

SURABHI

Journal of Arts and Literature

The Bi-annual Journal of Indian Institute of Space Science and Technology

**Vol.1 No. 1
(December 2013)**



**Indian Institute of Space Science and Technology
Department of Space
Valiamala, Thiruvananthapuram**

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भारतीय अंतरिक्ष विज्ञान एवं प्रौद्योगिकी संस्थान

(यूजीसी अधिनियम 1956 की धारा-3 के अधीन मानित विश्वविद्यालय घोषित)

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INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY

(A Deemed to be University u/s 3 of the UGC Act, 1956)

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Message



Dr. K. S. Dasgupta

Director, IIST

It gives me immense pleasure to present before you the inaugural issue of the bi-annual journal of arts and literature from Indian Institute of Space Science and Technology. It is the first of this kind from our Institute to promote the creative talents of scientists, engineers, administrators and other staff from various Centres of DOS as well as IIST faculty, staff and students. It is initiated with such a noble intention to popularize the artistic prowess of DOS employees.

The name of the journal, *Surabhi: Journal of Arts and Literature* aptly reflects the true spirit of the journal. It is vouched to spread the creative and innovative artistic talents of the individuals. IIST caters to the artistic, creative and technical aspirations of the individuals. *Surabhi* is such an initiative that provides a common platform for all to showcase their innate artistic and creative skills.

The success and popularity of any journal depend upon the quality of articles it publishes and in the number of successive issues it is able to release. The editors should be able to sustain the journal by inviting articles of excellent quality from its readers. Let them be able to inspire a scientific and technical community to dwell upon the abode of imagination, and be able to instigate others to explore the horizons of their imagination.

I truly appreciate the efforts taken by all in this regard. I wish all success to the Chief Editor and all the members of the Editorial Board. All the very best for such an innovative and wonderful initiative.



Government of India Department of Space

Message



Dr. B. N. Suresh

Founder Director, IIST
Prof. Vikram Sarabhai Professor

I am extremely happy to know that Indian Institute of Space Science and Technology (IIST) is planning to bring out a bi-annual journal *Surabhi: Journal of Arts and Literature* to promote the creative and artistic talents of our youngsters and staff at IIST. I always believe that all educational institutions in the country should provide appropriate platforms to nurture the creative talents of our youngsters particularly in arts and literature. Promoting arts and literature in a Scientific Institution like IIST is a very laudable idea and the proposed journal is indeed a right step in that direction. It will certainly play a very dominant role in achieving this objective and provides an excellent platform to all our students and staff to exhibit their hidden creative talents. This kind of opportunity not only enhances their creative talent but also helps them in their overall and holistic development.

I was also informed that the Institute is planning a wide circulation of this Journal, all across ISRO and DOS Centres and this should encourage the students/staff of the Institute to contribute very actively. The organizers have also plans to attract the creative works of employees from other Centres of ISRO/DOS over a period. This will surely provide a chance to Institute to interact with the likeminded creative people across various ISRO/DOS Centres.

I earnestly hope that this venture will be a very rewarding experience for all the personnel at IIST who have taken this initiative to start the Journal and I hereby convey my best wishes to the editor and the members of the Advisory Board for its great success. Let me also call upon the employees of ISRO/DOS who are deeply interested in showcasing their artistic and creative talents to utilise this excellent opportunity provided by IIST. I appreciate the efforts taken by the concerned staff of IIST to initiate such a Journal and convey my very best wishes to achieve greater success and sustenance of the journal in the coming years.



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Message



Dr. Thomas Kurian

Dean R&D, IIST

Indian Institute of Space Science and Technology (IIST) is a place where creative, critical, and technical talents are given unbiased encouragement. Institute journals and magazines play an important role in pruning the creative talents. As IIST ensures a comprehensive development of individuals, it is also concerned about providing a proper forum to exhibit their creative and artistic talents. *Surabhi: Journal of Arts and Literature* is a bi-annual journal which is an apt instance of such an encouragement from the Institute. Even though the Journal is published as an in-house journal, it will be circulated all over India, in various centres of DOS.

Let the journal be boosted by a large community of writers and artists, and readers. Let it be able to receive a good community of readers so that it will be able to nurture the creative and critical responses of all. This is a welcoming initiative which will surely ensure the cooperation and support of the students, faculty and staff as well the likeminded people from other centres too.

At this juncture I truly appreciate the efforts taken by the Editorial Board, and wish all the very best to all its members and to the contributors. Let you be able to inspire others to engage themselves in creative and critical thinking, making use of their imaginative power to explore their hidden talents and artistic passions.



Government of India Department of Space

Message



Dr. V. Adimurthy

Prof. Satish Dhawan Professor, Vikram Sarabhai Space Centre
Senior Advisor (Interplanetary Missions), ISRO HQ.
(Formerly Dean R&D, IIST)

Creativity is the most important attribute not only in literary and other artistic pursuits, but also in all scientific and technological developments. The dynamics and mental processes of creativity are similar in all these varied spheres of innovation. At this juncture, I recall the Tagore-Einstein conversations that took place in the year 1930 in Berlin. A glance through these transcriptions reveal the confluence of their thinking process; in fact these present Tagore as "the poet with the head of a thinker" and Einstein as "the thinker with the head of a poet."

I am hence very pleased to know that the Indian Institute of Space Science & Technology has initiated the publication of a literary periodical "SURABHI", with the aim to encourage and boost the literary creativity of the faculty and the students of the Institute; and also to provide a forum to showcase the artistic expressions of various gifted individuals across the Centres and Units of the Department of Space.

This is a very laudable initiative, and I wish the publication Godspeed and outstanding success.



From the Editor's Desk

P. Radhakrishnan

Every animal leaves merely a trace of what it was. Man alone leaves a trace of what he creates through his art, science and technology! A popular notion holds that art is the antithesis of science, a world of fantasy, imagination and subjective thought. Artistic creations are emotional and biased representations of facts and ideas. The scientific mind, on the contrary, is *ideally* expected to be unbiased in order to accept facts with a neutral curiosity. The essence of science is the establishment of repeatable truths of nature ; art must constantly be recreated in new forms lest it should reduce to copying.

Rabindranath Tagore summed it up best, “*The skylarks of science offer corroboration of their truth through their similarity; the skylarks of artists and poets through their diversity.*”

Doubtless, this is right to a great extent. Yet, all revolutionary concepts in science resulted whenever there was what seemed to be an irrational departure from the conventional track. True creativity is basically the same be it in art or science. It consists in looking at the familiar in unfamiliar ways to see what others don't !

