

Second Career: Life after Superannuation

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Just prior to returning home after completing my training at the Montreal Neurological Institute, I sought Dr. Penfield's blessings and advice for future. Among other things he said, "Develop a hobby other than Neurosurgery. We spend a long time to prepare for a working life but forget there is a life beyond it". He referred to his recently published book, "The Second Career". Regrettably until then I had no hobby, there was hardly any time to spare beyond striving to achieve the academic & professional goals. All neurosurgeons know what it takes to establish a neurosurgical department. Leave aside a hobby one doesn't have even time to spend with the family. Notwithstanding these limitations, over the years I got increasingly interested in research and basic neurosciences beyond clinical neurology and neurosurgery and progressively into science in general. Hence when time came for me to retire from my faculty position unlike most others instead of pursuing neurosurgery in private practice, I decided to give up the knife and pursue my love for intellectual pursuits. I now realise that unknowingly I was slowly driven in that direction even before I superannuated. Fortunately for me just before my retirement I was offered one of the most prestigious Fellowship recently established – the Bhatnagar Fellowship of the Council of Scientific and Industrial Research (CSIR). Besides other things it supplemented my meagre pension to take care of the modest family needs. I was the first medical man, and the best of my knowledge the only one so far, to be given this opportunity to pursue my "hobby" for at least five years with liberal financial support. I was also appointed at AIIMS as an Emeritus Professor and hence could continue my association with the Department of Neurosurgery. (Photo 1)

At around the same time I was elected President of the Indian National Science Academy having earlier as served as its Secretary and Vice President. I was the first clinician to be so recognized. Thus since my retirement in August 1990, I initially continued with my ongoing research in addition to some teaching but progressively got more involved with service and promotion of science in general and neuroscience in particular and continue to do so till today. At the time of my superannuation the Department of Neurosurgery was still a modest but well established well equipped nationally well recognized, with a competent cohesive faculty. During my Bhatnagar Fellowship for five years I fully participated in all its academic activities. For the next decade I visited the Department once a week for a seminar. Now, these visits are restricted to special occasions. In the meanwhile the Department has grown both in terms of its facilities and faculty and the quality and quantity of services rendered, no credit to me. There are however, two facilities – the microsurgery Cadaever lab and Centre of

Excellency in Epilepsy to which I could claim direct or indirect contributions. (For more details see Singh et al Neurology India 63,589-596, 2015).

Promotion of Neurosciences

In addition to my participation in the academic activities of the Department, I continued to pursue our research on foetal neural transplant along with Prof.GomathiGopinath. We published more than a dozen research papers and invited reviews on the subject during the next five to six years. At the same time it provided me an opportunity to complete some of the pending clinical studies. During the same time the Textbook of Neurosurgery was updated and published, as also a book on Head Injury, a Manual of Neurosurgery and Volume 3 and 4 of Lectures in Neurobiology for clinicians.

The National Brain Research Centre: Retirement has not abated the dream to complete the unfulfilled task of adding the basic science component to the now well established Clinical Neurosciences Centre. Taking advantage of the international declaration of the Decade of the Brain in 1990 and Prof. M. G. K. Menon becoming the Minister for Science and Technology, Government of India, I revived the proposal for creating such a Centre. Though approved in principle, after a national consultative meeting, it still took seven years to be finally approved as an autonomous institute under the Department of Biotechnology on 14th November 1997, with the persistent efforts of Dr.Manju Sharma, Secretary of the Department and blessings of Professor Murali Manohar Joshi, Minister for S&T and Human Resources Development. Throughout the intervening period I with the help of a steering committee chaired by me neurosciences were promoted in the country by organizing workshops and symposia, preparing a vision document and attending to the bureaucratic formalities. Once approved I was charged with the responsibility of the Chairman of the Management Committee and later as the President of the Society, Member of the Governing Body and Chairman of the Science Advisory Committee, positions that I continue to occupy up to date. In this capacity I have participated in planning, guiding and monitoring all its academic and research activities. It has been a very educative and intellectually satisfying experience – a fulfilment of a long – standing dream. The National Brain Centre is now a well-recognized institution even though for reasons beyond our control it could not be at AIIMS (Tandon PN; National Brain Research Centre: Ann. Indian Acad Neurol. 2,119.121, 1991) (Photo 2 a & b)

In addition to establishment of NBRC as mentioned in the Monograph by Prof. K. Rajasekharan, because of my association with DST, DBT, CSIR and ICMR (see later) I could catalyse the establishment of a NMR facility for Biomedical Research at AIIMS, a Brain Bank and a Neuro-informatic Centre at NIMHANS, Bangalore, a Primate Behaviour Lab at CDRI, Lucknow.

