

Abstract Book

**Summary of Lectures
Delivered at 72nd Orientation Programme
February 06th - March 06th, 2019**

**UGC-Human Resource Development Centre
Jadavpur University**

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Director's Note

The UGC-Human Resource Development Centre, Jadavpur University, is organizing the 72nd Orientation Programme, the last among the four such programmes sanctioned by the UGC in the session 2018-19.

Like the previous Orientation Programme, we have organized a study tour at Satyajit Ray Film and Television Institute (SRFTI) Kolkata, for the participants of 72nd Orientation Programme. In this study tour the participants would get first-hand experience in direction, sound, cinematography, editing and animation through a guided tour of different units of SRFTI, which they would thereafter document in terms of reports. My sincere thanks go to Debamitra Mitra, Director of SRFTI Kolkata and Ashok Viswanathan, Dean, SRFTI Kolkata, for arranging such an important study tour for the participants of the 72nd Orientation Programme.

While selecting topics of the lecture sessions, three criteria have been kept in mind: topics of current affairs of national as well as international importance (such as environmental preservation, biodiversity); topics of general interest for moral, psychological and professional development (such as lectures on IQAC, stress management, research methodology, CAS/service matters, general financial rules); and topics of cross-discipline and multi-discipline in nature (such as lectures on, philosophy and history of science, Disaster Management, Law, Media Studies). On top of all these, there has been one session on performing arts with live demonstration.

This Abstract Book collates summary of most of these lectures delivered by experts and eminent researchers in the relevant fields both from within and outside West Bengal. The summary lectures are arranged thematically according to the above-mentioned perspectives. I hope that the participants of the 72nd Orientation Programme would find this Abstract Book useful for ready references of what they have learnt through this programme.

On January 20, 2018, we have achieved a milestone by launching our own website (www.hrdcjui.in) and from the session of 2018-19 the application procedure has become on line both of which have been the first of their kind among all the HRDCs in West Bengal. I sincerely thank the University administration for all the help that has been provided to us in this regard. The e-copies of this Abstract Book as well as the earlier ones can be downloaded from link to Archive in this website. Apart from providing all necessary information regarding different programmes organized by us along with time lines and application forms, the website contains a feedback link which can be used by the participants and other stakeholders for providing us their valued suggestions. Such suggestions would help us improve our performance and discharge our moral responsibilities more efficiently and effectively according to the needs of the stakeholders.

At the end, I wish all the participants a memorable and enjoyable four weeks of interactive learning.

February, 2019

Rajat Acharyya

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Schedule for 72nd Orientation Program (February 06th - March 06th, 2019)				
Date	10:30 AM – 12:00 Noon	12:00 Noon – 1:30 PM	2:15 PM – 3:45 PM	3:45 PM – 5:15 PM
February 06 Wednesday	Inauguration Session: 11:00 am: Welcome Address by Prof. Rajat Acharyya , Director, HRDC, Jadavpur University 11:30 am: Tea Break 11:45 am - 1:15 pm: Inaugural Address by Amalendu Bandyopadhyay M.P Birla Institute of Fundamental Research, M.P.Birla Planetarium 1:15 pm: Vote of Thanks by Chaitali Mukherjee , UGC-HRDC		Sarmistha Raychoudhuri Department of Biophysics Molecular Biology & Bioinformatics, CU <i>Genetic Engineering of Plants: Science and Safety</i>	
February 07 Thursday	Sanjay Mukhopadhyay Department of Film Studies, JU <i>Documentary Film and Painting: The Crisis of Representation</i>		Mihir Chakraborty Department of Mathematics, CU <i>An introduction to Propositional Logic</i>	
February 08 Friday	Achin Chakraborty Director, IDSK Kolkata <i>Methodology in Social Sc.</i>		Indrani Choudhuri Dutt Coordinator IQAC Lady Brabourne College <i>Data Sourcing, Management & Analysis: Institutional Role & Involvement Participation In Iqac</i>	
February 09 Saturday	Basab Choudhury Hon'ble Vice Chancellor, WBSU <i>Plagiarism</i>	<i>Lab & Library Work</i>	Basab Choudhury Hon'ble Vice Chancellor, WBSU	<i>Lab & Library Work</i>

Lunch Break: 1:30 PM – 2:15 PM

Schedule for 72nd Orientation Program (February 06th - March 06th, 2019)				
Date	10:30 AM – 12:00 Noon	12:00 Noon – 1:30 PM	2:15 PM – 3:45 PM	3:45 PM – 5:15 PM
February 11 Monday	HOLIDAY		HOLIDAY	
February 12 Tuesday	Manjusha Majumder Department of Mathematics, CU <i>History of Development of Modern Differential Geometry</i>		Partha Pratim Biswas Department of Construction Eng. JU <i>Road Traffic Accident</i>	
February 13 Wednesday	Pradip Kr. Ghosh Pro-Vice-Chancellor, JU <i>Some Aspects of Philosophy of Science</i>	<i>Lab & Library Work</i>	Bijan Das Department of Chemistry Presidency University <i>Chemical History of the Origin of Life on Earth: Role of Polymers</i>	
February 14 Thursday	<i>Lab & Library Work</i> & <i>Submission of Report of Survey based Group Project & Discussion & Evaluation</i>		Amitava Datta Department of Power Engineering <i>Efficient use of LPG Cook-stoves in Domestic Households</i>	
February 15 Friday	Survey based Group Project & Discussion & Evaluation	Survey based Group Project & Discussion & Evaluation Avijit Mukherjee	Survey based Group Project & Discussion & Evaluation Subrata Mukherjee	
February 16 Saturday	Tilottama Raychaudhuri NUJS, <i>Cartels and Competition Law</i>	Priyadarshini Mallick D C Halder College, South 24 Parganas <i>Intellectual Property Rights: An Introduction and Overall Perspective</i>	Gour Krishna Pattanayak FO, JU <i>Basic Financial Rules and Service Related Rules Applicable for the College and University Teachers</i>	<i>Lab & Library Work</i>

Lunch Break: 1:30 PM – 2:15 PM

Schedule for 72nd Orientation Program (February 06th - March 06th, 2019)				
Date	10:30 AM – 12:00 Noon	12:00 Noon – 1:30 PM	2:15 PM – 3:45 PM	3:45 PM – 5:15 PM
February 19 Tuesday	Somnath Ganguli Department of Physiology, CU <i>Ergonomics</i>		Pulak Sengupta Department of Geology, JU <i>TBA</i>	<i>Lab & Library Work</i>
February 20 Wednesday	Supriyo Ghosal Secretary, WB Right to PSC, GoWB <i>Emotional Intelligence</i>		Sugata Hazra School of Oceanography, JU <i>Disaster Management and Sustainable Development</i>	
February 21 Thursday	Salil Kumar Sanyal Former Professor, Department of ETCE <i>Wireless Network</i>		Suchisree Ray Performing Arts: Indian Classical Music <i>Raga and Realisation</i>	
February 22 Friday	<i>Study Tour at SRFTI</i>		<i>Study Tour at SRFTI</i>	
February 23 Saturday	Suddhasatwa Chakraborty Department of Electrical Engineering, JU Let there be Light	Saswati Sarkar Department of Bengali, Future Foundation & Recitation Artist <i>Siksay Binodon</i>	Ramaprasad Bhattacharya Joint DPI, WB <i>Service Matter</i>	

Lunch Break: 1:30 PM – 2:15 PM

Schedule for 72nd Orientation Program (February 06th - March 06th, 2019)				
Date	10:30 AM – 12:00 Noon	12:00 Noon – 1:30 PM	2:15 PM – 3:45 PM	3:45 PM – 5:15 PM
February 25 Monday	Ajitava Roychowdhury Department of Economics, JU <i>Budget</i>		Chittaranjan Sinha Department of Chemistry, JU <i>Initiation of Chemical Education and Research in India : Inspiration from Acharya P. C. Ray</i>	
February 26 Tuesday	Shankar Nath Former Prof., R.G.Kar Medical College <i>Food and Cancer</i>		<i>Lab & Library Work Submission of Report of Study Tour</i>	
February 27 Wednesday	Susanta Kumar Chakraborty Department of Zoology, VU		Microteaching	
February 28 Thursday	Microteaching		<i>Lab & Library Work Submission of Seminar Report</i>	
March 01 Friday	Seminar Presentation and Evaluation	Seminar Presentation and Evaluation	Seminar Presentation and Evaluation	Seminar Presentation and Evaluation
March 02 Saturday	Seminar Presentation and Evaluation	Seminar Presentation and Evaluation	Seminar Presentation and Evaluation	Seminar Presentation and Evaluation
March 04 Monday	Seminar Presentation and Evaluation	Seminar Presentation and Evaluation	Seminar Presentation and Evaluation	Seminar Presentation and Evaluation
March 05 Tuesday	MCQ		Performing Arts Session	
March 06 Wednesday	Valedictory Session 11 am – 12:30 pm: Valedictory Lecture by Samir Kr. Saha		Feedback and Interactive Session	Certificate Distribution and Disbursement of Payment)

Lunch Break: 1:30 PM – 2:15 PM

Pogramme of the Study Tour at Study Tour at SRFTI

Day of the Study Tour: February 22, Friday, 2019

Venue: SRFTI, Kolkata

10:15 AM	Assembly at Preview Theatre, SRFTI
10.25 AM	Welcome address by Director
10.30 AM-12:00 Noon	Lecture on Literature and Cinema by the Prof. Ashoke Viswanathan .
12:00 Noon – 1: 30 PM	Lecture on Television by Prof. Avijit Dasgupta
1: 30 PM – 2:15 PM	L U N C H
2:15 PM – 03.45 PM	Lecture on Literature and Cinema by the Prof. Ashoke Viswanathan
3.45 PM - 5:15 PM	Lecture on Television by Prof. Sudipta Voumik
5:15 PM	Visit at Departments of SRFTI: Editing, Producing Animation, Television etc.

