Devi

By

Thrishantha Nanayakkara

Dedication

To Visakha, Akina, and Seth for their great love and affection

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memorable visits to Jaffna to see people affected by antipersonnel landmines had gone into this story without my knowledge.

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Thrishantha Nanayakkara

1. Prologue: the waves

On the 26th of December 2004, a new word, *Tsunami,* entered the Sri Lankan vocabulary. On that day, a series of gigantic waves achieved in few minutes a level of destruction that the catastrophic civil war in the North and the East could not reach in two decades. Communication towers were twisted and brought down to the ground as if caught up in a nuclear blast. A commuter train was twisted and washed away with thousands of lives within. The fishing industry was crippled, all but shattered, with the boats broken into pieces and mixed with the bodies of their former captains and dependants, a macabre, confused jetsam abandoned by the receding surf. Dazed, mothers were left looking amongst barren waste for the means to stop their breasts from swelling with nurturing, unwanted milk. Shocked, lovers were instantly torn apart, separated into two worlds. Horrified, children lost their teachers as well as schools and whole neighborhoods and towns. The government was miserably trembling with the tension, overwhelmed, stumbling around without direction and tripping on its own red tape.

University students became relief workers and arrived by the thousands to prop up the civil administrations in the affected areas, but they were not trained to live and work in such harsh conditions. There were no roads, no food, no safe shelters, no gas, no fuel, and no communication

systems except for one or two radio connections to the capital, Colombo. The whole area was reeking with decomposing bodies untended in the wreckage.

A group of university students were busy working in Hambantota. They chose Hambantota because they estimated that other affected cities like Galle and Matara had easier access from Colombo. They correctly estimated that a lot of NGOs would pick such cities. Students from the south were a little scared to volunteer in the Eastern coast except for those NGOs who had good footing there. Hambantota was located at the Eastern end of the Southern province. Except for the coastal highway that runs through Matara and Galle all the way upto Colombo, there was one alternative through Ambilipitiya, a winding road from Colombo. The group wasted no time. They hired two buses, packed some dry rations for them to survive one week, took some barrels of water, a Gas cylinder and a cooker, few laptop computers, and some extra clothes to wear. A senior lecturer who owned a construction company came with three pickup trucks with drivers and engineers. The gang of about two hundred undergraduate students, two senior lecturers, and six engineers from the construction company left Colombo on 27th Morning with the hope of reaching Hambantota before 9 a.m.

At Hambantota, nobody believed that this group could be of good help because the work seemed too rough for

university students. Nobody assigned them work. The group looked around and decided to divide into few groups so that they could attend to the most urgent bottlenecks to be cleared. One group helped the army to remove dead bodies even till late night. They were working near the lagoon under the moon light. The bodies stuck in the lagoon were badly decomposed, soaked in water, and weighed more than 200 kilos. The whole area was full of germs; the air stabbed the nose and lungs.

Some of the students, now relief workers, got the warehouses back in order. The dry rations that came flooding into the city from the hinterlands had been piled up without any record of what was inside those mountains of gunny bags. They organized and sorted the supplies into smaller heaps of baby items, biscuits, rice, milk powder, medicine, etc., and entered the data into a searchable database maintained at the divisional secretariat's office.

Some other self-organized groups of students were traveling in the affected areas, collecting data on the depth and breadth of the destruction so that the short and medium term relief planners would have a sound basis for their distribution of resources. One group of students stationed at a private office in Colombo kept in constant touch with the group that handled the database at the divisional secretariat of Hambantota through the only wireless telephone line in the area. Their summary of the situation

was regularly relayed to the Prime Minister's office that coordinated the relief work from Colombo during the first few days. A few senior staff members lived with the students in Hambanthota just to inject some encouragement and to help them plan the logistics. All were on their toes, determined, focused, and mindful.

To make sure that nobody fell ill, they stopped work at 10 p.m. everyday. They then met in a school building to review and summarize the daily reports in order to plan the work for the next day. Nobody had the appetite for a good dinner. The smell of the decomposing bodies of their brothers, sisters, friends, kids or parents, and the crying of devastated friends and relatives was constantly punching their brains. Yet, they somehow managed to cook some noodles and ate them with Parippu.

Most of the students in Hambanthota slept under the stars. The surroundings were deathly silent except for the intermittent rumble of pickup trucks. The trees were drenched with moonlight. The sea, now so tranquil, glittered under the moon. The air was dry. As they lay quietly, sorrowful scenes of what they had seen during the day started to creep back into their conscious minds. It was in the night they could think for a moment about the weird possibility of one of those bodies being somebody they knew. Some of them were unlucky enough to see some familiar cars of their old school mates. While working they

had no time to let emotions govern them. They just jumped from one job to another. Fatigue never bothered them; at least, they were not aware if it did.

Night after night, something transformed each of their minds into ones that began to stay firm in the face of disaster, ones that wanted to dive deep into the realities of nature untapped by modern-day science, and ones that cared more, without boarders, for humanity.

2. The unusual encounter

Dr. Amara was speeding along a narrow pathway leading to the Tissa refugee camp to do some data collection. There were news of some expecting mothers needing urgent medical attention. Dr. Amara wanted to assess the situation and inform Colombo. The double cab truck jolted along the road with a lot of broken trees and debris strewn around. They had to rush because it was getting dark. They had to re-group at a school in Hambantota town before mid-night. They could see white flags in almost every house they passed. It is the Sri Lankan way to signal that there was a deceased.

There was a monk walking back to his monastery. Dr. Amara wanted to stop and offer a lift.

“May I give you a lift? We are heading towards Tissa. Where are you going?” Asked Amara.

“Yes, it will be great if you could drop me somewhere near the town” Replied the monk.

He sat in the rear seat.

“By the way, what are you doing here walking all alone?” Amara asked.

“Well, I am walking around talking to my disciples. Few words of Dhamma are all what I can offer to those who were in sorrow.” Came the reply.

“Why do you think any Dhamma will help them at this moment?” Amara asked spontaneously.

“That is a good question. Dhamma is nothing but the rules of nature that governs our environment. If you realize the working of the environment, you tend not to get too shocked to encounter bad experiences. Bad experiences are there because you accept it as bad. When you understand Dhamma, you begin to stay impartial in front of the reality of life. Nothing brings more happiness than that state of the mind. But if you are not conscious about these rules, you tend to become disappointed at the slightest loss you experience.”

“Yes, that can be true. By the way, did the monastery got affected by the Tsunami?” Amara was curious to know.

“Well, the monastery itself was in great crisis. A lot of disciples who used to offer food had been silenced by the wave.”

The team in the vehicle talked to some donor people carrying dry rations to the area. They could quickly collect enough rations and water for few monasteries that had

faced the same problem.

Dr. Amara decided to change the track towards the monastery. The pick up truck was now heading into the woods along a bumpy track. They were passing by marshy areas with thorny bushes in this dry zone of Sri Lanka. Except for few salt water ponds, there were not many ponds even for the animals to drink. There were five Monasteries in the mid of serene environments. One very seldom gets to see these monasteries. They were different from normal temples. They were relaxed, silent, and looked very modest. No loudspeakers, and no forcing to listen to any Gatas like in other temples in the cities. There were not many buildings either. Monks meditated in caves. They preached sermons on full moon days because farmers could come to listen to these sermons in the night without having to fear about danger from wild animals. The monks wore yellow robes that kept the insects away from them.

There were ruins of the ancient southern kingdom here and there. Perhaps those were among the very few that remained in the south. This was the area prince Dutugamunu was born. His father's kingdom controlled a vast part of the South. Later, King Dutugamunu united the whole Sri Lanka by defeating King Elara who controlled the Nothern part of the country. Due to some reason, the old civilization have had a great technology to draw amazing patterns and carve out Buddha statues out of

rocks. Recent escalations of sponsored robbery had taken away most of the treasures hidden in these old temples and monasteries.

The monk wished the team a healed mind and wanted to show the way back to the main road leading to Tissa. He got back in the rear seat. It was a little dark. The tropical sun painted the western sky with glowing red and gold. The bumpy road kept the truck jolting along slowly. Dr. Amara had a question that he thought would be best sprouted out now.

He asked the monk, “I can not understand why this happened. Can Karma be the cause? No it can not be because this many people can not have had the same Karma that is this bad. I saw bodies of babies stuck in the woods. What sin can cause such a Karma?”

The monk paused for a while. He gently asked “Dr. Amara, what is your technical background?”.

“Well I am working on machine intelligence” Amara replied.

Then the monk started. “According to Damma, anything in this nature is an effect of a process that starts with a set of causes and conditions. The effects of one process can work as the causes and conditions of another process. Thus it can

go like a chain." He paused.

"There are five types of laws that govern the conversion of these causes and conditions to effects."

Everybody in the cab was silent. Minds fixed on the monk's story.

He went on, "There is a set of laws governing the chnges in matter and movements of matter. There is another set of laws that govern the seasonal changes, weather conditions, and other effects due to the planetary movements. The movements of continental plates might also fall into those set of laws. There is a third set of laws that govern the growth of organic bodies based on genetic substrates and other organic reactions. There is a fourth set of laws that govern the dynamic reactions in the mind. The last set of laws govern the working of Karma, those unseen forces that relates effects experienced now to deeds and thoughts of the past."

He went on to say, "Any effect can result in due to many causes and conditions working under one or more of these sets of laws at any given time."

The modern day science that the team in the cab knew had understood only a little portion of the laws in three of the above sets other than the working of the mind and the

working of karma. Since science relied by and large on sensors and mathematics, the things that science could understand were limited to the limit of sensors and mathematical axioms.

The monk said, “Therefore, the deaths or the survival in the Tsunami can be due to the working of all or a few of these laws. We can not attribute it only to the Karma. There are plate movements on the earth, and they can give rise to earthquakes. Due to the very basic principle that these movements are characterized by uncertain phenomena, the occurrence of the earthquakes can not be predicted. Also, there can be genetic phenomena. People with in born swimming talents or the animals with a sense for the ground wave that comes before the sea wave could have escaped. Other people, who could concentrate well, think logically and rationally without getting panicked could have escaped. Those are mental reactions. Forces of Karma could also be there. But Science must try to understand these laws so that you can predict what might happen in the future with a certain degree of confidence. The duty of the Damma is to motivate people to think about these facts of life in this universe. That was part of my job I was doing at the time you picked me up.”

Dr. Amara started again. “What I can not understand is how a human brain could understand all these as far back as 2500 years ago, when the knowledge about Genetics,

psychology, physics, and chemistry was almost nothing compared to what we know today".

The Monk resumed. "Mahathmaya, what you mean by science can only see things through man made sensors. When you had the Hubble telescope, you saw something called the universe. But what you see as universe today through the Chandrasekhar telescope is much more involved than what you saw through Hubble. Therefore, it is reasonable to say that science is limited to the limit of sensors."

"Agreed", Dr. Amara replied.

The monk paused for a while and then started again. "What a concentrated mind can see is different. A normal mind is like an incandescent lamp emanating light in all directions. It's light diffuses into the air in all directions. So, the things one could see with that light is just those very close by it. If you concentrate the light rays using a reflector like what you see in a flash light, the same light source can now show you things deep in the darkness that you did not see with the normal bulb. If you go further and concentrate more, the photons of the light rays could be converted into a laser beam. You know what a laser beam can do. It can even penetrate through concrete. Would you ever imagine that particles in a light ray could penetrate a concrete when you see normal sun light?"

Everybody was spell bound.

“The mind is something like that. The violent dust of the mind created by the violence in the uncertainty of sensory information that bombards the brain continuously can be settled by meditating. First you block the as much sensory information by sitting down in a suitable posture, and by closing your eyes. You may keep looking at your breath. It is like what you experience when you enter a dark room from a lighted up environment. First you see nothing and then you gradually begin to see things in the room. This way the mind gradually turns out to be like the flash light. You could use that to see phenomena in nature hidden in the darkness. If you go further, you can convert it to a laser gun. Then you can see things in the quantum world. What you see can not be translated to the lay languages very accurately. Therefore, Dhamma can not be taught entirely. One can only show you the path. After some point, one has to go seeing things by himself. The end to this walk is the ultimate state of permanent happiness and a fully awakened mind. This state of happiness is different from a series of pleasure bubbles followed by sorrow, stress, and frustration we feel now. You get rid of ego that keeps haunting you with fear to lose things that you think are yours. You get out of that illusion.”

The cab was approaching the main road. The monk said

good bye to the senior staff members from the university and started walking back to the monastery. The brains in the cab continued to dive deep into a set of philosophical questions.

Artificial Intelligence was a field that asked questions about things beyond what the normal man made sensors could see in this world. One such question was self awareness. No mathematics, physics, or Chemistry could explain what self awareness was. Nobody could give a recipe to build self awareness inside a machine. Yet just like other inventions in the human civilization that did not fall within one's common sense at the inception, scientists were chasing after this unknown mystery with determination. In this chase after synthetic intelligence, scientists came closer and closer to see the reality of the nature. Some scientists felt that there is something more to the world we see through the main fields of Physics and Chemistry.

"We are missing few important fields that physical sensors could not get into." Amara said.

"What are the other two sets of laws that govern the working of the mind or the chitta and and the working of the Kamma that we have not adequately explored, doing in this universe? Does the answer to a machine with self awareness lie in those two? Is flesh and blood essential to

have a mind?”

These were few tough questions the field of artificial intelligence is now asking. The present day machines can sense the world through sensors. Any physical quantity like pressure, heat, images, sound, and chemicals are first converted to electric signals. These electric signals are then sent to the brain. The brain processes these electric signals. In the world of machines also, these sensory information is fed to the microprocessors in roughly the same way the sensors in a biological body sends the information to the central nervous system. But there is a third layer in a biological system that enables them to feel the environment in terms of painful sensations and comfortable or pleasing sensations, whereas a machine can not feel that way.

Kamal, a villager and a farmer from that area who came to show them the way was seated in the rear seat listening to this conversation. Though he never got the chance to enter a university, he had been a keen reader of scientific literature.

Kamal asked. “The living beings have the choice to be mindful of the sensations or to look at them with a diffused attention. The programs that run in processors of the machines have no such choice.”

Dr. Amara replied. “Yes, they will just interpret the signals

including noise. For instance, if a machine with a sensor to detect Ammonia goes into a chamber full of Ammonia, it will say I am in a place with 98% Ammonia. But a human will first run away in pain and say that place stinks. There must be something that we do not know associated with living beings like humans that orchestrated the mind to feel things and pay attention to sensations."

"Yeah, that is amazing" Kamal said.

"The interpretations of signals inside a human nervous system are not quantified information, but mere generalizations between pain and comfort. But my biggest question is, where on earth these elements that can feel things could be living inside our body? Is it something material like neural networks or purely to do with the mind?"

Nobody in the cab had even a clue.

Kamal took the risk. "The monk pointed out that there are a set of laws that govern the working of the mind just like other physical laws like the Newton's equations. What laws could be governing this phenomenal world of the mind as the monk pointed out?"

"By the way, how far has science gone in this regard?" Kamal asked.

“Kamal, these days we are asking whether a set of distributed codes running in a network of processors attached to a set of powerful sensors orchestrate a similar process leading to feelings. Orchestration of such a phenomenon by a set of primitive processes is something we believe to be an ultimate solution. If that is impossible, we have to ask what is missing?”

3. The night shift

It was May 2005. Almost half a year had gone past the Tsunami experience. People were still working in the affected areas. Politics had settled down. People started to move inland to build their new settlements. Schools were back on track. Fishermen started fishing with new boats. Volunteers started resuming work in the usual jobs after having transferred their part of the work back to the Government machinery. The Government had learnt its own lessons of efficiency, but didn't do much to refine the administrative regulations and finance regulations to improve efficiency. Protecting the traditions of inefficiency was much more important than bringing about reforms. Maybe the educated senior officers of Sri Lanka were waiting till some foreign consultant recommending some new directions for them. Since everybody was fairly settled and the country was not starving thanks to the donors, people also did not care to talk much.

Dr. Amara and his colleagues were back in the laboratory working on robots to work in hazardous situations. That was a part of their job in the University. They were lucky to have their hobby as their job. They were dreaming of a robotic fish that could survive in the sea. The fish will serve a multitude of purposes. It will do surveillance, collect data of the availability of fish to advise the fishermen about the profitable fishing areas, monitor the

variations in the sea current patterns, and sense any sub-sonic waves propagated along the sea as a result of a Tsunami.

The team decided to use the opportunity to test their ideas on self learning systems. Therefore, this robot had to have the additional abilities to feel hungry, feel threats, look for food, and learn to swim in sea currents, etc. In the case of an emergency like a Tsunami, it would send the warning signals to a base station on ground. The ground station could also monitor where the fish goes.

The first task was to build a machine that could swim just like a fish. The physical morphology of the machine had to match exactly that of a natural fish. This was due to a fundamental belief in artificial intelligence that the intelligence of a particular living being is only meaningful only in that particular body. How one feels and influences the world around it depends on the shape and size of the body, and intelligence emerges as a result of such interactions. For instance, when a hippopotamus swims in the water, how it disturbs the water and how it feels the hydro dynamics is different from how a small catfish would perceive and disturb the water. Therefore, how the two animals would perceive and react in the water will be quite different from each other. Therefore, the brain that mediates perception and action should also be different.

The research team was stepping into unknown territory. They had to find new solutions to make self learning systems more efficient than what they are today.

The team got together every Thursday to brainstorm on ideas and to solve problems faced by the team members. It ranged from tough problems in mathematics and computer programming to admin issues like purchasing items for research. Usually the meetings started after breakfast. Junior students who stayed in rented rooms near the university had to eat from canteens in the university. It was very common to see lines of more than twenty meters in each canteen during the breakfast, lunch, and dinner times. One had to wait around half an hour to buy the meal. Therefore, the team always waited till the juniors turn up in the lab after a tiresome breakfast.

Namal, a final year undergrad student in mechanical engineering had a lot of questions in robotic learning. One mystery they had to investigate was the match between the body and the level of intelligence.

Namal started, “all living beings are born much smaller than their adults. Therefore, the child body interacts with the world in a different way than the adult body does. Therefore, the early substrates of intelligence are essentially built up in a body that is much smaller than the adult body. Does it mean that the brain and the body

undergo a series of improvements as a result of an interaction between the two systems?"

"It might well be the case" said Abaya, a senior postgrad student.

Namal resumed. "If that is the case, the early stages of learning should have a body with simpler dynamics. The additional neural substrates allocated to do more complex movements should come with a suitable improvement in the structure of the body itself. The improved structure should in turn support the brain to look for new experiences. This process must then snowball into a learning process leading to an adult system."

"Convincing" Dr. Amara supported.

"If we look around, we can see that the mobility is the most significant thing that makes animals different from plants. In fact the early development of primates was marked by a set of cells that could process information related to mobility" Dr. Amara paused.

"Then these cells supported the body to move, and these movements helped the cells to process more and more information about the world. Then, like how the administrative structure of a business splits into more specialized departments when it grows, the brain started to

develop layers of specialized processing areas" Amara continued while scribbling some diagrams that looked like cortexes of the brain.

"In any case, we guess that the brain wants to process sensory information no matter what they are. The neurons in the brain seems to be trying to reorganize themselves to process the sensory information in the most efficient manner. While doing so, it seems that the cells re-tune themselves according to the tune of the statistical properties of the sensory information it processes. It is just like the fielders of a Cricket team re-organizing to the tune of the most frequent shots of the batsman."

