1. THE GENESIS

Pandit Jawaharlal Nehru inaugurates - 16th September 1960
A landmark in the history of anti tuberculosis movement

1.1 The inauguration

The National Tuberculosis Institute (NTI), Bangalore the dream of several concerned and thinking individuals, became a reality on September 16, 1960, at Bangalore. The Prime Minister of India, Pandit Jawaharlal Nehru, reached 'Avalon' (the Institute premises) at 8.30 a.m. He was accompanied by His Highness (HH) Jayachamarajendra Wodeyar, Governor of Mysore, Sri BD Jatti, Chief Minister of Mysore and a host of other dignitaries. Awaiting their arrival were Sri DP Karmarkar, Union Health Minister; Dr KK Hegde, Minister of Health, Government of Mysore (GOM); Lt Col V Srinivasan, Director General of Health Services

(DGHS); Dr PV Benjamin, Adviser in Tuberculosis (TB), Government of India (GOI); Dr NL Bordia, Director, NTI; Dr C Mani, Director, World Health Organisation/South East Asia Regional Office (WHO/ SEARO); Mr TJ Davies, Chief of United Nations International Children's Emergency Fund (UNICEF) in India; Dr HT Mahler, Senior WHO Medical Officer (MO), staff and invitees[1].

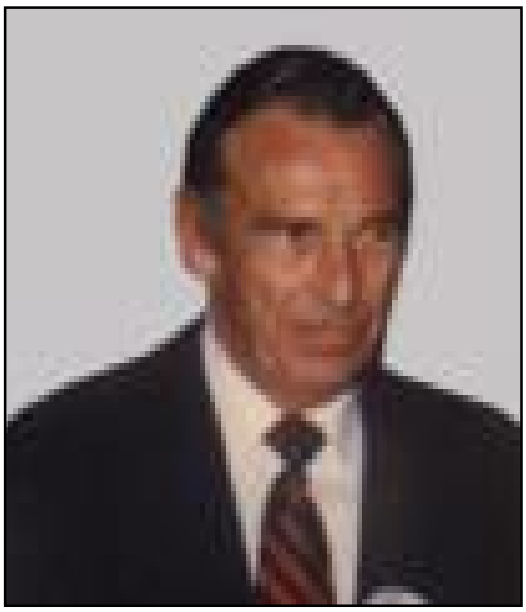
It is difficult to articulate the enthusiasm that pervaded the atmosphere. It was as if the best people had gathered to dedicate themselves to fight the dreaded menace called TB. All the leaders had come in support, with the Prime Minister and Governor of Mysore in the lead. The Indian National Flag fluttered on top of Avalon symbolising that India, through this Institute, would give it a hard try. The entire premises was tastefully decorated for the Inauguration.

On 15th May 1959, the mansion 'Avalon' had been taken over by the GOI. Dr Benjamin, the primary force behind this, was perhaps as eager to acquire it, as was HH Jayachamarajendra Wodeyar to relinquish it. There was some delay because Dr Benjamin had to commute from Delhi, nearly three days away by train, in those days. In fact, the first choice had been the Jayamahal Palace and not Avalon. Dr DR Nagpaul the TB Officer in the DGHS in 1958 mentions in his memorabilia: *In late 1958, Mr Reuben, Junior Architect in the DGHS and I had been assigned to survey the Jayamahal Palace premises for housing the proposed NTI. We arrived at the site and found the premises all locked up. A brief chat with the person running the petrol station located in a corner of the huge estate revealed that we must not entertain the idea of looking inside the palace premises as it was unused for long. We considered the Jayamahal suitable for the Institute. Especially attractive was the long line of stables, built for race horses which could be used for the large fleet of vehicles. The available accommodation would be appropriate after some modifications. The estate was wooded and attractive for use by an educational institution and there was sufficient area to add a few more buildings, like a*

library block, hostels and playgrounds. Returning happy and excited by our findings, we set to work on maps, charts and drawings, consuming litres of brewed coffee till the late evening. When all the "Blue Prints" were ready, I congratulated Mr Reuben on the birth of NTI.

However, in the end, it had to be Avalon and not Jayamahal as was originally proposed. A mini palace, Avalon had marble floored elegant buildings and was located in a 21 acre estate. There were so many trees, that one of the ancient buildings on the north side was called the 'garden house'. The take over was smooth due to the extremely helpful attitude of the GOM. As Dr Kul Bhushan, the Research Officer (RO) for the All India BCG Assessment Team, Indian Council of Medical Research (ICMR) recalls, "*the building should have been taken over much earlier. Dr Mahler and Mr Stig Andersen had already travelled to Bangalore as WHO experts to assist in establishing the Institute. Work did not proceed at a rapid pace even though the government itself was extremely interested. No national officer had been posted till then. There were procedures to be observed in recruiting officials, especially gazetted officers. Dr Raj Narain, perhaps the first national officer of rank to be appointed, arrived much later. Therefore, Dr Benjamin sent me to finalise the BCG Report for the year, and be with the two WHO Officers for some time. Upon my arrival, I saw that they were functioning from a room in Hotel Shilton. They were lodged there and had appointed Mr B Rama Rao as stenographer. They were moving about in their own car because the government had not yet provided them official transport".* Thus, the NTI was actually established in early 1959 in a single room of Shilton Hotel of Bangalore.

Welcoming the august gathering and the Prime Minister, Dr Benjamin said: "... Today, the 16th of September 1960, is a memorable day in the history of anti-TB movement. This Institute is a national institute meant for TB workers from all over. The Institute is a departure from orthodox procedures and a totally new idea is going to take shape. The major objectives, of this idea, are to evolve



Dr. HT Mahler
Sr. WHO Medical officer
Term of office : 1959-1961

Mr. Stig Andersen
WHO Sociologist

through research, a practicable TB programme that could be applied in all parts of the country, to train medical and para-medical workers, and to efficiently apply the methods in rural as well as in urban areas"[1].

Dr Bordia said: "... so far TB services have developed around a few sanatoria in remote places, where treatment of the individual patients was the main aim. Such measures could not reduce the problem of TB in the entire country. Teaching TB in India has been mostly at university centres, medical colleges and in large hospitals and by doctors occupying high positions, who may not choose a career in public health. It is against this backdrop that the NTI has been established to train the required personnel for the control of TB"[1].

Dr Mahler said: "... the first decisive step has been taken to conceive and coordinate in one *national plan*, the elimination of TB as a public health problem"[1].

The Prime Minister declared: "I promised to come here because I

am interested in this fight against TB. When I heard the real purpose of this Institute, it struck me that this was something unique and something far more important than some institute or hospital for treating patients... It is impossible to treat millions of cases by hospitalising them. So you have to adopt some different techniques, some different strategy of approach. Now, when you deal with vast number of people... you cannot do these things in a big way without large scale public cooperation... I welcome this Institute, exactly the kind of thing which vaguely I had thought of without knowing that people who know much more about it, were actually going to do it. Therefore, I welcome it all the more and wish it success"[2].

