

Professor T. R. G.: An appreciation

T. R. Govindachari will shortly be turning 81 and would have seen a thousand moons. I had the privilege of being associated with him for over four-and-a-half decades, as a student in his intercollegiate lectures for B Sc (Honours) in chemistry (long since discontinued), as his first Ph D student and as a CSIR postdoctoral fellow at Presidency College, Madras, as a Departmental Head during his direction of CIBA Research Centre, Bombay, and then on as a fellow organic chemist. I meet him off and on in some symposium or the other, and when I am in Madras, I unfailingly visit him in the compact but well-equipped Centre for Agrochemical Research which he has organized for SPIC Science Foundation. These visits are invariably inspiring and I return wondering whether the country cannot find in his personality panaceas for many an ailment that afflict Indian science.

Some weeks ago I telephoned to him to say that I would be in Madras for a couple of days. He immediately insisted that I should visit him for discussing the affairs of the National Organic Symposium Trust (NOST), a nonprofit organization established by five of the country's seniormost organic chemists, S. Swaminathan, Nityanand, Sukh Dev, Bhattacharya and himself. The major activity of NOST is to promote Organic Chemistry in India by holding conferences (like Guha and Gordon) and to support other symposia from funds that he and the other founders had collected. He had come to Bombay in 1987 for a fund collection drive. He was then 72 and I still remember vividly how he went from one industrial house to another soliciting donations. His strenuous efforts and those of other founders finally gave NOST the income to organize the NOST conferences, which are done by the Council, with the Trustees (TRG being one of them) keeping themselves in the background. NOST is carrying on its mission quietly and with very little fanfare, but, like other acts of good faith, has some disbelievers. TRG shared his concerns with me during this last visit and discussed with me at length how real or perceived imperfections in the organization could be addressed.

Actually, when I stepped into his laboratory that day, I found him engrossed in deciphering an NMR spectrum along with an associate. He told me with his usual self-deprecatory smile how he was trying to inform himself of recent techniques in NMR spectroscopy so that these could be mobilized for structure elucidations. He also divulged to me with pride and satisfaction that he was able to persuade SPIC and DBT to fund a modest Supercon NMR for the Research Centre, and with mischief in his eyes, he showed me how he had converted one floor into two by building a mezzanine, thus effectively doubling the laboratory space, enabling both the research group and the sizeable array of sophisticated equipment to co-exist comfortably. True to his colours, TRG at 81 goes about his research activities, quietly keeping abreast with recent scientific developments and with the tools available to him, not cribbing at the lack of one or the other but silently working towards adding the necessary ones.

On an earlier visit, he had shown me with undisguised excitement, beautiful crystals of azadirachtin A (the now universally famous antifeedant principle present in the seed kernels of neem) and the results of single-crystal X-ray studies (*Current Science*, 1994, 66, 295, 362). Formulations of crude neem extract containing 300–3000 ppm of azadirachtin A are marketed now in many countries as an eco-friendly pesticide. TRG's group has developed processes for obtaining azadirachtin-

enriched neem extracts as well as formulations which are now distributed by SPIC Biotech. I would not be surprised if he had the purest sample of azadirachtin A in the world. TRG also mentioned to me how he had a few other leads from plant sources with pesticidal properties. In fact, for nearly six decades, TRG has brought in unparalleled perseverance, single-minded devotion and incisive chemical insight to the study of the vast flora of this country.

Over the years, his group has isolated many complex-structured compounds belonging to diverse classes of natural products such as alkaloids, oxygen heterocycles and terpenes, quite a few of them being the prototypes of a particular group, e.g. tylophorine, echitamine, kopsine, ancistrocladine (alkaloids) wedelolactone (furocoumarin) and cedrelone and ishwarone (terpenes). Some of them had potent biological activity (tylophorine – antiasthmatic; wedelolactone – hepatoprotective, ancistrocladine – potential anti-HIV). TRG and co-workers had located a very rich source of the anticancer alkaloid, camptothecin in an Indian plant, when only milligrams were available for clinical trials in USA. Currently, TRG's extensive work on neem has yielded many new congeners of azadirachtin A.