Dr. Amara continued. "At least we know the work done on the visual cortex of the brain suggests that the receptive fields of the neurons in the visual cortex have organized according to the statistics of the natural scenes we have been seeing over generations"

"We don't know much about how we should design neural networks that best suits the swimming action of our fish. Maybe we should first look at some sensory data while the fish swings its fins in water. We maybe able to identify some statistics of the hidden dynamics of those movements and how they interact with the environment. Maybe we should have one team working on that part of the problem". Dr. Amara suggested.

Namal interfered. “Lets develop a machine with a fixed size, but let it learn simple things first.”

Abaya started. “Great! Lets start that way. We’ve got to write a code that keeps on growing another code.”

Dr. Amara joined them. “It is good to have small learning substrates. I mean, small independent primitives learn to do simple things. Then they collectively try to orchestrate complex things. The complexity of the code structure grows by organizing simpler code segments in some orderly structure.”

Dr. Amara went on. “What is most important is orchestration. You know what a symphony is. When you close your eyes, what you hear is music influencing your mind in complex ways. But if you open your eyes, you could see that all the phenomenal music was made by a coordinated group of people who played different types of instruments. So, there are few important things here. We have to have the critical number of instruments, we have to have the critical degree of diversity of the instruments, and we have to have a critical degree of ability in the director to coordinate or arbitrate these players. Like that, we’ve got to find some way to orchestrate complex behaviors and thoughts in a robot through an interaction among many simple code segments that maps sensors to actuators that

move the robot, or to an input to another code segment."

Kamal another senior postgrad working for his masters degree was very keen in such codes.

"Few of us can work on that code. Basically it will keep on growing another code by making and deleting connections among a pool of code segments till an incomplete picture of the abilities was completed gradually."

Dr. Amara wanted to give another hint. "I remember some meditators talking about how the human mind works. That might be useful to us"
"What could be that?" Kamal exclaimed.

"Well it is a bit involved. Let me put it this way. It says that our mind takes us forward through a sequence of desires or goals that appear in our mind one after another in a chain. Once we satisfy one desire, the mind brings in another. You know it is a painful thing, but we chase after all these illusions and never gets sick of it thinking that all these desires will bring happiness. One good things is that the brain keeps of re-organizing and developing to make us able to satisfy our goals. Likewise, the fish should start making wishes and then chase after them till the target picture of internal abilities or the desire is completed. Then another desire should appear and the fish should chase after it."

“Cool” said Kamal.

“Who will work on the embedded processors and circuits?” Dr. Amara asked.

“I can get together with Ajith and Gajedran” said Namal.

“OK folks, lets get back to work” Dr. Amara closed the meeting.

Namal had a big admin issue to be taken up at the end. “Sir, how are we going to convince the university that we have to hurry up with this project?”

“I guess no way. The university has no control over it. Our university is the fastest in Sri Lanka. But about 200 times slower than most universities the world respects. But what to do?” Dr. Amara replied.

“But, Sir, we have to import the microprocessors and other ICs using a credit card, because the suppliers in the US has an online purchasing system. We can not do it with the present system where you have to fill forms, get the signature of the head of the department, then from the dean of the faculty, and then from the bursar, and finally wait till the supplies department calls for quotations to realize that there are no local suppliers. It would take months for us

just to start buying things. After all, this is the money we brought to the university after such a pain in writing grant proposals and defending them in front of panels of evaluators".

Dr. Amara knew that these young and energetic students have been very frustrated working in a system designed by some brilliant people who advise the top political leadership to frustrate those who do some extra work for the country.

"Namal. You are not the first one to feel like that. I know the situation very well. I fought to change it, talked to most people who can take a step, wrote to newspapers, but it stays like a rock in front of us. All researchers in Sri Lanka face this issue."

"All starts from one dumb assumption that everybody is a rogue."

"OK, that is true in a colony where the invaders don't want to believe those who are fighting for freedom." Namal went on.

Dr. Amara resumed. "When I was a student like you in my university in the US, I was given a credit card that belonged to the laboratory to order things from the internet. We just used to inform our principal investigator what we

were going to order, and obviously what we bought was recorded in the credit card statements. That was enough."

"Unfortunately, this country was a British colony. We still follow the system they designed to curb what they didn't want Sri Lankans to do. That is invention and innovation. They just made sure we export raw material and cheap labor and buy finished products."

"You have to live with it for few more years buddy. Lets tolerate it and work. Maybe we can do some part time jobs and make our own money to buy things that we need immediately". Dr. Amara wanted to console.

Gajedran joined. "Sir, I don't understand this whole puzzle. There are politicians who pull out millions of Government money for their election campaigns. Few rupees we spend to make something new for the country is like pulling few feathers out of a peacock".

Dr. Amara laughed and got back to his room saying "If you go to the bat's wedding, you have to stay clinging to his roof. We have to work within the system, show results and keep the fight going. People will join us later."

The team Amara had was very energetic and critical about things that went on in the society around them. It was a part of being a good scientist in the twenty first century.

The team took up the project with much enthusiasm.

Kamal's group was working on the self growing code. It was just a code that wrote another code. First, the fish became able to make wishes. It wished it could swing its fins. This wish created a target picture of abilities that the fish did not have. In this case, the first target picture was a fish that swims in the water with its fins swinging elegantly. Program segments responsible for moving the fins did not know how to write commands to the motors attached to the fins to give rise to an elegant swinging motion. It tried different ways first, and at each attempt, a mathematical function generated a reward value representing satisfaction for the fish whenever its abilities came closer to the target picture of the abilities. Once the code segments caught a pattern to change the way it moves the fins so that the mathematical reward kept on increasing, the code segments quickly spiraled up learning how to make the fins swing elegantly.

There was an automatic mechanism to update the target picture of the abilities once a given target picture is achieved. The mechanism monitored the gap between the abilities the fish had learnt so far and the target picture of the abilities. In the early stages where the gap was large, there was much pressure on the system to explore wildly. When the system kept on improving, the fish got more reward to mimic satisfaction. Once the gap fell bellow a

threshold, the fish got a large reward to mimic a bubble satisfaction a human gets when they feel that they have achieved what they wanted. This bubble reward or the pleasure was not there to last long. It triggered the appearance of a new target picture of the abilities. It could be any other need that the system wanted to achieve. Amazingly, the system had no idea of what the next target would be when it was chasing after one.

This phenomenon of targets appearing one after achieving another led to fresh stressful situations followed by jubilant moments of achievement. This phenomenon of pattern completion, new pattern creation and chasing after the new pattern of abilities continued. This made the fish getting temporary satisfactions or pleasures due to achievements followed by stress due to new desires, but on average the happiness level kept roughly the same and the fish grew its physical abilities.

4. The lab outing

One day Dr. Amara entered the lab with a good mood.

“Hey guys I have a good news for you. I earned some money from a consultancy assignment. I am going to take you all on vacation at Sigiriya. What about next weekend? It is a long weekend.”

“Hurrah, at last! We needed that break. Amara, bring your family also.” Said Namal.

“Thanks. I will. OK. I will go ahead and reserve a good hotel near the Sigiriya sight.”

Dr. Amara believed in unity among lab members, and he always cared for the mental health of the students. He knew when to get a good break and how to do it. This trip to Sigiriya was not that well planned, but he was waiting for the earliest possible chance to get it organized. Dr. Amara, being a well known researcher, had no problem with money. He got very good consultancy assignments in hi-tech areas. He knew that the money came for the image of his laboratory. So, he shared a fair portion of it with its members. Even the undergraduate students did not have trouble with finances.

They started the journey on the following Friday evening.

Dr. Amara took his wife and two kids with him. Others were still singles.
They left Colombo soon after lunch to reach Sigiriya before dusk because there can be roaming elephants there.

“OK guys, I guess we should reach Dambula before 6. Namal, keep the map in any case.” Amara said from the front seat of the hired luxury shuttle bus.”

“I took some CDs, snacks, and fresh Orange juice if you want” said Amara’s wife.

“We always love eating snacks you prepare.” Said Namal.

“Thanks.” She replied.

“Amara, remember we had to do some shopping near Galleface green?” reminded Kamal from the rear.

“Oh. Goodness. We have to rush buddy. You know how terrible the traffic is near the president’s house and temple trees.”

They only had to get out of Colombo before the school rush hours. The Colombo city gets flooded with vehicles that come to pick up children from schools around 2 p.m. The traffic comes to a virtual standstill. It is a terrible mistake to get into that traffic. Colombo did not have many

alternative routes or city by-pass flyovers for those who wants to cross the city without going through it. Everybody wanted few flyovers and a city ring that encircled the whole city, so that anybody who wants to get from one end to the other end of the city could take the ring without going through the city. Then there could be radial roads that connects the city centre to the ring.

A fair part of the city was demarcated as a high security zone due to the president's and prime minister's residences located in the most valuable part of the city. Several good roads had been completely blocked for civilian traffic due to security reasons. The presidential security division had a hard time thinking about all possible ways the terrorists could launch an attack on the president. It was obvious that they were under tremendous pressure because the president was living in a commercial area where nearly 20,000 people visits everyday for business matters. This number could be even higher if all the road networks linking this valuable part of the city with the other commercial areas were released. It was estimated that nearly Rs. 10 million worth business is lost everyday due to this high security zone. Everybody wanted the presidential complex to move to a much more relaxed and serene area in the suburbs so that the president would not feel that much like a prisoner and the presidential security division would be able to concentrate more on few alternative ways of occurring an accident. The whole voter population would not mind

building a good complex near the Parliament in Sri Jayawardanapura Kotte. They would not mind investing money on a good complex with swimming pools, Golf courses, and walking trails for the president, and good schools, gymnasiums, and quarters for the members of the security division and their families within that highly restricted, well fortified high security zone. If the investment can be recovered within ten years with the gain we get by releasing the high security zone in the heart of Colombo, the president had a case to make in front of the voters. Obviously, if the additional business gain per day is even Rs. 10 million, it would be Rs. 36,500 million in ten years. Even a school child knows that a very good presidential complex could be built with that investment. But due to narrow minded politicians who kept on making a big song and a dance on the investment in the new complex, but not on the economic gain and the political gain due to improved mental health of the president on the other side, and because of bureaucrats who never thought beyond their convenience, this never happened. None of the so called donor agencies to develop the economy of the country wanted to fund such a move. As a result, no mater how good they were, president after president got cursed by the people who got stuck in the traffic jam. In fact this is one of the objectives of the elements who opposed the proposed movement away from the city centre.

Anyway, the team managed to creep out of the city before

2 p.m. The topic of the traffic jam naturally became their topic for a while. Then the settled surroundings, the paddy fields, and the smiling faces of people, calmed them down.

They stopped for tea in Kurunegala. It was a beautiful place near the Kurunegala lake that spread over a vast area. Over the other end, they could see the giant rock that looked like a sleeping elephant. That brought this city the name “Athu-Gal-Pawura”.

“Hey, from here you may turn off the AC and lower the shutters. Your lungs might enjoy some good air.” Said Gajendran.

“Tell me if you are tired. We will take turns to drive” he continued.

“OK. Somebody take the wheel till Dambulla”

“I will” volunteered Gaje.

The bus sped along. Lonely planes, hills, and valleys on either sides of the road made everybody engrossed in deep thoughts. It looked as if cues in nature stimulate emotions, feelings, and memories buried deep inside our mind. Romance, sorrow, union, separation, glory, victory, defeat,

and it continued with every scene. Nothing was more appealing than the “Thuru sevana”, a short stretch of the road going through well grown trees. This shady place prompted everybody to stop and have a herbal tea from huts erected on either side.

Gajendran pulled over and stopped. Everybody got down and filled their lungs with clean, fresh air. It was a wonderful place to have an evening walk. Amara’s children liked it very much.

“Take care. The vehicles go like bullets around here.” An old man said.

“Do you dare to eat hoppers and have some herbal tea? I can do it real fast.” He said.

“I need a tea. You guys order anything you want. But lets leave here in 10 minutes.” Amara suggested.

The team sat on benches erected outside the hut and enjoyed the tea breathing good air, listening to the music of the forest behind them.

“By the way, how long will it take us to reach Dambulla from here?”

“It depends, for your vehicle, it would be around one

hour.” Came the reply from the old man.

“Where are you heading?”

“Sigiriya”

“Is there any threats from elephants at this time?”

“Well, don’t worry too much. I am sure the blessings of the triple gems will be with you.”

“Thanks” said Gajendran.

“OK. Lets get going guys.”

“I can feel the difference in even in the accelerator. Trees have an amazing power to heal not only our minds but also machines.”

“I agree” said Amara’s wife.

She really believed in the secrets of nature. Whenever we get truly connected with nature, it transforms our body, mind, and soul to a more purified one.

“That is why I really like to walk in the beach near our house. Every evening tells us new stories there.”

“We are blessed to have warm air all the time. We can walk down to the beach at any time in the night and on any day of the year.” Kamal added.

“Absolutely!” Gaje replied.

“When Amara was doing his postgraduate studies abroad, I always missed our country. I always wanted to settle here and shuttle between the two countries on and off.” Amara’s wife said.

“Tell me Amara, do you really think that you made the right decision by coming back to the country?” Namal asked.

“Well, Namal, it can not be generalized. I personally think I made the right decision. If you think you are strong enough to face challenges in a developing country, nobody in the world will be as happy as you when you win those challenges. Look, today the country is rewarding those who are educated and living here. All what you have to have is a good laboratory where you can do good research and undertake good consultancy assignments from the industry.”

“You have no problem with that, of course.”

“Well, if you have that, this is a heaven for me. The

country respects you, the people adore you."

"And, research funds are not in short supply either." Added Gajendran.

"A lot of my friends who decided stay back are now suffering from various problems. I have not seen many happy faces. But they keep on consoling themselves by pointing at stupid reasons like Mosquitoes, garbage, and traffic jams here." Amara replied.

"But I have seen a fair number of Sri Lankans, especially in the academia who live well. Those who have links with Universities here seem to have more healed minds."

"After all, if Budda is right, you can be happy anywhere and you can be very disappointed about anything." Amara's wife added.

"Gaje, lets get a break at Dambulla. I will take the wheel." Kamal said.
"It is just about five minutes away."

"From where did you all get bus licence?" Amara's wife asked in amazement.

"That is our lab honey!" Amara said.

“We have a multi-talented bunch of rebels. They challenge things without fear, take up jobs that others are sacred to touch, and always think beyond the box.”

“Good for you.” She replied.

Dambula is said to be one of those agrarian cities in Sri Lanka that never slept. The city was awake any time of the day. Farmers brought their produce to the vegetable market and did the business themselves. So, you could see more lorries than cars and buses here. Dambulla was also well known for old monasteries. There was a famous temple on to of a rocky hill. The temple was built inside a huge cave. Still today, one could see the ancient paintings on the rock ceiling.

“If you want to eat some fresh vegetables or at least smell them, this is the place.” Namal said.

“We will buy some stuff on our way back.”

It was a bit dark outside. The team wanted to check in the hotel before they close their buffet around 9.30 p.m. All were hungry for a good dinner.
“Hey Kamal, I guess the right turn we should take to Sigiriya is somewhere close.” Amara reminded.

“OK. It looks like the one over there.”

“Where? I can not see any sign board.”

“Lets stop and ask from that shop. I’ll get down and get the directions” Namal volunteered.

Namal returned. “You know what? That stupid has parked his three wheeler right in front of the board. It seems that he stops there everyday because it is the junction.”

“The real stupid is not the three wheeler driver, but the man who decided to have the board sitting on the ground. The road signs should rise above the height of an average man”

“Anyway, it seems that we’re about half an hour away from the hotel.”

The narrow path leading to the hotel was bumpy. But it led to a nice hotel complex.

The staff in the hotel was very courteous. The team got straight into the rooms, had a quick shower and joined the buffet. The dining area was well ventilated. There were trees around. People felt as if they were in the middle of a small forest or a village. Somebody was playing a bamboo flute. It really took one’s mind to a peaceful country side village. The musician’s silhouette could be seen in the candle lit hut. The team was enjoying the delicious dinner

in this peaceful environment.

Amara was walking back to the room passing the swimming pool when he saw the scene of his life and he virtually yelled for others to come in total astonishment.

The majestic Sigiriya rock could be seen in big size completely dipped in the Golden flux of moonlight. It shined like a blue sapphire. The plane separating the giant rock and the hotel was dead silent except for the charming music of the bamboo flute. The sky was clear. Above them, only the moon, few stars, and some silky clouds drifting slowly. The foundation of the castle on top of the rock was vaguely seen. This should have been the dream of King Kashyapa in the fifth century A.D.

Amara kept watching how the scene changes from moment to moment with his wife and two kids cuddling to him. The rest of the team sat in the couches kept under the trees in this well maintained garden. They felt like having a swim in the pool watching this beautiful scenery.

“Amara, thanks lot for bringing us here. I have never had such a fascinating moment before.” Namal said.

“Is this the first time for you to come here?”

“Well no. But due to some reason, this setting is so nice.”

“I see”

“Guys, what are our plans for tomorrow?”

“Well the reception said there is a bird watching tour starting from 6.30 in the morning.”

“OK. Those who wants to go bird watching they should wake up before 6.30, those who wants to have a ride around the Sigiriya site, they can hire few solar powered electric cars, and those who wants to spend reading or sleeping in the hotel, they can also enjoy here.”

Everybody took different options. All decided to re-group at lunch, then have a swim, have a nap and then start climbing up the rock in the evening.

Amara decided to have a morning swim and then take an electric car ride in the Sigiriya garden with a tour guide. Amara bought few books published by the Central Cultural Fund. They were nicely written with a lot of clear pictures.

He learnt that the Castle built by King Kashyapa on the Sigiriya rock is about 200 meters above the surrounding plane. The whole palace complex had been surrounded by a perfectly rectangular moat and a rampart.

Moats added beauty and a natural barrier to enemies. It is said that these moats had deadly crocodiles. It was a deterrent to a normal trespasser. One had to have a good plan to cross the moat. Then there has been several other inner barriers before one could get to the inner garden. There have been fountains that are still active. The fountains had links to the pool on top of the rock. When the King's pool is filled, these fountains spray columns of water into the air and the scene would have been much more magnificent 1600 years ago when the palace complex was live.

One octagonal pool beside a rock took Amara's attention. His biggest question was why this pool was octagonal when everything else was rectangular? Even the Castle on top of the rock looks somewhat rectangular. Being a robotics scientist he could not comment. But a kingfisher who dived into the pool to catch a fish or an insect gave him some ideas. The waves made by the kingfisher bounced back from the octagonal walls and made a pattern that looked like a wheel with eight pokes connecting the

centre to the periphery. This looked somewhat like the "Dharnachakraya", the symbol of Buddhism that symbolizes the eightfold path to total freedom or happiness. Maybe the pattern can be more prominent if somebody swims in the pool. In fact there was a cut in the rock beside the pool suggesting that there has been a roof. There were few caves for meditation in the vicinity. It suggested that this part of the garden had been used for meditation and philosophical activities.

"Hey, it is high time we got back." Kamal suggested.

"Yep! Lets head back. The bird watchers must have been waiting for us."