**UGC – Human Resource Development Centre
Jadavpur University**

72nd Orientation Program
(February 06th - March 06th, 2019)

Survey based Group Project & Discussion & Evaluation

1. Time slot of Group Discussion: **15.02.2019 at 10:30 AM - 1:30 PM & 2:15 PM - 5:15 PM**
2. Presentation shall be made for **20 Minutes** followed by interaction for **10 Minutes**.
3. Presentation shall be made according to the following order.
4. Write up (**12 TNR; Single spacing**) on the topic must be submitted on **14.02.2019 (5:15 PM)**

Group	Name	Subject	Total	Topic
A	Arunima Sengupta	Biotechnology	6	Ethical Issues in Cloning
	Arpita Bala	Botany		
	Maitreyee Mondal	Microbiology		
	Abul Hasan Sardar	Microbiology		
	Nimai Chand Patra	Vety. Pathology		
	Ujjwal Paul	Zoology		
B	Mrinal Kanti Bera	Chemistry	6	Alternative Energy: Present and future
	Suparna Sadhu	Chemistry		
	Suchandra Chakraborty	Chemistry		
	Sisir Debnath	Chemistry		
	Sirsendu Gayen	Chemistry		
	Avijit Mondal	Chemistry		
C	Usha Mandi	Chemistry	5	Nanotoxicology: A new threat to environment
	Sk Mohammad Aziz	Chemistry		
	Arunabha Thakur	Chemistry		
	Samit Guha	Chemistry		
	Biswajit Mondal	Leather Technology		
D	Satabdi Roy	Geography	6	Sustainable Engineering and Eco Design
	Md Safi	Geography		
	Dola Chakraborty	Geology		
	Arnab Dasgupta	Geology		
	Nivedita Chakraborty	Geology		
	Anudeb Mandal	Geology		

E	Puja Ghosh	Mathematics	5	Laws of Large Numbers
	Subhadipa Das	Mathematics		
	Supratim Mukherjee	Mathematics		
	Asgar Ali	Statistics		
	Sourav Rana	Statistics		
F	Samir Chakravarti	Mechanical Engg	6	Robot and AI
	Sibsankar Dasmahapatra	Mechanical Engg		
	Subrta Mondal Mondal	Power Engg		
	Srijoni Maitra	Computer Science		
	Srinka Basu	Ets		
	Abhijit Chandra	Iee		
G	Manjishtha Sur Roy Chowdhury	Psychology	6	Quantum physics in psychology: a mind–brain interaction
	Debadeepa Banerjee	Psychology		
	Jayanta Kumar Saha	Physics		
	Arnab Gangopadhyay	Physics		
	Arnab Kumar Das	Physics		
	Sandeep Kumar Roy	Physics		

**Abstract
of
Lectures Delivered**

Inaugural

Astronomical Instruments Devised In Ancient India

Amalendu Bandyopadhyay

M.P Birla Institute of Fundamental Research, M.P. Birla Planetarium, Kolkata, India

Date & Time: 6th February, 2019; 11:45 AM - 1:30 PM

Astronomy is an observational science. The position and movements of heavenly bodies have to be observed and recorded very accurately before a theory to explain their motions can be propounded. All theories have to be revised if their predictions are not in accordance with observational results. Also for many purposes, the time since sunrise has to be measured precisely. However, visual observations are not very accurate and it is necessary to devise instruments to ascertain the positions and motions of heavenly bodies and measure the duration of time. Ancient Indian astronomers devised a number of instruments for observation. Ancient Indian astronomers had facilities for naked eye astronomical observation. In this paper a brief introduction to some of the major equipment used for observation by Indian astronomers of pre-telescopic period is presented. The equipment for astronomical observation was used primarily for two purposes-to determine time and to fix positions of the heavenly objects. None of the instruments described by Indian astronomers before the time of Maharaja Jai Singh (1688-1743) survive today. Perhaps they were made of perishable materials like wood and bamboo. Admittedly also, they were not very sophisticated. Details of some of these ancient instruments have been found out on the basis of information available in various astronomical treatises of ancient India written mainly in Sanskrit, which was the language of the astronomers. Some of these treaties were later translated into English and are still available.

**CAS/
Service matters/**

Data Sourcing, Management & Analysis: Institutional Role & Involvement Participation in IQAC

Indrani Choudhuri Dutt

Coordinator, IQAC, Lady Brabourne College, Kolkata

Date & Time: 8th February, 2019; 2:15 AM – 5:15 PM

- The lecture aims to emphasize that IQAC of an institution is essentially an interactive and participative body.
- The Core Committee should present itself as a body of team makers and team leaders. The rest of the Faculty should see themselves as key players in a team.
- A functioning IQAC must be open, interactive, communicative.
- It must instil among each Faculty member a sense being part of an integrated structure with graded levels of activity – increasing magnitude of intensity to facilitate resolutions which are holistic and beneficial for the institution.
- It must sensitize all Faculty members about
 - a) Primary data
 - b) Secondary data
 - c) Relative nature of the two kinds of data
 - d) Modalities of Analysis
 - e) Necessity for Analysis
 - f) Preparing Reports on the basis of analysis
 - g) Role of Analysis towards achievement of institutional goals.
- Beehive Role of IQAC Office: Storage hub of data, dynamism in collection and analytical process, sustaining correspondence between primary and secondary data.
- In the final part the lecture attempt is made to relate the knowledge disseminated about data collection & analysis by the IQAC to the latest templates of the SSR Manual introduced by NAAC in July 2017.
- The talk tries to impress upon the participants that given the comprehensive, quantifying and digital approach of the templates participation and involvement of the entire Faculty as extended IQAC is essential.

Basic Financial Rules and Service Related Rules Applicable for the College and University Teachers

Gour Krishna Pattanayak
Finance Officer, Jadavpur University

Date & Time: 16th February, 2019; 2:15 PM - 5:15 PM

General Financial rules normally includes sanction process, budgeting, spending norms, purchase rules, service benefits, pay and promotion issues and taxation matters, to name a few. The present lecture primarily focuses on these aspects.

Budgeting is essentially estimates for the future period based on past experiences, and flow of funds and expectations thereof. The principle of budgeting is essentially setting some benchmarks for future plan of growth and development. For academic institutes, the main source of funds is funding by the State and Central Governments and other agencies. In addition, there are incomes/revenues generated through fees, testing and consultancy, sale of publications, alternative use of properties and assets, and disposal of junk and other materials.

Purchase and expenditure thereof are primarily intended for academic and research activities and primarily within budgetary allocations and/or sanctions. The purchase of materials, equipment and furniture are now governed by GO No.: 5400-F(Y) dated 25.6.2012 of Government of West Bengal.

Accounting, reporting and auditing are the other crucial elements of general financial rules. In this context, introduction of GST has added another dimension to accounting of purchases. The present lecture shall briefly touch upon the scope, applicability, rationality and impact of GST.

The lecture also elaborate upon Service Rules, particularly pay fixation and promotion, promotion under CAS, retirement benefits and the new Pension Scheme introduced by the GoI with effect from 01.01.2004. Salient features of this pension scheme are as follows:

- This is a contributory Pension scheme, introduced w.e.f. 2004; 10% of Basic Pay as subscription and matching equal contribution by the employer will be provided monthly.
- A Pension fund will be maintained by a Fund Manager, where monthly the subscription and contribution need to be send by a employer.
- The employer shall have no liability for Pension of the employees under the scheme.

- The Fund manager shall release Pension monthly, based on the income on the accumulated funds with them.
- Such Pension would not have any DA or Pay-revision benefits.
- The employer has no financial liability for pension after the retirement.
- The fund manager receiving the funds will pay monthly pensions.
- There is a permanent Retirement Account number [PRAN], which is transferable.
- The scheme is controlled by PFRDA.

Value, Ethics and Human Rights

On plagiarism

Basab Chaudhuri

Hon'ble Vice Chancellor, WBSU

Date & Time: 9th February, 2019; 10:30 AM - 12:00 Noon and 2:15 PM - 3:45 PM

By now all of us in the academic circle are aware of the word “plagiarism”. The word means using other’s intellectual property as our own, and not giving due credit to the person who originally wrote or developed or invented the so-called ‘property’. With digital revolution all around, information can be freely obtained from various websites through internet. They can be read or commented up on. But users must not ‘steal’ information. They must be 100 yards away from the ‘copy-paste’ method. This is a matter of academic honesty and institutional sanctity. In some cases, even a person’s relatively old work should be properly cited in a newer work/ publication; otherwise, the new work will appear to be a repetition of the old. In the academic world, credit should not be claimed twice for the same contribution. Moreover, repetition of the same work does not lead personal or professional or institutional development.

Most research activities in Indian institutions are funded by the Government Agencies. They are expensive in terms of developmental work. If plagiarism occurs in the process of development, the purpose of research is lost. We all have to understand and appreciate the issues involved.

The lecture will engage participants in such discussions in the two-way communication mode with an objective of reaching a long-term strategy so that plagiarism, if any, in Indian institutions can be reduced or eliminated.

