



RAMANUJAN – MY CONTINUING JOURNEY OF QUEST AND MISSION ('47-)

Updated hand out based on Talk given by the Curator on 26.04.1999

I would like to share with you all at this seventh gathering of descendants of the relatives, benefactors well wishers, friends, beneficiaries, and contemporaries of Ramanujan and in furtherance of the mission to spread the inspiration of his singular life of extraordinary creativity in mathematics in order to discover potential Ramanujans, to mitigate the horror engendered by third rate teachers handling first rate children, to sustain the thrust of math loving teachers and parents, paving as it should for the ways and means of building up our mathematical man power which is not today commensurate with the strength of our population. This is the voice, of a grass roots level worker in math education.

Quest ('47-) The story begins in '47 when I read the book 'INDIAN SCIENTISTS' published by G.A. Natesan & co, the then leading publishers of nationalist literature in arts, culture, philosophy and science. Since mathematics learning and teaching has been a source of joy for me right from my school days, thanks to my teachers and my benchmates, I wanted to know more about his student days and the saga of his unique creativity in mathematics. I started reading and collecting literature that came my way in this regard. I could recall at this distance of time, the two part book 'PUGAZHPOOTHA THAMIZHARGAL' published by Kalaimagal Karyalayam and the lecture on Ramanujan by Prof. Ganapathia Pillai of Hindu college, Tirunelveli. The commitment came when I

read Ramanujan's letter (dated 9th Feb 1912) of application for a clerkship in Port Trust that appeared in illustrated weekly of India wherein he wrote, I have however, been devoting all my time to Mathematics and developing the subject 'Here was the man who said what he meant and did what he said in life.

As a qualified mathematics teacher, I commenced my service in village schools in Coimbatore ('48 – '52). The first thing I did was to start and run Number Friends Society in honour of Ramanujan so as to have the opportunity of getting into touch with the few mathematically inclined children studying in various classes and providing them special projects and programmes to develop themselves. To get them recognition, I organized annual mathematics exhibition to improve mathematical awareness in the community. After four years of service in Coimbatore district, I returned to Madras, my birth city, (now Chennai) and continued my professional career at Muthialpet High School (now higher secondary school), George town where I was appointed in 1952.

I started collecting clippings of mathematical interest and preserving them in an album (now in its 8th volume). Once I came to know that Ramanujan's wife and youngest brother lived at Triplicane, I wasted no time in establishing contact with them. Ramanujan's wife visited my school during one annual birthday celebrations of Ramanujan organized by Number Friends Society. It was my practice to invite university and college professors of mathematics to give opportunities for mathematically inclined students to talk in their presence. On non-routine themes in mathematics understandable with school math background and get the exposure through interaction with the professors. Low achievers in mathematics underwent altitudinal changes and improved their performance in exams to the surprise of their parents by involving themselves in preparation and articulation of mathematical concepts through working models. The most massive math exposition ever held was the one in 1960 covering 250 themes and it was declared open by Sri. C. Subramanian who was then the Minister of Education, Govt. of Madras Among the numerous students who benefited a lot through involvement in

math club activities, the few who continue to be in touch with me are Dr. S. Natarajan of ISI, Bangalore, Dr.P.Jothilingam HOD (Math), Pondicherry University and Prof. Ravikumar of the University at Rhode Island, USA. When I came to know that Govt. of India would be releasing a stamp in honour of Ramanujan on his 75th birthday in 1962, I seized the opportunity for intensifying my quest by setting up a seven member committee of my old boys with S. Natarajan, then a research scholar, as its chairman. Ramanujan's brother Tirunarayanan welcomed our efforts He was gracious enough to show and give us whatever materials he thought he could spare about Ramanujan S. Natarajan and I went to Port Trust to look into Ramanujan's personal file (now in national archives) and copy raw materials portraying his rise from obscurity to fame. The Muthialpet High School Number Friends Society Old Boys Committee went about enrolling old boys by collecting subscriptions that formed the nucleus to provide financial support to our undertaking.