Creativity is certainly not beyond the reach of lesser mortals like the majority of us. SURABHI is a platform for all in ISRO to give expression to their dormant spark of creativity in art and literature.

SURABHI is what SURABHI does - emanating fragrance.

Greetings to all !

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Ataraxia

Ramiz Ahmad

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Ramose remorse grips the skeleton
Shackles bind the soul within
Desperate attempts to fly to sky
The golden fob inhibits the flight
Thrashed down cruelly to the ground
Wings shattered to pieces, in bits
Held by the tension in the golden chain
Firmly rooted to the deep soil
Depressed, on the brink to quail
A **Princess** descends from the heaven
Golden chalice held gingerly
Brimming with the elixir of love
Cacology of the lips are lost
To the delirious, baffled mind
Demulcent eyes mollify the wounds
Eases the pain stacked within
A drop on the dried rusty lips
A new fire flows within
Whole soul gets ablaze
Golden chain sublimates to vapor
Elated, the awaited journey begins



Unhindered flight towards the zenith
Beatitude of nature engulfs the pain
Canonizing the freedom bestowed
In those moments of blissfulness
The angelic **Princess** accompanies
Rollicking by the side, smiling
A companion of the eternal freedom
A feeling called '**ataraxia**'



The Morning Hazard

Sindhu Shylesh

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MONSOON is, for the morning walker, a boon or a bane. For the diehard morning walker, umbrella in hand, braving the rain laden gusts of wind, the puddles and the cattle on the dry parts of the road, the rains are a bane. For the 'not so diehard walkers', it's a boon, an excuse to snuggle deeper into warm, dry beds.

Rain or no rain, for me the morning walk is a hazardous activity. As I walk out of my home into the early morning sunlight, breathing deep into the 'clean' city air, I step out into a world of hazards.

The road is my walking track. It stretches before me long and wide. The road is definitely long, but the width is relative. The width is the space remaining after subtracting the space of the parked vehicles. For the poor, unsuspecting morning walker, suddenly, one of the cars will spring to life and reverse into his portly stomach. A hazard indeed!

I walk gingerly, keeping a meter's distance from the parked cars and I find myself walking in the middle of the road. And there comes another hazard. Very suave and cool! The two-wheeler rider, who to avoid the laborious U-turn comes whistling blithely on the wrong side. And he dares to frown at me saying, 'What are you walking in the middle of the road for?' I smile an apology and then realize too late that he is the one who is actually 'in the wrong'. I turn to yell but the motorist has already turned the corner.

I walk and gaze at the first sun rays shining through the leafy fronds of the Gulmohar tree, and enjoy the cry of the Koel and the hoot of the Peacock, at one with nature, beginning to enjoy my morning walk. I turn a corner and my path passes near a cleft in the wall with a tree growing in front the cleft, hiding it from view of the road. The perfect place hiding an embarrassing hazard. The perfect place for all to answer nature's call. If you are not alert, you will be the one embarrassed. There are many such prime spots in the city. There is a rush there. Autorickshaws. Cars. Pedestrians. Cyclists. There is no hierarchy. In the eyes of nature all are equal.

Of course, there is this driver of the car and those riding the two wheelers. Their ears plugged with earphones, listening to music or talking. And heavens! Some are even texting while riding. My God! I clung on to the sidewalk, on the side furthest from the road. I hold my breath till the hazard



passes. The rider, immersed in his world of texting. The vehicle drives itself, driving all others mad! These mobile phone wielders are jugglers. Devising ingenious ways of talking on the go! Multitasking. That famed word of these fast times! Sometimes, we see some motorists talking to themselves. We look, is he crazy? Where is the mobile? On looking closer, you find it inserted into his helmet. I found another juggler with a *dupatta* tied around his head holding a mobile in place near his mouth. What dedication to the talk!

All this becomes very stressful for the morning walker. He who wants to walk for better physical and mental health is on the verge of exhaustion due to being continuously watchful of the world around. Other than the ones mentioned above, there are also some close encounters of the third kind. The ones of the senses. Of visual onslaught. Of nasal onslaught. The siege of the rotten, decaying kind! To steer clear of the kinetic hazards, I found a quiet tree lined lane. I breathed in quietly. I breathed in again. What was that? Then the hazard overwhelmed me. Mounds of garbage overflowing the cans. The refuse of the previous day, piled up, eagerly awaiting the garbage collection trucks. I steered clear.

I am the diehard morning walker. And I yearn for my morning walks, but devoid of the stress. I yearn for my friendly, neighbourhood garden. I see the vacant space in my neighbourhood, filled with the debris of broken structures and, of course, waste. Will this space ever become a garden with proper walking paths? Will the morning walkers have a proper morning walk and wave the morning hazard goodbye?



What's there in a Name?

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Everything, I would say. When I was knee high, I remember declaring to my mom one fine afternoon that henceforth I shall be called Alvida. It so happened that just few moments prior to this announcement I had listened to a song blaring over the radio. Hello, the new MTV cum mobile generation, it's the pre-historic times of All India Radio and Vividh Bharati much much before the advent of radio mirch and mp3 techx. Back to the past and me listening to a song on radio, *yaad kar tune kaha tha pyaar hi sansar hai... o basanti pawan pagal na jaa re na jaa*. And the song ended with the soulful voice of a female singer, singing alvida alvida alvida, several times over. And my little, no-so-developed brain put two and two together thinking that alvida is actually a person's name. May be. I think that's what may have been going through my tiny head, at that moment. Anyway, my mom got this news that her latest child who was just knee high had started taking crucial decisions of life on her own, starting with what she should be named. I think she took it too well at that moment. Little did she know that her little one would go on a personal campaign: "henceforth I would be called Alvida and only Alvida". Everyone was informed of this choice and my mom was specially appointed to inform the ones who were beyond my reach. I would respond only when I was called by my new chosen name Alvida. Imagine a person with a name like that "Alvida". Alvida please come here. When are



you going Alvida? Phew. This continued for a month and the initially cool mom now became a harassed worried lady who was trying all means to dissuade me from my Alvida *morcha*. But I was blissfully oblivious of all that was happening around me until one day I overheard my mom complaining to my neighbor and her friend and confidant. She was imploring her friend to talk sense into her little one to give up her demands of being called Alvida - a Muslim name of all the names that she had to choose. Why couldn't it be something more Hindu? I felt sorry for my mom, for no child wishes to see or hear her parents sound defeated and sad. So I decided to give up my demand and it was, *kabhi alvida na kahna*, for me. And my mom never broached this topic too. However, that day I did wonder only for a while that why I, a Hindu, can't have a Muslim name? And why this great fuss? Anyway, I had better, more urgent and interesting stuff to do at that age. Like climbing trees and chasing butterflies.



