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The Nilakantan Papers **A compelling account of the career of NAL's first Director**



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Dr P Nilakantan was NAL's first Director (1959-64) and, in many ways, its founding father.

In the past few weeks I have found it fascinating to browse through the Nilakantan files, still remarkably well-preserved in the NAL archives. The files contain excellent material especially about the last ten, and probably the most tumultuous, years of Dr Nilakantan's life.

Scientific Assistant, Scientific Officer

One started looking into the files to get a more authoritative account of Nilakantan's accomplishments: the obituary notice in NAL's Annual Report of 1964-65 (Dr Nilakantan died at Coimbatore on 18 April 1964, just a day before he would have turned 54 years old) was disappointing; the details in the database of the Indian Academy of Sciences were more complete, but still very brief. Just when one was losing hope, one found this remarkable 1944 letter written by an angry Nilakantan to the Civil Aviation Directorate in response to the offer to be "Scientific Assistant". The lowly designation rankled, and the proud man shot off a 2-page account of his academic and technical accomplishments. Then only 34, Nilakantan already had a record comparable with the best, including a doctorate in crystal magnetism under Sir C V Raman, 23 research papers (many jointly with Raman), a MS from Caltech and engineering experience at Hughes Aircraft Co., USA. Unfortunately this outburst (and a subsequent letter in a calmer frame of mind where Nilakantan implores: "an alteration in the designation, though slight, would mean a great deal to me") failed to immediately win Nilakantan the designation of "Scientific Officer" which he so coveted.

The officer's designation came two years later in 1946 on the eve of Indian independence. In independent India, Nilakantan rose quickly through the ranks and he was soon a Deputy Director in the R&D Directorate of the Civil Aviation Department earning Rs 1250 per month. Nilakantan was also emerging as an important voice in Indian aeronautics and all the hard work, leading to the setting up of the Aeronautical Society of India (AeSI), must have further enhanced his reputation (Sir N C Ghosh, as President AeSI, acknowledged in 1951: "The Society was largely the result of Nilakantan's untiring efforts and sound organisational work").

The Pilani Excursion

But around 1953, when Nilakantan seemed to be cruising along in his chosen vocation, there was a glitch. Declaring that he "preferred the academic life with its greater freedom for constructive effort", Nilakantan applied for the post of Principal of the Birla College at Pilani. The College (and, in all probability, G D Birla himself) sought Raman's advice. After checking with Nilakantan ("are you sure you want to do this?"), Raman must have recommended his case rather strongly because Birla College quite readily agreed to pay Nilakantan the salary of Rs 1500 which he wanted and even allowed him to partially redesign the Principal's bungalow "although this privilege is not normally granted". The academic excursion was however short-lived because Nilakantan spent just over a year at Pilani before returning as Joint Director Technology Development (Air) in the Ministry of Defence on 27 October 1954.

Why did Dr Nilakantan suddenly decide to move to the Birla College of Arts and Commerce in 1953? A few developments in the Civil Aviation Department were clearly bothering Nilakantan: his ambitious

five-year expansion proposal of 1948 (which would also have eventually made him a full-fledged Director) was stalled because of "strained finances"; and after the quick promotions of 1946 and 1948, his career too appeared to have reached a certain plateau. But what really hurt him was that "junior officers" become Directors before him. So it's not unlikely that Nilakantan's frustration with the Civil Aviation Department was the real reason for the flight to Pilani.

But once Nilakantan decided to move to Pilani, he appeared determined to give his new job a jolly good try. "I have no intention of being a bird of passage", he assured the Secretary of the Birla Trust, "and hope that the building up of a first rate College of Science will be my life's work". Unfortunately things didn't quite work out and within a year of taking over as Principal, disillusionment set in: "while the terms are attractive and the work interesting, I find that this is a purely administrative job with little time for scientific and technical work", Nilakantan wrote in a letter of March 1954. Nilakantan therefore tried to get back to the Civil Aviation Department - and even wrote to a very senior functionary of the Ministry of Communications seeking a return with a "Director's status". Fortunately, this was just the moment when the Ministry of Defence announced the creation of a Directorate of Technical Development (Air) and Production with a former RAF Group Captain as its first Director. For the Directorate's specially-upgraded post of Joint Director they chose Nilakantan.