Intellectual Property Right (IPR)

Priyadarshini Mallick

Department of Microbiology, Asutosh College

Date & Time: 16th February, 2019; 10:30 AM - 12:00 Noon

Intellectual Property Right (IPR) is a specific type of protection granted by law for patents, copyrights and trademarks, which encourage people to earn recognition or financial benefit from what they have invented or created using their intellect.

IP deals with the following branches:

1. Copyright is a legal term used to describe the rights that creators have over their literary and artistic works. Works covered by copyright range from books, music, paintings, sculpture and films, to computer programs, databases, advertisements, maps and technical drawings.
2. Patent is an exclusive right granted for an invention. In actual sense, a patent provides the patent owner with the right to decide how - or whether - the invention can be used by others. In exchange for this right, the patent owner makes technical information about the invention publicly available in the published patent document.
3. Trademark is a sign capable of distinguishing the goods or services of one enterprise from those of other enterprises. Trademarks date back to ancient times when craftsmen used to put their signature or "mark" on their products.
4. Industrial designs constitute the ornamental or aesthetic aspect of an article. A design may consist of three-dimensional features, such as the shape or surface of an article, or of two-dimensional features, such as patterns, lines or color.
5. Geographical indications and appellations of origin are signs used on goods that have a specific geographical origin and possess quality, a reputation or characteristics that are essentially attributable to that place of origin. Most commonly, a geographical indication includes the name of the place of origin of the goods.

Methodology

An introduction to Propositional Logic

Mihir Kumar Chakraborty

Department of Mathematics, University of Calcutta

Date & Time: 7th February, 2019; 2:15 PM - 5:15 PM

My talk will deal with the following sections as far as possible. The motivation of the subject and "What is Logic?" Formal language and the language of Propositional logic. The notions of semantic and syntactic consequence in Propositional logic. The notions of consistency and completeness. Soundness of the Propositional logic system. Completeness of the Propositional logic system. Connection with Boolean algebra. Modal Propositional logic. Many-valued logic and Fuzzy Set theory. Concluding remarks : Soft computing , Is human brain a machine ?

Mathematical Logic

The motivation of the subject and " What is Logic ?"

Formal language and the language of Propositional logic.

The notions of semantic and syntactic consequence in Propositional logic.

The notions of consistency and completeness.

Soundness of the Propositional logic system.

Completeness of the Propositional logic system.

Connection with Boolean algebra.

Modal Propositional logic.

Many-valued logic and Fuzzy Set theory.

Concluding remarks : Soft computing , Is human brain a machine ?

Methodological/epistemological issues in social research

Achin Chakraborty

Director, IDSK Kolkata

Date & Time: 8th February, 2019; 10:30 PM – 1:30 PM

1. There are different types of research inquiries. When a study is designed primarily to describe what is going on or what exists, without entering into the analysis of underlying relationships or causal connections that are not so apparent, it is *descriptive*. However, there is no such thing as ‘pure description’, as description involves conscious methodological choice. If we establish some association between entities, it is *associational* or *relational*, not necessarily *causal*. Most policy discussions, however, are based on some understanding of the causes and their effects on various outcomes. Therefore most inquiries try to establish some causal connections between choices or actions of agents (individual, group, government, MNC etc) and outcomes. Yet another altogether different kind of inquiry is *evaluative*. For an evaluative inquiry one applies certain normative criteria to judge states of affairs. Amartya Sen often makes this distinction between evaluative exercises and descriptive-analytic exercises.

2. To establish any connection between specific ‘causes’ and ‘effects’ there is no simple formula. Three basic ingredients of social research are (i) some *ideas* about how things are or how change takes place, (ii) *data* or observations on ‘facts’, (iii) *methods* that integrate ideas and observations. Ideas are obtained from various theories. They may often look like commonsense. But if they are part of a theoretical framework one can expect logical coherence in the ideas, which commonsense does not guarantee.

3. What is theory? I think it can be defined only within a *paradigm*. Broadly speaking, a paradigm is a set of underlying beliefs about the ways things are. For many of us who work in what is loosely called ‘development research’, a kind of *positivism* seems to be the underlying paradigm. In this version of positivism the core belief is that reality is out there and by gathering ‘facts’ it is possible to find out what is happening in reality. The researcher is assumed to stand apart from the observed and produce objective knowledge. How does she go about it? First, the researcher identifies separate aspects of reality and expresses them as ‘variables’. Then she goes on examining the relationships between variables. This involves both observation and reasoning.

4. Do “facts speak for themselves”? Surely, they do not. One needs to sort out relevant from irrelevant facts at the outset. Without some prior idea about the nature of the phenomena, without some propositions, assumptions etc, there is no way this

can be done, according to a positivist. Deciding that observation X, or Y, is relevant marks the start of a theory. In this paradigm, theory means a logically valid chain of reasoning starting from certain premises called postulates. Postulates contain certain terms that are representatives of persons, organizations, things, actions, states etc. found in the world of experience. A meaningful analysis presupposes that the terms are unambiguously defined.

5. By *method* we mean a tool or a technique informed by an approach which is applied in a research inquiry. But *methodology* is concerned with the framework within which particular methods are appraised. In other words methodology deals with the broader question of ‘how do we know what we know?’

6. Till this point we have taken the position that there is an underlying reality which research can find out more and more about. With effort and technique we can achieve greater precision in our understanding. However, an alternative belief could be that different accounts or pictures of reality are simultaneously possible based on different perspectives and interests. ‘Qualitative’ research methods are usually associated with this *constructivist* view. The researcher tries to bring out and record different accounts from different viewpoints and then construct what appears to be a complex story. But the problem with this view is that one does not have a sure way of deciding on what the best story among several possibilities is.

7. In some areas of social research, the qualitative-quantitative distinction has led to protracted arguments with the proponents of each arguing the superiority of their kind of method over the other. The quantitative side argues that it is ‘rigorous’, ‘hard’, ‘scientific’, and so on. The qualitative approach, as claimed by its proponents, is ‘superior’ because it is ‘sensitive’, ‘nuanced’, ‘contextual’, and so on. Both qualitative and quantitative research rest on rich and varied traditions that come from multiple disciplines and both have been employed to address almost any research topic one can think of. There is no reason to give primacy to one over the other. Different methods are required to tackle different problems, and a combination of techniques will frequently yield greater insight than either one used in isolation.

8. Two things have to be separated in this context. As far as types of data are concerned, there is little difference between qualitative and quantitative data. All qualitative data can be *coded* and expressed in numeric form. The difference perhaps lies in the assumptions about reality and about the way one should acquire knowledge about reality. For instance, many researchers who follow the qualitative approach believe that the best way to understand any phenomenon is to view it in its context. Some in the qualitative tradition believe that the researcher cannot stand apart from the process and produce objective knowledge. This can go on.

References:

1. Hollis, Martin (2000) *The Philosophy of Social Science*, Chs 1 & 3
2. Kanbur, Ravi (not dated) *Q-Squared*.

Environment

Bio-Diversity

Pranabesh Sanyal

*Addl. Principal Chief Conservator of Forests, Research, Working Plan & Monitoring,
West Bengal*

Date & Time: 18th February, 2019; 10:30 AM - 12:00 Noon

Definition : The variability among living organisms from all sources including inter alia terrestrial, marine and other aquatic eco-system and ecological complexes of which they are a part ; this includes bio-diversity within species, between species and of eco-systems.

There are 3 components of biological diversity

- (1) **Genetic diversity** : The Allelic variation within a species such as different rice varieties, different varieties of Babul, different varieties of cows, sheep etc.
- (2) **Species diversity** : This is the commonest method of measuring biological diversity which indicates total no. of species and their dominance. This also includes variation of different Taxa at various levels. Total no. of terrestrial species are much more than aquatic species. But total no. of terrestrial phyla is 50 whereas total no. of aquatic phyla is 52.
- (3) **Eco-system diversity** : The forest eco-systems are mostly highly diverse and within the forest eco-system Rain forests are more diverse than low rain fall areas or mangrove.

BIODIVERSITY

So far 1.7 million species have been identified on globe as below:

- Plant and Algae	:	4%
- Protozoa, Fungal, Bacteria, Virus	:	16.8%
- Vertebrates	:	0.4%
- Insects	:	64.3%
- Invertebrates	:	14.4%

Position of India:

India has a total of 89,451 animal species i.e 7.31% of world's fauna and 10.78% of world's flora.

According to red list of IUCN,

	Critically endangered	endangered	Vulnerable
Plant	44 species	113 species	87 species
Animal	18 species	54 species	143 species

Number of different animals and plants.

	Mammal	Bird	Reptile	Butterfly	Angiosperm
INDIA	350 (8th)	1200 (7th)	53 (6th)	1500 (3rd)	45,000 (3rd)
Global Highest	515 (Indonesia)	1721 (Columbia)	717 (Mexico)	2100 (Indonesia)	55,000 (Brazil)
WEST BENGAL	188	612	115	941	14,000

Endemism : 33% of plants, 32% of the reptiles, 62% of amphibians

MARINE & COASTAL DIVERSITY

Marine species constitute only 20% of the total number of species

but has greater diversity of higher Taxa as below :

All life form	:	70 Phyla.
Exclusive marine live form	:	20 Phyla.
Common marine and terrestrial life form	:	22 Phyla.
Exclusive terrestrial life form	:	18 Phyla.
Terrestrial and freshwater life form	:	10 Phyla.