"So, lets have some lunch and plan for the evening."

Everybody had enjoyed the morning. Lots of photos had been taken. Everybody was busy downloading pictures and exchanging them through laptop computers.

After a heavy lunch, everybody was in a mood to have a nap.

“Lets meet near the pool around 3 p.m.” Amara suggested.

Nobody took more than five minutes to pass away. It was Gaje who had to wake up the team. The evening breeze was so comfortable. The sky had been overshadowed a little. It was an ideal evening to climb up the rock.

Cameras, water bottles, hats, binoculars, some medicine, and some snacks were ready. Again the team was together and climbing the rock.

“Look over there. See how the ancient engineers had embedded the brick wall in the rock.” Gaje pointed out.

“This is real engineering man.” Namal exclaimed.

The crowd finally reached a huge rock that was used as a defensive weapon. The rock was propped up by a set of stone slabs. It is thought that there has been a mechanism to drop the rock over the edge by pulling out one of those Nobody could imagine how the rock was brought here and balanced on the vertically arranged slabs.

The best part was the famous Sigiriya frescos. They had been drawn on a plaster. After 1600 years, still the paintings look great. It was hard to imagine how it would have looked like when all of the frescos were to be seen. Beneath the frescos, there was a famous wall known as the mirror wall where people used to scribble poems. Therefore, this was one wall where one could see the evolution of the character system over a millennium. A lot of research has been done on this.

“I think the science used by them was not exactly what we mean by science” Amara said.

“What do you mean?”

“It has been a nice blend of arts, philosophy, and technology”

“That is referred to as Vidya”

“See the pool on top of the rock. King Kashyapa must have spent a very romantic life. What about swimming here in a moonlit night, when you can see the whole plane down there in blue?”

“yeah. He is a Sri Lankan I can not beleive”

“All this has been done with the techniques found in old Vidya that must have been so powerful”

“Do you mean that we have to go out of the traditional box of science we are engrossed in?” Gajendran asked.

“Well, especially in machine intelligence where the traditional science has failed to come up with a good model to make machine intelligence come even close to that of the natural behavioral intelligence of the most primitive insect.” Dr. Amara said with much confidence.

“When we were volunteering in the Tsunami relief efforts, we met a monk who explained us a lot of varieties of laws that govern the nature. It seems that we have neglected a fair portion of the laws to do with the mind. The Western world tend to depend largely on crisp mathematics where causes and conditions are mapped to effects through deterministic equations. That is, no matter how many times

you repeat it, you get the same effect given the same set of causes and conditions." He continued.

"You mean they do not account for the uncertainty" Gaje asked.

"Well, yes. But uncertainty can be understood if you mix philosophy, arts, and technology together. That is the true sense of Vidya." Amara emphasized.

5. The new science

After a good vacation, the team resumed work in Colombo. The scientists started to think in a new way. They were little skeptical about the crisp mathematics that was too rigid and inadequate to define natural behaviors.

The main problem they had to solve was the mechanism that generates desires followed by achievements. The desire is nothing but a target picture of things that the machine could enjoy or be proud of. The target pattern of abilities had to be defined in terms of mathematical equations. Translating a mental picture of natural abilities to a set of crisp mathematical equations was not that easy and interesting. To a fair extent, they could use linguistic mathematics found in fuzzy and rough set theories. Yet, it was also not adequate to represent the inherent uncertainty in natural systems. They burnt a lot of midnight oil working on the problems.

Namal was having a tough time fitting his schedule within the time the laboratory was opened. The keys to the laboratory were with a full time officer whose job was to keep the keys. His job was to come in the morning and open the gates to the buildings and close them in the evening. If somebody wanted to keep the building open after 5 p.m., the officer claimed over time. When the officers who kept the keys to the buildings went on strike,

the whole university had to be closed. In all the universities Dr. Amara and his colleagues did their postgraduate studies, the lab members their own keys to the lab, so that any researcher could use the lab facilities at anytime, and keep their schedules very flexible.

Therefore, they decided to work at a private residence in the night. Everyday, they took bits and pieces of the fish to the private residence and assembled it there. They brought back the back up codes and the dismantled robotic fish in the following morning to resume work. Everyday, they had to fill forms to get a gate pass. This procedure took at least half an hour every day.

Amidst all this bureaucratic extravaganza, the team was determined to get at their final goal of doing good science with the intelligent fish they were making.

Working at the rented room near the university was also fun. The room was shared by Namal, Ajith, and Gajendran. Before the project started, Ajith and Namal used to go home during the weekends. Gajendran used to visit his home in the Northern Sri Lanka at least once a month. He had few relatives in Bambalapitiya and Vellawatta. He used to visit them whenever he got some time. Now that they are too busy, they missed the good meals they used to have in their villages or at relative's places. All three dropped some weight. But the short term wins with the robotic fish

kept their tummies full. In the mid night, they stopped work for a while, took the guitar and sang few songs about the life in the Sri Lankan country side. Hot cups of Sri Lankan tea kept them warm. Two of them, Ajith and Namal had girl friends in their villages. They often missed their sweethearts. The only contact they had with them was through letters by snail mail. Mobile phones were yet to come in the villages of all three. Their villages had no electricity either. Still in Sri Lanka 65% of the schools did not have grid electricity. The city of Colombo has been the focus of all developments. A lot of people did not care to take this seriously even if Sri Lanka experienced three revolutionary uprisings from outside Colombo on the grounds that they were discriminated. Ajith and Namal experienced this disparity quite well. Gajendran had a quite different experience with the civil war destroying his village on top of other rural problems. They learnt English as a foreign language after leaving their villages thanks to the free education system. Due to some luck of mankind, these three brilliant kids from the village were becoming good scientists contributing to push the frontiers of human civilization a bit further.

Sometimes, Dr. Amara came to visit their rented room. He spent an hour or two helping them to wire circuits, check codes, and to work out problems faced in the research papers they read. Often these brief meetings before Dr. Amara drove back home were very casual but fruitful.

Whenever it got too late, he would have his daily bath there itself. There was a well behind the room. The well was covered by a grove of banana trees right round it. On nights with clear skies, having a well water bath under the moon awakened feelings inside one's mind the pen could not write. The tropical breeze was so soothing. Fireflies made random patterns in the darkness. Bats were looking for insects in the sky. The whole vegetation was drenched in moonlight. This drama awakened sediments of memories left by our early ancestors. The experience of a moment of genuine conversation with the naked nature was unique. One felt total freedom.

The scientists in Amara's group were very conscious about the chaotic political situation in the country. Since Gajendran was part of their family, they got to know a lot about the North and the East of the country than what others see through media.

It was in the tea breaks in the midnight they often took up these topics.

Ajith was very critical about the rebel groups in the North. He would often say, "Carpet bomb the bastards."

Namal would counter argue.

"You use dynamite to blast a rock in order to get few

pieces off the rock. But you never use dynamite to take off a slice of cheese. The society is the same. If the society is too rigid with no room for gradual change, you better be prepared to face revolutions."

Gajendran added. "I am with Namal. Change is something like a stream of water. If you block it, it will continue to fill till it finds some other way out through some other means." He paused.

"When you see the water breaking a dam, it is useless blaming the water for being that violent."

Ajith would interfere. "True, but if somebody boils the water that has been already violent, you have to first get rid of those vultures."

Gajendran added. "You can be right Ajith. Look at what happened to my family. My father was killed by a landmine. My own brother was caught up in a battle, and a stray bullet silenced him. My sister was forced to join a rebel group. She was a cute lady who never wanted to kill people. So, she never joined them voluntarily. My uncles who live abroad have to send money to a rebel group every month to save my life and those of our relatives in Colombo."

Amara always did not allow the students to get

discouraged. “Gajendran, I think it is our duty to show that politicians or rebel groups who wants to be kings by creating divisions among the innocent people that they can not continue like that forever. The answer is in our ability to live with diversity, enjoy diversity, and learn to share limited resources in a co-existing framework.”

Gajendran had another suggestion. “Sir, I remember my father saying that they had to travel all the way from Jaffna to Colombo to get any silly thing done from the Government. Very often, he would be asked to come again in the following week due to some reason like the absence of one officer. When you go today, you will be told Latha missie is absent today, you come tomorrow. Then when you go next day, you will be told, Sitha missie is absent today, you come tomorrow. When both are present, you will be told some other reason to send you back to Jaffna, till you give some underhand money. This made their generation to dream of a rule of their own in Jaffna. Of course the harassments done by the Sinhala police there contributed on top of this.” Gajendran went on to say.

“But, Gaje, don’t you see that the Police has changed drastically today?” Ajith inquired.

“Of course yes. I have met a number of such very nice Policemen in Colombo.” Gaje replied.

“But what I mean is, what went into the minds of my father’s generation made them generalize the hatred over all Sinhalese.” Gaje paused.

“Well, yes. That is very natural of humans. See what happened on September 11. The terrorists attacked the twin towers to teach a lesson to Americans, because they had generalized the term Americans. And, see what happened. People from 82 countries died.” Dr. Amara added.

“Well in any case, in a nut shell, you should facilitate evolution if you don’t like to see revolutions.” Amara summed up.

Gajendran interfered. “I think our group is a good case study. We don’t have explosions among us, because we can discuss and change anything. People listen to others and we express ourselves freely. Nobody keeps grudges.”

“That is because we have a common dream. We treat anything else secondary to that goal.” Said Amara.

He continued. “I hope one day Sri Lanka will realize the importance of being fair in identifying the unique opportunities and developing all the areas of the country. Every village in Sri Lanka has some resource that the others do not have. Our country is that diverse. There are great opportunities for Hambantota to be a hub in Asian

shipping routes. Trinco is the same. We can move from summer to spring within three hours. We have beautiful underwater sceneries that we can use to attract explorers. It is a matter of identifying these strengths and planning some original approach to develop these areas, without following advises of foreign consultants who advice the government without ever spending a night in the villages. Their number theories can not come even close to the reality in the villages."

"Do you think we will get such original thinkers?" Namal interfered.

"We had such people in the past. That is why we could build unique irrigation systems in the North Central Province. So, I don't see why we can not have such people in the future."

"You must be joking" Ajith said mockingly.

"Sir, do you think Mahathma Gandhi would have survived that long if he was born in this country? Do you think Abraham Lincoln would have been that leader if he was born here? Puran Appu was the only one who came even close to that. A lot of leaders might have born here, but died without our knowledge because our people don't trust in local initiatives."

Dr. Amara nodded. “One experience I had goes very close to what you say. When I was a student in the US, I wrote a letter to a minister suggesting some research work on robotics to detect landmines. He responded me within two weeks. But I have never got replies for my letters I sent to him after I returned to my own country.”

Ajith laughed. “Anything from abroad Sir. That is the diarrhea we are suffering from.”

Everybody plunged into laughter.

“Ajith, you better be careful when you talk in this society. Somebody might gun you down.” Gaje said.

“For talking the truth?” Ajith asked. “I don’t give a damn.”

“Ok folks. Time to get back to work. I’ve got to get back home before my wife rings my mobile.” As usual Dr. Amara changed the track.

6. The bush in the monastery

The monastery at Hambantota became a regular place the lab members visited. Philosophy and the research they were doing at the lab had no apparent relationship. Yet, the discussions triggered amazing ideas in their minds. They often discussed about the working of the mind, how greed works, what mindfulness is, what mindfulness can do, the nature of sensations, and how mind gets attached to uncertain sensations etc. They had a good understanding of the inadequacy of the mathematics we know today to at least model any of these concepts. Something is lacking in the whole axiom system. We must get out of the Boolean logic system. A number of such unsolved mysteries kept on bombarding their minds.

Dr. Amara believed that there must be other logic states that could be used to explain many phenomena related to uncertainty and change. The teachings to do with the nature of appearance and disappearance of the mind and the matter of the body was the core of Buddhist philosophy. If cognition is related to the body and the mind at all, an important part of cognition should be things to do with the phenomenon of instantaneous appearance and disappearance of matter and mind so that matter and mind travels along uncertain trajectories over time.

“Therefore, cognition can not be programmed using crisp

programs and hardware.” Dr. Amara exclaimed.

“It can not follow a deterministic Boolean logic system. It has to be associated with the natural rules of appearance and disappearance in a chain.”

One day he asked a meditator “I am interested in knowing the relationship between the mind and the body. Who is influencing whom?”

“Both are influencing each other. Each of these two work in the infrastructure of the other.” Came the answer.

“Each gets born, live for an instant and then die. Again it gets born in the neighborhood of the one that died. This goes on like a film roll unfolding from the reel. We keep looking at the movie on the screen when the film roll moves in front of a light beam. We generalize the discrete chain of pictures where one picture appears then disappears and then the other appears in the neighborhood of the one that just disappeared. We stay under the illusion that there is a realistic drama running on the screen, when the reality is a series of pictures moving in front of a window.” He paused for a moment.

“Our life drama is the same. Nature is the same. Look at how the clouds change their shape. If you keep on looking at them, you can not see that the shape changes over time.

If you close your eyes for ten minutes and then open again you notice the change. Shapes keep on changing here and there continuously. Nobody can predict what the shape of the cloud will be in an hours time. There can be some external factors like the speed of the wind and the pressure distribution in the sky that affects how fast the cloud changes its shape. It is same with our body and the mind. A lot of external and internal factors decide how fast the body and the mind change. But the underlying phenomenon is the same. That is how I feel it" he continued solemnly.

"Does it mean that the whole system of the body and the mind change in a discrete fashion? I mean, it does not change continuously, but undergoes changes at discrete steps of time?"

"Something like that" came the answer.

The meditator continued. "Teach your kids the fundamentals of uncertainty using simple things like what happens to flowers. They are beautiful and fragrant in the morning. When you look at them, your mind builds bonds with it and you begin to feel attached to them. Then, in the evening they get withered and die. If they go to the temple to offer flowers, they will see the withered flowers offered the day before. This will teach them the lesson that things in nature are bound to abide by the common phenomenon of completing a life cycle that spans from a birth to a death.

Some deeper thought will show them that the phenomenon of appearance and disappearance of matter take the flowers along the life cycle between the birth and the death. Therefore, they will soon realize that there is nothing much they can do to stop it. That maturity will train their minds to stay impartial when loved ones or loved things leave them, because they will consciously realize that things were just completing their own life cycles over which one has little influence."

"Thank you very much indeed" said Dr. Amara.

"These brainstorming sessions are very useful for my daily life, family life, and my research on artificial intelligence." He continued.

One day when Dr. Amara was about to leave a cave where monks meditated, he noticed a familiar thorny bush just outside the den. Due to some reason it was different from what he had seen in other places. The bush had grown bent towards the cave as if it had caught in a strong wind towards the den. What really caused it to bend like that? He walked around the den and saw the far away bushes with normal growth. There were few young bushes on the other side of the den. He could not believe his eyes. The tiny leaves had begun to grow stretching towards the den.

Upon returning to Colombo, the first thing he did was to

meet an old friend who had an expert knowledge of these bushes and tropical vines. He said, there is no reason why a bush should grow aligned to a particular direction. A vine would because it tends to look for a support. Above all, the bushes around the den could not have bent towards a common center inside the den.

They had to suspect that this is something to do with a relationship between some sort of an enzyme in the bush and the concentrated minds filled with silent happiness of the monks who meditated inside the den. Can the mind influence a physical thing seemingly exterior to the physics of the body and the mind? Or can a physical phenomenon exterior to the body and the mind influence the activities of the mind or the body?

Due to some reason, does this phenomenon work inside other living beings? Can they sense danger using this kind of a mechanism? Is it the reason why none of the stray cows in Hambantota had fled well before the Tsunami struck the coast?

This extra sense, whatever it maybe can be an important factor in the design of future robots. Can a robot ever get that sense with man made sensors and programs to process the sensory information?

These questions remained unanswered. Dr. Amara's team

focused on very primitive things that could lead to an advanced robot. They believed in providing those things that they thought were the essential ingredients needed to grow cognition, and leaving it to an evolving code running in a set of microprocessors to take care of cooking real intelligence inside a robot. They believed that the code will advance through interaction with the environment.

7. The launching

A lot of things had happened in the laboratory since the Tsunami. A prototype fish was getting prepared to be launched in the sea. It had a lot of unused processors that could be used in case the fish wanted additional processing capacity. A program that evolved inside the processors constantly tried to add more layers of skills, thinking capacity, and even tried to imagine. There were a lot of sensors that could feel the water temperature, sea currents, magnetic fields, touch, and distance to things around it. The fish had no vision. As far as it was concerned, the whole world was made up of a set of self constructed mental objects based on the sensory information. It constructed pictures it thought was beautiful. It began to like cold waters because it thought it was very comfortable. In fact it worked well to cool down the processors, motors, and other power circuits.

There was ample room in the silicon memory for the program to grow. There was a mother program that wrote few other programs. At any given instant, it was one out of many of these second generation programs that actually controlled the brain of the robot. Basically, the second generation codes looked like trees made up of other primitive code segments or classes written in an object oriented language. The branches of the tree grew up to be simple primitive functions that performed specific

calculations like one that would calculate the volume of a box given the length, width, and the height. The branch would feed the main tree with the result of the calculation that might be further processed by other primitive functions before it got to the root. The memory of the fish consisted of billions of these trees of code segments. Each tree had access to all the sensors and it could take full control over the functions of the fish. At any given moment, the mind of the fish picked one of these trees to process sensory information.

The mother program continued to expand these trees of code segments by adding branches to an existing one. A new branch was a new function or in other words a primitive code segment that added functionality to the tree. It created these new objects by picking operators like addition, multiplication, comparison, etc., from a pool of such operators. Each new code segment or the branch took the sensory information and whatever the half processed information from other branches connected to this new branch and relayed the output to whatever the other branches that is interested in it. Branches could set up their own connections with other branches upon the recommendation of the mother program. The mother program sometimes made the trees exchange branches with each other or copy branches from others.

The final output of the tree contained control commands to

the motors attached to the fins of the fish as well as some signals used to suggest the mother program as to what kind of trees should be brought to conscious processing a moment later.

The mind worked like the surface of boiling water. Trees of code segments popped up and vanished like bubbles. The mother program picked up some tree of code segments out of many that surfaced in the subconscious mind. Once a tree appeared it connected its input terminals to the sensory stimuli and the roots to the muscles or motors that moved the body. Some roots were plugged to the mother program. Through these connections, the mother program modified the structure and parameters of the tree by adding, deleting, and modifying few primitive code segments in the tree in order to improve the performance of the robot. Sometimes it would pick two such trees and swap a part of one with a part of the other. Sometimes the mother program modified parts of the tree to model the outside world. These internal models contributed to the memories of the past situations experienced by the robot.

The mother program did not hold one tree for more than few microseconds. Another tree would surface and the previous one vanished back to the pool of past memory sediments thereafter. The new tree took control of the brain during the next instant, got modified, and settled deep in the memory again. Thus the memories kept on updating

themselves while it was plugged to the sensory stimuli. Once in the deep memory of the mind, it helped the mother program to build larger trees of codes that controlled the brain.

This never ending process went on and on evolving a mind inside the fish. It was the whole sum of factors like the uncertain nature of popping up and vanishing of codes, the very nature of the outside world that fed sensory information to the robot, the way primitive code segments had organized in the structure of a tree, the way the codes interacted among themselves, the noise in the communication channels, the processing speed, the desire to achieve things, and a whole lot of things to do with the real world created the notion of the mind in the fish.