Roomie of Room no 33

Dr. Babitha Justin

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Mamta was an abused child; at least that was what she'd tell others whenever she clung close to her 'narratives' within the story-seeking 'sorority'. A brief stay abroad and a UK citizenship made her bolder, even proud of her abused self. She always wondered - the 'victims' were almost always silent, or why they never retaliated and she always felt agitated about that. She kept writing about abuse, or for that matter she kept writing how 'special' she was, as the 'abused' moment was a brutal way of awakening her to 'Nirvana', after which she saw the world in a different light. Enlightenment through stigma, pain and humiliation.

After a few years in UK, she joined JNU to take a post-graduate degree in Sociology from the School of Social Sciences. Delhi August was awful, she was still not acclimatised to Indian summers where the sun blazed and made you sticky with dirt and stink. Her thirty-two year old wisdom in choosing the core subjects, had to be exercised in the cool brick path that criss-crossed various schools to meet at various joints, shrouded by ivy and creepers of sorts. There she wrote her core courses and optional out in the semester forms given to her. One was a core course on 'Gender Studies in India' by Prof. Meenakshi Abbi. Another, option, she thought, had sought her out. She called that her 'jackpot' and it was 'Child abuse: History and per-

spectives from East and West'. She sat there slightly spellbound by how luck commensurated with her misfortunes in the past and also glowed at the fact that the course was taught by Prof. Vikram Vij, well known for his eternal young looks and obsession with young boys. Mamta felt the surging forth of historical poetic justice, as her (ex)victim's self inflated with pride, as she knew that it was her course where she will have lots to 'narrate', problematise and even enlighten the fellow classmates.

Incidentally, she got room in the hostel the very same day. As Mamta came second in the list, she not only gained a sort of celebrity status for being a thirty-two year old from UK, but also she was allotted a hostel room on the very same day of her admission, without having to stay with friends or relatives in their rooms. She was allotted room #33 in Godavari Hostel. "Three, three. Sounds fine," Mamta thought aloud and lumbered inside the dark hostel with a huge ruck-sack that hoarded her sparse clothing, books, a laptop, some canned tuna and her all-time favorite, Maggi noodles.

The hostel gloom miffed Mamta off in the beginning itself. The entrance led to a corridor that gave a disturbing view of three storeyed cliff-hanging on a wall. The sense of foreboding increased as there was a heavy stench of dog poop and phenol lingering in the corridor. Nauseated, Mamta opened room no 33. It looked messier than anything Mamta had ever seen in her life. There were books strewn all over the place and she sneezed the moment a carpet of dust wrapped her body once she was inside the room. Washed and unwashed clothes lay tousled on the bed, on which, the occupant had been sleeping on them for days, no doubt. On one corner

stood a dust bin spilling over with waste paper, food remains and pots and pots of cigarette ash. To her disgust, Mamta even thought she saw a used sanitary pad lying there as well. Mamta stiffened her sinews to fight out for a new room and she gathered her stuff to storm out as soon as possible. It was then she saw the dusty rack, almost cobwebbed to the wall. The rack held a lot of unexpected surprises. On the one side it had a collection of CDs that ranged from Joan Baez to Green Day, jazz, instrumental, Yesudas and AR Rahman Hits, Hip hop and Reggae. Naturally inclined towards music Mamta lingered, looking at the small yet distinctly well-flavored collection. On the other side there were books ranging from many versions of Ramayana, Andrea Dorkin, Edward Said, to Will Randall and Dalrymple to Zadie Smith. There were also Stevie Davies and Anna Akhmatova shelved in a rather imperious disarray. Mamta fingered the books and there she saw *The Bluest Eye*, picked it up and read through the first page and then left the book back on the rack. That was decisive; she would stay in this room no matter how dirty it is. She had been cleaning up other's dirt all her lives, now the room's garbage looked unsubstantial to her. She opened the door to an open balcony which looked out to a badminton court. Unused for some time, the court was overgrown with weeds, and out of the dry bushes suddenly a peahen hopped out followed by her consort, who immediately unfurled his feathers in a splendid display.

After dumping her luggage to one corner, she set about the room, first she dusted the book rack and made the beds, after folding all the tousled clothes which stank sweat and musty, she even found the fossil of a cockroach among the clothes. Then she started to broom the dust and cob-

webs off and took out an old *duppatta* from her bag and moped the room twice and then emptied the dust bin in the garbage corner. The room needed this much-awaited face lift and she felt like a fairy god mother by the end of all. She took out a fresh bed sheet from her bag and spread it on her bed and stood back to see the way she waved her wand- it was magical. She smiled to herself.

When Mamta came back after her bath, she could smell the whiff of cigarettes in the corridor. She walked in to the room with wet steps to see a thin sallow girl with a disheveled mane, smoking away in a daze. Hearing Mamta's steps she turned her big eyes on her and smiled. Her dimples prominent, she stubbed her fag, sprang up and shook hands with Mamta. "Thanks a lot, this room is unbelievably clean"; she laughed through her embarrassment. "Anjali Nair" she said with a twinkle, "As you can guess from my accent, I am a Malayalee", she laughed out aloud. Mamta, despite her reservations in the beginning, could not but like Anjali, her mane, huge eyes and dimples.

Mamta, despite her staggering record in academics, was dyslexic in many fields. Firstly, she confronted the maze JNU was. Its sprawling campus in 1500 acres was spread out into four zones. The north, where the Jhelum, Sutlej and Ganga Hostels were, was easy to locate as it was right near the entrance gate. The south was also fine with Godavari, Periyar and Kaveri, located in the midway. But beyond that lay the ring road and the administration, library and academic blocks were ensconced in the middle of the ring road. It was here Mamta stumbled. There was a straight way to the academic block as well as a short cut. Both confused Mamta and for days



and days she travelled in a rigmarole of mazes till she reached the administrative block and her class room. It took a while, but Mamta got adjusted to the pathways which had no markers or signboards.