I have dealt at some length on TRG's contributions to natural-products chemistry because I feel that our young organic chemists can learn a lesson from it. Currently, there is a resurgence in this branch of chemistry, particularly as



a source of ecocompatible bioactive molecules serving as leads or ending up as drugs or plant protection chemicals. Taxol, artemisinin and azadirachtin are but three recent examples. Let us ask ourselves the following question: Can we do interesting and useful chemistry in this area doing justice to our plant wealth, or rather, should we pursue the fashions of the day in vogue elsewhere. There is no doubt that science is universal and knows no barriers, but why cannot we be trendsetters for a change?

An X-ray crystallographer of the Madras University Biophysics Department told me the other day that even now TRG himself comes to the department personally with samples for structure determination. So does he for special NMR and mass spectra. It is typical of him even past 80 to be in the laboratory every morning regularly at 9 a.m. and work till late in the evening – surely a trait worthy of emulation by the younger generation. His achievements after retirement from CIBA Research Centre in 1975, such as establishing two research centres, speak for his indefatigable energy and passion for science. Besides development of useful processes for synthetic molecules and extraction of natural products, TRG has added about 30 papers to his earlier tally of 274.

Looking back, TRG can be justifiably satisfied with what he has achieved during 45 years of professional career. As a Professor of Chemistry, Presidency

College, Madras (1950–1962), he built up a school of research in natural-products chemistry (and that too with minimum available facilities) whose excellence has been acknowledged internationally. Simultaneously, he was acclaimed as a good teacher who ushered in an appreciation of modern theories of organic chemistry. For a year and a half (1961–1962), he also served as the Principal of Presidency college and might have well become the Director of Public Instruction. The next twelve-and-a-half years (1963–1975) saw him as the Director of Ciba Research Centre, which he moulded into an internationally known research centre and wherein he collected a group of the finest young scientists of the country to do basic research for the development of new drugs and dyestuffs. For a couple of years afterwards (1976–1978) he was a consultant to the Central Leather Research Institute, Madras. Later on he established a good R&D facility for Amruthanjan (1977–1986). He joined SPIC in 1987 as an adviser to their Science Foundation and set up the Centre for Agrochemical Research, wherein he continues his activities. In both these laboratories, TRG has been investigating natural products, in addition to guiding the groups in process development activities.

TRG's achievements have earned him several national recognitions (Bhatnagar Prize for Chemistry, Meghnad Saha Medal, Golden Jubilee Commemoration

Medal, Fellowships of IASc and INSA) and international honours (Plenary lecture at the first IUPAC, National Products Symposium, Membership of the Bureau of IUPAC) but I firmly believe that many more should have accrued to him. He has been a President of the Indian Chemical Society but not of the prestigious Science Academies. I suspect that his long post-academic association with industry, especially with a multinational company, has been responsible for his name not appearing in the Indian Government's list of New Year Honours year after year. Shy by nature and reticent by disposition, TRG is not gregarious or garrulous and certainly not given to beating his own drums. It is a pity that his experience and expertise in matters pertaining to education and academic and industrial research, especially in new drug development, have not been adequately appreciated and sufficiently utilized by the scientific community. The loss is not his but of Indian science and that is another ailment that afflicts Indian science!

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MEETINGS/SYMPOSIA/SEMINARS

Short Lecture Courses in Neurobiology

Date: 16–22 October, 27 November–6 December and 6–13 December 1995

Place: Bombay

Date: 26 October–2 November, 7–14 December and 26 November–5 December 1995

Place: Bangalore

Topics included for respective dates and places are: Synaptic transmission, Vesicular events at the synapse and neural development.

Candidates should apply to the course location that is closer to them.

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TIFR, Bombay 400 005
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Dr M. K. Mathew

NCBS, TIFR Centre

P.O Box 1234, Bangalore 560 012

Third International Symposium on Genetics, Health and Disease

Date: 1–4 December 1995

Place: Amritsar

Topics include: Genetic diseases; Diagnosis; Treatment and counselling.

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