as AS, DOS.

When YSDas came he had to overcome the TNS syndrome to which ISRO was used to. YSDas had a good Lucknavi style; hardly he would raise his voice. The language would be totally polite. But on professional (ie finance related matters he would want clear cut replies). He had been my Guru for Govt financial systems, starting from General Financial Rules / Supplementary financial rules etc. YSD was very much particular in using clear rules without obfuscatory language. ISRO rules used to be not clear in the administrative. More important things would be after technical jargons, the immediate need, schedule critical etc. Why it became schedule critical? Due to poor planning? Or unforeseen which explain those events. If public tender had to be avoided to go for limited tender to a few companies - explain reasons. Though these rules existed, in practice lots of loose explanations were accepted on record. Also most of ISRO persons in those days did not understand Govt budgetting. There used to be detailed budget exercises

within ISRO. The younger persons from ISRO HQ like Chandra with the lead by KSP (later P. Sudarsan) had devised various methods of ~~the~~ detailed budget analysis & evaluation. I was also an active participant. But those details get submerged in the Govt. budget which concentrates on Capital, ~~Revenue,~~ (Capital Equip, Works etc which are asset forming), Revenue (Salary, Admin etc) etc. ~~That~~ (Plan, non-Plan) Prof. SD did not like the idea of division of Plan, Non-Plan as it distorted the concept of Programme budget. What was done earlier as expenditure need ~~to~~ not revisited much; you need to fight only a small increase in Non-Plan. ~~In~~ Actually in many ways the Govt's Budgeting system which is what the Space Commission ~~Com~~ & ~~F~~ Finance Ministry consider as important, ~~to~~ was (is) in many ways anti-thesis to good programme management. What ought to be closed down can continue ~~for ev~~ forever as Non-Plan, and what ~~is~~ was new and important for ~~the~~ the future had to

struggle to get a line item; the Govt. finance person's worry ~~is~~ was always as to how much of new liability the new Plan projects ~~may~~ might bring in. Most Govt projects enter with a relatively low Plan budget as new items and after a few years escalate like mad; you can't close them as the auditors ~~can't~~ won't question the infructuous expenditure of what was already expended in the project. They ~~may~~ won't definitely question escalations but one could multifarious real and unreal reasons: ~~as inflation~~, foreign exchange fluctuations, inflation due to price-rise in various materials etc ~~etc~~ thus showing all causes as external beyond their control!

Since this was the general practice, finance persons were head on Plan and let go Non-Plan with low ~~as~~ per centage ~~etc~~ increase (future liability was clear!! and auditors hardly looked at them!!!)

Another item was whether these items referred by the Centres / Projects got into GOI Budget. It was always hard to decipher because TNS with his deep understanding of unpredictable technical activities of the Centres as GOI budget had to be projected 12 to 18 months in advance; during Sept of a financial year one had to project Budget estimates of the next financial year 1 April to 31 March. Technical reviews may change many details of equipment, materials etc. ~~for~~ For judging the technical correctness and relevance there were many good functioning review Committees ~~in~~ within ISRO. Even for approved budgetted items, one had to start with Need Aspect approval etc by ~~comp~~ expert Committees in

Centres / Projects. It was difficult to push through useless items. Therefore On the other hand if these details ~~are~~ were written in the GoI budget since they ~~are~~ were votes by the Parliament, DOS ~~cannot~~ did not have the powers; ~~You have~~ it had to go to the Parliament! That was not easy. Therefore TNS had evolved a system, which SD referred to as Seshan Transform from ISRO's detailed items / Budget papers to Space Commission's White Book

For examples VSSC's R&D budget for various divisions ~~with~~ words get into various pages of of: Capital, Capital ~~Exp~~ Equipment, Revenue, Non-Plan Planer with ~~some~~ all the key words ~~which~~ such as ~~Re~~ R&D in rocket

and launch vehicle technology for various technology elements such as ~~p~~ solid propellant, liquid propellant, solid - and liquid propulsion, avionics, control systems, aerodynamics

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TNS, KSP, & me ~~were~~ had mastered this transformation. Each of the Centres' budget elements could be fitted into these. Over a period the Internal Financial Advisers (IFA's) of Centre, PPEG's etc of Centres started understanding it.

For YSD it was learning But he wanted to be sure that items that could not be fitted to these should not get approved by ISRO / DOS purchase ~~pro~~ process. That would be serious violation of Parliamentary voting and will be

considered as serious breach of procedure inviting censure of the Department (Secy, AS etc included).

Therefore in case of doubt he used to call me to his room often" he will speak as friend too

Rajan Saab! Please look at the following provisions of New Works, New Instruments of Service etc.... Pl. let me know where these requests from Centres fall"

I had to read them, he would explain the intricacies. Then I used to go through the earlier year budgets and annual reports of the Dept. These would determine whether they were new or continuation of last year programmes. I would show each of them. He would read. Thus we had documentary evidences of New, or continuing etc in a formal Govt finance sense.

There had been tricky cases. I had gone through much earlier documents of Space Commission etc and he could comfortably decide.

Thus over a period, he got such a confidence in my judgement, he started

assisting DOS officers to route the files through me, though it was not the role of SS (or ASS); they were purely DOS files. These were great learning experience. In the process, I learnt the correct govt processes and also audit/ parliamentary requirements.

* * *

Let me now take a break to go into personal family matters during the 1975, 1976 periods.

After settling down in Palace Orchards upper part of the house of Mr Hallappa's house, our life was well adjusted to B'lore. Vijay was going to Poorna Prajna school. Periamma was with us.

~~Also~~ I had lots of travels including for abroad even during 1974 to USA, Europe, Russia (USSR). There were long spells especially while going for ~~it~~ ISSP related review, launch & later for SEO. US, Europe trips were shorter. DFVLR coordination which had receiving of equipment was inherited from Bhavsar. So whenever I went abroad, I used to buy some special kitchen equipment, etc for Soma.

She will give correct specifications and also small drawing about Vijay's pant - jean - wear sizes plus other specifications of fabric etc. I will bring some chocolate, special cheese, some canned food he likes etc.

During weekends when I ~~was~~ was at home, we used to go by autorickshaw to M. G. Road or Majestic. In M.G. Road, Brigade road Vijay loved going to a Koshy's restaurant to eat Fish & Fry; Gowa loved to take Wada-Sambar. We used to buy cheese etc from Nilgiris. Vijay (& later Vikrams) were fed with good nutritious food. To the extent my foreign travel gave me money ~~[illegible]~~ (the saving from my daily allowance) which could buy some good things for them. In 1976-77 period, even later India did not have any worthwhile consumer goods.

To get a refill gas for LPG cylinder it could take 3 to 4 weeks; Gowa had her good statistical-inference-intuition and used to order 3 to 4 weeks before the LPG gas cylinder will be over. Thus she could have a maximum gap of only 2-3 days. Some time she had to give the cylinder which had still some gas away, as exchange. To cover these gaps, ~~to~~ I used to get ~~two~~ a hot plate (German FRG in three days) with a redundant one, as repairing may be ~~a~~ very difficult. In that house

hot water for bath was through a big earthern pot built inside bath room; wood for that had to be stocked. In addition we had a kerosene ~~sto~~ store! Managing these supplying chain for energy was an important task. After washing clothes Uma used to iron the clothes for Vijay.

Periamma was with us. Uma & she were good companions. Vijay would go out most of the time for playing with his friends. I feel sorry now that I could not spend much time with Periamma. We could not take her out because she would not like those places nor the movie theatres to which we went. & I was too busy with office work, travel and also lots of tension in office work plus my continuing reading. I could just manage some time for Uma and Vijay, which Italy was not sufficient work balance.

In addition Periamma's arthritis had become worse. Also she had put on weight and therefore

walking was difficult; often standing too. But she would manage by moving on the floor. Often she would insist on Cooking. She had BP ~~a~~ but refused to reduce salt. Good medicines which could relief for BP and arthritis were not available in those ~~f~~ days.

Even for Aruna, Vijay & me during 1975, 1976 periods medical facilities from ISRO were very limited. Some worth while ~~hospitals~~ were a couple of missionary hospitals and Govt hospitals.

Veena had ~~a~~ two miscarriage due to a gynaecologists ~~(praised~~ (referred by ~~some~~ others as good in the Sadashiv area, daughter of a ~~the~~ big industrialist) handling things badly. She did not know what exactly was happening. Thank God, I was there when the first one took place. ~~&~~ The gynaecologist

could not even diagnose the ~~folle~~ fallopian conception and was holding ~~in the form~~ the symptoms with harmonal injection for a few months!

For Periamma we did not know what treatment to do. Also my salary was very limited to try for big ones; also we were ignorant of it. The normal medicines which the physicians gave.

~~Periamma had a stroke and~~ Her attitude to BP diet was ~~that~~ "Let me not eat tasteless food and ~~like~~ live for a few more years. Let me enjoy a good spicy food — காரம் சாரமாண சாப்பாடு — now as much as I can and ~~dep~~ die earlier, if I have to!"

She had her logic right in a way. Finally one day she had a stroke and was moved to Martha's hospital. It was in the general ward; we were advised that it was better to be in the general ward as she was in coma, and 24 hr attention was available only in the general ward. Coma stayed with Periamma at night.

The hospital was near ISRO HQ office. I went to office also. Vijay was taken care of, by neighbours as arranged by Coma. She also shuttled between hospital & home. I did not realise the magnitude of the problem.

Mr. Vellodi told me: "Rajan, I know you love your Periamma. But coma can be a difficult thing. If she does not come out of it, it can go like that for several months and years." He told about an example of one of his IFS colleague whose wife went like for several years, completely attended to

at home, living only on some horlicks with body shrinking to a very small size.

He said," Hope she goes off peacefully; don't feel bad that I am telling you like this!"

I shared it later with Goma. She had immense belief in God. Also Periamma loved Goma so much that she knew that Periamma would not cause ~~does any~~ ~~trouble~~ trouble.

A few days passed. Periamma did not regain her consciousness. One night a old lady ~~by Pe~~ in Periamma's bed side who used to talk to Goma ~~also~~ in Kannada also started praying for herself " Oh! God! enough of pain for me. Enough of this samsara. Take me away!" Next day she ~~was~~ passed away. Periamma passed away 22 Nov 1975. We informed relatives.

But Goma & myself went ahead with last ~~rite~~ rites and the ritual performances for 13 days.

A major duty for Periappa was done through ~~through~~ Gowa's father at Dharangadhra. For my Periamma it was done through Gowa herself. Periamma stayed with us for about 1½ years. She enjoyed with Gowa, living as she wanted and passed away peacefully, without causing any inconvenience for us.

Two great souls in my life who sacrificed a lot of their own lives for Papa & me, being our father and mother after my mother passed away.

The main thing I did for them was to get them out of the oppressive life they had under my father's Bombay regime, totally helpless — just after I went to Ahmedabad in 1964.

P. & P had a free life for themselves after 1964 till their deaths. I could not fulfil Periamma's desire of travel to several places, which was not possible at ~~to that~~ her Koltaram life and later with me. But she could be with her relatives for about two years before I got her back to Bangalore.

The age gap was so much between me and them about ~~41~~ 40 years. Both of them came close to 70 years, not bad by the standard of those days.

These were the only two people, to whom I feel I owed much more and could not give back.

But their love was so pure they would not expect it!

Otherwise our life went on as usual. We had a few dependable friends around.

Just we stayed in the upper part of a small house (linked by a staircase right from the ~~down~~ ground), our neighbours in the other side was Rustom Damania, Deenaz and their two small children (daughter) Tarana & Dilaara. Since both Aruna & I had lived in Bombay we knew ~~the~~ Parsis well. That young family was very good; we had good friendship. We could communicate often standing ~~the~~ in the balcony.

~~Draft~~ In the road accessing our house from the main circle Sadashiv Nagar, there was an empty plot probably 60' x 40'. ~~Its price was someth~~ I did not have any great interest in buying land; I was not sure where we ~~with~~ would stay. Neither Aruna thought of it then during 1976/77. It was late she got interest. But those lands were about Rs. 15000 - 20000/- We

did not have any savings with us in the bank. I had some US dollars 1000/- saved while living in USA which was for us an Emergency money, in case we had to spend anything for Vijay's health which were beyond ~~US~~ Med. Insurance given by ISRO: US Blue Cross / Blue Shield. Also since I was going abroad often ~~I kept~~ I used them also as a reserve for travel: it may be useful for purchase of some items needed for Kitchen ~~and~~ equipment etc. There was no TV ~~in 1975~~ after coming from USA. It would have been a deprivation for Vijay who used to enjoy Sesame Street in TV when he was two / three years age. Also no swimming pool.

Vijay, his constant friends Hari & Keshu had gone to the nearby Sankey Tank (it was without any protective wall etc) — I think when he was just between 4 & 5 years

fell in the tank, fortunately saved by street boys: It was God's Grace!

Vijay had adjusted to Bangalore life very well. So was Uma, who picked up quite a bit of Kannada. My ability to pick up languages had gone down. Also ISRO professional life locked us up to English.

During one of those years the land lord of the house in which Ruston Ramsay stayed told me a shocking episode. He had started a small Agency based in this house. The main business was selling instruments to scientific, and technological institutions. Most of the agents (including those engaged by foreign companies to sell in India) were not familiar with the capabilities of the instruments, the critical specifications, testing etc. They were just agents reaching out to the potential customers and finally

procure orders. Their agency commission depends on how many they sell — some per centage of the total sale. In theory they should be able to cover maintenance during the warranty period. But they mostly act as a post office. In ISRO, at the Engineer/Scientist levels we used to get brochures & directly from the OEM Original Equipment Makers — get additional informations through correspondence and then only get into purchase formalities. Then when the final orders are placed the agents also get in due to the administrative convenience of OEM companies.

Now coming to my neighbour, he was a conscientious man. Knowing his own ignorance on technical matters, he had employed a qualified Engineer also. It was an additional cost load on him. He was shaken up to the

rude realities of India. He described to me his work — instrument ranges, Companies represented etc. Then said:

"Sir, I thought this was a noble business as I can help the scientists, professors of esteemed institutions of our national laboratories, by ~~de~~ faster information and services. In one of the first orders I ~~got~~ was winning from IISc, I got a call that ~~the~~ I should go and see a Professor and the purchase committee had authorsor him to get a few technical clarifications and then place orders. I am totally ignorant of technical matters. Therefore I sent my engineer to go and see the Professor. He came back almost crying. He said that the Professor scolded him and angrily asked whether his boss — that is me — thinks himself so big that he would send only a junior engineer. He

had also told my engineer that he would cancel the order if I do not turn up immediately. I therefore rushed to IISc to the Professor's campus. He did not even offer me a ~~that~~ seat to sit. He fired me. ~~It~~ I told him "Professor Sir, I am simple man not knowing the technical details; that is why I sent the engineer. No disrespect to you Sir! My apologies!" Then he told me, "See, it is not technical matter. You have to give me this much amount of ~~money~~ money (~~some lakhs~~) (some couple of lakhs) by tomorrow evening. Then you will get the order!"