After the speeches, the Prime Minister inaugurated the Institute by cutting the tape. With the dignitaries following behind him, he entered the premises of Avalon. He visited every section and met the staff who explained the nature of their functions and duties. The Prime Minister's entourage then left, leaving the day for the Director and staff to deliberate along with the TB workers.

Mr S Ramaswamy, an officer from the Health Ministry accompanying the entourage reports: *Avalon, surrounded by vast evergreen wore a bridal look. The atmosphere of the assemblage was serene and silent as if in a chapel, just before the prayer. It seemed that the select gathering of doctors, technical people and interested workers in the field had come here to take a new message, digest it and carry it to the masses with the zeal of one who had discovered the truth.* ***It was not a mela (fair), not a social gathering, not even the opening of a building, but the inauguration of a bold new idea and a radical venture to fight one of the deadliest enemies of the human race[3].***

1.2. In the beginning

The reference section of NTI library contains a carefully stacked and faded mimeographed prized document, *The Plan Of Operations For The National TB Programme (NTP), India*[4]. This contains exhaustive details of the avowed objectives of

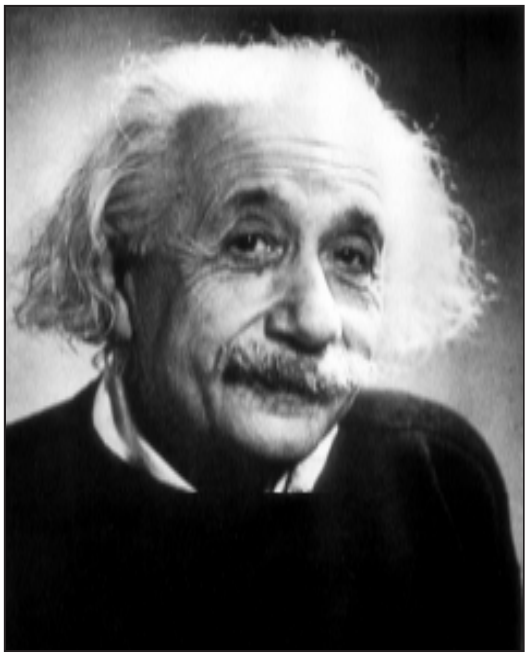
the NTI. If one wants to peep into the beginning, uncertainties creep in. When and where was the NTI born? What necessitated its birth? Who or which agencies endeavoured in formulating its ideology? What made the government set it up? The events are as important as their prime movers. There can be several versions, each as important as its narrator. Therefore, any story narrated will have shortcomings.

Obviously, the most dominant reason was the TB disease itself. With its long history across the world, as the captain of all the killers, (white plague, consumption, or phthisis) TB was a major killer threatening the Indian subcontinent too. TB was known in India as *kshaya,* *j`rajrogamOam{J* *and yakshma* *`j_m*. There are descriptions of a disease closely resembling TB from the Vedic times. The word *kshaya* means literally wasting away, like *consumption,* the name given by John Bunyan of England in the 17th century[5]. Till the middle of the 19th century, the cause was unknown. Hence, virtually any line of treatment was adopted in our country as elsewhere. Noticing multiple cases of pulmonary TB in households, people began to believe that the disease could be hereditary. The disease was feared as much as the taboos woven around it.

Researchers in Europe were the first to act on progressive lines. Rene Theodore Laennec (1781-1826), the inventor of the stethoscope, who himself suffered from consumption, laid the foundations of the knowledge of the etiology of TB[6]. After a series of experiments, Jean Antonine Villemen (1827-1892) demonstrated in 1868 that TB could be transmitted to rabbits by inoculation of tubercular material from human and bovine sources; the disease could later be passed from animal to animal. He said: "(i) TB is a specific infection; (ii) it is caused by an agent readily inoculable; (iii) inoculation from man to rabbit can be readily performed". Villemen predicted that his work would herald *a new era of research that would lead to the prevention and cure of TB.* **In effect, TB comes from TB[7]!**

Dr. Robert Koch
1843-1910

Robert Koch's (1843-1910) first investigations were on the anthrax bacilli. He observed their development from spores by inventing the 'hanging drop' technique. By 1877, he was able to fix smears. He evolved a method for the cultivation of germs on solid media and on coagulated human serum by an astute combination of heat fixing the bacilli to the glass slides and prolonged staining techniques. He, thus, discovered the causative agent of TB. The bacilli appeared brilliant blue and were associated with TB in human and animals[8].



Albert Einstein

1.2.1. Historic announcement

On March 24, 1882, Robert Koch read his paper on "Uber Tuberkulose", in the Berlin Physiological Society. Here, he announced the discovery of causative organism of TB. His discovery was so great that instead of the customary applause, he received an astounded silence. The silence was, however, short-lived. In that hour Koch introduced a totally new era in the struggle

against TB. Its relevance continues till today. He visited Egypt and India in 1883 as the Head of the German Cholera Commission and discovered the *Cholera Vibrio.* He later studied *Rinderpest* in South Africa, tropical malaria, plague and many other diseases. Finding cure for white plague was his foremost concern. An eager Koch announced it in 1890. It was an extract: i.e., a heat concentrated culture filtrate, on which the tubercle bacilli had been grown. However, these modified tuberculins failed as therapeutic agents and brought him some ill fame. Yet, Koch's school of work inspired many facets of research in prevention, control and therapeutic aspects of the disease. He was awarded the Nobel prize in 1905 and was elected to the German Academy of Sciences[9].

1.2.2. Efforts of non governmental organisations

Unfortunately, no cure was found for years to come. Therapy implied isolation in sanatoria, artificial pneumothorax (AP) and thoracoplasty. The eventual death that followed TB, fuelled further taboos. People began to believe that avoidance was the only approach possible. Robert Philip of Scotland (1857-1939) was among the first to recognise that preventive aspects must form an important component of therapy and an *organised effort* was needed to tackle a contagious disease like TB. In 1887, he initiated a well-directed movement. He set up a dispensary for ambulatory care of TB and laid down a standard routine to be followed[10]. Philip's efforts lead to "A national crusade against a national disease" and in 1898, the National Association for the Prevention of TB was born in Edinburgh. In 1900, the Central Bureau for the Campaign Against TB was born in Berlin, which was the forerunner of the International Union Against Tuberculosis (IUAT)[11].

After the First World War, from 1922, the IUAT started playing a prominent role. As governments alone could not effectively take steps, voluntary agencies began to assume responsibility for providing relief. The movement was more often lead by missionaries.

Country after country followed suit in a systematic campaign of public education calling attention to the dangers of the spread of TB, the precautions necessary for its prevention and the possibilities of treatment[11].