In the evenings, Anjali came to the hostel only for dinner and sleeping. Mamta never knew her whereabouts. Nor was she inquisitive. She was used to crunching the numbers about her future that she let go Anjali, who shifted in and out of her life like a phantom at night. In the mornings too she could hardly meet her as Anjali snored to peace while Mamta rushed for her classes. But Saturdays and Sundays they caught up on the lost threads of the week days. Anjali would lie on her tousled bed the whole day reading something or the other, and she also kept a diary where she would occasionally scribble down her spasmodic thoughts. As Mamta was new to the place and she came to JNU, with her sparse belongings, she would go

shopping to Khan Market or Sarojini Nagar on Saturday evenings. Occasionally Anjali joined her though she was really wary of crowds. For Mamta shopping was her passion; she would go on a spree seeing cotton cloth with ethnic design. She got some typical nerdy kurtas for JNU, of cotton clothes dyed in vegetable colours and block printed in earth hues. While she went on a spree, Anjali would stand silently in a corner puffing on a stub, as she always neatly halved her fags before smoking. Once to Mamta's horror she smelled burnt hair when Anjali tried to light her stub, inadvertently her lashes, Mamta was sure. On some Saturdays they would go to the National Art Gallery and lounge around there watching paintings. Though Mamta tried to talk about them, Anjali would indulge her with a smile and tell her the history of the painting. She was working on 'Amrita Shergill and the Iconography of Nationalistic Art' for her M. Phil in Art History and Aesthetics. That was a revelation to Mamta, who reserved her comments to herself after this.



Mamta did not remember how seasons skimmed passed her. It was early February already, and JNU was in the middle of an atrocious winter. Sun hardly shone and the fog kept the students in their beds till noon. This was a difficult season for Anjali, who would be wrapped from head to toe with socks and mittens and monkey caps and mufflers. She made a sorry sight in winter as she could not stand the chill and she would lie under the *rasai* reading poetry or some magazines. That morning, Mamta saw an advertisement about *Surajkund mela* and she wanted to go. She had also seen the girls of her neighboring rooms come back the previous night with their bags full of curios, knickknacks and stuff. As she had no other company, she turned to Anjali, whom she knew would be very hard to persuade. As expected Anjali complained of the cold, dust, backache, fatigue, loss of appetite and a hundred other things. Mamta was determined and she tried all her tricks including her first day in the room and the fairy god mother act. That worked. Anjali agreed with a frown.

The following Saturday they packed their lunch, filled their water bottles, picked up all the warm clothes Anjali needed and set off to Surajkund, and she returned to her cheerful self after they left the JNU entrance gate. They got down at Bikaji Cama and crossed the road to the ring road so that they can take a Trans-Jamuna bus to Surajkund. It was eight in the morning and the whole lot of office-going crowd was there in the bus. Mamta managed to get herself a seat in the bus. She squeezed herself between two Jat ladies and sat there cozily watching the city wake up slowly. It was cold still, and when the sun rays streamed into the streets, the city took on its warm grey wings.

She couldn't see where Anjali was, and in the chill and coziness of two plump women, Mamta nodded off to a jerky sleep in the bus. It was after a while that a commotion woke her up. She heard a loud shriek and a few men falling on each other. The bus came to a sudden halt as everyone started looking at the place from the noise came from. Because of the crowd Mamta could not see anything but men shuffling away from the scene. Curious, she got up and combed the crowd and peeped in. A man was holding to his bleeding nose and beside him Anjali was shouting at him, her fists balled up to assault him more. Anjali was shouting in hysterically Malayalam and English. Mamta was trying to fathom what exactly had triggered her fury in such a preposterous manner. Suddenly, Anjali saw Mamta and she stormed to Mamta, pushing the crowd away and she started speaking in unintelligible English and Malayalam, in which Mamta could only catch words like 'molester', 'child', ****, etc. Suddenly Mamta saw a seated teenage school girl, clinging to her seat as if it is her life. Things fell into their place for Mamta, who held Anjali gently and firmly so that she would cool off. Anjali stopped her string of blabbering and reached out for the school girl who cringed at her approaching steps. Anjali hugged the girl as the girl broke into a sob, and by that time the passengers in the bus also got of a whiff of what exactly had happened. A few men took charge and roughed up the bleeding molester. Needless to say, it was Anjali who had broken his nose-bridge. The bus restarted after the molester was handed over to the police and we too gave up the Surajkund mela and got back to the campus.

In the room Anjali was still agitated and she was smoking away. Mamta didn't want to disturb her, but she watched, rather detached, the way she was the rest of the day. In the evening, Anjali was as moody and agitated as in the morning. Mamta went to her, and she sat near her and held her close. "Relax Anju, such things happen. Good that you reacted and saved the girl". Anjali looked at Mamta and tears rolled down. she sobbed "It was me, It was me... I was that girl ten years back..." her sobs became inconsolable. Mamta sat closer, hugging Anjali to her bosom: " I was that girl too, twenty years back"

They whispered and consoled each other the whole evening, and somewhere in the musty corners of room no 33 of Godavari hostel, two souls became one through remembrances of past, which were not sweet at all, but coated heavily with pain, shame and humiliation.

The Anna Karenina Principle in Space Science and Technology



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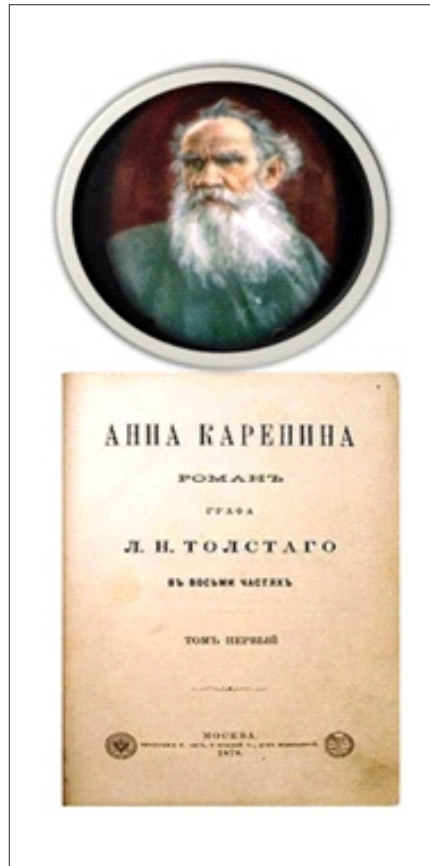
ABSTRACT

“Happy families are all alike; every unhappy family is unhappy in its own way.”

It is indeed fascinating and strange how great works of art can invigorate and inspire entirely new avenues of exploration and innovation not originally conceived or imagined by the masters who created them. Such is the magic of the great novel *Anna Karenina* that, more than 125 years after it was published, it triggered the enunciation of what came to be known as the Anna Karenina Principle, which gave a new perspective of analysis for complex systems in evolution, ecology, public administration, business management, medical ethics, predictive statistics and many more. The purpose of this article is to give a brief overview of these developments and show that the complex domain of space science and technology is one of the most befitting examples to interpret the meaning of the new principle.

