

1970-80  
Cmb

(1079)

only when she started getting pain.  
So we had to wait. I had the confidence  
that Mami was all the time with her  
at home. — an experienced mother  
herself. Krishnan - Lakshmi were also  
always at home. A Vasant Gehel -  
Pushpaben available on phone. And above  
all there was a home phone  $\frac{1}{2}$  (a rare  
luxury those days in India, thanks to  
Ludhite approach of the political system  
of all hues! They could support  
atomic energy, space and defence  
research, but things like telephones,  
TV etc were considered luxury  $\frac{1}{2}$ )  
and limited by the monopoly ~~State~~ Central  
Govt departments.)

18/Aug/1977

One day <sup>early morning</sup>  
I think 2 or 3 am in the morning  
Mami woke me up. She herself  
looked pale and weak. She said  
"Darna Carcinoma nahi hoga kisi ko."

(1080)

Roughly it "Rajan something is happening to Goma"

I jumped out of my bed almost being in a panicky state, because Mami was not responding to my queries as to how was Goma.

Came to the small hall / ~~the~~ living room which ~~was~~ was also the bed room / of rest room of Goma for about 9 months. Goma was sitting on a chair - totally pale.

I touched her, she was all cold.

Fortunately there was no bleeding...  
Goma was too weak to speak.

Mami's panic puzzles me. Unfortunately I had not seen Papa (for delivering Raja) or Goma (for delivering Vijay) in labor pain. This was the first time

(1081)

time for me. It ~~is~~ was the severity of labour pain that had made Goma pale and almost non-speaking — not even a moaning. Manji panicked — I don't why. She had been with Goma at Trivandrum for Vijay's delivery. May be then it was different. Also the two miscarriages which had Goma had and the need to bed rest her almost all the nine ~~months~~ <sup>heavily</sup> months, must have weighed in the minds of Manji.

I started ~~into~~ a chaos mode.

Dialled Krishnan; in those days <sup>No indicator display</sup> the hand dialling was by memory. I knew their number very well. But I got a gruff voice on the other side. I said "Sir! Sorry sir... Is it this number?" ~~Then~~ He slammed the phone "Wrong number!"

(1082)

I felt bad that I ~~wrote~~  
~~lost~~ woke up a person in ~~an~~ a  
terrible time in the morning. ~~I~~  
I carefully dialled Krishna ~~at~~

He and Lakshmi came within a few  
minutes from home to our house  
in their ~~car~~ car. Goma was

brought down. ~~at~~ Manji, Goma & I

plus ~~two~~ <sup>Krishna</sup> ~~of~~ them rushed to

the Desai ~~Atang~~ Nursing Home.  
Lakshmi stayed back to take care of Vijay (7 yrs old) who was sleeping.  
Since we were on the move, Manji

was better — Goma a little better.

In the hospital, they  
attended to Goma — Desai's daughter —  
in-law, a young trained doctor, being  
nurtured by Desai came to see her.  
They rushed her to a delivery  
room. Manji went along. I had

(1083)

to wait outside away from the delivery ward. I checked Kirman & ~~Lakshmi~~ and suggested that they could go home. They did. Lakshmi took care of Vidy taking him to her home and sending him to school.

Then after some time Mani came. She said that Goma was okay but the pain had subsided. There was little ~~#~~ we could do.

~~I got~~ Since the nursing home was in Sivarama Circle, I went to go and fetch some breakfast and coffee.

It was a long wait. ... yes pain .. no ~~st~~ subsides. The doctor had decided that it would be natural. So no question of inducing pain or other interventionist methods.

(1084)

Just past noon, Mani said "Raja, I heard a baby cry ...". She rushed to the room in which Gema was ....

Came back happy with all her tiredness gone, with a beaming smile: "Raja: a baby boy is born<sup>#</sup>; both well" ....

It took time for them to move Gema to the <sup>private</sup> room where she would be put post delivery ... I was later told that baby had placenta wound around and they had to disentangle.

Finally Gema came to her room with a new born infant wrapped properly. ~~She was~~ Then I was

(1085)

allowed to come and see. Soon Dr. Desai also arrives there. He would have been given upto date information. He would have given his daughter-in-law direct experience of what he considered a safe case.

He came laughing directly talking to Goma:

"So Goma! you got a baby boy..." and took his ball pen and drew a small ~~to~~ moustache ~~for~~ on the infant's upper lip.

Goma was all in smile seeing Dr. Desai:  
She said weakly "Thank you doctor!"

While going out Dr. Desai told with his usual gusto

(1086)

"Gomati! Get ready for another baby!"

Such was his confidence in cases he diagnoses!

The information was given by Krishnan / Lakshmi too and Gohels by phone by one. (Land line ~~to~~ from some nearby place - public booth or from a shop).

~~Evening~~ In the ~~evening~~ evening <sup>by Lakshmi / Krish</sup> Vijay was brought, after she finished his school. He was very happy. Gomati had thought of naming the child if male as Anand. She told Vijay. Vijay started crying "Mummy! His name is Vikram. I had told every body in the street

(1087)

my brother Vikram is born!"

His mind would have been what we had talked a few times earlier. Vijay's birthday

was that of Vikram Sarabhai ~~12.8.~~  
(12<sup>th</sup> August)

↳ Since he was alive, we did not name him Vikram. It was about 1½ years later Vikram Bhai died.

Now it was about 5½ years after he had died and he was a legend.

Vijay's mind would have fixed in that and also ETD for the baby was 12<sup>th</sup> Aug, though actually born on 18<sup>th</sup> Aug 1977.

So ~~the~~ baby's ~~name~~  
~~name~~ name karam was over.

Any way Gona & I never did such special rituals.

(1088)

So Vikram got his name within a few hours of birth, ~~a~~ named his proud brother Vijay!

Uma stayed a few days in the nursing home, before she was moved home. As Dr. Desai had predicted everything was normal with her and the baby.

During the few years we were in that house, a couple of maids had come and gone. Getting a good maid to help out was a problem then as it is now @ 2017. But in those days ~~the mai~~ most of the maids were very poor; often looks sick. They could ~~be~~ not dress well. Also we did not have much surplus to give them. Even then their stay was not assured. Then came one Lakshamma (whether before Vikram's birth or after I am not sure)

(1089)

Who ~~etc~~ had an important part of the family. Not only was she helpful ~~[there]~~ during those days (in later

years she became very eratic in coming in terms of time etc, then correct etc!) to Goma, she was ~~only~~ one of very few persons (Goma, Mani, Lakshmana, Sudha, Vijay & me) who could approach (let alone touch!) Vikram. He was a touch-me-not. With Lakshmana he had a special bond. Later when he started talking "He ~~will~~ won't tell" Lakshmana, shony!" etc.

Another member of the family almost after Vikram's birth was a baby puppy, named Benji.

(1090)

Krishnan & Lakshmi had a pet dog called Caesar (male). It was a pure breed Lhasa Apso (~~I~~ head (I learnt about all these when Baiji was to come to our house). Caesar was a ferocious and unfriendly dog. He ~~would~~ would listen a bit only to Lakshmi. He would not like any ~~any~~ visitor. He would sit only on <sup>the</sup> ~~a~~ sofa in the living room. When visitors come he would stare at them, on Lakshmi's telling in Tamil "Boru" ~~the~~ "Go man!" he would reluctantly go away. Some times he would show his anger by peeing on the sofa!

(1091)

But he had not bitten any body. He would move around all over the house and inside the compound of their house.

He was

Since he was a pure breed there was a demand for him to breed. So ~~he~~ they had taken him. As a result of the delivery they got a puppy in return — that was Benji. Lakshmi was attached to him as if it was ~~his~~ her grandson. But Caesar hates the whole thing. He did not want any body to share the love of his Master, Lakshmi. He not only protested but also became aggressive. He wanted to finish off

(1092)

Benji. Therefore Lakshmi was keeping Benji all the while in her hand; he was also an active puppy and would like to wriggle out. This made Caesar very ~~a~~ jealous and angry. At night also, Lakshmi had to keep Benji in her bedroom & close it!

After a couple of days of such struggles, Lakshmi decided to ~~the~~ chide Caesar. She showed him her anger. He did not like it as he had never been chided by her. Then he adopted "Caution" techniques. He disappeared. He would not respond to any call; even when it was his food time, when Lakshmi ~~was~~ <sup>went</sup> ~~goes~~ around with his food plate in hand

(P.T.O)

Attached is the one-page flyer on the last SkillsWorld event. We are finalizing the details of timings/sessions, venue in Chennai and our Media Partners. We will keep you posted about the developments. It will be an honour to host you at the upcoming SkillsWorld event.

Regards

Amit Bhatia  
Founder & CEO  
Aspire

(1093)  
and went on searching all around the house. Not even a whimper of response from Caesar. She was very worried. The gate was closed and hence no possibility of his going out. Even otherwise he would not go alone; he had been trained for that.

So he requested Krishnaam. There was a big hunt in their house. No where! Finally he was spotted under the Fiat car parked inside their house. He was on hunger-strike there. He refused to come out. He refused to eat from the food plate.... It was a great struggle for them. Then Lakshmi had to take a hard, painful decision of giving away Benji. But she did not want to give it any body about whom

1(094)

she was not sure that they would take care of him with love. That ~~is~~ was when she thought of Goma and told her that she (Goma) should take Benji immediately. Goma knew the constraints she had. Lakshmi had told her that she should not refuse. Goma was in a fix. She asked me when I came <sup>home</sup> & I replied: "Goma, do what you want, but it will not be easy. The children, house, maids... eh so much to manage!" In those days Goma was not going to school to teach. After she left teaching in the Dhurgathra school, she had stopped. Also she did not have the formal teacher training certificate or degree. Life was too tight on her. ~~I also~~ Since Vijay was excited and promised to take care, I added: "Goma!

(1095)

Vijay will say; I can say; any body can say. Finally the full load will be on you, that too right from the small puppy stage.... In any case without ~~understand~~ <sup>understand</sup> understanding about dogs I will feel ~~unf~~ uncomfortable. I have to read books on Dogs.. That is my part of the theory side... You go ahead and do what you want. We will help as much as we can!"

So Benji came to our house. Lakshmi was relieved. ~~But~~ Benji was at a stage when he could not fully walk... He was too small.. Aama manages him. He was a glutton; ~~with~~ would keep on drinking milk and have ~~and~~ loose motion... Lakshmi used to come daily, to see Benji, - Cuddle him.. I used to joke that Benji

(1096)

had one Grandma (Lakshmi) & Mother (Uma)  
Vijay also played. I had read all  
about Dogs — two books. One was  
more focussed on daily care:

from shampoo; ~~but~~ many don't do.  
Don't give coffee as dog's heart is weak;  
do not use any carbolic soap  
or wash basins on it as ~~the~~ <sup>its</sup> skin  
is porous (unlike human's). True  
for all furred animals. Other  
things about vaccination. One to  
be given right at its very small  
(-infant stage) and renewed once  
after one year etc. Food ....

Uma's job was to find  
the vaccination place. It was in the  
Veterinary College. In those days  
(mid 1970's), all areas beyond

(1097)

beyond Mekhri circle was almost jungle  
Even auto rickshaws were ~~a~~ not always  
willing to come. Later Uma found  
a place near Malleswaram. The  
anti-distemper ~~inject~~ vaccination  
was available in Indian version and  
one German inject version (around  
Rs. 75/-). Indian one was very cheap.  
But we were told that Indian version  
was often of poor quality, many  
puppies ~~are~~ were seriously affected &  
some die. Any way we did  
not want to experiment. Though I  
was always in favour of indigenous  
products (I thought I was expressing  
my patriotism for India - a deep  
commitment to make India advance!)

