



G N RAMACHANDRAN

FNA, FRS, FRSA

Professor, Mathematical Philosophy;
INSA Albert Einstein Professor,
Mathematical Philosophy Group
Indian Institute of Science, Bangalore

Born on 8th October 1922

Education:

- PhD, University of Cambridge, England
- D.Sc, Indian Institute of Science, Bangalore

Important Research Contributions:

- Discovery of the Triple Helical structure of the connective tissue protein called Collagen
- 'The Ramachandran phi-psi Plot' which has become a standard description of protein structure
- Development of the theory of image reconstruction from shadowgraphs (such as X-radiograms) using the Convolution Technique.

RAGHAVENDRA GADAGKAR

FNA, FASc, FNASc, FTWAS

INSA SN Bose Research Professor
Centre for Ecological Science
Indian Institute of Science, Bangalore



Raghavendra Gadagkar obtained his Ph.D. in Molecular Biology from the Indian Institute of Science, Bangalore. During the past 25 years he has established an active school of research in the area of Animal Behaviour, Ecology and Evolution. The origin and evolution of cooperation in animals, especially in social insects, such as ants, bees and wasps, is a major goal of his research. By identifying and utilizing crucial elements in India's biodiversity, he has added a special Indian flavour to his research.

As the founder chair of the Centre for Contemporary Studies, Professor Gadagkar has initiated a new experiment that endeavours to engage some of the best practitioners of different disciplines in the human sciences, such as philosophy, sociology, economics, law, literature, poetry, art, music, cinema etc. and aims to forge meaningful interaction between the natural and human sciences with special focus on understanding the diverse research methodologies of different disciplines and create opportunities to rethink the foundations of our own disciplines.



FIRST

G N RAMACHANDRAN MEMORIAL LECTURE

on

Interrogating an Insect Society

by

PROFESSOR RAGHAVENDRA GADAGKAR

Indian Institute of Science, Bangalore

on

3rd November 2010

at 3.30 PM

in the

Rabindra-Okakura Bhavan Auditorium

Salt Lake, Kolkata



S N Bose National Centre for Basic Sciences

Kolkata

As a tribute to Professor G N Ramachandran, the S N Bose National Centre introduces an annual lecture on Biological Sciences. Eminent scientists in this field are invited to deliver the lecture. Professor Raghavendra Gadagkar begins the series. A brief outline on his topic is given below.

Abstract

INTERROGATING AN INSECT SOCIETY



Many species of insects, especially among ants, bees and wasps, organize themselves into societies that parallel if not better human societies in their social organization, integration, communication, division of labour and even in their caste systems. Such societies consist of one or a small number of reproductives (queens) and a large number of sterile or nearly sterile workers. While the queens engage in laying eggs, all the tasks required for nest building, the workers perform acquisition and processing of food and brood care. How do such societies function in a coordinated and efficient manner? What are the rules that individuals follow? How are these rules made and enforced? These questions are of obvious interest to us as fellow social animals but how do we interrogate an insect society and decipher its "language"? In this lecture I will describe research designed to seek answers from insect societies to questions of obvious interest to us. I have chosen the Indian paper wasp *Ropalidia marginata* for this purpose, a species that is abundantly distributed in peninsular India and that serves as an excellent model system. An important feature of this species is that queens and workers are morphologically identical and physiologically nearly so. How does an individual become a queen? How does the queen suppress worker reproduction? How does the queen regulate the non-reproductive activities of the workers? What is the function of aggression shown by different individuals? How and when is the queen's heir decided? I will show how such questions can indeed be investigated and will emphasize the need for a whole range of different techniques of "interrogation". In closing I will reflect on what we can learn from understanding such insect societies.

S N BOSE NATIONAL CENTRE FOR BASIC SCIENCES

Block JD, Sector III, Salt Lake
Kolkata 700098



On behalf of the Centre

I have great pleasure in inviting you
to the

1st G N Ramachandran Memorial Lecture

at 3.30 PM on Wednesday,
the 3rd November 2010

at the

Rabindra-Okakura Bhavan Auditorium
DD-27A/1, Salt Lake
Kolkata - 700064

Arup Kumar Raychaudhuri
Director