At the stamp reliasing function held in Dec '62 at the University of Madras, our collection of artifacts was displayed and Prof. A.L. Mudaliar, then Vice Chancellor commended our work. I stationed my old boys at the entrance to the hall where the function took place, to collect date from the visitors regarding their addresses and relationship to Ramanujan. This move was tactical in giving a direction to my quest. We went about contacting those who had anything to do with Ramanujan. We visited Kumbakonam also in our quest for materials. To our pleasant surprise, we could collect quite a sizable amount of materials about Ramanujan. At the university we had discovered the relevance of Ramanujan's work to school students as well. We studied Carr's Synopsis of Mathematics So we decided to publish a memorial number in two volumes, the first one giving the story of man Ramanujan and the second one the mathematician Ramanujan as a super student star along with articles from math lovers who were not university professors and a few math educators. The memorial number was released at a public function held at Gokhale Hall in 1968, the first volume (entitled letters and reminiscences) by Rajaji and the second one (entitled an inspiration) by T.J.

Ranganathan the then editor of Manijeri, Kalki, Swarajya and Manjari covered the event, besides some dailies. Ramanujan Memorial Foundation

was set up with Prof. K. Venkatachaliengar of Mysore University as Chairman and myself as secretary. I made the announcement that there should be a Museum to preserve our collection and radiate the power and beauty of mathematics, Ramanujan's mathematical creativity in particular.

I retired from service in Nigeria in 1981. As a founder life member of AMTI, I continued my activities with greater involvement, Till 1987. I had to lie low with little hope to get the museum started. Ramanujan centenary was celebrated as a mega event all over the world, USA and India taking the lead. At the function organized at Children's Theatre, now Kalaivanar Arangam, my museum proposal got activated when I spoke about it at the instance of Prof. K. Srinivasa Rao to Prof. B. Ramamurthy who was then acting as the Vice Chancellor of the Madras University. The latter announced the setting up of a committee. Again there was lull. I had authored first three books in the series on Introduction to creativity of Ramanujan brought out by AMTI to mark the centenary of Ramanujan. The books serve as Instructional guides for teachers at primary, middle and high school levels. The rest of the books in the series are yet to be published.

I intensified my efforts regarding museum set up. All I could get was being humoured with tones of appreciation, kilograms of acceptance and grams of action, My pathological patience did not go in vain when my old boy R.G. Chandramogan, now the cream captain in our country today, introduced me to Mr. A.T.B. Bose in '92 as an innovative math educator. When I spoke to the latter about Ramanujan Museum to display the collection of original and Photostat letters of Ramanujan in my custody besides the bilingual charts giving jottings from Ramanujan's Notebooks of interest to students and teachers, he readily came forward to have the museum as a unit set up with his expertise in the Avvai Cultural Academy which was founded here at Royapuram in 1992. At long last the

museum started functioning from 18th March 1993, after it was declared open by our elder statesman late.Sri.C.Subramaniam. Mr. Bose put up a flat also at the terrace of the Academy building for me to reside to avoid daily commuting home 25km, away. Avvai Academy is supported by business community and organizes numerous programmes of educational, vocational and cultural value to the community around. He is ably assisted by like minded persons in running the Academy set up under Mahamayee Thangappa Nadar Trust among whom Sri. Aru Sankaralingam has served as president with his gift of the gap from the inception.

Sri. S. Balathandapani, an advocate and an old boy of mine came forward to associate himself with my work and service in the museum by setting up a supporting society called Ramanujan Museum Associates with his dynamic aunt Ms. B. Jeyakantham as its secretary. He spoke to the Editor Sri. N. Ravi of the HINDU and secured financial assistance for changing the cardboard charts into custom made laminated framed bilingual displays of uniform size, 61 in number. This was in '96.