Given some situation, the fish spent some time without being able to take a decision. This happened due to the fact that a lot of conflicting memories surfaced to compete among each other to take control over the brain. Sometimes, it thought it had taken a decision, but the popping up of some conflicting suggestion sent the mind off balanced again. The researchers thought this uncertain way of processing looked like a mess compared to the conventional deterministic way of processing codes one by one. Yet, due to some reason, the behaviors resulting from this messy processing looked very much like how living beings interact with the environment. But the laboratory

never knew whether the fish had evolved at least the primitive substrates of self awareness.

Days and months flew by them. There was no end to the tweaking of the hardware, adding new sensors, processors, circuits etc. Finally the team decided that the fish should be released to the sea for it to evolve its own realistic mind. The day came for the fish to say good bye to the lab. It should now find its home in the real sea. The only contact it may have with the lab was the periodic burst of data sent to the lab. Sometimes it would also receive new primitive code segments from the lab computers.

The robot looked like a Dolphin. The whole structure was made of modules of Carbon fibre. The top side of the robot was covered by a solar fabric. It was a fabric of solar cells of very high efficiency. There were several flexible wipers to keep it from gathering moss. It had enough capacity to charge the internal polymer batteries within half an hour on a sunny day. Communication antennas were in the fins. They were driven by servo motors with high torque to weight ratio. There were dozens of parallel signal processing cards that interfaced the sensors that converted tactile, thermal, proximity, electromagnetic field, vision, velocity of the robot, and other information such as battery level, heat in the circuits, etc., to internal perceptions of the robot. With this infrastructure the robot could perceive the environment, think about it, and take appropriate action

such as swimming forward, avoid obstacles, surface to do some sunbathing, be social with other fish, etc. It could develop speeds upto about 30 meters per second by releasing a chunk of energy. It was supposed to do that in case something moved towards it fast.

26th March 2007. It was a wonderful evening with the tropical sun sinking behind the western horizon. There were few fishing boats tossing up and down in the far away waters. The launching had to be done in the mid sea to avoid the roughness near the shore. The team was monitoring the sea conditions. Since the robot had very little capabilities at the beginning, they had to make sure that the currents were not that strong and the sea was mirror calm for at least a day from now so that the fish will have sufficient time to learn and adapt to the new environment. They had tested it in a pool but never in the real sea. Anything can go wrong now. The hearts were thumping. The final passwords had to be entered to switch on deep cognitive processing. All safety locks were opened. The fish is now free to let its mind take control over the body.

“Namal, double check what is beneath here. We must make sure there is nothing except sea weed.” Amara yelled so that Namal sitting in the cabin could hear it.

“Looks great. I can see nothing but beautiful valleys, and

some fleets of Tuna." Came the reply.

"Ajith, Gaje, what about the speed of the currents?"

"Calm. Except for some swinging towards the east. Lets move a bit more South."

"Abaya, what about communications and controls? Check if the receivers are working properly. I will get the ship to move South."

"Everything green Sir." Abaya replied.

"OK, folks. Here goes the baby of our years of hard work."

Dr. Amara opened the gate of the sliding channel that let the fish glide down to water. Within few seconds, it vanished in the blue waters.

They spent some time in the sea with mixed feelings. The sun had gone and it was dark. The wind was getting colder. All what they could see was mirror calm water around them and all what they could hear was the rhythmic music of the sea. Years of work had finally closed one chapter. It was a step towards making mankind more aware of what goes on bellow the blue waters. One day, if the fish becomes intelligent enough it will save a lot of human lives from another Tsunami, assist a lot of fishermen to improve

their income and safety, help us locate more marine resources, make us more aware of how the sea currents behave, help the police with various surveillance information, and a lot of more services like that.

It was time to get back to the lab and switch on the computers to communicate with the fish.

The ship with controls and communication hubs was docked in a reserved jetty that belonged to the university. The new staff was so thrilled to see their first mission a success. The computers in the ship could process the feedback information and relay them to the laboratory in the university so that a sudden alarm could be seen from there without having to come to the ship.

Ajith started the computers in the lab. The first burst of data was expected in about forty five minutes. Amara was virtually shaking. He was confident that the robot would not fail.

Namal prepared tea for everybody and the caffeine stimulated their already excited minds. Hearts were thumping and Dr. Amara's face had been flushed with his eyes turned red.

"Chill out guys. It will work" Gajendran wanted to calm everybody down.

The LED that indicated downloading of data from the ship started to blink.

“Open the file and see.” Dr. Amara jumped off the chair.

“Wow this is great!”

The whole team were stamping on the floor with rejoice. The team was jubilant when it saw the first burst of data. It said, the fish found a cave with some comfortable cold water. It was fantastic to learn that the fish had found a good place to rest. But the team began to miss the fish. They wanted to come up with a nice name for it. The obvious choice was Devi, to respect Vihara Maha Devi, an ancient Sri Lankan Queen who wanted to sacrifice her life to save her countrymen from a Tsunami that had destroyed the Southern coast of Sri Lanka.

Devi had to learn a lot of things during the first few weeks. Her brain was working at its full capacity just like that of a newly born child. Everything was new. She had to face the dynamics of the sea water, the pressure was different, the vegetation and the other neighbors were all different. She never ate other fish. She depended on the sun light. The whole body was an array of solar cells. When the batteries were low, she just floated on the surface of the sea. After about an hour of good sun bathing she was ready to play in

the deep waters. She loved the sunshine near the coast of the beautiful Island of Sri Lanka.

Her learning curve surprised those who observed her movements from the lab. When she wanted to learn some movement, she tried it several times in different ways without much care as to whether she does it well or not. It seemed that all what she wanted was to experience the situation from different aspects. Then she took a long break. Often floated on the surface with the fins relaxed. Though it looked as if she was resting, the brain was not at all resting.

The brain had constructed internal models of the environment and her body while experiencing the situation with the hope of playing with them later. It was like learning to lift a cup of tea. Before learning how to lift the cup, the brain quickly tries to estimate how heavy it is by just looking at it. Then it can guess what kind of force should be given to lift it smoothly.

Devi did a similar thing. Mental models of her own body and how the environment reacted to it when she moved was very useful for her to improve her swimming skills. These models were constructed using the trees of code segments that worked in her mind. When a set of control commands were given to these mental objects, they calculated how the body and the environment would

respond. Then it would compare these predictions with the real experiences. If there was an error, the mother program would modify the tree till its predictions were as close to the real world experience as possible. These internal models were enough for her brain to build and train another tree of code segments that would do the function of generating control commands to the fins, given a situation as input.

It worked like this. First a tree of code segments imagined a situation. It assumed that this situation was something created by real sensors if it were to face a real situation. Then this situation started to propagate along the code segments of the tree towards the roots. On the way, signals got transformed from one form to another. Finally it ended up at the roots as control commands to the fins. These imagined control commands were then fed to the internal model of the body and the environment constructed earlier. It was also another tree of code segments. It took the control commands as input and propagated these commands along its tree structure towards the roots. What came out at the roots were the estimates of how the body would move and how the environment would react.

Then the brain would assess whether that movement is good or bad. From instant to instant, different trees of codes would surface in a bubbling pool of trees of code segments to play with the internal model of the body and

the environment. They kept on adapting to give rise to an improved set of trees that could control the real body.

This process would go on and on till a good tree of code segments is made that could control the internal model of the body and the environment to her best satisfaction. Then she would go back and try the best set of these trained trees in the real environment. Amazingly, the real trial was always much better than where she stopped before taking the rest. She repeated experimenting several times before she became an expert. Her memory consolidation went on and on with these internal models of simple situations.

According to the data sent back to the control station in the laboratory, Devi seemed to have been progressing well with learning new things driven by the motivation to get more and more satisfaction. When she improved on something, the internal reward systems made her happier and happier.

There was a bizarre mechanism that the team had devised to make Devi a machine that never get satisfied. If she ever came to achieve a goal she had been dreaming of, she got an impulse of pleasure. This pleasure decayed down over time followed by the appearance an advanced goal somewhat related to the previous goal. This new dream made her stressful again. But she chased after it because every step she makes towards it gave her some pleasure.

This phenomenon of the appearance of new dreams in her mind upon the achievement of one dream went on an on like a mirage moving when you reach it. In other words, she was chasing after pleasure without realizing that her state of happiness in the mind did not change much.

Apart from her psychological advancement, she enjoyed swimming near the corals. The Southern coast of Sri Lanka was well known for magnificent coral reefs and the related rare species of marine life. On sunny days Devi spent a lot of time on the surface. The coral reef shined under the tropical sun. Fish in different colors and sizes came to play near this kingdom. Only a handful of Sri Lankans had seen this marine heaven.

She learnt about the waves by listening to the sounds it created. In fact the pattern of the sounds gave her a good indication of the roughness of the sea on the surface. Over time, she learnt to correlate the changes of the marine life near the corals to various physical phenomena like water pollution, things to do with sea currents like their direction and the temperature, availability of plankton etc.

Devi helped divers to locate a lot of things lost in the Tsunami. She saw skeletons strewn all over the marine landscape. She learnt that skulls of humans varied in size. She guessed that there could be small and large people. Her contacts in the lab helped her to solve a lot of problems to

analyze a lot of things she saw.

Indian ocean near the Island of Sri Lanka had such a diversity of life. The sea from beneath the surface had everything the land had. Rivers of water dragged seaweeds like a hurricane would swing trees. These rivers often changed the landscape of the marine world. Swirls of water moved randomly just like the wind on the land. The living beings in the marine world enjoyed the additional fun of seeing the beautiful sceneries from different angles, unlike the species on land who were under more influence of the laws of gravity.

Except for few spy submarines that hovered here and there through the valleys, there was not many man made things in this world. Occasionally the haunting sounds of the ships that ripped through the surface echoed in the sand valleys. The valleys along which these ships sailed had apparently different kind of marine life. Even the weed did not grow taller. Except for small fleets of fish that didn't mind being disturbed ventured into these ghost cities intermittently. These city folks often had breathing problems. But they got a lot of junk to eat. Most of them were heading towards extinction due to a sharp drop in the fertility of the male ones.

Devi was wondering why these species wanted to live in the harsher part of the world when they could have a great

life in the warmer, tranquil, and green areas near the Coral Mountains. The cities near the Corals were the richest. They had ample sunshine, a great diversity of life, and a cleaner environment. Devi came to a tentative conclusion that different species like different environments depending on how their sensors and the brain had organized to feel the environment. As far as the brain enjoyed the sensations, where the body lived didn't seem to matter.

Sometimes human intruders came with sacks and hammers to destroy parts of their beloved coral city. Once Devi questioned Dr. Amara as to why these people from the land were robbing the marine world. Dr. Amara explained that they did it because there was a good demand for the dry corals in the construction industry.

"Why don't they think about another alternative? Look down here, the beautiful cities beneath the surface are getting destroyed." Devi protested.

"We all know that it is true. But, Devi, there are some fishy things going on in the society on the land. We appoint people called representatives to take care of our common interests so that normal people can concentrate on the real work. Those representatives who come from these areas where you have seen a lot of destruction have to depend on those who thrive in this business. So, we never get to see them serving the common interests."

“But, what I can see from here is that the patterns of things I feel the valleys keep on getting altered to make weird pictures wherever the destruction is high.” Devi exclaimed. “The diversity of our society drops, and we have to face a lot of problems like brain drain, water pollution, and changes in the sand landscapes. And, I feel that people living by the shore are getting more and more vulnerable.”

The complexity of these brief conversations with Devi got more and more complex because, each piece of new knowledge was used to infer new knowledge inside her. She argued till she became very clear about things around her. Trees of code segments kept on growing.

8. Disappearance

The whole university was talking about a new kind of computer virus going around. It was some kind of a virus that monitored what people wrote in their emails, casual letters, and other informal communications and understood the personality of the writer. Then it sent emails to people with similar personality in order to network people with similar thinking. Soon, scientists in similar fields were in email groups communicating among each other, artists from different countries got together, and a revolution was taking place in the stock markets. It seemed that the civilization had once again started to warm up.

A lot of people had panicked. The most panicked were the politicians. Some politicians stopped writing emails fearing that their true personality will be understood by others. Some people liked the virus because it helped them to unite. Like never before, the opposition and the ruling party of the Sri Lankan parliament got together to fight against the virus, except for few leaders who voted against it.

Those media agents who never wanted to get to the streets during the Tsunami, now were sweating under the hot sun, shouting slogans to support the government to fight against the new virus. All of a sudden things became extremely efficient. All government resources were released to track

down the virus. Yet, no anti-virus program could track it. There was no code to be found. It was all virtual in the internet. People suspected that small code segments residing in different computers worked together as one program in the cyberspace. People gradually began to experience the effects of its mutants. Sometimes, pop up menus advised people not to write certain things or to delay sending mails because some program knew the mentality of the mail recipient before the mail was sent. Somehow this virus evolved according to how one would respond to it. People checked the validity of these messages by trying to send mails to their neighbors whom they knew very well. A virtual program was becoming too intelligent that many people did not like. The media started speculating all sorts of bizarre things. Those politicians who were caught to be the agents of the underworld gangs pumped money to media to create opinions against the virus. Some even wanted to pass bills in the parliament banning the usage of computers.

All automated weapon systems were detached from their computers, because some terrorist organization suffered a huge damage from a bomb blast in one of their arsenals. Then they suspected that the virus has begun to hate weapons that destroyed human lives. Many space agencies delayed their space missions due to the fear that the virus might misunderstand the shuttles as missiles. Credit card agencies went bankrupt, because the virus had penetrated

the security systems and sent flowers to some cancer patients in one hospital. The credit card belonged to a underworld gang leader. Then a lot of people feared that their cards would be used to send food to the starving. People started to walk to banks rather than using e-commerce systems. The e-world came to a stand-still.

Soon people realized how helpless they were when the cyber-space is taken over by an intelligent program that they could not crack down. It was useless formatting one hard disk or unplugging computers from the internet. Every time a network was unplugged from the internet or few computers were formatted, only the kind of behavior this intelligent computer Ghost elicited changed a little bit. But nothing could cripple it.

Dr. Amara had a big issue in communicating with Devi. She was in the sea looking for new experiences. They needed some contacts with her, but the weird feeling that she would also get contaminated forced the lab to take a tough decision. They had to abandon communicating with Devi for some time.

With this decision, the fisheries industry would suffer for a short time, because it was Devi's guidance that helped fishermen to find the best fishing areas everyday. She also saved a lot of fishermen from danger by keeping them informed of the changes in the wind and sea current

patterns.

A lot of deep sea resource exploration activities that depended on Devi's sensors would have to be suspended. The same would happen to surveillance operations. Earthquake monitoring would have to be done using conventional equipment.

Months passed by since the last contact with Devi in the sea. Now she must be smart with lots of new experiences. The virus attack had gradually died down even if nobody found an anti-virus program. A series of questions came to Dr. Amara's mind. How did the virus saw a natural death? He could remember the meetings he had with the monks in the Hambantota monastery, where they talked about the phenomenon of appearance and disappearance of uncertain forms in things completing their life cycles. Can this virus be some distributed program that abide by the laws of nature? Did it have uncertain code segments getting born and dying followed by the birth of new codes in the neighborhood of the function of the code segment that died? If so, who wrote this code? What made it spread and function in the world wide web and then die down like any other living being? What motivation did it have to help people to network and understand about each other more? Was it a message sent to the mankind that had they been more networked, those hundreds of thousands of lives lost in the Tsunami could be saved? No clear answer.

All dust about the virus had settled. The university was back in order. The network was functioning like usual only with one or two server breakdowns a week. People lost only few dozens of emails that they had learnt to live with. It was better than what the virus was trying to teach them.

Amara's lab was back in track. It was one September evening. Dr. Amara was cleaning his table before he packed up to go home. Just before he shut down the computer, he noticed that the hard disk was spinning like anything. It did that only when he saved large documents. He opened up the folders where he saved data from Devi. He could not believe his eyes when he saw what happened to his computer. There were huge chunks of meaningless data sent by Devi from the sea. He looked at the back ups he made for the last time before shutting down the communication link. They were all fine. It looked like she had invented a new language to talk about something. It could be that something has gone wrong in her.

They called an emergency lab meeting. Everybody was shaking.

"How did she get through the firewalls?" Asked Namal.

"I can not simply fathom out how she got the admin password to send data without we asking for data."

Exclaimed Ajith. He was right because Devi had no capability to send data to the base station voluntarily. The base station asked for data and passed the right to her to send data. Then only data started to flow.

“Looks like something bizarre like the Zenner breakdown has happened, where an electron jumps across a voltage barrier without that much energy in it.” Ajith laughed.

Kamal and Gajedran were spell bound.

“Kamal, are you sure we did nothing wrong when we shut down the communication link?” Amara asked.

“I’m positive that things went fine. But I suspect whether the virus had entered Devi before we closed the link.”

“It can not be, because any of the mutants of the virus did not generate this much meaningless data in anywhere in the world, and it never harmed anybody though our lunatics got panicked.” Dr. Amara reverted.

“Anyway, folks we have to take some quick decisions.” Amara took the lead.

“What about getting her back to the lab and have a look at all the codes and circuits?”

“Sounds good.” Dr. Amara sighed. “First, lets send her a call to come near the Unawatuna reef. Then we have to dive and escort her to the beach.”

As planned, messages were sent requesting her to come to a planned GPS location. Dr. Amara, Namal, and Gajendran would dive. Ajith and Kamal would take care of taking manual control over Devi and to monitor her feedback signals. Abaya took care of the logistics and coordination.

It was a sunny weekend. The waves broke on the coral reef that stretched parallel to the beach of Unawatuna. The white froth spread towards the land like a veil would flutter in the sea breeze. As usual, Unawatuna beach was very live in the noon of every weekend. A lot of tourists lay on the beach enjoying the sun shine. Locals were flocked to the beach to swim and relax with their families.

A boat carrying the team sped from the shore to cross the reef. Everybody was excited with the hope that they would see their beloved Devi after a long time. How would she respond to this encounter? Would she be excited to visit the lab? Nobody dared to predict.

The water at the target location was deep. The wide waves swinged the boat to and fro. It was just about twenty meters beyond the reef.

The sun was just on top of their heads. Water was warm and it was time to dive. Abaya signaled OK after checking the situation beneath the GPS location they planned to dive. Gajendran went bellow the surface first. Dr. Amara and Namal followed. The trio were moving steadily beneath the surface. The visibility was about fifteen meters. Beyond that it was just dark blue water. They could see the reef on one side. Various shadows mixed with bright sun shine danced to no particular rhythm. The colorful striped fish who were very rare in this part of the world were dashing from place to place as if they were playing hide and seek with somebody. One could see all kinds of colors in those fish. What a diversity it was!

From the dark side of the water, there emerged a familiar figure. It was their beloved Devi. She looked happy. She came closer dancing like how a faithful dog would wag his tail and dance when the master comes back home after work. Her behaviors were absolutely elegant. The trio couldn't believe that she could move that smoothly.

Due to some reason, she was restless. It looked as if she wanted to tell them an exciting story. She wanted the team to follow her for a moment before going back to the land. She signaled them to follow as if she wanted to show them something fascinating. They didn't have to go far to see something that mesmerized them all.