(1098)

I did not want to take a chance. So Benji had anti-distemper (Acanonam) vaccination. Special dog shampoo ~~the~~ soap etc.

He grew; he played but he also damaged many things to train his teeth. We lost some precious electronics items too! ~~But~~ Later we were very careful.

As he grew Vikram had started crawling on the floor. Benji had a special treatment for him. Excepting Goma he (Benji) would not allow any body to touch his tail. But he would allow ~~to~~ Vikram to do anything with him. Since he was walking and running when Vikram was still crawling

(1099)

Benji had given Vikram a younger brother status. ~~In~~ This continued even later when Vikram grew up standing up taller than him. Benji ~~pro~~ appointed himself as the special protector of Vikram, his toys etc. We will tell about an interesting happening when Vikram was about 4 years or so.

So Geema had three young sons to take care: Vijay, Vikram & Benji... Life moved on very tight. Geema health was fine. She began active life pretty soon

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(1100)

Some words about my book reading. In addition to reading many journals (not ~~so~~ just scientific alone but also commercial types like Aviation Week & Space Technology and other such journals, Space Daily etc), NASA reports, <sup>US</sup> GAO reports etc, I also read many other policy type books, management types etc procured for ISRO HQ Library. In addition I read also read some fiction books (English) Some of them built around historical events — some almost a narration of history in the form of story like The Source about Jews etc. Some of the fiction novels were around Japanese samurais, ninjas, some Vietnamese ones.

(1101)

I forget the names & authors.  
Some of the books were bought  
in the second hand Sunday shop  
road side shops in M.G. Road;  
some excellent books. I also  
read read about economics etc  
Wide reading: as I ~~you~~ used to  
say from Philosophy to pornography!

I had stopped reading ~~about~~  
the propaganda books of USSR.  
But I read some ~~novels~~ writings  
of Gorkii: ~~My~~ Mother etc bought  
in English version from Moscow. That  
is where I got the ~~So~~ book on ~~Sovi~~  
Fifty Soviet Poets. I did not  
read much in Tamil. ~~at~~ ~~the~~ ~~time~~  
For my forward looking learning  
material available in Tamil ~~is~~  
limited (in fact nil); even now

(1102)

it is so! So with other Indian languages.

Naturally in all these my space related readings were dominant — not necessarily limited to immediate ISRO needs. Used to read a lot on Space Sciences ~~as~~ as well, as ~~they~~ it was refreshing. Though ISRO ~~may~~ might not do any worthwhile Space Science research (mostly due to money crunch and also due to the near decay of PRL and TIFR's Space Science Comp.) I wanted to enjoy ~~the~~ ~~it~~ reading the findings of other world space scientists. ~~It~~ --- Direct Russian books were rare to get in English. I used to borrow some books from Chandra who was also

(1103)

a voracious reader. I remember one by Saul Bellow? (spelling?) a Israeli Nobel Prize winner. In terms of books, I do not remember in chronological order - also many novels I read in English ~~is~~ are not in my memory at all, even vague sketches of stories or author's name. They were probably ~~to~~ Read Only Memory!

\* \* \*  
\* \* \*

Another item worth noting was that in our street we had persons from different backgrounds. Mostly middle class life as. Probably we were the only ones who were "foreign returnees" at that time.

(1104)

There were Kerala Christians,  
Others Kannataka, different  
caste groups, one orthodox  
Brahmic Iyengar family ~~the~~ ~~to~~  
whose family head was a priest,  
Parsi - Bombay Rustom & family,  
There ~~was~~ were no Muslims.  
There were none from North India.  
But ~~at~~ on our streets lots of  
young Iranian boys and girls  
used to rush through in two  
wheelers ~~at~~ too often. I don't  
~~to~~ recall why they used our  
roads - maybe Sankay tanks.  
Post - ~~to~~ At Khomeini revolution  
they all disappeared.

Jai Singh & Sarita lived very near  
us and not far away. They were  
the only North Indians. Sarita

(1105)

~~Atharva Vedic Hymns~~

especially used to be very relieved to see Goma & me because she can speak in Hindi and we knew the North Indian food culture — more with Goma & Sarita though well educated in English ~~to~~ had grown up in UP. She had a daughter Malavika (called Babbar). Sarita loved Vijay and played with him. Sarita ~~not~~ would walk with Goma & talk in Hindi.

More about life there later. Also about Vijay & Vikram

~~\* \* \*~~  
~~Coming back to office matters~~

(1106)

Another memorable thing about Vikram's birth was ~~a~~ a handwritten note by SD with his unique style carefully put in a cover & sealed with cello tape. It congratulates us and noted that my responsibilities had increased.

\* — \* — \*

I found in my papers a suo motu write up by me dated 23 Aug 1977, just five days after Vikram's birth on a subject "Personnel promotion policy in ISRO and general technical management in ISRO". It is a "To be opened by

(107)

the addressee ~~class~~ only" marked Confidential and typed in plain paper. Not ISRO HQ memo sheet.

I have written with my full title Y. S. Rajan Asst. Scientific Secretary, ISRO and addressed to Prof S. Dhawan, Chairman ISRO and copy to Shri Y. S. Das Member Secretary (F), ISRO Council.

Though he did not deal with personnel matters of ISRO he was senior with Addl. Secy rank. The JS, I think was S. K. Warnior.

I had discussed about the managerial ~~crisis~~ crisis towards which ISRO was going. "It is partly because the system has grown at a very fast pace

(108)

and also greatly because of the past hang-over of general managerial indiscipline which was considered to be "freedom".

Then I had discussed about vacancy provisions, hierarchy based on grades, the need to reward specialists etc. I have clearly brought out the need to have "a cadre of technical managers who would decide policy matters and would do the executive functions of running project activities of ISRO. They will have top managerial back-up, command manpower resources etc. irrespective of grade".

That note is attached as a running text 1109, 1110, 1111, 1112, 1113, 1114 in the following.  
Then go to 1115

(1109)

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TO BE OPENED BY THE ADDRESSEE ONLY

To: Prof. S. Dhawan  
Chairman, ISRO

cc: Shri YS Das  
Member Secretary (F)  
ISRO Council

From: YS Rajan  
Asst. Scientific Secretary, ISRO

23 AUGUST 1977

Sub:- Personnel promotion policy in ISRO and general technical management in ISRO.

1. As one interested in ISRO, I am getting concerned more and more about the managerial crisis towards which we are going. It is partly because the ISRO system has grown at a very fast pace and also greatly because of the past hang-over of general managerial indiscipline which was considered to be "freedom". I am not trying to do any post-mortem, but with some analysis of what had happened and is happening in the background of my mind, I am suggesting some solutions and also posing a few questions. This is a matter which Chairman, ISRO and ISRO Council have to grapple with very soon if we are not to run into, sorry to say, disaster.
  
2. Even while vacancy promotions for the technical cadre would be demoralising and also <sup>since</sup> it is difficult to define vacancy in terms of grade for a technical job, the present system of reviewing periodically and giving promotions to scientists is possibly the best policy to adopt. However if we see the general pattern of the promotions to 'SE', 'SF' and beyond, by and large, those who have waited long enough in a grade or those who <sup>have</sup> spent sufficient

(1110)

-2-

number of years somewhere in ISRO or outside ISRO, are getting promoted as a matter of course at various levels like SE, SF, SG & G. This phenomenon is disconcerting because one could very glaringly see that many of the upper echlons are not in a position to command the situation when need arises. Whenever some critical activities are to be done in ISRO or for ISRO, we are always in search of right people; many in the top layers seem to have outlived their utility, in other words, have become some "toxic product" of the system.

3. At the same time there are some people in the higher levels who are scientifically and technically very good; however are managerially bad. Just purely for their technical and scientific contributions, they would deserve promotions, however as Managers (i.e. Project Directors, Heads of Divisions etc) they would not.
4. Given the two situations above mentioned in para 2 and 3, one has to pose a serious policy question as to
  - (i) whether the promotions in ISRO are meant for recognition of long and efficient service of the persons have put, or
  - (ii) is it just a thing to be done to fill up vacancies arising out of certain specific task (which is in a way the spirit behind the vacancy promotion)?
  - (iii) Also, is it necessary that a set of people who are in similar grades or perhaps higher should always report to persons much higher?

In fact it is this reporting aspect which is causing considerable amount of managerial crisis and coordination crisis in ISRO.

(III)

-3-

5. In about a year or two, we would be having about 200 people in SF grade and beyond; if we consider the SE grade and above it will be about 400 persons. This being so, given the situation when everybody aspires to report to the big bosses, one can imagine how a managerial functional hierarchy can develop and how ordinary tasks can be fulfilled. One way would be to "administratively empower" the layers of SGs & Gs and make these people in SF and below to report to them. But many a time it is found that the people who could handle efficiently the various tasks are at levels SF, SE etc, the intervening SG, G etc. may complicate and perhaps muck up matters. I need not quote specific examples here. This existence of 200-300 high level persons aspiring to report only to big bosses makes reporting system very complicated when a SF person is, say for example, a Project Director. So many other co-equals or those who are above them in grade they think that they are bigger in the Organisation. Cooperation from them towards Project Director would be lacking a great deal, since everybody would be looking forward to Director or Chairman as the case may be. This problem is going to multiply further as further promotions take place.
  
6. If this psychosis is allowed to continue we would be an atomistic or amoebic organisation where everything splits into small units. This may be alright if there are a number of small research problems for each one to tackle. Unfortunately ISRO tasks require bigger systems and hence in the overall ISRO, one could have only 10 or 15 such major systems going. Hence one could think of not more than 30 to 40 technical managers in line role and another 30 to 40 senior persons could function in the form of staff or advisory capacity. By senior I mean here mostly from SF and beyond. In a

few cases it may even be SE also. In such a situation how to make the system workable as the supply of senior managers at least in numbers would be much higher than the required number. In fact this numerical surplus coupled with general inefficiency or narrow speciality of many in the higher brackets and psychosis

that each one should have an independent empire leads to unmanageable managerial crisis. In fact this is the crux of the problem in today's ISRO activities and I believe that general slow down of ISRO is because of this situation which leads to gaps in coordination, communication etc. Each little problem gets escalated to very highest levels for solutions. This frictions in the Centres happens between Projects and Divisions and in the ISRO level between various Centres.

7. It is to stem this crisis ISRO has to evolve some major policies with respect to the technical managers.

(i) First of all ISRO should make up its mind as to what is the role of the technical managers<sup>to</sup> and what ~~are~~ their powers<sup>are</sup>.

(ii) What is the philosophy of promotion? Is it to reward the good services and general contribution of the employee or is it an indication of status?

(iii) Is it necessary that persons in the equal grade or grades above cannot be managerially controlled by those who are in the same grade or even below? This is a peculiarity of science management where a senior specialist cannot always be made a Manager or Project director and at the same time the Project Director will need the services of the Senior Scientist in some cases.

- (iv) What to do with people with narrow speciality or who generally lack managerial expertise though they would be useful to the organisation? If they are promoted, does it mean they have function independently, reporting to Directors or Chairman?
- (v) If high salaried people cannot co-exist in the Organisation without escalating every issue to the highest bosses, then either promotion has to be made strictly in terms of keeping good technical managers on the top of the salary structure, which could suffocate quite a few good scientists who may not be aspiring to become managers, or it has to be clearly laid down that salaries/grades need not be indicators at least above certain level for reporting structures.