Prof. K. Srinivasa Rao was invited to give a talk at one of the fortnightly meetings of the Academy. This experience cemented his relationship to the museum and Mr. A.T.B. Bose and he started taking keen interest in popularizing the museum among visiting professors from abroad as well as from universities in the North. He has also brought out an enlightening book on Ramanujan, The Institute of Advanced Study in Mathematics has also been helping us by recommending visit to the museum by foreign professors. So far 36 mathematicians from 11 countries, besides some dignitaries from our own country have visited the museum. The status of the museum got enhanced with donations of original letters of Ramanujan made by Prof.C.G.Swaminathan and Smt. Saraswathi V. Dole. There was a big upsurge during the days of 86th Indian Science congress and 6th Children's Science Congress held in Jan 99 at Anna University Campus. Thanks to my old student P.N. Srinivasan, P/o. Krishna Photo Stores, T. Nagar, a photo album of the displays in the museum was prepared and this provided the impetus for Prof. Rao to set

up a replica of the Museum in the Congress. Mr. A.T.B. Bose got into a spree to scan the pictures and photos in the Museum to improve their quality and the print outs were availed of in organizing the replica and renovating the museum. The replica received a lot of notice and appreciation.

Prof.Rao organized pie pavilion to enhance the mathematical background of the replica. Now pie pavilion and replica adorn Periar Science and Technology Centre at Kotturpuram, Chennai – 25.

Two contact centres have been set up, one at South Chennai and the other at Central Chennai to provide access to more people in knowing about the legacy of Ramanujan. The South Chennai Centre is at my residence Door No.14(Old No.20), Street 25, T.G. Nagar, Chennai – 61 and the Central Chennai Centre is at V31, 13th Street, Anna Nagar, Chennai – 40 the residence of Sri.S. Balathandapani.

Prof. Bruce Berndt of Illinois University, USA who has spent 22 years in bringing out a critically edited version of Ramanujan Notebooks(which had been earlier published as facsimile version by Tata Trust of Mumbai) visited the museum on Feb 14, '99 a red letter day in the annals of the Museum. There was vibing with Ramanujan's expo by members of Ramanujan Math Lovers Club of K.K. Nagar, Chennai – 778, organized under my guidance and encouragement. A Commemoration plaque marking his visit was unveiled by Mrs. Valli Alagappan. Prof. Krishnaswami Alladi of Florida university, USA who has emerged as a felicitous exponent of Ramanujan's mathematics visited the museum twice, once with this illustrious father and has been taking abiding interest in the success of this mission. He has honoured the Museum by favouring it with a complimentary copy of the Ramanujan Journal, an international journal started in 1997 and edited by him.

The Museum observes two days Dec 22 marking Ramanujan's birthday as Creativity Day and Apr 26 marking Ramanujan's remembrance day as Gathering Day , Feb 14 saw

the Museum given a big Face lift with air conditioning, thanks to Mr. Bose and his associates. We have decided to mark henceforth Feb 14 as Museum day, when entrance will be free. We charge nominal entrance fee of Rs.5 per adult and Rs.3 per student towards museum maintenance. Mathematics teachers and professors are honoured by free admission and they generally give donations.

Since Mr. Bose expect every unit of the Academy to be self- supporting, I would like to live up to that requirement but I need patronage from persons like you and other big concerns known to you and educational institutions. About forty world renowned RAMANUJAN MEMORIAL NUMBER sets are still available with me and they are given away as mementos to well wishers who make a donation of not less than Rupees one thousand. I wish you could take interest in sponsoring donations and clearing the stock.

We would like to complete the series on Creativity of Ramanujan. We look forward to patronage in this contribution to math educators at higher secondary, college and university levels.

The Museum has received considerable media attention, English press in particular. But it is not reflected in the number of visitors. Many of the visitors in their comments have stressed the appropriateness of this museum being treated as a tourist spot. We hope that you could influence inclusion of this museum as a tourist centre in all tourist literature and guides. We have plans to secure PAGES TURNING GADGETS from abroad to help visitors turn and see through the pages of Ramanujans Notebooks, We would like to put up a voice equipment as guides to highlight the exhibits the exhibits in the Museum. I hope these will evoke your attention and interest. The Museum needs volunteers about seven in number each to serve four days a month. Senior Citizens and part time student are most welcome. I am sure the gathering will offer their advice and help. Of course they will be given decent allowance.