In India, the first open air sanatorium for treatment and isolation of TB patients was founded in 1906 in Tiluania, near Ajmer, followed by one in Almora after two years. Both were built by Christian Missionaries. In 1909, the first non-missionary sanatorium was built near Shimla. Upon the earlier work done by Dr Louis Hart from 1908, the United Mission Tuberculosis Sanatorium (UMTS) was built in 1912 at Madanapalle, south India. Dr Frimodt Moller became its Medical Superintendent. This institution and Dr Moller played a large role in India's fight against TB through the training of TB workers, conducting TB surveys (1939) and introduction of BCG vaccination (1948). In addition, the first TB dispensary was opened in Bombay in 1917, followed by another in Madras. Soon anti-TB societies were formed in Lucknow and Ajmer[6]

On behalf of the government, Dr Lankaster conducted a tuberculin survey for several years and published the report in 1921. Due to the high incidence of TB infection, he recommended that the government should work closely with the non-governmental organisations (NGOs) and support their activities. Following this suggestion, India became a member of the IUAT in 1929. At that time, India was a conglomerate of provinces and states ruled by the British. The disease was threatening but funds were scarce. In 1937, Her Excellency Lady Linlithgow issued a public appeal for anti-TB funds on behalf of the government. As a result, nearly a crore of rupees was collected. 5% of this money was retained by the centre and the balance was distributed to the provinces and states. With the help of this 5% direct donation and the King George V Thanksgiving (Anti-TB) Fund, The TB Association of India (TAI) was formed in February, 1939. Her Excellency became the President of the TAI. Dr Frimodt

Moller became its Medical Commissioner and Dr BK Sikand its Secretary. The provinces and states which received money also started their TB associations. The Bengal TB Association, however, had been functioning from 1929, and maintained dispensaries in Calcutta and Howrah. Its activities were strengthened by this funding. Drs AC Ukil and PK Sen were working in Calcutta in the All India Institute of Hygiene and Public Health[12]. In 1946 there were only 6000 beds available for the treatment of TB patients. The Bhore committee[13] estimated that there were about two and a half million patients in need of treatment and half a million deaths annually. For a huge country like India, which included Pakistan and Bangladesh in those days, the sporadic efforts of NGOs were not adequate. The government had to intervene.

However, the issue of diagnosis, let alone treatment, remained unresolved. The diagnostic methods for TB, even as late as 1920s, were ordinary physical examination without X-rays. **Wilhelm Conrad Roentgen** (1845-1923) had discovered X-rays by the turn of the century. Yet, it took some time and many innovations, before the chest X-ray became technically adequate. Only by **1925, chest radiology** could detect a deep-seated area of TB consolidation and thoracic surgeons began to demand X-rays. Even then, Mass Miniature Radiography (MMR) remained a dream until the work of **Manoel de Abreu, a Brazilian physician.** In 1936 with his efforts, the **first X-ray apparatus** of relevance in a collective thoracic survey was introduced in a German hospital of Rio de Janeiro. By 1945, the capability of the apparatus was enhanced to embody the MMR version[14].

As no drug or combination of drugs were effective against TB, the main line of treatment was good food, open air and dry climate. Till the advent of adequate chemotherapy, the treatment took a second place to diagnosis and prognosis. Even great physicians could only advocate vague platitudes like "attention should be paid to the

bowels …… adequate rest, …. etc". The Proceedings of the 1939 TB Conference was awash with physical examination, clinical observation, X-ray examination as a guide to treatment[15]. In 1939, the TAI recommended the Organised Home Treatment Scheme as the best compromise under the prevailing circumstances: the TB Clinic becomes the hub of all anti-TB activities around which such a limited TB programme works[16].

Meanwhile, the Second World War broke out. Fighting diseases took a back seat. However, after the War, even though India was being ruled by the British, it is to the credit of the government that they recognised TB as a major problem. They established a **TB Division** in the DGHS in 1946, with the Adviser in TB as its head. TB was also given a prominent place in the planning. Since the government was not only concerned with TB but with other diseases and health infrastructure, it constituted a committee under the chairmanship of Sir Joseph Bhore. Its secretary was Rao Bahadur KCKE Raja, who as the DGHS, played a dominant role in the TB field during his tenure. Published in 1946, the report presents a harrowing picture. As mentioned earlier there were about half a million deaths from TB and 2.5 million open cases of TB who were continually disseminating infection in the undivided Indian sub-continent. No surveys of sufficient magnitude have yet been undertaken to map out the distribution and intensity of TB infection in the country as a whole. Yet the information available suggests that, the incidence of disease is higher in urban and industrialised areas than in rural regions… existing facilities for an effective campaign …. are altogether meager…. The number of doctors with sufficient experience of TB work to qualify for posts in TB institutions does not probably exceed 70 or 80; fully trained TB health visitors (HVs) are in all probability only about 100… These figures help to indicate magnitude of the task that has to be achieved before satisfactory control can be established over the disease[13].

The Bhore committee placed

Rajkumari Amrit Kaur
President
Tuberculisis Association of India
First Union Health Minister of India

organised domiciliary service at the forefront of the programme. It recommended setting up of a clinic for each district and the use of mobile clinics for rural areas[13].

BCG vaccine, named after the two scientists who developed it, stands for Bacillus Calmette Guerin. First introduced in 1921 in Paris, BCG vaccinations were administered in most countries in Europe[14]. Every one had pinned high hopes on BCG and the GOI followed suit. The BCG work started in India as a pilot project in two centres in 1948. In 1949, it was extended to schools in almost all states of India. Under the aegis of the International

Rajkumari Amrit Kaur addressing the BCG Conference in 1952

Tuberculosis Campaign, which had considerable experience in BCG work in many countries, it was introduced in India on a small scale in Madanapalle with Dr Frimodt Moller in the lead. India started the Mass BCG Campaign in 1951. There was a Central BCG Organisation with one BCG officer, one publicity officer and one statistical officer. A BCG Vaccine Production Centre in Guindy, Madras was set up in 1948. The WHO and UNICEF provided the necessary support. BCG work in India gained momentum[17].

The next issue was treatment. In the 1930s, sulfanilamide and penicillin came into the pharmacopoeia and revolutionised medical practice. Can drugs be found to combat TB? Fortunately, remedies were discovered rapidly. A breakthrough occurred in 1944 with the discovery of streptomycin (SM) by Dr SA Waksman. In 1946, Jorgen Lehmann found out that para-amino salicylic acid (PAS) had a demonstrable bacteriostatic activity against *M.tuberculosis (M.tb)*. By 1950, Dr Domagk et al introduced thioacetazone (T)[18].

The very notion that there can be effective drugs against the tubercle bacilli, was so revolutionary that researchers began to experiment on the effective dosages and combination of drugs to be used. The issue of affordability was also considered[18]. In the 1949 Annual TB Workers Conference, several papers were presented on the effects of PAS and SM on the patients and on the distribution of SM in India[19]. In 1951, Dr BK Sikand, the Director of the New Delhi TB Centre (NDTC) stated succintly in the paper: *Some observations on the organised home treatment scheme in Delhi*. He focussed on the organised scientific diagnosis, modern scientific treatment and economic relief to patients. He summed up his technique as "BCG syringe in the right hand and AP needle in the left"[20]. In 1952, Dr NN Sen presented a paper in the IX TB workers conference on the use of antibiotics and Dr E Nassau on the determination of sensitivity of the tubercle bacilli to SM and PAS[21]. Although Isoniazid (INH/H) was known to medical researchers from 1920 onwards its use as an

antitubercular drug was established in 1952 by Drs Robitzek and Selikoff who revealed that INH is a miracle drug against TB and it continues as such till date.