Leo Tolstoy's *Anna Karenina*

Tolstoy published his novel *Anna Karenina* as a serial from 1873 to 1877 in the periodical *The Russian Messenger*. For some reasons of political principles, the final installment was not published in the periodical, and the full novel appeared first in a book form in the year 1878.



*Tolstoy's “**Anna Karenina**” was first published in Moscow, 1878*

Anna Karenina is the tragedy of aristocratic socialite Anna Karenina and her affair with the affluent Count Vronsky. A parallel story within the novel is that of Konstantin Levin. Levin is often considered an autobiographical portrayal of Tolstoy's own beliefs, struggles, and life events. The novel frequently focuses on the opposing lifestyles and attitudes of its central characters of Anna and Levin. Through the sequence of situations and ideas depicted in *Anna Karenina*, Tolstoy succeeds in presenting a treatise not only on the contemporary Russian socio-political

situation, but also on the universal trials and tribulations of entire human society. *Anna Karenina* is considered as the epitome of realistic fiction and a flawless work of art. A relatively recent poll, conducted and published in *Time* magazine in 2007, declares *Anna Karenina* as the "greatest novel ever written".

The plot opens with a family reunion at Moscow railway station when prophetically a railway worker falls by accident in front of a train and is killed. Towards the end of a nearly thousand-page epic portrayal of human emotions, attractions, betrayals, failures and successes, the cycle closes when Anna commits suicide by throwing herself under the carriage of a passing train. The essential message of the novel is the difference between what happens to Anna and what happens to Levin whose journey to understand the spiritual meaning of life constitutes the other parallel story of the novel. Levin did not shoot or hang himself but went on living. In the complex interactions of life; faith in the soul and a positive approach to living underpins the success of Levin. Instead of imagining that the stories of Anna and Levin are poles apart, we understand that both are seeking the answers to the same question of the meaning of existence and life. Levin has been all through in the direction of the right answers; which tragically Anna is too late to find.

The Anna Karenina Principle of Jared Diamond

Jared Diamond (1998), in his outstanding book *Guns, Germs, and Steel: The Fates of Human Societies*, has addressed the question why history has proceeded very differently for peoples from different parts of the globe. He particularly studies the reasons why Eurasian civilizations have survived and conquered others. He argues against the idea that Eurasian hegemony is due to any form of Eurasian intellectual, moral or inherent genetic superiority. Diamond finds that the gaps in power and technology between human societies originate in

environmental differences, which are amplified by various positive feedback loops.

In the Chapter 9 entitled: *Zebras, Unhappy Marriages, and the Anna Karenina Principle*, Diamond studies why some animals are domesticable and why some are not. Here Diamond introduces the Anna Karenina Principle. By the famous first sentence of the great novel *Anna Karenina*: "Happy families are all alike; every unhappy family is unhappy in its own way", Tolstoy meant that, in order to be happy, a marriage must succeed in many different respects: mutual affection and trust, agreement about money, child discipline, religion, in-laws, and other vital issues. Failure in any one of those essential respects can doom a marriage even if it has all the other ingredients needed for happiness. This principle can be extended to understanding much else about life besides marriage.

It is human tendency to seek single-factor explanations of success. Diamond argues that success actually requires avoiding many separate possible causes of failure. The *Anna Karenina* principle explains a feature of animal domestication that had heavy consequences for human historynamely, that so many seemingly suitable big wild mammal species, such as zebras and peccaries(a species of pig), have never been domesticated.

By a detailed historical data analysis, Diamond finds that all but a few candidates for domestication have been eliminated by the *Anna Karenina* principle. Most animal species could not be domesticated for one or more of many possible reasons: the animal's diet, growth rate, mating habits, disposition, tendency to panic, and several distinct features of social organization. Only a small percentage of wild mammal species ended up in domestication with humans, by virtue of compatibility on all those separate counts.

Other Applications of the Anna Karenina Principle

After the masterly application of the *Anna Karenina* principle (AKP) by Jared Diamond, a host of studies in diverse fields attempted to have a fresh analysis of complex interacting systems using AKP.

Ecological Risk Assessment: Dwayne Moore (2001) applies the *AKP* to ecological risk assessments involving multiple stressors. He argues that multiple stressors assessments and environmental decision making will not have a happy marriage unless the following can be achieved: (1) there must be societal and political buy-in to the assessment and decision-making process; (2) the assessment must have the latitude to consider a wide range of stressors and potential risk management options; (3) there must be a commitment to following a rigorous focusing of the assessment and to expending resources for model development and data collection; and (4) an adaptive management strategy must be adopted wherein risk management actions are undertaken. Failure to meet any of the above criteria for success will doom a multiple stressors assessment and prevent its use in effective decision-making.

Public management: Robert Behn (2005) studies the application of Anna Karenina Principle in public administration particularly by government agencies. Effective public agencies are all alike; every ineffective public agency is ineffective in its own way. Behn identifies a list of ten problems that the leadership team of a public agency has to solve. These relate to resources, motivation, learning, credibility, purpose, strategy, theory, measurement, target and communication. No wonder that many public agencies are ineffective and thus unhappy. Each of these ineffective and unhappy agencies is, of course, uniquely ineffective in its own, distinctive way. And there are many, many ways in which a public agency can be ineffective.

Health Care Ethics: Lawrence Schneiderman et al. (2006) apply AKP to a study in the field of health care, where ethics consultations were found to be helpful in resolving the conflicts and reducing non-beneficial treatments. In a study of more than 500 intensive care unit patients, ethics consultations received favorable reviews by 80% of patients and more than 90% of physicians and nurses. Nevertheless, several participants in the ethics consultation process expressed dissatisfactions with the intervention. The authors, in this application of the *Anna Karenina* principle, report their efforts to determine the factors associated with these negative responses so that they might provide insights of future use to ethics consultants.

Business Research: Steve Shugan (2007) studies the data collection biases in business research say in finance, marketing, and production. He addresses the sometimes serious biases associated with only studying business survivors that can lead to misguided policy. The data on non-survivors business is more important. Through the application of Anne Karenina principle, he concludes one of its important implications which he calls the Anne Karenina bias. If we only observe survivors and survivors share the critical properties necessary for survival, then there will be little or no variation on the key variables (or constants) related to these properties. Hence, it will be difficult to infer the descriptive theory leading to success from the passive observation of survivors. We would need to actively observe nonsurvivors.