Service to Neuroscience Institutions:

I served on various academic and administrative statutory committees of various neuroscience institutions like National Institute of Mental Health and Neurosciences, Bangalore, SCTIMER, Thiruvananthapuram, SGPGI Lucknow, IHBAS Delhi, Centre for Behavioural and Cognitive Sciences University of Allahabad, Neurobiology Centre, Jiwaji University Gwalior in addition to AIIMS and NBRC. The limited scope of this write up does not permit any further details. Suffice it to say these assignments permitted cross-fertilization of ideas aimed at promoting neuroscience education and research in the country.

In addition to these over the years I was nominated to serve on the Governing Body or the Science Advisory Committee (as a member or Chairman) of several other scientific institutions e.g. Central Drug Research Institute (CDRI) Lucknow, Centre for Cellular and Molecular Biology (CCMB) Hyderabad, National Aids Research Institute (NARI) Pune, National Institute of Immunology (NII) New Delhi, Institute of Life Sciences (ILS) Bhubaneswar, Translational Health Science and Technology Institute (THSTI) Faridabad, ICMR – NIC Centre for Biomedical Research, New Delhi, Indian Institute of Advanced Research, Shimla, Nuclear Science Centre New Delhi, Patel Chest Institute, New Delhi, Indian Institute of Advance Study, Gandhinagar. This served the purpose of providing a broader view of Indian S&T and an opportunity to help its growth. Of course this often required to first update one's own knowledge to permit desired monitoring and mentoring.

Indian Academy of Neurosciences: I was inducted as an Honorary Fellow of the Academy in 1986. Over the years I was frequently invited as the Chief Guest to Inaugurate its Annual Conference or as an Invited Speaker and in that capacity as a member of the Council. In 2006 I was elected President for two years. In 2003 I was awarded the B K Bachhawat Life Time Achievement Award. Once again the Academy felicitated me for my contributions to neurosciences at its Annual Conference in Cochin in 2008. I contributed a Chapter on “Neurosciences in India: An overview”, to a book edited by Prof. B. N. Dhawan and P. K. Seth in 2009. This chapter updated an earlier publication on the subject by me with Prof. M. Gourie Devi in Annals of Indian Academy of Neurology in 2000. (Photo (3a & b) Indian Academy of Neuroscience. Annual Conference).

Service to Science through National Science Academies. Indian National Science Academy (INSA).

I was elected President for 1991-2, having served earlier as Secretary (1981-1984) and Vice-President (1989-1990). I was the first clinician to be so honored (Photo 5). This entailed an onerous responsibility to recognize reward and promote science in India, project Indian Science aboard and interact and collaborate with scientific academies around the world. In this capacity I had to spend a fair amount of time in organizing various national and international activities in pursuance of the objectives of the academy. Besides the usual functions of such an academy, only one of the most unique event is being mentioned here

since it projected the academy and Indian science on a high pedestal globally. In turn it helped in establishing a formal organization for scientific academies globally to define, discuss and laydown policy guidelines for the role of S&T on regional and global issues of societal relevance. It all started with a proposal by the Royal Society London, US National Academy of Sciences and the Royal Swedish Academy of Science to hold an inter-academy conference on Population. Representing INSA at the Consultative meeting of Ten academies at London, my proposal to hold such a conference at New Delhi was unanimously approved. The Population Summit in which, for the first time in the history of science, 55 science academies of the world participated, to arrive at a consensus statement on this complex and sensitive issue. (Photo 5)

I was assigned the responsibility of presenting the collective views of this Conference first at the Prep Com III of the UN International Conference on Population and Development (ICPD) at New York and then at a plenary session of the ICPD at Cairo in 1994. Once again it was first time in the history that collective views of the science academies were heard at a UN Conference.