In 1953, Frimodt Moller and others presented the paper *The effect of SM and INH, single and combined, in the treatment of pulmonary TB in Indian patients* in the conference. They stated: "*The findings of the present investigation has impressed us by the remarkable results caused by the chemotherapy alone....some cases relapsed after treatment was withdrawn, so it can be concluded that chemotherapy may have to be kept up for more than 9 months*"[22]. There were other studies of importance on treatment efficacy presented in the same conference.

In 1956, Drs Sikand and Pamra presented a paper on the "effect of SM, PAS and INH in 703 cases of pulmonary TB, diagnosed and treated during 1951-53". They found that the results of domiciliary treatment were encouraging enough to warrant a shift of emphasis from hospitals and sanatoria to clinics without waiting for any further trials[23].

These studies would, in time, revolutionise the management of TB all over the world. However, it soon became apparent that the tubercle bacilli could not be destroyed easily even with drugs. They had powerful survival techniques, besides developing resistance to drugs. Trials indicated that the newly available drugs, when used singly, were effective only for short periods. To be effective, treatment should be continued for at least 12-18 months. This brought with it several problems. How many patients will continue to take medicines for such a long duration? How to keep track? Further research was, therefore, needed to harness the potential of these newly discovered drugs[18].

In the mean time, the government had established in 1956, the Tuberculosis Chemotherapy Centre, later known as Tuberculosis Research Centre (TRC) in Madras (Chennai), under the auspices of the ICMR, Government of Madras, the WHO,

and the British Medical Research Council (BMRC). This Centre was to provide information on the mass domiciliary applications of chemotherapy in the treatment of pulmonary TB. It demonstrated that the time honoured virtues of sanatorium treatment such as bed rest, well-balanced diet and good accommodation were remarkably unimportant provided adequate chemotherapy was prescribed and taken. Further, there was no evidence that close family contacts of patients treated at home, incurred an increased risk of contracting TB[24]. Therefore, it would be appropriate to treat infectious patients in their own homes.

Dr BK Sikand who had conducted several studies on the treatment and its organisational aspects would often stress: one thing is certain that no drug therapy can be employed to optimal advantage without frequent periodic review of the situation. Effective antibiotics have increased, and not lowered the responsibility of a correct diagnosis, especially when the treatment is to be continued for at least 12-18 months. The patient's willingness to continue treatment for years is in proportion to the physicians conviction that it is necessary and his ability to transfer his belief to the patient[23].

1.2.3. Measurement of TB problem

Even though India was a forerunner in inducting chemotherapy, paucity of funds was a real issue. The sheer inaccessibility of the vast number of patients posed problems of unmanageable proportions. The belief that TB was more urban oriented and concentrated in industrialised pockets could be well founded but was not proved. Data from tuberculin surveys conducted from 1930 onwards indicated that 75% of the population living in industrialised cities, above the age of 15 years were tuberculin positive. However, in reality such surveys had not been carried out in rural areas. What was the prevalence of infection in rural areas? Soon evidence began to pile up to the contrary by way of mass BCG Campaigns. The tuberculin testing done on a mass scale prior

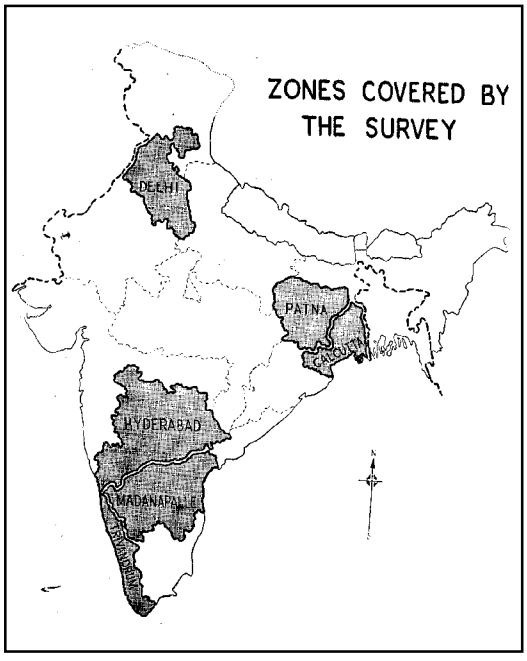
to BCG vaccination for 27,95,904 persons in 18 different parts of India during 1948-49, yielded some results. Dr Benjamin concluded in 1950, that the tuberculous infection is so widespread that no part of the country is free from it[25]. The subsequent BCG campaigns revealed similar findings. However, this needed to be checked by scientifically conducted surveys. From 1938, surveys were conducted in many parts of India by motivated TB workers, e.g., Dr Benjamin, 1939; Drs PC Ukil and Sahani, 1941; Dr Aspin, 1945; Dr Frimodt Moller, 1949; Drs Sikand and Raj Narain, 1952. However, different workers had their own survey plan, methodology and target group such as police, gurkha regiment and labour units. Each survey yielded valuable information and indicated a very high morbidity (sickness) rate, from 2.3 to 7% of the population studied. These failed to provide adequate information for estimating the incidence of TB in the general population. In 1952, Dr Frimodt Moller conducted a survey in a rural population of 34,000 persons living in 175 villages around Madanapalle, south India. The mortality rate in this group was 0.42% and tubercle bacilli were demonstrated in 0.24 %[26,27].

1.2.4. Planning of national sample survey

For a country as large as India, this sample of one area was inadequate. Reliable information on the magnitude and extent of the disease in the various cross sections of the population was required. This was not an easy task. Apart from resources, trained personnel to conduct large scale surveys was not readily available. In the post-independence period, Pandit Jawaharlal Nehru was eminently suited to harness the patriotic fervour as well as available talent in the country. Raj Kumari Amrit Kaur was the Health Minister and KCKE Raja the DGHS followed by Lt Col CK Lakshmanan, and the recently created TB Division was headed by Dr Benjamin. By any standard, this was a rare combination at the helm of affairs of any country. Even UNICEF and the WHO were eager to provide the required support.

A special committee of the ICMR

was set up to address the issue of obtaining this information expeditiously and rationally. It decided that a systematic survey on a countrywide basis should be undertaken. There were many obstacles, technical as well as non-technical. However, through the government's efforts all obstacles were removed and the best of people got to work under the auspices of the TB sub-committee of ICMR. The pace was hastened by India's decision to host the International TB Conference (ITC) to be held in New Delhi, early in 1957. Dr Benjamin was to be the President. Both the central and state governments cooperated in this major effort. Necessary money was procured, essential staff recruited were quickly trained at Madanapalle and New Delhi, where considerable experience of conducting surveys with MMR was already available. A rigorous time schedule was prescribed; and the proposed field work was to be completed in about two years time, i.e., from 1955-57. Seemingly unsurmountable impediments were somehow overcome. Six teams equipped with mobile X-ray units and laboratory facilities started field work as per schedule in six zones. Despite all odds, the field work was completed in two years time. It took one more year to write the report.