"I sweated. Did not know what to say. I had always treated scientists, Professors as men of God in my mind! Every thing shattered! What should I do was an overwhelming thought.

Professor told me to go!" Mister, go and collect money and come. No instalments Okay?" Thank God I got time to think. I came back and consulted my friends. They advised me to collect the money and pay the Professor urgently. They told me that ~~this~~ most of these "purchase world" was like that only. If I tried to be very moral, I cannot do business — is what they advised me .... So I did ... ~~Now bus~~ ~~my business has p~~ It was a good part of the agency commission, I will get. But still it was profitable. Now my business is going on well ....

Sir, I had this burden in my head & mind. Since you are a scientist and a neighbour, about which we are proud of, I thought of telling you this...."

Though I was not totally an ignoramus on these matter, I did not expect it from IISc. (This was in late 1970's). I did not ask the name of the Professor... Prof SD was Director IISc then! I had sufficient administrative knowledge about the difficulties of proving these through the laid out "constitutional" processes — enquiry, opportunity to the accused to defend, concrete proofs etc. Also my neighbour will get into trouble. He was having a good business. He had his family and a little daughter...

I just mumbled to him "What to do? Any way happy that your business is going well!..."

He would have probably guessed about a question in my mind and answered it without my asking him "Sir, I have not

come across such a case from ISRO Sir, to which also I supply equipment....!"

I told within myself "Thank God!" But also there was a lingering doubt in me, whether it would be so for long. May be we could reduce the probability and reduce the number of persons who would engage in such corrupt practices. But India was so even before 1970's. I vividly remember what my grand-uncle Rama Subba Sastrygal asked me when Periappa, Periamma, Uma & I moved to Trivandrum Thycaud house. I have explained about it in 1960-70 part.

"Ambi, what is your salary — Chambalam and what is your other money Kimbalam!"

This was the socialist India we were building.

During the late 1970's since I used to go to Delhi often for meetings of Planning Commission etc., I could hear many such stories of corruption — big, medium, small scale. It was ubiquitous. ISRO did not have any ~~mad~~ major such "activity" was a consolation. Some of us had to take extraordinary precautions to ensure that ~~it~~ such "evil ~~snakes~~ snakes" do not crawl ~~into the~~ near persons around us. Within ISRO too in the Centres there were some "vigilance" cases — most of them small.

As we would see in the later ~~chapter~~ part of the write up after BP stepped down as Director VSSC

there were some high profile cases of Corruption — many of them were cases of personal vendetta & politics within ISRO. They happened when SD was very much the Chairman ISRO. "Law took its own course" — a number of such innocent persons were ~~acqui~~ exonerated fully — but after years of agony and loss of reputation. Fortunately such cases were not many in number.

~~Though I~~ Asma had friends all around the street. I knew a few of them but not very having time to be talking to them. Rustom Damania & Dinaz were people with whom we had almost daily contacts. Still we did not have lunch routine or dinner routine etc. ~~We~~ Rusi Dinaz & Asma used to exchange cooked special food items. Opposite our house was a doctor Prabhamani. Nice person; she used to go to a nursing home outside. We were not having her as doctor. Behind our house was one Asst. Prof. of Physics IISc — and his wife was a good friend of Asma. They had only one child — daughter. ~~Their~~ Sister of

Prof. was widowed at a young age and ~~the~~ she was with her brother – the Prof. She had all the rigourous acharam of the Tamil Brahmins. She was not well disposed to the grand daughter getting into higher studies. She (Raji) had completed B.Sc; a bright student. She was to join M.Sc. The old lady dug her heels. "No further studies; now marriage!" The girl's mother was telling this to Goma. Her husband was so soft, that he won't oppose his sister. Amidst my tight schedules, I decided to go to their house one day. After some pleasantries I engaged the old lady. One had to deal them in their own terms. My life in Kottaram, that too in a Brahmin agraharam village, had given me many practical cases. The discussion had to be long, feeding on her ego, ~~their ea~~ her each points.

Her basic emphasis was that the girl ~~will~~ would lose her character. "கெட்டுப் போயிடுவா!" I took on that point initially not

Contesting.

"ஆமாம் நீ சொல்லறது — Yes, you are right"

"But ~~she~~ now she had completed B.Sc. Had she been stopped at 8th standard it would be another story... Now having completed B.Sc. her mind is open... Doing more is not going to change too much..."

Then after her talk... my another logic: If ~~she~~ Raji does M.Sc. Ph.D etc as she is very good in studies, she will be much more confident.. She will be mentally strong also because she can earn; she will be respected...

After all what is character: what you all have given her right from childhood. That is the base; foundation; If that is strong then why should we worry?...."

~~Then a~~ She starts conceding to my viewpoint. Then I gave a last salvo — all in Tamil, as

spoken by Brahmins:

"~~[illegible]~~ "நானும் கிராமத்திலே,
அக்ரகாரத்திலே வளர்ந்திருக்கேன்..
எத்தனையோ பார்த்திருக்கிறேன்...
ஒண்ணுமே படிக்காதவாள் எல்லாம்
தூ கெட்டுப் போகாம இருக்கிறாங்களா?"

"I have grown in ~~Brah~~ a village agraharam... seen many things... those who have not studied any at all, ~~do~~ are they all without "losing character?"..."

That finally clinched the argument. In the old lady's mind, the entire past which she was witness to would have gone by.. I did not press for answer, not elaborate...

She said "சரி, சரி... அவ படிக்கட்டும்... Yes Yes let her study!"

I was relieved and happy. It so happened that she did Ph.D in ~~xxx~~ Molecular Biology, got married & went to USA. In fact she had a post-doc fellowship and she supported her husband's higher study for MBA in USA. I had not met them later.

But this type of pro-active intervention for study of girls was ingrained in me, thanks to Brahmanya Bharati. Many of the girls or their parents may not even remember. Even in ISRO, I used to encourage the young women who had joined as typists etc, to ~~to~~ earn higher degrees, pass competitive exams etc; many of them are doing very well.

Now (@2017) things has changed very well; ~~xxx~~ most girls are taking up higher studies and in fact do much better academically in terms of

medals, ranks etc. Still there is a new problem. Many of them drop out of active professional life. Wherever I go to give talk to Students in schools, colleges, universities etc, I emphasise this point:

"Even if parents here many not like what I say, I appeal to young woman to get into professional life. Marriage, child bearing, child rearing etc may take some toll. But adjust; don't give up. Much of what is forcing 9-5 work or all days presence are due to many archaic stupid mindsets which are entrenched in India. That will change within a decade. If you are without work experience then, you can't participate in professional work ... Flexi-times, work from home etc are to be pushed ... If young women now have to plan to work ~~for~~ upto their age 70 or more due to increasing

longevity... Young men, ~~please~~ you also have to do so. So you also have to find new dynamic equilibrium in family life, child care etc.. ~~Have~~ Women form 50% of the economy; having them in the workforce will make the country strong!"

Bharati's Vision of New Indian Woman has ~~not~~ come into being ~~at~~ after about a century when he sang his poems. When I go to Tamil Nadu for talks, I specifically mention about it. Even in other parts of India, I point out the unique position of Subrahmanya Bharati who had given a vision for New Indian Woman way back in the early decade of 1900 - (at the dawn of the 20th Century, when most of the great Indian leaders, poets, thinkers, writers etc were absorbed with other issues including independence. Bharati dealt with all of them

but saw that all of them would only be partial if woman do not participate fully in all walks of life. Swami Vivekanand was the only other person who emphasizes it and his associate, ~~the~~ et Nivedita was ~~Bharathi's~~ greatly respected by Bharathi. Swami V also was my great Guru, inspirer ....

Coming now to other aspects of our personal life during ~~1971 to~~ middle to late 1970's, we had to deal with many constraints / problems of severe shortages of daily needs. LPG gas, Kerosene ~~to~~ etc. Telephone was a scarce commodity. ISRO was struggling to get office phones. Thanks to one Arifullah (now late) who had some of his relatives in Karnataka govt and due to his contacts & (He was Admn Asst), he could manage some office phones and very limited

home phones. As per office rules due to my ~~seni~~ seniority and the position of A.S.S. I should get the priority. Arfullah manages one from the Palace Orchards (Sadhashiv Nagar) exchange. JPS, as usual, wanted to complete. Since he did not have an administrative case to fight on, he came to me ~~that theatre~~ saying that there was ~~no~~ one home phone allocation to Sadhashiv Nagar area. "Let us toss and fix who will get it!"

No point in fighting. I agreed. I won the toss! That is ~~how~~ how a home telephone came! That was of some relief to me as I could contact Goma if necessary or she could contact me. Actually due to high costs and poor performance of most phones, we did not have the habit of calling home, ~~but~~ when we went out of station. The simple rule was :- No call often meant good news!

There was no TV. Was a constraint for Vijay & Goma. Both of them

learnt to forget after returning from USA. It was only in the USA Bangalore got one B&W channel! I recall we rushed to pick up a TV! To get a Japanese tube was considered than getting a Korean one.

Vijay preferred playing with his friends — very active out door work. Some days I used to walk with him around the vicinity of our house, one of it being Raman Research Institute. Since he was curious about it, I had explained about it especially C.V. Raman.

I was not consuming alcohol at home. Only during office parties, which were rare and when it had invariably visitors. And when I went out. I used to get Johnnie Walker Black label (Half Bottle) — cost was a problem. When Uma's father (my F/L) came he used to enjoy it.

Some persons had told that Bangalore can be very bad for asthmatics due to its flowers and pollens. Fortunately I did not have

much problem. The most severe period of asthma was in B'lore from 1958 to 1964. When I went to Ahd, the frequency had started going down. I was not Sprays had not been common in those days — came to India much later. In Trivandrum there was also very practically none. In USA, there was no asthma problem at all, despite snow etc. So when we came to B'lore, the asthma had weakened very much. Only when I went into major dusting operations, I had the problem — had to control before attack with antibiotics & anti-allergics.

In the overall ISRO med facilities at B'lore was very poor in the 1970's because of which Gowa had to suffer through her pregnancies. I had to go by the big names which were told to us. The second miscarriage really unnerved her & me. Then we got an advice to go and meet Dr. Desai who had a nursing home at Sivanna

circle. ~~He was~~ It was told that he was exceptionally good for pregnancy delivery related matters. One generally accepts rumour (I did not try to find out) was that he was a Govt. doctor and got into trouble relating to ~~some~~ some corruption and left. Who cares? He turned out to be most successful doctor. His charges were reasonable.

We went there after the traumatic second miscarriage, which I consider as the medical negligence (or incompetence) of the "big" lady doctor. We shd not have gone to her second time. But I was trying to reason out that not all items can be captured well in the imperfect science of medical field. But it appeared to be mixed with her incompetence.

Any way after all the tests on Gouna, Desai told "Komati! No problem with you; you can get a second child very successfully. Don't worry. You can travel to go to your father's place as desired. Come back. When you miss

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the period and see some anomaly immediately come to me!"
That was a great relief to us. Goma went to Dhrangadhra; ~~B' lore to A'~~
~~B' lore to B' bay flight; then by train.~~
~~She came back~~ She went with Vijay.

She also felt lot better from the trauma. ~~This event was after Peenya's dea~~ When she returned, she looked lot healthier. Normal life started. My office routine continued. Her routine, Vijay's school, play etc continued.

One day when I was in Peenya satellite project area, I got a call. It was from Dr. Desai "~~You~~

"Mr. Rajan, Gomati has come to me. ~~There~~ All is well with her. I had given her stitch and given her rest. You don't have to come now. ~~She~~ You come when you finish your work. I may keep her for a day or two!" I was worried, though he assured me.

Dr. Desai was a tough man. He won't care for any body except for the patient's health. Even then he demanded discipline from the patients. He would also insist that they come with the papers where the case history was written. I had seen him firing some of his rich clients. "Do you think I can remember every patient's case by seeing ~~their faces~~ the face. I told you to bring the case paper. I don't have copy here. Go home and get it back!"

For Goma, who was always meticulous in bringing her papers, he was very kind. ~~When~~ Before even she shows the paper "Gomati! Tell me how you feel etc" He remembered her case and therefore took care to phone her "busy husband". He was not waiting for the formality of taking ~~appr~~ my assent to keep her in ~~the h~~ his nursing home ~~for~~

for observation. We were so lucky.
I went and saw Gama & him.
He said "There was a small bleeding.
Nothing to worry. We have given medicines.
I will take out the stitch, once things are
satisfactory. May be tomorrow or
day after. One more precaution; let
her take bed rest and not go by
auto even to come to nursing home"

She was released the next
day. I don't recall how she brought
back home; by car or ~~at~~ auto.
Taxis were rare those days.

Dr. Desai had prescribed an
injection of progestron — once a week, I think —
and ~~to~~ bed rest — coming to him ~~to~~
once a month, ~~whether~~ ~~Prabh~~ He
also told that any local doctor ~~could~~
give the injection and no need to come
to his nursing home.

Dr Prabhavanni in front of
our house, was the person who gave
injection. She used to tell Gama, that

progestron babies would be very beautiful.
For taking Goma to nursing home in a car ~~is~~, Lakshmi & Krishnan would have helped. But Goma was already in touch with her Dharangadhra connection Pushpa ben & her husband Vasant Gokhel. VG was a techno-business man. He was an excellent Textile engineer. He was one of the early pioneers with Birla Group in Rayon industry. He was responsible for setting up a Birla rayon factory in Indonesia in (1960's or 1970's). After retiring from Birla's (or taking early retirement) he had set up a Consultancy in Bangalore. An excellent house near Chalukya Hotel. With all his knowledge & riches he was a simple person.

The couple were keen that Goma would be taken by their car to Sivan Desai Nursing home.

Every month a nice big black Mercedes Benz would come to our home. Too big for the locality! It was a great spectacle for every body. That

would transport Goma & bring her back so that there are no jerks in the ~~pot~~ Bangalore roads — no difference now @ 2017 though it had become big and has some ~~excellent~~ good patches of road in between!

Goma's progress was well. It was mainly through her discipline. To help Goma, her father had ordered her mother to come immediately to help Goma. I recall picking her up at B'bay in the same flight we came to B'lore. It had a tyre puncture on landing; many ~~fig~~ fire fighting vehicles around. My mother-in-law (Mami) did not know — so far so good. We reached home safely. Goma was in total bed rest. Mami made food etc, managed the maids etc. and also Vijay. Vijay used use to love ~~coming~~ rushing towards his Mom while coming from outside after his play or

or school. His height was very close to Goma's abdomenal region. We needed to prevent it. It was a little tough to train him; he would have felt deprived of his pleasure.