Let us take the first step of compiling a directory of persons who constitute the Remembrance day gathering, starting from this one. This may be followed by an annual issue of Bulletin on Feb 14, the Museum Day.

MISSION

The objective of the Museum is to inspire the rising generation and motivate the mathematically gifted youngsters to pursue mathematical careers. There is the illustration example to emulate in the life of Prof. Selberg the mathematician, who has blossomed into one of the leading number theorists and field Medalists after going through Ramanujan's works presented by his father when he was a school student. Keeping this in mind, Math Education centre as an adjunct to the Museum offers assistance to educators, educationists and parents in knowing how to identify mathematically gifted children and cater to their special needs. There are also special programmes for low achievers. We want to set up a cadre of well briefed resource persons from retired teachers in the age group 60 to 65 to work for this mission.

The sociological climate favourable to genuine or authentic math learning is yet to emerge, as math education continues to mean coaching for exam and the teachers continue to be by and large functionaries to cater to exam passing needs. Since parents and teachers are by and large products of this pernicious system, there is appalling ignorance about what is being missed right from pre primary school. It is one thing not to know what one does not know but to remain unconcerned about it by saying I don't want to know what are more bothered about administrative matters since, as one official put it, academic exercise does not carry as much prestige and power as administrative one. Professional organizations are also cold shouldered if not shunned. Innovative individuals are ignored and dismissed as irritants and nuisances as they form a negligible minority. This will go on as we have the climate only for cognizable offence and not cognizable merit.

Befriending and seeking the services of innovative teachers is a rare phenomenon. Of course the society is not teacher friendly. There is no move on the part of education ministries to recognize such persons by their own efforts and equip them to give their services, in our system of vote bank democracy. At the most they are given rewards and left in wilderness.

This annual gathering is attracting more and more like minded persons who cherish the memory of Ramanujan and how they are interested in seeing that our younger generation get the exposure to Ramanujan's legacy; I hope by pooling our resources, taking cognizance of our contacts and doing collective thinking, we can brighten the prospects and step up processes, to make for setting up replicas of Ramanujan Museum in all State Capitals. We intend taking a Ramanujan float during the ensuing Republic Day celebrations, We should go about to see that every school has a photo or picture of Ramanujan in principal's room. It will not be a great achievement as Ramanujan T shirt has made its appearance in USA. The objective is to help every body remember that he/she is born with a mathematical core which needs cherishing and nurturing particularly in this Golden Age of Mathematics. Many can develop mathematical eye given a favourable environment. Science Express and The Hindu carry articles, to facilitate this exercise. It is unfortunate majority of journalists are allergic to mathematics; this is particularly so of periodicals in regional languages.

Let me spell out for propagation and adoption some easy measures to start with. They do not cost much but are certain to trigger mathematically conducive social climate right from home. These measures would offset the disinclination of media to produce mathematical programmes and of publishers to bring out books of general interest in the plea they are slow sellers. That mathematics as a performing art through say magic square dances and dramas or play showing the agony and ecstasy that characterize breakthroughs in mathematical thinking, can be presented with animation is not known. It

is not enough if we simply repeat, ennum ezthum Kannenathagum and ennenba enaya ezhu thenba ivverundum kannenba vazhum uyurku. We Should go beyond the text book and expose ourselves to mathematical enjoyment and share it with our children at home. Children do not see adults, talking about mathematics at the dining table, dressing room and kitchen. With a little orientation given by RM & EC, parents can witness a sea change in their homes. Our schools would find it worth while to include programmes of mathematical interest in their school annual day function. For guidance RM & MEC can be approached. Schools can paint the compound wall at the entrance with thematic pictures provoking mathematical thinking, since what eyes see not the heart aches for not.