NSS Area Map

1.2.5. Findings of national sample survey

After the exhaustive analysis as a special report: *TB in India - A National Sample Survey (NSS) 1955-58* was released by the Minister for Health on 1 May, 1959[28]. Its findings were:

1. Among 1000 persons there were

2-8 persons bacteriologically positive, i.e., persons in whose sputa TB bacilli were demonstratable.

2. *Among 1000 persons, 13-25 showed active or probably active disease, indicating that they were suffering from the moderately advanced disease, requiring treatment.*

3. *The disease was more or less equally prevalent in cities, towns and villages.*

4. *The disease prevalence was lower for females than for males, specially in the age group above 35 years.*

The NSS scientifically revealed what was common knowledge for some time. The government could not be complacent. Action on a massive scale was needed. What kind of action? Who should take it? In fact, the problem was so large that no amount of expansion on formal lines viz., more sanatoria, more TB clinics would suffice. The findings of NSS and TRC revealed that the control of TB would require a totally new approach. The focus should be on the preventive aspects: to find and deal effectively with potential cases. Such work must be done on a community basis, especially in the hitherto neglected rural areas. A National TB Training Centre must be established, to develop the modus operandi of such work and to train personnel who would translate the tasks as envisaged[25].

The objectives with which the TRC was established were limited in scope and content; despite being important could not be assigned the work of developing a nationally applicable programme. Intense discussions followed. As stated earlier, Dr Mahler and Mr Stig Andersen were already working in India for the BCG Campaign. They had toured the country extensively and had acquired first hand knowledge about the land, the people and their behaviour. Dr Nagpaul had joined the TB Division in the DGHS which had Dr Benjamin as Adviser. There were many supporters like Mr TG Davies of UNICEF and Dr C Mani of the WHO-SEARO. With Dr Benjamin

as the driving force, the government found the necessary support from the WHO and the UNICEF. In 1958, it reached an agreement, most of which is enshrined in the *Plan of Operations*[4]. Work began in right earnest for establishing the NTI.

As Dr Nagpaul recalls in 1998: *But why did India need NTI? Sometime in 1954, at Jaipur in Rajasthan, I was called to the office of Dr Kelavkar, Director of Health Services (DHS) to discuss the problem of TB. In his office, I was introduced to Dr Halfdan T Mahler, WHO MO, who had come to introduce the Mass BCG Campaign in Rajasthan. I confessed that my knowledge about BCG was quite academic, my interest in the subject was minimal. As a surgeon, I was already neck deep in setting up thoracic surgery facilities in King George V Sanatorium, where I was the Medical Superintendent. I was advised by Dr Lodha, his Deputy, to accept a position in the TB division because in Rajasthan there was hardly any one who knew anything about BCG in early fifties. Giving up surgery for few months, I spent a lot of time with Dr Mahler in the field to find out that he was not a TB worker but a dynamic public health person. He left behind two public health nurses, one of whom was Ms Moller, a sister of Dr Frimodt Moller of Madanapalle sanatorium, to show me how the campaign was to be organised and supervised. In my last meeting with Dr Mahler at Deeg, he asked me why I had taken so keen an interest in a public health oriented programme when I was a surgeon. I told him about my personal disillusionment with surgery for TB and my plan for organising a network of TB clinics in Rajasthan, if only the state government would let me do so. Perhaps, that message got stuck in Dr Mahler's mind as he returned to Delhi.*

Early in 1955, I heard from Dr PV Benjamin, asking whether I would be interested in going over to the Centre (GOI) to help organise a network of TB clinics in the country, as recommended by the Bhore Committee. For a couple of years, I had gone round the states looking at how the existing TB clinics were operating, when I was asked to go to West Bengal to report on the care being given to TB patients in the Refugee Camps. Before leaving, Shri Dharam Vira, then Rehabilitation

Secretary wanted the impression to be checked that a considerable number of the TB patients were actually masquerading as TB patients in order to get additional benefits. I came back completely confused, frustrated and somehow convinced that we were not doing the right things for TB patients. Dr Benjamin listened to my account in silence: He neither endorsed my view nor contradicted me. However, a few months later, I was asked to work with two WHO experts, Dr Mahler and Mr Stig Andersen, a Sociologist, in order to prepare a plan for control of TB and care of TB patients which is more suitable for Indian conditions. At the end of three or four months of continuous application, we came up with a ***plan of operations*** *which could be submitted to the GOI and the WHO as well as the UNICEF for approval and support. The Plan centred around the creation of an institute to provide the required answers.*

1.3. The early days

Dr Benjamin may have been dissatisfied that he could not send national officers to Bangalore to set up the NTI; or at least somebody with Dr Mahler and Mr Andersen. The latter may have felt that the government was being tardy. In fact, the contrary was true. By the inauguration day, most sections were operational. A tuberculin survey in Bangalore city and surrounding areas was in full swing and the next operational study was being planned. Many new recruits had received field training. A methodology to train key personnel was being evolved. These tasks were not easy.

Further, Avalon was not really built for a TB institute, but for the princely family members to live in. Though the campus was adequate for the present needs of the institute, certain modifications were needed. This was a time consuming process because the architects had to come from Delhi and their plans had to be approved and sanctioned by the government. They commissioned suitable alterations in the main building so that it became more functional, and drew up plans for the conversion of the entire single storied rear block to house the laboratory. This proved

to be a very difficult task because, it had to accommodate a national laboratory consisting of an incubation chamber, a cold room, a sterilisation room and a gas plant hut, amongst other things. In front of the main building on the slopes of the southern side, they planned a temporary hostel to accommodate about sixty trainees who would be deputed shortly by the various state governments. These plans were approved, necessary budgets sanctioned, modification work began late in 1959 and was completed by August 1960. A remarkable achievement considering that even a direct telephone connection from Bangalore to New Delhi did not exist in those days[29].

Since the NTI would be unique as compared to other institutions engaged in TB work anywhere, the organisational set up would have to differ. It would have a national director who would be in-charge of all operations, would represent the GOI and would execute the objectives as envisioned in the plan of operations. There would be an epidemiologist, for studying the disease dynamics of TB as it existed in the community. A control officer would be appointed to devise the means to seek out the patients rather than await their arrival at the hospital. He/she would formulate a methodology to enlist sustained cooperation of the patient and the family during the prolonged treatment period. A bacteriologist would head research oriented needs of a national laboratory. Training was also the responsibility of the control officer assisted by all the concerned sections. The director would also be assisted by a sociologist, so that the social ramifications would be understood and if feasible, woven into the strategy. This proved to be the most radical inclusion of all. There would also be a full fledged statistics, X-ray, administrative and transport sections. Library and hostel facilities would also be available (Annexure I, p 3).

