process and treatment, including some surgery, the wound got completely healed up. Prof. Pisharoty had become weak and felt rather depressed, due to heavy medication and also due to the feeling that he had become very weak and could not do much as he wanted to do. I saw him in this condition at Bangalore when I went there for TROPMET-97 Seminar in IISC, Bangalore (10-14 February 1997). I used to go to him every evening, either with a friend or alone. After sometime, Prof. Pisharoty returned back to Pune and lived in the same house, not far from my house, along with his family. To cheer him up, and to bring him back to his old form, as far as possible, myself and my office friend used to take my car to his house every day around 11AM, bring him to my house to spend an hour and a half in the company of my office friends, computers and library books. Occasionally, he looked at Satellite Pictures also in the computer. By 12.30, we used to take him back to his house. This was a daily routine for a few months on all working days. Members of his family also welcomed this diversion for him. We had to discontinue this practice when it was found that he had become too weak and he might get a fall in this process, beyond the control of myself and my office friend. Subsequently, I used to go and meet him in his house about once a week in the evening. He welcomed my visit; it cheered him a little. When I could not visit him for a couple of weeks due to my own health, Prof. Pisharoty himself arrived at my residence along with his son, Dr. Narayan, to inquire about my health! I was moved by his anxiety and sympathy for me.

When Mrs. Pisharoty found that Prof. Pisharoty was not picking up, she lost interest in her own life and became sick of liver problem. She went to Bangalore for treatment at Jaya's house; and she passed away at Bangalore. This was a great loss to Prof. Pisharoty.

(xxx) Prof. Pisharoty and Vasundhara Trust

After retirement from PRL, Prof. PR Pisharoty shifted his residence from Ahmedabad to Pune, first in a rented house near Masoba Gate and then to an ownership flat at Chaitraban, Aundh, which was at a walking distance from my residence. Even though retired and more than 80 years old, Prof. Pisharoty used to keep himself active and used to participate on invitation for some seminars in India. After some preliminary discussions and encouragement from Dr. BD Acharya of DST, Delhi, I suggested to Prof. Pisharoty that we may start a Trust at Pune under the auspices of which, his ideas on popularization of meteorology could be implemented for the benefit of society in general and students in particular. We talked to a few friends and finally decided to have a Public Charitable Trust, under the name "Vasundhara Trust" with the primary objective of promoting research and popularizing Atmospheric and Environmental science as an NGO. The following scientists agreed to become the Founder Trustees: Padmashree Prof. PR Pisharoty,

Padmashree Prof. VG Bhide, Padmabhushan Prof. EV Chitnis, Padmashree Prof. PP Kale and myself. The First Meeting of the Trust was held on 27th February 1995. The Trust was registered with Charity Commissioner's office in Pune on 2nd May 1996 under Registration Number E-2245. I was named as the Settler of the Trust. Prof. Pisharoty was the First President of Vasundhara Trust.

Prof. Pisharoty took lot of interest in the work of the Trust. In the Trust files, we have considerable material written in Prof. Pisharoty's handwriting, on the various items of work to be undertaken, including:

(i) Studies of Monsoon Rainfall over Maharashtra

(ii) Air Pollution and Water Pollution in Pune

(iii) Water Conservation: Ground water and Rain water

(iv) Publication of Books and booklets in simple popular language

(v) Use of EMRC located in Pune University, in spreading the knowledge on Atmospheric and Environmental Sciences

Some observational work was also undertaken on Air Quality and Water Quality in Pune with the help of Dr. PN Sen. Pune Edition of daily Newspaper Indian Express of 12th May 1997 gave some publicity to this work.

Marathi translation of Prof. Pisharoty's Book on "Tropical Cyclones" was prepared in draft manuscript form in the beginning of 1997.

PROF. PISHAROTY PRIZE ESSAY COMPETITION

Under the inspiration of Prof. Pisharoty, Vasundhara Trust started Essay Competition for High School students in Pune. The First Essay competition on the subject "Monsoon" was held in the middle of 2002. We got 346 entries of written essays from the students. The essays were examined and "moderated" with the help of Meteorologists of India Meteorological Department and IITM. A short-list of 13 students with best essays was made and the students were interviewed on Saturday, 21st September 2002, at my residence, by the Board of Trustees and some co-opted scientists from IMD and IITM, Pune. Seven students were selected for award of Cash Prizes and Merit Certificates; the rest of the student participants were to be given Certificates of different Grades. We computerized the results and I joyfully took the results to Prof. Pisharoty's residence on the evening of Monday, 23rd September 2002, to show him that we have successfully completed one Essay Competition. I was shocked to know that while moving in his house, he had received a head injury during a fall against the wall; he was in a state of coma! I went with joy; I returned with tears. He breathed his last around 8 AM on Tuesday, 24th September 2002.