8. To the above questions which I have raised, I suggest some radical solutions, namely:

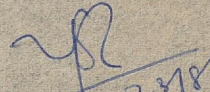
ISRO decides to develop a cadre of technical managers who would decide policy matters and would do executive functions of running the project activities of ISRO. They will have the top managerial back-up, command manpower resources etc. irrespective of grade. Such manpower which they will command will be defined by the top managers for each individual situation. There should be clear instructions to all that there will be no flouting of lines just because of grades etc. This radical solution would allow for a reasonable efficiency system even while the promotion opportunities to scientists are not unduly restricted since the executive powers and salaries are reasonably decoupled.

(111A)

The alternative to this is to do a vacancy promotion in which case the hierarchy gets built up; however what one would do with the past hang-over and toxic products is something to be thought of.

- 9. I am raising this issue after observing cautiously with concern the present developments in ISRO which are not altogether rosy. I trust some decisions in this regard would be done by ISRO very soon.

Regards

  
2/18  
(Y.S. Rajan)

(1115)

Such issues plague ISRO even today. The persons best-fit for the type of work are not put for those tasks, due to the problems of ~~so~~ "juniority - seniority" — also the managerial jobs are more visible and therefore those who are best fit for R&D try to push themselves into managerial positions; they don't do their best in those positions and organisation loses the talents of the best R&D person.

In USA as I had observed such ~~a~~ problems ~~is~~ are greatly resolved because of multiplicity of opportunities available outside NASA and not every fund or ~~the~~ project in USA relating to space is controlled by NASA or its top managers. For example if

(1116)

a person leaves ISRO, he/she would find it difficult to get into space related activities in HAL or BEL or an academic institution

— all of them will depend on ISRO for funds. ~~IS~~ Industries working

in space related work are totally dependent on ~~IS~~ ISRO contracts.

Only option for the person would be to go DRDO — which that person may feel as "from frying pan to a fire!"

Not so in ~~NASA~~ USA.

There are projects of Dept of Defence & NOAA and even in the 1970's

a vibrant <sup>emerging</sup> private space industry

not dependent on <sup>funds of</sup> Govt of USA alone,

Also ~~the~~ there was <sup>(is)</sup> a continuous churning of managerial jobs/positions

(1117)

So much so that nobody ~~would~~ wouldn't feel permanency of their chairs nor would others ~~be~~ below ~~would~~ feel that they had to look for boss's retirement.

• ~~Of~~ Such situation was possible in USA due to the huge size of Space Enterprise even during the 1970's; it was so in many high tech enterprises. Whereas in India it was miniscule and therefore many talented persons were locked up in a few institutions which had hierarchies (while promising egalitarianism as their practicing ideal!)

• In India now @ 2017 such hierarchical suffocations are

(1118)

not felt much in ICT industry,  
and competitive industries like Auto,  
Pharma.

Most of the S&T based  
endeavours are still (@ 2017)

• Suffocating for aspirant younger  
persons who reach middle  
levels of hierarchies. The  
ISG report I did by talking  
to many such persons and  
having an ANONYMOUS survey  
~~indicates~~ confirm these (@ 2010).

It is ~~an~~ ~~is~~ a policy  
issue, if unresolved, would  
lead to ~~symptomatic~~ stymieing of  
"intellectual productivity" in India.  
"Brain in the chain" as the  
Prime Minister Rajiv Gandhi told

(1119)

in 1980's.

I In 1977 sitting at ISRO and being able to access various levels from young ~~and~~ persons to highest hierarchical levels, I could sense these. I could only raise the issues with persons at the highest levels. I knew that they ~~cannot~~ could not solve the problem within ISRO easily. It would affect the deep social psychology of many scientists, engineers and managers of ISRO. ~~Though~~ Also in the short term which was ~~also~~ their primary concern it would have been better to keep

(1120)

things as they were and postpone any radical steps (even discussion on them) to a distant future.

My intent was that if some discussions begin, a few positive steps towards the future may emerge.

Many ~~#~~ excellent persons left ISRO in the 1990's and 2000's. But most people stayed ~~one~~ on. TINA factor (There is no Alternative) perhaps held them inside ISRO. Will ~~they~~ it act in ~~#~~ the later 2020's? Or maybe ISRO has found within itself a method to ~~main~~ keep its flock — a mix of dynamic <sup>and</sup> mediocre, ~~or~~ patient ~~writers~~ persons who would wait for their chance, even

(1121)

while doing their own versions of internal politics. It seems to be working.... My concern expressed in 1977 and also as I saw ~~in~~ during the ISG report period (2000-2011), were perhaps a mere reflection of "cribbing" by some of the best / aspirational persons from ISRO!

Almost immediately following was a handwritten note from me addressed to

~~Chairman ISRO~~ SD dated

~~26.8.77. It appears to be the~~

~~final draft - corrected to final~~

~~stage. Not clear whether I~~

~~re-wrote an original~~

(1122)

I had my final handwritten draft.  
I found a bit later my final  
~~the~~ note sent to SD with neat  
handwriting. It explains  
~~the ISRO side~~ my aspirations,  
my psyche etc very plainly. It  
would be useful to learn about  
my own evolution.

Then constraints of ISRO  
and terrible situation within ISROHQ  
ruined with internal competitive  
politics. I had submitted to him only on 22/9/77  
I don't recall SD calling  
me and discussing them. ~~But~~  
~~he did not show me as can be~~  
~~seen by a note later of 8.8.77. - He~~  
had kept my 26.8.77 <sup>Submitted 22/9/77</sup> note ~~(submitted)~~  
carefully (It is 8 days after Vikram's birth)  
and returned. Was he seeing my tolerance  
levels by referring to it -  
The 26.8.77/ <sup>22/9/77</sup> note follows..  
31/8/77 / 1123, ~~1125~~ - to - 1134

(1123)

PERSONAL

ISRO HEADQUARTERS  
STAFF OFFICE TO SECRETARY, DOS AND CHAIRMAN, ISRO

0

Chairman to see: AT LEISURE

My problems have been worrying me for a year or so. I was postponing such a writing to you. Even now, I had withheld the draft submission due to Chairman being busy with INSAT-1K. Good times, when Chairman won't have worries, do not seem to come; and I cannot keep my burden too long.

I request a patient reading of this note.

Regards

FROM:

Rajan

DATE:

22/9/77

(1124)  
To: Prof. S. Dhawan  
From: Y S Rajan

Sub: ABOUT MYSELF

PERSONAL  
Chairman may read  
AT LEISURE ;

I request a full reading.

DT. 26.8.77

1.0 Over the past 2 or 3 years, I have written a few notes to you, about my aspirations and fears, — sometimes on specific suggestion from you. The latest one emphasized the somewhat gloomy conclusion I often come to, about "the writing on the wall." You just told me, "I don't think you have to get out of ISRO!" We did not discuss the issue further. In the present note, which would perhaps be the last one from me on this subject, I <sup>attempt</sup> to put certain <sup>issues and</sup> questions rather bluntly and pointedly.

2.0 The only person to whom I have even made a frank self-analysis is you because I have so far not found a person in high position, who would understand my intellectual aspirations, human dilemma etc. This is not a flattery, but a mere statement of fact; in fact, this fact makes my life tougher. Amongst equals due to the unfortunate "competition", I cannot open up fully (even in this category there are only

a very few who can understand me; I do occasionally discuss partially with them.)

3.0 To put it in a nutshell, I am a materialist with a considerable hope in the power and the future of collective humanity (with substantial faith in Marx-like optimism). On my personal ethics, I am largely governed by a strange mixture of Hindu-Buddhist self-discipline — Right Path, Golden Mean, general compassion and moderate asceticism (detachment).

The above two approaches to life lead to my cherishing self-respect as a value, and having some amount of intellectual arrogance. These two personal qualities pose problem in a social-organisational environment largely governed by irrationality — which is the characteristic of most Indian organisations including ISRO.

4.0 To describe my situation in a simple operational language I could list the following items:-

(i) I wish to contribute to and direct some major Science & Technology activity in the country. Contributions

(3)

(126)

Personal

to basic research at this stage is almost ruled out. Hence it has to be a Technical / Managerial role.

(ii) I have not attempted to have nor do I have "personal" contacts in "higher circles of power".

(iii) Opportunities in ISRO are dwindling.

(iv) Second fiddling to many persons in ISRO would almost be a disaster to my career and personality due to their propensities; INSAT etc fall in this category (so it seems!)

(v) ISRO Centres/Units are getting jealously exclusive and it is getting increasingly impossible for any trans-plantation; in other words each person has to find a future in his own Centre / Unit, unless something extremely rare takes place (Vasagam as APPLE, P.D; Pant as Director, SHAR)

(vi) HR itself is generally overstaffed in terms of senior persons (GSF/SE) and there is too little each one can "command" for himself. It

must be noted that HQ cannot do detailed research work which is better done at the Centres. What it can do is coarse planning and high aggregate level & monitoring.

The problems of this overstaffing is further complicated by the general non-recognition of HQ role by Centres/Projects

Imp. pt. (VII) My role in HQ has been governed very much by the changing needs of the organisation, which, I hope, I am able to meet well. But the reward I get (I feel) is general diffusion of my role and real ~~confusion~~ confusion about my future.

Chairman perceives that I <sup>care</sup> "take of" Satellite technology. This was tone of ARYABHATA. For SEO definition itself Ravi tried his best to interpret the Satellite design itself in terms of the remote sensing mission. Then in APPLE, the two key words ESA & Communication focal point reduce my involvement to ~~&~~ the membership of APPLE Management Board, ~~and~~ participation

(5) (128)

in some meetings called by Chairman, Prof. URR etc., and dealing some papers marked to me by Chairman / JPS. I cannot take <sup>major</sup> initiative since I do not want friction with Jai whose contributions to ISRO are very good.

In Communications systems, though I am really a specialist, ~~due to~~ <sup>due to</sup> the broad division of responsibilities we (at HQ) were given in the beginning I play only a peripheral role. I don't regret it.

Remote Sensing & Meteorology became my concern since Ravi left for NRSA and I have developed considerable understanding and insight into the subject. I feel I enabled Chandra to grow; and was instrumental in improving SAC-HQ relations and introducing some systemsness in ISRO. Since Ravi is back this role is under challenge.

If Chairman says that Ravi will be the focal point for Remote Sensing & Met, by the same logic Jai applies, SEO, Future Earth Resources Satellites etc will be Ravi's concerns.

What is then left of Satellite Technology?  
Crumbs of RS-1. This peculiar situation is because entire satellite activities are highly projected.

(6) and are under development.

(1129)

With Jai's penchant for "totality" of whatever he gets involved (ESA, Communications, INSAT etc) there is no planning or coordination possible in satellite facilities & techniques (be it APPLE, INSAT or any other satellite). If Jai & Ravi use the same logic, the stable position for me would be to accept a position as I do today for APPLE i.e. "a general consultant" and at the most a Mgmt Board Member (even this Ravi would not allow for SEO or Earth Resources Satellite since his penchant for "thread" is even more stronger.)

In launchers, SHAR launches etc somehow VS, PS, PNJ & myself seem to work without this focal point problem. My role is limited to Avionics & SHAR interfaces only. VS is the overall person, (with autonomous operations by us).