Getting suitable persons for key positions was not easy even for Dr Benjamin who had perhaps the full support from the government. The concept of fighting a disease with the community as the basis,

was just taking root. So, even in the late fifties it was far easier to find experts in clinical medicine; in sociology; in mathematics and statistics. It was very hard to find people with experience in public health. It was the sick and not the healthy that concerned the clinicians. The preventive aspects were neglected because most hospitals, clinics and surgeries were overflowing with the sick.

Doctors felt more important amidst such surroundings. A thoracic surgeon who drew crowds had more prestige than the physician who was advocating tablets and injections that were being developed and whose potentials were still experimented upon. Much less acclaimed were people who thought about healthy persons and preventive aspects of health.

The NTI had to develop feasible ideologies in TB control which would render justice to any person contracting TB anywhere in the country. Therefore, it needed people who could understand and develop public health methods in TB control. They would initiate research in the development of such a methodology, train large number of key personnel from various states of the country who would in turn implement and practice the methodologies taught.

While Dr Benjamin was trying to get talent from Delhi, Dr Mahler

Dr. P.V.Benjamin, Adviser in TB
Father of Anti-TB movement in India

and Mr Stig Andersen were trying to get it from Bangalore. While with the Director of Health Services, GOM once, they chanced upon Dr K Padmanabha Rao who had just returned from England after training in bacteriology. They seized this opportunity and arranged for Dr. K.P.Rao to join the NTI as bacteriologist without delay. This was, as later events proved, a highly wise move. Dr Rao worked very hard in setting up the laboratory which could handle a large number of specimens. His dedication was such that he would not hesitate to clean the laboratory or lift a load. As a result, the staff had no choice but to follow his lead.

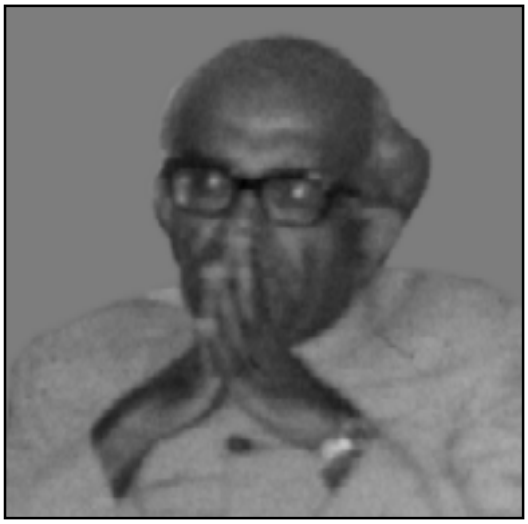
Dr Rao was ably guided by Dr Nassau, bacteriologist, sent by the WHO as a short term consultant. Mr Cobbold, laboratory scientist was also sent by the WHO to assist them in setting up the NTI laboratory. Others sent by the WHO were Dr A Geser (epidemiologist), Dr Spadoni and Dr M Piot (MOs), Mr Kroezen and Mr Ernborg (X-ray engineers), Mr HT Waaler (statistician), Mr I Thorup (field investigator - FI) and Ms I Mundt, J Mclary and D Rangaard (public health nurses - PHNs)[29].

On its part, the GOI sent Dr NL Bordia, a surgeon of renown as the NTI's first director; Dr Raj Narain

Dr. NL Bordia
First Director & Father of NTI
*1959-1962**

* : Term of office

Dr. Rajnarian
Father of Epidemiology of TB in India &
Director, NTI
*1962-1963**



Dr. D Banerji
Sociologist

Dr. K Padmanabha Rao
Bacteriologist

who was working in the NDTC as epidemiologist; and Dr D Banerji, who despite being a doctor working in Himachal Pradesh had trained himself as a sociologist. In later years, both these men were destined to attain much distinction for doing original work in their respective fields. Besides doctors, several others: PHNs, X-ray technicians (XTs), laboratory technicians (LTs), HVs and others working in the NDTC or UMTS, were recruited. Dr MV Jambunathan, a professor of statistics was persuaded to head the statistics section. Dr GVJ Baily, who was with the GOM, Dr P Chandrasekhar, who was working at UMTS, were taken as MOs (assistant surgeons). Mr R Kapoor joined as assistant training officer and Mr KL Rajan as the administrative officer (AO). Simultaneously, action was also taken to recruit 75 technical, 15 non-technical and 31 Class IV staff either through advertisement or the regional employment exchange[29]. The GOM extended its cooperation by placing at the disposal of NTI, the services of three BCG teams, one bacteriologist, one team leader and four HVs. It also agreed to develop the Lady Willingdon State Tuberculosis Demonstration and Training Centre, later known as the Lady Willingdon State Tuberculosis

Centre (LWSTC), Bangalore under the guidance of NTI and recruited the necessary staff for it[30].

The government initiated action in the purchase of immovable assets like office furniture, books and special equipments. The UNICEF started sending equipments like X-ray machines, calculating machines, BCG kits, spare parts. As regards X-ray, a Siemen's mobile unit mounted on a Bedford truck and Watson mobile unit mounted on two Landrovers were imported. An old unit (IGE, mounted on a big bus) stationed at Hyderabad was requisitioned. It took a lot of ingenuity to get these machines going. The X-ray section had a tough time in repairing these units. Often the engineers had to work the whole day and late into the night to get the machines ready for the next day's field work. These machines were made in Europe and contained hundreds of small parts. Should a part fail, the machine failed. If the faulty part was not in stock, work would be stalled for weeks or months till the part was imported from the manufacturers[29].

Besides the three X-ray vehicles, there were 43 transport vehicles, jeeps, landrovers, station wagons (with trailers), three wheeled lambrettas, motor cycles and a chevrolet sedan. All the vehicles were being used by the field teams and officers continuously. The maintenance of such a large number of vehicles proved to be a tremendous administrative problem apart from the expenditure incurred in their upkeep. Efforts to build an automobile workshop where minor repairs, servicing could be done, were unsuccessful for want of mechanics and supervisory staff. The difficulties of establishing the Institute were truly immense. As summarised by Mr DP Karmarkar, Minister for Health, GOI: *We had our difficulties in starting this Institute; we had to find suitable accommodation and to look into many details associated with starting a new institution. We are extremely grateful to the GOM for acquiring for our use a palatial building and the WHO for loaning to us the services of some of their experts. They are working side by side with our Indian staff in the field, especially rural areas, putting*

up with difficult conditions without any hesitation. An institute of this type, meant to carry out a programme of community TB control, needs large supplies of equipment and transport and all these have been provided generously by the UNICEF. I would like to express my appreciation to all these bodies for the help they have rendered in making it possible for us to start this all India institution for the control of TB in the country[31].

Finally, NTI started functioning on schedule. It is best to excerpt a quote by Dr Benjamin in the editorial of the Indian Journal of TB (IJTB)[32]:

We believe, the NTI will be a landmark in the history of anti-TB movement in this country, and probably in some other countries also. Though it is well known for many years that TB is a social problem, efforts to control it were mainly directed towards diagnosis and treatment of the disease, and that too in hospitals and sanatoria. The Institute attempts a departure from this orthodox procedure.