As a consequence of this success the academies decided to establish a formal association for continued interaction which gave birth to Inter Academy Panel (IAP). Needless, to say my intimate association with INSA continues up-to-date. Along with other colleagues over the years. I participated in a number of Committees, Seminar, Symposia and Workshops dealing variety of subjects of national importance. I edited a series of books (see appendix) related to Indian S&T and the Academy. I was awarded the INSA Gold Medal for Promotion and Service to Science in 2011.

Inter Academy Panel (IAP):The Steering Committee of the Population Summit met once again during the Diamond Jubilee Celebrations of INSA. At this time a final decision was taken to establish IAP as a formal organization. I was requested to Co-Chair this body along with Dr. Sherry Rowland (NL) Foreign Secretary, US National Academy of Sciences soon more science academies joined it. IAP was requested by organizers of the UN Conference on Human Settlements – (Habitat II) to provide inputs on behalf of the science academies. We prepared a consensus statement on “S&T and Future of Cities” which was presented by me and Sherry Roland at a Plenary Session of the UN Conference at Istanbul, Turkey in 1996. The panel decided to take up the issue of Sustainable Development for its deliberations. For this purpose an international steering committee was constituted which organized discussion groups in different parts of the world – Washington (1996), Cairo (1999), Budapest (1999), Trinidad & Tobago (1998), Trieste (1998), Rio-de Janeiro (1997) – ending at a major conference at Tokyo in May 2000 resulting in a consensus statement, which was widely circulated by all member academies now numbering nearly one hundred. My term as Co-

Chair ended at the end of the Conference. I was invited to give a plenary talk at the IAP General Assembly at Mexico (2003), where I delivered a talk on “Genesis and Evolution of IAP”. A historical album prepared by me was released. (Ref: Tandon PN. The Inter-Academy Panel (IAP) and the Inter – Academy Council (IAC). Current Science 79, 101-102, 2000).

Inter Academy Council (IAC): Following a number of discussions between Bruce Alberts, President US. NAS. and myself, IAP decided to establish an executive arm – the Inter Academy Council – with fifteen Presidents of the member academies constituting its Governing Board. I along with a representative each from the French, Brazilian and German academies were charged with the responsibility of finalizing its constitution. IAC was finally established in 2000 at the end of the IAP conference at Tokyo. The first task undertaken by IAC was to produce a studied report on “A Strategy for Building Worldwide capacity in Science and Technology for the 21st Century”. A twelve member Study Panel, in which I was a member, was constituted in 2001. It held several meetings in different parts of the world and finally a draft report was submitted to IAC in 2003, which after an extensive external review was published in 2004 for release worldwide. Since this first report IAC has produced several such reports on subjects of global interest.

Indo- US Science and Technology Forum: Was constituted to utilize the remaining rupee fund from the PL480 scheme to promote Indo-US collaboration in S&T. I was nominated by Department of Science and Technology, GOI as one of the non-official members of its newly created Governing Body in 2001 for 5 years. The Forum met at New Delhi and Washington alternately to discuss policy issues of concern to the two countries and identify useful activities. In addition it sponsored a series of Seminars and Workshops of mutual interest both in India and the US. The first Workshop under its aegis on Research and Development in Genomics covering Health, Agriculture and Industry was held at Bangalore where I delivered an invited talk.

A new programme – Indo-US Frontier of Science Initiative was started to encourage multidisciplinary symposia, involving mid-career scientists to be held alternately in India and US. The first such programme in India was held at Bangalore. Goverdhan Mehta and I were the Coordinators. It was followed by an Indo-US Round Table on Drug Development held at Hyderabad where I participated. For several years I served as a member of the Organizing Committee of the Indo-US Frontier of Science Program me, which is now a well-established organization for many such bilateral activities.

The National Academy of Sciences India(NASI):Having been elected a Fellow of this oldest science academy in the country in 1976 and served in its council since 1983 till

recently. I was elected its President 1997-98. My active participation in its activities continues up-to-date in various capacities. Limitation of this write up prevents enumerating this in details. My contributions to the Academy, and through it to Science in India, was recognized by the award of its most prestigious Fellowship – The MeghNadSaha Fellow (2000-2005) and NASI President's Platinum Jubilee Gold Medal (2006). The main focus of this Academy is concerned with S&T for Societal Issues and promoting Science education among the young.