Many of Mami's relatives were in the South. She was one of the 13 children — 10 girls & 3 boys! They were all spread over Coimbatore, Madurai, ~~etc~~. Tirunelveli etc. They naturally called her to come. She also liked travel (she did ~~[illegible]~~ even when she was ~~[illegible]~~ in ~~the~~ ~~[illegible]~~ her eighties!). She was getting bored. She would have pressurized Goma. ~~One day she asked me~~ I had ~~[illegible]~~ inputs from Goma.

One day she asked me: "Raja, I will go to Coimbatore and come back in a week or two!"

What can I tell her. If Mama knew it he would bang her. I ~~[illegible]~~ should not do so.

I told her "Manni, you have full freedom to go wherever you want. I will arrange for tickets. But you know about Goma's situation. Please find out some body whom you trust can take care of her. If you say this person will do the job, I will trust it. I won't even ask you, who it is. But you should have the confidence that that person will take of Goma as you would do!"

Then Manni said "Raja, if you tell like this what can I do?!..."

"Yes Manni, we need to help Goma for a few more months... You are the best person... Even I cannot do what you can do... above all, if you are there, then I can go peacefully to office, travel outside Bangalore..!"

Manni well understood what was needed. But it was just a desire to move out and see her siblings, their family... She had a travel itch" too (which exists when she crossed her eighties). So Manni had to be the anchor for Goma who had to lie down in the cot for most of the time. ~~The~~ ~~The~~ ~~bet~~ A good deal was made in the

living room itself... For a short time, she would outside in the balcony and watch outside.. Her friends came and saw her, in our house.

We will describe the later part of the ~~for~~ pregnancy and birth of Vikram later.

That ~~next~~ pregnancy ~~followed~~ ~~to~~ preceded by two mishaps, have made us extra-cautious. That disrupted the ~~daily~~ routine which we had built up successfully over the two years after returning from USA. Now the weekends outings had gone.

The worst hit was our going to cinemas. ~~I used to~~ Right from my childhood I had not seen cinemas though I had seen the blare of advertisements for cinemas at Palayamkottai & later in ~~B'bay~~ Bombay. Only after going to Ahmedabad when I was in PRL hostel for ~~a~~ a few months, I used to join others when we went for Sunday movies.

That also stopped after I moved to Paldi ~~with~~ with Periappa & Perianna. My ~~g~~ seeing cinema regularly was after marriage when we moved to Trivandrum. Gama & I went to cinema often. In my one year TVM stint, there was no tour outside. We used to walk to the theatre, the only one which showed some Hindi, Tamil movies.

Later in USA, no movies in theatres. But TV was great. It had serials and movies. Gama was very familiar with English movies. I found them difficult (even now I find it hard to understand them @ 2017!) After coming to Bangalore, though the TV was cut off, ~~we ha~~ Gama really enjoyed seeing movies: English, Hindi & Tamil. She often chose the one & we ~~wo~~ would all go. & I started liking those ~~mo~~ movies which were not the usual soap opera. In the earlier times I like Guide: Dev Anand & Wahida Rehman, only movies, I saw twice! Then other items were when Smita Patil acted, Shabna Azmi, Amol Palekar etc. G. Balchander's movies were an

attraction.

For the whole of 1977 this was disrupted. No TV as well. Fortunately Gomu also liked (even now likes) light music songs, especially Hindi. So she would hear them in radio. (No FM radio also then. Only AM!)

Fortunately, for Vijay, such disruptions were not a major issue since he had his friends to play. He would go out & come. During this period also Gomu was taking care of his routines (school etc)

My office work load went on increasing.

My interest in the Indian politics — Centre or State ~~or local~~ — diminished substantially. Though I read news papers, I did not take interest in thinking as to who was right or wrong. Though had seen the news of Emergency, and rumours of excesses that took place (since there was a severe censoring of the Press), somehow my mind did not engage in them. Whenever I went to Delhi I

I had heard stories of the excesses by Sanjay Gandhi.

My interest in doing something concrete to help the people of India remains. I knew also that the political paths were not open for me (right from 1967-68!) and also that I could do very little to change or modify the political process. Sometimes I had felt sad about what was happening to the country — the slow growth, etc. But I had convinced myself (may be a heavy dose of self-hypnotism) that we from ISRO ~~could~~ would contribute through INSAT, Remote Sensing etc was going to be substantial for India — including in a later period for the defence services. It was not in a quantified form. In those days discourse in terms of GNP (or GDP) and the relative contributions of various sectors was not in popular domain. Though I read Economic & Political Weekly (a habit from 1964 —) I did not find any such holistic discussions in the articles. Each of them

took a narrow topic and gave some scholarly treatment. & I found them invariably not addressing specific end actions. They were more in terms of what GOI should do in policy, ~~etc~~ budget allocations etc or about some narrow ~~auth~~ view articles on a political issue.

Thus I could not place ~~ISRO~~ the benefits of ISRO's work in GDP terms. But I held the feeling / opinion that what we did, was going to be of ~~just~~ immense use. I had seen some American papers (in American context) about the role of telecommunications in increasing the economic activity of many local societies; they were papers specifically in the context of satellite communications. So our INSAT would be useful. Remote sensing would help to plan Natural Resources effectively (to benefit people) etc etc.

Probably subconsciously I would have realised that I should confine myself to what I can and to the activities ~~to which am~~ towards which my life had moved on. And it was a frontline pioneering field, no doubt. It had many technical and organisational challenges. Therefore I had assumed that my contributions to ISRO – to an Indian Space Programme – would be equivalent to my contributions to India and Indian people! (It had turned ~~about~~ out that over a period ISRO's contribution has helped the country and I can confidently say that I had contributed to it all through – especially since 1974 – from ISRO HQ).

But it did take a toll on my career. All through 1974, 1975, 1976, I had always worked for "Others". No doubt I learnes. I visited many foreign countries – an exposure which was not easy for

for most persons in ISRO in my age group ~~them~~ then (even for the seniors); they might have been jealous of me. In addition, I had access to most of the top management ~~activities~~ activities of ISRO / Dept of Space, a role which even many senior persons in ISRO did not have. They might have even thought I had some role in shaping activities that affect them or impact them. Some of the younger ~~persons~~ persons of my age group who were toiling with their hard ~~work~~ ware, tests, procurement etc including the "oppression" by their bosses, might have thought I was enjoying life writing only papers and giving comments and going along with Chairman ISRO and spending time in the company of powerful Directors of the Centres.

But I knew ~~how~~ how fragile ~~was~~ was the structure being

tries by Prof SD. It was perhaps a good system as used in USA — in the big multinational Corporations of USA and to a limited extent in US Govt systems like NASA.

But I could clearly see the Indian cultural context. It had a deep hurt (and shock) when ISSP Project (URRao) distributed the Achievement Awards for Aryabhata, for its success and to those who contributed. My name was not with the Scientific Teams, it was with the Support Groups (like ISSP's Purchase Admin etc).

So was it when SITE Project (Dr. YP) gave after SITE success.

Both URR & YP know of my immense technical, often pioneering contributions to Aryabhata & SITE even when I sat in USA.

But they don't care once the job was over. They had to consider their own power structure. I can't see very clearly the tribal leadership, ~~the~~ who were ~~in the~~ within the "kingdom". Y. S. Rajan was not in them. ~~He seems~~ He was, for them, in the Emperor's staff — a person to be handled for their benefit and rest was not their care. They might think "let the Emperor decide!"

Almost immediately coinciding with the pregnancy settling successfully for Homa and the ~~routine~~ new routine getting established, I had written a ~~note~~ New Year note Pr/SD (4/1/77). It is a handwritten note, marked PERSONAL

Subject of the note is straightforward "My career trajectory — your advice for".

Starts "For the past few months, I have been having worries about my future esp., in view of the peculiar social culture of Indian (and ISRO) scientific organisations ....."

I then explain as to how I cannot discuss the matter with Centre Directors or other Senior persons. I felt I might compromise my ISRO HQ role by talking my personal-career problems and considered it as unethical.

Third para says

"Indian (and ISRO) scientific culture respects only hierarchial

structure; ~~obj~~ obeys only
the para structure based on
these; excellence, peer group
evaluation etc are nice words
for the cocktail party of the scientists.
Hence any person with
ambition should strive for
a visible executive managerial
positions to do something....

Then I have explained
my position. How my activities
keep shifting to keep on
adjusting for other colleagues
within ISRO HQ. Then I
have said "... I seem to
be coming to a conclusion ~~that~~ that
I have to leave ISRO in about
a couple of years. How? When?..."

The full handwritten
note is attached — to be typed
as page 960, 961, 962, & 963.

(960) PERSONAL

To: Prof. S. Dhawan
From: Y. S. Rajan. 4/1/77

Sub: My career trajectory — your advice for

1) For the past few months, I have been having worries about my future esp., in view of the peculiar social culture of Indian (and ISRO) scientific organisation. Your mental energy is being severely taxed now; I did not therefore wish to bother you. But I find my load difficult — psychologically.

2) With my concept of ethics, I cannot discuss with the senior persons (Directors etc) of ISRO because my problem is closely linked with HQ management and so on. I have to put a brave face, a serene face to do the staff job effectively. But the writing on the wall about myself is clear and glaring; I can't ignore it. Nor can I tell it to anybody but yourselves. Hence this brief note.

3) Indian (and ISRO) scientific culture respects only hierachial structure;

P.T.O

Obeys only the power structure based on these; excellence, peer group evaluation etc are nice words for the cocktail party of the scientists. Hence any person with ambition should strive for a visible executive management position to do something; otherwise he has to be content with second-or third-fiddling. ---- Hence the scramble for Directorships, project managership, Headship & so on. So, without a place in the scientific executive role one cannot hope to achieve much [normally]. ISRO is not an exception to this.

4) If I analyse my situation, I have been out of the power structures of SAC, VSSC, ISAC and so on. I underplayed my expertise in Communication Systems to do a staff job on Satellites; then had to handle Remote Sensing for a while; due to exigencies of the situation, many a times, played a substitute batsman / fielder.

[P.T.O

(3) (962)

Whatever Chairman imagines of the Asst. Sc. Secy job, there is no clarity; I handle the housekeeping because they can't be left floating. Sometimes, it is told that I have to take care of Satellite Technology from HQ. How ?! APPLE, INSAT, etc have their own way! I do not wish to be a bull in a china-shop either.!

Many ideas thoughtfully generated by me in the form of notes on Advanced Planning, or issues like Orbit Mechanics etc go to dusty cupboards. Only person reading them is Chairman, ISRO. This is a biggest cultural factor one cannot ignore. Many of these ideas cannot be pursued in detail further because I do not "command" (sic) a set of people as Centre Division Heads/Proj Directors/Directors do.

5) So the picture is clear. ISRO at best can tolerate some gadflies. It is only executive power that counts. Excellence, ideas, etc shall only come from the power structure and not from the outside observer (like me).

6) ISRO still "works". It is more important. I can never forget its welfare. At the same time, I don't personally have the courage for a professional harakiri. (assuming there is a profession, in the real sense!)

7) With my limited inputs, I seem to be coming to the conclusion that I may have to leave ISRO in about a couple of years. How? & When?

(i) Firstly, I need your advice abou my analysis and conclusions.

(ii) Secondly, if my conclusions are correct, where, in India, should I be "farmed out"? Need less to say I need your help.

8) Let me reassure you that I am not bitter, nor will I ever be, but I am sad.

Rajan

1.1.77

960
961
962
963
4/1/77 note: Planning for INSAT ~~was~~ had picked up some momentum as various inter-departmental committees with a lead role by Plan Commission (with strong support of ISRO/DOS) had been completed.

There is a note by me dated ~~18/1/77~~ 18/1/77 clearly delineating the elements:

"The following elements are involved in the ~~Dep~~ INSAT System procurement for the country.

~~= Procurement~~
- Procurement of Satellite
- " Launch Services
- Gmd TV System design
- Telecom network planning
- Meteorological data gmd syst
- Overall Management

Interesting the note mentions about the existence of Director, Special Launch Services (ie Dr. Y. S. Rao without

mentioning his name) and ~~it~~ that ~~it~~ that office may handle launch services. It also ~~at~~ addresses the emerging fact that other Ministries may not agree to give the total control to DOS.

Note brings out clear differences of ISRO and DOS.

There ~~was~~ is also another organogram of possible ~~rem~~ organisation for ~~a~~ Remote Sensing — it mentions NRSA also — ~~definitely it is not of 1999 but later period.~~

~~May be It~~

NRSA was not with DOS then. Wg Cdr K.R. Rao had gone ~~in 19~~ as Director. ~~As a~~

May be Prof SD wanted an overview. The charts also mentions about Microwave Remote Sensing as a separate Box.

(966)

~~But as~~ A subsequent note on the role of Dr Rasi Sharma — a draft office order, states, NRSA had come into operation That note is dated 18/1/77. Maybe the Organo-chart was ~~into~~ in that context — it states that Chairman ISRO is a member of NRSA Governing Council (Dr was under DST then a!)

I am attaching as a running text my note to Prof SD — Chairman's use only — a handwritten one dated 18/1/77 Sub: An order (draft) on Dr. Rasi Sharma's task.

~~He had~~ SD had ~~written~~ returned to me on 2/4/77 That note is important in the context of ~~the exp~~ giving a picture of the fluid situation of the ISRO HQ — of use of various persons. (967, 968, 969, 970, 971)

(972)

967
968
969
970
9710

Handwritten 18/1/77 note in file Then continue with 972.

Apparently there ~~is~~ was an order dated 25/1/77 ~~giv~~ giving the role of RDS in Remote Sensing Meteorology etc. It might have been done after SD had seen my ~~do~~ note. I did not check with any of the HQ persons ~~wit~~ whose names I had indicated in that note. I thought it was unethical on my part. On a more practical side, ~~&~~ if I keep asking like that one day it would reach the ears of ~~&~~ SD; I thought my effectivity would go down. I did not want to be looked at as a "power-lobbyist" or "power player" Thank God! I was able to maintain myself so all through

① CHAIRMAN'S USE ONLY

18.1.77

(967)

To: Prof. S. Dhawan

From: Y. S. Rajan

Sub: An Order (draft) on Dr. Ravi Sharma's tasks

1.0 Of the four tasks (drafts) given to me by Chairman, this one is very complicated. I believe, that an Office order should not be too restrictive. At the same time, if Chairman declares Ravi as overall-in-charge of Remote Sensing & Meteorology in HQ, his interpretation seems to be to cut the coordination with others in HQ; this per se would not pose a problem, if his interfaces with some key persons at SAC were good. This unfortunately is not the case. Hence I present the elements of Remote Sensing Activity at HQ and the persons concerned.

