

*Guest Editorial***Indian National Science Academy: Some Challenges Ahead¹**

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Esteemed Fellows of INSA and members of INYAS, during the past three years, it has been my honour and pleasure to serve INSA as its President. For me this short three-year journey has been a great learning experience and will remain forever a memorable experience in my life. Truth be told, that part of my duty, which involved interacting with the government, was often challenging and sometimes frustrating. But the part which involved interacting with INSA staff, officers, council members and fellows, was always enjoyable and rewarding. Perhaps I had not hitherto realized how remarkable our science academies really are. It is hard to imagine another kind of institution where nearly a thousand of the foremost experts in different disciplines, smilingly compete with each other to freely volunteer their time and offer their knowledge and skill in response to a simple request by email. The credit for establishing such a glorious tradition must go to the founders, successive presidents and office bearers of the academy, since its foundation in 1934. Being the 37th President of INSA, I owe a debt of gratitude to a long and illustrious line of predecessors and of course to the entire fellowship. Among the few innovations we have made during my tenure as President, the one I will cherish most and the one that I think will outlast everything else in its impact, is the establishment of the Indian National Young Academy of Science (INYAS). Rather than set out to describe in more detail all the wonder that INSA is, I seek your indulgence in permitting me to describe instead, some important challenges that lie ahead for INSA. I will dwell briefly on what I believe are four important challenges namely, ethics and etiquette, inclusivity, policy advice, and social sciences and humanities.

Ethics and Etiquette

Election to the fellowship of INSA is both a coveted honour and a call for serving the scientific community. We are fortunate in having inherited the noble tradition that election is by nomination and not by self-application. But I am afraid we have not entirely realized the spirit of this tradition. To do so I believe that we must endeavour to take several steps. Ideally we must ensure that nominees are not even aware of their nomination, let alone have the opportunity and bad taste to lobby on their own behalf. Nominations are made by fellows of the academy - a proposer, a seconder and several supporters. We must insist that the proposer and seconder should be acknowledged experts in the field of research of the nominee. Either the proposer or the seconder should also be intimately familiar with the career path of the nominee. The supporters should either be reasonably familiar with the nominee and/or with the field of his or her research. It follows logically from all this that the proposer and not the nominee should fill-up the nomination form, summarize the contributions of the nominee and update the file where necessary. The office should not entertain direct correspondence with the nominee even to update their files. Let us face it - today none of these norms of etiquette and ethical standards are being observed by us. There is an urgent need to change the present 'normal' and 'accepted' standards of conducting our most important business, i.e., that of election of new fellows. After all, the alternative standards I am suggesting are indeed normal and accepted in the best science academies of the world.

Then there is the matter of conflict of interest. Today we do not deal with this issue satisfactorily.

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There are at least two deficiencies in our approach. First, we conflate conflict of interest arising out of close family ties such as one's spouse or relative being a candidate for election, and conflict of interest that is presumed to arise out of one's students or close colleagues being candidates. In both cases we ask the concerned member of the committee to declare such potential conflicts of interest and pledge to remain unbiased nevertheless. In the case of conflict of interest arising out of family ties, I think this is not adequate. The concerned member should, in my opinion, refrain from participation in the proceedings of the selection committee. In the case of one's students or close professional colleagues, I personally do not consider this a conflict of interest. Indeed it would be very valuable to have a knowledgeable member of any committee who can provide much more authentic information and express much more informed opinion about the concerned candidate. My plea is that we should begin to believe that we can indeed behave like reasonable human beings. We should therefore encourage a tradition of honest, subjective evaluation by knowledgeable experts, rather than rely on blind, apparently objective numerical indicators.

Inclusivity

Whether we are electing new fellows or conferring other forms of recognition, it is imperative that we do all that is humanly possible to achieve inclusivity. Nobody would disagree with this noble objective. And yet it is very hard, perhaps impossible to achieve it in total. But of course we should keep trying to approach the ideal end-goal even if only asymptotically. There are many axes along which there is potential for exclusion and inequality. Perhaps the most important of these is gender. Women continue to be grossly underrepresented in all our professional bodies. In INSA for example, we have at present only 65 women among a total of 897 fellows. Needless to say, there are many complex, often inscrutable factors that contribute to this situation. Is there something we can do without resorting to separate quotas for men and women? I am convinced that we can bring about a significant reversal in the skewed gender balance by redoubling our efforts to locate, identify, assess and nominate more and more women or other underrepresented groups, rather than merely nominating those who first come to our attention and

worse, those who proactively approach us with a request to nominate them. We receive only about 120 nominations per year from 897 fellows. Clearly there is great scope for fellows to take more interest and nominate outstanding candidates, both women and men.

Age presents a somewhat different kind of challenge. We are constantly endeavouring to bring down the average age of the fellowship. This is certainly a laudable goal but it need not come at the expense of ignoring highly deserving older nominees. It is adequate if we do not explicitly discriminate against young nominees on the grounds that they can wait, and with the sentiment that it is wrong to elect younger nominees while older nominees are still in the queue. We need to learn to use a judicious mix of promise and performance in our measures of merit.

There is a widely prevailing perception that nominees working in premier national research institutes have an undue advantage over those working in traditional universities. Whether or not this perception is based on reality, it is important for us to counter the perception. I believe that it is possible to do so by increasing our efforts to locate and nominate more individuals working in traditional universities. Neither women nor individuals working in traditional universities should go unrecognised simply because they are not so prominently visible to us.

