



# IGC Newsletter

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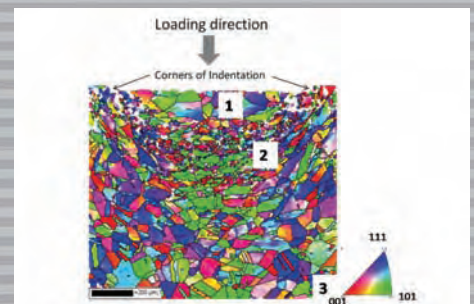
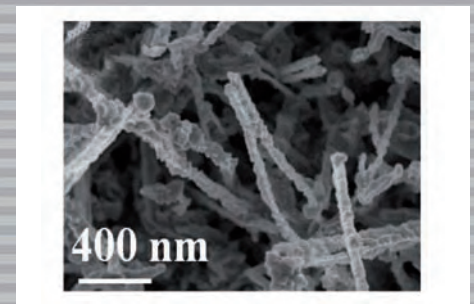
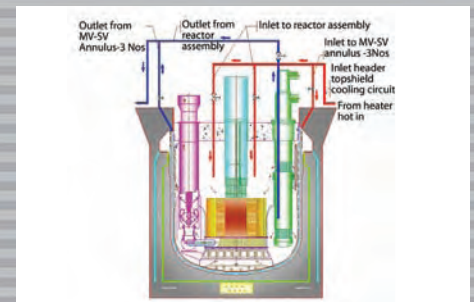
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## Interaction with Dr. Baldev Raj



Young Officers with Dr. Baldev Raj, Dr. P. R. Vasudeva Rao, Director, IGCAR and colleagues of the Centre

Can you share with us your experience regarding commissioning of Hot cells at Radiometallurgy Laboratory, IGCAR. Do you recollect any special knowledge you gained from this assignment?

I was inspired by Homi Bhabha to join the Department, he was like a magnet, pulling me even in my dreams to join the Department and I was luckily accepted by the Department. I was about just twenty five years old, when the then Director, Late Shri N. Srinivasan assigned me the task of commissioning the hot cells and designated me as Group Leader of hot cells. I was elated for two reasons – one because this was the second largest project, next only to FBTR being pursued at our Centre at that time, and the other was that, the Director of the Centre placed confidence in such a young person. Shri N. Srinivasan wanted a young person to be fully independent both in terms of thinking and execution, which has been great for me throughout my life. The assignment was in the area of civil engineering, so I went back to him and said,



**Dr. Baldev Raj**, is currently Director, National Institute of Advanced Studies, Bangalore and President, Indian National Academy of Engineering, Former Director of Indira Gandhi Centre for Atomic Research, Kalpakkam, Department of Atomic Energy, Member, German National Academy of Sciences, International Nuclear Energy Academy, Fellow, The World Academy of Sciences, Fellow of all Engineering and Science Academies in India. His specializations include materials characterization, testing and evaluation using non-destructive evaluation methodologies, materials development and performance assessment and technology management. He has steered and mentored large, multi, cross-disciplinary and multi-institutional teams to earn for India an eminent and esteemed position

in high technology domain of sustainable clean energy system through the sodium cooled fast reactors with closed fuel cycle. He has more than 970 publications in leading journals and books. He has co-authored and co-edited 70 books and special journal volumes. He has 6 Indian Standards and 26 patents to his credit. He is Editor-in-Chief of three series of books, NDE Science & Technology, Metallurgy & Materials and Corrosion Science & Technology. He has delivered more than 300 honour, plenary, keynote and invited talks in his fields of specialization. He has won many awards and honours, notable among them are Homi Bhabha Centenary Gold Medal, Indian Science Congress 2012, Homi Bhabha Lifetime Achievement Award, Indian Nuclear Society(2011), Indian National Science Academy Prize for Materials Science (2010), Portevin Lecture of International Institute of Welding (2011), Distinguished Alumni Award (2007) of Indian Institute of Science, Pandit Jawaharlal Nehru National Award from Department of Science & Technology, Government of Madhya Pradesh (2007), Padma Shri from Government of India (2006), Life Time Achievement Award of Indian Society for Nondestructive Testing (2004). These achievements establish him as an eminent and prolific researcher in domains of his expertise.