2.0 The Elements of HQ role are:-

① Governmental interface such as Secretaries Committee's etc. YSR

② NRSA interface mainly as a Staff support to Chairman who is a member of NRSA Governing Council. YSR

(968)

(3) Certain correspondence relating to User interface when Chairman initiates a program (e.g. with ONGC / Mr. Prasad) or some stray enquiries come addressed to ISRO or Chairman, ISRO or Scientific Secretary.

YSR

(4) Monitoring of aerial campaigns conducted by SAC (by themselves or with others)

(Chandra) SCS RDS?

(5) Visual interpretation aspects which includes photographic facilities.

(Chandra) SCS RDS?

(6) Computer processing aspects including the data products.

KSP

(7) Meteorology which involves Rocket meteorology, Satellite Receiving Station and data processing aspect.

MSN, RDS PNJ, YSR

(8) Operational User Coordination from SAC — a general overseeing of it from HQ

(Chandra) SCS RDS?

(9) Oceanography — a new element.

VS

(10) SEO Utilisation.

SCS, YSR RDS?

(11) Inputs for future planning such as Microwave Sensors, ERS (satellite) Study etc

SCS, YSR RDS

(12) Remote Sensing Hand

R, PNJ, JPS

(969)

I have shown in red ink persons who do some activity at HQ relating to various elements at ISRO HQ.

The problems in assigning a defined responsibility to Ravi are related to the coordination aspects of these elements within HQ.

My analysis is as under:-

(1) KSP's knowledge of data processing should be drawn more and more with Remote Sensing; he is already doing it by various discussions with Mr. Kamat. If & when Ravi takes charge of Remote Sensing, it should be clear to Ravi that he should utilise KSP to the full extent. Whether he will do, is doubtful to me.

(2) In cost analysis & user interface Chandrasekhar at HQ is developing very well. Ravi should learn to interface with him, effectively.

(3) In oceanography as I spoke with you earlier, Siddartha is developing a keen interest and in fact soon be bringing out a document, about the utilisation of ISRO

technologies for Oceanography research. This aspect may be kept in view also.

(4) As regards hardware for Remote Sensing, for Satellite Earth Stations Jai & myself have the necessary expertise.

For microwave remote sensing hardware, multispectral sensor hardware etc, the knowledge available is better with me and PN Jayaraman.

(5) On photography & visual interpretation Ravi is the best amongst HQ.

In view of the above, I feel Chairman may discuss with Ravi, myself, VS and KSP separately and then decide about the future course of action. It will be better if Chairman discusses with Chandrasekhar also to have his broadly. Also importantly, the interface with SAC esp., Kamat, George Joseph & Balder Sahai is to be considered. Ravi should learn to respect them as contributors to the ISRO programmes.

With the above, I end this note. May be Chairman need not issue anything now.

(971) (5)

~~When~~ Chairman perhaps can wait till the HQ is organised. But again in the organisation of HQ also, how to place Ravi will be a basic problem. I have raised it ~~in~~ in my draft to you, given separately (regarding HQ organisation).

More when we discuss.

Rajan

18/1/77.

Go to (972) handout

Then (973)

Career in ISRO, DST, TIFAC, CII, Punjab, ek! ~~It may~~ Such an attitude and discipline might have caused me a number of immediate gains in career, ek, ~~but~~ but it could help me hold my moral ground, with a great peace of mind.

The note RDS sent to SD was about the "Record of decisions taken by Chairman regarding ISRO Monex Project at VSSC, Trivandrum on 15-3-77 at the meeting held at Director's office. The note is dated 17 Mar 77; it is a cyclostyled note. It was characteristic of me not to delay any action. 15/3 meeting at Trivandrum. The Record is issued on 17/3! The note is signed by me. RDS ~~took~~ was also marked a copy.

The RDS ~~xxx~~ slip note says.
"I have not seen any internal ISRO Management Structure for MONEX, nor the mechanisms for interface with IMD. If Chairman has decided ~~xxx~~ ~~something~~ anything I would like to know! Chairman's memo says that I deal with Met? Regards Rai Sharma"
22/3/77."

Then I have in my papers a two page handwritten note by SD. It delineates the role of RDS, Proj Bhavan, PNTek. Whether he issued it or not I do not remember.

~~Such~~ But this note is illustrative of the types of conflicts which existed in ISRO HQ and which continues to exist. SD did not

do anything to resolve them. Probably in the scheme of things, they were not resolvable. He tumbled through such confusing chaotic situation. Perhaps at his level, it did not matter. Hierarchially he was at the top. Age-wise he was about ~~25~~ 20 years elder to all of us at ISRO HQ. He can get rid of any of us, anytime, if ~~he felt~~ any one of us tries to breach his "lakshma-rekha"; but what was it, was not known.

* * *

Leaving apart such note it would be interesting to note how MONEX (Monsoon Experiment) experiment got organised in India. Meteorology being a global phenomena there was a tradition among Meteorologist,

and Met agencies to exchange data. No great scientific analysis can be done by taking even very good data within a country, even for a country as big as India (it is only about 2% of the total land mass of the world!) ~~India~~ India Meteorological Dept (IMD) was doing it at a low key, just following the precedents which had been set up. At that time IMD was under Min. of Civil Aviation & Tourism (The assumption was that IMD data was useful for Aviation & that Dept was the nodal dept!!) For the Min., ~~the~~ IMD was nothing! The IMD chief called Director General of Observatories (DGO) was just that of Joint Secretary in scale — not in rank! I had seen them shivering before the Ministry officials even at the Under Secy

levels. Therefore when the request to IMD came for participation in the international MONEX program, they were unable to move to get approval, budget etc.

In addition those were the periods of high levels of Indian paranoia ~~ga~~ against the Western powers, especially USA. Therefore one can easily make an "hypothesis" that the foreign powers ~~a~~ were trying to get ~~Intrad~~ Scientific information on many natural parameters like atmosphere, earth, biology etc and use them against India. It was unfortunate that many scientific bigwigs played this paranoia game. The science academies ~~which were~~ like INSA which were a part of International Council of Scientific Unions

~~IS~~ (ICSU) ~~that~~, and who have to uphold the universality of science players second fiddle, and more often as silent spectators, of things done by the powerful science leaders who held govt positions.

(Indian Science or Engineering Academies still continue the same even in ~~2012~~ @ 2017!)

The importance of internationally coordinated experiment was about taking ~~accepts data~~ selected data in a SYNCHRONOUS manner all across the globe. Timing and calibration of the instruments were crucial.

The need for India participating in the international MONEX experiment was brought to the notice of SD by Prof. Bhavsar & Prof. R. Narasimha who

started taking interest in atmospheric sciences. IMD was too scared to move anything with the Ministry. A strategy was worked out to bring a via media: not to ruffle the feathers of paranoid elements for international participation; at the same time not to miss an Indian opportunity to collect data synchronously.

So an INDIAN MONEX was evolved with minimum amount we can do; Rocket flights from Thumba & Balasore Int'lly around the same longitude was done by CNES in Seychelles Islands ... Then a few other experiments.

SD took the initiative of talking to the Civil Aviation Secretary who ~~the~~ was then N. Mukherjee. (Nobody would have even thought that he would become Cab. Secretary under Janata Govt regime later !!). It was decided

that the matter would be brought to the Planning Commission to get their approval. To cut short all the painful clerical processes, SD had sought the time of P.N. Haksar (PNH) by Chairman P.C. (He was familiar with ISRO through his ~~~~ association with Space Commission)

I helped SD in various preparations for it. We had created a world map — done in those days with drafting paper & taking an ammonia print. How various ships ~~with~~ would be located etc; where the major observatories will be etc.

I still distinctly recall an event that took place. SD had gone to PNH's room a little bit earlier. The presentation meeting was to be in that room. SD wanted to make audio-visual presentation — not

possible. We can stick our Ammonia Print Map. In addition SD wanted a black board so that he could explain important points. That was also not available!

SD said to PNH: "Haksar saab What is this? No black boards in Planning Commission?"

PNH laughed loudly: "Satish! What do you think? Planning in this country is not done based on facts and figures. It is done by feelings and emotions! Why then do we need a black board!"

Any way, the map we had was a panacea for SD. Presentation went well. Mukherjee assures full support. He suggested that though this Ministry is was supposed to be the nodal one,

he wanted ISRO/DOS to take the lead and coordinate with all.

That is how MONEX ~~was~~ Project was born into ISRO. Many atmospheric scientists were happy. The same pattern was used later for the Indian Middle Atmospheric Programme (IMAP). I played a major role for both MONEX & IMAP, especially the later which had much more complex interfaces with Indian University scientists and had more ~~of~~ coordinated experiments.

The Indian Sounding Rocket programme with which Indian Space Programme was borne, had became dormant later: ISRO was busy with SLV-3 and satellites. Routine flights especially the ones based on the Soviet M-100 rockets were the main staple diet for RSR Project (Rohini Sounding Rocket progone)

(983)

It may be worth mentioning here that India's ~~La~~ Landsat receiving station (ie the Station which was to receive free Satellite data from USA's Earth Resources Technology Satellite ERTS — later rewarded Landsat) was initiated by Dr. A. Ramachandran (AR) the brilliant first Secretary of the newly formed Dept of Science & Technology. He was instrumental in forming NRSA and ~~g~~ ~~ta~~ for taking up this project. The paranoid groups opposed it (MGK who was then Secretary Defence Research) was the major one; SD went along with him! Thank God, they did not prevail. AR had his method of ~~get~~ dealing with Delhi. He got the approval for receiving USA data in an Indian Earth Station. That became

later the mainstay of the Indian Remote Sensing programme. The ~~data~~ Landsat data derived from NRSA's earth stations helped many Indian scientists familiarise with the use of remote sensing. ISRO/SAC used them too!

RDS (Rao Sharma) unfortunately did not look at ~~these~~ all the elements of MONEX etc holistically — as a programme. He used to get stuck with a few scientific elements & get involved. In fact, sitting at HQ, he started conducting ~~~~ aerial surveys, doing scientific papers out of them (Hasselblad Cameras). It was in competition with SAC which was also competing with budgets. There were instances where the ideas of SAC proposals were stolen by RDS & converted into his experiments.

(98-)

Once during the ISRO level budget meetings, Prof. ~~R~~ P. R. Pisharoty who is the father of ~~Indian Remo~~ Earth Observation Program ~~IRS~~ (remote Sensing & meteorology) told openly about a proposal:

PRP: "Chairman Sir, this proposal is like a situation when a young scientist sends his research paper to a journal and finds that after a few months the paper appears in the name of the Asst Editor of the journal!"

Still, SD was allowing RDS in his methods; whether SD advised him privately and RDS did not listen, I do not know. But all these items, his competing for space with me in HQ activities (I had to concede most of my Communication Space to JPS)

was a major irritant. But the bigger issue was how my contributions at ISRO HQ would translate into betterment of my future career was a question mark.

One person who was blunt ~~about~~ about SD's ~~social~~ social experiment was Gita Siddartha, who had married to Siddarth a couple of years earlier. She was a successful entrepreneur in Advertising & PR. & Wonderful lady! Good family friend. She used to tell me & VS:

"Rajan & Ravi (VS ~~was~~ was called so by his close family friends) You may be all in praise for your Dy Dhawan. His sociological experiment is bound to fail. You youngsters are jumping around now! What is your ~~future~~ future after Dhawan

All of you young fellows will be dumped over time!"

To a large extent, she was right. Today's HQ is almost a hierarchy within itself and also in overall ISRO context. My fears about the engineer staff role of ISRO HQ were by-and-large right!

But I continued my work, keeping away my worries about my future, except for writing periodic notes to SD!

I was also getting worried that SD was getting bogged down with fire-fighting. A number of these fires were because of the slowness in decision making. Even though it was not so much of "analysis by analysis" syndrome yet, SD's style made many items to hang in "fire"

988 989 990 991

My sincere expressions & perhaps commitment may be seen in a note 30-3-77 sent to him. See carbon pages for typing → Then go to 991(a) & (b) before going to 992

(992)

988
989
990
991

30.3.77 handwritten note.

Then go to 991(a) 991(b)

There is another sitting note dated 15/5/77 handwritten, which is more philosophical. It was probably a period where the "intellectual discussions" started veering around "small is beautiful" syndromes; also appropriate technologies. The so-called "left" was behind such appropriate technologies claiming them to be for the people and springing from the society. The same "leftist, socialist" thinkers would not say anything Soviet Space Programme or missiles. Also not strangely some of the traditionalist thinkers also went for these. VS swung towards "appropriate syndrome".

That apart I was worried about the future of the space programme in India. Also India was churning. Emergency excesses were leading to simmering anger, which could explode. There was a danger of a number of babies being thrown along with dirty bath water.

It was also an occasion when I could write on India – its "political economy". (On which SD & I talk without getting into details of personalities in politics. That I had written a note (8 pages) 993, 994, 995, 996, 997, 998, 999, (1000)

(988)

FOR CHAIRMAN'S USE ONLY

Bangalore
30.3.77

With the health and growth of India's space programme in view, I consider the following Six items are the most important elements on which Chairman has to concentrate in the next six months. I am aware that there are many bush-fires and red-flags constantly arising; but I am afraid that Chairman has to ignore (bush-fires) personally many of these and concentrate on these Six elements mainly. This is so because we can have only one Chairman and his vital energies are needed for most important items.

Item 1 Develop proper equations in Delhi with PM, FM, and others concerned with Space. Get a new Composition of Space Commission formed soon; and get them acquainted with our on-going programmes and future projections;

more importantly about the integrated approach of our profile which may not healthily accomodate to start - stop budgets.

Item 2 Since Chairman's time is preciously needed for top policy issues in the coming six months, find a senior, stable person who can spend at least 10 days in Bangalore to find bush-fires for Chairman. I see only Dr. BP fulfilling that role.

Item 3 The above is closely tied up in finding a successor to Dr. BP. Even by itself it is a critical issue. I feel Chairman should name a deputy to Dr. BP right now so that things will stabilise in 6 to 9 months. One cannot evade the issue now. In view of SLV schedules change is better introduced now than later to plug to successor issue. Dislocations during succession can be better absorbed now.

P.T.O

Item 4 In order that ISAC will grow healthy and we do not suffer a single-point failure, healthy structure should be de facto ensured. Chairman alone can ~~ensure~~ ensure it de facto, by getting into the details of organisation, delegation, consultation methods etc that exist at ISAC. If this is done, APPLE, SEO, RS-1 and their interfaces with each other etc can be taken care of. The nuclear pile will soon be ~~reaching~~ & reaching criticality there! Moderating rods need to be pushed!