The Halcyon Years



Chatting with Sir James Lighthill in 1961

The troika of P Nilakantan, V M Ghatage and Satish Dhawan virtually wrote India's aeronautical agenda for the future.

It was an inspired choice. Relieved that the minor professional crisis had passed over, and delighted to be back in Delhi, Nilakantan blossomed. By 1956, Nilakantan had entered the most productive phase of his career. A look at some of the projects he was undertaking at that time is marvellously illustrative: air transport requirements for the civil sector, analysis of the failure of the HT-2 aircraft wing, indigenous manufacture of parachutes, the HJT-17 vs Vampire debate, canopy failure of the Toofani aircraft, assessment of the Twin Orpheus Transport aircraft, comments on the expansion of the Aeronautical Engineering Department of IISc., indigenous production of water-methanol mixture as power booster in turbines, debate on the kind of aircraft Prof Tank should design for India, R&D reviews of resistance of tethered balloons, review of HAL's light transport aircraft (LTA) plans of 1955-56(!) ... from all accounts, those were some of the most exciting times in Indian aviation, and in Dr Nilakantan's life.

1956 also saw Nilakantan finally take over as the Director, Technical Development and Production (Air) after the trifling matter of 'civilianisation' of the post, and pay fixation, was settled (Nilakantan successfully persuaded the Ministry to give him a starting salary of Rs 2000 per month after pointing out that Dr V M Ghatage was then getting Rs 2300 at HAL "and my standing in the Indian aeronautical profession is on a par with that of Dr Ghatage").

Two other developments at that time were notable. First, the emergence of the troika of P Nilakantan, V M Ghatage and Satish Dhawan which worked together on dozens of national aeronautical committees, and virtually wrote the country's aeronautical R&D agenda for the future. And, second, the preparation of an outstanding 50-page report (January 1956) by P Nilakantan titled: *Organisation of Aeronautical Research and Development in India*. There is no doubt that this report contributed in no small measure to the eventual creation of the National Aeronautical Laboratory on 1 June 1959.

Birth of NAL?

Can the creation of National Aeronautical Laboratory be directly



NAL's Palace Road Office in 1960

The formal recommendation to create NAL (initially called 'National Aeronautical Research Laboratory') was made on 30 October 1956.

traced to the recommendations contained in Dr Nilakantan's 1955-56 report on the Organisation of Aeronautical Research and Development in India? One guesses that the report provided considerable momentum to the NAL concept, although it is quite likely that there were others also voicing the same idea around that time.

More specifically, the report, submitted to CSIR's Board of Engineering Research, called for the creation of two specific entities: an Aeronautical Research Committee (ARC) to function as an apex level advisory committee and an Aeronautical Research Establishment "to function under a Director who will guide and supervise (aeronautical) R&D programmes on a full-time basis". The report contains considerable detail about the nature of activities in the proposed research establishment, including divisions for aerodynamics, structures, propulsion, materials and processes etc. It is tempting to conclude that Nilakantan was already seeing himself as the Director-designate of the proposed new NAL-like establishment.

The report evoked a very positive response; although the R&D establishment was not immediately formed (presumably because one needed time to lobby for the significant funding this involved), the ARC was formed almost immediately, and even held five meetings in the first eight months of 1956! Indeed, it was at the momentous fifth meeting of the ARC, held at Delhi on 24 August 1956, that Prof M S Thacker, then DG-CSIR, first indicated that "a considerable amount of money had been earmarked for aeronautical research during the Second Five-Year Plan". Things happened quickly after this announcement and by 30 October 1956 the formal recommendation to create NAL (initially called 'National Aeronautical Research Laboratory') had been already made.

The Birth of ADE?