“ I am a gold medalist in Metallurgy and came to the Department to do research and you are asking me to do concrete, embeddings, cells etc., would not a civil or mechanical engineer be more appropriate?”. He replied in a single sentence, “This will be helpful to you”. At that point of time, I did not realize that Shri N. Srinivasan himself had done the same by building the plutonium plant at BARC, being a chemical engineer. So the message was bold and clear that if he was asking me to do something, it meant that he was dreaming something for me. Then I took up the assignment. As a metallurgist, I was not good at reading civil drawings, but I had to read a big bundle each day as a part of my assignment. I approached my colleagues Shri P.V. Kumar, Shri K.V. KasiViswanthan and Shri P. Kalyanasundaram and told that “though I would like to pursue research, the Department has given me this responsibility, which I would like to pursue and you people have to support me”. It was a management of equals at the age of twenty five. It was a small team with good understanding and all of us shared the work.

What I cherish the most is learning civil engineering and I soon started enjoying it. After a few years, I never felt a stranger to concepts in civil engineering. Another thing that I would like to mention is that the civil engineering team led by Shri C.R. Nagaraj was very strong. He was very particular that construction activities should never get delayed. He along with late Dr. Placid Rodriguez was able to convince some of the suppliers to ensure the supply of embeddings thereby speeding up the activities. I can tell you that there are two ways to face any challenge: (i) give up and say, “I cannot meet the challenge” that means you are shutting down your career and your own confidence, or alternatively (ii) beat the challenge with your imagination and the support of your team.

**Sir, extending this question to carbide fuel, how did you feel when the choice was made on carbide fuel. What was your personal reaction, because it was for the first time a reactor in the world had to go critical with this fuel?**

At that time Shri N. Srinivasan asked three groups, Chemistry, Reactor Design and Metallurgy Groups to make studies independently. We were all competing with each other. Youngsters would discuss, but the seniors would not. Sometimes even the youngsters would not discuss because of the superiors' instructions to maintain secrecy. One thing that was converging was that the carbide fuel could not be used unless it was tested in an existing reactor like Cirus etc., Characteristics of the fuel with 70% plutonium is a well known devil, but what was intriguing was the plutonium in the form of a carbide. It was destiny that Dr. Raja Ramanna chose me through the then Director of the Centre, to make a presentation on behalf of the Centre to the Council, as to what should be the choice of the fuel. I said we had confidence based on the interpolation from the known literature, because there was some literature available on 20 and 30% Plutonium content carbide fuel. Mechanically speaking, the key factor lies in the control of the centre line temperature. Swelling would not pose a major issue, because as long as you stay below the break-away swelling, you can exactly identify how much swelling would happen upon irradiation. With a very good understanding of the basic feature that a linear heat rating of 250 watts/cm and a burn up of 25000 MW day or so is durable, we confidently went to the regulatory body with the proposal. It was accepted right away and we started working on the manufacturing of carbide fuel at BARC, which was successful. I also appreciate the extreme capability of the operating colleagues of FBTR with whom we were closely associated towards working out a regimen of raising the temperature from beginning till contact is made between the cladding and fuel, to avoid breakaway swelling. We had to establish complementary aspects of robust testing and evaluation of clad tubes with eddy current and ultrasonic tests to be acceptable to manufacturing and design professional at the highest level. Like the approach of Mahatma Gandhi (sustained selfless efforts directed to good cause), we had to convince Shri K Balaramamurthy, the then CE, NFC, regarding the specification of cladding tubes, and had to undertake innumerable trips to fine tune the specifications for acceptance and implementation. As far as I am concerned, the success of carbide fuel is attributed to the combined effort of BARC, IGCAR and NFC. In this process, it was remarkable that we had built a great team, confident to achieve something substantial. To be a leader doesn't mean that you have to do all things, instead you should drive to do, which nobody else could do. So we could thrust time in the younger years of the Centre, and also our younger years to do something which nobody has done. From the doubting eyes and minds of the world and our own colleagues, the extreme confidence in science and technology of the Fast Reactors emerged in India. That again is a message that "you challenge the challenge, you don't get challenged by the challenge" so it is a mindset of the same wording that would take you far.