BIO-DIVERSITY INDEX

1. **Shannon & Weaner Index (1963)** :

$$H = - \sum (Ni/N) \ln (Ni/N)$$

Where,

Ni = No. of individuals of the species.

N = Total No. of individuals of all the species.

To compare between two systems each having 2 species

(i) Ratio = 95 : 5

(ii) Ratio = 50 : 50

Which one is more diverse?

2. **Simpson (1949)**

Species Diversity Index (D)

$$D = 1 - \lambda$$

Where, $\lambda = \sum (n_i(n_i-1)/N(N-1))$

λ is a measure of dominance

Large λ implies aggregation of few species.

Small λ implies more uniform distribution.

3. **C.B. Williams's (1964) index of Generic Diversity**

The formula show higher diversity for greater number of genera. If 'G' is number of genera and 'S' is the number of species in the sample ecosystem,

$G/S = ((1-x)/x) * \ln(1-x)$. Coefficient of Generic Diversity is $100 * G/S$.

Generic diversity GD = (S*(1-x))/x

In SW Bengal the effect of Joint Forest Management is monitored by the simple measurements of Biodiversity indices.

From species vs area curve it was determined that the plot sizes should be as follows:

Trees : 10 m x 10 m

Shrub : 5 m x 5 m

Herb : 1 m x 1 m

Dist. Burdwan

Mouza : Jalikandar

FPC : Jalikandar

Date : 15.02.93.

Category; Tree

Plot size: 10m x 10m

Species	Local name	No.	p	P ^ 2	Ln (p)	P*Ln (p)
<i>Shorea robusta</i>	Sal	23	88%	0.783	0.123	0.108
<i>Semecarpus anacardium</i>	Bhela	1	4%	0.001	3.258	0.125
<i>Pterocarpus marsupium</i>	Peasal	1	4%	0.001	3.258	0.125
<i>Madhuca latifolia</i>	Mahul	1	4%	0.001	3.258	0.125

26 100 0.787 9.897 0.484

Relative frequency of species	p	
Total number of species	S	= 4
Simpson Index for dominance	Sum(P ^ 2)	= 0.787
	1- Sum (P ^ 2)	= 2.13
Simpson Index for diversity		
Shanon Index for diversity	Sum (p*Ln (p))	= 0.484
Normalised Shanon Index	Sum (p*Ln(p) / Ln(S))	= 0.349

Comparative chart of Mangal Diversity of Global top three mangrove eco-systems

Tomlinson's Types	<i>Indian Sundarban</i>	Andaman and Nicobar Islands	Mahanadi Estuary
Major Elements	18 No. of species	21 No. of species	19 No. of species
Minor Element	13 No. of species	16 No. of species	14 No. of species
Back Mangals	64 No. of species	30 No. of species	34 No. of species
Total	95 No. of species	67 No. of species	67 No. of species

Comparative Generic Diversity

Tomlinson's Class		Sundarban		A&N Islands		Mahanadi Estuary	
Major Element							
S/G		2	18/9	2.33	21/9	2.38	19/8
X		0.429		0.4289		0.429	
Generic Diversity		23.96		27.96		25.29	
Minor Element							
S/G		1.18	13/11	1.23	16/13	1.4	14/11
X		0.529		0.523		0.518	
Generic Diversity		11.57		14.59		13.03	
Back Mangals							
S/G		1.31	64/48	1.17	30/25	1.375	34/27
X		0.5128		0.527		0.52	
Generic Diversity		60.80		26.93		31.38	
Total Mangals							
S/G		1.39	95/68	1.27	67/47	1.571	67/46
X		0.505		0.502		0.498	
Generic Diversity		93.11		66.47		67.54	

Forest Conservation

Pranabesh Sanyal

*Addl. Principal Chief Conservator of Forests, Research, Working Plan & Monitoring,
West Bengal*

Date & Time: 18th February, 2019; 12:00 Noon - 1:30 PM

The global Carbon dioxide reserve of atmosphere is consumed by 2 large consumers, the forest in the terrestrial area and corals in the marine area. These 2 large Carbon sinks are indeed protecting the mankind from extinction due to global warming. The total quantity of Carbon sequestered in the terrestrial eco-system in the planet is 2000 ± 500 Giga Ton Carbon out of which Northern peats sequester 450 GTC.

This apart, annual Carbon sequestration which is done by the terrestrial eco-system amounts to 2 GTC per year and forests play a major role in the same. An estimate has recently been made about the total burning of global bio-mass which is found to be 3.94 GTC per year, out of which deforestation alone contributes 1.6 GTC per year in the atmosphere.

The total global area of forests is 33% of the terrestrial area which is about 51 million km². In India, the total standing bio-mass of forests has been calculated to be 2.4 billion tons Carbon. But the forest has also a special property to store additional Carbon in the soil and thus considering both vegetation and soil, the forests sequester 5.4 Billion tons Carbon. Globally the potential yield of natural forests is much higher in Amazon Basin (11 M³/ha/y) as against India (6 M³/ha/y). Of course, world average potential yield of natural forests is 2.1 M³/ha/y.

Why forests are to be conserved?

From the aforesaid data, it is evident that forests are counteracting the global climate change to a great extent. This apart, forests have the following role.

- ☐ Amelioration of local and global climate.
- ☐ Increase in rainfall.
- ☐ Decrease in temperature.
- ☐ Decrease in surface run off for both soil and water.
- ☐ Recharging ground water.
- ☐ Makes the stream flow perennial.
- ☐ Abode of Bio-diversity.
- ☐ Place for recreation and eco-tourism.

- ☐ As a pollution sink.
- ☐ As a barrier to noise pollution and noise buffer.
- ☐ Stores of timber, fuel-wood fodder and non-timber forest produce.

Forest Conservation in India

In India, there is age-old tradition of conserving the forest, right from the time of Shakuntala. The first concept of Abhay Aranya was enunciated in the writing of Chankya Kautilya's "Artha Shastra". In recent years, the first Forest Act came in 1878 as Indian Forest Act which was revised in the year 1928. The first Forest Conservation Act came in the year 1980 and was revised in 1988 which envisages 33% forest area in the plains and 60% forest areas in the hills.

As on today, no felling of forests is allowed from the natural forests and the total timber and fuel-wood need of India stands as below:

(Copy)

Management of forests

The forests are sustainably managed. The area of forests, which is felled, is also subsequently replanted in order to maintain the equilibrium. During such management, in the post-independence period, it was observed that there was a lot of diversion of forestland for non-forestry purpose and the total area slowly dwindled. The total recorded forest area in India is 75 million ha. was found to get reduced to 63 million ha. in the year 1983 in the satellite imageries. Today, the situation has improved a bit and in the year 2001, the area has increased to 67.14 million ha. and tree cover outside forest is another 10.48 million ha. which is nearly 20.55% of the geographical area.

In West Bengal, the total recorded forest area is 1.209 million ha. i.e. 30.60% of geographical area and tree cover outside recorded forest area is 0.44 million ha.

Social Forestry

During early 80s, it was felt that the existing extent of national forest is unable to cater to the need of timber fuel and firewood. Thus, the concept of social forestry to raise forests outside forest area in the form of farm forestry in wasteland, street plantations along canal banks, roadside, railway line etc. came into being. This apart, this concept gave rise to the tree cover which today we find outside the forest areas to the extent of 10.48 million ha in the country.

Participatory Forest Management

In the year 1989, Participatory Forest Management came into operation and the local people were involved in forestry management, right from planning stage to implementation stage and then to exploitation and monitoring stage. Today nearly 6,000 Kms² of forest area in West Bengal is managed by the Joint Forest Management concept. In fact, this concept came from the Arabari village of Midnapore district of West Bengal and today in India 1,42,500 Kms² area is managed under Joint Forest Management. There are nearly 4,100 Forest Protection Committees in West Bengal and 63,000 in India are managing the forests under Joint Forest Management.

Disaster Management and Sustainable Development

Sugata Hazra

School of Oceanographic Studies, Jadavpur University

Date & Time: 20th February, 2019; 2:15 PM - 5:15 PM

The goal of disaster management is to reduce the vulnerability of local communities through disaster preparedness and capacity building . Earlier (2000-2015) Hyogo Framework and later Sendai framework (2015-30) set the specific goals and targets for disaster risk reduction. It is observed that Deltas and coastal zones are major impact areas, particularly for multiple disasters exacerbated by Climate Change. By 2025, coastal population will account for 75% of total world population. At the same time , one third of the coastal regions run at a high risk of degradation due to various natural and anthropogenic forcing. Asia is the most threatened region with 69% of their coastal ecosystem at risk of both fast and slow onset disasters. However, there is an inverse relationship between the level of development and loss of human lives in a disaster. Inclusive and sustainable development emerges as an essential requisite for long term disaster risk reduction.

Natural hazards are extreme events of otherwise steady state natural processes. Their magnitude and frequency (recurrence interval) are inversely related .In turn they can affect the environment beneficially or adversely. Understanding of natural processes and environmental change are therefore necessary for any society capable of integrating nature, in it's regular and extreme forms, in the process of development planning. Human activities, on the other hand, are capable of affecting both magnitude and extent of natural hazards and disasters.

A Disaster happens while hazards converge with biophysical and social vulnerabilities. Disaster Risk relationship is given by - Risk of Disaster= hazard*vulnerability/capacity to cope. Vulnerability is the degree to which a system is

susceptible to, and unable to cope with, the adverse effects of hazards. If we can assess the vulnerability of society and environment and risks to various hazards, we can undertake effective disaster management through risk reduction.