Dr. Amara clutched Gajendran's hand in amazement. It was unbelievable. What stood in front of them was a house made up of rubble. Who on earth would have the need and the ingenuity to design and construct such a wonderful house under the sea? It was too small for a human to live. Why would a fish want such buildings on the other hand?

Devi took them a bit further down the reef. Dr. Amara almost raised his hands up when he saw a total stranger. It was not a fish. It was not a human either. It was totally new to this planet. It was a strange animal. It could swim but, had two hands. The fingers were longer than those of the humans. It had several fins at the back that gave them a lot of degrees of freedom to control the movements. It had no head as such. The face was just like that of a fish. They seemed to be some new species who have gone beyond the passive approach to co-exist with the nature. Somebody has got the need to create things and manipulate the nature to uplift the standard of living under the sea.

They were busy working on a construction. What they were building looked very much like a bunker. Why would they need a bunker after all?

Devi tried to explain what she could. There were a lot of garbage data in what she sent as messages. It looked as if she has tried to add few new words to her language to explain the new phenomena, but some incompatibility with

the existing software platforms led to the interpretation that they were garbage. According to Devi, they used tools to hunt. They wanted to improve things all the time, a sharp difference from other species whose talents were more or less hardwired. The new ones had a lot of creativity. They were not loath to discard old ways of doing things if they understood that something else could do better. Yet, they never forgot to keep the old tools in museums here and there.

They were very smart in designing traps. Their favorite was Tunas. The sharp arrows spiraled when it moved through the water. It confused the prey. They had a good idea of what the hydrodynamics do to something that moves fast through the water. The prey often had no time to think but to give in to the injury. For bigger ones, they had booby traps. They devised hooks that looked just like the ones the fishermen used. The hooks with the bait were tied to a lot of other bows with arrows that shot at the prey from various directions if one swallowed the bait and tried to shake it in order to get away. There was nothing called cooking in this civilization. The salt water did not permit much germs to enter this world either. They knew how to use knives to cut flesh, sea weeds, and mix them to make a meal. They ate a lot of fibrous food. Apart from hunting and cooking, this civilization was marked by a tendency to use tools to design security systems in their houses to protect the young ones from bigger predators. Devi was

relating a story that the team hardly understood.

The most astonishing thing in this world was that the new intelligent species used some kind of machines that sent out bubbles of air when they operated. The energy must be coming from some combustion process. The by-product is some kind of a gas. Devi tried to explain that these machines were something similar to the computers that Dr. Amara had at the laboratory. The community here heavily relied on these machines and the sensors to monitor various phenomena under the sea. They used these computers to design the structures in their cities, tools and weapons, etc.

All what Devi could see was three shocked faces. They were trembling as if they had seen a monster. So was the remaining team members on the shore. They were monitoring what went on down the sea with their eyes glued to the computer screens at the coordination center. They were concerned about what might happen to Gaje, Amara, and Ajith in case somebody from the new civilization got angry. Yet, they wanted to trust Devi. She would never expose them to such extreme dangers. After all it seemed that the new arrivals had some good acquaintance with Devi, for she could translate many of the conversations.

“I wonder what kind of algorithms they are using in these computers.” Ajith was curious to know.

“No clue. Maybe we can guess whether the computer architectures are more advanced than what we are using by seeing what they can do with them.” Dr. Amara suggested.

According to Devi, the computer programs would never give out crisp answers to any query they enter. It would give out linguistic answers. For instance, if they wanted to know the temperature of some part of the sea, the computer will check those sensors and give out results in sentences like “It is quite warm and comfortable out there”, “It is cold and very uncertain” etc. The whole hardware architectures seemed to have based on the functioning of a network of Algae like primitive life forms. Strings of these primitive life forms were processing information in a massively parallel structure. From instant to instant, these strings underwent change marked by birth and death. Therefore, the hardware architecture was not as certain as the silicon chips. How they consciously and subconsciously react to different sensory feedback in the form of situations gave rise to results.

The logic system they used went beyond the duality of the Boolean logic system. It accepted the phenomenon of appearance and disappearance during an unnoticeable instant of time. These computers could therefore process contextual perceptions, feelings, emotions, and generalized situations as opposed to sensory feedback with no

contextual information.

Years of mysterious incidents gradually began to unfold. It was Dr. Amara's first guess that Devi had come into contact with these newcomers to the marine world some time before the virus started to haunt the human civilization. Most probably, the seeds to the distributed virus has come from them. It seemed that both these species and Devi had gained from interacting with each other. The species must have got information about the people on the land from Devi, and Devi must have learnt her lessons of learning behaviors from these intelligent species new to the marine world. It could be that a code segment evolved in the processors that tried to communicate with these new friends. It had the properties of the virus that tried to network the community. If that is the case, the first intension should not have been any harmful desire to collapse the networks in the human society, but a mere accident. The code segment or few segments were hidden in the data that Devi relayed to the workstation in the lab. Then it developed further in the network. All were guesses that Dr. Amara could make. There could be other possibilities also.

"But, what about the garbage data she sent some months ago?" Ajith was curious about it. Nobody had an answer.

"Folks, time to get back. Lets get Devi and we can see how

we can figure this whole thing out later." Dr. Amara rushed.

It was dark. The whole beach was lonely. This was the ideal time to get Devi out. The controls made sure she was hibernated before taking out of the sea. She should not remember what happened. Sudden changes might set the evolving programs unstable.

The wind was a bit cold. The whole bay was dominated by the only sound of impounding waves. There was no human habitat near the beach except for few resort hotels. A range of mountains stood right around the bay. There were fireflies in the mountain range nearby. The crane in the boat pulled her slowly along the channel at the back of the boat. Once docked in the chamber safely, Amara checked if she is well placed on the props. He wrapped her up with the safety belts and closed the lid.

"Guys remember one thing, nobody saw the new species. We shouldn't let it go around. Media will set fire to the whole sea in no time." Namal warned everybody.

Gajendran was silent. He was in deep thought trying to figure out the puzzle.

"Can they be aliens? I mean, how can evolution or some kind of a mutation can do such a thing in this hurry?" He

spelled out.

“Who knows when they started their civilization? Maybe the divers didn’t go to that part of the sea so far. There is no reason because the deeper part has no resources. No corals, no crabs or prawns, nothing.” Namal said.

“But, this is a place a lot of visitors dive. They have no specific objective but to see things around the corals. We didn’t go much far from the corals either.” Gaje argued.

“I am too tired and trembling with too much excitement. The whole thing is still a dream for me. I don’t want to jump into conclusions right now. Let me have a beer and a good sleep. How long will it take to get to the lab now?” Amara said in excitement.

“Three hours with her in the cabin.” Gaje estimated.

9. New lives

The team had not been able to find any fault in the robot. They had released Devi back to the sea off Negombo few years back. There was nothing much new other than intermittent weather reports, water pollution level reports, bad news about damage to the coral reef, and Devi's consistent plea to stop destroying the diversity of the marine life. Nobody knew anything about the strangers in the marine life for the strangers had become smart enough to camouflage their buildings. They had a good spy service that warned them in advance when humans intruded their habitat. There were occasional fights with those who came to destroy the reef, but none of them saw the land again to tell the horrible story.

Gajendran and Ajith were finishing their thesis. They had got Fulbright scholarships to work for the PhD degree in the Chand University in the USA. But both of them were happy because both Universities were in the state of Maryland so that they could meet often. Namal and Abaya managed to secure the Monbusho scholarship to undergo their work for the PhD degrees in Agas university, Kyushu, Japan. Both universities hoped to start collaborative research programs with Dr. Amara. Having his products in those universities were thought to be the best approach to get the collaborations going smoothly. It was a good strategy because more junior students would get the

opportunity to follow the links established by their seniors. Life had come to start a new chapter. Dr. Amara had mixed feelings. He was happy to learn that his young ones have realized their dreams to continue their careers, but on the other hand he had the feelings a father would have when his only daughter got married and about to leave the nest.

Gajendran and Ajith were the first to leave. Dr. Amara wanted to have their going down party at the Mount Lavinia beach. It was the practice of the university to have their most important and emotional parties at the Mt Lavinia beach for it had so much to offer in a quiet night. On one side one could see the Bank of Ceylon tower and the Twin Towers near the old parliament in the heart of the Colombo city. If one were to take a cab, it would take at least thirty minutes to get from the beach to these towers. On the other side, one could see the Mount Lavinia beach hotel. There stood the mighty Indian Ocean between these two ends of the city.

Everybody decided to cook at Dr. Amara's place near the beach hotel. It was their last get together as a lab team. Gajendran and Ajith had brought their fiancés. They could cook well. Gajendran's fiancé Shanthi knew how to cook Manioc steaks. It was the best they ever had. Ajith's partner Indu cooked a great spicy potato curry. Dr. Amara's wife cooked a nice mushroom curry. Others got together and made yellow rice with cashew nuts. The smell in the

kichen made everybody very hungry.

“Man it is so sad to realize that this is the last party with Gaje and Ajith” Dr. Amara sighed.

“Never mind. No matter where we go, we will unite back in this land someday.” Gaje reassured.

“Good if that happens.” Dr. Amara said patting Gaje.

“OK, it must be dark out there. Lets pack things up, grab the guitar and get down to the beach. It is nice to be singing out there now.” Amara wanted to rush.

Mt Lavinia beach had its own unique music and a story to tell to each visitor. The vast Indian Ocean brought with its breeze the spirit of its confidence. The team sat on the white sand. Gaje got the guitar and started to sing a Tamil song. Except his fiancé nobody understood Tamil, but the rhythm was so solemn. All what matters is what you feel. His pretty fiancé kept on gazing at the distant sea. Few tears welled up in her eyes because she knew the meaning of the song. The strings of the guitar added a strange life to the whole song.

Ajith, Abaya, and Namal took turns to sing. In between they enjoyed the warm, spicy food. They sang till it was mid night. The songs with deep meanings hidden in a

country side Sri Lankan life made them feel sad about the huge disparity between Colombo and the rest of the Island in terms of the infrastructure development. The songs reflected the hard life all of them had before entering the university. But the songs never hated that life. Instead every word highlighted the beauty of that life when you look at it from outside.

One song Ajith sang said:

It is not only today we have, we get a tomorrow..
The soft sun will smile to mark a new day..
There will be gems shining inside dark mines..
Like that, the Nation will see some light for a new era through our work done amidst tough challenges..

“Sir, say something” Gajendran broke the silence.

“By the way, tell us something about your childhood, and how you began to like science.”

“Well my parents were teachers. We had a hard time trying to meet both ends meet, because we were six in the family. We survived with three cows that brought us some income, and a small poultry farm. Everyday, after school I used to work in the farm. I did the collection of eggs everyday. It was so smelly in the poultry especially in the rainy days. Sometimes, my school mates used to say that my shirts

were smelly. I didn't have more than two shirts to wear either. I used to walk to the school. And was not a brilliant student till suddenly I got some desire to change my life when I was in grade seven. That was the last time I became the last in the class." Amara paused.

"The whole life changed after that. I started to concentrate on studies more, and continued to become the top in the class till the university entrance. That is why I still believe that parents should not push their young ones to study with out an aim. Rather what they should do is to create a desire in them to be successful people. Things like success stories of other people should be highlighted and appreciated at home. If you invest enough time and money on that, kids automatically pick up the desire to chase after their own dreams. Without that you force them to be handicapped people who will collapse one day. I know of many colleagues of mine who were super genius when they were in the primary school but ended up being losers in the senior school. They never knew why they were studying, or why they were sent to school."

"I think we all share similar stories" Namal said.

"I believe in giving as much expose as possible during the early childhood. We learnt the most important lessons from the forest, the rivers, and the animals around us in the village. Plastic toys or computer games wouldn't have

done that.”

“I am totally with you Namal”. Gaje said.

“Anyway, we are closing a wonderful chapter in our lives with you Amara. How do you feel?” Ajith asked.

“Well, I feel bad to lose you. But we did some nice work when we were together. Always remember that we are a lucky lot. We explore the nature looking for her secret laws that govern our lives. We have no bosses. We do what we like to do with no apparent thirst for money. Our thirst is to uncover the secrets. That is exciting. Each finding we do changes the way mankind feels their environment. You must continue that. Human brain is an amazing thing. Maybe our strange counterparts in that water might have better sense than us. Never mind. Our brains are designed to think. They are thinking machines. The more you imagine, the more you enjoy. Never be followers. They are next to dead bodies. All I want you to do is to continue challenging life.” Dr. Amara paused.

“And, I want you to keep one more thing in mind. That is, a man’s value comes from his uniqueness. In Japan and in the United States, you will be unique because your background is unique to you. Do not think that you should wash that away to be one who is accepted in those societies. Learn from them while keeping your core values.

Of course you will be different men after few years. But still you should be unique with your Sri Lankan core values at the canter of your life."

"In a Sinhala-Hindu new year party when I was studying in the US, some of my Sri Lankan friends who had lived there for more than fifteen years asked me how I had so many American friends just after a year in the US, when they had only few friends even after such a long stay. I wanted to tell them that my American friends loved the difference they enjoyed at my place with a warm cup of Sri Lankan tea, hot spicy food, and the relaxed way we talked and behaved when at home. At the same time, I never looked down upon others habits."

"So, be unique and enjoy diversity. You will have a lot of friends."

"By the way, Namal and Abaya, are you getting ready to leave for Japan? Are you studying Japanese?"

"We went to the Sasakawa center one day and got to know about the Japanese culture a little bit." Namal replied.

"Good, but you will see that the real Japanese culture is a bit different from what is found in the books. You must live there to see that." Amara said.

“What do you mean?” Abaya asked.

“It is a unique Asian culture. Japanese believe in precision. For me, their whole culture is spun around precision and crisp promises. Sometimes they sacrifice love and affection to keep these values. They will not ask you for excuses if you break a promise. Uncertainty in things is something they don’t seem to accept.”

“Japanese believe in a homogeneous society. When you are in a team, you can not have your identity. One leader takes decisions and others just implement it. Japanese professors are good commanders. You should be careful in arguing like we do here in our lab meetings. There are professors who can get very angry with you, because a lot of them think his duty is to command and your duty is to implement them. Arguing is like challenging his position.” Amara paused and plunged into some deep thought.

“But, everything depends on how you interpret the situation. Due to some reason, I loved the normal Japanese society where people were thirsty to see a warm, genuine friendship. Never miss Unsen, the hot springs. First you have a shower bath and get into these natural hot water bath tubs. Immerse yourself in the warm water and stay without moving much. The warmth will take away your stress, fatigue and all the frustration in no time. I used to go to one of those places in the Yamato mountain range when

I was a student there. During winter, the experience is very exquisite. You can enjoy an out door bath tub. In the night, you can see the snow flakes falling all around you under the moon light. Amidst this cold environment all around you, amidst this wonderful natural beauty, you enjoy the warm water covering your body upto the neck."

"I am looking forward to it, except for the fact that I pray for a professor who understands that arguments and challenging is an essential part of science." Namal said.

"I can imagine, I will have to read long emails and write similar ones once you four are there. But keep in touch. All what matters is the continuation of our work. Lets see how Americans and Japanese look at our findings." Dr. Amara posed a challenge.

"So what are your plans with the newcomers?" Namal asked Dr. Amara.

"I want to have a better relationship with those strangers in the sea. Hope Devi will help us to establish an acquaintance with few of them. I am so much interested in the logic system we suspect they have in their computers. Their parallel processing algorithms might help us to make few good breakthroughs in the field of artificial intelligence. What most struck me was the inherent uncertainty in the very hardware that processes the

information."

"Why do you think so?" Gaje asked.

"Well the fact that the computers were emitting bubbles of gas means that they are breathing. It could be made up of some kind of sea weed. Then, the whole circuit should be changing over time. That means parts of the circuit should be growing and decaying over time. The appearance and disappearance of hardware primitives while contributing to the processing function fascinated me." Amara replied.

"Sounds exciting." Gaje said solemnly.

"Now, what I still can not understand is how Devi got to know about the newcomers and how they started to understand each other." Namal was curious.

"Yeah. There is a lot to be understood. But the good part is that we are heading towards some fantastic discoveries the man could ever do." Amara said jubilantly.

"OK. Lets keep research for tomorrow. Now lets sing one last song before it gets too dark" Namal interfered.
"What about a song from you Amara?"

Well, when I see this moon drenched sea and the far away ships, it reminds me one song about a family in a village.

The moon is shining on my backyard..
It reminds me of her face..
She would bathe me with the moonlight and disappear in the darkness..
The stars would shine and they would smile..
But here I am left alone in this wonderful night..

“Wow, that is great Amara. It took me to my village”

The stars were shining on the Indian Ocean. A naked moon tried to wear some tender clouds. Everything was silent around them. The sea breeze swept the Golden beach. The team was silent. Everybody looked a bit sad to experience the last moments of being together in Sri Lanka. They had done much together and contributed much to science.

“Well, Good luck Amara. Time to get back home” Gaje broke the silence.

Amara said goodbye to the team and decided to walk down the beach with his wife. He was so grateful to her for all the sacrifices she has been making to support him. The vise wives knew the importance of sacrificing on behalf of the family. Amara’s wife always thought it important to let her husband spend time with the society and with his work he adored so much. In return it brought prosperity and happiness to the whole family.

It was September 23rd 2011. The team came to the Puran Appu International Airport with their parents. Dr. Amara and his wife were there to say good bye to the team. The whole team were first supposed to go to the Chand university, Maryland, and then after two weeks, Namal and Abaya will take off to Japan from there. It was such a heartening moment for Dr. Amara. He had a nice time with these budding scientists and they were such a team. Faced all hardships together and nobody grumbled.

“Hey don’t worry Amara, we will unite in Sri Lanka in few years. Maybe with better background.” Gaje said.

“OK. Take good care of yourself buddy.” Said Amara sobbingly.

Amara didn’t leave till the four disappeared at the far end of the departure terminal. It didn’t occur to him this long that we never plan for separation when we get together. We are getting along with life like how the spider man moves through buildings. We send strings to various things that we love to be with no idea that we have to break those strings at some point of time if we are to move forward. It is these strings that brings us sorrow sometimes. Amara plunged into some deep thought. He could remember what the meditators at the Hambantota monastery used to tell him. Those discussions of attachments with uncertain

things around us helped him to calm down his sorrowful mind.

10. Beyond Boolean logic

Dr. Amara decided to recruit few new students to work on the robotic self awareness research. That part of the team from the Agas university in Japan and Chand university in the US will support them with few parts. The first attempt would be to collaborate with the marine strangers. Devi was assigned to establish a link with them. Her close acquaintance with them made things very much easier. A lot of people asked Dr. Amara as to why he was driving down to Unawatuna so often. He said he loved diving and that it was becoming his favorite hobby. Nobody suspected about his new friends.

The bubbling computers were amazing. Some programs running inside those computers could understand certain emotions of Amara without attaching any sensors to him. It was just like the bushes at the Hambantota monastery. The bushes sensed something inside the caves and they grew bent towards the cave. Some enzyme must be responsible for that. Amara guessed that a same type of phenomenon is working here. Anyway, the processors here were made up of living cells. All phenomena associated with biological cells and systems were already there.