**Sir, how important is the role of mentor in young researchers' life?**

To me it is extremely important to have a mentor even at this age. First I will tell you the definition of mentor. A mentor is a person who sees in you something which you cannot see for yourself, because we are all limited by our own perceptions. Sometimes the outsider's view is extremely important. A mentor has to be totally selfless. Your superior could have certain selfishness, because he is pursuing with you to complete the mission oriented programme, wherein you are a partner. Mentor is not a partner in your success. He is there to enhance your successes and either take you to the place where you want to go, or where he feels that you should go and starts a journey with you to take you there. Mentor has to be critical, has to take tough stands at times even while being extremely affectionate, even if it meant that he was totally wrong in supporting you. I had mentors who supported me in most of the difficult circumstances and never allowed me to lose my confidence. In life it is never a linear graph. We all have very high points, during which we feel we can challenge and do anything, and during certain other





times when we feel low for some reason and feel unable to accomplish the goals, that is when the mentors have a greater role to play.

**Sir, coming to BARC Training School at IGCAR, you have mentored us. It was like a dream child for you. Now it has completed eight years. How do you feel looking back at the training school, do you feel the same excitement and thrill?**

No, I feel a lot more excitement today, than at that time. Initially it was the joy of creation. When I initiated the Training School, it was pretty clear to my mind that, we have come to a stage, where without the input of the young people, this Centre would not be able to meet its aspirations. I was looking for leaders for certain programmes to push the mission. In a certain time period, we were not getting best of the people from the BARC Training School. I was convinced that we require the best people to pursue the difficult technology, of Fast Reactors. So I started thinking on how to get them? It came to my mind instantly that we should have our own Training School. Then we had to convince Dr. Anil Kakodkar the then Chairman, AEC and justify the need in various bodies. I am happy to have been able to accomplish my goal within a very short time as I was very clear and confident in my mission. Then finally when the IGCAR Training School was born, I was very happy because I thought that I have contributed towards providing quality human resources to the Centre in a sustained way. Joy of creation then and now the joy of achievement, I can see a few exemplary students, who would grow as leaders and also see much wider impact in the Centre. I realized that this influx is not complete and we needed to have a University. That also slowly emerged (HBNI) and I was a part of first committee to look into how this university should work. It worked out successfully, we attracted some good people. But to my mind if we ask, whether we have created a university eco-system, I would say no. Here your boss is a Ph.D. guide also. There is difference between a boss and professor. I took my Ph.D. from the Indian Institute of Science. The relation between the professor and a student is very unique. There needs to be a change in the mindset of the bosses when they are guiding to become professors and become bosses when the student is doing mission oriented job. I am happy that some of the my colleagues have been able to play the dual role effectively. My relation with people has remained very different from those who became my Ph.D. students. I like everybody who is my colleague but that relation is never the same to those who were my students. When I like someone, I tell them that you are like my Ph.D. student that is the maximum extent to which I can go.

**First I would like to congratulate you for being appointed as the Director of NIAS. It is an institute that deals with sociology, humanities etc. We feel that youngsters are not realizing the importance of ecosystem or environment. Do you think it is high time to make these subjects mandatory in the curriculum of engineers?**