Pre disaster activities for risk reduction include vulnerability and risk assessment , risk mitigation, risk transfer, prediction and preparedness planning. It needs to be followed up by post disaster emergency response, reconstruction and rehabilitation keeping the environmental sustainability a priority. Reviewing a set of case studies the paper attempts to find out the scope of synergy of efforts of disaster management and sustainable development. It is observed that attempts to attain the 17 major goals of sustainable development may considerably reduce the risk of disaster to any community or country. India , nearly 10 years after the en action of National Disaster management Act 2005, has adopted a National Disaster Management Plan in 2016. The plan incorporated the approach enunciated in the Sendai frame work (2015-30) with the four basic objectives

1. Understanding disaster risk
2. Strengthening disaster risk governance to manage disaster risk
3. Investing in disaster risk reduction for resilience
4. Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction.

The NDMP has also outlined specific financial responsibilities for disaster management which envisages a National Disaster Response & Mitigation Fund, a State Disaster Response& Mitigation Fund in each State and, within the States, a District Disaster Mitigation & Response Fund in each district.

However, the paper argues that In the apart from provisioning for ‘fast onset’ disasters, adequate emphasis needs to be provided to prepare a community for “slow onset” disasters particularly those exacerbated by Climate Change . In the state level, we need to publicize our disaster management plans, need to make it more participative and gender sensitive. Anticipating migration due to Climate Change, we may take up appropriate retreat and rehabilitation plans for the vulnerable deltas and coastal communities.

Stress Management, Counselling and Psycho- analysis

Interpersonal Skills-Transactional Analysis

Supriya Ghoshal

*Secretary, West Bengal Right to Public Service Commission,
Government of West Bengal*

Date & Time: 20th February, 2019; 10:30 AM – 12:00 Noon

Interpersonal skills are the set of interactive skills which help us to interact successfully in our social and working life. These sets of skills may also be called as 'Human' or 'Life Skills' and are exhibited by us when we interact with people around us.

Transactional analysis is a very important tool in analysing our behavioural pattern which shows how effectively we interact with each other and is also one of the most accessible theories of modern psychology. It has wide application in clinical, therapeutic, organisational and personal development, encompassing communication, management, personality, relationship and behaviour.

The theory was founded by Dr. Eric Berne in 1950's. He said that verbal communication is at the centre of human social relationships and psychoanalysis. He also said that when two people interact, one of them will speak to the other. This he called the transaction stimulus. And the reaction from other person called the response.

Berne stated that each person interacts from three ego states: Parent, Adult and Child. Parent is the taught concept and conditioned and developed by copying our real parents or parent like figures. It is the repository of values and prejudices. We can change it but this is easier said than done.

The Child ego state is the 'felt' concept and the emotional body of data within each of us. When anger or despair dominates reason then the Child is in control. Like our parent we can change our Child ego state as well.

Our 'Adult' is our ability to think and hence it is the thought concept. It determines action of us based on received data and it is oriented towards current reality. If we are to change our 'Parent' or 'Child' we must do so through our 'Adult'.

Emotional Intelligence

Supriya Ghoshal

*Secretary, West Bengal Right to Public Service Commission,
Government of West Bengal*

Date & Time: 20th February, 2019; 12:00 Noon – 1:30 PM

Emotional intelligence is the ability to monitor one's own and others' feelings and emotion, to discriminate among them, to use this information to guide one's thinking and action.

Emotional intelligence is scientifically anchored by four cognitive components:

1. The capacity to perceive emotion.
2. To integrate emotion in thought.
3. To understand emotion &
4. To manage emotion effectively.

When these cognitive components are effectively exhibited in interaction with others, a person has emotional competence, which includes:--

1. Self-awareness; 2. Impulse-control; 3. Persistence; 4. Confidence; 5. Self-motivation; 6. Empathy; 7. Social- deftness; 8. Trustworthiness; 9. Adaptability;
10. Ability to work cooperatively.

Daniel Goleman and others have categorised the component of EI into two areas of concern, each with an awareness and application dimension. Thus, EI has four dimensions:

1. Self-awareness
2. Self-management
3. Social awareness &
4. Relationship management

Applying EI at work requires:

- Being aware of our feeling and acting congruently.
- Sharing our feeling with straight forward and composed manner.
- Treating other with compassion, sensitivity and kindness.
- Being open to emotion and ideas of others.
- Building and mending relationships.

Media Studies

Documentary Film and Painting: The Crisis of Representation

Sanjoy Mukhopadhyay

Retired Professor, Department of Film Studies, Jadavpur University

Date & Time: 7th February, 2019; 10:30 AM - 1:30 PM PM

“I am not a painter, but a filmmaker who paints”

Michelangelo Antonioni

Today, the scopic regimes of modernity in which we live, demand that even an original work of art should be reproducible preferably by moving images. But is it at all possible/ desirable to ‘document’ a painting using the medium of film? This seems to me a very intriguing question because we, more often than not, encounter cinematic adaptations of painting. Notwithstanding their relative success or failure I remain in doubt whether painting can be located as a pro-filmic piece of art although I never question the usefulness of filming a particular piece of painting or sculpture. These reproductions can serve as historical evidences. At the same time I do remember that North European traditions are often considered to be more pro-cinematic than say Renaissance painting.

In any case I may give you an example, a very famous one in the history of cinema when Alain Resnais made a short film on Van Gogh or we can also refer to his more famous work on Picasso’s Guernica. Despite the fact that the films were made by very competent artists like Resnais people’s reaction were outrageous. They did not hesitate to call Resnais as immodest. Only at the intervention of Bazin, the great realist-theoretician Resnais was rescued. What was the fundamental reason of misunderstanding between the public and artist? I would submit that the functions of the frame in the cinematic images and paintings are different. The problem is when the French viewer believing that he was seeing the picture as painted was actually looking at through the instrumental form that profoundly changed its nature. Space as it is used in a painting is radically destroyed by the screen. One may ask -why? The answer is simple. Basically the frame of a painting encloses a space. In direct contrast to natural space the space in which is experience occurs, a painter opts for a space the representation of which is inward.

Whereas the outer edges of the screen are not the frames of the film image. They are the edges of a piece of masking that reveals only partial reality. A frame is centripetal. The screen is centrifugal. In a frame you see everything converging where as in screen there is clear divergence or outward movement. That is why the basic sense of movement in Guernica is lost in its film version. We have no reason to condemn Resnais. For the moment if we turn our attention to another great filmmaker Akira Kurosawa we would be compelled to see that in one of the segments of his

unforgettable Dreams he, compared to Resnais, became more successful with Van Gogh because in that particular segment he could inform us on the differences of painting and film. He compared and contrasted both media in a superb way. Kurosawa was a student of painting and that is why his tributes to Van Gogh became so moving.

In fact Van Gogh often acts as a darling to filmmakers only because his representational mode. A careful investigation of the Dutch painter's works would expose that his revolution laying the fact that he like a true iconoclast forced painting to come in close liaison with music. His violent lines convincingly cross the boundaries of frame. They go outward. Instead of converging they diverge. That was one among the reasons for which Kurosawa attempted to pay tribute to Van Gogh's concept of motion appears to be so meaningful. Even if the moving camera sits on a motionless space, the film is still moving and we are still watching, expecting and representing our eyes and spirit in motion. Movies that end with fade outs on continuing action or freeze frames show how endlessness is at the core of the medium – no tableau can be a true stop to visual flow or to the flow of temporality. Let us again consider the case of the Inner Eye – the Satyajit Ray master piece on the artist Binod Behari Mukherjee who was Ray's teacher during his Shantiniketan days. To my mind the Inner Eye is a brilliant documentary not because Satyajit submitted a chronological account of Binod Behari Mukherjee's development and his unfortunate blindness in later years but owing to Satyajit's ability to decode a kind of untold motion in Binod Behari's murals. Satyajit made a horizontal journey through the murals but never lost his basic point that his tasks envisage a responsibility to translate Binod Babu's form into an apparently foreign term. One of the most striking points in the film is the depiction of Dasaswamedh Ghat at Varanasi respectively by Binod Behari and Satyajit. Not only these two contradictory representations shake hands but also enter into a conversation on the nature of visual culture itself. Inner Eye therefore is more successful as a task and comment on the limitation of translation rather than illumination of an artist in totality. The same thing is also true for Ritwik Ghatak's unfinished project on Ramkinkar. The rushes would reveal that Ghatak refused to stay within the domain of neutrality. On the other hand the subjective camera discovers Ramkinkar's greatness from the most unusual angles. We can conveniently refer to the pieces of sculpture on Tagore and Buddhadev. It is impossible to miss that Tagore's long hair has been cut by Ramkinkar and Ritwik very consciously tried to handle these subtle moments as observations on the late age agony of a creative artist. In Lord Buddha the sweating in the form of water droplets in the screen of the saintly Buddha has been emphasized by Ramkinkar and Ritwik like a true admirer recorded it on the screen to preserve the austerity in his camera. Ultimately what Ritwik does is a kind of magic he comes closer and closer to Ramkinkar thus proving Ramkinkar as a work of sculpture in himself.

When I say film and painting are different media, I actually underscore the point that every great art form live within its own enclave and it has its own autonomy. It may

be communicated to us to an extent but whenever you try to translate something gets lost in translation. Jean Luc Goddard in his 1982 film *Passion* showed us a series of classical paintings - most undoubtedly among them was *Nightwatch* Rembrandt. At one point of time he cried out in despair that even the best studio in Europe could not fix the lighting pattern which was rare in the original canvas. One can at best try to have a very weak copy but the copies cannot reach the heights of original Leonardo, Goya and Delacroix.