Item 5 This concerns SAC. As a visionary, in an otherwise bureaucratic and somewhat not so hopeful situations, Prof. YP can bring in a ray of hope by his personality. This is very useful for ISRO. However, when it comes to details of management, Prof. YP suffers from the lack of efficient deputies. With Shri Pant gone, only two good executives at SAC seems to be Kamat,

and George Joseph. Something has to be done to rectify this especially, to curtail the negative role of SAC Admin & PPG.

Item 6 This is INSAT. Chairman to make all efforts to get this through. This is the high point of our Space programme getting into operational phase. If INSAT is shot down at this stage, I am afraid that the Space programme in the Country will wind down. As you know, I am not a supporter of Space Tech. for my job or for parochialism. This country is a great country and cannot afford to kick away its own future.

Well, I stop here wishing and hoping that you can successfully complete the above tasks.

→ Go to 991(a) & (b) Then go to (992)

Rajan

30/3/77

991 (a)

End of March 1977 was a tough time for SD. ~~He~~ He was invited to be Chairman ISRO by ~~Mrs~~ Indira Gandhi. She had a massive defeat in election. Morarji Desai took over as PM on 24 March 1977. In general the new Govt wanted to clean up the Govt Admn by removing all those who were "committed" to Indira Gandhi & Sanjay Gandhi and helped them in Emergency. SD was not one of them; but he was brought in by IG. So he wrote an excellent note (Hope they are in Govt archives) to the new PM not crudely saying he was resigning but giving an option for the new PM. Morarji Bhai ~~to~~ very elegantly asked him to continue. That was a ~~strength~~ strength for SD. Still he had to deal with a whole new set of bureaucracy. He had to pilot the major approval for INSAT, bulk of the work done under IG's regime. The note was to be sent to PM's approval so that Cabinet Note can be circulated. The election

After 988 to 991 Govt notes

991(b)

The election changes the entire scenario. But as I recall bulk of ISRO (in fact all of ISRO) never felt that ISRO will be affected. ~~There~~ I think there was a hypnotised belief in ISRO people that what they did was of great value to the country and nobody ~~will~~ will stop it!

It is in that context, just after a few days of Govt change, my note has been written. I sensed some degree of "lost feeling" with SD. He had special relation with the PM unlike the usual Secretaries to GoI. He respected the position but had his way of reporting to PM.

His worry would have been whether it would be so. Also the new Govt was a clean entity. It had all spectrum of people whose main aim was to get rid of Emergency and IG.

→ Go. to 992 to typ → Then go to (993)

For Prof. Dhawan's Use Only

To: Prof. S. Dhawan

From: Y. S. Rajan 15/5/77

Sub: India and its Space Programme

The country is going through a change; there is some rethinking, adjustments, introspection and so on. Siddhartha is concerned about ~~ab~~ some issues of social relevance. Such a situation leads to some thinking and introspection which I have been doing for past few days, beside doing the daily chores.

By necessity if one were to think or analyse a country's long term activities, one needs to have a philosophy, a social outlook, a world-view-point. As a Head of a Govt Dept (and as a leader of a bureaucratic establishment), it is appropriate that we cannot hold a dialogue with you on social-outlook etc; rather one should not for the sake of organisation concerned (ie ISRO/DOS) in the present context.

[P.T.O

(994)

However, without any assumption about your world-outlook, I am giving below an analysis based on my view-point; this is an input, I consider, on a larger context.

I am basically a materialist with faith in human progress; a nearest term to describe would be historical materialism, though I am not bound by any conventional interpretation by some political schools. So I believe in this world; human work in this world; constant attempt of the collective humanity to master nature, which I define as progress. So for me the world is beautiful; man's life to shape the things around him is a laudable effort and therein lies his destiny. There is no spirit or absolute being to which he can ~~of~~ escape to.

It is in this broad context, I love the country and especially its growth. To make efforts, all possible efforts, to bring some millions of human beings from a primitive, animal existence and to give them material progress is a historic task, in which I feel proud & happy to contribute my mite.

Now, the question arises; Can there be progress and growth without a particular social organisation? For want of better terminologies, one could, say, socialism, capitalism and fendalism. I do believe that socialism only can release the human productive forces steadily and continually; but this I mean in a historical sense, on a long term basis.

The Indian social structure since independence has amply used

(996)

Page 4

the word Socialism though essentially the dominating ruling classes are made of: Big business, Rich ~~f~~ farmers (the Landed Gentry), and petty-bourgeosie, (the educated, the middle class). It is the latter which imagines some form of Socialist measures and ends up only in a limited bureaucratic controls. Comprador, feudal and revivalist elements sometimes are found in all the three groups. ~~The~~

The interests of these three groups ~~are~~ are contradictory. If Big Business enters into heavy industry, the job security of the petty bourgeesie (represented as clerks, professionals & bureaucracy) is unsafe and they want the tutelge of the State, the public sector.

It is thus, the balancing act between the priveleged, that has

been the Indian politics and the economic planning. So does one leave everything in despair? I feel no. In any system spontaneous breakdowns do not occur; some sort of growth will continue to take place, and given time the productive forces can always develop sufficiently; this is true of the pseudo-socialist, capitalist growth in India too.

I don't think any major political change will occur in this country; this is partly due to the "maturity" of the ancient civilisation. Hence to a great extent India will stick to the slow-moving capitalist path with some socialist-phraseologies. Then can a person, believing in materialism, then hope for anything at all. Yes, in a limited way, because no societies breakdown totally. There

are some elements of human endeavour which have greater implication on the progress of the collective humanity; one such is Science & technology

In the complex interactive process of cause & effect some of the high technologies will lead to an industrial organisation in the country that will induce growth.

In my world materialist outlook, without commitment to a particular political glasses, some growth is better than no growth for the Indian masses.

It is in this context, I views the Science & technology in the country, more so the Space Research. I am convinced it has great potentials

for inducing progress in a society and even with not-well organised social organisations, its effect on progress in the Society will be considerable. It holds future, which as a materialist, I cherish. [It should be noted that though I hold economic forces (organisation as primary in progress, the cause & effect-complexity, should not be overlooked].

The above analysis, resolves to a great extent, the contradiction between my world outlook and my work in ISRO. It is this rationale that makes me defend, the Space Research against a mere populist approach to

 (1000)

the Indian Social problems.

The reason for putting my views to you is partly for my own clarification; and also because you are in a position to greatly influence the growth of high technology and Space Research (in particular) in the country.

Rajan

15/5/77.

That note in a sense describes my "world view" around 1970's and my commitment to S&T, high technology, industry etc as a part of it. Those commitments still continue. But faith in "pure materialism" has taken a beating as also full confidence in 'socialism". High-tech is common to both capitalism & socialism (in the Communist interpretation of socialism).

The note is pretty much clear. I think I had written such a note on my world view etc after about a decade ~~Later~~ (I was doing it when I was in PRL 1964-67 period and publishing in newspapers). Even then and also in first 1970's, my commitment was to progress in technologies — my interpretation of Marx, Engels, Lenin was not to decide high tech. It was not of Maoist Cultural Revolution which deprecates Western academic knowledge — making Professors to go to fields and learn from the peasants. It ~~was~~ might have served this local-political

struggles; but it was not Marxism.

India of course was suffering from multitudes of socialist interpretations — Nehruvian, Lohiite, JP type, Gandhism etc. Most of the socialists liked ~~the~~ govt controls, and had little faith in industrialisation or modernisation of agriculture or economy. In spite of ~~the~~ the "hypnotic words" words uttered by Jawaharlal Nehru about Science, Some how the country has committed to Atomic Energy & Space. Hardly any parliamentary discussion took place — ~~the Budget~~ the Annual Budget was passed by "guillotine"!

Even now I don't think political systems understand S&T applications, ~~this~~ modernisation of agriculture, water resources etc. Their mind is still stuck with "appropriate!" The new Govt spoke in ~~How~~ ~~One the same day I had written a nitty-gritty note.~~

(1003)

several voices ~~and some~~ of them were dead against Big Science.

On the same day, ~~g.ge~~ when a note was written from a philosophical height, another note was on very important practical aspects of ISRO.

Problems of administrative staff on one side and on the other the Chief Administrators in the Centres (called Controllers — deputation of IAS, IPS, IAAS officers) were gaining power over senior scientists. They started thinking that they were Number 2 to Directors of the Centres. ~~The~~ Then there was a general slowing down; spending budget which had been voted by the Parliament was becoming tough.

I had addressed these issues in my note 15.5.77 (for Chairman's use only) handwritten 6 pages

Also pushing for initiating activities for SLV Variants & Remote sensing Satellites. Again the concern was that SD should not slack down with new Govt.

~~100~~ See the running text.

1004, 1005, 1006, 1007, 1008, 1009.

~~Again~~

(1010)

1004 –
1009
15/5/77
handwritten note

It did not take too long for SD to settle down with the new Govt. One great help was the new Cab. Secretary ~~Also~~ Nirmal Mukerjee. Also in general SD's reputation in Delhi was very high. He did not get involved in any of those "power-gossip" circles. He was mostly recluse and dealing with the Secretaries of other departments with correctness. ~~Also~~ Same also when he interacted with Ministers, Parliamentarians etc. Keeping aloof from them and also ~~from~~ immersed in ISRO work — he ~~was~~ stood apart. He did not get too close with the scientists – politicians ~~(as science~~ emerging as science – leaders in Delhi ~~RM had a straight for~~ Morarji Desai did not ~~to~~ make

↳ Go to 1011

(004)

Chairman's use only

To: Prof S. Dhawan
Chairman, ISRO

15.5.77

From: Y. S. Rajan

Sub: Some urgent actions to move the ISRO machinery.

I feel guilty to flood a busy boss with notes. But there are some important issues I need to bring to your notice. My observations over the past few months show that there is some general slowing down, build-up of senility within ISRO. There is in a sense, some alienation at the lower working levels and lack of direction at the higher levels. Partly this might be because of the large size. I feel a great deal can be rectified. Hence this note.

(1) One important problem area is in the front of administrative staff. We should not allow ourselves to be

(1005)

driven to a rigid "Govt" structure which are good for Railways or a Secretariat. Total ISRO is a single organic body; by extending the logic of cybernetics, decay of a subsystem will lead to the decay of the system. Though I recognise that administrative persons per se (Controllers, IAS etc) have their role, they should not take decisions or give advice without effective voice for the scientists. In ISRO "administration" seems to be gaining upper hand on one side while the administrative staff is being treated badly in terms of career opportunities.

This has to be reversed soon.

(2) At Director / Group Director / Area Chairman level, there does not seem to be fire towards a goal. May be all are not capable of. But partly this is due to the fact that

they are not able to guess their Chairman's mind or understand it. (No body has told me so, but it is my good guess). It should be noted that these persons are the executives. Hence I feel it is necessary for the Chairman to spend more time with Directors / Group Directors to discuss the operational aspects of long term planning; this will clarify the overall strategy for everybody concerned. If this is not done fairly soon, we (ISRO) will be reduced mere annual-budget-makers which is catastrophic for growth. To expect Directors alone to get feed back from Group Directors is not sufficient because the culture of discussions on long term planning has not set in.

I would therefore request Chairman to devote majority of his time in long term planning and in discussing with his principal executives. That means Chairman might have to pull out from some of the operational tasks e.g. Sanctioning a limited manpower, approving travel abroad, etc. Such tasks can be shared by say Dr. Brahm Prakash (for whole of ISRO).

(3) The above item has important organisational implications on: ISRO's organisation, selection of executives, deployment of persons within ISRO for handling different tasks, ~~the~~ ~~se~~ attempt to remove sectarian approach to ISRO's problems (ie VSSC interest, SAC interest etc) and so on. Dr Chairman's Meeting with Directors & Group Directors (may be

every fortnight) such issues also should be handled. Broad philosophy above would not suffice; one has to face some level of details on these matters.

Chairman may wonder as to what the ISRO HQ can do? Yes; my above recommendation has implications ~~of~~ on HQ also. As I had felt before, I feel even more that HQ should at best try to help the executives & Chairman to have more ~~dialog~~ dialogue; that means greater sub-ordination (functionally) to the Centres.

(4) Another one important action item which needs to be completed by Chairman in about 3 or 4 months is to initiate action on:

(i) SLV Variants & (ii) Ramakrishnan Satellite

(6) [1009

This has to be done even while INSAT activities proceed. We cannot afford to wait because without those two elements Sixth Plan will be a vacuum.

(5) ~~Even~~ In this year, if above steps are considered by chairman, we can avoid surrender of money and make ISRO more vigorous.

Regards.

Raja

15/5/77

Go to
1010
→ Then
1011

any changes to the Science secretaries. Not many those days: DAE, DDRD, DOS & DST. (CSIR was under DST though the DG CSIR had considerable autonomy) But one general rule he ~~~~ brought did affect some of the "Science-leaders": One-man; one-post. PM made MAK to choose between TIFR & Dept of Electronics. But for SD, he allowed him to continue as Director IISc and also Chairman ISRO.

I remember ~~~~ a Press Meet, SD had with ~~~~ many Science correspondents assembled. This was a practice, ~~~~ SD introduces for transparency / ~~~~ outreach. ~~~~ After finishing many useful & questions, one correspondent was insistent on a question.

"How come you are continuing

with two posts?"

SD was polite: "See, I was asked to do certain jobs; I am doing!"

Correspondent: "Does it not affect efficiency?"

SD: "I cannot comment on that. It is for those who gave me my jobs to decide whether I am performing or not!"

That correspondent should have stopped, at least by the norms of those days (1977). But he persisted. Correspondent: "Suppose you are asked to choose between the two!"

SD by now had lost his patience. He said: "It is very clear; it is Institute, I will choose!"

All other correspondents who were present were aware of the sensitive nature of SD and were very much appreciative of the move being done by

They suddenly got worried that SD may go to his room and send a resignation letter to PM or the post of Chairman ISRO / Secretary DOS. They all got up and appealed to SD:

"Sir, You ignore this fellow. We are all so appreciative of your work in ISRO and Institute. Please Sir, ignore this fellow and we want you to lead our Space Programme as well!"

If my memory serves me right, I think the Press meet was in the Senate Hall of IISc, as ISRO Lauvey Bhavan did not have enough Space. Later we created a hall.

On policy matters, budget or other functioning of ISRO/DOS there were no problems with the change in Govt. One person who bore

the brunt was Mr. Y. S. Das Addl. Secy who had to deal with sending replies to literally hundreds of references which came from PMO ~~and~~ about "Emergency excesses!", ~~Some~~ ~~de~~ If somebody did not get a promotion, it was attributed to Emergency. If somebody did not get a purchase order, it was Emergency.

Since the Govt was committed to bring "justice" to all those who suffered in Emergency, all their correspondence were to be replied to by the Dept to PMO. YS Das was a very conscientious person. He did not want to sent a routine reply. He used to look at all items meticulously, and reply with reference. He had a ~~best~~ beautiful handwriting. Hundreds of file noting he ~~over~~ wrote with his Parker ball pen.