One more significant difference between these computers and the ones Amara had was that these computers knew if there is something malfunctioning in their own circuits. It

would not give error messages as such, but it gave linguistic warnings and other symptoms so that a computer doctor could recognize what the inner problem was. In other worlds, these computers have some self awareness. The big difference between self awareness in an evolved biological being and this computer was that these computers were designed and made by those strange species. It was uncertain that they knew the essential ingredients of self awareness before making these computers or if it was some accidental realization.

If it was the former, the world would see a revolution in the field of artificial intelligence. Therefore, Dr. Amara allocated a lot of manpower and resources to debug the existing programs to improve its decoding capabilities. Gradually it became able to improve decoding the data Devi had sent few years ago, that showed a lot of garbage at that time. Devi helped to improve the libraries of the decoding language by interpreting the meaning of the data by showing the meaning of each patch of data. For instance, a sadness in a marine stranger was first shown by asking somebody to act. Then she relayed the information. Some information had good data, but some meanings had garbage data. Whenever they could associate a meaning to some garbage data, they improved the libraries, so that next time, the decoding program understood what they were.

Without their knowledge the program grew up to get

internal conflicts. Different libraries recommended more than one meaning to a certain patch of data. This gave rise to a fundamental change in the way programs were written. They learnt how to accommodate uncertainty into the codes. That included the accommodation of logic states like “It could be A and B at a given time, meaning a mix of A and B could occupy the state”, “It could be A or B at a given time, meaning A and B could be toggling to occupy the state without any order.”, “It could be neither A nor B at a given time, meaning it is not certain as to whether it is A or B that occupies the state.”. Of course the conventional Boolean logic system that said “It is A if not B, and B if not A” with crisp certainty was also there. The conventional way of writing equations was also changed. The conventional way wanted somebody to write equations like A + B = C + D. The unit systems of variables on each side had to match those of the other side. For instance, if A is measured in meters, B, C, and D should be measured in meters also. Moreover, A, B, C, and D will hold their values independent of time. They won’t change over time. Yet, these equation systems could never explain phenomena such as what love, attitude, affection, or happiness of a cook at different times could do to change the taste of some dish he/she cooked according to the same recipe with the same proportions of ingredients across trials. The conventional type of equations could only write some chemical equations under some heat and pressure conditions, where the molecular balance was kept between

the right hand and left hand sides of the equations. But what about the contribution from the attitude, happiness, or affection to the people to whom he/she cooked the food? Therefore, the new way of writing the equations mapped a set of causes and conditions to a set of probable effects. The same set of causes and conditions would give rise to different effects across trials. There was no "equal" sign. Instead, there was a transition sign. Therefore, the new way of writing equations could explain the cooking process like (Ingredients, the way they are prepared, the way fire is controlled over time, how love and affection had taken control over the cook's mind from time to time "results in a transition" to a dish with a particular taste with some uncertainty). Therefore different quantities with different unit systems could be added together in some strange sense.

With these logic systems and new ways of writing equations, they could understand how Devi could penetrate the firewalls of the system to fill their hard disks with garbage data few years back. The secrets behind processing emotions were beginning to unfold.

Dr. Amara kept those who were working from abroad updated. There were a lot of life in all their email conversations. Abaya had met a pretty Japanese girl who seemed to have fallen in love with him. That made his Japanese proficiency shoot up like anything. She had taken

both Abaya and Namal on sightseeing trips around the Island of Kyushu. They had gone to see live Volcanoes and had eaten eggs boiled in the steaming water that comes out of the mountain. They had also learnt how to eat row fish called Sushi. Sushi was expensive. Abaya used to do some part time jobs in restaurants along with his Japanese lab mates. He washed dishes, packed lunch boxes, and learnt how to cook Japanese food. He worked in the laboratory till about 6 p.m., and then left to do his part time job. Went back home around 1 a.m. and had a nice Ofuro bath where he spent about half an hour in a hot water bath tub. That took all his stress and fatigue away. Watched the late night news briefly and went to sleep. Sleeping was like floating in air after a good day of work. Woke up around 7 a.m. and jumped out to ride his bicycle to the lab. The morning bicycle ride was a great part of the Japanese life. They got to breathe fresh air, saw the flowers by the streams, and had a brief exposure to the morning sun shine. That kept everybody in good shape no matter how much they ate or worked. Namal was getting used to the system little slower than Abaya because he had nobody to guide him at the beginning. But Namal seemed to be catching up soon. He would soon begin to enjoy his life when his wife arrives in Japan. She had few responsibilities at home till the next Spring. Anyway it is good to unite with one's wife in the spring with a lot of Sakura flowers making the world a heaven.

Anyway, the progress of both Namal and Abaya in terms of research had been fantastic. They were working in a group with a lot of foreigners. A lot of foreign students who were working in homogeneous Japanese groups said Namal's group had all the good qualities of a powerful research group. There were some other Sri Lankan students in the university. They had stayed long enough so that their way of thinking had been molded a little towards being typical Japanese. They had good qualities that both Abaya and Namal appreciated, but they hated their belief that everybody should agree to a common set of principles before doing something. That led to group identities and conventions that nobody dared to break. Anyway, Namal and Abaya alone had great fun with their fellow Japanese colleagues without they getting succumbed to the social pressures to be homogeneous and conventional.

Ajith and Gaje on the other side of the world were sending reports of their new life. Gaje had already taken his wife there. Namal was planning to move to a new apartment before asking his wife to come to the States. Their lab had twelve researchers from seven different countries. Except for the four Americans, others were from Iran, Israel, Canada, India, China, Thailand, and Sri Lanka. It was such a nice family with diversity. They had frequent get togethers where they got to eat food with seven different types of tastes. Everybody loved the Sri Lankan potato curry and the Cashew nut yellow fried rice. Hanukah

parties of their Jewish friends had food cooked with oil. Though Indian food looked very much like Sri Lankan, they tasted little different to Gaje. Iranians loved some over done rice spread on top the normal rice. Quite amazingly, that was what Ajith used to have at their village. The clay pots always burnt the bottom part of the rice. For most city folks, it was indecent to have those burnt parts of rice in their plates. Iranians loved it. Chinese and Thai food were also different. For Americans and Canadians, any food seemed to be American food. Gaje and Ajith often felt so sorry for their old friends in their villages who often made their ethnic backgrounds and languages an issue to mix with those with other backgrounds. How they were enjoying life there after they learnt how to enjoy diversity of people's habits and thoughts made them wonder why Sri Lanka had such a long civil war over nothing. Luckily now it was over.

Unlike Namal and Abaya, Ajith and Gaje never went to the lab during weekends. Life and work saw a nice harmony just like different people lived together in harmony. Traveling to work was not as fun as what Namal and Abaya enjoyed in Japan. They took a subway train to the lab everyday. The university had given them discounted season tickets. The subway train took about twenty minutes to reach the university. They used to read science fictions and various novels during the trip to the university. They left the lab around 5 p.m. From home they could access the

lab computers. So, if they were in a mood to work, they logged on in the night. Both had cable TV at their apartment. They loved the scientific and geography channels. News was as crappy as they used to be in Sri Lanka. Gas and electricity was relatively cheap there. So, they had their air conditioners on all the time. Gaje and Ajith used to ring Namal and Abaya in Japan who were sixteen hours ahead of them. The telephone charges were nothing compared to the income. Even in Sri Lanka, the situation had changed. A new state owned telecom giant had become very competitive there. It had cable connections with India and Singapore. The large network made them able to bring the prices down. So, the world had become a very small place. Dr. Amara often had telephone conferences with the whole group. He explained how his new computers were working. He had developed a number of operating systems and application software to run in those machines. He had begun to realize the early primitives of machine self awareness. He was going to present some of these results in an artificial intelligence convention to be held in Orlando. The whole group planned to meet there during the convention.

One day Amara got a mail from Ajith that said his mother was not feeling well in his village. Anyway, Amara had planned to drive down to Unawatuna that weekend. He promised to drive a little further to the east and visit his mother.

The usual dive beyond the coral reef of Unawatuna was a whole new experience to him that day. That was the first time he came to know that his friend Rinza could notice that one of Amara's friends needed some help even if Amara had not told her anything about Ajith's mother. The computers recommended some sea weeds as medicine. He was told how to prepare the medicine for the unknown patient. It seemed that though we live and move all alone, there are systems that see us as networked people. They could see at least a part of the network of people who were in our mind at a given time. So, mind had a picture that could be seen. The supper intelligent computers could even see the dynamics of those nodes associated with that network. They noticed that Ajith's mother needed help. In other words, they saw a picture of somebody who needed something else to complete the picture of a healthy person. So, they could quickly fill what is missing.

Amara took the medicine and headed towards Ajith's village. With the new street light system, people were working till night. He could see more houses near the road than what he could see few years ago. Ajith had sent some money for his family to repair their old dilapidated house. It was mid night when he could reach the house. The old bumpy track had not yet been developed though the main road had been carpeted. There were some relatives of Ajith who had come to stay there in the night in case his

mother's situation got worse. His father had gone to the town to buy some Kottamalli for his mother. Ajith's sister and the relatives told Amara the story of the illness and the hard time they had during the past few weeks. Dr. Amara handed over the medicine he brought. It was just some moss for others. But he wanted to prepare the medicine with the lemon juice and Ginger. Dr. Amara was relieved when she could drink it. He sat under a coconut tree outside the house and sipped a cup of warm plain tea. Ajith's sister wanted him to eat some dinner. Amara said he wanted to head back to Colombo soon.

"Why do you want to take the risk? Stay here and leave early in the morning. Have a well water bath and relax with a nice sleep." Said one of Ajith's relatives.

"Yes, I wish I could. But I must go." Said Amara.

"OK. As you wish. But driving is dangerous when you are sleepy."

"I know." Amara accepted.

"Dinner is ready sir." Said Ajith's sister.

"Oh. You have been so quick"

"No, we usually cook some extra food, because in this part

of the country, people don't let their visitors go back without their tummies full." She said with confidence.

The Kakulu rice with a spicy coconut sambol and a Karawala dish alone could ignite a strange appetite. Amara finished two plates of the food as if he had had no food for ages. That food cooked with the intension of offering to somebody with appetite tasted different from the city food cooked with the intension of selling to somebody in a hurry to eat.

Finally Amara decided to stay back. A well water bath in this part of the country was something only a few was blessed to experience. The total freedom when the water fell along the naked body reminded those nights Amara used to spend at the night workshop at Ajith's boarding place. What a river of memories it was. The lonely moon, hooting of an owl, distant voices of peacocks that sounded like the cry of cats, total darkness spotted by tiny spots of glitter made by fireflies brought what Amara thought was the feeling of a close chat with mother nature.

Amara woke up in the morning to see a miracle. Ajith's mother was out of the bed walking though looked very feeble. He only wished he could ring the marine world and tell Rinza that her medicine had worked. It was the happiest thing he could ever write to Ajith as soon as he gets back to Colombo.

11. The reunion

The hectic session in the conference was followed by a small coffee break. People were running between sessions. The conference handbook had five parallel sessions. The one where Amara presented his new theory of robotic consciousness was filled with questions. People were so intrigued to see the new results. As usual, the keen scientific community had thousands of questions for Amara. His explanations satisfied some but could not convince some who did not want to change their stands.

A lot of people did not want to believe in writing equations with variables of different unit systems. They believed that two variables with different units can not be mixed in an addition operator. Amara tried hard to explain that this is not addition in the strict sense, but an interaction that obeyed a logic system that went beyond the conventional Boolean logic system.

In any case, people might come up with new questions and they might change their mind after reading the detailed scientific paper published in the conference proceedings. The most important thing for him next was to spend the evening with Namal, Ajith, Gaje, and Abaya. Namal and Abaya had arrived in the US to attend the conference along with their Japanese professors.

There was a trolley bus that circled round Orlando. They decided to have a trip to the Walt Disney world in the evening and have dinner together. The ferry ride to Walt Disney in the afternoon was so relaxing. Amara wanted a break after so much stress during the session.

“Anyway, how is life man?”

“Great!” said Gaje. “Same here” Ajith said.

“Yes, with the help of everybody, we are doing fine” Abaya said.

“Man, you have become Japanese.” Amara said.

“Why” asked Gaje.

“In Japan they always give the credit of their success to the society, for they believe that it is hard to become successful in a bad society.”

“Agree.” Said Ajith.

“But in the US, we take it for granted that we should be nice to the society in order to expect something nice from the society. So, we keep that part silent.”

“Whatever.” Said Amara.

The dinner in that quiet environment was so delicious. Seeing happy people walking here and there in a relaxed mood was also a fabulous thing to see.

Namal broke the silence. “It seems that in the US, people go out in families than what you see in Japan. Over there, you get to see individuals or company circles in the restaurants more than families like here”

“It is when I come back to the US for brief visits I realize that there are a lot of things we can learn from these people.” Amara sighed.

“It is my firm belief that secrets behind development are too simple that people often overlook them.” Amara

paused.

He had a sip of Orange juice, and started again. “The most powerful secrets are not in the economic policies or in the history or in the location or in the natural resources, but in the hearts and minds of the people who live in that country.”

“I feel that the attitudes of the general public play a major part behind any development. If the attitudes are right, that Nation will always have right leaders.” Gajendran added.

“Why do you think leaders are so important?” Namal asked.

“I think we have talked about this before also. But, the most important thing to remember is that leaders are not created by some magical force. If that is the case, that force has been very unfair and cruel to a majority of countries. From what I have observed, one simple truth that I want to summarize is that each culture and each economy had their unique attributes that sometimes contradicted with another country of similar economic status.”

“I am with you Gajendran” Said Amara. “There is no

unique social or political system for a unique level of economic growth. On the other hand I strongly noticed that the people in developed countries have very remarkable similarities in the attitudes toward work, towards protecting common properties, toward achievement and in the ability to find some reason to stay united, though their social structures, family relationships, religious beliefs, and political environments differed drastically"

"By the way, do you want to try some ribs? It is so tasty. That is Orlando special." Ajith asked.

"You go ahead. I am fine with this." Amara said.

Abaya interfered. "If we get back to sociology, the gem in Japan is their astonishing attitude to be precise, punctual, and the ability to demonstrate a remarkable level of perseverance in any effort to achieve any crazy target in front of obstacles that one might think is insurmountable."

"Yes, I agree." Namal added. "Sometimes they start with nothing necessary to achieve it, but they set targets and make their way like a tiny worm drilling his way through hard soil. Immature failure or death is a pride. Falling ill is left for tomorrow. Living is a today's notion. Seeing results

could be a reality in the next generation. But they march as a Nation to achieve some goal set as a Nation. Being a Sri Lankan, I was astonished one day, to see a group of construction workers mending a road in heavy rain. I later asked a friend, why those crazy people worked in the rain."

"The answer was, completing the work within the promised time period with best quality is regarded golden in Japan".

Namal continued. "I have never seen a community who believes in precise planning than Japanese. In any simple event that involves a group effort, they are very quick to appoint a leader who plans things through consultation, but once planned all those involved will keep to the plan no matter what comes up. In a Japanese plan, they leave no room for flexibility, though it might be seen as a weakness."

Abaya wanted to add something. "In extreme cases, they might change the plan but never give up the objective."

Gaje had his own view. "I think the Americans are far more advanced in planning for flexibility, but sincerely Americans waste a lot of time on arguing on nothing compared to the seemingly fast approach Japanese take in

arriving at a final action plan. As opposed to this, Americans may be smarter in leaving redundant action plans that is ready for activation in case things hit turbulence."

"In the Chand University, my research partners planned to build a safety system for a robot that involved three devises so that one should work if another fails."

"In Japan, the normal custom is to build one system that is absolutely reliable and trusted upon. If it fails…well it better not fail. Sounds theoretical but that is how strict they are." Namal said laughingly.

Abaya continued "As a Sri Lankan student who grew up with much family and social support, I was amazed at the Japanese norm of do it yourself or in more strict Japanese words, would rather die on the feet than living on the knees. At work people are together but in life people prefer to be independent. Even the kids like to do things by themselves. One of my friends said a Japanese life is like a Sakura flower. If you pick up a fallen Sakura flower, you will see that it is not withered like the death of other flowers. Sakura petals die a graceful death. So is Japanese lives he said. Every Japanese citizen is a soldier who is

trained to give no reasons for not going for a set target."

Dr. Amara had a suggestion. "The Sri Lankan education system and the society at large should question about the strength of our will power to stay self-sustained, because we have continued to stretch our open palms to foreign aids for too long. The society seems to be enjoying it as they show no enthusiasm in working harder. Taking foreign aid to invest is a different matter. Japanese still remember that they took foreign aids soon after the war, but as a Nation they wanted to escape from it as soon as possible. Still today, they remember that, and that is why they have become the biggest donor to the United Nations, maybe in gratitude."

"Now, Abaya and Namal, have you understood why Japanese make things with a good finish?" Amara was curious to know.

"Absolutely! The Japanese capture markets by being of top quality. The technology involved can be very basic, but their finish is unbeatable. I have spent many hours with my Japanese professor in making figures to be published in research journals. I am still amazed at the percentage of time he takes on the finishing touches. He often tells me, "Kanse is very important". Kanse is a Japanese word for

which there is no word in any other language. It is the sense you should have about how somebody else might feel about your product. How you feel about it or how you market it is not important in the long run. It is the Kanse that decides your survival. Japanese train their young kids to have these qualities through works of art, Origami, etc. In simple words, know the customer before making the product."

Dr. Amara joined again. "What causes many western giants raise their eye brows is that Japan has become a major manufacturer and exporter of industrial goods with no original technology, no coal, no oil, no steel, but constant natural disasters. The secret is their unshaken patriotism and the promise "till death do us part Nippon". Japan is a land where all political theories fail. People believe that to develop a country, there should be a strong leader. Japan has hardly ever seen strong political leaders. The Japanese parliament is one of those most sick systems in the world that can change about thirteen times within twenty years. I have met a lot of people who took their loved ones on trips on days of general elections. Then who are the true leaders and Gods of the nation? It is people themselves. No matter where they work what they do, they know that doing it right with utmost honesty is the best way to make the lives of all Japanese happy."

“What did the Second World War do to Japan? Why are Japanese so silent after the world war?” Gaje wanted to know.

Abaya had an answer. “Japan seems to be the few countries who really learnt a lesson by the war. They know that the war is destructive. They have a promise not be weak again! They have a promise to take the world in the markets.”

“Do we order some more freedom fries? I loved the Mexican pizza. By the way, if you don’t mind spending a few days in Maryland, we could have a nice Sri Lankan dinner with all our lab mates.” Suggested Gajendran.

“Great idea. I should check with my friends there. I have a plan to drive down to Pittsburg also.” Amara said.

“OK, we will keep next Friday night tentatively. Let us know if you want to change the plans” Ajith suggested.

“OK. Thanks.” Amara replied.

He continued. “Tell me more about what you have learnt from these countries. It is so exciting to know what you have observed. It is strange to see a bunch of robotic scientists talking sociology and politics.”

“What else do you want us to talk? Science even at the dinner table?” Gajendran replied.

“Yeah. True. We need to be balanced. But, it seems that you guys have noticed a lot in Japanese system. well, I don’t know if you have heard that Japan from its Samurai era, has continued to sustain a culture that is impermeable by foreigners. There is a proverb, a foreigner is a foreigner. Anything foreign is looked down upon with the exception that anything American is embraced.”