The World Academy of Sciences (TWAS): I was elected a Fellow of TWAS in 1992. Between 1996 and 1998 I served as the Chairman of the Medical and Health Sciences Committee. Originally named Third World Academy of Science it is now christened as the World Academy. Its main objective is to promote S&T capacity building in the developing countries. It is playing a commendable role in this direction. During these years I also served as a nominated, Member Governing Body Indian Council of Social Science Research (ICSSR) 2002-2004 and Indian Council of Philosophical Research (ICPR) 2003-2005.

Service to Various Science Departments and Councils

Medical Council of India (MCI): Owing to the growing public criticism of the functioning of the MCI the Hon'ble Supreme Court of India, by its Order dated 20.11.2002, appointed a "committee of four eminent doctors namely Dr. N. Rangabhashyam of Chennai, Prof. P. N. Tandon of New Delhi, Dr. S. K. Bhansali of Mumbai and Dr. (Mrs) S. Kantha of Bangalore as members of an Ad-Hoc Committee to assist and monitor the work of Medical Council of India". The Committee which was expected to work for six to eight months really served for nearly six years. It met at least once a month, reviewed the current programmes and practices in MCI, participated in all its regulatory functions, suggested improvements in its procedures for inspection and approval of the proposed establishment of new medical colleges and the status of the existing ones. Detailed reports were prepared from time to time and submitted to the Hon'ble Supreme Court. In this brief write-up it is neither necessary nor possible to provide the details of the work carried out, but at least during the period the Ad-Hoc Committee functioned there was no public hue and cry about the Council. However, it is also true that though appointed by the Hon'ble Supreme Court the several undesirable aspects of MCI functioning vis-à-vis the Government, state High Courts and private medical colleges pointed out in our report were obviously not taken note of or consciously ignored by all concerned. It is not surprising that some of these maladies have once again come to light recently.

The University Grants Commission (UGC): I was nominated as a Member of UGC in June 2003 for 3 years by the Ministry of Human Resource Development (MHRD). Besides the

routine functions it entailed additional responsibilities as Member/Chairman of a host of other sub-committees like Committee on Research in Universities, Committee for Selection of Universities with Potential for Excellence, Screening Committee for Grant of Deemed University Status, Committee to Revise the Guidelines for Approval of Deemed Universities etc. It was here that we became aware of how commercially motivated individual entities attempted to manipulate the system and misused it to establish sub-standard “teaching shops” in the name public service. Soon large number of such fraudulently established institutions – so called Deemed-to-be-Universities came up all over the Country. (See Below)

A Committee to Review the Functioning of the “Deemed-to-be-Universities: This malady had acquired such vicarious proportions, adversely affecting the whole higher education system in the country, that Ministry of Human Resource Development appointed a Committee to review these institutions in July 2009. Thus three years after completing my term as a Member of UGC, I found myself (along with three other very distinguished educationists Profs. Anandkrishnan, Goverdhan Mehta, Mrinal Miri) as a member of this Committee, which for some unexplained reason came to be known as the “Tandon Committee”. A total of 126 such institutions were reviewed meticulously utilizing well defined criteria over three months. Only 38 institutions were found to justify their continuance as deemed-to-be-universities, while 44 held the potential for improvement. Another 44 institutions had no attributes or promise to retain their status as Universities.

The whole subject is too complex to be described here in any details. Suffice it to say the Hon’ble Supreme Court took nearly a decade to resolve the issue. It was only in 2017 that the final judgement was delivered. Ultimately once again a new committee is “re-reviewing it” and CBI is investigating some of these institutions. At the same time the so-called “Tandon Committee” (and in some instance I along with other members) were involved in related matters on the request of UGC till 2013-14. Needless to say all this required lot of our time and energy. At the moment we are working on bringing out a book on the subject.

Indian Council of Medical Research (ICMR): My long association with ICMR, initially as a recipient of research grants, later as member of the Neuroscience and Mental Health Task Forces and other committees continues unabated during the period covered in this write-up. Without detailing my participation in all such activities I will mention only few important ones. I served as Chairman of the Scientific Advisory Group for Basic Sciences including Neuroscience and later as a member of the highest policy making Committee the Scientific Advisory Board. Initially as a Member and later as it Chairman till recently I served the Central Ethics Committee of ICMR for over two decades. In this capacity I contributed to the formulation of the Ethical Guidelines for Biomedical Research on Human Subjects released

in 2000, revised in 2006, updated in 2017. In the meanwhile a draft of “The Biomedical and Health Research Regulation Bill” was submitted to the Government in 2013-14.