But in 1958, when all was set for the creation of NAL, Nilakantan did something seemingly strange. As Director, DTD&P (Air), he proposed a clone of the NAL-like formulation to the Ministry of Defence, leading to the creation of the Aeronautical Development Establishment also at Bangalore. When one reads this Nilakantan proposal, it is clear that whole pages have been lifted from his 1956 proposal to the ARC. The proposal is careful in stating that the scope of the proposed ADE shall be "the indigenous development and production of aeronautical equipment and stores required by the IAF", but the formulation is strikingly similar.

Why did Nilakantan do it, especially when he could not have been unaware that he was tipped to be the first Director of NAL, also at Bangalore? (In a secret letter to Mr O Pulla Reddi, Secretary, Ministry of Defence dated 14 December 1957, Dr M S Thacker, DG-CSIR, had written: "we have have looking around for a suitable person - to head, NAL - and the name that occurs to us is that of Dr P Nilakantan ...would it be possible for you to consider releasing Dr Nilakantan for this project?").

NAL and ADE

A careful reading of the Nilakantan papers suggests that Nilakantan viewed NAL and ADE as the two enabling arms of his grand aeronautical vision for India, spelt out in his famous report of 1956; while NAL was to "concentrate on objective basic and applied research", ADE's mandate was aeronautical "design and development". It is a moot point whether such clear demarcations can actually work out in practice, but that's another matter. (Actually the confusion about the relative roles of NAL and ADE in the Indian aeronautical scene persisted for at least a decade. Dr S R Valluri, who succeeded Nilakantan as Director, NAL in 1965, recalls that NAL and ADE did "tread on each other's shoes" quite frequently in the early years; and "we reached a definitive understanding only around 1976").

The question of the relative roles of NAL and ADE, or more precisely of the relative aeronautical roles

of CSIR and the Defence Science Organisation (DSO), was informally raised by Mr J R D Tata in the course of NAL's Executive Council meeting on 28 March 1963. Apparently DSO was also considering a very general aeronautical proposal, which included a duplication of NAL's wind tunnel plan, and Mr Tata was concerned. Nilakantan took pains to allay Mr Tata's concerns and in his letter dated 11 April 1963, marked "personal and confidential", Nilakantan explained in some detail the roles he foresaw for NAL and ADE adding: "when I wrote the plan for NAL, I took particular care not to duplicate the work of ADE". A few weeks later, Nilakantan also wrote to Dr S Bhagavantam, then Scientific Adviser to the Minister of Defence, pleading for a "proper co-ordination of all aeronautical activities" and re-assuring him that NAL's proposed 4 ft tunnel "would anyway be mainly used by HAL for supersonic aircraft development".

India's Man of Destiny in Aeronautics



Showing visitors around the NAL wind tunnel complex

Nilakantan saw himself as the grand architect and mastermind of Indian aeronautics, and to achieve his dreams Nilakantan knocked on many doors.

One fact which becomes glaringly obvious while reading the Nilakantan papers is that Nilakantan sincerely believed that he was India's man of destiny in aeronautics. His passion for this role was all-consuming; he saw himself as the grand architect and mastermind of Indian aeronautics, and to achieve his dreams for his country Nilakantan was willing to knock at many doors. I have no doubt that when Nilakantan made the ADE proposal he expected to become its Director; and when he wrote the proposal for NAL he was sure he wanted to be its Director too! In fact, could one conjecture that Nilakantan wanted to eventually lead a unitary aeronautical establishment (comprising NAL and ADE) at Bangalore? Could this be why ADE's first chief executive was only designated "Officer-in-charge", although the original proposal explicitly indicates a Director's position? Could this be why Nilakantan insisted (in his communications to the Ministry of Defence in 1958) that NAL's proposed wind tunnels, and IISc.'s wind tunnels, should eventually be controlled by the Ministry of Defence?

During his first four years as NAL Director, Nilakantan was so swamped with work that he couldn't have taken on any additional responsibility. He was happy that his dreams were being realised and, by his own admission, he was "not in touch with developments in the Ministry of Defence". In the second half of 1963, however, when "about 50%" of the wind tunnel work was over, Nilakantan began to take a fresh look at his career options and preferences, especially since his equation with CSIR's new Director-General, Dr S Husain Zaheer, wasn't altogether happy. Little did he know, then, that he only had a few more months to live and that his life's mission was almost over.