Sports Achievement: David Roher (2009) Studies the performance of sports persons. Through a statistical analysis in the field of base ball game, the author studies various correlations and identifies various factors of success in an application of AKP.

Science Projects: Lutz Bornmann and Werner Marx (2012) apply the Anna Karenina principle to the explanation of success in science projects. They refer to

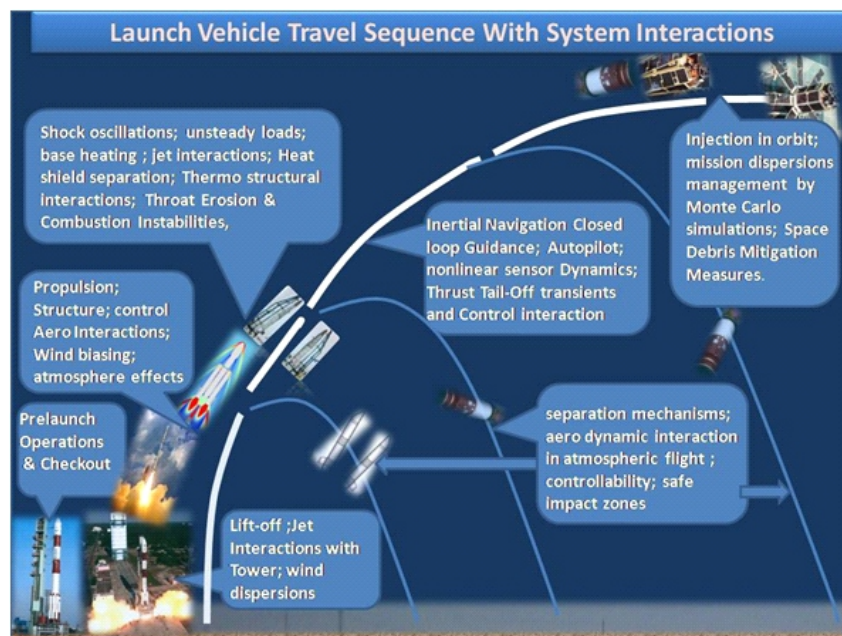
three central areas in modern science in which scarce resources will most usually lead to failure: (1) peer review of research grant proposals and manuscripts, (2) citation of publications and (3) new scientific discoveries. In this paper the authors present the AKP as a concept that can be used to explain success in science: Success in science always depends on several key aspects that must all be fulfilled. One missing aspect out of many other aspects will lead to failure and makes the failure a unique matter.

AKP in Space Science and Technology

Space system engineering throws interesting challenges in complexity arising out of the need to bring together multiple disciplines of engineering and sciences. Development of satellites and launch vehicles calls for the definition of a systemic configuration resulting from the interplay of a number of disciplines including flight mechanics, aerodynamics, mechanism, structural and thermal sciences, navigation, guidance, control and propulsion. Further, the design should also address the thermal and aerodynamic effects of atmospheric flight and high vacuum of space.

The figure represents the sequential steps in the travel of a spacecraft from the lift-off at the spaceport to injection into an orbit for subsequent on-orbit operations and services. Following several weeks of launch vehicle and spacecraft integration and testing activities, the vehicle is readied and moved to the launch pad, and just prior to launch hundreds of onboard system parameters are measured and monitored by the check-out system for ensuring the health of all subsystems for ensuring a successful launch. If any single critical parameter is beyond the tolerable bounds, the launch is kept on hold until the issues are understood and resolved. Critical issues at lift-off are the huge mechanical, thermal and acoustic loads generated by the hot jets on ignition. As the thrust

overcomes gravity and the vehicle slowly raises, the interactions of the ground winds, thrust misalignments and the control forces should be so managed that the vehicle clears the launch pad without any physical impact. The aerodynamic load distribution on the vehicle is critically influenced by the prevailing wind conditions and the dispersions in propulsion and auto-pilot performances. This in turn can lead to the build-up of vehicle angles of attack and lateral deflections of the long and slender vehicle structure. These atmospheric and wind effects can be suitably managed by wind-biasing techniques, Proper functioning on the onboard electronics and computer systems depends on limiting the acoustic and vibratory environment created by the high speed jet flow, aerodynamic shock oscillations on the bulbous heat shield, flow separations and the shock-boundary layer interactions and the complex shockwave patterns created due to aerodynamic interactions of the strap-on and the core configurations and the influence of several local body protrusions. These critical parameters are the direct functions of vehicle aerodynamic angle of attack, which in turn is determined by the vehicle flexibility, control, trajectory and atmospheric winds.



The spent strap-on stage jettisoning generally occurs within sensible atmosphere, and hence is influenced by the nonlinear aerodynamic interactions of the separating bodies. An important parameter in the transfer of control is the tail-off thrust profile of the strap-on boosters, and the characterization of the control forces derived from them. The Vehicle guidance system and separation mechanisms should ensure that the separations of spent stages are so managed that the on-going vehicle has no adverse interaction with the separating bodies and also the spent stages fall back on to earth in safe zones without causing any harm whatever to life or property and meeting all requirements for such impacts.

As the desired orbital parameters are reached consequent to the continuous corrective actions of the onboard vehicle guidance system, the propulsive stage is shut-off and the satellite is separated and inserted into its orbit for further orbital operations. When multiple satellites are injected by a single launch vehicle, it is required that the sequence of separations, timings and orientation of separation are designed to ensure no subsequent short-term and long-term interaction among the injected satellites. The entire launch trajectory and orbital insertion should also take into account any possible detrimental impacts with orbiting space debris. This is done by space debris proximity analysis and collision avoidance procedures.

The list of complex system interactions depicted here is only representative, and the totality of mission critical parameters that can have bearing on the failure of a space mission is much longer. All the systems, parameters have to function properly for mission to be successful. Any apparently small or minor deviation in one of them can trigger large departures in other critical systems and can lead to a catastrophic failure, which is exemplified by several failures in the

past in the attempts of every space faring nation. Each failure is different and unique in its own way.

Success of a space mission is thus ensured by eliminating all possible failure possibilities; and that alone is the secret of success in space ventures. Thus, the Anna Karenina Principle operates here with unforgiving finality. In real-life human interactions, one can somewhat assimilate the severity of the AKP, as there is a good possibility to absorb errors of judgment and move ahead with experience gained. This option is not always available in the complex domain of space science and technology; but the good hope is that scientists are vigorously working to develop fault-tolerant systems.