This is the mystery where we usually get stuck and that inspired me to talk and listen to the debate around painting and film in India and abroad. Let us then proceed to the abstract space where still point of motion can be located.

History
and
Philosophy
of
Science

Some Aspects of Philosophy of Science

Pradip Kumar Ghosh

Pro-Vice-Chancellor, Jadavpur University

Date & Time: 13th February, 2019; 10:30 AM – 12:00 Noon

In general idea we know that Physics, Chemistry and Biology constitute science with Mathematics. In literature science viewed as: “Systematized knowledge covering general truths or the operation of general laws, esp. as obtained and tested through scientific method.” One of the key problems in Philosophy of science is to understand how techniques such as experimentation, observation and theory construction have enabled scientists to unravel so many of nature’s secret. The study of the most general and abstract features of the world and the categories with which we think. In philosophy the concepts with which we approach the world themselves become the topic of enquiry.

Though History of science usually not embedded in the curriculum and while science is taught rather in a historical way, it is argued that close attention to the history of science is indispensable for doing good philosophy of science.

It may be recalled that rapid scientific development occurred in Europe between the years 1500 and 1750. There were scientific investigations in ancient and medieval times- The dominant world was Aristotelianism. According to him all earthly bodies composed of just four elements: earth, fire, air & water.

Ptolemy’s earth centric model of universe was uprooted by Copernican model of Sun centric universe. In fact the whole system of mechanics, explanation of fall of apple and planetary motion was finally solved through Newton’s law of gravity. In leading to the conclusion we saw how the collection of data based on observation by Tycho Brahe and predicting the formula of planetary motion by Kepler helped the discovery of most natural force exist in Universe- “The force of Gravity”.

The scientific views established on Newton’s deterministic science upto late part of nineteenth century saw development science through number of discoveries and theoretical explanation. Concept of Atom by Dalton advanced many ways the physical science which we generally termed as Physics and Chemistry while “Theory of Evolution” by Darwin gives a better understanding of living being.

The entire scenario of science changed dramatically after discovery of Electron by Sir J.J. Thomson and quick theoretical advance in developing atomic structure and introduction of Quantum Mechanics on one hand and introduction of theory of relativity by Albert Einstein on another hand. Their emergence caused considerable

conceptual upheaval not only in physics but in other branches of science. Finally yet incomplete revolution in biology took place in 1953 by Watson & Crick through the discovery of the structure of DNA. It leads to development of molecular biology, Understanding of Heredity & process of building organisms.

Scientific theories established through imagination, observation & experimentation. Both observation & experimentation on a system cannot be done infinite times. Then, how we can say that it still become effective in next experiment or observation. Here lies the question why?

Twentieth century Philosopher Karl Popper's Theory of Falsification, Lakatos' observation and Hempel's covering model are discussed to know how science and philosophy are embedded. How deductive inference and inductive inference plays role in understanding the philosophical aspect of science and its theory is looked through Hume:

- Use of induction cannot be rationally justified.
- Whenever we make inductive inferences the presupposition is "Uniformity of nature".

Causality, conflict between Realist and Anti Realist are also discussed.

Finally we discuss how Thomas Khun arrived at paradigm concept. According to him a paradigm, therefore, determines not only a set of beliefs about the world. It also defines what counts as good science, and even determines what counts as a scientific fact. It is a conceptual framework that determines how the world looks to those who have accepted it. It defines not only the scientific outlook for practitioners of a particular science, but also the scientific "form of life."

In the conclusion it may be referred that in this lecture we have discussed about Induction, Explanation, Realism and Scientific change which are within the purview of General Philosophy of Science. There are scopes of issue based philosophical questions specific particular sciences. Conflict in physical science, Biological Science and human mind are dealt with examples.

Finally a short review of criticism on overdose of "Scientism" and idealistic difference between Science and Religion is made.

History of Development of Modern Differential Geometry

Manjusha Majumdar (Taraftdar)

Department of Pure Mathematics, University of Calcutta, Kolkata

Date & Time: 12th February, 2019; 10:30 AM - 1:30 PM

The History of Geometry may be roughly divided into four periods. Euclid wrote a book, named ELEMENTS about 300 B.C. There was a lack of perfection in the definition of “point” and “line”. Mathematicians were not willing to accept V as an axiom, as stated by Euclid. For 2000 years, they tried to prove it. Their failure, led to the invention of NON-EUCLIDEAN GEOMETRY. In the early part of 17th Century, a new approach of geometry was developed by the famous French mathematician Rene Descartes. It is due to him that such type of geometry is called CARTESIAN GEOMETRY. DIFFERENTIAL GEOMETRY is (loosely speaking) the study of Geometry with the help of Calculus. Modern Differential Geometry requires the knowledge of TOPOLOGY. The concept of a manifold generalises the concept of a curve or a surface in \mathbb{R}^3 .

Initiation of Chemical Education and Research in India: Inspiration from Acharya P. C. Ray

Chittaranjan Sinha

Professor & Head, Department of Chemistry, Jadavpur University

Date & Time: 25th February, 2019; 2:15 PM = 5:15 PM

Chemistry is a most versatile subject and serves all branches of science, commerce, health-medicine, industry and environment. In India formal chemical education in higher degrees has started since 1872. Prof. Alexander Peddler was the first Professor in Chemistry to educate Indian students. A revolutionary acceleration in Chemistry teaching and research started with the joining of Prafulla Chandra Ray in Presidency College (Presidency University) as faculty member on 1889. In his Presidency period (1889-1916) he started laboratory teaching in chemistry, published *A History of Hindu Chemistry from the Earliest Times to the Middle of Sixteenth Century* (Vol. 1, 1902; Vol. 2, 1908), established Bengal Chemical and Pharmaceutical Works Ltd (BCPW) and India's first pharmaceutical company in 1901. His early research from Presidency College published in the Journal of Asiatic Society of Bengal and made him famous for the publication of 'Mercurous Nitrite, $\text{Hg}_2(\text{NO}_2)_2$, in 1896. From the laboratories of Presidency College he published more than eighty research papers in major journals like Proceedings of the Royal Society and Journal of Chemical Society, London. In 1916 P. C. Ray retired from Presidency College and joined as Palit Professor in the University College of Science, Calcutta University where he worked for more than 20 years and published about another 80 research papers in Nature, the Journal of Indian Chemical Society etc.

Under his leadership in 1924 the Indian Chemical Society (ICS), one of the pride nationalistic establishments of India, the fourth oldest Society of the country (Asiatic Society, 1784; Indian Association for the Cultivation of Science, 1876; Indian Science Congress, 1914) started in India. Acharya Prafulla Chandra Ray, the doyen of chemical sciences in India, as the Founder President with support of illustrious chemists like Professor J. C. Ghosh, Professor J. N. Mukherjee and Professor SwantiSwarupBhatnagar on May 09, 1924. Acharya Prafulla Chandra Ray is aptly regarded as the pioneer in initiating teaching and research in chemistry in our country as well as in the establishment of chemical and pharmaceutical industries. He is awarded '**Father of Indian Chemistry**'. In 2011, the International Year of Chemistry, the Royal Society of Chemistry, UK honored his life and work by establishing an *International Chemical Landmark Plaque*, first time outside Europe, in Presidency College where Prafulla Chandra had started chemistry teaching and research. The Plaque reads "To commemorate the life and achievements of Acharya P. C. Ray, father of Indian Chemistry, philanthropist and entrepreneur who founded modern chemistry teaching and research in India."

Science and Engineering

Some Aspects of Communication and Wireless Networks

Salil Kumar Sanyal

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Jadavpur University, Kolkata*

Date & Time: 21st February, 2019; 10:30 AM - 1:30 PM

This lecture begins with the technological developments of Communication and Computer Engineering scenario starting from pre-2nd World War era to the current state of the art. Starting from the conventional Telegraph and Telephone networks, emphasis has been given to the development of Computer Technologies with societal applications to make the life of human being more comfortable at affordable price. Different technological issues related to Computer Data Networks have been covered in a lucid manner so as to impart practical knowledge to the common people having little background on this vast technological domain. Several implementation aspects of Computer Communication Network have been incorporated. The same trend is being followed in the Wireless Networks also to figure out the fundamental basis of Wireless Cellular Communication. The chronological development, access technologies, control and data mechanisms associated with Wireless Communication have been included.

Let's Light: A Journey towards Enlightenment

Suddhasatwa Chakraborty

Department of Electrical Engineering, Jadavpur University, Kolkata

Date & Time: 23rd February, 2019; 10:30 AM - 12:00 Noon

The definition of light as particle as well as wave has been established a long ago in physics. But there is a fine line exists between light & lighting which is not well defined still today. Lighting is apparently not to deals with physics only but the application of light to illuminate a space. There is a myth that light source takes the most vital role in lighting design, but real story says something more. The lighting designs encapsulate the selection of luminaries, light source, the placement of the luminaries moreover the energy efficient design. The classical tools of lighting design are becoming outdated today, because of two revolutionary steps in field of lighting design. The lighting design is now no longer restricted with the energy efficient solutions rather a new dimension has been included, which is called future of lighting, the “Human Centric Lighting”, which is really a revolutionary change in lighting. The “Internet of Things (IoT)” is also a remarkable footstep towards future lighting, where, internet can be used to control the level, color, intensity of light in any space in concurrence the general harmony between human centric lighting requirements and energy efficiency.