Sometimes VS may be unhappy that I am SLV Board Member; but I think he is well adjusted <sup>now</sup> due to TTG role etc.

THE CRUX OF THE PROBLEM ABOUT HQ TECHNICAL JOB IS THAT IT CANNOT BE DETAILED OR TOO SPECIALIST;

(7)

(1130)

FOR EXAMPLE I CANNOT DESIGN SATELLITE OR SATELLITE FACILITIES AT HQ EXCEPT AT BROAD BRUSH LEVEL — THE WORK MOVES OVER TO ISAC; SIMILARLY REMOTE SENSING, SCIENCE OR COMMUNICATIONS OR LAUNCHERS. THIS BROAD MANAGERIAL ROLE IS PRECARIOUS ESPECIALLY WHEN THE HQ ROLE IS TENUOUS, INSECURE AND UNDER CHALLENGE (WITHIN & WITHOUT). THAT IS THE REASON (AT LEAST PARTLY) OF RAVI TRYING TO GET OVERALL REMOTE SENSING, JAI ATTEMPTING TOTALITY OF INSAT, APPLE, ESA etc, MY GENERAL DISCOMFORT (as I express here) and so on.

Coming to the Asst. Scientific Secy's role the abbreviation really describes much of the tasks handled! The tasks are DFVLR Coordination, HQ administration (unavoidable) which is to be done in a laissez-faire manner because of the high string scientists and various other pat-pouvo items. It is a load I gladly take because otherwise Chairman has to worry. The only positive feature is that if at all I become a Director / Chairman one day, I will know how to handle administration. Otherwise it is a nuisance

(8)

(1131)

and adds nothing to my status in the organisation or outside (as it has no spelt out role nor gubernatorial connotations).

As Scientific Staff Officer to Chairman the tasks are same as I did before except that it adds some status for Delhi Correspondence! For Shri Das I always assist in advisory cum drafting capacity — as what, perhaps, Rajan.

By and large, my role is that of a friend-philosopher to many in ISRO and a good Samaritan <sup>and a fire-fighter,</sup> & But, <sup>can</sup> <sup>leave alone growth,</sup> that be a basis of Survival & in an organisation?!

I have spelt out the above facts not to grouse but as arguments for the statements which will follow. On territorial issues (even for the nebulous territories !!) within ITR, as & a matter of choice, I mostly yield to aggression as the 'spoiling' of relations on these nebulous issues, I believe, won't help anybody and also it will increase Chairman's headaches, without solving problems.

(9)

(1132)

(viii) I should mention some positive points that some senior persons in ISRO including all Directors have good opinion about me (again an inference); but I am doubtful whether they would worry about rewarding me ~~and~~ or caring about my career. I do not discuss such issues with them for obvious reasons, as I had mentioned to you

(ix) As years are passing by to get into "projects" after a few years would be a retrograde step unless it is a very big one. The only route for me seems to be through an organisationally important (and active) and senior position, occupying which for a few more years, can make me ready for a higher position of <sup>or more</sup> Director role etc in say a decade. Whether it is feasible, I don't see a visibility.

(x) So WHAT DO I DO? I CONCLUDE THAT MY GROWTH IN ISRO/DOS IS FLATTENED AND I ~~can~~ "SEE" THE WRITING ON THE WALL. IF SOMETHING SOON DOES NOT HAPPEN FOR ME TOWARDS GOOD, I FEEL, THE NEXT DECADE FOR ME WOULD BE A DECAY PERIOD. EVEN MY OFFICE-LIFE COULD BE IN JEOPARDY IF CHAIRMAN LEAVES

(10)

THE SCENE,

(xi) I had requested Chairman earlier to help me find some useful role outside ISRO/DOS.

(xii) I WOULD NOW SEEK ONE ~~A~~ FRANK OPINION FROM CHAIRMAN:

Am I aspiring for the impossible not in consonant with my capabilities? If the answer is yes, then I should perhaps revise my goals and my own conception of my roles.

I do not seek tutelege nor guarantees. I would not feel hurt if I am told of my ~~in~~ inadequacies. I need some advice,

5.0 If Chairman would tell me about his appreciation (including criticism) of my capabilities, and advise on (a) possible course of action(s), I could at least start to plan my career and future.

Days are galloping fast.

(11) (1134)

If I don't plan soon —

either I lose out in "Life",  
~~or~~ and resign myself to "Fate" which  
is the last thing I would like,  
or at some later stage may be  
forced to take chancy routes.

6.0 I seek some frank opinion of  
Chairman about me and advice on  
possible future course of action.

Rajan  
31/8/77.

P.S.: Chairman may destroy this after  
reading (or keep if he so wishes). This  
writing is submitted to Chairman, mainly  
to bring out some facts — the only alternative  
would have been sulking. Otherwise,  
(Chairman perhaps need not be told),  
I assure full, conscientious, and efficient  
performance of any duties I am doing  
now or called upon to perform; when I  
have problems in that I will be frank enough  
to inform Chairman.

Rajan  
31/8/77

~~(1128)~~ (1135)

I had mulled over the earlier note from 26/8/77  
updates ~~Am~~ ~~An immediate example is~~  
on 31/8/77 & submitted only on 22/9/77 date

Another hand written note 31.8.77

It starts "Chairman gave me back  
a few notes I had written to  
him on various subjects and a

few more and asked me to  
summarise the action points

They are as under: "

My note start from  
DOP of 25 Sept 26 etc. ... Then  
in the next page some crisp  
bullet points under a title

" Action yet to be taken "

They cover only the ISRO  
programme related issues, Newspaper  
convention & National self-related  
to develop self-reliance. None of  
my personal issues.

It is an excellent summary

See next pages as recap but  
~~1129, 1130, 1131, 1132~~

→ spots 1136, 17, 8, 9, 1139(a) → then go to (1140).

Handwritten:  
31/8/77

To: Prj. Dhawan ~~(1136)~~ Chairman's use only

From: Y. S. Rajan.

31. 8. 77

Chairman gave me back a few notes I had written to him on various subjects, <sup>and a few more</sup> and asked me to summarise the action points. They are as under :-

(1) Data Collection Platform for SEO  
— dt. 25 Sept 76. ~~is~~ Appraised of the general confusion at SAC esp., the ISAC interface (SAC's handling of it) More or less solved. NO ACTION needed.

(2) P. N. Jayaraman to be formally named SPAG member. Not done yet

(3) S. B. Iyer's work as ISAC: I had suggested (a) Dy. Head, Systems Test Section & (b) Dy. Head of Environmental facilities under Gambhir. I had also highlighted the importance of some title he should have, without which he may be abused or underused. Chairman yet to take action.

(4) M. K. Saha's letter to Chairman through Director, ISAC for kind consideration of an alternate

(2) ~~(1142)~~ (1137)

position outside APPLE.

Action yet to be taken.

(5) Some important actions — notes on; Some have been completed. Some have been overtaken by time. I record only yet to be completed items.

- The human problem of QAD, & Shri Mathur of VSSC and its impact on SLV-3. A good QA head to be found & new team for VSSC.
- Deployment of some good engineers to help Venkatachary with ISTRAC. Skill incomplete.
- Microwave Remote Sensing needs internal organisation in SAC; skill confusion continues.
- NRSA - ISRO interface. Belting of.
- Identification by exemplary punishment and selective boosting, some (senior) better line executives at the centres to reduce Chairman's loads.

(3) ~~(1143)~~ (1138)

- Formation of an SLV Variant study team with a few dedicated people
- Settling the problem of Ravi Sharma
- Finding a senior person like Dr. B.P. to assist Chairman's routine work so that Chairman is free for policies & Delhi work.
- Naming a successor to Dr. B.P. at VSSC right now to allow settling time of 6 to 9 months. (and limited stock of)
- SAC's depletion of efficient executives. The negative role of Admin & PPG there.
- To better career opportunities of administrative staff of ISRO.
- Chairman to have regular exchange of ideas with Directors / Group Directors to imbibe ISRO policy in them. To day they all seem unaware or alienated.
- Some major reshuffling of persons at senior levels within

~~(1144)~~  
~~(1140)~~ (1139)

(4)

ISRO to avoid Centre - parochialisms

- Form formal study group and start ~~at~~ limited R & D activities needed for SLV Variants & Remote Sensing Satellite so that they can become reality in Sixth Plan. (Otherwise Sixth Plan would be a vacuum).
- Take care of our spending rate and avoid surrender of money.

#### National Science

- Setting up of an Aerospace ~~Space~~ Consortium in India: ~~to~~ start with a Consultancy Firm within DOS with VRG as MD and an "intergovernmental" Board.
- Science losses in the country to evolve a method of selectively developing certain technologies in ~~the~~ India so that a viable S & T base can be built up. Otherwise, with the ~~of~~ country getting used <sup>to</sup> more and more to imported

(5) ~~(145)~~ (139a)

Systems, dependence on foreign countries and especially on critical technologies will increase with all the resultant implications. A mature, & planned self-reliance is more needed in S & T sector now.

(With our INSAT system approved, I abhor the consequences of not undertaking corresponding indigenous technical growth).

— X —

Rajan  
31.8.77

(1140)

There is another remarkable note from me titled "Science Policy for the Country" dated Sept 3, 1977. It is a typeset note. ~~It~~ Why I say remarkable is ~~that~~ because it addresses crucial issues — the difference between Science & Technology — How selfish scientists are promoting the confusion etc.

I had not referred to this note in my ~~earlier~~ later writings. These 2 papers returned <sup>to</sup> me by SD remained as archives. But I find now how Indian Science Policy had deteriorated!

↳ See continuous paper

1141, — 1145  
incl newspaper cuttings

Pink sheet  
✓

(1141)

INDIAN SPACE RESEARCH ORGANISATION

HEADQUARTERS

MEMORANDUM

For : Prof S Dhawan, Chairman, ISRO/  
Secretary, DOS.

File / Ref: 04/29/15

From : Y S Rajan,  
ISRO HQ

Date: September 5, 1977

Subject: SCIENCE POLICY FOR THE COUNTRY.

- 1.0 Sometimes I wonder why I should worry about this at all in the circumstances prevailing in the country (past and present). However various trash that appears in the newspaper daily in the name of discussions on science matters really increases nausea and depression. The issue seems to have boiled down to CSIR, Scientists versus IAS, procedures of consultation etc while the real problems are almost untouched. As a Government servant myself, there is very little I can do in this matter. I cannot analyse the issues and express any views because it can always be interpreted as public criticism of the Government. Also considering the general state of elite in the country, mostly it will be infructuous to write one or two guarded letters or articles. If I can express my views to the powers-that-be, I hope at least I would have done something in this regard. I happen to be fortunate to be able to address this to a Science-boss, who would at least listen. Hence I am putting forth my ideas on the subject to you; I am doing it partly to relieve myself of some of the burden !
- 2.0 One of the greatest tragedies which have taken place in the Indian Science over the past few years is to mix up science and technology in an undue hurry. Self-seeking scientists and scientists-politicians have used these as exchangeable words; their short term goals have been to seek funds for their laboratories or projects by fooling the politicians & administrators. This has created a state of confusion where the subtle but important difference between long term scientific research and quick-result-oriented development activities has been ignored and almost not understood at all. Import substitution, completion of erection & installation of imported hardware and facilities, etc have passed in the name of science and technology. This has done considerable damage to both science and technology. The administrators have not been educated about the processes of science & research and have been fooled to expect some quick results by showing some of the activities which are neither development nor research i.e. building of a laboratory and installation of an equipment or computer system and so on. On the other side the importation goes

unchecked both by the scientists concerned and also other sectors of the economy. Thus without the true nature of science not being discussed or understood at all, much of the elitist show-business that has gone on so far, has not made a dent in the social/economic ~~scen~~ of India.