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Vignettes from the Brushstrokes



Based on an interview by Dr. Gigy J. Alex

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My visit to Sri. T. C. Rajan's home on one sultry Saturday afternoon brought me face to face with many unforgettable scenes and heart wrenching themes. The road to his home was a long winding one. He came to the by-lane to show us the way to his home in his bike. But I never dreamt that this man with this athletic body is an artist, too.

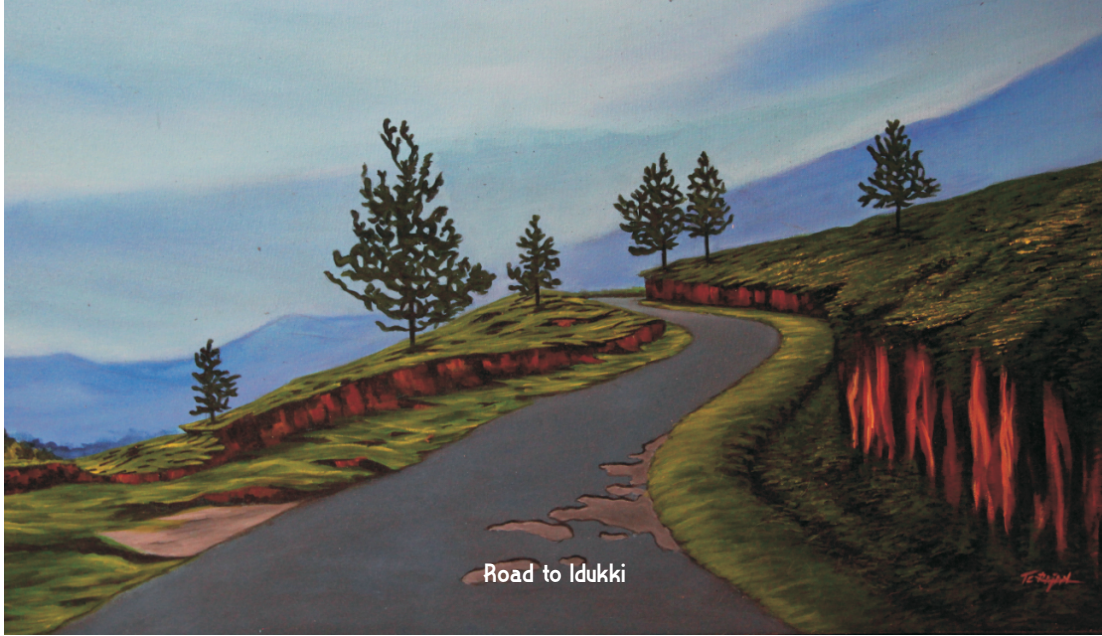
After a casual chat he took us to his studio, which is an abode of his thoughts and dreams, his struggles and pain, his angst and hopes. Suddenly he shifted from the role of an avid athlete to that of an artist who handles paint and brush, who is a master of acrylic painting, a prolific painter and a devoted artist. He who started his career in the Vikram Sarabhai Space Centre in 1986 has G. V Raja Sports College as his Alma mater. Now he is working as Senior Project Assistant at VSSC. It is his father's unflinching support and guidance that helped him to become an artist of this magnitude. He started drawing pictures at the age of three. Without any formal training he plunged into this world of visual images with his brush strokes and the vivid designs it etched.

✍ For the last ten years he has been the dedicated President of Kerala Chitrakala Parishad. He is also the Vice President of the Cultural Forum at VSSC, *SPARC*. He is also engaged with the *Gagan* team from VSSC, by regularly contributing sketches to the journal.

- ✍ He has conducted 30 exhibitions all over the world.
- ✍ He has five Solo Exhibitions to his credit, which he conducted in Chennai, Bangaluru, Malaysia, and Singapore.
- ✍ He co-ordinates with Soorya as its Painting Director, Sri Swathi Thirunal College of Music, Trivandrum, and YMCA to conduct exhibitions and to conduct classes for other artists.
- ✍ As an athlete he specializes in long jump and triple jump.

He has proven his expertise in pencil drawing, caricature, charcoal painting, sketching, oil painting, water colour painting and acrylic painting. Now he is a veteran in acrylic painting. He paints pictures based on scenery, themes, and portraits. For those pictures that he paints based on scenic beauty, sometimes he takes the photographs and then make use of them to draw pictures. At times it will take up to twenty days to finish a picture. There are many instances of such paintings which include “Road to Idukki”, “Painting of a lady named Lily at Neyyar Dam”, “A Resort in Munnar”, “Varkala Beach”, etc. For him journeys are part of his life, and he carries imprints of almost all his journeys when he returns, and vivifies those images through the brush strokes. Once he found a broken flower pot in his neighbour's house and that inspired him to draw the beautiful picture, “Green Leaf”. For this great man who finds his muse everywhere, inspiration oozes out of everything, be it big or miniscule. He draws pictures related to villages, greenery, themes, and beautiful scenery.





Sri T.C. Rajan is also noted for his lively portraits of A P J Abdul Kalam, Madhavan Nair, Mother Theresa, and Yesudas. He painted the portraits of these personalities and handed them over personally. He still cherishes the thank-you letter delivered from A P J. If one asks about the most popular painting he has made, it is that of “Sree Padmanabha Swamy Temple”, in all its glory and splendour.



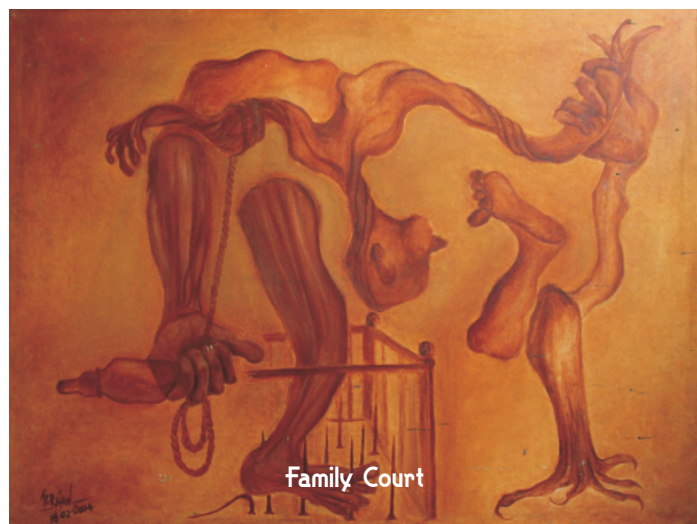
Regarding his passion and pain in painting pictures, he feels great strain while painting themes. Even if he is a professional artist he has the apprehensions of a child when he starts a painting - whether he will be able to convey the emotions and thoughts concerning the theme fully with all its vigour and sensitivity. The efforts and strain behind a thematic painting is fully conveyed in his paintings. If you ask him about his favourite painting, with no doubt he will pick the painting by Salvador Dali, *Christ of Saint John of the Cross*.