(1015)

~~I use~~ Actually he used to sit late many days replying to these. I knew almost all of them were bogus. This is what happens when Govt at a high level ~~takes a gen~~ makes a general declaration. It applies to those who ~~are free~~ claim as freedom fighters or for accident relief etc. Here it was a real mess. The political bosses would not have even understood the great inefficiency they were pushing into an already inefficient govt system.

~~Da~~ One day I asked Y.S Das: "Sir you know by now after seeing so many such letters, that these are all bogus. Why are taking so much pain?" We generally talk in Hindi

"Arre kya karen. PMO se reference aayaa tho acchi tharaj

se karnaa padega naa! (If the reference comes from PMO, we need to do it well, is it not?"

He put in extra effort and ensured that a formality was done without affecting ISRO work.

At the programme level it is worth noting that the proposal for proceeding with INSAT Project with global procurement (as had been worked out by inter-ministerial Committees — all formed by the earlier Govt.) was taken to the new Govt a few weeks after its taking charge. It was a clear go-ahead. There was not any hesitation of its having been nurtured under IG regime. No doubt SD would have briefed the key bureaucrats. But it is also to the credit of political leaders to discern the difference between what was

good for the country. These ~~are~~ were really micro-events when considered in the larger context of the country — and the political changes (convulsions) it was going through. But the fact that India could have such a political system of respecting continuity of key elements had saved the crucial developments in India. The change from IG Govt to Morarji Desai govt was not a simple electoral change. It was after a bitter struggle; many of the opposition leaders like Morarji Bhai jailed; many tortured. The heroic escapades of George Fernandes, who was hounded by the Govt of IG, was a legend. It was ~~a~~ a sort of mini-revolution. In many ways it shows the maturity

of Indian democracy. To an extent IG's decision to go for an election against the advice of her advisers including "Intelligence Inputs" was itself a sign of ~~making~~ maturity of Indian democracy.

The fact that there were many petty episodes including comic ones of arresting her, ~~is~~ was also a side-show of the democracy.

As far as ISRO was concerned it was business as usual. We ~~did~~ went through the comic ~~re~~ moments of economy measures which included cutting down of STD connections ~~of~~ to the Secretary of the Dept (SD)! All these ~~to~~ came and went! Each one of the economy measure increased the paper work of getting approvals!!

I learnt a lot in terms of absorbing much of this "muck of public governance!" The patience of YS Das was a great teaching point.

Looking back one good contribution of the Janata Govt was to introduce Joint ~~Com~~ Consultative ~~Machi~~ Mechanism (for Machinery) JCM for Govt servants, thus avoiding the Trade Unions. It creates enormous amount of paper work by the junior staff who would like to unionise themselves from the office side. It provides an opportunity for "Goose Dance" by the Management & Staff. Some of the Staff leaders felt great as they could sit on par with Secretary DOS

Addl. Secy, JS etc. I also learnt a lot in the process, of labour management. I could empathise with some of the real problems and also the stupidity of some proposals by JCM, which were given because they themselves could not rationally resolve some of those issues themselves. It was an exercise in self-deception by all concerned; done often ~~with full~~ being fully conscious of it!! These were all the "games the people play"! ISRO Service

* * *

Another important aspect of Morarji Desai's decision making, which many may not know as they were busy teasing him for Urine Therapy, strong belief in naturopathy etc ~~Thus~~ Thus creating an anti-Science image of him and also "backward" in thinking, occurred with

~~the~~ decision on INSAT.

Through excellent ground work was done by SD for a couple of years, in spite of demonstration by SITE etc, Min. of Info & Broadcasting (MIB) under which TV came, was not interested in having TV broadcast. They were happy with their Krishi Darshan in Delhi and almost a total starvation of TV all over India (even in the 1980's). But in ISRO Vision (starting from VS) reaching Television all over India — with all 600,000 villages inclusive, in fact as the main focus. But DOS cannot force it on MIB. As per the style of SD he did not complain to IG to get them fall in line.

Thus for the INSAT ~~project the~~ satellite, there was an important decision point: to have the S-Band TV transponder or not. The sizing of the satellite was such two S-Band transponders can be accomodated. If they ~~one~~ were not put

that much of volume would go waste.
Launch vehicle cannot be downsized gaining some reduction in launch cost. It was by steps. Already INSAT was in a launch size class and we could not avoid that launch cost. Of course, if we did not build an S-Band transponder, we can save some money — it was a pittance compared to the whole satellite cost.

If they (MIB) change their mind after DOS floats the global tender and awards the contract, cost of change will be great. If satellite construction was already on way, any change would compromise quality, as redesign would be involved. It might cause slip in schedule as well.

If the satellite flies with the S-Band transponder and MIB was

adamant in not using it, it might attract a major CAG objection the brunt of which DOS had to bear. "Public Money Wasted!" may be the newspaper cries!!

These issues were crisply brought out ~~to the~~ in a note to PM giving him the options on which he can decide:

(i) Don't build S-Band TV Transponder and then it mean no TV in INSAT

(ii) Build only one S-Band Transponder (some thing like Solomon wisdom)

& (iii) Go ahead with two S-Band TV transponders. If MIB wants to build ground ~~sat~~ stations & receiving terminal later, let them do.

Morarji Desai had perused the note and as per his practice, he himself record his decision on file. "Go ahead with

TV transponders onboard satellite. Let MIB take its own time and decide about its ground system.

He ~~could~~ had a good foresight and his decision was not on penny-pinching, nor to procrastinate decision making by asking another Committee to look at it.

There were other criticisms of this, I had seen directly. The ~~Con~~ Consultative Committee of Parliament used to be an elaborate affair. All departments from top Secretary to Undersecretary, assistants etc will be present. Almost 200–250 persons crowd the room. Actually it was a total waste of time under the highest name: Parliament Work! From DOS, normally Addl. Secretary would go with one person to help. I used to go as well to assist. SD would seek permission ~~not to~~ to be absent (sometimes).

For one such early meetings of Morarji Desai, the Science departments were taken up together (as was the practice). From Dept of Electronics, among the officers was Brig. Balasubramanian in Army Uniform — he was the Chief controller of computers in India; a terrible control role DoE took on itself.

DOS had a very few persons only.

After meety was over, the PM rose and starts moving out. We all stood. I clearly heard him looking at the crowd: "One Army Officer and an Army of Officers" He repeates it a couple of times. I said to AS that "Just see! Tomorrow all depts may get instructions that number of persons are to be limited. It was so; a letter from Principal Secy to PM to all the Secretaries: limit the numbers

two or three. Also after a departmental ~~hearing~~ hearing ~~is over~~ was over, ~~all of~~ they all should go away.

Morarji Desai was very concerned about the efficiency of govt work. He had chaired Admn. Reforms Commission (ARC).

There are many items concerning Morarji Desai even during his brief tenure which I will give in other places as appropriate.

* * *

Coming back to ISRO matters, I am not chronicling the projects or proposals or reviews that took places or tests etc. or even of visits of foreign dignitaries etc.

~~It was~~ My write up is more in the nature of how I functioned in ISRO. That brings forth many side issues which were considered — some of them got absorbed in ISRO. Some were left loose. Of course I also deal with issues which were of a firefighting type which I might

the attention of Chairman ISRO. Items which were referred by him are also there. These are but glimpses of the whole live drama which was enacted daily in ISRO.

Here is a piece. Around 1975, Prof. Dhawan ~~brought to the~~ informed Space Commission about the plan to get as much work as possible to be done by Industry (in the current day parlance outsourced to Industry.) He also wanted to involve national laboratories. Those who were directly responsible for delivery of projects were not happy with this policy. It was understandable because these institutions especially the Public sector units had no interest in taking up: no incentive either. National laboratories had good in talking but did very little.

For example CECRI, Karaikudi wants claim to have given Ammonium Perchlorate technology to ISRO. ~~It was in~~ When they tried in Ammonium Perchlorate Experimental Plant in Aluva (Alwaye) the results were

eaten up very fast in the electrolytic process. It ~~is not~~ was not only the question of lot of expenditure but also huge operational crisis of changing anodes almost daily. Finally it was Dr. Vasant Gowariker's group with Sreenivasa Setty, young mechanical engineer, in the lead solves the problem and supplies cost-effective and quality Ammonium Perchlorate to rocket & launch vehicle projects.

SD attempt to have BEL take up Satellite Electronics ~~fizzled out~~ during 1973-74 fizzles out (not because of the resistance of URR, who would have agreed finally) because of the the BEL Chairman's last minute "chickening out!"

During 1975-1976 a large number of ~~teams~~ small teams with exallent experts like N. Vedachalam (I was ~~also~~ also there) have visited most of HAL, HEC facilities and generate thick cyclostyled reports - listing their

production facilities and to what possible future & present ISRO programmes they would fit in. ISRO/DOS Budget exercises were also used as ~~a~~ a tool to nudge the project-executives to try outsourcing. ISRO was willing to invest on facilities in the Industry or Laboratory to do the work for ISRO. Actually in the developed world, Industries invest on their own with a contract for guaranteed purchase by the Space Agency. Also they ~~are with~~ were (are) willing to the Prime Contractor & taking responsibility for design/production etc based on the specifications by NASA or ESA etc. But Indian industries wanted to be job order contractors only. (Even now @ 2017 they are so!). The national labs overcautious and take up R&D job and abandon in between without meeting the schedules. ISRO had some such limited experience even for ~~&~~ software development.

But still it was necessary to try. SD's desire to do so was not just ideological. He could foresee the workload on ISRO for R&D and production/fabrication, testing etc if ~~we were~~ ISRO was successful and started scaling up to meet user demands within India itself. To look for others at that stage, may be too late because the ~~last~~

high-tech experience of Space Technology cannot be acquired overnight.

SD often used to tell me during his discussions with me on such subjects "We can leap frog in thought. But engineering is a step-by-step process. It needs assiduous collection of experience." He had sometimes compared the process to placing one brick over another to complete the building.

His concern was therefore that of building up necessary skills in various academic/scientific institutions and industries (big, medium & small) that could effectively take over many of the tasks resulting from the progress (and success) of the Indian Space Programme.

In this context one of my earlier notes quoted here and fully reproduced about different types of skills

persons in ISRO (Level 1 through 5) has to be borne in mind.

While ISRO could make progress to place some work with HAL (paying it heavily) and with L&T etc, with R&D institutions the progress was much slower. It is one thing to write individual scientific papers (even in "reputed" journals) but another thing to produce a concrete product which can fly as a part of satellite or launch vehicle.

At the time frame we were discussing was in 1977 — ISRO had only about 2 to 3 years of working with outside world. Dr. S. R. Valluri & Director NAL (he was co-brother of SD — ie wives of SD and SRV were own sisters). A well known researcher in aeronautics, trained in USA. He was fiercely independent and did not get into the coterie of "in science-politicians" who were trying to take leadership. He had strong opinions on many things including as to how organisations should be run.

He had shared with me many such ideas as well. NAL was also doing research projects for DRDO.

Unfortunately, NAL also ~~was~~ had the same "genes" of CSIR. A lot of individual scientists working some problems of their choice - often times a continuation of their PhD or post-doctoral work done abroad. They publish papers, occassionally tell about a new finding (which is often new only for India, done abroad several years ago). Also in the projects given by DRDO, etc, they take up only a small part of the system and amplify it as a major contribution. Often times, they do not complete it fully. There ~~are~~ were (are) a few exceptional persons, who try to do something concrete in the Indian context; they often have to struggle.

An example was my ~~one~~ neighbour Rustom Damania. He ~~did~~ was in the aeronautics department of IISc. He was senior to Dr. N. Ramani who did PhD in that department. Dr. NR had

explained to me as to how Dr. Rustom used to ferry students — one by one — to HAL airport where IISc's own Pushpak ~~air~~ trainer aircraft used to be parked. He ~~with~~ would give them flying experience. He was a trainer certified pilot himself. Later IISc abandoned that programme.

Sometime later IISc academic system won't promote Rustom — he was too practical and did not write papers! So being a Director won't interfere and had ~~Rustom get~~ helped Rustom getting a job in NAL. He continued there; made India's first Composite aircraft, which he himself flew from Bilm to Delhi and back.

But NAL won't build on this capability. They started of their own still struggling to have an Indian made civilian aircraft.

While talking about Rustom I have

a couple of decades.

Let us get back to NAL of 1977. SRV was sincere to his desire to do concrete R&D for the Space Programme. As to how much he could carry his colleagues with him in realising that tough challenge was a question mark.

Though ~~NAL~~ SRV & Dr. S. Ramaseshan used to come for many of the ISRO review meetings, the desire expressed by SD & SRV did not move much ahead. It was in that context, I had written a note to SD calling for creation of a specific Aerospace Consortium for India / a Consultancy Company within DOS. It is dated 17th June 1977 marked VERY SOON.

I have in the note suggested a holding company of some from within ISRO. I say inside. "What is bothering me is that the productive forces within ISRO and utilisation of national productive

forces by ISRO are not in keeping with the needs of complex ISRO tasks. The managerial solution therefore is not cutting back on ISRO programmes but to modify the managerial structures to try new avenues"

I have suggested Dr. V.R. GOWARIKER to head it as Managing Director; & also have also suggested a Board.
It is to be noted that by this time VRG had completed most of the developmental tasks for propellents.

This note also encloses an earlier note 5/Feb/1977 — ISAS & NAL interface — Possible areas of joint work. It is a detailed note done with Dr. SR — with names etc. I note a spelling correction done by SD in its detail. added ed in red ink. He has read it ~~carefu~~ carefully.
Already 4 months passed. Hence my rush ... 1036; 37, 38, 39, 40, 41, 42, 43, 44.

June 17/77 note with answer

Had ~~the~~ action been taken then ISRO in a broader sense would have been very different. An research / academic arm of NAL and two major production arms. More could have been added.

I don't know what exactly happened to stall the process. SD might have found the coordination difficult. Also it had no clear enthusiastic support from ISRO seniors.

~~It~~ In my opinion it was one of the ~~great~~ big missed opportunity for ISRO and India. I did not ask Dr S Ramadorai what happened. It would ~~have~~ look odd that I do not ask SD & ask him!

Subsequently ISRO was busy with ~~their~~ energising the Projects by giving organisational structure etc

(Go to 1046)

INDIAN SPACE RESEARCH ORGANISATION

HEADQUARTERS

MEMORANDUM (1036) VERY SOON

FOR CHAIRMAN'S USE ONLY

For : Prof. S. Dhawan,
Chairman, ISRO.

File / Ref :

From : Y.S. Rajan,
ISRO HQ.

Date : June 17, 1977

Subject : An Aerospace Consortium for India/A Consultancy Company within DOS.