- 3.0 Yet another grave damage to the system has been done by many of the scientists and science bosses whom, I am sorry to say, I would not categorise as scientists because many have not even caught in their daily life the right philosophy of science which is observation, empiricism, and theory based on observation; also in the entire process of science and technology there is an implicit faith in this world and more so in the material nature of human activities and development of human society. This subtle factor when not understood and imbibed, leads them to treat science as 'Pooja' or a magic wand. The resultant consequences in a tradition-bound and superstition-ridden society have been disastrous. Though I agree that basic production activities, even the largely imported machineries etc used in the commercial sector would slowly lead to the changes in the attitudes of the society, the casual relations can be "reversed"; i.e. if the correct attitudes are consciously imbibed in the society, the industrialisation can be made faster. When the scientists and technologists take unscientific attitudes towards life, or don't even understand the basic premise of science, it is too much to expect the politicians especially the bulk of the staid and obscurantist ones to understand the inner dynamics of the present day societal development ~~xxxxx~~ and human progress.
- 4.0 There is a confusion about the entire development process in the country; the mixture of ideas that float around range anywhere between an obscure and revivalist interpretation of Gandhism to the populist intrepertation suggesting various panacea.
- 5.0 Recently I saw an article about the defence science which has justified the entire defence science activities because of the immediate utilisation function resulting from the differences in the environmental conditions in which the foreign equipment are made and those prevailing in India ! We know the disastrous results of the mechanistic interpretation of import substitution as practiced by DRDO and the Services. The author does not realise that the direct result of such a simple interpretation is to condemn the entire defence Science in India to a modifier of an equipment

imported or producer of the necessary spares from "indigenous" sources. This is an essential technology function needed on the short run for a country which is (hopefully !) trying to catch up with the rest of the world in terms of some basic assured living for its people . But can it be called science at all? I don't say that such popular articles don't have a role. But issues on science policy in the country are not discussed anything beyond this level !

6.0 The same confusion can be seen in the whole controversy about CSIR. S&I are mixed up in the minds of people who criticize and suggest changes. I am not for a moment suggesting that science & technology should be decoupled and separated into watertight compartments. Not at all. They cannot be as they have organic linkages. Technology is the outward sign of a changing society; a sign of the changes in the productive forces that are taking place in the society. We have to acquire it - imported and indigenous only as a short term process; but acquisition of a sign can at best be a short term effect that cannot be sustained without internal dynamics leading naturally to the outward signs. In other words, the contradiction or hiatus that exists in today's India between the rate of technological growth and the "internal will" of the masses cannot last long. Either the internal will of the society should correspond to the technological growth or else the growth is bound to stagnate whatever be the amount of external or foreign transplation.

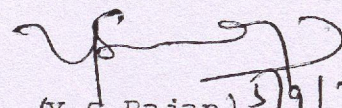
7.0 It is in this context the science (and all the implicit philosophy and methodology behind it) has relevance. Science is the provider of the internal will to a society to make material progress; it observes material nature; it believes in the material origin of life and therefore man's ability to observe, understand and control it. Having said so much, I do not want to shy away from the statement that the development and growth of science in a society cannot be decoupled from its social movements or social dynamics. It cannot be grown in an ivory tower with formulas (though occasionally one can produce a Raman or Ramanujam); the general social role of science is not just to produce eminence but to propel a society (or to be one of the important ingredients that propel a society towards material progress). How much the Indian science has contributed towards this end? Would the Indian scientists turn their minds to the roots of some of these issues - the social origins and the social necessities of science and not necessarily populist panacea?

1144

8.0 I view the reports of the re-organisation of CSIR, DAE etc in this light. There is no use taking a tribalist approach to the problem by reducing it to the level of a fight between bureaucrats versus scientists and to the procedures of consultation. I still, even in these days, believe that the assertion that the scientists alone should decide about themselves and their organisation is not correct in principle as it is the society that sustains them. Society exerts itself through various channels and one should take note of all these and allow for these. The real issue is whether India wants to grow materially or not, and whether Indian society will develop the inner mechanism of this development for which Science is an essential ingredient. This means fixing some goals of development, certain vision of the future, and certain philosophical attitudes towards the world and its growth. From this broad canvas one can derive the plan of action with lots of debate, of course. Without this theme in mind, the whole issue of debate by the scientists as it is conceived in the case of CSIR etc is likely to fizzle out as to who gets the lolly-pop and who gets a brick-bat.

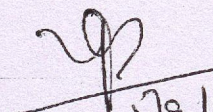
9.0 Though I am reasonably clear about the issues I am concerned whether the situation can be reversed and politicians/administrators could be educated by well-meaning scientists; in this process I do not consider the whole "tribe" to be useful. Today by and large the national perspective is lacking and the issues are seen as protecting the empires. Today a great deal of qualified ~~specified~~ "Scientists" look at their work as means to earn in order to fulfil the middle-class yearning for luxury goods (I don't preach asceticism by any means !). Unfortunately science is not seen as a tool in scientists are to be blamed. How would one correct the situation? This is a question I am just leaving with you, at least for the present, for the reasons I have mentioned in the beginning.

With regards,

  
(Y S Rajan) 3/9/77

P.S.: I don't in any way under-rate the little operational fights some well-meaning scientists would carry on various issues, while I describe the broad scenario. World or society does not come to a standstill waiting for a great-leap forward or for an all powerful mid-wife to pull out the revolutionary baby. But the broader scene should be remembered often so that the little issues don't become an end in themselves.

usr\*

  
3/9/77

# Research & development in the defence forces

by Lt. Gen. K. P. Candeth (Retd.)

(Our Defence Correspondent  
(Ind. Express Aug 23, 77))

IN 1947, when India became independent, the Armed Forces of India, obtained all their defence equipment from Great Britain. For some time thereafter, it was felt that as a peace-loving country there was no necessity for an armament industry to be set up and even the necessity for a standing Army was questioned. However, India soon found out that it takes two to make peace as it takes with Pakistan and the Portuguese in Goa, China and internal insurrections in places like Hyderabad, Nagaland and Mizoram—established clearly the necessity for an Army and a defence industry.

Even after Independence, we continued to be dependent for some time on UK for our equipment, but soon found that the cost of importing all our arms and ammunition requirements was prohibitive and it was realised that we must undertake development of arms and equipment ourselves and so set up a Defence Service Organisation and Technical Development Establishment (DTDE). The electrical and mechanical engineers who manned DTDE were really expert repairers and maintainers of equipment, but their training did not equip them for design and development. Nor did they have the requisite scientific and laboratory backing and facilities to design and develop equipment.

It may be argued, as indeed many have done, that it would be cheaper for a developing country to select arms and equipments from various countries and enter into agreements with them to manufacture them under licence in India. Indeed, recourse was taken to this method initially as agreements to make Vijayanta tanks, Leonard class frigates and MiG aircraft bear witness.

However, this method has serious drawbacks. Firstly, each country produces equipment to satisfy its own needs to work best in the terrain and climatic conditions in which it expects to fight and for the tactics it employs. The equipment produced by outsiders may not satisfy all our requirements. To take a case in point, the tanks produced in UK and European countries are primarily designed for use in Europe, in the mud and slush of Flanders and in the winter of Europe; they do not cater for the dust and heat of the Punjab and Rajasthan, and this was a major defect in the design of Vijayanta tanks. Similarly, the Russian radars supplied to our Navy were built for operation primarily in the Baltic Sea and Northern European waters whereas our fleets operate in the hot and humid waters of the Indian Ocean in which climate these radars need frequent rest and maintenance to keep them going.

Secondly, the country supplying the equipment can call the tune by denying fresh supplies or crucial spare parts, or equipment may become obsolete in the country of origin and so new equipment and spare parts may not be available. In fact, during our conflict with Pakistan in 1965, the British stopped all sales of arms and equipment to us and caused us much embarrassment. The Russians too tend to be very tardy in sending us fresh supplies of brake pads required for the braking gear of our MiGs resulting in many of our aircraft being out of action.

Lastly, it must be realised that

we can only obtain equipment which is already in use and surplus to the supplying country's needs. Further, in such items as electronic devices, it means that the supplying country knows our exact capacity, wavelength and even our tactics. Again, as a large number of these items come from commercial companies, there is no guarantee that they will not sell the same equipment to countries hostile to us or give them information of the equipment given to us. This would jeopardise our security.

Therefore, it is essential that we take measures to design, and produce our own weapons and equipment in our country. For this, we need dedicated scientists who have at their command facilities to design, test and develop arms and equipment, and facilities at call to give form to their ideas. This calls for close liaison between scientists and the defence forces, for the scientists must know the requirements of the forces and must be able to see how each equipment is used in practice, its drawbacks and limitations, so that they can eliminate the defects by improved designs. A remarkable example of what has been achieved is the use of immersed paint and cathode treatment of ships which has almost combated the tar snags can be kept at sea, thus saving congestion in drydocks and crews of ships.

The realisation that science and scientists have a great part to play in helping our country's defence efforts resulted in the creation in 1953 of a Defence Research and Development Organisation (DR & DO) by amalgamating the Defence Science Organisation created in 1948 and the then existing Technical Development establishments. The head of this organisation is the Director General, DR & DO who also functions as the Scientific Adviser to the Raksha Mantri. The policy is laid down by the Defence Research & Development Council which is presided over by the Raksha Mantri himself and all matters relating to the design and development of equipment and spare parts, or improvement of performance of the existing equipment, are referred to this organisation for advice and solution. In order to maintain liaison with the Services, there are Scientific Advisers at Service Headquarters and at the Army Commander level who attend manoeuvres and exercises, and watch the performance of equipment and advise on use, improvement and preservation of arms and equipment.

The DR & DO is headed and staffed by eminent scientists and their work and advice have already resulted in saving much foreign exchange and are making us increasingly self-sufficient and consequently less dependent on foreign supplies. This organisation which started in a small way in 1948 has matured and grown and now has a strength of over 2,500 scientists and has call-over establishments and factories employing scientific and technical personnel expert in their own fields of work. It is now engaged in over a thousand defence projects, which will make us more and more self-reliant. Research and development is necessarily expensive, but the neglect of it will mean dependence on foreign countries for our security and so it is an activity that must be fostered if we wish to retain our right to

an independent foreign policy.

~~10/10~~  
10/10  
awes

(1146)

My writings above ~~would~~  
~~have~~ has a strong Marxian  
content — not directly from Marx,  
Engels, Lenin or Mao or the useless  
~~pit~~ leftists who were claiming  
to be the gaudian-angels of Marxism  
& Left.

It comes more from my  
understanding of J. D. Bernal,  
& D. D. Kosambi and a few others  
~~and me~~ (even M. N. Roy)

Plus my own interpretation of  
life. I was not anti-religion  
even in those days. Especially  
in India it was not necessary to  
be so, because various versions  
of Hinduism, as spoken about,  
or written about or practised

(1147)

do not conflict with the workings of science. My concern was to make Indian people aware of the scientific methods & technological applications for their betterment.