First of all I am looking forward to go to NIAS. NIAS was born out of the vision of JRD Tata. Twenty six years before, he realized that the country's challenges would not be met unless humanities, social science, science, technology, policy, finance and diplomacy are combined. You see the vision of the great man. He started the institute and found a person like Dr. Raja Ramanna, to be its first Director. It has grown very well. This institute has been created only for the purpose of creating leaders. I invite all of you, to study the institute and meet some outstanding people. The whole idea there is to create leaders, as envisioned by JRD Tata, in all walks, be it government, public and private. Coming to personal perspective, you see the curriculum of Cambridge, Oxford, University of California, you can find an element of social science which would not make you specialist in environmental ecology but definitely would prepare your mind to the reality. You don't want to become an ornamental specialist, but you must interpret and plan your work within the context of what is the reality of the country and its sustainability. How do you get that? You cannot get it from newspapers or websites, but from somebody who would be engaged with you. He/she may engage you for two or three hours, that doesn't matter. But I think we all know that, a good teacher can transform you even in one lecture. Teachers have the ability to really touch you and give something which leads you to learn for yourself. We must think of meeting

outstanding people in humanities, social science and environmental science at IGCAR. For a Centre like IGCAR, at least 10 to 20% of the visitors should be musicians, doctors and environmentalists. It will change the fragrance of this Centre. I can provide the resources from NIAS. These outstanding persons can come and communicate to you and also stay in our campus for few days. You can also come to NIAS stay with us and communicate your perspective for enriching us.

Another important aspect to be successful, according to me is, to be comfortable in different domains. When I engage with the community around Kalpakkam, unless I am a social scientist by my liking is not necessarily by my degree, I would be a failure. When I have a responsibility of engaging with the school children, teachers, principals, I must be an educationist at my heart. I must be sensitive to their needs. I remember that whenever a Principal of our schools would join at Kalpakkam, they come and meet the Director. Normally I keep not less than an hour and the meeting would always end by saying that "Schools are very important for us which would make many people stay in Kalpakkam campus because education of their children is taken care of very well. You are a VIP and not just the Principal of the school, I will do everything, that you want, you will have access to me and I will also come and talk to the teachers and students, whenever I can".

Internalizing success is another secret to success. I am successful, if I feel successful and feel the impact of my life has been positive. You must get down to all the levels and don't ever shy away. Sometime we face very challenging times, sometimes it's a struggle and you are totally lost, because you don't understand the parameters. But I think, if you challenge yourself, you get into that, first of all you learn a lot, second thing, you work with people who feel that it is a good place to work, but that part we have missed in our curriculum.

### How has been your journey from being the Director of IGCAR to Chairing R&D of the PSG Institutions and from there to take over as the Director of NIAS?

When I left Kalpakkam, I was very confident that IGCAR and BHAVINI have come to that stage of trajectory which could sustain excellence on its own. Fortunately I had two of my colleagues, who are more my friends, to steer the institutions. I have never tried to enquire about the well being of the Centre with anybody, but if some of my erstwhile acquaintances seek my advice, I would simply advise them to discuss with the present Director and also give my suggestions qualifying that "my way of working is like this". I went to Coimbatore, which is basically a very good educational institute. But if you look at the capacity to generate a discussion on cutting edge science and technology it is very difficult. Before deciding to go to Coimbatore, I got many an opportunity in other reputed intellectual systems. I was requested to take up the Homi Bhabha Chair, I could have continued that by sitting at IGCAR, BARC, IIT or somewhere. But I was very clear that my first journey or first innings was for my body and soul, more for body and less for soul. Second innings I wanted to make it only for my soul. I was very clear. I felt going to Coimbatore is my commitment to my soul. During my tenure at IGCAR, I had the opportunity to interact a lot with, children at the school level and under-graduates. I did go to colleges and universities but those were very little. Three years I spent interacting with the students, school children and teachers, school teachers getting to know the challenges and trying to contribute. My soul was better there as compared to my soul here. Coming to the innings at NIAS, which has tremendous opportunities, in current trajectories of the growth of the country; creating leaders, creating policy interventions and so on. It is another challenge and another opportunity which has come my way. You can be sure that I shall put my best of imagination and efforts, in the new assignment too.