1.0 The continuous reviews of our projects and observations otherwise are making it increasingly clear that the talents within ISRO are not adequate to meet the various demands of the complex space technology - both managerially and technically. Also the "inbreeding" leads to many inter-personnel problems which cannot be solved within ISRO without soft options of over duplication and import in many instances. One could afford to do this in the early stages of the ISRO programme because it not only gives easy (convenient !?) management structures but also leads to growth of talents needed at the initial stages. But such soft options are not possible in projects such as APPLE which are getting extremely complex and therefore costly.

2.0 It is in this context Chairman had mentioned some time ago that NAL should be "married to" ISRO very soon for some activities regarding satellite work; immediately, I had submitted a memo to Chairman which is given in the Appendix. Chairman had seen the memo. Chairman had promised that he would talk to Dr Valluri and Prof Rao to arrive at broad managerial agreements. Four precious months have slipped and various inputs that would have been available to APPLE had not taken place. The only link happens to be Dr Valluri and Dr Ramaseshan when they come for formal reviews.

3.0 On the HAL side things are slightly better because fabrication support cannot be had within ISRO ! Hence people have to go to HAL albait helter-skelter. So it is taking some shape.

4.0 Deep reflection over the past few months about the trajectory of ISRO and also the facts about the progress of our major projects especially APPLE point out the fact that it is not just enough to have HAL fabrication support move the projects. We need lot of brain to be utilised in much more formal ways. It is in this context I suggest Chairman considering organisation of an aerospace consortium immediately consisting of ISRO, HAL, NAL, BEL and perhaps one or two defence laboratories if they are

.... 2

so willing.

4.1 This is not just a mere formal affair of "dog and pony show" done for Aero R&D Board. It should be a serious corporate commitment from the organisations concerned. To start with it should consist of at least one middle level scientist from each of these organisations having 4-5 hard-core engineers assisting them. These people should sit in once single place; the ideas about the various programmes of interest to the individual units will then flow thru these personnel. These persons having an intense awareness of the needs of their own organisation (both the present and future needs) will also get the familiarity with other capabilities through this co-location. Position papers and analysis papers should be created by this team. Then the heads of the individual organisations should formally meet to discuss these issues in broad terms once a month. In about a year the pattern of contributing mutually to each other will emerge.

5.0 I am aware that some of the organisations like HAL, NAL do not have clarity about their long range strategy to the extent we have. But this need not be of serious concern to start with.

6.0 To give a little muscle to this unit certain formal activities of cooperation between the organisations should slowly be routed through this "Aerospace Consortium" unit for a while. Also in a fire fighting mode some small-scale cooperative activities between the organisations should be worked out within a year's time. APPLE will be ideal focal point.

7.0 To argue on the side of pessimist one may wonder whether we should load such a critical experiment on a project like APPLE. Another question which will arise is what we have done in the three decades and how something new is going to come now! It is all the same old rotten path ! I somehow feel that we can afford to be optimistic neglecting some of these doubts because there are certain major events which have taken place in the country which can make the people to come together. Another one important national phychosis nowadays would be generally hard-questioning of the relevance big science which I hope will make the bosses in the big science to pull together or to else they will hang together.

8.0 I am rushing this idea to you because something is to be done soon; this is not a mere spike and has been a thought out idea. Later it will be hard to get some opportunity

.... 3

to start this "consortium"; may be one can wait for INSAT to get approved. Even for INSAT the schedules are critical and one can use the same old arguement of not experimenting with a time critical project. But I am sure, without a concentrated activity (like APPLE, INSAT, SLV-Variant) nothing will move in forming a consortium because without action, it will be end up a coffee table chat.

9.0 AN IMMEDIATE SOLUTION

One excellent way of starting this activity (which I consider is in the interest of ISRO) with the basic spirit unchanged, is to start a Consultancy Type Organisation (Holding company or some other form) immediately within DOS. This organisation then will not only transfer the technology from ISRO to other organisations but also buy technology of use to ISRO programmes. We have in the past bought KaraiKKudi Ammonium Perchlorate technology. For example we may in future buy operational or near-operational computer programmes or get computer programmes developed for structural design; we may buy an OBP developed by say ECIL; etc. A "Commercial" organisation to do this buying and selling technology make the work more businesslike.

9.1 Also this is something we can start of our own without initial commitment of NAL, HAL, etc. We can put them in the Management Board to start with & later convert this into an Aerospace Consortium if needed. What is needed is fast action. What is bothering me is that the productive forces within ISRO and utilisation of national productive forces by ISRO are not in keeping with the needs of complex ISRO tasks. The managerial solution therefore is not cutting back on ISRO programmes but to modify the managerial structures to try new avenues.

This consultancy agency of DOS can transfer lots of chemical technology and electronics systems and thus earn both prestige and money. With these and with the money from ISRO projects can buy technology.

10.0 Chairman may wonder whether I have thought of who will man this. Yes; I have. The Managing Director should be Dr. V.R. GOWARIKER. . . .
The Board may be as under:

Chairman, ISRO	-	Chairman
Chairman, HAL	-	Member
Director, NAL	-	Member
Chairman, BEL	-	Member

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Secretary, DST	-	Member
Director, VSSC	-	Member
Director, ISAC	-	Member
Director, SHAR	-	Member
Dr V Siddhartha	-	Member
Dr. GOWARIKER	-	Member-Secretary.

The choice of Dr. GOWARIKER. as Managing Director is based on his great capacity to innovate, create and lead. Also this will be the best way to utilise his enormous energy for ISRO. As far as buying of technology is concerned, he may have inhibitions probably in the field of Chemical. technology. But in this field we need more selling and in others (structure, fabrication, analyses etc) more buying. Hence there will be no mismatch of individual motives and the ISRO goals.

11.0 The above is put before Chairman for consideration, with a request for urgent action.

With regards.

Rajan

17/6/77

usr*

INDIAN SPACE RESEARCH ORGANISATION

HEADQUARTERS (1040)

MEMORANDUM

CONFIDENTIAL

FOR CHAIRMAN'S USE ONLY

For : Prof S Dhawan
Chairman-ISRO

File / Ref :

URGENT

From : Y S Rajan

Date : 5 February 1977

Subject : ISAC-NAL interface: Possible areas of joint work.

1.0 Chairman may recall telling me a few days ago that Dr Valluri had offered a place meant for ISRO/NAL teams utilising the space for activities concerning ISRO. In this connection Chairman mentioned that we should consider having some Memorandum of Understanding for ISAC and NAL to work together on various items related to the satellites. Chairman also mentioned that this will perhaps be a good opportunity to utilise the talents of NAL weld together a team which has broader base in Satellite Technology.

1.1 The need for this is immediate because of the pressing tasks of RS-1, SEO and more importantly APPLE and preparatory work for indigenous INSAT-2.

2.0 During the visit of the Solar Cell Team I had an opportunity to discuss with Dr Ramaseshan about the possible areas in which NAL can contribute to ISRO. The exercise we did has been fairly detailed for a first cut discussion and hence I am giving it below so that Chairman could use this for initial discussions with Dr Valluri and Prof UR Rao which he wanted to do before I return - say around mid February. If the preliminary discussions indicate some plan of action, then I could follow it up on my return.

3.0 POSSIBLE AREAS OF COOPERATION BETWEEN NAL & ISAC (ISRO)

Essentially the satellite technology components have been broken up into subsystems and subelements thereof, and possible NAL contributions are shown as remarks.

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Elements needed	Remarks
*Structure	
- Analysis	Structures Division, NAL (Dr Somashekar)
- Design	No help envisaged.
- Testing	Vibration elements (Structures Division)
- Adhesives	No help envisaged.
*Thermal	
- Analysis	Structures/Aerodynamics Divn
- Painting	Shri PS Narayanan, Dr Venkatasubramanyam } IISc., Physics Division
- Mylar/Kapton Super insulators	
- Contamination Studies	
- Testing/Simulation	No help envisaged.
*Electronics	
- Telemetry	No help envisaged.
- Telecommand	- do -
- R-f	- do -
- Antenna (rods)	- do -
- Antenna (dishes)	Materials Divn (Shri R V Ramani)
- Thermal/Structural analysis of Boxes	Structures Divn (Dr Somashekar)
*Control & Propulsion	
- Analysis	No help envisaged
- Simulation	- do -
- Momentum wheel (material tech)	Consultancy (Materials Divn)
- Sensors (Attitude)	No help envisaged.
- Testing incl. setting up of test facilities	Instruments Div (Shri CS Rangan)

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- Hydrazine bottles (Ti) - Plumbing - Micro thrusters	Suggested by Dr Ramaseshan: Bladder: Shri R V Ramani Shri S Rama Rao Consultancy: Shri V Ramachandran (Fabrication) (Welding - Shri S Radhakrishna) Shri R V Ramani, Shri A Krishna, Shri A V Raman } Materials Divn
- Apogee Motor (Fibre glass)	No help envisaged.

* Solar Array

- Panel tech.	Shri R V Ramani, Materials Divn
- Cells & Welding	No help envisaged
- Adhesives	Testing - Materials Divn
- Batteries qualification, testing etc	Dr S R Rajagopal - Materials
- Electromech deployment etc	Shri C S Rangan - Instrument Div

* Systems

- Mission Planning	No help envisaged
- Quality Assurance	No help envisaged
- EMI analysis + test	No help envisaged
- Failure analysis of devices	Shri Radhakrishna, Shri Raghuraman, Shri N Balu } Materials
- Material degradation studies	Shri N Balu - Materials Divn

4.0 The best course of action would be to identify a small Working Group between ISAC and NAL with some of the names suggested above and some more names that may be suggested by Dr Valluri. These people should immediately get on to the job of identification of detailed task that NAL could do for ISRO in APPLE, SEO etc. There may be reluctance on ISRO side and also some academic slowness on behalf of NAL, but still we should

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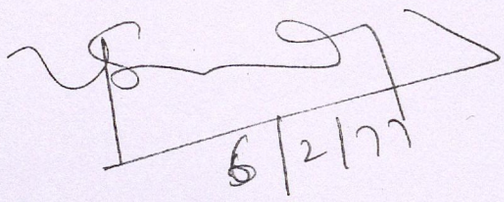
(1044)

force up this if we have move on this at all. If we slip by another two or three months, probably the time would have overtaken us. From ISRO HQ side Siddhartha and myself would keep in touch with this detail working group so that some steering can be done for their final reporting to you.

Regards.



6/2/77

(Go to 1045) bao

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daK

(1046)

One of the urgency I had felt was because ISAC was formed ~~to~~ vide an Chairman ISRO order of 3-11-1976. (I remember this through ~~the~~ ~~of~~ my papers returned by SD regarding posting SBIyer dated 20/6/77 (one of the three young IIM MBA colleague who was at HQ. — He, Chandra, and Kalyanraman were a trio inducted). ~~For~~ For SBI SD thought of a change for ISAC, for which I had attached ISAC reorganisation order by URR dt January 11, 1977 — suggesting that ~~to~~ SBI be ~~should~~ should be accomodated in a good position and not just "dumped". I was aware of the ~~tra~~ "tribal" dynamics in operation — old PRL, old ISSP, old VSSC's SSD division merged with ISSP, the new ones etc. SBI would be treated as an outsider and had a chance of getting lost in the new ISAC!

finally he was not taken into ISAC. I don't remember what exactly happened!

Coming back to Aerospace consortium, it is sad (even when I see in @ 2017) that such a thing did not get formed. At that time of writing and later when nothing happens, there was a feeling of helplessness that SD did not move on crucial things and was only tied up with 'routine' things — most of which of course he created during his 5 year stint after taking over as Chairman ISRO. There was even a feeling that he gave a lot of visionary talk to me (and to some of us) and sometimes even in a larger meeting about how ISRO had to shape up like CNES of France creating companies to execute development & production jobs.....

In terms of strategic thinking, it cannot

be thought of as revolutionary, even in terms of what was happening in USA, Europe, ~~the~~ Soviet Union in 1977. But, of course, ISRO's scale was too small (even now it is so @ 2017 compared to world standards!). Aspirations of many active, dynamic scientists/engineers in ISRO then was to create a huge empire around them even while executing the projects. Naturally they would not like to let go establishment of various facilities around them; and more importantly their direct control on them. ~~It~~ They knew (actually now, @ 2017, I admire them for that, as I was not that clear in my own idealism of vision of large scale space industry, about the ~~need~~ individual human aspiration of personal fame and power derives from it!) that such an outside entity with powers and activities of its own, though given by ISRO, would dilute their own individual hold. After all they are

going to dedicate their ~~that~~ lives for ISRO. ISRO posting ~~was~~ (or appointment) was not temporary. They could continue in the same place and same work for years. Therefore their game plan was to suit that. If there were a territory one could hold on: a chieftain, a minor king, a major king, an emperor etc! Most of them have been rewarded in the long history of ISRO: of course some have been massacred such as Y.S. Rao, K.R. Rao (Wgr Cdr), B.S. Rao, Nambinarayan etc. Some like Kalam were minor kings; ~~ka~~ Kalam went out and was lucky to create a territory for him and later become an Emperor within DRDO then for the country. ~~Many~~ Some had been minor kings and retired! Persons like Vasant Gowariker, Muthunayagam became major kings and were knocked out of ISRO — ~~but~~ acquired empires elsewhere (~~but~~ albeit not so famous), O.P.N. Calla remained a micro king!

PP Kale became a major king and knocked out at the emperor stage and had to leave ISRO; Because URR emperorship saw to it that his (student) dynast Kasturi Rangan took the seat! Then another story was that KKR totally suppressed URR from limelight and chalked out ~~bigger~~ bigger territories for himself. ~~Satish PP Dhawan~~ YP who entered later, would have become the ISRO Emperor after SD laid down office; but his foray into UN removed him out of ~~ISRO throne~~ the race for ISRO throne!

(Rattan made it easy for SD to have him out!).

I had in the above fast forwarded ISRO history from 1971 to almost to late 1990's.

But in 1977, all the above mentioned individuals and many others not mentioned like S. Srinivasan, R. Jayaraman, R.M. Vasagam

ek ek were serious players! There ~~were~~ were also persons like S.C. Gupta, R. Aravamudan ek who played a different para game! ....

They were all aspirants; perhaps I too! But I was seeing the "writing on the wall" as I could not be a part of a "tribal territory!" I was with a great 'avatar' (SD & BP), served them. Knew they would go away! The 'avatars' were not meant to leave behind a tenory in their name; they could not be dynasts!

Was my idealism of a greater Space Industry, my motivation to take up the suggestions of SD and work seriously on it? Though I had written notes the original idea of such concepts of a Space Industry, Consortium of Space-capable institutions ek no doubt

Came from SD. I, in ~~discussion~~ discussion with some colleagues in ISRO like Chandra, VS, KSP, PS etc and also through my own reading of the then contemporary Space news, journals etc, developed the idea more. Persons like Ramasesham helped... I sometimes used to discuss (more to say argue) with some of the ISRO aspirants referred to above; they ~~with~~ would invariably oppose only! But it gave me practical ideas. Some who knew they may not rise higher ~~in~~ within ISRO due to their relations with their bosses (but who were otherwise technically capable) would support...