Unfortunately during the new Janta Govt period ~~the~~ some attempt to restructure <sup>Govt</sup> science laboratories on "one side" and also to tilt towards "Gandhian socialism" of various versions ~~the~~ had created a confusion. The later became anti-Western SPT, go for "appropriate science" etc with many scientists also advocating it to promote themselves (in the name of science for society). The restructuring of laboratories ~~the~~ were more in the name of Administrative Reforms with which the PM was familiar. Let the CSIR labs go to the appropriate

(1148)

Mimistries. In theory, it was a very good idea; the Mimistries concerned ~~can~~ could refer their problems (to be solved) to the labs under them. They could study and find solutions. Also when the Mimistries import goods and equipment (even big plants) the laboratories ~~can be~~ could be associated in the process. Indigenisation ~~can~~ could be easier done.

But this "theory" was based on the fact that administrators in these Mimistries ~~are~~ were aware of S & T possibilities and were ready to seek S & T opinion. And also that the scientists were ready to look into <sup>the practical</sup> the problems of ~~the~~ faces by the Mimistries (social and economic needs) and took interest in them; in practice these

(1149)

Scientists were in their own world. Often they were continuing in the narrow topics they did their Ph.D or post-doc work abroad. ISRO was a rare organisation in which the specific end goals were fixed and all had to work towards them.

Hence the whole idea of PM (Janata Govt) was converted into a fight between the "scientists" and "bureaucrats". Scientists wanted the CSIR labs all together to be managed by scientists, even in fixing their work! Hence the newspapers were full of articles / letters to editors etc. ~~Dr~~ VS (Siddhantha) was on the <sup>scientist</sup> scientist-side. To give concessions to political side of relevance of science,

(1150)

many ideas "mushrooms" for appropriate technology — with no clarity except in making statements about using local materials, using local technologies etc, thus backing the stagnant past Indian methods of working in villages. I was very clear that the centuries of stagnation had <sup>made</sup> them irrelevant in the context of the 20<sup>th</sup> century we were in. There was little option than adopting Western S & T, but making system designs to suit our context (which ~~was what~~ was how ISRO functions).

~~Another~~ Rest of the ISRO work was not affected as PM

(1151)

was very clear in supporting ISRO and not interfering with its functions. = Politicians when given responsibility appear to have an uncanny inhibition about things which ~~are~~ were good.

As ISRO was going and taking up more projects, internal conflicts and inter-centre disparities because each ~~the~~ centre was given considerable freedom (and thus reflected ~~the~~ ~~for~~ the local ~~or~~ ways of working) had grown up. The VSSC Centre under the strict discipline of Dr BP ~~had~~ rewarded work. It was the opposite in SAC where

(1152)

Talking became more important.  
Both in ISAC & SAC, the favorites  
of the Directors were pushed  
upward for promotion, better positions  
etc.

All these concerns were  
put together in a note of 8<sup>th</sup> Oct 1977  
(~~typed~~ by me <sup>(a typewritten)</sup>) There for the  
first time I use an analysis of  
senility - "I feel that ISRO  
is too young to grow senile"  
(However in the Indian context  
the average age for an organization  
to grow senile seems to be  
around 20 years. We seem to  
be approaching pretty dangerously  
to that period!) ..."

(1153)

I have requested SD to reverse these trends; the suggestions given were within his reach. However he had to confront his Directors on some issues (especially YP & to some extent URR) Actually VSSC needed some loosening!

The note continues  
as pages

1154 - 1158

↳ Then go to 1159)

(1154)

CONFIDENTIAL

For : Chairman, ISRO

From : Y S Rajan

8 October 1977

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1.0 For quite sometime I have been concerned about some of the negative features developing in our Organisation. Therefore assuming the occasional gad-fly role I wish to point out the problems and perhaps some solutions in this note. I have already spoken to you on this subject rather sporadically on a few occasions and also lately during our journey back from Trivandrum.

2.0 My impressions are not purely subjective and I wish to quote a few objective instances which are some indicators about the health of the organisation. They are as under:

i. For the first time in the last year there was a fairly heavy surrender of money by ISRO. Though various reasons like foreign exchange, non-availability, Government rules etc have been quoted, it is not the full fact. This year's experience shows that even when the foreign exchange is available in plenty there is still no increase in the spending which has perhaps worsened.

ii. There are serious slippages developing in various programmes in SILV, Avionics items, NOAA terminal, APPLE, MONEX related items etc. Generally people complain of manpower and the rest. A close scrutiny would reveal that not all the problems are related to the non-availability of manpower. Mostly the problems are due to the lack of coordination between individuals, reluctance to work out details, etc.

....more

iii. A general alienation amongst many, manifesting in terms of strikes, rumours and a general slow-down.

iv. There are serious delays in programme directions, e.g. in launch vehicle area, earth station productionisation, etc.

3.0 I have thought seriously about these matters and I conclude that if some positive action is not taken soon it is likely that in another couple of years we would have serious problems and would probably go the way of many national laboratories (having some generalised activities without having a focus or a theme).

3.1 I do not propose to be a prophet of doom. My criticism is that of a concerned person who fervently hopes that his criticism would be proved wrong. Though, at the broad national level, I visualise quite a bit of problems and I am also aware that the general socio-cultural environment in the country is not specifically suited to the growth of healthy scientific institutions, I still firmly believe that some oases can be built in the desert and preserved well. What I find in the past few years is that an oasis is not developing and whatever green pasture that has grown is becoming parched.

4.0 I shall attempt to point out below a few reasons why things are shaping this way, with some suggestion on how to rectify the situation.

4.1 Some major lacunæ in our management system are as under:

- a. DOERS, by and large, tend to be neglected since they would be busy with working out details and executing them, be it software or hardware.
- b. A set of people are developing in ISRO who pass general remarks, and use very often lots of management cliches; these persons are seen in very good light by the management. Many of them happen to be in positions of power or on the right side of authority. For the purpose of this note I just term them as TALKERS.
- c. There is a big hiatus developing between the TALKERS and DOERS; unlike the conditions that prevailed in the earlier stages of organisation, TALKERS and DOERS are becoming separate entities competing with each other. Still there are a few DOERS who also happen to have positions as TALKERS (and Managers) thus combining both the roles, e.g.

But such persons who have a dual role and who can to some extent bridge the gap between talk and deed are fast losing their grip on the organisation. The hiatus between the TALKERS and the DOERS would be total in a couple of years.

- d. The reward the TALKERS get are considerably more than DOERS in some places. These DOERS and TALKERS seem to be concentrated in pockets in a few Centres. For example, VSSC due to its higher management policies severely restricts TALKERS and SAC has tended to encourage TALKERS a great deal; and as a result, in general, VSSC gets neglected in many ISRO decisions. This alienates quite a bit of young DOERS who are in the prime of their youth. If after some time these DOERS

shut themselves off, the prime energy which propels ISRO will be gone and after a few years we would be a talking organisation without corresponding deeds to back it up.

- e. Another item which is equally serious is the general indiscipline which has developed in middle management and higher management levels. Those who violate protocols, those who violate higher management decisions etc somehow seem to get rewarded. This has been true in many instances, be it in the sanction of manpower or trying to take up some positions or trying to get contacts outside ISRO/DOS or going to the public to get into limelight etc. If some person can manage to do things even in open violation of the management directive, he is never punished and perhaps he not only gets away with bloody murder, but also gets a rise in the management structure. There are many instances which I can quote, but for brevity I am not quoting here. This will slowly tend to percolate among the engineers at different levels also. In fact it has started percolating and it is one of the reasons why delays are generally taking place in ISRO activities. For example, a person, be it a Director or an engineer, often flouts management decisions, causes delays, and waits till the situation turns to their advantage. In general flouting of directives and hard bargaining etc seem to pay off.
- f. Responsible persons who generally percolate and disseminate cynical and gloomy ideas seem to be increasing even while they are enjoying all the protections.

g. Even while some senior managers and engineers work very hard for ISRO programmes, there are some who neglect ISRO/DOS work they are responsible for and spend considerable time in outside lobbying, PR etc to boost their future. Such people are on the increase.

5.0 I do not suggest that there should be an iron clad discipline without dissent. However there has to be certain norms of discipline in the organisation. As pointed out in the above, lack of such norms in the organisation is fast corroding its strength and great many of the DOERS would soon join the bulk in the organisation which is normally apathetic. This apathetic group acts as a buffer between the DOERS and TALKERS. Finally in a few years we would just have a bulk apathetic group with TALKERS at the helm of affairs. Then the results are obvious.

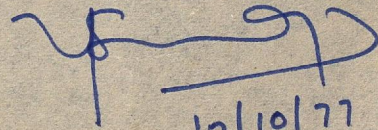
6.0 What can one would do in such circumstances - leave things to fate, or attempt to inculcate some general sense of discipline and belonging? I feel the latter can still be done by rewarding the DOERS, while trying to avoid rewarding mere TALKERS. This can be done, provided Chairman devotes more time considering these aspects rather critically and reverses some of the present management patterns even if this results in things becoming a little messy in terms of paper work, reviews etc for a while. One should go back in figurative sense "to the fields" and try to get some fresh crops of DOERS as Managers. Also there should be certain exemplary punishments of the indisciplined people especially at higher management levels so that some fear of God would be inculcated into the Organisation in general.

(1158)

7.0 Attempting to do this, no doubt, could cause some confusion and perhaps lots of changes, for a while, but I think it will be worthwhile attempting a change. As I had always maintained it is not necessary that a few persons will remain always DOERS or TALKERS. In the organisation which is growing and dynamic, there should be a constant review of the roles of persons so that the organisation can rejuvenate itself; if it is not done biological senility will take over. I feel that ISRO is too young to grow senile. (However, in the Indian context, the average age for an organisation to grow senile seems to be around 20 years. We seem to be approaching pretty dangerously to that period!) I only wish, with some healthy scientific scepticism that I will be proved wrong and some silver lining will appear in the meanwhile.

8.0 I request Chairman to give some serious thought to this matter of rejuvenating our organisation by getting rid of some of the negative features.

Regards.



10/10/77

(1159)

Another very interesting note  
# is about 'Military Space  
Activities - A Preliminary System  
Overview'

" The note mentions that  
I ~~am~~ enclose herewith  
a document prepared by me 'Military  
- - - ' You have quickly  
glanced through it at the airport  
when you were going to Calcutta..

Recently you mentioned that  
you ~~are~~ would again read it  
before going to the Committee  
of Secretaries meeting. Hence  
the document is put bfr 'Chaman''

~~#50~~ (1160)

Then I had listed items ~~as~~ needing immediate shows from India's viewpoint

The papers given back SD to me had only ~~the~~ my ~~note~~ covering note and the document "Military ..."

Maybe he had kept it with him as it was 'Secret' category. The actual note should be in ISRO archives as the note carries ~~file ref. number~~ ~~draft~~ it is a typed note & it has reference of Chandra office also. Copy of that covering note is attached in next pages.

1161, 1162

→ Then go to 1163

(1161)  
ISRO HEADQUARTERS

SECRET  
URGENT

3/12/77

For: Prof. S. Dhawan  
Chairman, ISRO

From: YS Rajan

I enclose herewith a document prepared by me regarding 'Military Space Activities - A Preliminary System Over-view'. You have quickly glanced through it at the airport when you were going to Calcutta. Recently you mentioned that you would again read it before going to the CofS meeting. Hence the document is put before the Chairman.