This venture is a novel and pioneering one. There are still several hurdles to overcome. It would be appropriate in this connection to remind ourselves of a message given to the nation by Pandit Jawaharlal Nehru many years before Independence. He said: "Success often comes to those who dare and act; it seldom goes to the timid". The establishing of this Institute is a bold step, and we hope to succeed.

Mr. HT Waaler
Statistician

Dr. MV Jambunathan
Senior Statistical Officer

Benjamin no more

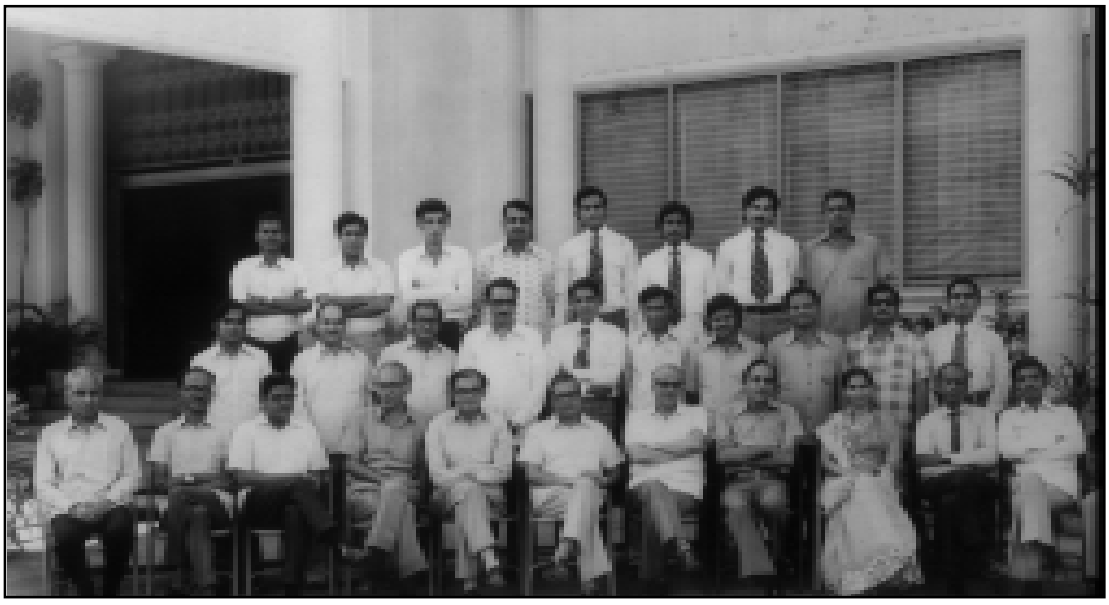
When he passed away in 1973, in an obituary, IJTB wrote: "Dr Benjamin was regarded as the 'Father' of the anti-TB movement in India and as an elder statesman among international experts[33].

Dr Benjamin was a fighter of TB. After his MBBS degree (1921) he went to Cardiff (England) to take his Diploma in TB Disease (1931). He became the Medical Superintendent of the UMTS at Madanapalle, which was destined to undertake pioneering work in TB. He conducted a TB survey in Madras as early as 1939, and presented a paper. He became the Medical Commissioner to the TAI in 1941 and later its Technical Adviser (1944). He then became Adviser in TB to the GOI (1948) and continued to inspire TB workers. As Adviser, he presented a summary paper on TB every year, and was always inspiring further research ideas. He was the Editor of the IJTB (1953-64). He was the moving force behind the introduction of the Mass BCG Campaign in India; setting up of the Mehrauli TB hospital, now known as Lala Ram Sarup Institute of TB and Allied Diseases (LRS); resource upgradation of the TB services in the NDTC; in persuading several universities to start post-graduate and under-graduate education in TB. Being a member of the Health Planning, in the Planning Commission, he was instrumental in initiating the ICMR to undertake the NSS and finalising its reports. And finally, Dr Benjamin was responsible for the establishment of the TRC at Madras and NTI at Bangalore.

No wonder he was an international figure. He was a delegate to the First Empire TB Conference held in London in 1937 and was closely associated with the IUAT of which he was a member of its executive body and was its president (1955-57). He presided over the XIV ITC held in New Delhi (1957). He was a member of the WHO Expert Committee on TB for a number of years. He was a recipient of the Kaiser-I-Hind Gold Medal (1945), Sir Robert Phillip Gold Medal (1955), Padmashree (1955), and the TAI Gold Medal (1969). In his presidential address, TJ Joseph said "Padmashree sounds like a cultural award. For a person who is the spearhead of a vigorous campaign against a virulent enemy, something like 'Veerashree' …वीरश्री……would have been more fitting".

Even after retiring from active service (1963), he often visited NTI making enquiries on the current work in progress and offering guidance. Most of the times, Dr Benjamin was satisfied because the achievements of NTI matched his expectations. There were times too, when he would put pressure if he found the work slow or lacking in substance. Constantly remembered and revered at the NTI, the photograph of the late Dr Benjamin adorns the cherished place in the committee room of the NTI, where most technical and sometimes important administrative meetings are held.

Group Photo of XXXV Training Course (DTO's) 7th Feb - 7th May 1977



Sitting L to R — Dr. T.B. Chhetri, Mr. V.A. Menon, Mr. N. Naganathan, Dr. B.C. Arora, Dr. Kul Bhushan, Dr. N.K. Menon (Director), Dr. G.D. Gothi, Dr. K.S. Aneja, Dr. (Mrs) P. Jagota, Dr. N.M. Sudarsanam, Dr. H.R. Raj Mohan and Dr. S. Dwarakanath.

Standing (1st Row) — Dr. E. Chandrasekaran, Dr. G. Saproo, Dr. S.B. Pande, Dr. M.J. Kochak, Dr. Padmanabhan, Dr. C.L. Prasad, Dr. K.K. Paria, Dr. K.N. Rao, Dr. R.F. Jain and Dr. N.P. Dubey.

Standing (2nd Row) — Mr. M. Sonappa, Dr. A. Akaram, Dr. M. Gohain, Dr. S. Prasad, Dr. M.I. Akhtar, Dr. R.C. Sharma, Dr R.K. Chaturvedi and Dr. T.B. Singh.

1.4 Memorabilia

Mr B. Rama Rao
former Sr PA to Director,
21.9.1994

'You boy!' the foreigner, whom I later came to know as Dr HT Mahler, told me, 'You have made a mistake. You have wrongly spelt the word pulmonary'.

I wanted to be annoyed but couldn't, because the face was amiable. I was not interested in the job but was persuaded to consider it by our family friend, Dr Iyengar, the State BCG Officer.

I replied: 'It is a new word for me. I am not well versed in medical words'. Why couldn't you ask for a dictionary'?

'Dictionary! In India we don't ask for a dictionary in an interview'.

Both the officers had a hearty laugh. Then one of them told me: 'Okay, from tomorrow you are hired'!