Dr Nilakantan's fifth year as Director, NAL (which was to prove to be his last year) was far from happy. The official files of 1963-64 reveal a worried, hurt and frequently ill Nilakantan.

The UNSF Story



With experts from UNSF in 1961

The principal source of worry was the funding for the proposed 4 ft tunnel project. Funding for the twin (1 ft and 4 ft) wind tunnel projects was first obtained from the United Nations Special Fund (UNSF). The UN expert (Dr Coombes), who visited NAL in 1960 to evaluate the proposal, however recommended funding only for a 1 ft tunnel "which", he felt, "should be adequate for basic aeronautical research". Since the idea all along was to build a 4 ft tunnel for the indigenous design and production of supersonic aircraft, Coombes' recommendation posed certain problems in the long run. It was however decided to go ahead with the 1 ft tunnel project "as a first step". Things were progressing very well till two events

NAL had to forsake the UN assistance for the wind tunnel project in national interest.

cast a shadow on the project: first, the question raised by Pakistan at the UN in 1961 about "India's supersonic wind tunnel project" which led the UN to seek (and obtain) a specific assurance from India that the 1 ft tunnel would not be used for military purposes, and, second, the war with China in late 1962 and the consequent realisation that India required its own fighter aircraft project "whatever be the price". The cumulative effect of these two events was that India was no longer prepared to go with its earlier assurance that the wind tunnels would not be used for military purposes. If this meant forsaking the UN assistance for the project, then so be it! All these developments must have greatly upset Nilakantan who saw his life's mission fading away unless an alternate funding and foreign exchange source was found. Eventually, Canadian aid was obtained for the project - with the inevitable proviso that a Canadian agency would obtain the 4 ft tunnel contract - and everything worked out very well with Canadian Vickers. But Nilakantan did not live to see all this happening.

Nilakantan and Husain Zaheer

Another matter which caused Nilakantan great personal anguish during 1963-64 was the unfortunate turn in his relationship with Dr S Husain Zaheer, CSIR's new Director-General. It is puzzling why the two great builders of modern India failed to see eye to eye. While official correspondence between the two is seen to be polite and correct, the warmth and respect which characterised Nilakantan's correspondence with Zaheer's predecessor, Prof M S Thacker, is noticeably absent. One of the contentious issues was Nilakantan continuing as NAL Director on foreign service terms. Zaheer was insistent that Nilakantan should opt for permanent absorption into CSIR ("we need a Director who has a permanent stake with CSIR") while Nilakantan, who curiously enough had enthusiastically agreed in 1961-62 to be absorbed in CSIR, insisted that he retained the "privilege to continue on the original conditions of appointment". There were other exchanges too, about "the ill-planned and uncoordinated research at NAL", and even about Nilakantan's "ill-health", but no useful purpose will be served by delving further at this point of time. It will suffice to say that Nilakantan's responses were brave and convincing.

His Last Days

Although Nilakantan wrote (indignantly) to Husain Zaheer late in 1963 that he "worked without rest or holiday from early morning to late evening", something was indeed wrong with his health. During his last six months, Nilakantan availed two prolonged spells of medical leave; he also initiated correspondence to consolidate his GPF credits. It appears that Nilakantan was (reluctantly) coming to terms with the fact that his health was failing, but he certainly didn't expect to die. In fact three months before the end came, Nilakantan even decided to shift to a new house in Malleswaram heaping scorn on the astrologer who warned him that the date was inauspicious. A week before he died, Nilakantan, who was recuperating at Seethagundy Coffee Estate near Palghat, was informed by cable of the signing of the agreement with Canadian Vickers in New Delhi for the 4 ft tunnel. This news must have cheered the ailing Nilakantan; sadly, it proved to be the last hurrah in a remarkable life which ended at Coimbatore on 18 April 1964.

Srinivas Bhogle

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Updated on 1 Feb 1998.