Efficient use of LPG Cook-stoves in Domestic Households

Amitava Datta

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Date & Time: 14th February, 2019; 2:15 PM = 5:15 PM

Liquid Petroleum Gas (LPG) is the most widely used fuel in Indian urban households for the purpose of cooking. It is favoured widely because of its safe, less polluting and easy to use option. Presently, Govt. of India has taken up an initiative to extend the LPG supply in rural households and to families who live below the poverty line, using the Pradhan Mantri Ujjwala Yojana. LPG is primarily a blend of propane and butane gases and is obtained either from the gas fields or more commonly during crude oil refining. Due to the limited reserve of fossil fuel in general and crude oil in particular it should be a concern to utilize this fuel in an efficient manner for the sake of sustainability. Moreover, efficient use of LPG helps the consumer to spend less over fuel in their monthly bill. Therefore, it should be the duty of every household to utilize LPG gas the most efficiently.

In a LPG cook-stove, the fuel gas burns in air producing a flame at the burner. The heat released in combustion is then transferred to the load, which is placed upon the burner. The overall efficiency of the cook-stove can be expressed as the product of the combustion efficiency and the heat transfer efficiency.

LPG burns in the stove as a partially premixed flame with the burner configuration similar to the commonly used Bunsen burner. The ingress of primary air and the premixing of it with the fuel inside the burner affect the combustion efficiency. A good amount of primary air helps to complete the burning in the premixed flame front. However, as the primary mixture gets richer, the burning at the premixed flame becomes incomplete thus generating incomplete products of combustion. The incompletely burnt species complete their oxidation in a non-premixed flame with the air from the surrounding atmosphere. Non-premixed flames can be more sooty resulting radiative loss from the flame. Soot also has adverse effects when deposited on burners and utensils.

Heat transfer efficiency can be improved as the heat loss in the hot gas is reduced. This depends on the height of the load from the burner top, relative dimension of the load to the burner, flow rate of LPG etc. A clear knowledge of the impact of all factors can help in optimizing the performance of the cook-stove.

Safety in usage is another important aspect on which the consumers should have a clear idea. The use of good quality hose, proper regulator and clean burner ensure safety in operation. The cylinder pressure should be properly maintained during filling and any leakage of gas should be immediately brought into the notice of the authority.

**Bio Science
and
Biotechnology**

Introduction to Design Ergonomics

Somnath Gangopadhyay

Occupational Ergonomics Laboratory

Department of Physiology, University of Calcutta, Kolkata

Date & Time: 19th February, 2019; 10:30 AM - 1:30 PM

Ergonomics can be defined as “Science, Technology & Art of Man at Work”. The subject is related with the definite aim on the enhancement of human performance. In other word, application of ergonomics is “the improvement of individual and group productivity”.

The subject seeks to change the things to better match capabilities, limitations & needs of people.

Ergonomics is the application of the human biological sciences in conjunction with the engineering sciences to the worker and his working environment, to obtain maximum satisfaction of the worker which at the same time enhances productivity

On the basis of its application it can be divided in three categories: Physical, Organizational and Cognitive ergonomics.

Cognitive ergonomics is the subfield of cognitive science. It concerns with the human task oriented activities and deals with processing and decoding of information and finally plays a definite role in understanding. It has a direct contribution in the design of product. Through this way, ergo design term has recently been coined.

By application of cognitive science, ergonomics and anthropometry, product is now becoming more easy to use with maximum comfort. Simplification in gadgets and proper application of anthropometry in it makes the tools more user-friendly.

Genetic Engineering of Plants: Science and Safety

Sarmistha Raychaudhuri

*Department of Biophysics Molecular Biology & Bioinformatics, University of
Calcutta, Kolkata*

Date & Time: 6th February, 2019; 2:15 PM - 5:15 PM

Biotechnology is the technique used by modern biologist to modify the genetic makeup of an organism. This will pay tremendous dividend in future if under-taken with safety measures. Both biological as well physical methods of transforming crop plants could be used to improve the quality of nutrients, use of the plant as bioreactor and all these need proper safety protocols. Electroporation, microinjection, bombardment with microprojectiles are used regularly by the scientists. The soil borne bacterium 'Agrobacterium tumefaciens' is also used to transform plants. The present lecture will discuss the methodology and adopted safety measures usually followed to carry out genetic engineering.

Chemical History of the Origin of Life on earth: Role of Polymers

Bijan Das

Department of Chemistry, Presidency University, Kolkata

Date & Time: 13th February, 2019; 2:15 PM - 5:15 PM

How did life on earth arise? There can hardly be a bigger question. This is the story of human's quest to discover our ultimate origin. It is the story of the birth of life on Earth. It is a story of obsession, struggle and brilliant creativity, which encompasses some of the greatest discoveries of modern science. The endeavour to understand life's beginnings has sent men and women to the furthest corners of our planet, and made-made spacecraft even to one of the moon of the saturn.

For much of human history, almost everyone believed some version of "the gods" did it. Any other explanation was inconceivable. In particular, Aristotle believed the life on earth arose spontaneously, according to him "It was a readily observable truth that aphids arise from the dew which falls on plants, fleas from putrid matter, mice from dirty hay, crocodiles from rotting logs at the bottom of bodies of water,...".

That is, however, no longer true. The origin of life on Earth is a scientific problem which is not yet solved. There are plenty of ideas, but few clear facts.

Over the last century, a few scientists have tried to figure out how the first life might have sprung up. They have even tried to recreate this Genesis moment in their labs: to create brand-new life from scratch. According to the scientists, the origin of life is a natural process by which life arises from non-living matter (a process commonly referred to as abiogenesis), such as simple organic compounds. The transition from non-living to living entities was not a single event, but a gradual process of increasing complexity that involved molecular self-replication, self-assembly, autocatalysis and cell membranes. Although the appearance life from non-living matter is uncontroversial among scientists and it is now generally accepted that life on earth began almost around four billion years ago, there is no single, generally accepted model for the origin of life, and this lecture presents several principles and hypotheses for how abiogenesis could have occurred.

The various hypotheses considered the possibility of the origin of life on earth by the action of lightning and volcanic activities in the earth in its early days, by the combination of molecules on clay, by the warmth provided by the deep-sea vents, by extraterrestrial contributions.

Law

Cartels and Competition Law

Tilottama Raychaudhuri
WBNUJS, Kolkata

Date & Time: 16th February, 2019; 12:00 Noon – 1:30 PM

In general parlance, cartels are secret agreements between competitors to eliminate competition amongst them, in the market. Cartels are attractive arrangements because if a cartel is successful then the total profits to the participants would be higher than the sum total of the individual profits in an otherwise competitive market. Cartels are prohibited the world over, by all systems of competition law, because of the damaging effects they have on the market. Cartels cause loss to the consumers as well as the economy.

Combating cartels effectively has become a vital agenda in all countries. Unlike the previous law, India's new competition law, the Competition Act, 2002, contains numerous provisions relating to control of cartels, starting from a proper definition of the term cartel, to wide powers of investigation, imposition of penalty and grant of leniency to cartel members, for cooperation in anti cartel investigations. In the last decade, the Competition Commission has been active in its prosecution of cartels. Indeed, some notable judgments have been passed by the Commission where cartel conduct has been condemned. Most importantly, with effective use of its leniency programme, by which leniency is granted to whistleblowers, the Commission has encouraged more and more cartel members to co operate in anti cartel investigations, resulting in crackdown of cartels in many sectors of the economy.

This lecture gives an outline on what are cartels, how they impact consumers and businesses and what legal measures are being taken against cartels by the Competition Commission of India.

Medical Science

Food and Cancer

Dr. Sankar Kumar Nath

*Senior Oncologist, Ex. Deptt. of Oncology, R.G.Kar Medical College and Hospital,
Calcutta.*

Date & Time: 26th February, 2019; 10:30 AM - 1:30 PM

Cancer is such a group of diseases, which people fear most. They associate cancer with death. But the fact is different, no doubt. In fact we can control or arrest or sometimes cure Cancers today with the help of all modern medicines and technology.

Simultaneously we must think the old proverb “Prevention is better than cure” which is applicable to cancer also.

Now we know that 70-75% of cancers are preventable according to WHO. The following cancers can be prevented –

- 1) Occupational Cancer.
- 2) Radiation induced Cancer.
- 3) Hormones and Cancer.
- 4) Tobacco and cancer.
- 5) Exercise and Cancer.
- 6) Diet (food) and Cancer and so on.

We shall discuss here in short on Food and Cancer.

What is cancer :

Cancer is a disease in which a family of cells will grow progressively with permanent impairment of normal growth control, resulting in spread of the primary group of tumour cells.

Character of cancer cells :

Cancer cells are very much different from the normal cells. They do not remain confined to primary part only. Rather they infiltrate into the adjoining part of the body. Usually some of the cancer cells from the original site may be detached and travel to the distant sites of the body through blood streams, lymphatic channels or other methods. This is called metastasis. This is how the cancer kills the patients quickly.

Carcinogens :

These are such substances that can initiate neoplasia (both benign and malignant).

FOOD AND CANCER (Cancer Prevention through Foods)

- 1) Diet causing cancers.
- 2) Diet preventing cancers : 30 – 40% of cancers can be prevented by diet.

- 1) Diet causing cancer:

- A) Fat :

Several studies have shown that there is strong association between consumption of dietary fat and formation of cancers in the breast, the prostate, colon, rectum endometrium and ovary.