An equally time consuming task undertaken by a High Power Committee, with me as Chairman, comprehensively evaluated the ongoing research activities of ICMR – all its 32 Institutes, 13 technical divisions at Headquarter and extramural Centres and individual investigator driven proposals. The Final voluminous report was submitted in 2014. After a persistent effort Dr.Katoch (then DGICMR and Secretary DHR) finally got the Cabinet approval to initiate a major program on “Expanding Research Initiatives in Medical Colleges”. A Committee Chaired by me was assigned the task to implement this scheme by “Establishment of Multidisciplinary Research Units in Government Medical Colleges”. This is an ongoing activities and I continue as its chairman.

International Bioethics Committee (UNESCO): In 2001, I was a member of the Indian Delegate to UNESCO General Assembly led by Prof. M. M. Joshi who asked me to represent him at the Round Table on Bioethics and International Implications. Government of India nominated me as India’s representative to the International Bioethics Committee in 2002. In that capacity I represented the country at the Meetings of Government Experts Responsible for finalizing the (UNESCO) Draft International Declaration on Human Genetics Data at Paris in 2003. In the same year I was invited to be a Member of the Organizing Committee of an UNESCO-MHRD International Meeting on Dialogue among Civilizations. I gave a talk during Group Discussion on Science and Technology and helped in drafting the final declaration referred as “Delhi Declaration”.I was invited to be a Member of International Bioethics Committee (in my personal capacity) by D.G. UNESCO D. Koichiro Matsuura in 2004 for four years. During this period following a number of meetings at Paris, Tokyo and Nairobi IBC ultimately finalized a “Universal Declaration on Bioethics and Human Rights” which was adopted by the General Conference of UNESCO in October 2005. Besides several other discussions, ultimately a book on the subject was published to provide a new impetus to the promotion and dissemination of the Declaration to which I contributed a Chapter on Article 17: Protection of Environment, the Biosphere and Biodiversity.

Service to Government Science Departments: Department of Science and Technology (DST): I had earlier served the Department as a Member of the Science and Engineering Council (SERC); Chairman of Neurobiology and Animal Behaviour Task Force; Committee for BOYSCAST and Young Scientists etc. However, in recent years, I served on the two important Committees: Committee to draft Science and Technology Policy of the Government, released in 2003, and as Chairman of the Task Force for Promotion of Cognitive Science in the country (2008-2016). Besides screening and selecting research

grants applications, organizing some symposia and seminars to promote awareness and interest in this emerging discipline, we managed to publish a book, "Expanding Horizons of Mind Science (s) (eds) P.N. Tandon, R.C. Tripathi, N. Srinivasan, Nova Science Publishers Inc, New York 2011. In addition DST nominated me as a Member of the Institute Body of Sri ChitraTirunal Institute of Medical Research and Technology (SCTIMRT), Trivandrum (2002-2007). As already mentioned I was nominated as on the non-official Member of the Governing Body of the Indo-US S&T Forum.

Department of Biotechnology:I have been involved in many of the programmes of the Department since its inception till date. Brief mention is made of only a selected few. Activities related to the promotion of neurosciences and establishment of NBRC are already described. Others included, As a Member of the Science Advisory Council (SAC); Member of Biotechnology Research and Promotion Committee (BRPC). Chairman of the Medical Biotechnology; Chairman National Bioethics Committee; Chairman Task Force for Development of Immuno-diagnostics and Vaccines among several others for nearly two decades, provided me to promote Research and Development (R&D) in Biotechnology in general and wherever possible those related to neuroscience in particular. Mention may be made of programmes on developmental neurobiology, stem cell research, Centre of Excellence for Epilepsy Research etc. I was a Member of the Indo-US Vaccine Action Programme (VAP) since its inception for twenty years. Currently I am Member of the Technical Committee of Biotechnology Industry Research Assistance Council (BIRAC) for last more than ten years.