His voice now was so earnest, I couldn't utter any other word other than nodding my head. I was unaware of who was hiring me, whether WHO or GOI and on what salary.

Though I did not understand many things they did, I knew they were available for consultations and were possessed with the idea of building up some concrete programme for our country. On every important issue, they would consult others and finally Dr PV Benjamin.

Today, after serving the Institute for 34 years, I consider that I was privileged to be hired on that day, by those two WHO officers. Where else could I have seen giants like Mahler, O'Rourke, Raj Narain, Nagpaul, working at such close quarters? Their very functioning would enthuse the staff. It is in such functioning the institute's glory lies.

संस्करण

श्री.बी. रामराव
निदेशक के भूतपूर्व वरिष्ठ व्यक्तिगत सहायक
२१.९.१९९४

डा.एच.टी. माहलर जिन्हे मैं विदेशी समझता था, उन्होंने मुझे सम्बोधित करते हुऐ कहा कि ऐ लड़के तुमने पलमोनरी शब्द की स्पेलिंग गलत लिखकर, एक गलती की है । मैं चिढ़ने वाला था परन्तु उनके ओजस्वी चेहरे के सामने ऐसा न कर सका । यहाँ कार्य करने की इच्छा न होने के बाद भी मैं यहाँ मेरे एक पारिवारिक मित्र डा. आइंगर राज्य बी.सी.जी. अधिकारी के सौजन्य से आया था ।उनका दबाव डालने के कारण मैं यह इन्टरव्यु देने आया था। मेरे लिये यह एक नया शब्द है, मुझे चिकित्सीय शब्दों की जानकारी कम है, मैंने उत्तर दिया । तुम ने शब्द कोश क्यों नही मांगा ? शब्द कोश ! भारत में साक्षात्कार के समय शब्द कोश नहीं मांगते । दोनों अधिकारी उन्मुक्त होकर हँसे और उनमें से एक ने कहा ठीक है, तुम कल से नौकरी पर आ सकते हो । उनकी स्पष्ट वाणी के आगे मै एक भी शब्द न बोल सका और खुशी से स्वीकारात्मक रूप से सिर हिला दिया। मै उस समय यह भी नहीं जानता था कि मुझे कौन नियुक्त कर रहा है, विश्व स्वास्थ्य संगठन या भारत सरकार और मेरा वेतन क्या होगा? अपने कार्यकाल के दौरान उनके साथ काम करते समय मै उनके बहुत से कार्यों को वास्तव में समझ नहीं पाता था । परन्तु यह जानता था कि वह हमारे देश के लिए किसी महत्वपूर्ण योजना बनाने हेतु अग्रसर थे । वह सदैव परामर्श हेतु उपलब्ध रहते थे, प्रत्येक विषय पर दूसरों से विचार करते थे और अन्त में डा.पी. बेन्जामिन से विचार करते थे ।

संस्थान की ३४ वर्षों तक निरन्तर सेवा करने के उपरान्त आज मैं सोचता हुँ कि यह मेरा सौभाग्य था कि उस दिन उन दोनों अधिकारियों द्वारा मुझे नौकरी दी गयी और मेरा साक्षात्कार माहलर और ओ', रुरक जैसे महान हस्तियों से हो पाया । वरना ऐसा कहाँ सम्भव था, कि मुझे श्री.डा.राजनारायण एवं श्री डा.नागपाल के इतने निकट रहकर कार्य करने का मौका मिलता। उनकी कार्य करने की शैली समस्त कर्मचारियों को प्रेरित करती थी । उनकी प्रभावशाली कार्यशैली के कारण ही इस संस्थान की कीर्ती स्थापित है ।

Mr. Rajan Mathew,

former Senior Technical Assistant (Bact)

(1994)

Way back in 1958, I was working as a LT in the NDTC. As the institute was being established in south India, near my home in Kerala, I managed to join NTI as LT on 1.9.1959. The next day, I was promptly despatched to the field to Sira taluk in Tumkur district. The work was very tough and sometimes we would work the whole day. All of us were brought back from the field just before the inauguration. Amongst other things, I remember His Highness the late Maharaja of Mysore, the then Governor of Mysore. I felt he was a born king, a real Maharaja, a personality born to rule and to give. He was very amiable and generous too. When he spoke, his voice was loud and clear. He looked so dignified, distant and yet so near. I felt sure that if the staff coming from different parts of India asked for a favour, he would readily do.

Today, after 34 years of serving NTI, I state that I am lucky to get into the Institute. A boy then who could not face a group of people way back in 1958, today I can take a whole class for two or three hours continuously. In the TB field, I can say that I am quite competent and the laboratory work done here is very diligent and of high standards.

श्री. राजन मैथ्यु
भूतपूर्व वरिष्ठ तकनीकी सहायक
जीवाणुविभाग (१९९४)

सन् १९५८ मे, मैं नयी दिल्ली क्षयरोग केन्द्र पर प्रयोगशाला तकनीकी के रूप में कार्यरत था । दक्षिण भारत में यह संस्थान मेरे गृह राज्य केरल के पास होने जा रही थी और मैंने १.९.१९५९ को प्रयोगशाला प्रविधिज्ञ के रूप में राष्ट्रीय क्षयरोग संस्थान में साक्षातकार देकर कार्यसेवा करने की सफलता प्राप्त कर ली । दूसरे दिन ही मुझे तुमकूर जिले के सीरा तालुक मे कार्य करने हेतु भेजा गया । कार्य की कठिनता के कारण मुझे पूरे दिन व्यस्त रहना पड़ता था। उद्घाटन के दिन हम सभी क्षेत्र से वापिस लाये गये । तत्कालीन मैसूर के महामहिम राज्यपाल दिवंगत महाराजाधिराज को देखकर मैंने सोचा कि वह जन्म से राजा थे और राज्य करने हेतु ही पैदा हुए थे । वह प्रसन्नचित्त और उदार थे उनकी वाणी ऊँची और स्पष्ट थी। वह दूरस्थ होकर भी अति निकट प्रतीत होते थे । उनका व्यक्तित्व ऐसा लगता था कि यदि कोई उनसे कुछ भी माँगता तो अवश्य दे देते । परन्तु हम लोग अपनी कठिनाइयों को अपने आप निपटाने का प्रयास करते हुये राजकीय कार्यों के प्रति समर्पित थे ।

आज राष्ट्रीय क्षयरोग संस्थान की ३४ वर्षों की सेवा के उपरान्त मै यह कहता हूँ कि मुझे संस्थान में कार्य करने का सौभाग्य प्राप्त हुआ । सन् १९५८ मे एक लड़का जो एक छोटे से समूह का भी सामना नहीं कर सकता था । आज १९९४ मे २ या ३ घन्टे की कक्षा ले सकता है । क्षयरोग के क्षेत्र में मैं निपुण हूँ और यहाँ की प्रयोगशाला का कार्य कौशल पूर्ण एवं उच्चकोटि का है ।

Mr. B Rama Rao
Senior PA to Director

Mr. Keshava Murthy
Sister Tutor