### After interacting with students, what do you feel about their expectations from an R&D Centre like IGCAR?

Young minds today do not consider the boundaries of India and the world. Those who are best want the best and are choosy. They get a number of opportunities, they come to me to choose the best and as a mentor, I interact and guide them. If they get convinced that they will get their best in IGCAR, then they will definitely join IGCAR. If you ask me, it is a common notion amongst educational institutes that IGCAR is one of the right places to work. Now the question is, is it the place to reach the highest aspirations of achievements, my mind would say no. Now how to change that, I would say we need to produce excellent scientific and technological work. Everybody is convinced that "Fast Reactor Fuel Cycle Facility" is a challenging technology. The moment the fast reactor goes critical and fuel cycle facility is established, it would be a great demonstration and iconic representation of how the *ab initio* science of this Centre can get converted into world class technology. We are on the path towards that, but as the Indira Gandhi Centre for Atomic Research, what are we doing in research? what are the iconic pieces of science we are pursuing to convince the world that we are endowed in terms of facility and power? Has our work been ever attracted with 1000 or 500 citations and is the world talking about our work? There are some examples, but not many. I would say that you along with the management have the responsibility to produce iconic science, even while we produce iconic technology. I am fully convinced that we can do it. In my own life in a humble way I got elected by all the academies of science, engineering, medicine, archeometallurgy and so on. You may think that my life was focused only on career, no it is not true, I have many other interests, I did many things and it certainly did not burden my life. It was very light and I enjoyed a lot. I could do only a little because I belong to the era of 60's and 70's of India, when India did not have the capacity to dream and capacity to realize. If you come to 2014, India is a very different country with different aspirations. So why not you achieve three times more than Baldev Raj. To my mind the answer should be yes and can tell with confidence that the system supports you,



as I have grown in the same system. Not only the system, but your mentor and eco-system will also support you. I believe that you must first internalize your vision, if you don't own your vision, who would own yours? Once you internalize your vision and start working towards it, you will definitely be successful. Many a times we have a vision given to us by the Centre. Your vision should be beyond science which you are doing immediately, it should connect the society, country and the world. I believe mind is a great machine.

**Sir, you have seen both sides of the coin, research institution as well as educational institution, girls are equally performing as good as boys in educational institutions, but we don't find many women in the top positions in most of the research institution or hard core engineers?**

This is a topic which I discussed passionately till last evening with two women who are at the cutting edge of performance. It is the family which becomes the most important parameter for a woman to be successful, than the outside world. You talk to all successful women, and you will learn that it is the family that has propelled them and not the organization. I am very sure that the women are not asking for a special favour. I am amazed by the way in which they meet their responsibility in the family as wife, mother, sister and so on, to their consciousness and stay at the cutting edge in the technology, while the men do one job and take pride. Women do two jobs and both are very important. Those women who come out of the threshold are extraordinary and can reach the pinnacles of success.

**Sir, if we compare the R&D pursued by India twenty years ago and the research which is going on now, we are involved and contributing for one of the prestigious projects of the world, ITER, among the few countries. How do you think has the world's perception changed and when do you see the first electricity to be generated from fusion reactor?**

Answer to the first question about Indian science, yes it has increased significantly by way of our involvement in certain projects and achieving within certain milestones. For example, you see our space, missile and atomic energy programmes, some of the industries competing very well with the cutting edge, some of the pharmaceutical and bio companies are emerging as leaders. The days when people use to talk of India as the land of snake charmers and elephant riders are gone, though snakes are still there, and so are the elephants. I was newly married and went to Denmark in 1974, many times I had to face the question on "what is India and how the Indians live". They thought Indians to be a separate species and realized after some time that Indians are much the same as them. Indians made a name as individual, even at that time and were known for their intellectual ability. As a country, India emerged stronger after 2000. Though we were working with low level technology, the impact was global for the first time. Till that time we were known in atomic energy, which had accomplished a lot. That was the beginning. After travelling for forty years, mostly related to domains of atomic energy, I can see several more domains. But if you see Indian professionals who have established themselves as intellectual work force in the US, be it science, technology, management or anything, question that comes to my mind is where are we? I think we still have a long way to go. Our country has to do more in many levels. Government has to put more money into research, industries have to contribute equally as that of the Government, as products and innovation come from equal participation of the industry and the Government. Then the more the aspiration of the individuals, who are part of the country, the more is the success. Many times I try to count how many Indians have made a difference in science and technology, say from 1900. There are many scientists and technologists but not many have made a difference, but even in smaller countries many have made a difference at individual level. According to me, there are two parameters that define the science of the country: (i) average level of the science and technology of the country and (ii) what are the peaks? You cannot singly contribute to average level of science, it all depends on the policy and projects of the country but nobody stops you from creating individual peaks. Are we doing our job of creating individual peak?, that is the question you have to ask for yourself. But when you take up senior positions, you must start working towards raising the average level of science.