There were several other assignments in recent years like Membership of the Medical Education Group of the Knowledge Commission, Steering Committee on Perception Engineering, Department of Information Technology; SAC and GB, Thrombosis Research Centre Bangalore; some Committees of Ministry of Health and Family Welfare; Honorary Consultant, Principal Scientific Advisor to GOI.

During all these years academic activities were not neglected. Besides participating in teaching programmes at Neurosciences Centre, AIIMS and National Brain Research Centre I delivered nearly 40 named orations and approximately 100 invited talks and inaugural addresses at various conferences, seminars, symposia and workshops. In addition the Textbook of Neurosurgery 2nd Edition (1996) and 3rd Edition (2012) and Manual of Neurosurgery (2014) were published. Along with Prof. B. Ramamurthi I was a consulting editor of the Textbook of Operative Neurosurgery (2005). In addition one dozen monographs and books were also published (See list). Nearly one hundred papers and 50 Chapters in various books have been added to the list of publications after my superannuation.

Retrospectively having voluntarily dissociated with clinical work, I have no regrets for my decision since it helped me serve an equally dear aspiration, that is service and promotion of Science in general. Future will judge if I succeeded but at least at the moment there are indications that it was worth it. Unsolicited, unexpected, though not unappreciated, recognition through some of the most prestigious positions and awards may be an evidence that my services were worthwhile. These include the Co-Chair of Inter academy Panel of the World Academies of Sciences; Presidentship of the Indian National Science Academy; National Academy of Sciences, India; Platinum Jubilee Gold Medal of NASI, INSA Gold Medal for Promotion and Service to Science and the National Research Professorship among many others I consider myself blessed to have had unstinted support of my family, friends, colleagues and students in persuing my second career – “Service to Science and the Country”. I am grateful to the Almighty for granting me physical and mental faculties to enable me to continue to serve even at my advanced age.

ANNEX 1

Publications since Superannuation in 1990

Books and Monographs:

- Ramamurthi B, Tandon PN, Ramamurthi R, Sridhar K: Textbook of Neurosurgery (2nd Edition) B.J Churchill Livingstone, New Delhi 1996.
- Menon MGK, Tandon PN, Agarwal SS, Sharma VP (Eds) Human Genome Research: Emerging, Ethical, Legal, Social and Economic Issues. Allied Publishers, New Delhi 1999.
- Pursuit and Promotion of Science: Indian Experience .Indian National Science Academy, New Delhi 2001.
- Tandon PN: Health Scenario in India: Hope for a Better Future. Bharatiya Vidya Bhawan, Pune 2002.
- Inventing a Better Future: A Strategy for building worldwide capacity in science and technology: Inter Academy Council, 2003
- Tandon PN; Collected works of Professor V. Ramalingaswami: Indian National Science Academy and Ranbaxy Science Foundation, New Delhi 2009
- Mohan Ram HY, Tandon PN: (Eds) Science in India: Achievements and Aspirations: 75 years of the Academy. Indian National Science Academy, New Delhi 2010
- Tandon PN, Tripathi RC, Srinivasan N: (Eds) Expanding Horizons of Mind Science(s). Nova Science Publishers, Inc, New York, 2011
- Tandon PN, Ramamurthi R: (Eds) Textbook of Neurosurgery 3rd Edition: Jaypee Medical Publishers, New Delhi 2012

- Tandon PN, Muralidhar K, Gupta YK: (Eds) Use of Animals in Scientific Research and Education. Indian National Science Academy, New Delhi 2012
- Tandon PN, Ramamurthi R, Jain PK: (Eds) Manual of Neurosurgery, Jaypee Medical Publishers, New Delhi 2014
- Tandon PN: My Tryst with Bio-Medical Research. National Academy of Science, India, Allahabad 2015
- Sharma M, Tandon PN, Govil G: Festschrift Dedicated to Professor MGK Menon: National Academy of Sciences India, Allahabad. 2016
- Jana Nihar, Tandon PN, BasuAnirban (Eds) Inflammation: the Common Link in Brain Pathologies. Springer Science & Business Media, Singapore 2016
- Sahni SK, Tandon PN (Eds): Indian National Science Academy's Inspirational Journey in 75 years. Indian National Science Academy, New Delhi 2017.