The simplest, the easiest and the most telling way to pay homage to Ramanujan's memory and recognize our mathematical selves is to include DATE MAGIC SQUARE in birthday greetings, weddings invitations, meeting invitations, welcome boards, foundation stones, etc. Many have started adopting this novel move to Notebooks is the first one on Magic Squares 8 yrs old class III pupils good at addition and subtraction of numbers with digits not exceeding two learn it fast and show the courage to greet the audience in a meeting after the invocation is over, winning applauses from the gathered elders.

Since editors of magazines show disinclination to publish even pop math articles as mathematics is anathema and allergy for them reflecting the damage done by prosaic and formal teaching of mathematics in their school days, schools can go about bringing out supplements of 4 to 8 pages to school calendar and diary or school magazine to expose students and parents to non-routine thinking in mathematics within the scope of school math curriculum. So far six schools have started the practice, Narayana Mission school at West Mambalam, T.I School at Ambattur, Padma Seshadri School at K.K. Nagar, SBOA School at Anna Nagar and Bharathi vidyalaya at Perumpakkam. If this is taken up by every private school, there will be a dramatic change in people's attitude to mathematics, a must in this age of mathematics science and technology. Popular

expositions in mathematics are being published abroad in large numbers. They need to be made available through their libraries and for being given away as prize book to winners an information yet to be known to school authorities.

Since publishers in our country, as mentioned earlier, are shy of bringing out books of general interest in mathematics on the grounds that they are slow sellers and many copies cannot be printed, private trusts could be persuaded if need be to give a helping hand in this regard as they don't lose money but only advance and wait. They would certainly earn the gratitude of the rising generation whose thirst for fame. So far three trusts have adopted this measure successfully. Lakshmi Ganapathy Educational Charity Trust of Nandanam, Avvai Kalaikazhagam of Royapuram, and Mr. AR. Educational Society of Raja Annamalaipuram. The math section of any school library, barring exceptions, speaks volumes about the little importance given to provide facilities for teacher growth and student development in mathematics. This is because of lack of interest on the part of teachers to visit bookstalls and managements to encourage them. So far five schools have responded to this suggestion of equipping their school libraries with books and journals that would update and upgrade the professional expertise of teachers and mathematical needs of bright students. RM & MEC has brought out checklist of general books in mathematics and math education to assist school librarians. It can be had for a nominal fee of Rs.5/-

Thanks to Mr. A.T.B. Bose, I could develop and fashion manufacture of math learning kits to be used individually by students in primary and middle schools for hands-on kick of take-off experience in getting at mathematical concepts, thereby blossoming into self-reliant, efficient learners. Our objective is to get the kit prescribed along with uniform at the beginning of every school year. Parents being to see that buying kits is investment whereas buying uniforms, costlier than kits, is expenditure. Kits are seen to influence parent-child and teacher-pupil relationships in a healthy way. They also highlight the need to hold math practical tests to include non-verbal response to test questions in

assessment, It was a red letter day in the annals of MEC when live demo math mela was organized by Mr. Bose at the Guild of service Hall Egmore in 96. We look forwards to the times when math kits will be sold in all shops of general provisions all over the country. This revolution will usher is a sociologically favourable climate for more and better mathematics in less time with less drill. There should be cafeteria or buffet approach in learning – teaching strategies. Served food style does not suit everybody, as it known to all.

We have plans to manufacturer press button mathematical toys to develop number sense and learn tables with joy and understanding. A lot of help or patronage is needed in all these ventures which have great market value. Indigenisation of math curriculum through inclusion of kolam, folk math and contributions of Karinayanar, Mahaveeracharya and Narayana Pandita is yet to receive its due in curriculum making in mathematics.

Setting up math learning centre in schools to provide in service briefing for teachers and orientation for parents is a must to meet the problem of dearth and migration of math teachers.

I am particularly thankful to Mrs. Uma Maheswari, Mr.M. Kumaraswamy and Mr. S. Rajesh for joining me in my programmes. My special thanks goes to the management of C2 Technologies for various services.

Finally, I repeat my appeal for providing vehicular convenience and services of a personal assistant for improving and extending my usefulness to the community.