**Can you share with us your experience during the Tsunami in 2004? It was totally unexpected and in scientific terminology it is called beyond design basis, how did you prepare yourself?**

I was not prepared neither as an individual nor as the Director. It was a Sunday, I had just finished my tea and started reading the newspaper

and water started raising. As a senior person, I rushed to the hospital. I found dead bodies in the verandah, it shook me and I have never been shaken in my life like that. Then I met the Medical Superintendent and the doctors and instructed them to do their best to any one who comes for treatment and not to differentiate between residents of the township and the nearby villagers. The next thing that I did was to give a ring to Dr. Anil Kakodkar that such a thing has happened and it was very severe. Then I visited all the facilities, our nuclear submarine reactor was there at that time, right in the sea. It was a great relief that all the facilities were safely shut down and there was no radiation leak.

When I looked at PFBR, my dream project for which I had worked all my life, it was under water with full of salt, sludge and sediments. Then we set up an emergency room in GSO and started working from there. The next day I noticed the greenery going away, the trees started shedding their leaves due to the large amount of salt deposited in their roots. It was like a horror movie, rather than a place which was beautiful to live. I knitted a team of 10-20 colleagues and started interacting with people. How do you console people who have lost their family member and those who have just escaped from death. The difference between death and life was just three centimeter, if water was three centimeter more you are dead and if it was a few centimeter less, then you are alive. Everybody would come with a lot of pain, agony and lot of requirements. There was pressure from parents and well wishers to leave the place, but your job was to retain them and continue the work. It was sort of sharing pain and being in the midst of the people who have suffered and do everything which you could do. I remember I never slept for ninety hours, maybe in between I might have winked but I never slept, I could not sleep because the shock was too much. Then we restored the township and everybody who had the credibility helped us. We were fortunate that it was a Sunday, because the hospital did not have too many patients and on any other working day the school children would have been wiped off. Even in extreme grief we did have some blessings. One more thing that we did was, god forbid tsunami comes to this place again, we would make sure that tsunami is mitigated. We involved all specialists to redesign the township, I believe that it was a mistake, because tsunami possibility in the township should have been perceived by me, even if others have not done it. My advice to all those who take up responsibilities is please don't go by what has been perceived by your predecessors. Take a fresh look at things, to summarise on the opportunities and threats around.

#### What is your view on the current education system in India?

Our young students are very good. We are not in the learning mindset but still in the mindset of teaching. We have less emphasis on doing things with hands and more repetitive kind of things. Then coming to information technology, the data can be accessed easily. We don't have to really memorize a lot of things, which I did when I was a student. When I was a student, there used to be a question "What is melting point of this" or "What is thermal conductivity of that". That used to be question by itself and you get good marks if you are able to answer the same. Some of the teachers are still continuing this practice. But it has to be learning. Learning has to be both theoretical and practical. We have to change our systems. How much students can learn on their own and how much we can complement it with help of teachers and laboratories is what we should focus upon. Recently, I met our Honorable Minister for Human Resource Development, Ms. Smriti Irani, in a meeting at Goa. She is very conscious about the school education. Though we were discussing about IIT's, as it was the council meeting of IIT, she insisted on the need to introduce innovative laboratories in schools for the students to connect things or mess-up upon a few things, so as to expand their understanding of science. Our students are much valued throughout the world. We shouldn't change along the lines of the west. We should ask as to what is good in our schools which is not in the west and in spite of our not very robust education system and infrastructure, we are doing well. The teachers are very important and they should work with lot of commitments and should also have a sense of discipline and spirituality that makes us strong internally. But I strongly believe that transformation from teaching to learning is required.