But did my idealism contain an element of detachment

because I may not get into ISRO hierarchy due to my existential Dilemma mentions often in these pages? Or did I think that creation of such entities would help me? I think the ~~later~~ latter was not the case. I did not recall, my envisaging a role in the entities that ~~may~~ might be created. By Around 1970's and even later till 80 was around, I felt that I would play a major role ~~of creation of playing~~ in creating a High Tech Development History of India. May be these were the vestiges of Historical Determinism derived from ~~Karat~~ Marx !! Karl

(1054)

There was a great desire to do something that would be an important event (or set of events in Indian history — history of its people): A burning passion like Subramaniya Bharati:

"... பல — வேடிக்கை மனிதரைப்
போலே — நான்
வீழ்வேன் என்று நினைத்தாயோ!"

— his challenge to Kaali. I ~~was so~~ had somehow hypnotised myself to believe that I would do something extraordinary. That was the reason of my being attracted to Karl Marx and communism. Though in the early teens there was an attraction to religious / spiritual achievements, that path was being alone and looked uncertain.

So the drift was towards doing something great in the external world. Bharati & Swami Vivekananda seemed to suggest that. The Karma Yoga interpretation of Bhagwad Gita & (rather emphasis on) from persons ranging from Lokamanya Tilak to Mahatma Gandhi to Vinoba Bhave — and the implicit call by Swami Vivekananda for social actions and above all Bharati —

"பயன் பகுக் கெய்கையே அறமாம்!",

some how impressed me. The lonely spiritual ~~question~~ quest and emancipation looked like a sign of extreme selfishness for me. I had seen poverty, ~~di~~ large scale diseases, scarcity etc around me

I was not born in a rich family. We had many financial constraints.

There I had elaborated the reasons why I left the political path, which in theory, would have given the largest amount of opportunities to change history — to contribute in a major way. I saw such a possibility only in communism, which in India had not taken root at all in the real sense of the term. They were more like social democratic parties of the Europe and later degenerated into playing secular - regional chauvinistic - casteist games even during the 1970's and more importantly depending on the obstructionist trade-union politics. I saw them only as some sectarian agitationists.

Fortunately I had gone into a field of science & technology — Space —

which had a great promise for future. It had technological challenges; ~~scien~~ ~~front~~ in frontier areas of new science; exploring universe; ~~also~~ above all great potential to reach many unserved people of India, to help in their daily lives. It could help India to 'leap frog' in economy. And also it was a great tool for military ~~of the~~ enhancing Indian (State) parade to achieve in the world. India could show to the colonial powers that ~~India~~ it was not always second or third to them! (in that sense strong nationalistic streak like Bharati, Vivekananda)

By 1970's itself it was very clear that the "universal" part of communism was dead and gone (in fact never existed except in Karl Marx's writing)

Also my having been in USA with family for a few years had cleansed ~~brainwashed~~ me of the false propaganda

from the Right & Left of India that the Western way life ~~is for~~ was full of evils and was the cause of poverty and suffering! In fact I came to understand that mastering of S&T and its applications to all walks of life ~~wonts~~ could only save India. In that aspect it was Nehruvian in words. ~~But~~ I also believed that ~~such a~~ industrialisation of S&T in a major way could be achieved through public sector — it was so the Soviet Union. So India could also build such major industries was the belief frame in the 1970's. SD' also was of similar world view.

Therefore working for creating big operations through such public sector initiatives was the right thing to do. In addition

I did not find any dynamic ~~bio~~ reasonably big private sector industries. Incidentally SD did not have a bias against Indian private companies when he was articulating ~~the policy of~~ and attempting to implement the policy of ISRO outsourcing to ~~I~~ industry. That ~~is the~~ was the reason ~~how~~ SLV-3 project had so many private sector, industry contractors ~~it~~ (this practice had expanded later for PSLV and many satellite projects as well.)

HAL ~~BEL~~ was dominant was purely due to technical reasons: due to lots of investments done by Govt ~~in aircraft~~ for aircraft production, which has ~~so~~ ~~lots~~ many commonalities with Space Technology. ~~BEL~~ ~~also~~ also had such investments; but it ~~was~~ was (is) easier to produce ~~them~~ electronics subsystems in the

electronics
ISRO facilities in VSSC, ISAC & SAC.
BEL later was withdrawn for Radar
production; it was a tardy affair,
mainly from BEL & later by ISRO.
In general it is said that ISRO
lost out totally in ground systems
for Space applications. In hindsight
I attribute it to the loss of
Wg. Cdr K. R Rao & Dr. B. S. Rao
from the S SITE programme
due to the politics after Y P
joined as Director SAC and
subsequent winding down of
SCSD & ESD divisions which
they headed. Also as points
out elsewhere, ~~amongst the~~ in the
ISRO's own internal perception
system those who did not do

satellite or ~~gr~~ launch vehicles (ie space borne) and did only ground based systems — as in SHAR, ISTRAC and even within VSSC, ISAC, or SAC ~~or~~ on environmental ~~the~~ systems or ground checkout systems, were considered inferior. So the competition ~~of the~~ ~~bet~~ amongst the better ones was to avoid ground ~~System~~. In terms of applications and commercial value (to use modern parlance @ 2000 plus, the down stream space systems) it is the ground systems that ~~mak~~ make a large portion of revenues from space and also ~~p~~ profit!

Had the ~~H~~Holding Company

of Aerospace Consortium been formed around 1977, they would have realised. It had HAL & BEL also — and their mandate was to buy & sell — Consultancy etc.

But inability to start it cannot be considered as ~~a~~ the weakness of SD. The fact that he could think of thinking about such systems — his model was France, a consortium of ~~PS~~ ~~pvt~~ Govt & private companies promoted by the Space Organisation CNES — was remarkable. He gave us ideas. We developed it. I feel great when I read the Aerospace mtg (VS was when

(1063)

showed him ~~in 2 during~~ in May 1, 2017 at a NIAS meeting) that I had been able to absorb SD's ideas and was able to convert into a concrete proposal. The amount of work done with Dr Ramaseshan getting into the details is remarkable!

As far I was concerned, I ~~cannot rea~~ could not reach the political decision makers or administrators (most of them IAS persons, unfamiliar with such techno-business items but ~~wie~~ wielded power and unreachable except in the political or administrative power circles). Only SD can. I was

fortunate that I was exposed to such forward thinking ideas, and was able to absorb them / develop them into concrete action plans. I could only reach SD 0. He had a good standing with Delhi's power circles (The irony was that he was so highly respected because he kept aloof from the power circles! He approached them only professionally for ISRO work.) That was a good point Morarji Bhai as PM would have noted and therefore let him alone hold two big posts: Director IISc & also Secretary DOS. He did not disturb the decision to have DOS headquarters at Bangalore — not Delhi, though he was a traditionalist in his approach

to ~~co~~ govt administrative matters.

SD ~~has~~ would have had problems not just within ISRO big orgs to have such a consortium but HAL, BEL etc was luke warm. As far as NAL was concerned though SR Valluri was eager, it was not sure when he would be able to ~~e~~ carry his colleagues who were used to the mode of individual departments in the University. Each person was independent! So very little of team work required to deliver products was possible. (In fact that would have been a major issue for URR

who ~~is~~ was known to take up nearly impossible schedules, ~~but~~ & like in Aryabhata, and still deliver.)

So I accepted the helplessness of the situation and shifted on to other items. The hope of "next time!" was high because we all believed that Chairman ISRO in the persona of SD would make it possible

* * *

Home front ~~was~~ had settled to a new routine. Mani continued to stay at our Palace orchards house without interruption. Gana was doing well except for the fact that Dr. Desai made her to be "bed-rest" month by month. The weekly "progestron"

injection was given by Dr. Prabha mani — She would come upstairs and give. Only small luxury Goma had was to come to balcony ~~for a~~ and stand for for some small period. She was given ~~Our~~ iron tablets, calcium tablets and also ~~some en~~ Bestozyme to help digestion — all according to the prescriptions of Dr Desai.

Once a month she would go royally in the black Mercedes car, a huge one for that lane, sent by Vasant P. Gohel, husband of Pushpaben ~~Co~~ (formerly from Dhrangadhra) He was a technologist — business man. This arrangement was to

ensure that Gama had no shake in her travel, which would be in an auto. Vasantbhai did not even want a smaller car. Roads of Bangalore were not great then too (@ 1977). So Gama would have a smooth ride. I did not have to go.

Dr Desai would check and extend bed rest by one-more month. It was just an extra precaution. Her condition was very good. He told her that she would have a natural birth. Her expected date of delivery (ETD) was 12 Aug 1977, the same birthday as Vijay.

~~On~~ Our routine was upset vis a vis going to Cubbon Park, M.G. Road, Cinema etc and eating out — fish fry, chicken etc for Vijay etc

It would have upset Vijay but he had another great opportunity to play with his friends Hari & Keshu. He was already close to 7. He could also cycle ... Mami was there for all items of food etc. His school was nearby ... I was keeping in touch. Already we had a phone at home. Also another great help for mobility was Uma's friend (Hari's mother) ~~and Kri~~ Lakshmi & Krishnan. They had a fiat car. Krishnan who was high level executive (I think GM) in a pharma company had left it and started an enterprise of his ~~own~~ own — really in todays (@2017) parlance, a start-up. His enterprise was to reach practising doctors with uptodate information ~~on~~ on latest

medicines. There were many cross-connections; by disease-category; by alphabets etc. Those were days when India did not have even TV connectivity. ~~Despite~~ INSAT had not yet become a reality. The terrestrial methods of TV was so costly that even in 1977 we did not have TV at home (not even one channel!) No FM radio. Goma's only entertainment was AM/shortwave radio and some tapes.

Coming to Krishnan-Lakshmi couple, they had a nice house in Palace Orchards opposite Sankey Tank (thanks to his earnings in the private sector company in which he worked). As a start-up he had

he had to ~~st~~ struggle — with contents & typing etc being his job and Lakshmi did all the posting. I had seen her pasting addresses ~~=~~ with the glue done by traditional technique — starchy rice. Even the ~~gum~~ ~~as~~ synthetic gum was rare or perhaps costly.

They had a ~~fia~~ Fiat car. Lakshmi - Krishnan had assured Amma that ~~they~~ ~~could~~ she could call them any time for help. They were home almost all time, busy with work.

Lakshmi, Themse, when it came to the class ~~of~~ performance of her son, Hari was extremely competitive. In order to make him come first, she would do his home work — just to make him write

his ~~tis~~ lessons just by copying. If Vijay got more marks, she would go and fight with their class teacher! ... Many I find many mothers in the ~~the~~ 1990's, 2000's doing the same!!

Goma was calm ~~of~~ on these matters. She did not fight back! Vijay when he sought my help in studies, I used to put lots of questions to him, systematically. ~~It~~ In the process he would have solved the problems. Then I would tell him: "Vijay: See, you knew the answers. Just think"

He would retort: "Daddy, but, I hate you for this; ~~I~~ it has taken 15–20 minutes. I could

have gone to play! Other parents give them answers!"

I would tell: "Vijay... on the long run, it does not help. I think you should develop your own capability"

Neither Leena or I put any pressure on him for rank in the school or class — or even the marks.

When it came to writing stories as homework, I would explain options, tell him some tips. "Don't start: Once upon a time — start with an event". He would lose some time; but with words write, sometimes in a hurry to go for play. For Hari, Lakshmi would write and ask him to copy with his

handwriting. Vijay would have felt bad that we did not do this. But he would have got used to this mode.

~~We will come back to the house related~~

In between Gama's friend Sarita would visit her some time.

~~We will come back to personal matters later close to the delivery...~~

* * *

Office work was going on as usual. ~~Some~~ The management structure of APPLE was finalised after lots of struggle. RMV was a vociferous and committed supporter of VSSC; he belonged to the "total loyalists" of SSTC who opposed

moving the first Satellite project (ISSP) to Peenya, the decision for which was done by MGK Menon at the pursuit of UR Rao. Solar cell being affected by the sea coast was one of the reasons given — RMV used to say that ISRO gave such reasons to the Parliament; I had not checked it. These events happened when I was in USA. Even RMV was there but he had cut short NASA stay & went back to VSSC to be with launch vehicle development. But VSSC did not use him well! He did not fit into the tribal politics there. His tribe's so-called Chieftain was Dr. S.C. Gupta who was more interested in his own self preservation and since he was the senior most in Avionics he was safe from the fights of big tribes

of the propellent, propulsion, launch vehicle groups. He did not take care of ~~his tribal~~ individuals of his tribe. Still RMV's attachment to SSTC & therefore VSSC was too much.

Hence he was fighting to make APPLE project the project of VSSC — he used the logic of major systems being Apogee motor, the secondary propulsion systems and ~~a~~ momentum wheel etc coming from VSSC. SD had made him study director. To make him the project director under URRao — who soon was to become a Centre Director of ISAC — was a herculian job. SD once told me in exasperation that I should be ready to go and

take over as APPLE, PD. I told him (SD) that while I can take it up, it would bring down the prestige of Chairman ISRO, as the fight between URR & RMV was open all around ISRO and inability of Chaman ISRO to exert his authority would reduce his prestige within ISRO. Finally RMV blinked — it was a project of ISAC. URRao's Jan 11, 1977 order shows RMV as Project Director of APPLE In addition RMV is shown as Head of Control & Guidance Systems Division of ISAC also (though with an asterik mark "temporary until further orders). P. Ramachandran

had not been inducted into APPLE project yet. M. K. Saha who was in ISSP Aryabhata Project had been given Project Manager's position in APPLE. He could not be put under SEO, PD, Kashmir Rangan as he was junior. There is a note in my papers from him (MKS) to Chairman ISRO forwarded by U R Rao that he had no work to do in APPLE and wanted to be relieved from it. Thus it was a period of unease in APPLE project. Also ISAC, the new born Centre, was setting down. Building work in the NAL complex also was due to start.

I would have been fully engaged in many of these. I was in SLV-3 Proj. Mgmt Board (The Apex one)

and similarly in ~~of~~ SEO, APPLE apx boards as well. Plus ASS work. My self-appointed duo ~~was~~ more assignments.

There was not a month which was free and little relaxed. ~~We~~ Mostly I did not take any leave - casual, EL etc. There were of course official travel outside Bangalore.

As the ETD for Goa ~~&~~ was nearing I took care to see that I did not travel out. 12-8-77 was ETD. It did not take place. Dr. Desai had assured not to worry and said that the delivery would be natural. He therefore desired that she should be brought to the nursing home