- B) Fast food :

Children today very much like to take fast food and begin to take from early ages. Fast foods are rich in fat, high sodium, low fiber, low calcium content and also deficient in essentially nutrient. This is why fast food leads to develop cancer.

- C) Preservatives and Additive :

Some substances of nitrate are used as preservatives of food stuff specially meal. Nitrate is transformed into nitrite and in stomach it is transformed into Nitrosamine which is a form of potent carcinogen.

Sometimes we see a fungus called *Aspergillus flavus* that grows mainly on peanut plants and dry fruits. This fungus contains a carcinogen known as Aflatoxin which can cause liver cancer.

Gyromitra esculenta, a type of mushroom used in cooking, contains N – methyl – N formyl – hydrazine which is a strong carcinogen.

Additive like metanil yellow, Iron oxides, lead bromate are usually mixed in '*Ghoogni*', '*Bonday sweets*', leads to the formation of Cancer stomach, Cancer colon etc.

Tremendous use of pesticides like DDT, Aldrin, Carbon tetrachloride, formaldehyde, Vinyl chlorides is threatening for development of different cancers like Leukemia, Lymphoma, brain cancer, skin cancer etc.

Taking salt cured foods regularly may cause stomach cancer. This is probably the reason why Japanese suffer most in cancer of stomach. This may also give rise to Esophageal cancer.

Radioactive substances contaminated foods are threat to the formation of cancer lung, cancer bone etc.

- D) Smoked food:

Smoked foods (meat, fish etc) may be delicious but because of the smoking process, cancer-causing substances are deposited on the

surface of the food. Regular consumption of smoked food may give rise to cancer stomach and others.

E) Drinks:

a) Alcohol: Excessive alcohol consumption is a risk factor for cancers of the oral cavity, pharynx, larynx, esophagus, pancreas and liver.

Women who consume alcohol have a greater risk of developing cancer breast than the non-drinkers.

b) Coffee: Excessive coffee drinking may be related to cancer of lower Urinary tract including Urinary bladder.

c) Water: Excessive chlorination in drinking water may be associated with Gastrointestinal cancer and urinary bladder cancer. Regular taking of such water, contaminated with arsenic, asbestos particles and other organic compounds, may lead to formation of cancer lung, cancer Gall bladder and skin cancer.

d) Too hot or too cold drinks – if taken regularly may lead to cancer esophagus.

2) Diet preventing cancer:

There are lot of foods that are considered as anti-cancer agents at various degree. The types of food, you eat are really important. You are to keep these cancer preventing foods in your daily dish. These are as follows:

A) Vitamin C:

Citrus fruits, tomatoes, berries, green vegetable, potatoes, guava, cucumbers. Daily need 30 – 50 mg.

B) Vitamin A:

Tomato, milk, eggs, liver, kidney, leafy green vegetable, yellow vegetable, carrot, ripe mango, 'lal notey sak', radices, Daily need: 5000 IU

C) Vitamin E:

Leafy vegetable, vegetable oils, whole grain cereals, mother's milk.
Daily need : 15 mg

D) Minerals :

Selenium : Liver. Sea fish, Rice, Wheat
Calcium : Protects from Colon cancer.
Other minerals : Magnesium, Iron, Copper, Zinc etc.

E) Other foods :

Cabbage, Cauliflower, Sweet potato, Bean, Grape, Banana, Turmeric, Garlic, Legume, Pumpkin, etc.

F) Dietary Fiber :

Dietary fiber is very much protective against cancer. Daily need is 25 – 30 gm. But Americans typically consume 3 to 5 gm per day only. High dietary fiber protects against colon cancer, rectal cancer, breast cancer. Bantu tribe of South Africa take lot of fibers from their daily foods ---- 200 to 250 gm approximately per day. Incidentally colon cancer, rectal cancer, breast cancer, cancer prostate are very rare amongst the Bantu people. Fruits, Vegetables, Wheat etc. are all rich in fibers.

G) Vitamin C is a strong anticancer agent. So do take Vitamin C as per daily need. Vegetables high in Vitamin C , like Potato, Broccoli, Cabbage, Spinach etc. should be cooked briefly and where possible, whole and in covered dishes. If you squeeze the juice from the Orange, you will reduce the Vitamin C to a greater extent , because it is reduced by the oxygen in the air. Luckily for us, most of the foods that are rich in Vitamin C e.g. Citrus fruits, Strawberries, Melons etc. do not need cooking.

H) Do's and Don'ts in preparing foods :

1. Don't drown your foods :

You will retain more Vitamin C and other Vitamins when vegetables are cooked without added water. More water you use fewer Vitamins you retain.

2. Do keep foods in one piece :

The more you cut the cells, the more you expose Them to air or water and more nutrients are lost. Whole Sweet potato retains 89% of Vitamin C, but cut in half, it keeps only 31%.

3. Don't allow sliced food to stand :

Cucumber loses at least 25% of Vitamin C when they are sliced, and they lose 30%, when slices are left standing for an hour. After 3 hours almost 50% of Vitamin C are vanished.

4. Do use all parts of the plants :

Broccolis have more Vitamin A in their leaves, stalks and flower buds than stem.

5. Do save cooking liquids

I) Remember 7 Cancer Warning Signals :

1. A Lump Or Thickening In Breast.
2. A Change In A Wart Or Mole .
3. A Sore That Does Not Heal.
4. A Change In Bowel Habits.
5. A Persistent Cough Or Hoarseness Of Voice.
6. Constant Indigestion Or Trouble Swallowing.
7. Unusual Bleeding Or Discharge.

References :

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3. The Prevention of Cancer Ed by M. Alderson, 1982.
4. The Complete Book of Cancer Prevention Ed by Carol Keough, 1993.
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Performing Arts

Nritya Kala Manjori Indian classical Dance **A traditional study of Bharata Natyam & Manipuri at a glimps**

Sucharita Sharma

Date & Time: 05th March, 2019; 2:15 PM - 5:15 PM

Indian classical dances are definitely the strong pillars of Indian's cultural history. In India, dance is performed on all auspicious occasions like births, marriages, harvest of crops, festivals etc. These dance forms are integral part of life itself whether it is folk or classical. All our Indian classical dances are inspired by 'bhakti' & religion & often mentioned as the path of being united with the god or supreme power.

Amongst the seven Indian classical dances we will try to throw some light on the traditional background, historical aspects, the repertoires & the modern trends of the two renowned classical dances namely Bharata Natyam & Manipuri.

Raga and Realization

Suchisree Ray

Date & Time: 21st February, 2019; 2:15 PM - 5:15 PM

The little girl had the making of a poet in her who, being told to be sure of her meaning before she spoke, said: "how can I know what I think till I see what I say."
Graham Wallas, The Art of Thought.

North Indian classical music is all about expressing one's experience though certain rules and techniques those are to be followed. Two sorts of (classical) musical-forms are there, Dhrupad - the older and conservative genre and kheyal - the younger and democratic one. My genre is kheyal.

The ancient form of classical singing after the Vedic age had been "Dhrupad" and "Dhamar". Basically gods and goddesses were praised through the bandishes (lyrical composition) of Dhrupad; and Dhamar describes the joyful and colourful Hori festival. Thus Dhrupad was very conservative style of singing. Tansen, the legendary vocalist of Akbar the great's Court used to sing dhrupad.

After Islamic invasion in India due to the amalgamation of art and culture between two extremely different religion and country, entire socio-economic character of our country as well as music and its form changed. It must be mentioned that court musicians that time had to perform before a Mughal emperor or Sultan and so influences of Persian music could never be avoided. Thus evolved kheyal (a Persian word) that means imagination. This style gave classical vocalists more freedom and space .

The protagonist of the singing style, may be dhruwad , dhamar or kheyal, is Raga. Raga means mood, or emotion though technically means a phrase of musical notes , may be of five six or eight *swara*-s but not less than four. In the vedic age there were only three notes, one middle, one lower and the other upper, gradually other notes were added and thus it became saptak, the seven notes.

As there were no proper scripture of North Indian classical music, Pandit Bhatkhandeji started working on it(i.e framing the pattern of manifestation, compiling the grammar, and registering the do-s and don't-setc) in the beginning of 20th century though till today it is mostly taught and learnt by listening. It is well understood why, really difficult is the attempt to maintain the authenticity of this core of the core art-form, when we believe in guru shishya parampara, supreme faith in guru, the teacher and his lineage that is Gharana, depending on our limited merit and composure.

The protagonist of north Indian classical music is Raga . Surprisingly, time and hour are mentioned while describing each Raga, like, 'Yaman' is sung in the evening just after dusk. There are ragas, sung in afternoon, moonlit night, midnight, late night, day break. Even the ragas are there for different monsoon like autumn, spring and rainy season! So raga is related to nature and concept of raga emerges out of relation and communication between nature and human being and even with animals.

I personally do feel that we personify a raga while singing. We give him or her a particular character, nature and temperament. It is like portraying someone. He/she may be extrovert, smart and linear; may be shy, introvert and soft. May be, very complicated or simple, bright or sad! We practice difficult vocal workouts to make our voice ready enough to describe and portray apt and appropriate character of the raga.

To be precise my focus in this lecture demonstration will be to focus on how I do relate myself to a specific raga-portrayal and how do i give it a soulful rebirth. I believe it all depends on my approach, reaction and reciprocation towards life and nature. It is more a process of evolution than a process of mathematics.

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