The immediate stress from India's view point would be the following:

- 1) The development of small air-transportable terminals for satellite communications in conjunction with a synchronous satellite such as APPLE will greatly facilitate the physical movement of Forces. In fact this logistic flexibility has been a major constraint to our army's planning. This technology will be a follow-out from STEP. Also man-pack for satellite-based communication at these frequencies can be done with certain coding techniques.
- 2) The development of Ship-borne Communication system which will give a great flexibility to the Navy.
- 3) Space meteorology systems using US/USSR satellites and also development of Indian satellite systems for the same.
- 4) Development of Recon satellite systems.

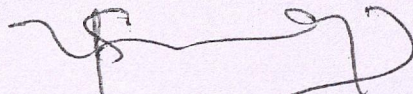
If a system development starts on the above lines, which essentially I term as Phase-1, I think the military space systems can develop healthily in the country. This development should include development of launchers to be self-reliant. Even if the initial works are little crude, it is necessary that this phase has to be done, because otherwise trained personnel to handle the system will not be available. Hence it is essential that almost immediately we should start on this system.

...2/-

(1162)

-2-

I wonder whether Chairman would like to give some copies of this document to Prof. Menon C's of S since it is written in an Executive Summary form. Of course Chairman can, while giving the document, mention that this is only a preliminary over-view and lot of thinking in systematic fashion need to be done. If Chairman wishes, I can bring along with me a few copies when I come to Delhi.



YS Rajan

31.12.77

(1163)

I do ~~not~~ not recall SD giving me a feed back on what happened in the COS meeting. In those days due to various technology denials being done by USA against India, and since our Satellite programmes (almost fully in electronics products) and ~~the~~ L/V programmes to some extent for equipment / machinery ~~was~~ were dependent on US & European imports, he was very cautious in getting involved in any military links. (Later I had also found from actual experience of interaction found

(1164)

that the military and security agencies showed only superficial interests in development of technologies in advance; & a couple of odd individuals were keen. Otherwise their approach had been "Well let us keep some talks with Indian R&D people ... When actual need arises we can always go for import." This was tone of the civilian administration / political ministers who were supposed to oversee the defence services or security agencies. I would give a few examples later in 1980-90 period

So SD would have done his "duty" and kept quiet!

(1165)

\*

\*

Post 1976 was a period of many rapid activities by ISRO / DOS.

During that period SLV-3 Project & Programme (i.e. related facilities) had started taking a rapid pace. STEEX, SPROB, SHAR launch facilities, ISTRAC etc.

On the satellite ~~sat~~ side from the One-Satellite project mode ~~is~~ SEO (later named Bhaskara) ~~the~~ project started. It had some ~~from~~ satellite ~~sat~~ stabilisation ~~to~~ when the <sup>TV</sup> camera pointed towards the earth. Along with a microwave radiometer ~~paper~~ payload was also to be incorporated. The complexity of

(166)

satellite increased. ~~Another~~ Along with this for the first time SAC started to be "recognised" as a Payload making Centre (refer to my earlier & notes on the pros and cons). & ISAC became an independent centre with the same status as VSSC; so was SHAR. Therefore the ISRO Council which was just made of three Directors VSSC, SAC & PRL plus Adol. Secy, Joint Secy, & Sc. Secy ISRO had two more Directors. ~~The~~ The Budget exercises culminated in ISRO Council.

The effects of ISRO becoming full Govt ~~at~~ from & 1 April 1975 had been ~~in~~ fully imprinted in ISRO.

& Impact of Emergency all around the country was practically absent from

(1167)

absent from ISRO. Similarly the new regime of Janata Party and a new Prime Minister was also not felt by ISRO. He did not change any programme of ISRO.

He was a little luke warm to the programme for ~~team~~ sending an Indian as a Cosmonaut; a programme informally agreed to by Indira Gandhi as PM with Brezhnev - on which nothing much moves. SD was also luke warm to it.

The entire effort done by ISRO/DOS for procuring an INSAT satellite through a global tender was not negated by the new PM or Gov. In fact it went through as if there were

(1168)

no Govt change at all. It is to be noted that ~~that~~ new Govt fully supported Atomic Energy also. It really questioned ~~out~~ mainly CSIR. DRDO's formation was though big at that time was too diffused to ask any questions.

Similarly the PSU's were run the same way. Heavy import of ~~exp~~ plant, equipment & machinery and even know how. Acted only as a manufacturing place ~~without any~~ ~~etc~~ under strict guidance of the Principals. The ~~weak~~ numerically and ~~size~~ size wise weak Private sector also behaved that way. The

(169)

licence - permit - quota raj (as I understood it in later years during later 1980's when I started initiative TIFAC) remained intact.

After all both political <sup>practioners</sup> ~~persons~~ and bureaucrats loved para.!!

Import of some machinery and (and print paper) equipment in the print sector was a little bit "liberalised"; that is why ~~the~~ <sup>annual</sup> ISRO reports could be brought out better!

~~It~~ Though relatively small compared to the efforts of NASA, ISRO started bringing out a number of Scientific, Technical and General reports — in the same style <sup>as</sup>

(1170)

This was possible due to the desire of SD and my encouraging Dr. S. K. Dutta who came along with PDB to Ahmedabad but was finding himself misfit in the ~~hard~~ hurly-burly life of ISRO HQ. I found his calm temperament and ~~an~~ ability to get into meticulous details a great asset to bring out error free (or with a very few errors) ISRO reports. In those days there was no desk top printing. All in Letter Press - it was a hell for those who had to proof-read etc. SKD has to be appreciated for that. It is sad that in ~~the~~ later days, the Report activities

(1171)

had diminished and have  
~~collaps~~ collapsed now.

Similarly Tech. Transfer  
(Spin off) activities started getting  
some roots. It was later  
during 1980's, under P. Sundaran  
it really took off and peaked!  
Again sad that it practically  
came to a standstill after PS  
left ISRO in 1988. Even now  
there is ~~an~~ a TT office but  
it does precious little.

Thus ~~two~~ two major  
DOTREACH programmes which  
were successfully nuclearised  
during 1976-79 period had  
been abandoned in practice!

(1172)

~~SITE~~ Post SITE (1976)

there was no great difference in Govt opinion about the use of ~~IT~~ a national TV beamed at the Centre of India Nagpur, for developmental purposes. ISRO/SAC and MIB were more at logger heads, so much so the TV studio ~~was~~ had to be inside ISRO/SAC finding some new work! But some how the new pay as we had what before ~~also~~ asked ISRO to go ahead with its S-Band ~~to~~ (TV) transponder even though MIB off was indifferent to it.

But ISRO had an opportunity to use the Franco-German

(1173)

Satellite Symphonie to have a joint experiment with the Telecom dept (Post & Telegraph dept). That was also during this period.

And above all a major step in <sup>ISRO</sup> Satellite Technology took

place in terms of having a developmental project called APPLE (Ariane Passenger Payload Experiment) ~~done~~ with ESA's developmental flight ~~called~~ of ARIANE. This was possible due to the excellent "chemistry" of relationship ~~to~~ between SD and Roy Gibson then DG of ESA.

(1174)

It was a great opportunity. Soviets would not have given it. They were stuck with their Interkosmos ~~and~~ launched of near Earth orbits, (even IRS for which we went later to them was near Earth). Most likely ~~it~~ this was ~~also~~ not because Soviet wanted to deny India, as it was done by USA (even right from SLV-3 type launch!), but because Soviets had ~~very~~ very little experience of geostationary launches. ~~Their~~ Their land is far away from equator. Their communication needs ~~and~~ were well met by the Molniya type orbits — which were really a hybrid of geostationary heights.

(1175)

at the apogee and very low heights  $\approx 400$  km at the perigee. They used it for some earth observations at perigee and communications for their ~~lands~~ land mass. So their thinking in those days ~~was~~ <sup>was</sup> not around geosynchronous satellites.

But India needed geosynchronous satellites. It is close to equator. ~~It~~ ~~the~~ Even the first profile of VAS had the Geosynchronous Launch Vehicle as the goal. Our first design of INSAT at ISRO-MIT studies was for a geosynchronous satellite.

So we needed geosynchronous satellite capability — which meant not just satellite making but an apogee motor to take the satellite

(1176)

from the ~~geosyn~~ geostationary  
transfer orbit (GTO) to

§ geostationary Orbit - (GSO).  
Synchron

Three axis ~~sat~~ stabilisation  
was a must to point steadily  
the satellite <sup>communication</sup> antenna towards

India. Even the <sup>Intequs</sup> Remote Sensing  
Satellite which would be ~~is~~ in

the ~~sun~~ sunsynchronous / polar  
near earth orbit  $\sim 700$  km, requires  
a three axis stabilised satellite.  
So that the Earth Observation  
camera can take good pictures.

Bhaskara - # I or II (SEO I or II)  
were nowhere near that. They  
were more a continuity of Aryabhata

(1177)

but with some stabilisation  
and picture taking. (It was  
an interim learning curve  
to take pictures from <sup>a</sup> satellite  
and to decode ~~it~~ the digital  
stream into good pictures  
on the ground (Data Processing;  
Image Processing))

So ~~APP~~ the ability  
So the opportunity for  
APPLE flight free-of-charge  
as it was in a developmental  
flight of ARIANE (with attendant  
risks) was a great ~~opport~~ boon  
to ISRO. In those days only  
USA had the operational experience of

(1178)

GS launches. Europe with the leadership of France (there was no EU) but France managed to get the European nations to establish an ESA — earlier ELDO), Ariane programme was ~~built~~ launched.

France ~~had~~ was of course to gain as it was building a strong launch vehicle programme. That is why India could benefit ~~with~~ through

an ISRO-CNES cooperation to

get the Viking engine technology:  
(Vikas Project)

↳ It was pe-75 and was going on well during 1976, 1977. ~~But not~~

(The credit to Vikas project goes primarily to BP & TNS); because of them SD supported it). Later the solid ~~propulse~~ propellant / SLV type groups

(179)

took over VSSC giving lots of  
hurdles to the liquid programme,  
with snide remarks that it  
was indigenous ~~as~~ as SLV-3 or  
Solid was. ~~Dr. Das~~ Y.S. Das  
was supporting liquid programme  
but he would ~~not~~ not have  
the aggression of TNS. Also  
Dr. B.P. was getting overloaded  
in that period ~~at~~ with fast growing  
~~the~~ LfV, SHAR activities and  
also the huge growth VSSC, which  
also had ~~the~~ its share of "labour  
union" problems which were  
dominant in India all over  
with political parties, intruding  
them. There was even a lock out.

(1180)

Even at Sriharikota there were union problems — at one stage a threat to fast unto death.

Pant was Director, K A Vasadan was Controller SHAR. Sh S.K. Warrior was ~~IS~~ JS. There were hilarious situations — which I won't describe later . . . . .

~~But in~~

But looking ~~of~~ back one wonders if what ISRO would have done if VIKAS project was not there, with technology transfer from SEP / France. ~~It~~ It is the main ~~the~~ muscle for the workhorse PSLV, which is making ISRO proud now!

(1181)

The transition from the two founding bureaucrats of the Dept of Space (MAV to TNS) was complete during this period to YS Das & SK Warrior. Both did ably to understand for the first time the unique nature of ISRO and its relation to Dept of Space (DOS); the role and power of the mysterious entity called Chairman ISRO & which was more prominent than Secretary DOS and Chairman Space Commission.