Gaje laughed. “On the contrary, America has been amazingly open to foreign goods. Every weekend my wife and me shop for vegetables and other groceries in a Korean supper market. We see almost all types of goods are imported from somewhere. We can not count the number of different languages we hear in that market also.”

Ajith started. “Here in the US, almost every city has restaurants from almost all the other countries and if you

buy things it is very often made outside USA, with the exception that software is often only from Microsoft."

"But not in Japan." Abaya said. "In Japan, they will find some fault in any foreign thing and refrain from buying it. Amazingly, Japanese people do not buy the cheaper Chinese vegetable, as they know if they buy it, they are cursing the Japanese farmers. But Japanese believe in exporting to the foreign land and pumping money from outside."

Amara started with so much curiosity in his face. "Hey I have a big puzzle. United States claims to be the richest in the world. And the American life is claimed to be the best in the world by majority Americans. Within just 200 years of history, US has become the most diverse, technologically advanced, seemingly the richest Nation. It's military power almost unchallenged by any of the European countries the first immigrants came from. Is it an unshaken patriotism like in Japan? Is it because Americans drink Coca-Cola and seemingly good in Rock and roll as many teenagers and sometimes adults in Asia think? Or is it the supper military power that helps them to open up markets? Can it be the vast brain drain to US that make them able to hire well-trained people in whom their education system has invested nothing."

“Yeah, that is a weird question” Ajith replied. “On Sept 11, it was estimated that people from 81 countries had died in the WTC building. Is this huge flow of cheap, quality labor the secret behind American development? How did the American constitution limited to as few words as 4000 words held this diverse free society together through international wars, revolutions and economic turbulence? Some people claim that American Whites were very clever in exploiting the other ethnic groups while keeping them at hand’s distance from the main inner core of Governance and corporate structure. Some people claim that though US is seemingly free but they have so many unseen devices to enforce control over the social trends.”

“Too complex for me to conclude anything.” Said Amara.

“To me, America is one dynamic system with controlled chaos. I am inclined to think that by large, it is the powerful economy where everybody can find a niche that gives people a reason to stay together. In any case, I must say one thing. Due to this complexity and a sea of secrets, what appears superficially in US is not a good model to be followed by third world Asian countries like Sri Lanka.”

Ajith wanted to add something. “Sri Lanka has tried to follow the American concept of open economy while America itself building their walls to protect their steel and automobile industries.”

“Good observation” said Amara.

“Compared to Japanese who believe in strong group norms in any social, commercial or official matter, Americans seem to have a greater level of individualistic culture. But I was amazed at how the American society and the parliament reacted to Sept. 11 attacks. It was not only Americans, but also the British and Canadians came to fight in Afghanistan together with Americans. They took no time to unite. Will this happen in Asia? Even in a case of obvious terrorism, will Asia get together to combat against common problems? Even our politicians were fighting over a 100 meter buffer zone for months when the people affected by the Tsunami were crying for help.”

Gajendran had made few observations about unity. “I think, what Sri Lankans should try to derive from America is not how it developed economically but how Americans became successful in keeping an amazingly diverse society together. Though I am not experienced enough to come to

conclusions, I am sure the American society exposes many seeds that could be reasonably extended and tuned to find solutions to many ethnic conflicts in the third world Asian countries like Sri Lanka."

"Agreed." Ajith said.

"I am glad you agreed, Ajith" said Amara.

"To be a proud American all what one needs is to be born in American soil. His color is not so important as in many other western countries." Said Gajendran.

"On the contrary, Japanese believe in a homogeneous society of Japanese citizens who look the same and behaves the same." Namal commented.

"On the other hand, US has followed an open policy of using any talented man from anywhere in the world to achieve whatever the goals the true Americans have set to make their lives more comfortable. Therefore, American society has been seemingly open for opportunities, diverse in culture and people up to a certain cross section of the society."

“Lo and behold! Both Nations are rich. What does that mean? Doesn't it mean that ethnic diversity is not a problem to economic growth as many think it is?” Amara questioned.

Gajendran was very serious about this topic. “Sri Lankan leaders who continued to use the British slogan of divide and conquer better look at USA who carry the slogan, Let’s unite and grow.”

“Lets pay the bill and have a walk around. We have to catch the last ferry.” Amara said.

“Did you see the humanoid robots explaining the exhibits? It should be somewhere over there in that building. Lets go. You will find it interesting” said Ajith.

Truly, the robot who explained things in that room really looked human when it moved his hands around. They were well coordinated movements.

“This is fantastic” said Amara. “It was not there when I came last time. Humanoid robotics was in its early stages

few years ago. It has advanced so rapidly. This is beauty of the system here. Americans firmly believe in continuous effort to be competitive by putting a huge effort on research and development. Continuing to be creative is one remarkable feature I admire in America."

Abaya wanted to add to that. "Japanese often have adopted a shortcut approach of starting from where America stops and get the R&D to come up with a finished product that nobody can beat. Japanese add Kanse on American technology. That is all what they do to capture the world. Japanese do this by having branches of their companies in US. They hire people graduated from top Universities in USA that has high R&D value, and transfer this technology back to Japan where the magic goes on."

"Maybe." Amara shrugged.

"If Sri Lanka thinks of starting a good R&D culture, it already has a lot of resources. It is rich in knowledge among Sri Lankans spread all over the world and among the few who have returned back to Sri Lanka. In terms of the imaginative power that works as the root of creativity, every Sri Lankan kid is born rich enough if the country wants to harness it effectively." He continued.

“There can be more than one approach to achieve it. You don’t have to copy one system. We can think of our own unique strengths and come up with a good system. Now look at these countries. Americans have used a lot of military power to influence other countries to change while Japan has not in the recent past. But, both have progressed. If you take the religion, Japan is predominantly Buddhist while Americans are Christian. It seems that religion also has not affected creativity. In ten years from now China can be the richest Nation in the world. Then they will add several other possibilities. Therefore it is obvious that there can be more than one approach, culture, history, and a religion towards development.”

“Really weird.” Gajendran exclaimed.

“Before big things, we have to start from simple things that we can do without a single Rupee of investment.”

“For instance?” Namal asked.

“While in Japan and during brief stays in Singapore, I enjoyed watching people doing little contributions to keep their cities clean. Of course the system supported the public by keeping enough trash bins by the roads. The

people showed an amazing level of maturity in waiting till they meet a trash bin to throw litter. In Singapore the Government did not trust the public for their maturity, so they had imposed severe penalties for violations, but in Japan it was a nice demonstration of patriotism. After every party, or a public function, no matter how drunken people were, they made sure to separate trash into combustible, non-combustible and recyclable trash and put them in respective bins. After every festival, if you go to the city in the following morning, you will be amazed to see how they converted the roads back to that clean rich look. The important thing to notice is that volunteers, not the municipal men, do these things. In the US, unfortunately, I have seen some people who have no idea of what a trash bin is. In response to this, in Baltimore, eating, drinking or smoking in the subway is strictly prohibited. And I have seen how strictly the city police implements it. The admirable thing is these countries get it done by some means. If by law, they enforce it just like the law says."

"Well in Sri Lanka why do things fail? Is it due to bad examples by the leaders? In Japan, I have never seen any poster of the candidates to the parliament on city walls or public bus stops. The irony is, when you live in an environment full of this kind of low quality behavior, you take it for granted. This is why we should show our

students another world of difference." Amara went on to say.

Abaya had few more things to add. "Look at road manners. Both in Japan and US, one admirable, beautiful item of social maturity was the level of excellence they show in road manners. People care about each other. In a number of situations, people have either stopped or slowed down their vehicles to allow me to change tracks. When pedestrians cross the road, they stop their vehicles well beyond the safety range and respect the pedestrian's right to take his own time. Sri Lanka claims a 2500 years of civilized history, but we rarely see these qualities. From the Government's side, they have shown no care in laying down some permanent tracks on the road. People don't know how many tracks are on the road ahead. Junctions have no road signs or guidance. For example in Japan or in US, anybody can find their way to any block if they know how to read a map. Major places like airports are guided from anywhere. Even when we came here from Japan, we had no problem in finding our hotel. We just grabbed a map from the airport and followed the road signs."

"By the way, I heard that Abaya was doing a nice part time job over there. How is it going? I guess that is the best way to learn one section of the society one would never get to

see otherwise." Amara said.

"Well, I really enjoy washing dishes and packing food. A lot of my Japanese lab mates also work there. I wonder why we didn't work like that in Sri Lanka. It is so much fun." Abaya said.

"Well, in Sri Lanka, if a University student makes an extra bit of pocket money by washing dishes in a restaurant or making cocktails in a bar, what would the other students talk about him? In Sri Lanka, depending on parents to eat or even to drink is regarded much prestigious than being independent with some money made out of working. In Japan, or in US, students would not care what job they do to make some money. I worked in a bar, a restaurant washing dishes, and sometimes cleaned houses for a fair wage. All my friends who's parents were Japanese billionaires did the same. We had a lot of fun and were proud of the training we got. The society respected work no matter what it is. Depending on others is one of the most shameful things one could ever do. I think several social barriers stand in our society that discourages these kind of progressive attitudes towards work."

"I agree with you Amara. In Sri Lanka, people prefer to live respectfully even if they have nothing in their pockets.

Where does the pride go when they go around the world, begging for money?" Ajith asked mockingly.

"Ajith, I have heard of a thing called just in time systems in Japanese manufacturing industries. Is it just theory, or do they practice that?" Gajendran asked.

"Yes, in some placed it works. The reason why they need it is they have little space to keep stocks. So, if the system passes what is made here to the next place where they are needed and finally straight to the ship, the whole system looks good, and you can keep promises to the customer. On the other hand, punctuality is a key behind the wonderful order in the society and in any manufacturing system in Japan. In the society, the reason why they adhere to a strict punctuality is that it is a social norm that respectable people know the importance of other people's time. If you ever keep anybody waiting for you at least for a minute, you lose your respect for infringing a great human right not to wait in vain. Above everything, it allows precise planning and to satisfy the customer better than others. Therefore it is instrumental to implant the social norm that wasting the time of others is the most low level behavior one could demonstrate."

"OK. Now I understand. They have a good reason for that.

By the way, you said Japanese always give the credit of their success to the society. What is the deeper cultural reason for that?"

"Yes, only in Japan, if you ask somebody how he/she was doing, you would get With all your help I am fine or the short form with all your help"

"How do you say that in Japanese? I want to surprise few guys in our lab."

"Okage samade."

"Often people do not mean this, but the culture has continued to force people to recognize the fact that the an individual should always be grateful to the society even if they fight alone."

"Still I can not understand why Sri Lankans are very good at the negative form of the same answer. We often say Not bad when somebody asks we are doing."

"But on the other hand, we have to remember one thing.

That is, there is nothing called right things or wrong things. Everything is relative. The best example is my chopstick story. Have I told that before?"

"I can not recall." Gaje said.

"A simple cultural feature in three countries, namely Japan, China, and Korea show that any method to live can be right provided you have a reason for that. As you know, all these three countries use chopsticks to eat. But the chopsticks are different in each country. Japanese use short wooden chopsticks and they say it is light and easy to manipulate. Chinese use wooden chopsticks but much longer than Japanese. They say, long chopsticks make it easy for you to eat in groups because you can have a lot of dishes at the center but still easily reach far. Koreans use steel chopsticks. They say it is environmental friendly as you can use it for a long time as opposed to the Japanese wooden chopsticks that you throw away after eating. Simply, these three types of chopsticks prove that there can be many solutions to a given problem."

"Excellent. Yeah, that says, some of our own systems though they look odd can be right given the cultural background" Gajendran said.

“When we get back to Sri Lanka one day, we want to do some real contribution. I am looking forward to it.” Said Namal.

“We all do” said Gajendran.

“Let me give you an advice if you really want to run away from work and just want to mind your own business, but still want to keep a patriotic picture in the society.”

“How?” asked Abaya.

“Just keep shouting at others. I have seen many people who have become very successful with this strategy. For example, if you really don't want to give a hand to a group of volunteers, but wish to show that you are a patriot, just find some mistake or weakness in them and shout about it. Get together with a similar group like you and laugh at them.”

“But Sir, they will survive in a developing country like Sri Lanka, where there are no strong performance measures, but never survive in a developed country where what

matter sis what you have achieved not how much you shout at others."

"Such people will get several organs hurt if you are in the US." Said Ajith.

"If in Japan, they will decay down to nothing." Said Abaya.

"Amara, when you go to the secondary schools for science days, get the opportunity to talk about these things. Teach them not to wait for the others to start and not be discouraged by the majority who behaves otherwise. Change will start from a minority. If they succumb to the pressure from the majority who follow attitudes that keep our country a third world Island, it will never go forward. Give them courage to stay on their feet." Namal insisted.

"For example in a school where the majority do not care about throwing litter only in a Trash bin, few who care about it should have the self esteem and courage to do what they think is right. In extreme cases where people laugh at those who try to be truly responsible citizens, they should have a strong individualistic mind to continue doing it. This is where leadership will be born. Students should have the courage even to influence and ridicule the elders who

do not care the country."

"And, also, I think Sri Lankans need to be organized in volunteer groups focusing on our grave problems." Amara said.

"Supporting government institutes like the municipal authorities to keep the cities clean, supporting the health department to reduce the cost in keeping the hospitals clean can help. These can be hilariously simple, but making focused groups is a key to solve them. For example it is not hard for few schools in Kandy to organize a volunteer group to do weekly cleaning around the Dalada Maligawa and the side walks around the Bogambara Wewa. The same can be done in Colombo at Galle face green and the Petta bus stand and the railway station. Organize volunteer activities in focused groups with a clear vision. Maybe the high school students can do a lot."

"By the way, what time should we get back to catch the last bus to the hotel?" Amara asked.

"Got almost an hour" Ajith said.

“OK. Lets head back to the bus stop, and if we have time, lets chat while having a coffee.” Amara suggested.

It was a bit chilly in the evening. The wind was strong. But whether in Orlando never got bad in the winter. It never went bellow freezing.

The team sat in a coffee shop near the bus stop. They could see the trolley from far if it came. Amara felt very relaxed with a lot of talking with his old students. It was amazing to see how people get transformed by the environment. He could see some differences between those who lived in Japan and those who were in the US, though their core values had not changed. It reminded him a question one student asked him about synapses between neurons, while he was doing a lecture on neural networks. The student asked how fast the brain can change by changing the synaptic connections between neurons. It was when Amara said, “The synapses can change at least faster than you can change the way you think or behave.” The student really understood that it is the brain that controls our movements and thinking, and we can change the way we do these by changing the inner arrangements of the brain. So, it was amazing to realize how much the brain depends on the environment in which it lives by looking at these people.

“So, tell us something about science in Sri Lanka. Is the university system the same?” Namal inquired.

“No. most of them have revolutionized the systems. Now you have more research grants and using the grants is not like it was before.” Amara said.

“Oh no! don’t remind me that again. That was one of the biggest nightmares we have ever had. I can remember, even to buy a microprocessor out of our own funds, I had to fill those stupid forms and get your signature, then wait till the head of the department signs it, then wait till the dean of the faculty finishes the whole mountain of forms from the whole university, and then convince the bursar of the requirements and answer questions like why I wanted to buy a microprocessor with four ports when I only wanted to use only one port for sure and the rest was for future expansions, and then wait till the supplies department calls for quotations and to learn after four months that the damn processor is not in Sri Lanka. I knew that the processor was not in Sri Lanka right from the beginning. But the stupid red tape wanted me to go through this stupid process and prove before allowing me to buy using my credit card.” Gajendran said.

“How do you do now?” Amara asked.

“Our professors here have the authority to use a credit card. They give the card number to us to order things that we want. Anyway the credit card report will have what we had bought.”

“Anyway, in Sri Lanka, things are moving very fast now. The political leaders also seem to be listening to what we are saying compared to those old ones who never listened to anybody bellow their Lords who advised them nothing but crap.” Amara said with a sarcastic voice.

“That is what you get when you have dumb bunnies as your leaders. They only knew how to count the number of coconuts that fell in their coconut states, and to pay those innocent fellows a small wage. The rest, they left for the Lords to decide.” Ajith said mockingly.

“And, the Lords screwed them in gratitude!” everybody laughed.

“After the change, Sri Lankans have contributed a number of findings to the scientific world.” Amara said.

“How is the media responding?” Gaje asked.

“Well, some seem to have the sense to pick the right ones and give publicity, and the others also pick them up after the Discovery channel telecasts them.” Amara replied.

“I am glad we could finally call ourselves a useful Nation to this planet. Glad to see that we are no longer a burden to the world for every little thing.” Abaya said.

“We have a good power system and a transport system also. Now it takes only one hour to go to Galle from Colombo. And Colombo city traffic has a number of options with a lot of city by-pass fly-overs. We might get few mono-rails. Some people were planning to have few model towns with moving pavements. They say, the slowest track will be adjoined by open grocery outlets. People will be able to pick things while moving and pay at the exit. ” Amara said.

“I saw some news on the internet. But I never believed that they would seriously do it.” Namal said.

“The existing universities have been expanded with a lot of round the clock research laboratories. There are five new universities and almost 60% of the students who sit for the A/L exam can get into a university. Since universities are no longer just tutory centers, academics who do research get good salaries. Automatically, the students pass out with fresh knowledge unlike before.”

“I heard the Universities give a lot of fullbright scholarships now” Namal interfered.

“Well, yes. There are a lot of international students, and a lot of students now pay for their education. But with the extra income made, the universities give Fulbright scholarships to brilliant students. The fantastic thing is that more students now get Fullbright scholarships than the few who were able to enter the universities when it was free. ” Amara replied.

“But that is very counter intuitive.” Gaje exclaimed.

“Well, Yes. But it is due to the volume of activity in the new system. The old system could give a university education to only 2% of the students who sat for the A/L exam. Now the size of the University and the number of

qualified staff has grown many folds.” Amara went on to say.

“As far as the poor categories of the society get access to the education system, it is OK.” Namal suggested.

“What poor people are you talking about? People are not poor. Of course, they can be made to think poor. Now any brilliant student can get a bank loan even if he/she fails to secure a scholarship.” Amara replied.

“Anyway, what about their employability?” Asked Gajendran.

“A lot of them start new businesses, and others have ample opportunities in the economy that grows on average at 12% a year.” Amara said with pride.

“A lot of back up institutes such as the Sri Lanka Inventors Commission is doing a wonderful job in encouraging students to come up with innovations. A number of such innovations have managed to secure venture capital from the new venture banks started by the Government.” Amara went on to say.

“Here they have product incubation centres in the universities. I saw on the internet that Sri Lanka has also started doing that.” Gaje inquired.

“Of course. I think Sri Lankan product incubation centres are examples to that region. They are located in the Universities, private manufacturing companies, and other Government institutes. What they do is, they get half baked ideas and prototypes, and incubate them to finish products. The Venture Capital funds have begun to respond positively to this good move.” Amara explained with a pride.

“Hope such leaders will continue to steer our country.” Said Gajendran.

“No, now it can not be reversed. People have seen true development and freedom. You can remember those good old days where we used to get threats for writing to news papers. In the recent election, we never heard of ballot rigging also. None of those old dogs have the power now. After the change, a lot of those political families left Sri Lanka. So, I hope we will have a better country in the future.”