During the next Meeting of the Vasundhara Trust held on 14th October 2002, in addition to recording appreciation of Prof. Pisharoty's contribution to the Trust, it was decided by the Trustees that the Essay Competition shall hereafter be named as Prof. Pisharoty Prize Essay Competition. That practice continues till today. We have subsequently held Essay Competition on subjects like "Water Crisis in India- Man-made or Natural? (2003)", "Wind and Wind Energy (2004)", and "Tsunami (2005)". For this last Essay Competition, as many as 503 students participated ! Students, Teachers and Parents are all taking interest. This has proved to be a good way of not only popularizing Science but also of generating interest among the young students for study, written presentation, and oral presentation during interview. The system is not costly at all. The whole process costs between 10,000 and 15,000 rupees, of course, with some voluntary free support from Examiners. This year, Vasundhara Trust has also started a Rolling Trophy for a school whose students, as a group, show best performance.

In my preliminary discussions with Dr. BD Acharya of DST, Delhi, Dr. BD Acharya had mentioned to me and he even sent me some literature which suggested that in course of time, if a Trust is run properly, DST may support its programme on a large scale. Has the time come for DST to assess the utility of this Prof. Pisharoty Prize Essay Competition run by Vasundhara Trust? At the moment, Vasundhara Trust by itself does not have the capacity to enlarge the area of Essay Competition beyond the city of Pune. Possibly, DST or an Organization under DST could use the experience of Vasundhara Trust in running Prof. Pisharoty Prize Essay Competition at Pune and run it, under any name, on a larger scale in various cities of India; the purpose is to popularize science among the young persons and excite them to participate in competitions.

(xxxi) A movie on the life of Prof. Pisharoty

When Prof. Pisharoty was at Ahmedabad, a movie was prepared by EMRC, Gujarat University Unit on "Ashadhasya Pratham Divase", in which Prof. PP Kale interviewed Prof. PR Pisharoty asking questions on his career and his interest in Meteorology, Remote Sensing, ISRO, etc. It is an excellent movie in which a viewer gets reasonably good impression about Prof. Pisharoty's depth of feeling and interest in science and its applications for human welfare.

PROF. PISHAROTY'S SCIENTIFIC PUBLICATIONS

A list of Prof. Pisharoty's scientific publications is given under 'Bibliography' at the end of this memoir. However, in summary, it must be mentioned that he made significant contributions in Ultra-sonics, X-rays, Kinetic energy fluxes in the upper atmosphere, the Monsoons, cloud clusters of the Atlantic and the Pacific oceans, Equatorial electrojet, subsidence and drying up of ocean air while crossing the equator in the lower troposphere from the Southern Indian Ocean and then picking

up moisture from the Arabian Sea and the Bay of Bengal, Remote sensing of vegetation.

In addition to recognized Research Papers published in standard scientific journals, Prof. Pisharoty took great interest in remote sensing of India's natural resources including water and agricultural products. He also encouraged younger scientists in study of Indian Monsoon, floods, droughts, long-term weather and climate forecasting, rocket meteorology, etc. He co-authored, with Dr (Mrs.) Girija Rajaram, the Book "The Earth's Magnetic Field". He also wrote popular books on "Tropical Cyclones", "Meteorology for the Indian Farmers". His every speech at a Seminar on Meteorology became a popular lecture on Meteorology. As written by Prof. BLK Somayajulu of PRL, Ahmedabad (*Current Science*, **Vol. 84, No. 3**, 10 February 2003), "Prof. Pisharoty had a sharp memory for varied meteorological information of significance. His clarity of thought and effectiveness in speaking ensured that he was great force in national and international committees. If he began debating for a project, one could be sure that his recommendation would be approved. A Sanskrit scholar, he could cite the most appropriate Sanskrit sloka in any meeting, be it an international scientific conference or a social function, and instantaneously translate it into chaste English."

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