The transition was also possible because of the excellent Section Officers, ~~an~~ Under Secretaries & Dy Secy of the DOS. Their knowledge went beyond the usual rules to specific nature of fine ~~time~~ turning done to <sup>Indian</sup> Govt rules to meet the needs of the ~~the~~ Space Programme.

(1182)

It was also because of the specific care taken by TNS to make the rules of Books of Financial Powers etc etc in simple form (thanks to the help of ~~the~~ another senior bureaucrat ~~Bhaktar~~ Bhaktavatsulu taken as consultant). And TNS spent considerable time in taking "classes" for ISRO admin / finance personnel by explaining to them basics and some nuances. He similarly coached his Section officers / under secretaries etc That helped a great deal; it was possible to do at his level as ~~ISRO~~ DOS/ISRO ~~was~~ were very small. In bigger departments JS & AS's of his calibre would not easily

(1183)

accessible. They would be with Secretary or Ministers most of the time, only Directors, Dy Secretaries would access them. Then visitors some of whom ~~would~~ would be politicians such as MP's, MLA's...

Fortunately the small size of DOS helped the AS, JS's to be deeply involved with ISRO's actual functioning.

They were not remote sitting on judgement, ~~but~~ but witnessing many technical activities, the problems/dilemmas in execution etc. They ~~can be~~ could ~~confer~~ counsel and guide. Then, of course, in rare cases take an independent view in the Department with the help of the ~~Secretari~~ Secretariat.

(1184)

There are occasions in which TNS used to explicitly say ~~to the~~ when he was participating in ISRO Committees for formal executive actions.

"I would listen to all of you and try to be helpful as much as possible, within the overall constraints of the Govt system. I want to make one thing clear: Just because I ~~for~~ am a member of this Committee or Chairman and agree to it and even sign the minutes, it does not take away the right of Department of Space to examine it and even reject it!"

This is a fine point of govt work.

Department ~~&~~ is different from all the units that come under it. But that does not mean that Dept

(1185)

has to ~~re~~ retrace all the work done by the Centres / units / offices under it. ~~The~~ One had to go by how the system had been structured to function; also there has to be a TRUST. ~~There as~~ Such fine points of "division" between the Dept and the subordinate units / offices ~~had~~ have to be handled carefully. DOS ~~is~~ which had continuous interactions with ISRO units / centres through the ~~off~~ persona of AS & JS was therefore ~~sub~~ subordinated ~~not~~ in its role but not subservient.

for a new IAS or IAAS officer

(1186)

not used to ~~see~~ SET activities  
it was (is) not easy to ~~enter~~  
understand it and internalise it.

To them SKWarner wants put  
it humourously:

"If you come to DOS, first  
of all understand DOS is a  
subordinate office of ISRO. Then  
you will know what to do!"

De jure ISRO Units were

• subordinate offices of DOS!

One of the main reason why many  
SET institutions which ~~are~~ were  
(are) under Ministries be it  
CMTI, CPR I etc ~~are~~ were (are)  
• unable to function under the  
So-called Economic Ministries was (is)

(1187)

because these big departments  
had ~~mostly~~ <sup>invariably</sup> IAS officers at the  
~~top~~ top and the Secretariat ~~is~~ very  
powerful and treats all under  
them be it ~~a~~ small institutions  
like CMTI, ~~ERICPRI~~ etc or even  
big PSU's ~~as~~ to be UNDER  
them; subordinate to them.

Chairman of big para sector  
companies used to invite the

Under Secretary from the Ministry  
at the Airport! <sup>So the company got better favours from the Ministry.</sup> That was  
the practical reality which  
may not be felt by the  
political masters.

(1188)

That ~~is~~ was the reason why people were resisting the ~~CSIR~~ ~~the~~ ~~relevant~~ individual CSIR laboratories being brought under the "relevant Ministry" instead of being under the Min of S&T.

The IAS hegemony of the entire government (not just Central but the State Govt.) as well) was not disturbed even during the Janata Govt. Politicians were happy with them as they would serve their masters — or appear to serve the masters.

But even ~~then~~ then, there was a "hunt" of those bureaucrats who were perceived to be close to the Indira Gandhi / Sanjay Gandhi Govt. That did rattle many persons in bureaucracy. This I learned from my frequent visits.

~~11~~ (1189)

to Delhi. The so-called "committed  
bureaucracy" ~~was~~ was the target.

I ~~also~~ had also seen ~~many~~ a  
number of "also ran" type of persons  
promoted from Dy Secy levels to Joint Secy  
in key Ministries under the premise  
that they ~~had~~ had suffered under  
Emergency. People used to talk  
about such persons in hushed tones.

Finally I found most  
of the persons - the bureaucrat big  
or small or politicians - were committed  
to self-preservation and self-advancement.  
I did not find ~~many~~ even a few  
persons who ~~were~~ <sup>social-economic</sup> was committed  
to certain areas of development  
or industrial development which  
would take India forward.

(1190)


~~In that~~

From that point of view DOS was unique. It was not only the scientists & engineers and other staff of ISRO, but DOS officers right from AS, JS to Section officers and other staff ~~of~~ of DOS, were infected with some passion / commitment to see that the ISRO programmes succeed. Later I found that a few persons in the Planning Commission like Raman, Dr. S. Ramamathan, P. K. Biswas were vigorous in the Budget exercises but wanted to help ISRO.

A few others in the User departments for INSAT & Remote Sensing (Geology, Agriculture etc) were committed to ISRO success

(1191)

(That was in ~~1990~~ 1980's. We would talk about it later)

Also in the late 1980's & 1990's,  when I established TIFAC, I found a number of persons from higher levels of Admin / bureaucracy Secy, Addl Secy, JS, Directors - who were very helpful in introducing better technologies to the Industry. In those ~~the~~ periods the Scientists in Bureaucracy (ie those who ran S & T department as a part of its Secretariat - ~~was~~ wielding Govt paras) who were more self centred - 1990's - ~~2000's~~ <sup>2000's</sup> & now they ~~have decayed~~ <sup>are</sup> decaying.

(1192)

When I read about MITI,  
the Chinese Gov. Organisations,  
or Korea, or Singapore or Israel  
(all these I learnt later  
after I got into TIFAC in 1988 plus)  
I wonder India was unable to  
develop such a system. Was it  
due to the compulsions of electoral  
democracy in a large country, which  
had diverse forces pulling in  
different directions? Thus the role  
of IAS etc being reduced to serve  
the political masters and keep  
the semblance of the State State  
~~state~~ intact. "Let the system  
run". Let us not attempt some  
novel experiments with unknown results.

(1193)

Some times I wonder whether INDIA as a ~~State~~ nation ~~but~~ State would have survived without such all India services like IAS, IAAS, IPS, IRS etc and the Defence forces which had also agreed to the "civilian rule" essentially such "all India bureaucracy" and a ~~large~~ subordinate & bureaucracy the State level ~~but~~ and a Central Civil Service (CCS) at the Delhi level to serve the apex ~~for~~ bureaucracy — as <sup>Assistant</sup> Section Officers, Under Secretary, etc.

I was partly aware of such a governance system in the country even in those days because I had to function in the Troika of AS, JS & PS. ~~for~~ informally formed by SD.

(1194)

But most of the ISRO persons were oblivious to it. For them it was going to ~~Chair~~ Director of the Centre and ~~then~~ to Chairman ISRO. They knew Budget was discussed in ISRO Council. The AS, JS were also members. They often came to Centres as a rep. of "Chairman ISRO" — the fine point of Secretary DOS was irrelevant to them!

Some in ISRO HR ~~was~~ knew to the extent they had to interface. But the way I had described, also ~~was~~ came to my understanding much later. But I was aware of the fights of the "technocrats" vs "bureaucrats" raised by scientists of SACCC.

(195)

because I read the papers received  
by SD.

Coming & now to the period  
of 1977-1979 in ISRO, it was  
immune to many things happening  
outside including the bickering fights  
by the members of the ruling  
coalition. They would have read them  
only as a 'tamasha' in the newspapers.  
Post-emergency, ~~the~~ India's Press  
became free again! Overall effect  
of such a reporting would have  
been only gloom! But ISRO's  
work was expanding so much that  
those within ISRO did not feel it.  
Even the increase of trade union  
activities was due to such "freedom"

(1196)

suddenly felt. The union actions were determined to the political parties to which they were "affiliates". Split in the parties ~~led~~ led to split in the Unions too. In Trivandrum the unions ~~repr~~ had affiliations to national & ~~reg~~ local (State level) parties, as well. But the effect on ISRO was small.

~~One very~~ One very important (long term) Staff welfare measure taken up by the initiative of Y.S. Das, AS was Contributory Health Services Scheme (CHSS).

SD or Directors had not given much attention to health services. Trivandrum had a small reference hospital and some affiliations. SHAR had hospital.

ISAC has a couple of resident doctors. ~~These~~ These were grossly inadequate.

Even for ~~me~~ the medical expenses I incurred, much of it <sup>was</sup> from me. ~~& there~~

(1197)

These were left to individual choices,  
\$ with little of reimbursement.

A general scheme available to  
all Central govt servants was a Central  
Govt Health Scheme (CGHS). It was  
not extended to Bangalore, Ahmedabad,  
Tiravandur etc then. Though technically  
the best service, actual working was  
ridden with problem. We, in ISRO,  
did not know then. Not was it  
an agenda ~~as~~ as the average <sup>age</sup> ~~of~~ of  
ISRO persons was under 30 years  
then. They were active with their  
work, not thinking of health  
services!

Y.S. Das, unusual for  
a very senior officer in a Dept (AS level)  
saw this lacuna. He also knew from  
Delhi circles, CGHS services may get

(1198)

extended to Bangalore etc. ~~In~~ Once  
extended ~~at~~ ~~they~~ ~~was~~ Govt. would not  
allow individual departments to have  
their own schemes. So he was in  
a hurry convincing Directors of  
Centres, SD etc to begin CHSS  
Scheme in ISRO; it would need Space  
Commission approval. As usual SAC  
had to oppose ~~it~~ it, without even  
understanding the pros and cons.  
Any idea other than ~~those~~ that  
which came from the select  
persons of SAC needed to be opposed!  
VSSC was lukewarm. SHAR  
of course had a full fledged  
hospital. CURR, <sup>Director</sup> the new Centre,  
agreed. So the question was ~~to~~ whether  
~~we~~ ~~go~~ DOS goes for it. Normally

(199)

in such situation, "waffling" would be the mode of decision making.

Y. S. Das called me and spoke in his best of Lucknawi ~~UP~~ style Hindi. It meant this:

"I find that ISRO fellows don't seem to have a priority ~~or over~~ for ~~the~~ their own health scheme. ~~ISRO~~ DOS has special paras for purchase; ~~the~~; does not have to go to DGSD. It has its own Civil Engg. Division with full paras and does not have to go CPWD. But no health scheme. ~~Am~~ has a provision for CHSS. ~~I have~~ It will be available only when CGHS ~~is~~ does not exist. I learn that CGHS will come very soon. Then to argue for a special CHSS for DOS

(200)

will be a problem. Govt may not give. The Centres / Directors are ~~but~~ like warm or oppose like SAC.

There is a small monthly fee for each employee. But we can

give excellent services. The excess of expenditure over the small fee can be subsidised by DOS. On the long term, this is best for ISRO persons.

Some of them, think as if I have some interest in it. I am on deputation and belong to an all India service. I will go away. But CHSS is for ISRO people!

They don't seem to understand. We should push it fast when CG & HS is not still there. We need