“So, do you think there will be some meaning if we return back to Sri Lanka after the studies here?” Gajendran asked.

“Of course. In fact a lot of families are now returning, because we are believed to be having the best primary education system also. We have what are called nature parks for kids. They go to school in those parks. They get to explore freely and learn. A lot of private companies have started their own schools for the benefit of their employees. Now they don’t have to waste a lot of time driving to the schools to pick their kids. The Government gives a lot of subsidies for such schools.” Amara continued.

“If those problems are solved, and if we can do good science there, what else? Nothing is like diving near the corals at least once a month.” Namal said.

“By the way, how are our marine folks doing? Tell us about the classified stories.” Abaya was curious.

“Classified means classified. But for you guys, we are having a very nice collaboration with them. The government has given top priority to the secret project. We

are working on a new computer architecture based on their computing philosophies. The world will be a different place very soon." Amara replied.

"OK, the trolley comes. Lets go."

Amara fell asleep in the trolley and got up when Ajith woke him up.

"I am tired man. Good night. We will regroup for breakfast." Amara said.

Next day the breakfast meeting was graced by Namal's professor.

"Hello I am Akihide." He started the conversation.

"Nice to see you. I am Amara." Dr. Amara sat down.

"So, your two students have been very successful in my laboratory." Said Akihide.

“I am pleased to hear that.” Amara replied.

“They work very hard. I have asked them to work in the night also.”

“I didn’t know that they could work while sleeping.” Said Amara jokingly.

“Anyway, we should continue to collaborate. Please send me few more students after Namal san and Abaya san leaves.”

“I will try my best.” Amara said.

“I heard that you have a guest lecture tomorrow. See you there.” Prof. Akihide left.

12. Science for kids

Anthony was a young fisherman in the southern town of Weligama. He and his wife Roselin had four children. When you enter their relocated new apartment in the sixteenth story of a tower, the eyes would first go to the photo of a beautiful young girl. She was lost in the Tsunami in 2004. Anthony started fishing again very recently with the new boat donated by a local rubber products exporter. Recovering his normal life had been so tough. But the new system of fishing towns and fishing companies kept him in the trade. From 2016, the government had introduced a lot of fishing companies partly owned by the government and partly owned by the fishermen. Anthony was one such owners. Their lives had improved a lot after the new fishing town system.

Yet, Leaving for fishing and returning back home had been the most heartbreaking moments for him without his youngest daughter who came to say good bye when he left home and then ran to grace him when he stepped on the shore again.

“Roselin, I feel like quitting this job and working for a construction firm. I can not do this job. I feel so lonely in the sea when I realize that Dingi is not at home.” Anthony said very often.

Roselin was a courageous mother. She never wanted to give up. “We must think of the schooling of the other four. It is true that we will suffer. That is fine with me, if they grow up with a better education.”

“One gentleman came and offered me a good job in Hambantota. That is the fastest growing city now. Maybe we can all move there. Other option is to move to Colombo.” Anthony went on to say.

“Colombo is out. I never want my kids to be treated like animals in those schools. They should go to Colombo with some strength, so that they don’t have to be second to none. Hambantota is getting too busy. They want to beat Singapore.” Roselin was pessimistic about the move.

“I can not make this move if you don’t support. You must understand that a lot of folks like us have had to take tough decisions now. A lot of people change their traditional trades. There are a lot of better chances coming up.” Argued Anthony.

“The tough decision is to stay and fight back. This trade has just begun to grow. In few days, we will get a lot of more multi-day ships. Then we can get into the export market.” Roselin was firm.

“How do you know?” Anthony asked.

“Don’t forget I am taking business administration classes over the internet. Now I know what to do. Just be patient. Just look outside. Where on earth do you get to see that beautiful sea from the 16th floor of a building on top of a hill by the beach?” Roselin argued.

“Anthony, it is not only money we should be concerned about. We should think about our happiness. Aren’t we happy like this.” Roselin came closer to Anthony with a smile.

Anthony never moved out of the town. He somehow managed to live with the new life.

Few good people volunteered to be friends to the four schooling kids. Among them there was a young couple without children. They visited Anthony’s place a couple of times a month. They brought a lot of drawing papers, water color sets, and pencils for Anthony’s kids.

Due to some reason, whenever the elder kids painted a scene of the beach and the sea, they didn’t forget to sketch some kind of a fish that looked like a large Dolphin with radio antennas. It was moving by some building. Instead of coloring the fish like others, they scribbled what they thought were inside the body. It looked like a factory inside the fish. The couple always wondered what made them

draw such bizarre kinds of fish swimming by buildings. The kids never knew how to explain what they had scribbled. But they said the teachers at their school were talking of such a creature living being near the coast. The teachers were also not very sure of what it was. None of them knew that it was that creature who made their lives safer by predicting danger.

“One day an uncle came to our school and talked to us about science.” Said Mala, Anthony’s eldest daughter.

“What did he say?” Asked Meena, their new friend who brought books and pencils as gifts.

“He explained us the fun of observing things in the nature. He did some games with us. We went to the beach and collected shells. We went back to the schools and he asked us to draw the shapes. Then he asked us to write few things we noticed in the shells.”

“Looks fun.” Said Meena. “We didn’t have such fun when we were at your age. We were asked to memorize things.”

“Then?” Meena wanted Mala to continue.

“Then he wanted us to imagine how different shells got their shapes. That was a best part. We wrote all sorts of stories. Finally, he taught us the related scientific findings.

Amazingly, they were very much closer to what we had guessed. So, a lot of us wanted to do science."

"So, when did he talk about these strange species in the sea?" Asked Meena.

"He talked about a robotic fish in the sea. He said that the fish helps our father's fishing job by sending daily reports of the best fishing sites, weather information, and lots of more information we didn't really understand." Mala continued.

"Wow. Looks exciting. Was it made in Sri Lanka?" Meena inquired.

"Yes, now it seems that he manufactures them in Sri Lanka. But he told us his sad history where in the good old days before the change took place, he had to get a Singaporean company to sell the fish to the Sri Lankan government."

"Why the Sri Lankan government didn't want to buy from his directly?" Meena asked angrily.

"That is what we heard. He said, he could have sold one robot directly to the government for Rs. 2 million, but the government wanted to buy from the Singaporean company for Rs. 30 million. Even our teacher knew the story." Mala

exclaimed.

“Thanks to the Swiss banks!” Meena murmured.

“Anyway, we must be happy about the change. Your generation is lucky.” Meena said.

“Hey, by the way, why did you paint the buildings by the fish. There are no buildings under the sea.” Meena exclaimed.

“Don’t you know that there are smart fish living there who can build things like we do, perhaps even better?” Mala replied.

“OK. I can understand. That uncle was not very interested in talking to the adults about his new findings. He enjoyed talking to kids. He told us that he like teaching the kids because we have fresh minds unlike the rigid minds of the adults. That’s why you guys don’t know much about these new things.” Mala continued.

“Hey, do you mean that there are smart fish in the sea and they can make things like we do?” Meena came down from the chair.

“Yes. They build thinking machines out of sea weed. See, that is why I have these bubbles coming from the rooms of

the building. Those who live inside those apartments use these thinking machines to get advice. When the machine works, it begins to breathe fast and that gives these bubbles." Mala went on.

"Wow, you are becoming a good scientist Mala. I am so proud of you. That uncle must be a good teacher to have explained you all these sophisticated science." Meena was jubilant.

The next thing Meena did was to start ringing the University where Amara did research to see if she could meet him.

Finally she got through to Dr. Amara.

"Hello Dr. Amara, I came to know about you through a student whom I am helping. She told me about few stories about your robotic fish. It was fascinating. In fact I am really interested in Artificial Intelligence. Can I come and meet you sometime next week?"

"Yes, you can come one Tuesday at 10.30 a.m. I will come to my room after a lecture." Came from the other side.

The meeting went a long way in Meena's life. Finally she became a volunteer student in the work related to early warning of natural disasters, a project initiated by Dr.

Amara. She increasingly became interested in the new field of intuitive perception, an area Dr. Amara spent much time working on. With this new knowhow, they could predict many things that the conventional sensing technology could not tap. For instance, diagnosis of deceases became much easier. Weather forecasting needed much less computation. Prediction of social reactions to new policies became very easy. The accuracy of the prediction of landslides, earthquakes, and floods increased significantly. Amazingly, the secrets of these new capabilities lied in the invention of new ways to make artificial sensors that co-existed with biological systems. Sometimes, the nano electromechanical systems collaborated with bacteria colonies the population dynamics of which depended on many complex natural phenomena such as weather changes, the change in the chemical composition of the air, pressure changes, and emotional conditions of the people around it etc. Sometimes, the nano-sensors lived inside the bodies of animals. All these tiny sensors that co-existed with biological systems were connected at a higher level information sharing layer. The orchestration of intuitive perception was done by a somewhat chaotic information mixing mechanism.

Finally Meena moved to Sri Lanka with her husband and enjoyed her life working in the research labs that Dr. Amara led. Now there were researchers from eight countries: India, Israel, South Korea, China, Canada,

Vietnam, Iran, and Lebanon. The group was funded by the National Science Foundation of Sri Lanka and several other international funding agencies. They got an ultra-modern building by a river with a serene environment. The lab became very rich with a lot of local and international consultancy projects flooding in. Their latest technologies could deliver the most cost effective solutions to a wide range of sensing and automation solutions of the modern sophisticated manufacturing environments.

With the money they earned, they could see the real beauty of Sri Lanka. The whole team enjoyed white water rafting, outdoor camping, painting in the hill countries, diving down the coral reef of Unawatuna, and of course cooking their authentic food. Sometimes, when they were bored with the work, all of a sudden they would decide to reserve a hotel in Nuwaraeliya and take a flight from Colombo. Therefore, research life was enjoyable like never before.

Add to the glory of their life in Sri Lanka, the group was looking forward to receive Dr. Gajendran, Dr. Nimal, Dr. Ajith, and Dr. Abe who were returning home after securing their PhD degrees. They were supposed to set up new labs in the same group. They had to take up a lot of responsibilities in research and teaching because the University had new plans to expand the activities. There was a lot of demand from the foreign students. Now almost 40% of the student population comprised of foreign

students. The number of local students had increased twelve fold since 2006. The number of students who received Fulbright scholarships was five times the total number of students admitted to the University in 2006. The University that depended on treasury funds in 2006, was now completely independent from Government grants. Researchers never had to go through the nightmare of filling dozens of forms to use their research funds, and they could order their equipment using lab credit cards. They never had to get three quotations from three bus companies before deciding to travel somewhere. Both the students and the professors were spending a good life and a lot of Sri Lankan scientists were returning back to Sri Lanka.

Gaje was planning to work on the computational algorithms adopted by the new marine dwellers. Namal was interested in intuitive perception in a networked set of nano-sensors that co-existed with bacteria colonies. Ajith was planning to work on the hardware architecture of the microprocessors of the breathing machines used as computers by the marine dwellers. Abaya was interested in communicating emotions over cellular networks. Amara was now working on machine *vedana*.

13. The Narrow Escape

It was one night in year 2030. Anthony returned home in the mid night, much earlier than usual.

“Roselin, today the sea was unusual. All the fish had gone somewhere. When I came to the shore, I noticed that the shore had widened as if somebody had taken a lot of sea water to a different planet.”

“Good gracious you are home. Yes, I was trying to contact you but the lines were busy. We got alerts in my mobile. It said you should be either in the deep sea or should move away from the shore.” Roselin replied.

In the meantime, Amara was in great trouble. His computer had just got a lot of information sent by the marine dwellers through Devi. It had a red alert. He had no time to waste. He rang the coast guards. They did not bother to spread the warning message because the Pacific tsunami warning center had not yet issued a warning. But the Navy took the risk, because they knew how reliable Amara’s system was.

His intuitive perception based systems kept on ringing the alarms through all communication networks. The automatic telephone messages were waking up people from deep sleep. Amara noticed the stray cows and dogs running

inland with a prodigious speed. It looked as if somebody was shooting them from behind. They jumped over things that he had never seen them jumping before.

Amara first commanded the auto guided mother ship that was docked near the beach to move deep into the sea as fast as possible. Then he took the risk and jumped into his double cab and sped along the coast with his siren on. He did it for about ten minutes and could cover about thirty miles when he saw a mountain moving towards him in the darkness of the night. He quickly activated the balloons that inflated in a fraction of a second. It took the cab up into the air.

What he saw from above was the most horrendous scene he had ever seen. The big wave pounded on the ground creating few deep craters. Then it made froth that shot up and fell over the coconut trees. The deafening sound of the impact resounded in the air. Then, the violent waters moved forward with a magic power that broke everything it came across into rubble. Then, the water was sucked back into the sea even faster. That swept whatever was left unattended to the abyss of the ocean.

Amara quickly figured out that this time, the waves came from the South.

It took him few hours to get back to the lab. All evidence

suggested that this time, it was a huge Glacier in the South Pole that made the Tsunami. The scientists never imagined that the run away effect of Global warming would start this soon. The Southern States of Australia, New Zealand, South America, South Africa, and some parts of Arab were affected. Fortunately, this time, the damage to human lives was very low. Only about thousand lives were gone with the waves. Those who died in Sri Lanka were drunkards who spent the night in the bars in the West coast. They never figured out the SMS alert sent to their mobile phones.

Almost 90% of the properties bellow three meters above sea level had been washed away. Amazingly, only about 2% of the structures built by the marine dwellers in the West coast had been damaged. That gave the Government enough reasons to start learning from the new civilization under the sea.

The new civilization had expanded its infrastructure building activities. More than hundred copies of Devi were now doing the go-between work to facilitate the interaction between the land civilization and that in the ocean. The marine civilization exported a lot of fertilizer, sea food, oil, mineral based finished products like germanium microprocessors, and they did a lot of service related work like processing data using their superior computers. They had virtually taken over all weather forecasting and natural

disaster prediction work for the land civilization. They also earned a lot of money from marine tourist industry. They had managed to negotiate a settlement on how to share the fisheries resources. They had superior weapons that could be launched from the bottom of the sea. They imported a lot of stainless steel from the land civilization. They shared spy information and did the surveillance operations at a fee. They never believed in capturing other people's lands and robbing their resources under the banner "We carry the burden of civilizing them". They always believed in diversity of ideas and change of norms over time. They believed in religious principles that said the nature is an ever changing system and that change should not be obstructed. Uncertainty was something they used to accept. Therefore, they never believed in hard and fast agreements. All agreements were subjected to the surrounding conditions. So, they updated the agreements often. Their flexibility was paid off by an amazing level of peace in the new civilization.

Above all, the strong relationship they had with Amara was growing from strength to strength. The whole marine civilization had a great regard to the lab led by Amara not only because of the level of research they were doing, but also for the great qualities and principles Amara based his work. This relationship had come to a very important milestone. The two civilizations were planning to hold the first joint inter species conference on *Matter, Life, and*

Vedana.

14. The press conference

Dr. Amara faced his first international press conference ahead of the historic inter species conference on *Matter, Life, and Vedana*. He was a bit nervous about talking in front of media because he had to choose words very carefully. If he makes one mistake, he can not withdraw it that easily.

Spetember 3rd 2038. Reporters from more than thirty television channels sat in front of Dr. Amara. He was not alone. He was joined by his counterparts from the marine civilization via a telepresence network.

Reporter: "Good evening Dr. Amara, are you all set for the conference?"

Amara: "Good evening. Well, yes indeed. We are all set to go."

Reporter: "What is the big difference between Vedana and sensing?"

Amara: "Oh, you are starting with difficult questions. Well, basically sensing involves converting a physical signal to a common medium like electric signals and interpreting the physical signal. Vedana goes few steps beyond that. It involves all parts of sensing and goes on to give you a common feeling on comfort, neutral feeling, or

discomfort.”

Reporter: “Why is it important to have Vedana in the machines?”

Amara: “Well, a lot of benefits are there. To tell you a few, if a machine has Vedana, it will ask you to lubricate its joints well before it breaks down due to lack of oil or grease. It will also avoid dangerous work and recommend you the best way to handle it. There are a lot of more benefits.”

Reporter: “How far have we understood the related principles?”

Amara: “Well, our civilization is far behind the marine colleagues in that sense.”

From the marine civilization: “Dr. Amara is kidding. He is the one who gave us the first few ideas. It is true that we worked on that thereafter.”

Amara: “But, they are the champions now”

From the marine civilization: “OK. It is a good result out of a good collaboration”

Reporter: “It is nice to see the strong friendship you guys are having. How do you plan to hold the conference?”

Amara: “We plan to do it using our telepresence network. It is a result of the modern virtual reality and kansei systems engineering”

Reporter: “Perhaps, you could tell us how you are going to translate from one language to the other.”

Amara: “Well, anybody can present their findings in any language. Our Kansei systems and feeling translating machines will do the translation to the other languages. Of course that service will be provided by our marine friends because it is them who has the technology”

Reporter: “How much does a participant has to pay?”

Amara: “Well, we are planning to charge only to cover the cost of infrastructure. It will cost about Rs. 20,000 per person for all the sessions.”

Reporter: “Do you have special rates for students?”

Amara: “Sorry I forgot to mention. Students can volunteer to take up some administrative work of the conference. Those who work will be exempted.”

Reporter: “What kind of infrastructure one should have to participate?”

Amara: “It is very simple. Your Linux operating system supports our software. One you pay using the credit card, we will allow you to download the virtual reality software. You can use your home 3-D viewer to see all the physical movements. The software will have the language translator also. All are open source systems. So you won’t have any problems.”

Reporter: “May I ask a technical question?”

Amara: “Yes, go ahead.”

Reporter: “How is your Devi robot doing out in the sea?”

Amara: “I guess the best person to answer that question is out there under the sea.”

From the marine civilization: “Thanks Amara. We are having a nice relationship with Devi. It became the first machine with an artificial Vedana. It can imagine things, it can argue, and it can lie. She started that very recently.”

Reporter: “Scary.”

Reporter: “Do you think machines can go beyond human intelligence?”

Amara: “Certainly. If the machine knows how to collaborate and share sensors with other living beings.”

Reporter: “When will that happen?”

Amara: “You will find that out in the conference”

Reporter: “One final question Dr., ”

Amara: “Yes, go ahead”

Reporter: “What do you think the future of our space explorations be when we have a new intelligent species at our door step?”

Amara: “Space explorations are space explorations, that will continue. We must explore for life in and out of our solar system. That will bring us a wealth of new knowledge. Even if we find new friends, man would continue their exploration. In fact that is what humans are all about. Now, we have an intelligent partner right on our own planet. They have joined us for the search for life outside our planet. And I am so happy to see Sri Lanka which was begging for food in front of the world just about 30 years ago, becoming a partner in that endeavour.”

From the marine civilization: “Congratulations Amara. We will continue to be partners in all your dreams”

Reporter: “That is good news. Hold on please, Dr. Amara, can you tell us the biggest achievement in your life? I mean the thing that you treasure most.”

Amara: “Of course, the biggest thing I have ever achieved in my life is my small family. Without their support, I would never have achieved what you might value. Then comes my research colleagues. Without them and their good minds we wouldn’t have done any of this.”

Reporter: “Thank you Amara, and thank you over there from the Ocean. Wish you good luck with your meeting and the future work.”