#### You have interacted with lot of international delegates, can you please share your experience?

By my nature and philosophy, I believe that we have to learn from many. I have never considered anybody to be on the pedestal or a single stream from whom I can learn. I also like the young people who are directly engaged with me, not necessarily under my influence as a mentor, my first advice is to experience from all over.

#### What drives you?

My mother, who is not there physically with me now, had only one message for me that I should stay ethical in my life no matter what position I reach. Second thing that drives me is the internal enquiry, as destiny has given me lot of opportunities, am I using those opportunities for my selfishness or am I using it for others? Thirdly, to me it is very important that, before I die, this country should be in the lead of the best nations and in fact better than them because we should create more quality and ethical society. I think ethics are failing everywhere in the world. As I said before, we have an element of spirituality and philosophy. We definitely can be a very progressed nation with better equity and ethics as compared to many other countries. I hope if God gives me sufficient number of years, I would like to see that kind of India. I am very positive in spite of so many negatives. I am not blind to negativities, I fully absorb them, feel very bad, sometimes cry over that and sometimes ignore them. But they are all there. I still feel we have sufficient amount of good people and opportunities. I have internalized my own commitment. If we have internalized our vision, we will find many good collaborators to work with. Sometimes a younger colleague drives you, sometimes



a senior mentor drives and sometimes the country drives you. As long as you are not selfish, you have a strong reason to be successful. The moment you are selfish, everything is gone.

**Sir can you share with us your hobbies?**

I love watching sports. I can spend twenty four hours in listening to music and I love reading. I read a lot and read all subjects right from philosophy, religion, biology, archeology, space, theoretical physics to computational methods.

**Whom are you supporting in this FIFA world cup?**

Emotionally, Brazil and technically Germany.

**You have spent most of the time in research. How does madam (Mrs. Baldev Raj) react to this?**

She is happy and unhappy at times. She is happy and convinced, when she sees that I am not doing anything for myself. It took a lot many years to prove her. Second thing is that, after I stepped down as Director, IGCAR, she had a hope that I would spend more time with her and the family. It has happened the other way round. Now I have less time than what I had when I was at Kalpakkam. But many a times we travel together and stay together. I think we understand each other because we fight quite a lot. Every fight makes us understand each other better.

**When you demitted the offer of Director, IGCAR, we were all worried for two reasons. One is that we miss your leadership and mentorship. The other thing is the responsibility of maintaining what you have set for us. It is really a big challenge to us. You have set us the challenge and we would at times say, If Baldev Raj was there what he would say, it is like a sort of benchmarking ourselves in doing things.**

I have the opportunity of keeping track of what you are doing, I feel you have filled the gap that was required in different domains.

**Having seen a Centre like this in the Department of Atomic Energy, academic institutions and the policy making bodies in which you are a member, Sir, can you tell us if we are preparing the next generation to takeover?**

We have excellent people in science and technology. But to be a leader we don't need only science and technology. To lead the people who are driven by the country or driven by internal desire of theirs, who are selfless, I would not be making a wrong statement if I say that, we have become more self-centric as the technologies have grown. That part really disturbs me. While the private world has fully realized that the young leadership is better than the seniors and senior must be kept in a loop of wisdom and contributing, in a government system we have still not come to terms that a person at the age of 45 can be a Director or a Chairman. And why not only the competence and the capability become the criteria? Homi Bhabha picked up very young people, gave them huge responsibilities and they came out with success. I have always preferred to see a scenario in this country that young people take the leadership role. But we have to choose those young people who are not self-driven and are only driven for the society.



The team:

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