Sri. T. C Rajan being a self-made man is a self-taught artist, too. Today he is a master of acrylic painting. He learns through experiments the mystery and magic of mixing of colours. He loves to discuss with veterans in his field, to get and give tips on painting, mixing and matching of colours. He regularly updates his knowledge and he is also an ardent enthusiast of Vincent Van Gogh. He considers the role of the painter as that of a creator. He says that when we make portrayals, we will get a feel that even one's mother has never observed her baby with such kind of microscopic detail. He never says that a painting is removed from reality, for him it is near to the reality, if one trusts one's eyes and imagination.

Among his thematic paintings, the most touching ones are that of the "Addict", where he speaks about human beings who are addicted to one or the other, either it be drinks or drugs or knowledge or ego. Another painting "Prisoner", speaks about the various prisons the human beings create, whether it is that of religions, or cast or creed. There is another heart touching



thematic painting “Family Court”, where the painter speaks about the infants who are strangled by the struggles of the parents. Yet another thematic painting “Unity is Power”, speaks about soldiers who guard our country at the borders.



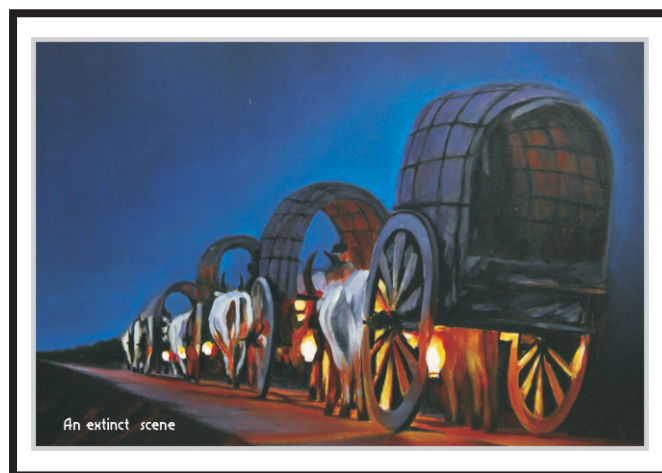


When we visited him for this interview he was busily planning for another exhibition titled “Twenty-Twenty”. It aims at presenting twenty different types of cycle journeys.

His elder daughter Sandhra is a good singer, and she is learning music, too. His younger daughter Varsha is learning violin. His

wife, Sindhu Fernandez is an aficionado who gives full support and encouragement to her husband and children. It's an artists family, where sports, painting and music gel together.

It was a beautiful journey. We carried with us shades of the wonders that he chiseled before our eyes, the magical strokes of his brush, and the impressions of his images. His sketches taught us a lot. Before bidding goodbye I asked him his favourite colour, and he replied with a gentle smile, “It's blue”.





புத்தாண்டு வாழ்த்துக்கள்

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புது புது வாழ்த்துக்கள் வர வேண்டும்
புத்தாண்டு வாழ்த்துக்கள் பெற வேண்டும்
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இறைவா அதை நீ தர வேண்டும்

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தோல்விகள் வந்தால் பொறுமை வேண்டும்
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எது வந்தாலும் நம்பிக்கை வேண்டும்

அன்பில் விளைந்தது மனைவியப்பா
ஆசையில் முளைத்தது குழந்தையப்பா
ஆயினும் மனதில் வருத்தமப்பா
அதை வந்து தீர்ப்பாய் பழனியப்பா

சக்தியும் சிவனும் சண்டையிட்டால்
சக்தியே வெல்லும் காலமப்பா
சக்தி தான் என்று சிவனும் கொஞ்சம்
விட்டு கொடுத்து போங்களப்பா

குழந்தை நலம் பெற வேண்டிடவே
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கேட்டதும் கொடுப்பது அன்னையப்பா
கேட்காமல் கொடுப்பது இறைவனப்பா
அவன் புகழ் பாடி மகிழ்ந்திடவே
அனுதினம் துதிக்க நீ வரணுமப்பா

கற்பனை கடந்த ஜோதியப்பா - அவன்
கருணை வடிவான தெய்வமப்பா
அற்புதமான கலைஞனப்பா - அவன்
திருவடி காண வேண்டுமப்பா



சாதிகள் இல்லையென கூறிடுவோம்
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சாதனை செய்யாமல் ஏங்கிடுவோம்
சாதித்த பிறகு எழுந்திடுவோம்

போருக்குப் பிடிப்பது வாள் என்றால்
தேருக்கு பிடிப்பது வடமப்பா
பாருக்குள்ளே நல்ல நாடு என்றால்
நம் பாரத நாட்டை கூறும்பா



എഴുത്തുകൾ

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എഴുത്തുകൾ! നാലക്ഷരത്തി-
ലാരോ കുറിച്ചിട്ട മന്ത്രധാരികൾ
സ്നേഹദീപ്തമാം വർണ്ണക്കടലാസിൽ
കൊത്തിയ സുന്ദരശില്പങ്ങൾ
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അതിൽ നിന്നുറി വരുന്ന
 വാത്സല്യത്തളിനീരുറവകൾ
 ഇന്നു നീ എനിക്കായെഴുതും
 കത്തുകളിലൊക്കെയും നൊമ്പര-
 പ്പിണക്കങ്ങളെങ്കിലും
 സ്നേഹത്താൽ പ്രകാശിതമല്ലോ.
 വെളുത്തൊരീ കടലാസിൽ കുറിച്ചിട്ട
 കറുത്തവരികളിൽ
 നിന്റെ ദുഃഖത്തിൻ നോവു ഞാൻ
 വായിച്ചറിയുന്നു.
 ഒന്നു കാണുവാൻ കൊതിയുണ്ടെ-
 നടുത്ത വരികളിൽ
 എന്നോടുള്ള സ്നേഹത്തിൻ ആഴവും
 എഴുത്തുകൾ! സ്നേഹമന്ത്രധനി-
 കളാം മുത്തുകൾ കോർത്തു
 നമ്മളെഴുതുന്ന പ്രണയകാവ്യങ്ങൾ



Tribal Women - A Scene from Palakkad

T.C. Rajan

Senior Project Assistant at VSSC, Thiruvananthapuram.
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