Another contentious issue is that of interdisciplinarity. While we all extol the importance of doing interdisciplinary research, those who heed our advice often face a distinct disadvantage when they are assessed and compared with others who work within the confines of a single traditional discipline; their nominations are sometimes shunted between different 'reluctant' sectional committees. We urgently need to evolve procedures to overcome this problem and genuinely encourage interdisciplinary research.

Yet another kind of complication arises when we attempt to compare nominees who produce knowledge and publish papers or obtain patents on the one hand and those who participate in large technology missions of national importance. In the latter case, individual contributions cannot be measured or attributed in a simple way. It appears that such comparisons cannot be made by our existing

sectional committee mechanism. INSA has recently established a separate search-cum-selection committee to overcome this problem. This committee also helps the academy to induct fellows in the areas of history and philosophy of science. This is a new experiment and it has to be evaluated in the course of time and refined as necessary.

It is not so much a matter of fairness or a moral imperative to distribute fellowships uniformly. Instead, it is in the selfish interests of the academy, an imperative for our own good functioning, that we must aim to be inclusive, that we must endeavour to elect the best people available, be they men or women, young or old, situated in universities or national labs, working in any discipline or at the intersection between disciplines, producing knowledge or technology. Thus it is our collective responsibility to find ways and means to ensure that our existing rules and traditions are not used to exclude deserving individuals – merit should not be sacrificed at the altar of rules and traditions.

Policy Advice

An important function of the world's leading science academies is to provide their governments with well-conceived, evidence-based advice on all matters where science has a role to play. Indeed, the National Academy of Sciences, USA was established "by an act of Congress, signed by President Abraham Lincoln in 1863" and is explicitly "charged with providing independent, objective advice to the nation on matters related to science and technology". INSA's history is rather different and we have to find clever ways of acquiring for ourselves an advisory role. It is generally true that our advice is not sought and when given, our advice is not necessarily heeded. It is easy to remain passive spectators of this ground reality and witness the gradual erosion of our relevance to society. But nothing prevents us from becoming proactive and voluntarily putting in the public domain a significant number of well-researched policy documents on a variety of subjects. Clearly we have the expertise to do so, otherwise we would not be complaining that our advice is not being sought. The US government funds the US National Academy of Sciences only for the advice it provides them. But our government funds us even without demanding any advice, or anything else in return. In some ways we are in an even more fortunate position because we can choose the topics

on which we would like to prepare policy documents. Consider the titles of the following small sample of the policy documents published by the National Research Council, a wing of the US National Academy that organizes the preparation and dissemination of their policy reports: *Developing Multimodal Therapies for Brain Disorders; Pathways To Urban Sustainability; Reducing the Use of Highly Enriched Uranium in Civilian Research Reactors; Developing a 21st Century Global Library for Mathematical Research; Chemical Laboratory Safety and Security; Attribution of Extreme Weather Events in the Context of Climate Change; Exploring Strategies to Improve Cardiac Arrest Survival*. Are we really incapable of producing such reports? Let us seriously introspect and ask why we are not already doing so.

Social Sciences and Humanities

It is now widely recognized that there is unity of all knowledge, that the boundaries between natural science, social science & humanities are artificial and porous and that we cannot solve many of the world's problems today without integrating all forms of knowledge. I think it is superfluous for me to further elaborate these obvious facts. It follows then that we cannot give meaningful advice without such integration of different forms of knowledge across the natural sciences, social sciences and humanities. Unlike us, the best academies of the world make no distinction between scholars across these domains of knowledge and regularly elect scholars from a wide range of disciplines to their fellowship. By doing so and thus building an interactive community of multidisciplinary scholars, they are able to add value to the expertise available with practitioners of each discipline and thereby make their advice much more refined and useful. Consider once again, the titles of the following small, sample of the policy documents published by the US National Academy of Sciences: *Deterrence and the Death Penalty; Priorities for Research to Reduce the Threat of Firearm-Related Violence; Confronting Commercial Sexual Exploitation and Sex Trafficking of Minors; Reforming Juvenile Justice; Implementing Juvenile Justice Reform; Parenting Matters – Supporting Parents of Children Ages 0-8; The Growth of Incarceration in the United States – Exploring Causes and Consequences*. I recently had the

privilege of watching the video recording of a lecture organized by the US National Academy of Sciences, by Mary C Waters, Professor of Sociology, Harvard University and a fellow of their academy, on “*The war on crime and the war on immigrants: new forms of legal exclusion and discrimination in the US*”. Can anyone really believe that we can produce such reports without the close collaboration of scholars in the social sciences and humanities? How can we even begin to address such challenges, which undeniably exist in our own environment, if we insist on maintaining our misconceived ‘purity’ and treating the social sciences and humanities as untouchables? We have a rather strange and paradoxical attitude toward the social sciences and humanities. On the one hand we maintain and cherish an ill-conceived air of superiority of the natural sciences and use this as an argument for not electing fellows in these

important areas of scholarly knowledge. On the other hand we seem to harbour an unfounded fear of these disciplines. Unless we shed our notions of superiority and overcome our fears, we will continue to be perceived as irrelevant for solving real-life problems facing the society.

I have briefly outlined four challenges ahead for INSA namely, ethics and etiquette, inclusivity, policy advice and social sciences and humanities. In each of these areas we are not doing too well. But I refuse to believe that we cannot do better. I am an incurable optimist and my optimism is further buoyed by the knowledge that I am leaving the council of INSA under the care of an outstanding new council and an exemplary new president. Let me close by wishing the INSA family a happy new year and much success ahead.